Altitude Business Centre Phase 1

FOCUSED TRAFFIC IMPACT ANALYSIS

CITY OF CHINO

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LIST OF ABBREVIATED TERMS

(1)	Reference
ADT	Average Daily Traffic
CA MUTCD	California Manual on Uniform Traffic Control Devices
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
CMP	Congestion Management Program
DIF	Development Impact Fee
E+P	Existing Plus Project
EIR	Environmental Impact Report
HCM	Highway Capacity Manual
ITE	Institute of Transportation Engineers
LOS	Level of Service
NCHRP	National Cooperative Highway Research Program
PCE	Passenger Car Equivalents
PHF	Peak Hour Factor
Project	Altitude Business Centre Phase 1
RTP	Regional Transportation Plan
SBCTA	San Bernardino County Transportation Authority
SBTAM	San Bernardino Transportation Analysis Model
SCAG	Southern California Association of Governments
SCS	Sustainable Communities Strategy
SF	Square Feet
SR	State Route
TIA	Traffic Impact Analysis
TSF	Thousand Square Feet
v/c	Volume to Capacity Ratio
vphgpl	Vehicles Per Hour Green Per Lane

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1 INTRODUCTION

This report presents the results of the focused traffic impact analysis (TIA) for the proposed Altitude Business Centre Phase 1 development ("Project"), which is located west of Mayhew Avenue and south of Kimball Avenue in the City of Chino, as shown on Exhibit 1-1.

The purpose of this focused TIA is to evaluate the potential circulation system deficiencies that may result from the development of the proposed Project, and where necessary recommend improvements to achieve acceptable operations consistent with General Plan level of service goals and policies. This traffic study has been prepared in accordance with the San Bernardino County Congestion Management Program (CMP) Guidelines for CMP Traffic Impact Analysis Reports (Appendix B, 2016 Update), the California Department of Transportation (Caltrans) Guide for the Preparation of Traffic Impact Studies (December 2002), and consultation with City staff during the traffic study scoping process. (1) (2) The City approved Project Traffic Study Scoping agreement is provided in Appendix 1.1 of this TIA.

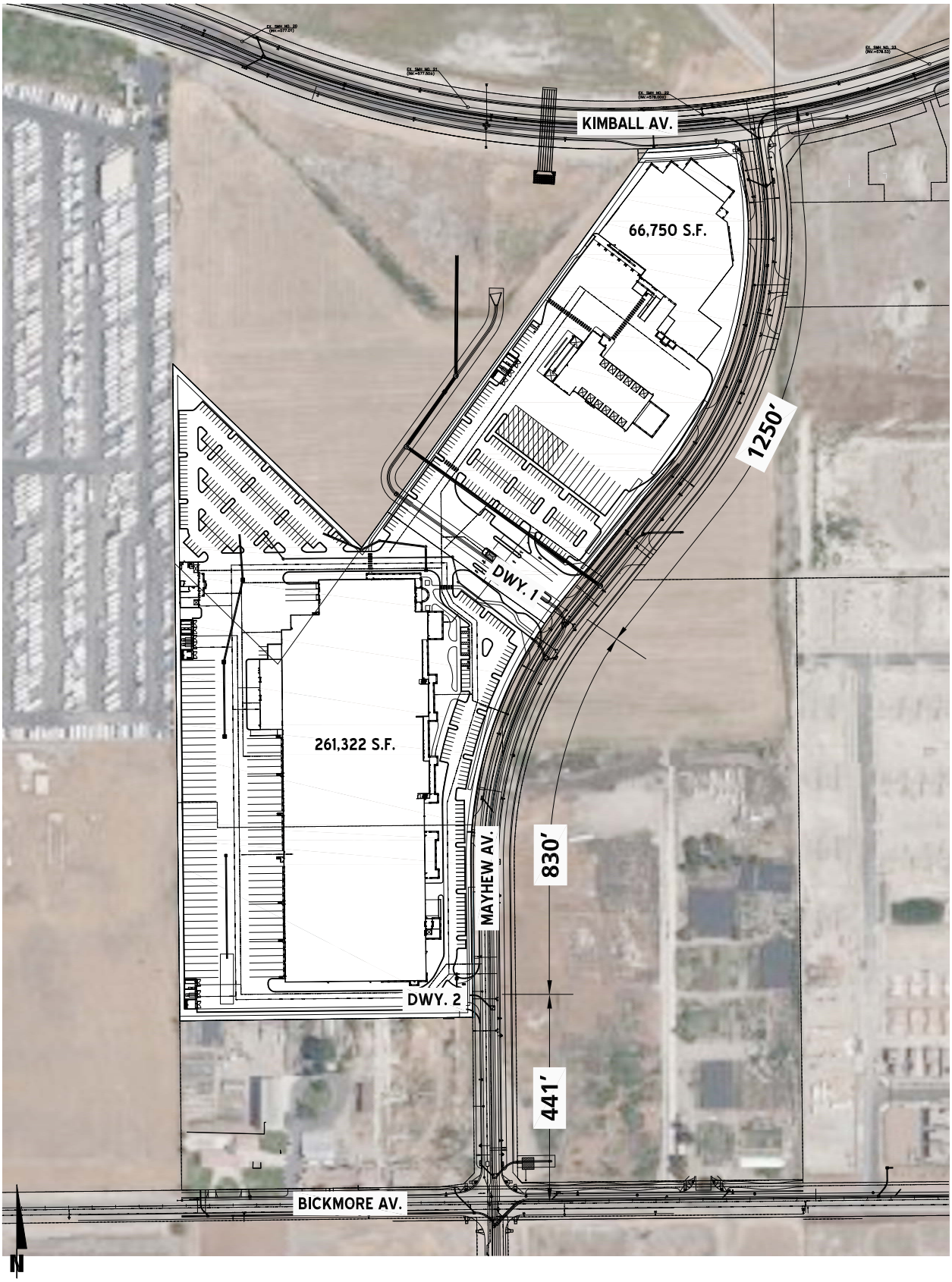
1.1 SUMMARY OF FINDINGS

The Project shall ensure that the following improvements are in place prior to the issuance of the occupancy permit:

- At the intersection of Mayhew Avenue and Kimball Avenue: traffic signal with a northbound left turn lane with a minimum of 150-feet of storage, a northbound right turn lane, an eastbound right turn lane with a minimum of 165-feet of storage, and a westbound left turn lane with a minimum of 100-feet of storage.
- At the intersection of Mayhew Avenue and Bickmore Avenue: stop control on the southbound approach with a southbound left turn lane with a minimum of 130-feet of storage, a southbound right turn lane, and an eastbound left turn lane with a minimum of 100-feet of storage.
- At the intersections of Driveway 1 at Mayhew Avenue and Driveway 2 at Mayhew Avenue, the Project is to install a stop control on the eastbound approach, with a northbound left turn lane within the painted median, northbound through lane, a southbound shared through-right turn lane, and an eastbound shared left-right turn lane.
- Mayhew Avenue from Kimball Avenue to Bickmore Avenue is to be constructed to its ultimate full-section width as a commercial collector with paseo (92-foot right-of-way) in compliance with the circulation recommendations found in the Altitude Business Centre TIA (dated March 4, 2019) (hereafter referred to as the "March 2019 Traffic Study"). (3)
- Kimball Avenue from the Project's western boundary to Mayhew Avenue is to be constructed to its ultimate full-section width as a major arterial highway with Paseo (124-foot right-of-way), consistent with the circulation recommendations found in the March 2019 Traffic Study. (3)

Additional details are provided in Section 1.6 *Recommendations* of this report.

EXHIBIT 1-1: PRELIMINARY SITE PLAN



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The intersection of Euclid Avenue (SR-83) at Pine Avenue currently operates at a deficient level of service (LOS) and will continue to operate at a deficient LOS for each of the future analysis scenarios; however, the Project is anticipated to contribute less than 50 peak hour trips to this intersection, so no Project-related improvements have been recommended. The following intersection is anticipated to operate at a deficient LOS under Opening Year Cumulative (2022) With Project traffic conditions in addition to the location identified under Existing traffic conditions:

- Euclid Avenue (SR-83) & Merrill Avenue (#1) – LOS E PM peak hour only

The following intersections are anticipated to operate at a deficient LOS under Horizon Year (2040) With Project traffic conditions:

- Euclid Avenue (SR-83) & Merrill Avenue (#1) – LOS F AM and PM peak hours
- Euclid Avenue (SR-83) & Kimball Avenue (#2) – LOS E AM peak hour; LOS F PM peak hour
- Euclid Avenue (SR-83) & Bickmore Avenue (#3) – LOS F AM peak hour; LOS E PM peak hour
- Euclid Avenue (SR-83) & Pine Avenue (#4) – LOS F AM and PM peak hours
- Mayhew Avenue & Kimball Avenue (#5) – LOS E PM peak hour only

The proposed Project is anticipated to contribute traffic to these intersections (as measured by 50 or more peak hour trips). All locations along Euclid Avenue (SR-83) were also previously identified as deficient locations in the TIA and Environmental Impact Report (EIR) prepared for the Altitude Business Centre development.

1.2 PROJECT OVERVIEW

Exhibit 1-1 illustrates the preliminary Project site plan. As shown on Exhibit 1-1, the development of the proposed Project is to consist of up to 284,996 square feet (sf) of warehousing use with a 66,779 sf sharehouse/cookout building and 24,429 sf fleet building. For the purposes of this analysis, the Project is proposed to be developed in a single phase with an anticipated Opening Year of 2022.

The trip generation for the proposed Project is based on user-specific data supplied by the Project Applicant. The data supplied by the user is based on a combination of operational characteristics of other similar sites and anticipated operations for the proposed facility. The proposed Project is anticipated to generate a total of 1,532 actual vehicle trip-ends per day with 129 AM peak hour trips and 174 PM peak hour trips. In comparison to the actual vehicles, the proposed Project is anticipated to generate a total of 1,796 passenger car equivalents (PCE) trip-ends per day, 137 PCE AM peak hour trips and 187 PCE PM peak hour trips.

1.3 ANALYSIS SCENARIOS

For the purposes of this traffic study, potential traffic impacts have been assessed for each of the following conditions:

- Existing (2019)
- Existing plus Project (E+P)
- Opening Year Cumulative (2022) Without Project
- Opening Year Cumulative (2022) With Project
- Horizon Year (2040) Without Project
- Horizon Year (2040) With Project

1.3.1 EXISTING (2019) CONDITIONS

Information for Existing (2019) conditions is disclosed to represent the baseline traffic conditions as they existed at the time this report was prepared.

1.3.2 EXISTING PLUS PROJECT CONDITIONS

The Existing plus Project (E+P) analysis determines significant traffic impacts that would occur on the existing roadway system with the addition of Project traffic.

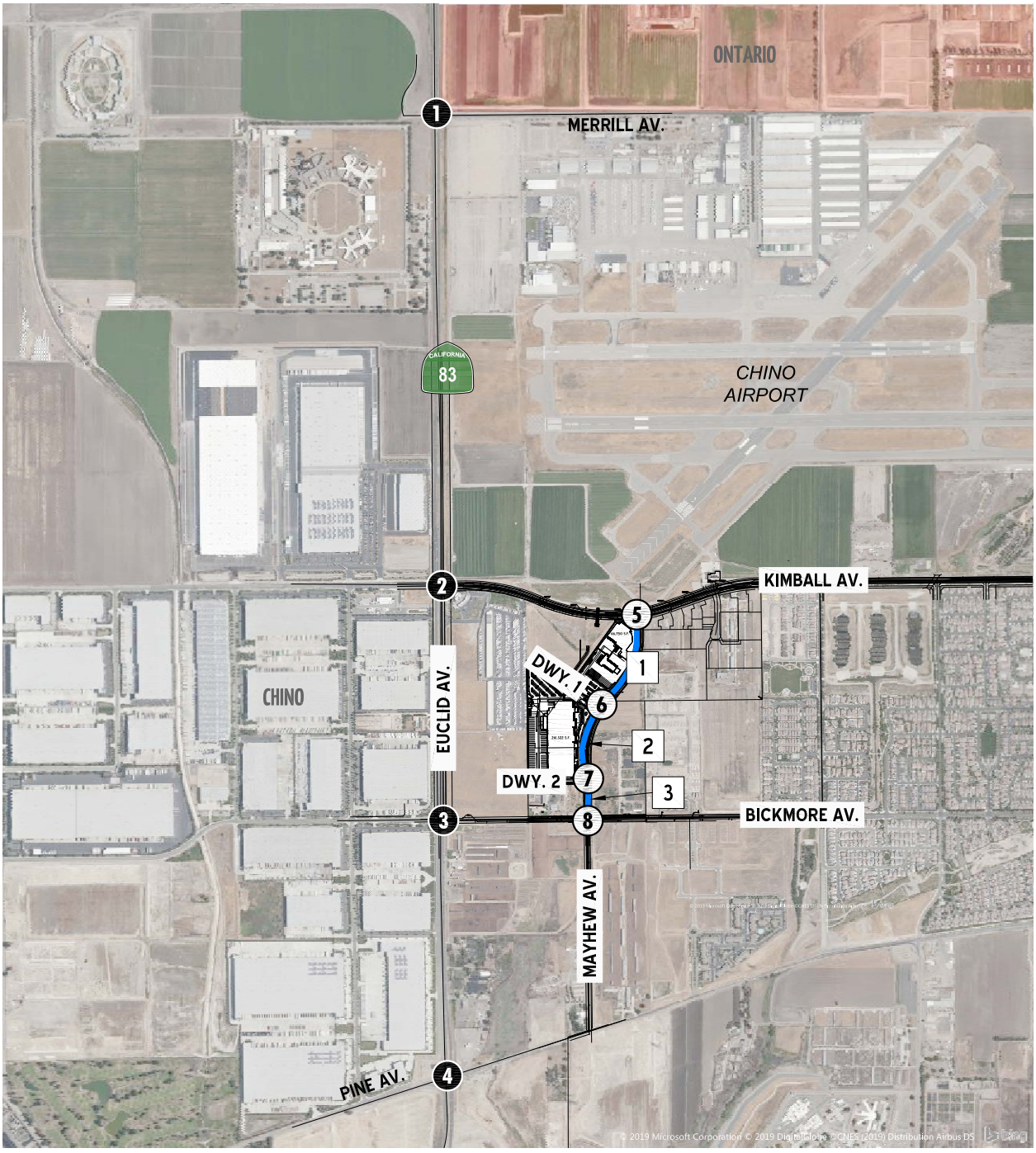
1.3.3 OPENING YEAR CUMULATIVE (2022) CONDITIONS

The Opening Year Cumulative conditions analysis determines the potential near-term cumulative circulation system deficiencies. To account for background traffic growth, traffic associated with other known cumulative development projects in conjunction with an ambient growth factor from Existing conditions of 2% per year (compounded annually) are included for Opening Year Cumulative (2022) traffic conditions. This comprehensive list was compiled from information provided by the City of Chino and other near-by agencies.

1.3.4 HORIZON YEAR (2040) CONDITIONS

Traffic projections for Horizon Year (2040) with Project conditions were derived from the San Bernardino Transportation Analysis Model (SBTAM) that has been modified to represent buildout of the City of Chino. The Horizon Year (2040) conditions analysis will be utilized to determine if improvements funded through regional transportation mitigation fee programs, such as the City's Development Impact Fee (DIF) program, or other approved funding mechanisms can accommodate the long-range cumulative traffic at the target LOS identified by the City of Chino (lead agency). It should be noted that the City of Chino has updated their DIF program to also include appropriate contributions towards regionally significant improvements that have been identified via the San Bernardino County CMP regional fee program study. If the planned and funded improvements can provide the target LOS, then the Project's payment into established fee programs will be considered as cumulative improvements. Other improvements needed beyond the "funded" improvements (such as localized improvements to non-DIF facilities) are identified as such.

EXHIBIT 1-2: LOCATION MAP



LEGEND:

0 = EXISTING INTERSECTION ANALYSIS LOCATION

(0) = FUTURE INTERSECTION ANALYSIS LOCATION

00 = ROADWAY SEGMENT ANALYSIS LOCATION

N

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1.4 STUDY AREA

To ensure that this TIA satisfies the City of Chino's traffic study requirements, Urban Crossroads, Inc. prepared a project traffic study scoping package for review by City staff prior to the preparation of this report. The Agreement provides an outline of the Project study area, trip generation, trip distribution, and analysis methodology.

1.4.1 INTERSECTIONS

The following 8 study area intersections shown on Exhibit 1-2 and listed in Table 1-1 were selected for this TIA based on consultation with City of Chino staff.

TABLE 1-1: INTERSECTION ANALYSIS LOCATIONS

ID	Intersection Location	Jurisdiction	CMP?
1	Euclid Av. (SR-83) & Merrill Av.	Chino, Caltrans, Ontario	No
2	Euclid Av. (SR-83) & Kimball Av.*	Chino, Caltrans	No
3	Euclid Av. (SR-83) & Bickmore Av.*	Chino, Caltrans	No
4	Euclid Av. (SR-83) & Pine Av.	Chino, Caltrans	No
5	Mayhew Av. & Kimball Av. – Future Intersection	Chino	No
6	Mayhew Av. & Driveway 1 – Future Intersection	Chino	No
7	Mayhew Av. & Driveway 2 – Future Intersection	Chino	No
8	Mayhew Av. & Bickmore Av. – Future Intersection	Chino	No

* Note: At the request of City staff, 95th percentile queue also evaluated for each analysis scenario.

The "50 peak hour trip" criterion utilized by the City of Chino and the City of Ontario is consistent with the methodology employed by the County of San Bernardino, and generally represents a minimum number of trips at which a typical intersection would have the potential to be substantively impacted by a given development proposal. Although each intersection may have unique operating characteristics, this traffic engineering rule of thumb is a widely utilized tool for estimating a potential area of impact (i.e., study area).

The Project is anticipated to contribute less than 50 peak hour trips to the intersection of Euclid Avenue (SR-83) and Bickmore Avenue and Euclid Avenue (SR-83) and Pine Avenue for near-term traffic conditions (E+P and Opening Year Cumulative traffic conditions). The Project would contribute 50 or more peak hour trips to all other locations during one or more peak hours for all analysis scenarios.

The intent of a CMP is to more directly link land use, transportation, and air quality, thereby prompting reasonable growth management programs that will effectively utilize new transportation funds, alleviate traffic congestion and related impacts, and improve air quality. Counties within California have developed CMPs with varying methods and strategies to meet the intent of the CMP legislation. There are no study area intersections that are identified as CMP facilities in the County of San Bernardino per the San Bernardino County Transportation Authority (SBCTA) CMP. (1)

1.4.2 ROADWAY SEGMENTS

At the request of City staff, daily volume-to-capacity (v/c) have been evaluated for the following roadway segments list in Table 1-2 for all "With Project" analysis scenarios only (do not exist for "Without Project" traffic conditions):

TABLE 1-2: ROADWAY SEGMENT ANALYSIS LOCATIONS

ID	Roadway Segments
1	Mayhew Av., Kimball Av. to Driveway 1 – Future Segment
2	Mayhew Av., Driveway 1 to Driveway 2 – Future Segment
3	Mayhew Av., Driveway 2 to Bickmore Av. – Future Segment

1.5 ANALYSIS FINDINGS

This section provides a summary of potential Project traffic impacts. Section 2 *Methodologies* provides information on the methodologies used in the analysis and results found in Section 3 *Area Conditions*, Section 5 *E+P Traffic Conditions*, Section 6 *Opening Year Cumulative (2022) Traffic Conditions*, and Section 7 *Horizon Year (2040) Traffic Conditions* includes the detailed analysis. A summary of LOS results for all analysis scenarios is presented on Exhibit 1-3.

Existing Conditions:

The intersection of Euclid Avenue (SR-83) and Pine Avenue currently operates at a deficient LOS during the PM peak hour only. Roadway segments were not evaluated for Existing conditions. The following movements are currently experiencing queuing issues based on the 95th percentile peak hour traffic flows:

- Euclid Avenue (SR-83) & Kimball Avenue (#3), eastbound left turn lane – PM peak hour only
- Euclid Avenue (SR-83) & Bickmore Avenue (#3), southbound left turn lane – PM peak hour only
- Euclid Avenue (SR-83) & Bickmore Avenue (#3), westbound left turn lane – AM peak hour only

E+P Conditions:

Although the Project is anticipated to contribute to the deficient intersection of Euclid Avenue (SR-83) and Pine Avenue intersection, the Project is anticipated to contribute less than 50 peak hour trips under E+P traffic conditions. As such, improvements have not been recommended.

All of the study area roadway segments are anticipated to operate at an acceptable LOS for E+P traffic conditions. There are no additional movements anticipated to experience queuing issues based on the 95th percentile peak hour traffic flows in addition to the movements previously identified under Existing (2019) traffic conditions.

EXHIBIT 1-3: SUMMARY OF DEFICIENT INTERSECTIONS BY ANALYSIS SCENARIO

#	Intersection	Existing (2019)	E+P	Opening Year Cumulative (2022) Without Project	Opening Year Cumulative (2022) With Project	Horizon Year (2040) Without Project	Horizon Year (2040) With Project
1	Euclid Av. (SR-83) & Merrill Av.						
2	Euclid Av. (SR-83) & Kimball Av.						
3	Euclid Av. (SR-83) & Bickmore Av.						
4	Euclid Av. (SR-83) & Pine Av.						
5	Mayhew Av. & Kimball Av.	NA		NA		NA	
6	Mayhew Av. & Dwy. 1	NA		NA		NA	
7	Mayhew Av. & Dwy. 2	NA		NA		NA	
8	Mayhew Av. & Bickmore Av.	NA		NA		NA	

LEGEND:

- = AM PEAK HOUR
- = PM PEAK HOUR
- = LOS A-D
- = LOS E
- = LOS F

NA = NOT AN ANALYSIS LOCATION FOR THIS SCENARIO

Opening Year Cumulative (2022) Conditions:

The following study area intersections are anticipated to operate at a deficient LOS during one peak hour for Opening Year Cumulative (2022) Without Project traffic conditions:

- Euclid Avenue (SR-83) & Merrill Avenue (#1) –LOS E PM peak hour only
- Euclid Avenue (SR-83) & Pine Avenue (#4) –LOS F PM peak hour only

There are no additional study area intersections anticipated to operate at a deficient LOS during one or both peak hours for Opening Year Cumulative (2022) With Project traffic conditions, in addition to the intersections identified under Opening Year Cumulative (2022) Without Project traffic conditions. These intersections were previously identified as a deficient location in the TIA and EIR prepared for the Altitude Business Centre development for Opening Year Cumulative traffic conditions. The Project is anticipated to contribute to the deficiency at Euclid Avenue (SR-83) and Merrill Avenue only by adding traffic (as measured by 50 or more peak hours trips) to deficient pre-project operations resulting in an increase to peak hour delays.

Roadway segment analysis was not conducted for Opening Year Cumulative (2022) Without Project traffic conditions and all of the study area roadway segments are anticipated to operate at an acceptable LOS for Opening Year Cumulative (2022) With Project traffic conditions. The following movements are anticipated to experience queuing issues based on the 95th percentile peak hour traffic flows for both Opening Year Cumulative (2022) Without and With Project traffic conditions:

- Euclid Avenue (SR-83) & Kimball Avenue (#2), eastbound left turn lane – PM peak hour only
- Euclid Avenue (SR-83) & Bickmore Avenue (#3), southbound left turn lane – PM peak hour only
- Euclid Avenue (SR-83) & Bickmore Avenue (#3), eastbound left turn lane – PM peak hour only
- Euclid Avenue (SR-83) & Bickmore Avenue (#3), westbound left turn lane – AM peak hour only

Horizon Year (2040) Conditions:

The following study area intersections are anticipated to operate at a deficient LOS during one or both peak hours for Horizon Year (2040) Without Project traffic conditions. The Project is anticipated to contribute to these deficiencies by adding traffic (as measured by 50 or more peak hours trips) to already deficient intersections resulting in an increase to peak hour delays. The Project would contribute traffic to the following deficient facilities:

- Euclid Avenue (SR-83) & Merrill Avenue (#1) – LOS F AM and PM peak hours
- Euclid Avenue (SR-83) & Kimball Avenue (#2) – LOS E AM peak hour; LOS F PM peak hour
- Euclid Avenue (SR-83) & Bickmore Avenue (#3) – LOS E PM peak hour only
- Euclid Avenue (SR-83) & Pine Avenue (#4) – LOS F AM and PM peak hours

With the addition of Project traffic, the following additional study area intersection is anticipated to operate at a deficient LOS for Horizon Year (2040) With Project traffic conditions:

- Mayhew Avenue & Kimball Avenue (#5) – LOS E PM peak hour only

These intersections were previously identified as deficient locations in the TIA and EIR prepared for the Altitude Business Centre development.

Roadway segment analysis was not conducted for Horizon Year (2040) Without Project traffic conditions and all of the study area roadway segments are anticipated to operate at an acceptable LOS for Horizon Year (2040) With Project traffic conditions. The following movements are anticipated to experience queuing issues based on the 95th percentile peak hour traffic flows for both Horizon Year (2040) Without and With Project traffic conditions:

- Euclid Avenue (SR-83) & Kimball Avenue (#2), eastbound left turn lane – PM peak hour only
- Euclid Avenue (SR-83) & Kimball Avenue (#2), westbound left turn lane – AM peak hour only
- Euclid Avenue (SR-83) & Bickmore Avenue (#3), northbound left turn lane – AM peak hour only
- Euclid Avenue (SR-83) & Bickmore Avenue (#3), southbound left turn lane – AM and PM peak hours
- Euclid Avenue (SR-83) & Bickmore Avenue (#3), eastbound left turn lane – PM peak hour only
- Euclid Avenue (SR-83) & Bickmore Avenue (#3), westbound left turn lane – AM peak hour only

1.6 RECOMMENDATIONS

1.6.1 SITE ADJACENT AND SITE ACCESS RECOMMENDATIONS

The Project shall ensure that the following improvements are in place prior to the issuance of the occupancy permit. Exhibit 1-4 shows the site adjacent recommendations.

Recommendation 1.1 – Mayhew Avenue & Kimball Avenue (#5):

- Traffic signal with a northbound left turn lane with a minimum of 150-feet of storage, a northbound right turn lane, an eastbound right turn lane with a minimum of 165-feet of storage, and a westbound left turn lane with a minimum of 100-feet of storage.

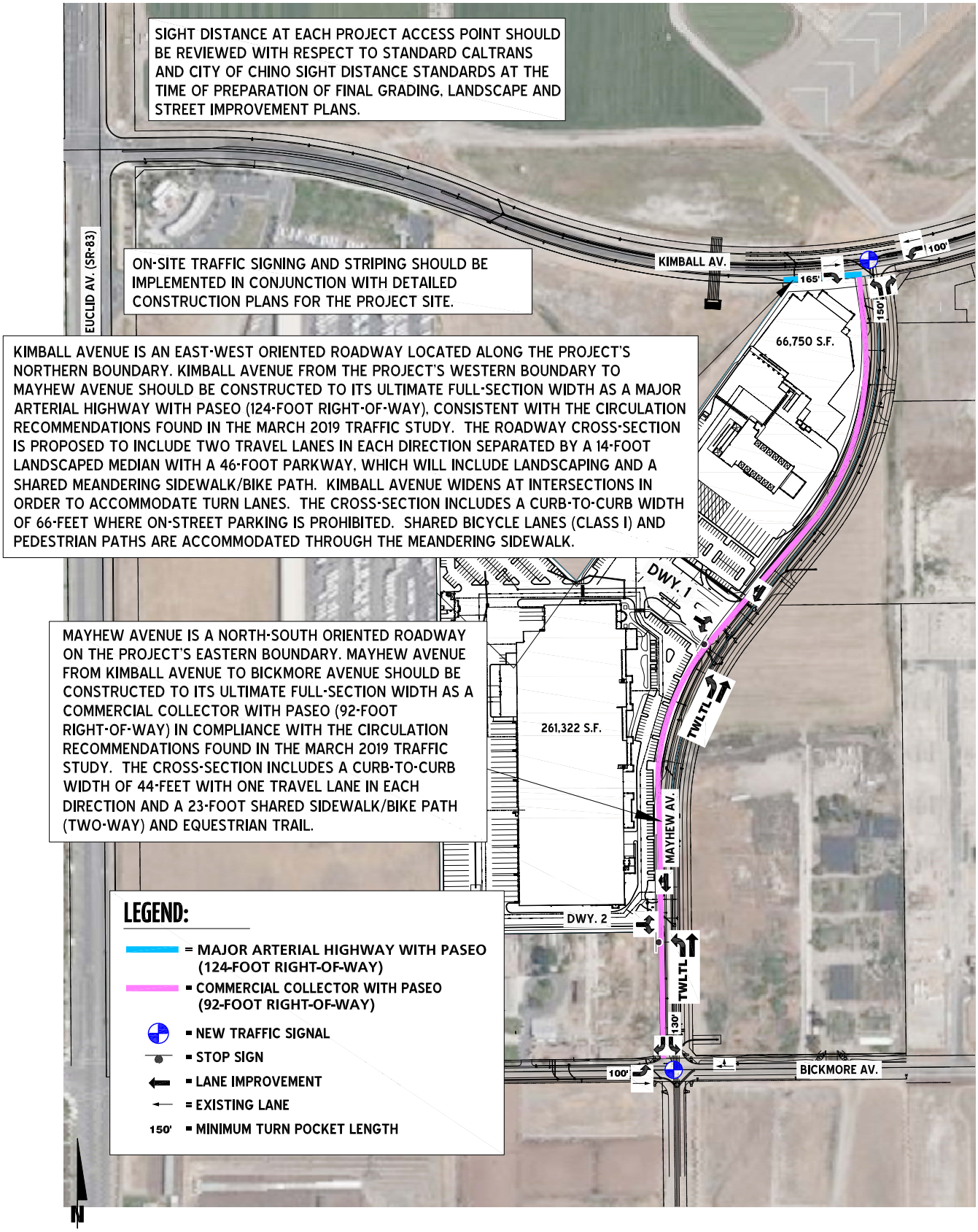
Recommendation 2.1 – Mayhew Avenue & Driveway 1 (#6):

- Project to install a stop control on the eastbound approach with a northbound left turn lane within the painted median, a northbound through lane, a southbound shared through-right turn lane, and an eastbound shared left-right turn lane.

Recommendation 3.1 – Mayhew Avenue & Driveway 2 (#7):

- Project to install a stop control on the eastbound approach with a northbound left turn lane within the painted median, a northbound through lane, a southbound shared through-right turn lane, and an eastbound shared left-right turn lane.

EXHIBIT 1-4: SITE ADJACENT ROADWAY AND SITE ACCESS RECOMMENDATIONS



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Recommendation 4.1 – Mayhew Avenue & Bickmore Avenue (#8):

- Stop control on the southbound approach with a southbound left turn lane with a minimum of 130-feet of storage, a southbound right turn lane, and an eastbound left turn lane with a minimum of 100-feet of storage.

Recommendation 5.1 – Mayhew Avenue is a north-south oriented roadway located on the Project's eastern boundary. Mayhew Avenue from Kimball Avenue to Bickmore Avenue should be constructed to its ultimate full-section width as a commercial collector with paseo (92-foot right-of-way) in compliance with the circulation recommendations found in the March 2019 Traffic Study. The cross-section includes a curb-to-curb width of 44-feet with one travel lane in each direction and a 23-foot shared sidewalk/bike path (two-way) and equestrian trail.

Recommendation 6.1 – Kimball Avenue – Kimball Avenue is an east-west oriented roadway located along the Project's northern boundary. Kimball Avenue from the Project's western boundary to Mayhew Avenue should be constructed to its ultimate full-section width as a major arterial highway with Paseo (124-foot right-of-way), consistent with the circulation recommendations found in the March 2019 Traffic Study. The roadway cross-section is proposed to include two travel lanes in each direction separated by a 14-foot landscaped median with a 46-foot parkway, which will include landscaping and a shared meandering sidewalk/bike path. Kimball Avenue widens at intersections in order to accommodate turn lanes. The cross-section includes a curb-to-curb width of 66-feet where on-street parking is prohibited. Shared bicycle lanes (Class I) and pedestrian paths are accommodated through the meandering sidewalk.

On-site traffic signing and striping should be implemented agreeable with the provisions of the California Manual on Uniform Traffic Control Devices (CA MUTCD) and in conjunction with detailed construction plans for the Project site.

Sight distance at each project access point should be reviewed with respect to standard Caltrans and City of Chino sight distance standards at the time of preparation of final grading, landscape and street improvement plans.

1.6.2 OFF-SITE RECOMMENDATIONS

Table 1-3 lists the incremental improvements that are required for each analysis scenario from Existing to Horizon Year (2040) traffic conditions to alleviate circulation system deficiencies. The regional and local transportation impact fee programs have each been reviewed and compared to the recommended improvements for each impacted facility. Recommended improvements already identified and included in the City of Chino DIF are clearly denoted. If an impacted facility was found to require improvements to transportation facilities not identified in the fee program, the Project would be required to contribute to the associated intersection or roadway fair-share percentage toward the costs of the recommended improvements. The construction of facilities by the Project Applicant would be eligible for DIF credit and reimbursement (if the costs of construction exceed the Project's fair share contribution or amount of DIF payment), as identified in Table 1-3. These fees are collected as part of a funding mechanism aimed at ensuring that regional highways and arterial expansions keep pace with the projected vehicle trip increases.

The improvements listed in Table 1-3 comprise lane additions/modifications and installation of signals. As shown in Table 1-3, the identified improvements are all covered by the City of Chino DIF Program. Depending on the width of the existing pavement and right-of-way, these improvements may involve only striping modifications, or they may involve construction of additional pavement width. Additional discussion of the relevant pre-existing transportation impact fee programs is provided in Section 8 *Local and Regional Funding Mechanisms.*

Recommendation 7.1 – Prior to the issuance of occupancy permit, the Project Applicant shall participate in the City's city-wide DIF program by paying the requisite DIF fee. DIF fees may be reduced or off-set based on the cost DIF eligible facilities constructed by the Project Applicant. The following intersections are included in the City's DIF program, which the Project would be contributing to future improvements through the payment of fees:

- Euclid Avenue (SR-83) & Merrill Avenue (#1)
- Euclid Avenue (SR-83) & Kimball Avenue (#2)
- Euclid Avenue (SR-83) & Bickmore Avenue (#3)
- Euclid Avenue (SR-83) & Pine Avenue (#4)
- Mayhew Avenue & Kimball Avenue (#5)

Recommendation 8.1 – Prior to the issuance of occupancy permit, the Project Applicant shall pay the Project's fair share amount of $2,266 for the improvements identified in Table 1-3 at intersections located within the City of Chino.

Recommendation 9.1 – Table 1-3 of the TIA includes intersections that either share a mutual border with or are wholly located within the City of Ontario that have recommended improvements which are not covered by DIF. Because the City of Chino does not have plenary control over intersections that share a border with these other agencies, the City cannot guarantee that such improvements will be constructed. Thus, the following additional recommendations is required: The City of Chino shall participate in a multi-jurisdictional effort with the City of Ontario to develop a study to identify fair share contribution funding sources attributable to and paid from private and public development to supplement other regional and State funding sources necessary to implement the improvements identified in Table 1-3 of the TIA, that are located in these other jurisdictions. The study shall include fair-share contributions related to private and or public development based on nexus requirements contained in the Mitigation Fee Act (Govt. Code § 66000 et seq.) and 14 Cal. Code of Regs. § 15126.4(a)(4) and, to this end, the study shall recognize that impacts attributable to the City of Ontario facilities that are not attributable to development located within the City of Chino are not paying in excess of such developments' fair share obligations. The fee study shall also be compliant with Government Code § 66001(g) and any other applicable provisions of law. The study shall set forth a timeline and other agreed-upon relevant criteria for implementation of the recommendations contained within the study to the extent the other agencies agree to participate in the fee study program. Because the City of Chino and these other agencies are responsible to implement this recommendation, Developer shall have no compliance obligations with respect to this Recommendation.

Recommendation 9.2 – The Developer's fair-share amount for the intersections that either share a mutual border with or are wholly located within the City of Ontario that have recommended improvements which are not covered by DIF are as follows:

- City of Ontario: $3,399

Developer shall be required to pay the amount shown above to the City of Chino prior to the issuance of the Project's final certificate of occupancy. The City of Chino shall hold Developer's Fair Share contribution in trust and shall apply Developer's Fair Share Contribution to any fee program adopted or agreed upon by the City of Chino and other agencies as a result of implementation of Recommendation 9.1. If, within five years of the date of collection of Developer's Fair Share Contribution, the City of Chino and other agencies do not comply with Recommendation 9.1, then Developer's Fair Share Contribution shall be returned to the Developer.

1.6.3 SITE ADJACENT QUEUING ANALYSIS

A queuing analysis was conducted at the site adjacent intersections and Project driveways for Horizon Year (2040) With Project traffic conditions to determine the turn pocket lengths necessary to accommodate near-term 95th percentile queues. The analysis was conducted for the weekday AM and weekday PM peak hours.

SimTraffic is designed to model networks of signalized and unsignalized intersections, with the primary purpose of checking and fine-tuning signal operations. SimTraffic uses the input parameters from Synchro to generate random simulations. The random simulations generated by SimTraffic have been utilized to determine the 95th percentile queue lengths observed for each turn lane. A SimTraffic simulation has been recorded 5 times, during the weekday AM and weekday PM peak hours, and has been seeded for 30-minute periods with 60-minute recording intervals. The 95th percentile queue is derived from the average queue plus 1.65 standard deviations. The 95th percentile queue is not necessarily ever observed; it is simply based on statistical calculations. The turn pocket storage length recommendations shown on Exhibit 1-4 are based on the queuing analysis findings. The queuing worksheets have been provided in Appendix 1.2.

Table 1-3

Summary of Improvements and Rough Order of Magnitude Costs

#	Intersection Location	Jurisdiction	Existing (2019)	E+P	2022 Without Project	2022 With Project	2040 Without Project	2040 With Project	Improvements in City DIF?[1]	DIF Project #	Project Responsibility[9]	Total Cost[2,3,4]	Fair Share %[4]	Fair Share Cost[5]
1	Euclid Av. (SR-83) & Merrill Av.	Caltrans, Chino, Ontario	None	None	Add 3rd NB through lane	Same	Same	Same	Yes	TR-166	Fees		2.891%	
					Add 3rd SB through lane	Same	Same	Same	Yes	TR-028	Fees			
							Add 2nd SB left turn lane	Same	Yes	TR-028	Fees			
							Add EB left turn lane	Same	No		Fair Share	$78,400		$2,266
							Add WB left turn lane	Same	Yes	TR-028	Fees			
							Add 2nd WB left turn lane	Same	Yes	TR-028	Fees			
							Add WB right turn lane	Same	Yes	TR-028	Fees			
							Modify the traffic signal to implement overlap phasing for the WB right turn lane	Same	No		Fair Share	$117,600		$3,399
											Total	**$196,000**		**$5,666**
2	Euclid Av. (SR-83) & Kimball Av.	Caltrans, Chino	None	None	None	None	Add 3rd NB through lane	Same	Yes	TR-166	Fees		--	
							Add 3rd SB through lane	Same	Yes	TR-166	Fees			
							Add 2nd WB left turn lane	Same	Yes	TR-166	Fees			
							Modify the traffic signal to implement overlap phasing for the SB right turn lane	Same	Yes	TR-128	Fees			
											Total	**$0**		**$0**
3	Euclid Av. (SR-83) & Bickmore Av.	Caltrans, Chino	None	None	None	None	Add 3rd NB through lane	Same[10]	Yes	TR-166	Fees		--	
							Add 3rd SB through lane	Same[10]	Yes	TR-166	Fees			
							Add NB right turn lane	Same[10]	Yes	TR-129	Fees			
							Add 2nd SB left turn lane	Same[10]	Yes	TR-129	Fees			
							Add NB right turn lane	Same[10]	Yes	TR-129	Fees			
							Add 2nd SB left turn lane	Same[10]	Yes	TR-129	Fees			
							Add 2nd WB left turn lane	Same[10]	Yes	TR-129	Fees			
							Add WB right turn lane	Same[10]	Yes	TR-129	Fees			
											Total	**$0**		**$0**
4	Euclid Av. (SR-83) & Pine Av.	Caltrans, Chino	Add 2nd NB right turn lane	Same[10]	Same	Same[10]	Same	Same	Yes	TR-166	Fees		--	
					Add 3rd NB through lane		Same	Same	Yes	TR-166	Fees			
					Add 3rd SB through lane		Same	Same	Yes	TR-130	Fees			
							Add 2nd NB left turn lane	Same	Yes	TR-130	Fees			
							Add 2nd SB left turn lane	Same	Yes	TR-130	Fees			
							Add SB right turn lane	Same	Yes	TR-130	Fees			
							Add 2nd EB through lane	Same	Yes	TR-165	Fees			
							Add 2nd WB through lane	Same	Yes	TR-130	Fees			
							Add WB right turn lane	Same	Yes	TR-122	Fees			
											Total	**$0**		**$0**

Table 1-3
Page 2 of 2

Summary of Improvements and Rough Order of Magnitude Costs

#	Intersection Location	Jurisdiction	Existing (2019)	E+P	2022 Without Project	2022 With Project	2040 Without Project	2040 With Project	Improvements in City DIF?[1]	DIF Project #	Project Responsibility[9]	Total Cost[2,3,4]	Fair Share %[4]	Fair Share Cost[5]
5	Mayhew Av. & Kimball Av.	Chino	None	None	None	None	Install a traffic signal	Same		TR-151	Construct		--	
							Add NB left turn lane	Same		TR-115	Construct			
							Add NB right turn lane	Same		TR-115	Construct			
							Add 2nd EB through lane	Same		TR-121	Fees			
							Add EB right turn lane	Same		TR-115	Construct			
							Add WB left turn lane	Same		TR-115	Construct			
							Add 2nd WB through lane	Same		TR-121	Fees			
											Total	**$0**		**$0**
Total Costs for Horizon Year (2040) Improvements												**$196,000**		**$5,666**
Total Project Fair Share Contribution to the City of Chino (non-DIF/other)[6]												**$2,266**		
Total Project Fair Share Contribution to the City of Ontario[7]												**$3,399**		
Total Project Fair Share Contribution to Caltrans[8]												**$0**		

[1] Improvements included in City of Chino DIF program for local, regional and specific plan components (City of Chino Development Impact Fee Nexus and Calculation Report, December 28, 2017).

[2] Costs have been estimated using the data provided in Appendix "G" of the CMP (2003 Update) for preliminary construction costs.

[3] Appendix "G" costs escalated by a factor of 1.568 per City direction except Traffic Signals.

[4] Program improvements constructed by project may be eligible for fee credit, at discretion of City. See Table 8-2 for Fair Share Calculations.

[5] Rough order of magnitude fair share cost estimate.

[6] Total project fair share contribution consists of the improvements which are not already included in the City-wide (Preserve) DIF for those intersections wholly or partially within the City of Chino.

[7] Total project fair share contribution consists of the improvements which are not already included in a fee program for those intersections wholly or partially within the City of Ontario.

[8] Total project fair share contribution consists of the improvements which are not already included in in a fee program for those intersections wholly or partially within the jurisdiction of Caltrans.

[9] Identifies the Project's responsibility to construct an improvement or contribute fair share towards the implementation of the improvement shown.

[10] Project contributes less than 50 peak hour trips.

1.7 TRUCK ACCESS

Due to the typical wide turning radius of large trucks, a truck turning template has been overlaid on the site plan at each applicable Project driveway anticipated to be utilized by heavy trucks in order to determine appropriate curb radii and to verify that trucks will have sufficient space to execute turning maneuvers (see Exhibit 1-5). A WB-67 (53-foot trailer) has been utilized for the purposes of this analysis. This is based on the types of trucks that would likely be attributable to the proposed buildings based on their size.

As shown on Exhibit 1-5, the following change is necessary in order to accommodate the ingress and egress of heavy trucks:

- Driveway 1 on Mayhew Avenue should be modified to provide a 60-foot curb radius on the southwest corner.

Mayhew Avenue and Bickmore Avenue is anticipated to accommodate the wide turning radius of the heavy trucks as proposed and no additional modifications are necessary (consistent with the March 2019 Traffic Study). (3)

1.8 SIGHT DISTANCE ANALYSIS

Sight distance has been evaluated for all study area intersections along Mayhew Avenue. As defined by the California Department of Transportation (Caltrans) Highway Design Manual, sight distance is the continuous length of highway ahead visible to the driver.

At unsignalized intersections, corner sight distance must provide a substantially clear line of sight between the driver of the vehicle waiting on the minor road (driveway) and the driver of an approaching vehicle. For the purposes of this analysis, a 7 ½ second criterion has been applied to the outside travel lanes in either direction to provide the most conservative sight distance. The 7 ½ second criterion allows waiting vehicles to either cross all lanes of through traffic by turning left or cross the near lanes by turning right without requiring through traffic to radically alter their speed.

Adequate visibility for vehicular and pedestrian traffic can be provided at each Project driveway by limiting sight obstructions within the limited use area. Any landscaping/hardscape within the limited use area should not exceed 30-inches (2.5-feet) in height. The limited use area should be kept clear of any landscaping or any other obstructions that may impede the visibility of the driver, including on-street parking. Minimum corner sight distance for the Project driveways is illustrated on Exhibit 1-6, however, sight distance should be re-evaluated in the field once the driveway has been constructed.

EXHIBIT 1-5 (1OF3): TRUCK ACCESS

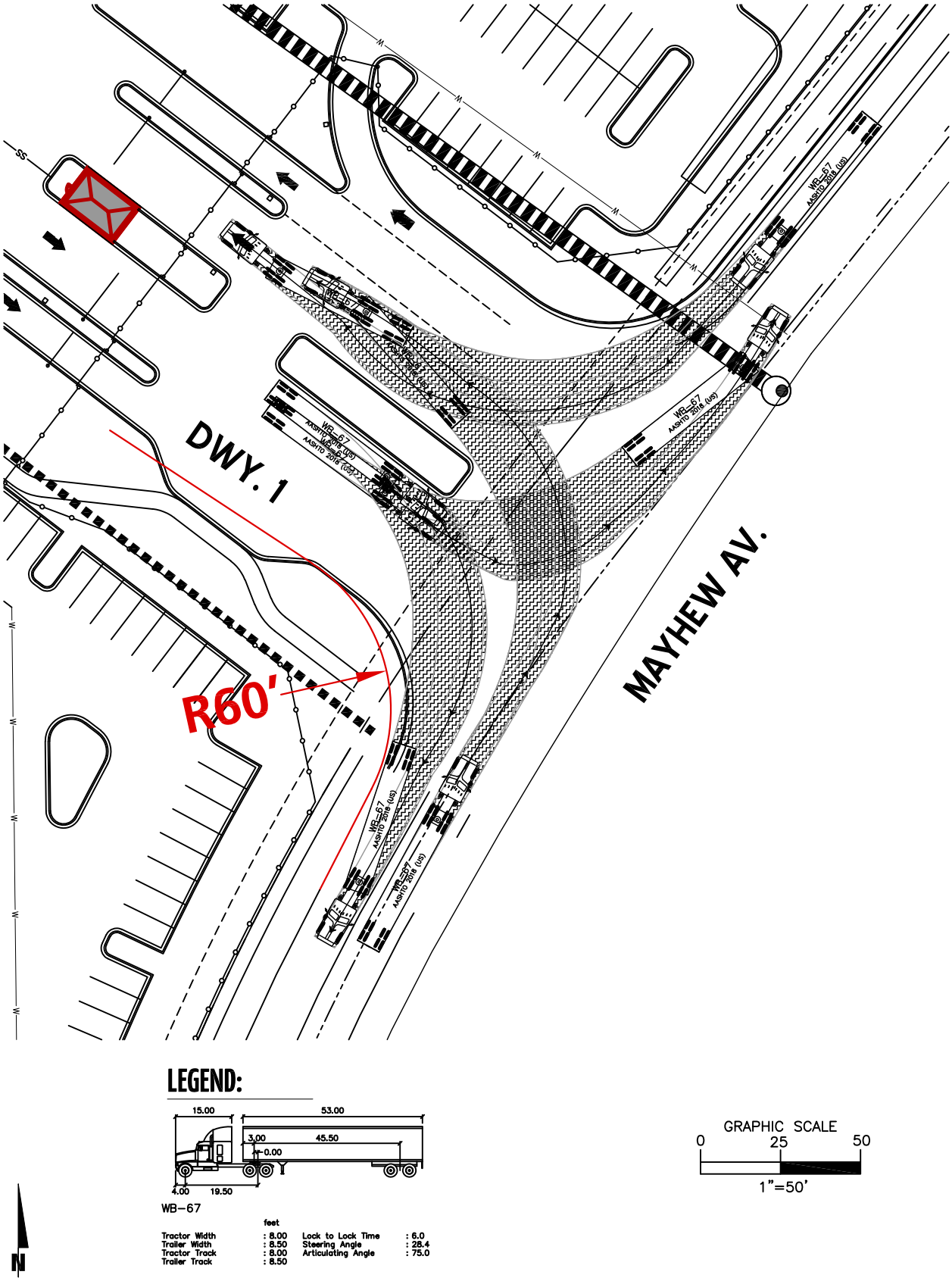
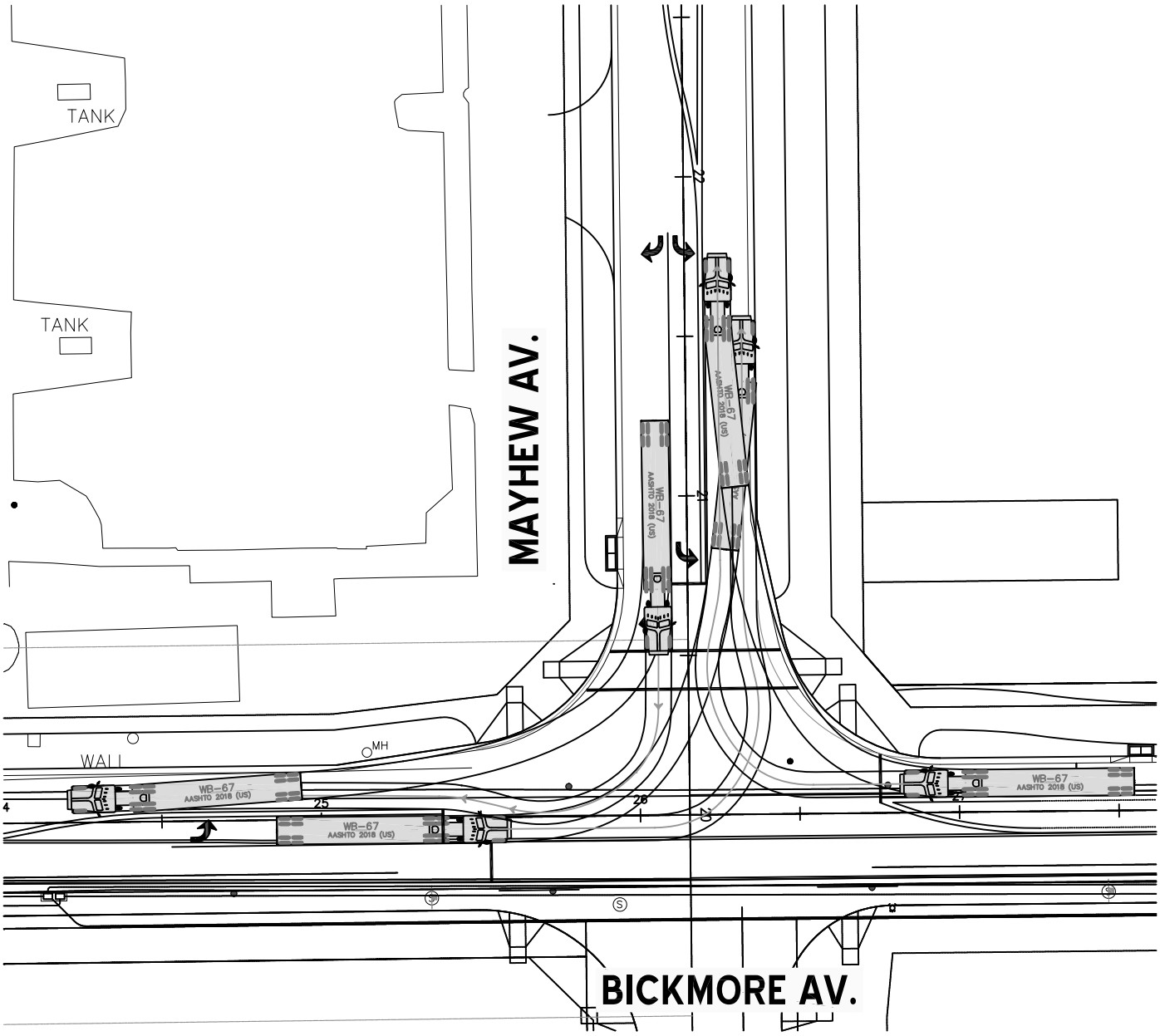
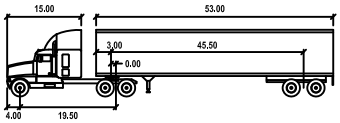


EXHIBIT 1-5 (2OF3): TRUCK ACCESS



LEGEND:



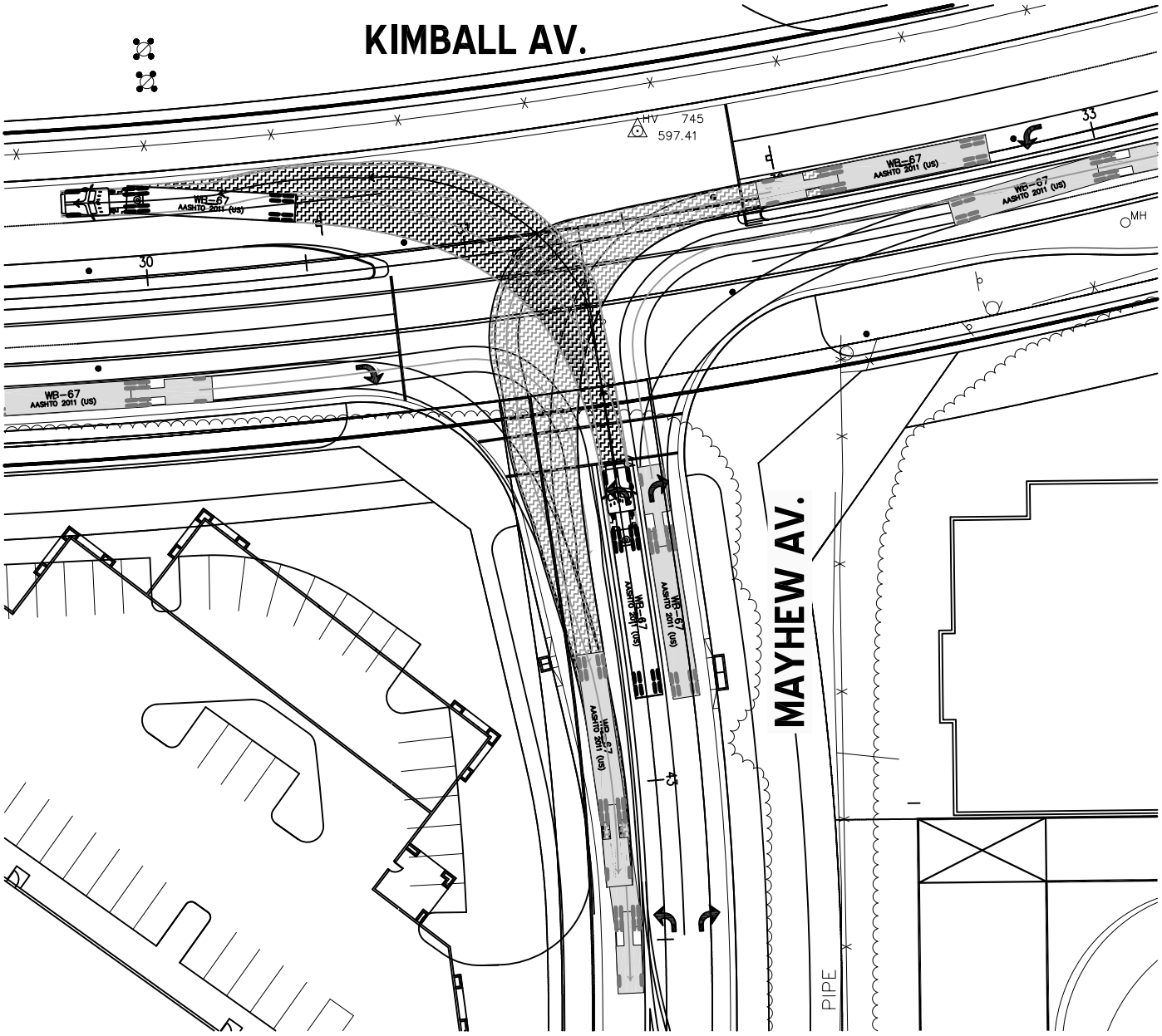
WB-67

feet			
Tractor Width	: 8.00	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 28.4
Tractor Track	: 8.00	Articulating Angle	: 75.0
Trailer Track	: 8.50		

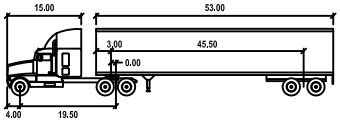
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1"=50'

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EXHIBIT 1-5 (3OF3): TRUCK ACCESS



LEGEND:



WB-67

feet

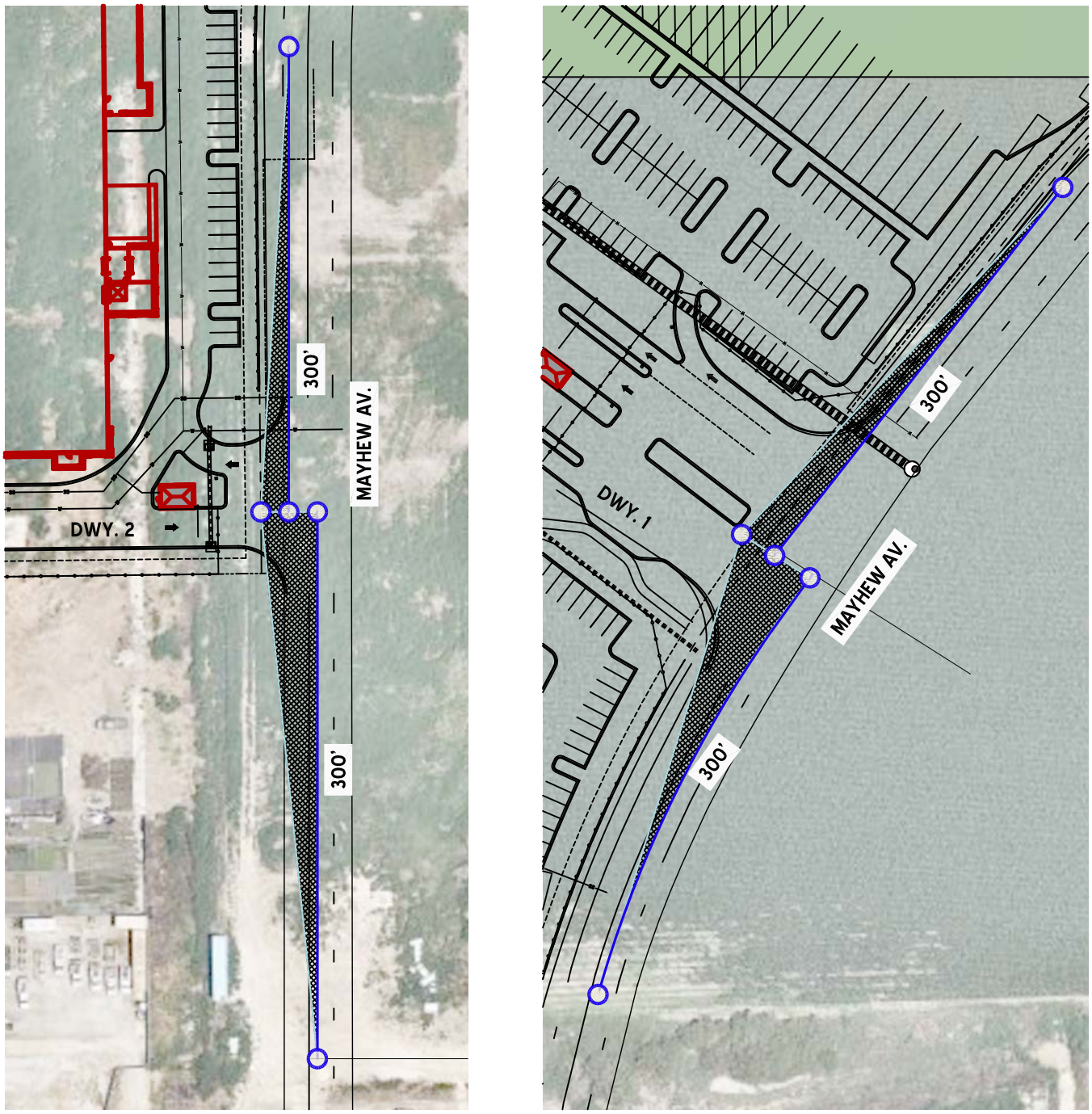
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Trailer Width	: 8.50	Steering Angle	: 28.4
Tractor Track	: 8.00	Articulating Angle	: 75.0
Trailer Track	: 8.50		

GRAPHIC SCALE
0 25 50
1"=50'

N

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EXHIBIT 1-6 (1 OF 3): HORIZONTAL SIGHT DISTANCE



LEGEND:

= MINIMUM SIGHT DISTANCE LINES

= LIMITED USE AREA
(THERE SHALL BE NO OBSTRUCTION WITHIN THE LIMITED USE AREA. OBSTRUCTIONS INCLUDE, BUT NOT LIMITED TO, ANY SIGNS OR OBJECTS HIGHER THAN 2.5' MEASURED FROM PAVEMENT WITHIN THE AREA OF LIMITED USE.)

GRAPHIC SCALE
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1"=100'

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EXHIBIT 1-6 (2 OF 3): HORIZONTAL SIGHT DISTANCE

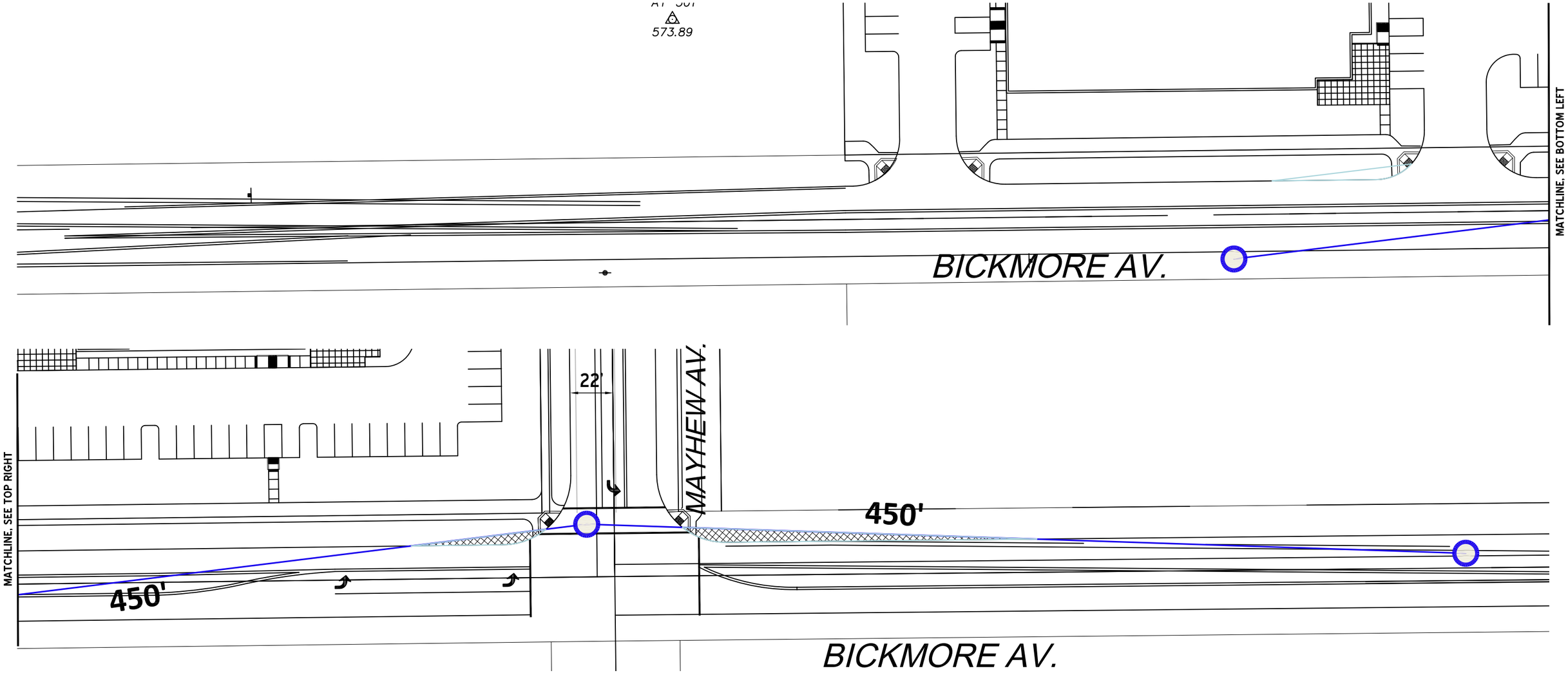
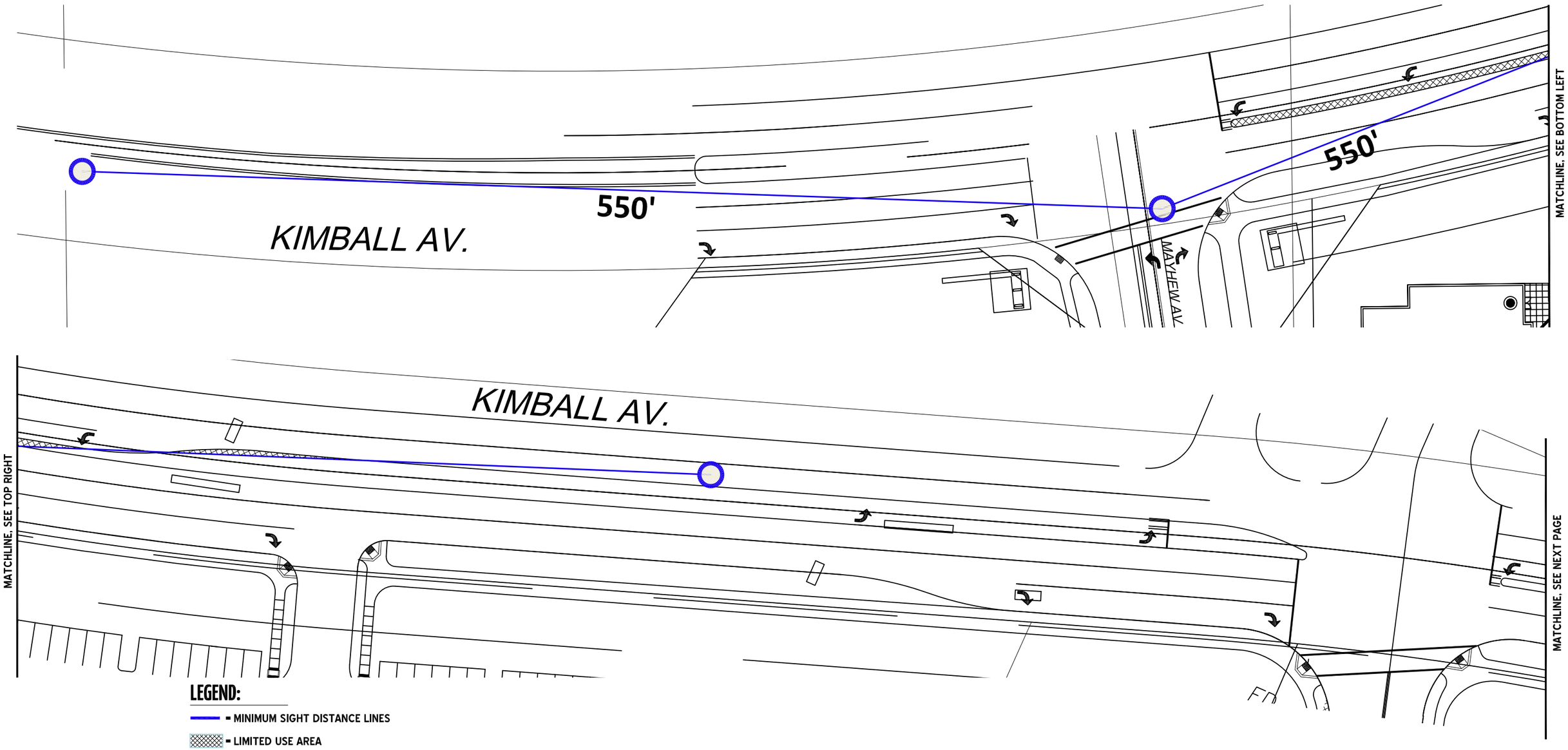


EXHIBIT 1-6 (3 OF 3): HORIZONTAL SIGHT DISTANCE



2 METHODOLOGIES

This section of the report presents the methodologies used to perform the traffic analyses summarized in this report. The methodologies described are generally consistent with City of Chino traffic study guidelines.

2.1 LEVEL OF SERVICE

Traffic operations of roadway facilities are described using the term "Level of Service" (LOS). LOS is a qualitative description of traffic flow based on several factors such as speed, travel time, delay, and freedom to maneuver. Six levels are typically defined ranging from LOS A, representing completely free-flow conditions, to LOS F, representing breakdown in flow resulting in stop-and-go conditions. LOS E represents operations at or near capacity, an unstable level where vehicles are operating with the minimum spacing for maintaining uniform flow.

2.2 INTERSECTION CAPACITY ANALYSIS

The definitions of LOS for interrupted traffic flow (flow restrained by the existence of traffic signals and other traffic control devices) differ slightly depending on the type of traffic control. The LOS is typically dependent on the quality of traffic flow at the intersections along a roadway. The Highway Capacity Manual (HCM) (6th Edition) methodology expresses the LOS at an intersection in terms of delay time for the various intersection approaches. (4) The HCM uses different procedures depending on the type of intersection control.

2.2.1 SIGNALIZED INTERSECTIONS

City of Chino, City of Ontario

The City of Chino and City of Ontario require signalized intersection operations analysis based on the methodology described in the HCM. (4) Intersection LOS operations are based on an intersection's average control delay. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. For signalized intersections, LOS is directly related to the average control delay per vehicle and is correlated to a LOS designation as described in Table 2-1.

TABLE 2-1: SIGNALIZED INTERSECTION LOS THRESHOLDS

Description	Average Control Delay (Seconds), V/C ≤ 1.0	Level of Service, V/C ≤ 1.0	Level of Service, V/C > 1.0
Operations with very low delay occurring with favorable progression and/or short cycle length.	0 to 10.00	A	F
Operations with low delay occurring with good progression and/or short cycle lengths.	10.01 to 20.00	B	F

Description	Average Control Delay (Seconds), V/C ≤ 1.0	Level of Service, V/C ≤ 1.0	Level of Service, V/C > 1.0
Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	20.01 to 35.00	C	F
Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.	35.01 to 55.00	D	F
Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences. This is considered to be the limit of acceptable delay.	55.01 to 80.00	E	F
Operation with delays unacceptable to most drivers occurring due to over saturation, poor progression, or very long cycle lengths.	80.01 and up	F	F

Source: HCM, 6th Edition

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

Existing and Opening Year Cumulative Traffic Conditions:

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

Horizon Year Traffic Conditions:

- Exclusive through: 1900 vphgpl
- Exclusive left: 1800 vphgpl
- Exclusive right: 1900 vphgpl
- Exclusive dual left: 1700 vphgpl
- Exclusive triple left: 1600 vphgpl

The traffic modeling and signal timing optimization software package Synchro (Version 10) has been utilized to analyze signalized intersections within the City of Chino and City of Ontario. Synchro is a macroscopic traffic software program that is based on the signalized intersection capacity analysis as specified in the HCM. Macroscopic level models represent traffic in terms of aggregate measures for each movement at the study intersections. Equations are used to determine measures of effectiveness such as delay and queue length. The level of service and capacity analysis performed by Synchro takes into consideration optimization and coordination of signalized intersections within a network.

The peak hour traffic volumes have been adjusted using a peak hour factor (PHF) to reflect peak 15-minute volumes. Common practice for LOS analysis is to use a peak 15-minute rate of flow. However, flow rates are typically expressed in vehicles per hour. The PHF is the relationship between the peak 15-minute flow rate and the full hourly volume (e.g. PHF = [Hourly Volume] / [4 x Peak 15-minute Flow Rate]). The use of a 15-minute PHF produces a more detailed analysis as compared to analyzing vehicles per hour. Existing PHFs have been used for all analysis scenarios. Per the HCM, PHF values over 0.95 often are indicative of high traffic volumes with capacity constraints on peak hour flows while lower PHF values are indicative of greater variability of flow during the peak hour. (4)

California Department of Transportation (Caltrans)

Per the Caltrans Guide for the Preparation of Traffic Impact Studies, the traffic modeling and signal timing optimization software package Synchro (Version 10) has also been utilized to analyze signalized intersections under Caltrans' jurisdiction, which include the intersections along Euclid Avenue (SR-83). (2) Signal timing for the freeway arterial-to-ramp intersections have been obtained from Caltrans District 8 and were utilized for the purposes of this analysis.

2.2.2 UNSIGNALIZED INTERSECTIONS

The City of Chino and Ontario require the operations of unsignalized intersections be evaluated using the methodology described in the HCM (6th Edition). (4) The LOS rating is based on the weighted average control delay expressed in seconds per vehicle (see Table 2-2).

TABLE 2-2: UNSIGNALIZED INTERSECTION LOS THRESHOLDS

Description	Average Control Delay Per Vehicle (Seconds)	Level of Service, V/C ≤ 1.0	Level of Service, V/C > 1.0
Little or no delays.	0 to 10.00	A	F
Short traffic delays.	10.01 to 15.00	B	F
Average traffic delays.	15.01 to 25.00	C	F
Long traffic delays.	25.01 to 35.00	D	F
Very long traffic delays.	35.01 to 50.00	E	F
Extreme traffic delays with intersection capacity exceeded.	> 50.00	F	F

Source: HCM, 6th Edition

At two-way or side-street stop-controlled intersections, LOS is calculated for each controlled movement and for the left turn movement from the major street, as well as for the intersection as a whole. For approaches composed of a single lane, the delay is computed as the average of all movements in that lane. For all-way stop controlled intersections, LOS is computed for the intersection as a whole.

2.3 ROADWAY SEGMENT CAPACITY ANALYSIS METHODOLOGY

Roadway segment operations have been evaluated using the applicable average daily traffic (ADT) roadway capacity values provided in the City of Chino General Plan Circulation Element (Table TRA-3). The roadway capacities utilized for the purposes of this analysis are considered "rule of thumb" estimates for planning purposes and are affected by such factors as intersections (spacing, configuration and control features), degree of access control, roadway grades, design geometrics (horizontal and vertical alignment standards), sight distance, vehicle mix (truck and bus traffic) and pedestrian bicycle traffic.

While using ADT for planning purposes is suitable with regards to evaluating potential volume to capacity with future forecasts, it is not suitable for operational analysis because it does not account for the factors listed previously. As such, where the ADT based roadway segment analysis indicates a deficiency (unacceptable LOS), a review of the more detailed peak hour intersection analysis and progression analysis are undertaken. The more detailed peak hour intersection analysis explicitly accounts for factors that affect roadway capacity. Therefore, roadway segment widening is typically only recommended if the peak hour intersection analysis indicates the need for additional through lanes.

2.4 TRAFFIC SIGNAL WARRANT ANALYSIS METHODOLOGY

The term "signal warrants" refers to the list of established criteria used by Caltrans and other public agencies to quantitatively justify or ascertain the potential need for installation of a traffic signal at an otherwise unsignalized intersection. This TIA uses the signal warrant criteria presented in the latest edition of the Caltrans' California Manual on Uniform Traffic Control Devices (CA MUTCD), for all study area intersections. (5)

The signal warrant criteria for Existing study area intersections are based upon several factors, including volume of vehicular and pedestrian traffic, frequency of accidents, and location of school areas. The CA MUTCD indicates that the installation of a traffic signal should be considered if one or more of the signal warrants are met. (5) Specifically, this TIA utilizes the Peak Hour Volume-based Warrant 3 as the appropriate representative traffic signal warrant analysis for existing traffic conditions. Warrant 3 is appropriate to use for this TIA because it provides specialized warrant criteria for intersections with urban characteristics (e.g. located in communities with populations of less than 10,000 persons or with adjacent major streets operating above 40 miles per hour). For the purposes of this study, the speed limit was the basis for determining whether Urban or Rural warrants were used for a given intersection.

Future unsignalized intersections that currently do not exist, have been assessed regarding the potential need for new traffic signals based on future average daily traffic (ADT) volumes, using the Caltrans planning level ADT-based signal warrant analysis worksheets.

As shown in Table 2-3, traffic signal warrant analyses were performed for the following unsignalized study area intersections during the peak weekday conditions wherein the Project is anticipated to contribute the highest trips:

TABLE 2-3: TRAFFIC SIGNAL WARRANT ANALYSIS LOCATIONS

ID	Intersection Location	Jurisdiction
5	Mayhew Av. & Kimball Av. – Future Intersection	Chino
6	Mayhew Av. & Driveway 1 – Future Intersection	Chino
7	Mayhew Av. & Driveway 2 – Future Intersection	Chino
8	Mayhew Av. & Bickmore Av. – Future Intersection	Chino

Since there are no existing unsignalized study area intersections, no traffic signal warrant analysis has been conducted for "Without Project" traffic conditions, including Existing (2019) traffic conditions. The traffic signal warrant analyses for future conditions are presented in Section 5 *E+P Traffic Conditions,* Section 6 *Opening Year Cumulative (2022) Traffic Conditions,* and Section 7 *Horizon Year (2040) Traffic Conditions* of this report.

It is important to note that a signal warrant defines the minimum condition under which the installation of a traffic signal might be warranted. Meeting this threshold condition does not require that a traffic control signal be installed at a particular location, but rather, that other traffic factors and conditions be evaluated in order to determine whether the signal is truly justified. It should also be noted that signal warrants do not necessarily correlate with LOS. An intersection may satisfy a signal warrant condition and operate at or above acceptable LOS or operate below acceptable LOS and not meet a signal warrant.

2.5 QUEUING ANALYSIS

At the City's request, a queuing analysis was conducted for the intersections of Euclid Avenue (SR-83) and Kimball Avenue, and Euclid Avenue (SR-83) and Bickmore Avenue for Existing, E+P, Opening Year Cumulative (2022), and Horizon Year (2040) traffic conditions in an effort to determine the turn pocket lengths necessary to accommodate 95th percentile queues for all intersections. The analysis was conducted for both the weekday AM and weekday PM peak hours.

The traffic analysis tool and HCM intersection analysis program, Synchro, has been used to assess the potential deficiencies/needs of the intersections with traffic added from the proposed Project. Storage (turn-pocket) length recommendations at the ramps have been based upon the 95th percentile queue resulting from the Synchro progression analysis. The footnote from the Synchro output sheets indicates if the 95th percentile cycle exceeds capacity. Traffic is simulated for two complete cycles of the 95th percentile traffic in Synchro in order to account for the effects of spillover between cycles. In practice, the 95th percentile queue shown will rarely be exceeded and the queues shown with the footnote are acceptable for the design of storage bays.

The queue length reported is for the lane with the highest queue in the lane group. The 95th percentile queue is derived from the average queue plus 1.65 standard deviations. The 95th percentile queue is not necessarily ever observed it is simply based on statistical calculations.

2.6 MINIMUM ACCEPTABLE LEVELS OF SERVICE (LOS) AND INTERSECTION DEFICIENCY CRITERIA

Minimum Acceptable LOS and associated definitions of intersection deficiencies has been obtained from each of the applicable surrounding jurisdictions.

2.6.1 CITY OF CHINO

According to the City of Chino, LOS D is the minimum acceptable condition that should be maintained during the peak commute hours, where feasible. Therefore, any intersection operating at LOS E or F is considered deficient. A higher LOS standard of LOS C has been applied to the Project driveways.

2.6.2 CITY OF ONTARIO

The City of Ontario utilizes a minimum acceptable LOS of LOS E, where feasible.

2.6.3 CMP

The CMP definition of deficiency is based on maintaining a level of service standard of LOS E or better, where feasible, except where an existing LOS F condition is identified in the CMP document. However, in an effort to overstate as opposed to understate potential impacts, LOS D has been utilized for the CMP intersections for the purposes of this analysis.

2.6.4 CALTRANS

Caltrans endeavors to maintain a target LOS at the transition between LOS C and LOS D on the Caltrans facilities, however, Caltrans acknowledges that this may not always be feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS. If an existing State highway facility is operating at less than this target LOS, the existing LOS should be maintained. In general, the region-wide goal for an acceptable LOS on all freeways and intersections is LOS D. Consistent with the City of Chino, LOS D will be used as the target LOS for Caltrans facilities.

2.7 THRESHOLDS OF SIGNIFICANCE

To determine whether the addition of project traffic (as defined through the comparison of Existing traffic conditions to E+P traffic conditions) at a study intersection would result in a project-specific traffic impact, the following will be utilized:

- When the pre-Project condition is at or better than LOS D (i.e., acceptable LOS), and project-generated traffic, as measured by 50 or more peak hour trips, causes deterioration below LOS D (i.e., unacceptable LOS), a deficiency is deemed to occur.

However, when the pre-Project condition is already below LOS D (i.e., unacceptable LOS), the Project will be responsible for mitigating its impact to acceptable LOS operations for intersections that receive 50 or more peak hour project-related trips (see Table 2-4).

Cumulative traffic impacts are created as a result of a combination of the proposed Project together with other future developments contributing to the overall traffic impacts requiring additional improvements to maintain acceptable level of service operations with or without the Project. A Project's contribution to a significant cumulative impact can be reduced to less than significant if the Project is required to implement or fund its fair share of improvements designed to alleviate its cumulatively considerable contribution to the impact. Cumulatively considerable impacts are defined where the Project is anticipated to contribute 50 or more peak hour trips.

In the event that an intersection is operating at or is forecast to operate at a deficient LOS, the CMP guidelines have defined a series of steps to be completed to determine the Project's contribution to the deficiency of intersections, which has been applied to both CMP and non-CMP study area intersections. The steps are as follows:

- Determine the recommended improvements necessary to achieve an acceptable service level,
- Calculate the Project's share in the future traffic volume projections for the peak hours,
- Estimate the cost to implement recommended improvements, and
- Calculate the Project's fair-share contribution to mitigate the Project's traffic impacts

TABLE 2-4: THRESHOLD OF SIGNIFICANCE

Pre-Project Level of Service	Level of Service with 50 or more Project trips	Significant Impact?	Improvements Required?
City of Chino			
A	A-D	No	No
B	B-D	No	No
C	C-D	No	No
D	D	No	No
A-D	E or F	Yes	Yes, bring LOS to D or better
E	E	Yes	Yes, bring LOS to D or better
E	F	Yes	Yes, bring LOS to D or better
F	F	Yes	Yes, bring LOS to D or better
City of Ontario			
A	A-D	No	No
B	B-D	No	No
C	C-D	No	No
D	D-E	No	No
E	E	No	No
A-E	F	Yes	Yes, bring LOS to E or better
F	F	Yes	Yes, bring LOS to E or better

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3 AREA CONDITIONS

This section provides a summary of the existing circulation network, the City of Chino General Plan Circulation Network, and a review of existing peak hour intersection operations, queuing, and traffic signal warrant analyses.

3.1 EXISTING CIRCULATION NETWORK

Pursuant to the agreement with City of Chino staff (Appendix 1.1), the study area includes a total of 8 existing and future intersections as shown previously on Exhibit 1-2. Exhibit 3-1 illustrates the study area intersections located near the proposed Project and identifies the number of through traffic lanes for existing roadways and intersection traffic controls.

3.2 CITY OF CHINO GENERAL PLAN CIRCULATION ELEMENT

As noted previously, the Project site is located within the City of Chino. The roadway classifications and planned (ultimate) roadway cross-sections of the major roadways within the study area, as identified on the City of Chino General Plan Circulation Element, are described subsequently. Exhibit 3-2 shows the City of Chino General Plan Circulation Element and Exhibit 3-3 illustrates the City of Chino General Plan roadway cross-sections.

The study area roadway that is classified as an Expressway is identified as having a 206-foot right-of-way and 168-foot curb-to-curb measurement. Expressways include four lanes of travel in each direction and a 64-foot curbed and/or landscaped median. The following study area roadway within the City of Chino is classified as an Expressway:

- Euclid Avenue (SR-83) from SR-71 Freeway to Riverside Drive

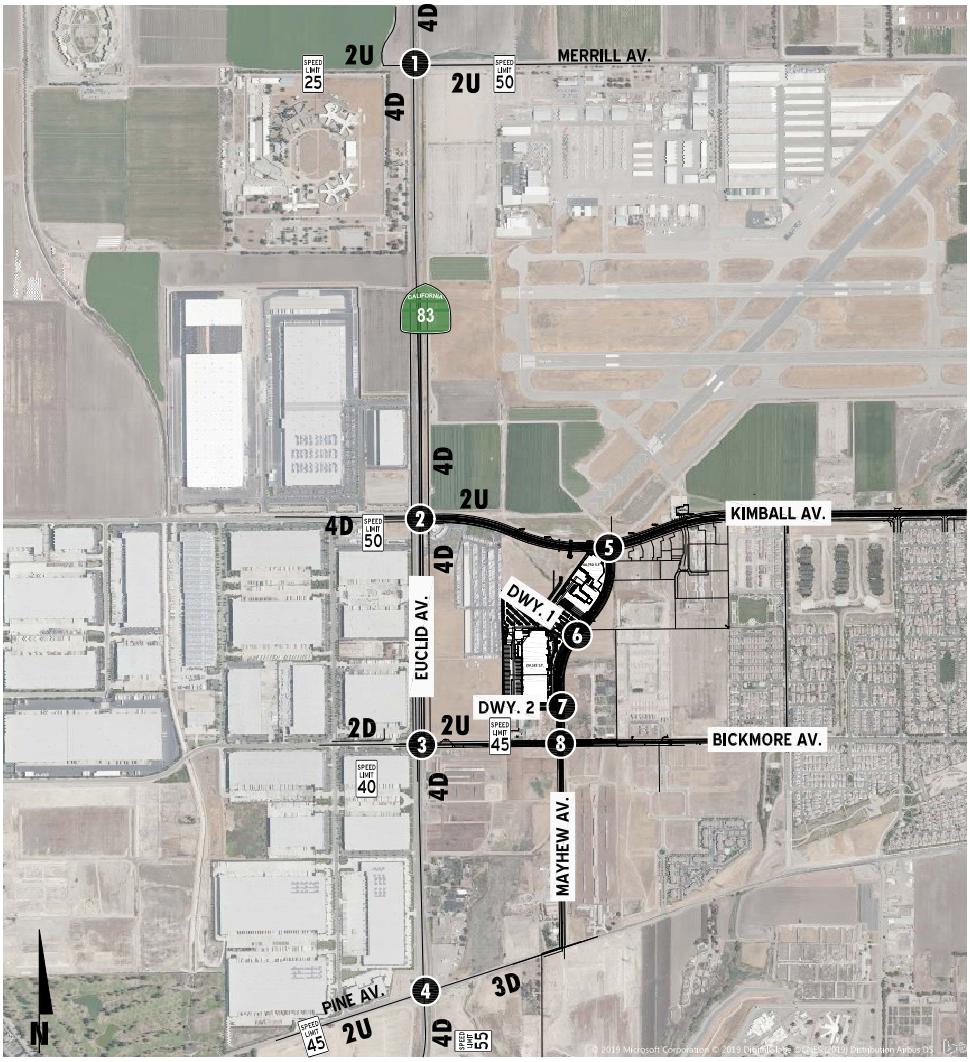
The study area roadway that is classified as a Primary Arterial is identified as having a 98-foot right-of-way and 74-foot curb-to-curb measurement. Primary Arterials include two lanes of travel in each direction and a 14-foot curbed and/or landscaped median. The following study area roadway within the City of Chino is classified as a Primary Arterial:

- Kimball Avenue from Euclid Avenue (SR-83) to Hellman Avenue

The study area roadway that is classified as an Urban Residential Collector is identified as having a 60-foot right-of-way and 40-foot curb-to-curb measurement. Urban Residential Collectors include one lane of travel in each direction and 8-feet of parking in both directions. The following study area roadways within the City of Chino are classified as an Urban Residential Collector:

- Mayhew Avenue
- Bickmore Avenue from Euclid Avenue (SR-83) to Hellman Avenue

EXHIBIT 3-1: EXISTING NUMBER OF THROUGH LANES AND INTERSECTION CONTROLS



1 Euclid Av. (SR-83) & E. Facility Dr./ Merrill Av.	2 Euclid Av. (SR-83) & Kimball Av.	3 Euclid Av. (SR-83) & Bickmore Av.	4 Euclid Av. (SR-83) & Pine Av.
5 Mayhew Av. & Kimball Av.	6 Mayhew Av. & Dwy. 1	7 Mayhew Av. & Dwy. 2	8 Mayhew Av. & Bickmore Av.
Future Intersection	Future Intersection	Future Intersection	Future Intersection

LEGEND:

- = TRAFFIC SIGNAL
- = CHANNELIZED YIELD
- RTO = RIGHT TURN OVERLAP
- 4 = NUMBER OF LANES
- D = DIVIDED
- U = UNDIVIDED
- SPEED LIMIT 25 = SPEED LIMIT (MPH)

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URBAN CROSSROADS

EXHIBIT 3-2: CITY OF CHINO GENERAL PLAN CIRCULATION ELEMENT

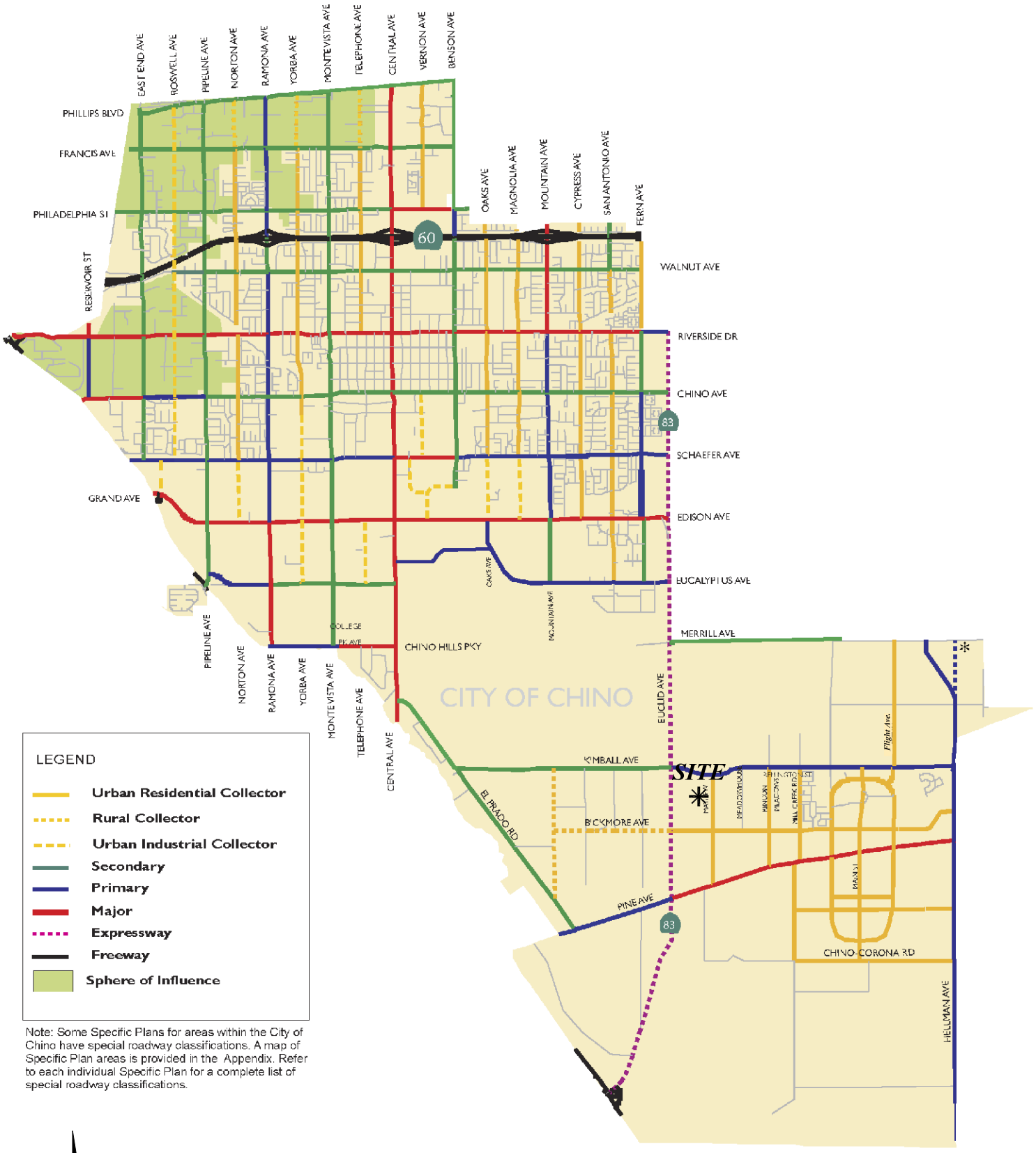
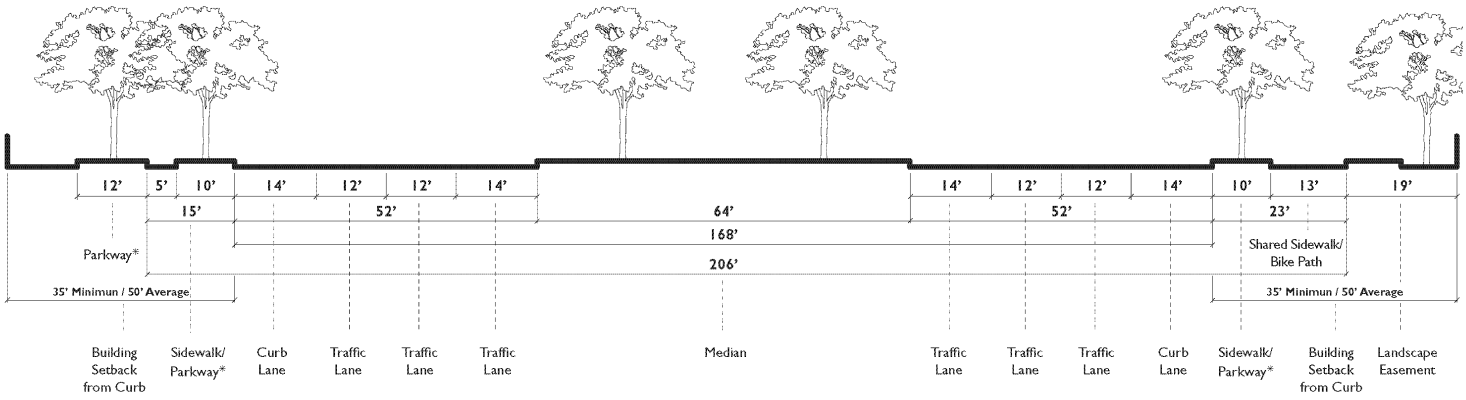
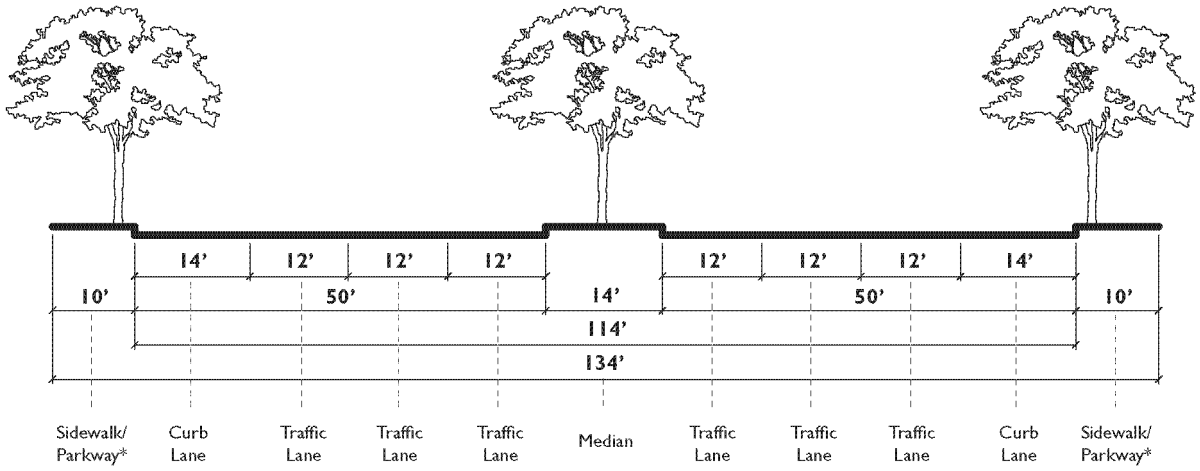


EXHIBIT 3-3 (1 of 2): CITY OF CHINO GENERAL PLAN ROADWAY CROSS-SECTIONS

Major Arterial (Expressway): Typical 8 Lane
Provides 8 traffic lanes and a wide median without parking



Major Arterial: Minimum 8 Lane
Provides 8 traffic lanes and 2 bicycle lanes separated by a median without parking



Major Arterial: Minimum 6 Lane
Provides 6 traffic lanes and 2 bicycle lanes separated by a median without parking

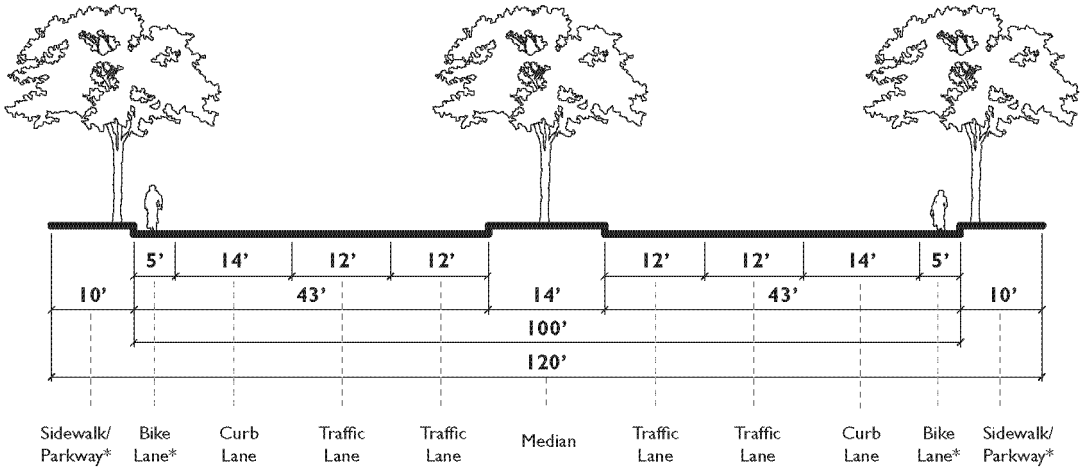
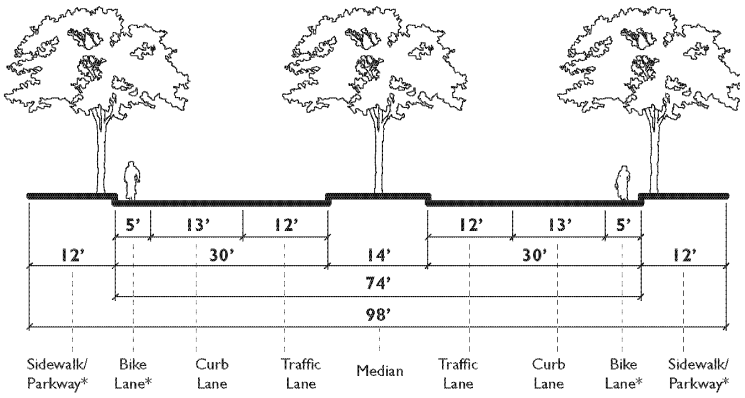
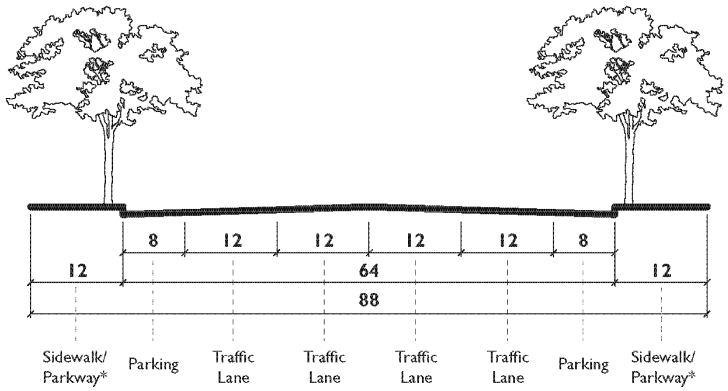


EXHIBIT 3-3 (2 of 2): CITY OF CHINO GENERAL PLAN ROADWAY CROSS-SECTIONS

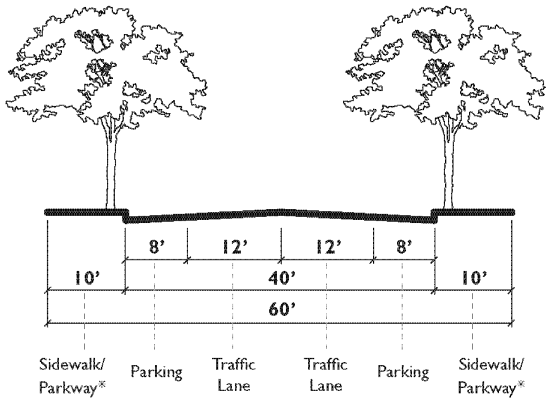
Primary Arterial: Typical 4 Lane
Provides 4 traffic lanes and 2 bicycle lanes separated by a median without parking



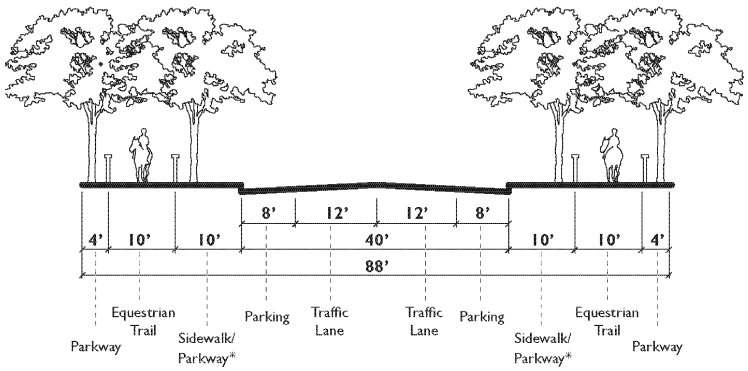
Secondary Arterial
Provides 4 traffic lanes with parking



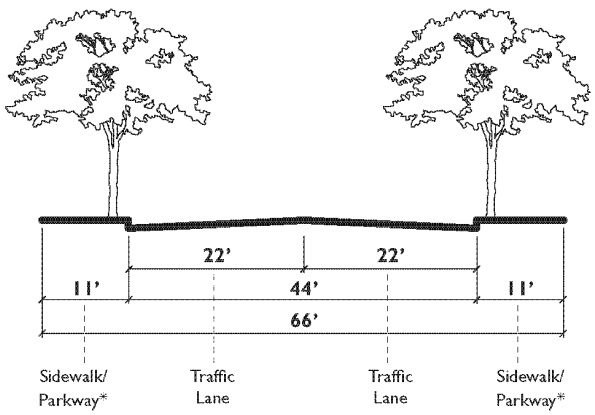
Urban Residential/Rural Collector
Provides 2 traffic lanes with parking and shared bicycle access



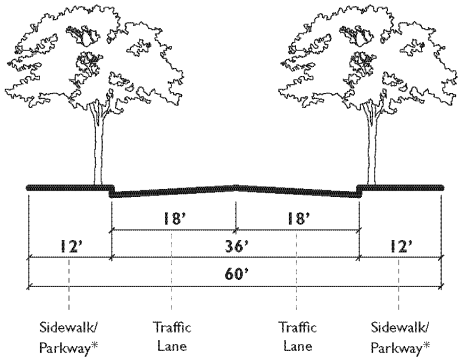
Urban Residential/Rural Collector with Equestrian Trails
Provides 2 traffic lanes and 2 equestrian trails with parking and shared bicycle access



Urban Industrial Collector
Provides 2 traffic lanes



Local Street
Provides 2 traffic lanes



3.3 THE PRESERVE AND CITY OF ONTARIO GENERAL PLAN CIRCULATION ELEMENT

Exhibits 3-4 and 3-5 show The Preserve General Plan Circulation Element and roadway cross-sections, respectively. Exhibits 3-6 and 3-7 show the City of Ontario General Plan Circulation Element and roadway cross-sections, respectively. These classifications and cross-sections have been utilized for the purposes of determining the ultimate planned improvements along these study area roadways/intersections.

3.4 TRUCK ROUTES

The City of Chino designated truck route map is shown on Exhibit 3-8. Bickmore Avenue (Euclid Avenue (SR-83) to Mayhew Avenue) and Kimball Avenue are designated City of Chino truck routes within the study area while Euclid Avenue (SR-83) is designated as a State Truck Route. The designated truck route map has been utilized to route truck traffic for future cumulative development projects throughout the study area. The City of Ontario truck route map is shown on Exhibit 3-9.

3.5 BICYCLE, EQUESTRIAN, & PEDESTRIAN FACILITIES

Field observations conducted in November 2019 indicate nominal pedestrian and bicycle activity within the study area. Exhibit 3-10 illustrates the City of Chino future planned bicycle facilities, which proposes Class I bike lanes along Bickmore Avenue, Kimball Avenue, and Mayhew Avenue in the vicinity of the Project site. Euclid Avenue (SR-83) is planned to have Class II bike lanes in the vicinity of the Project site.

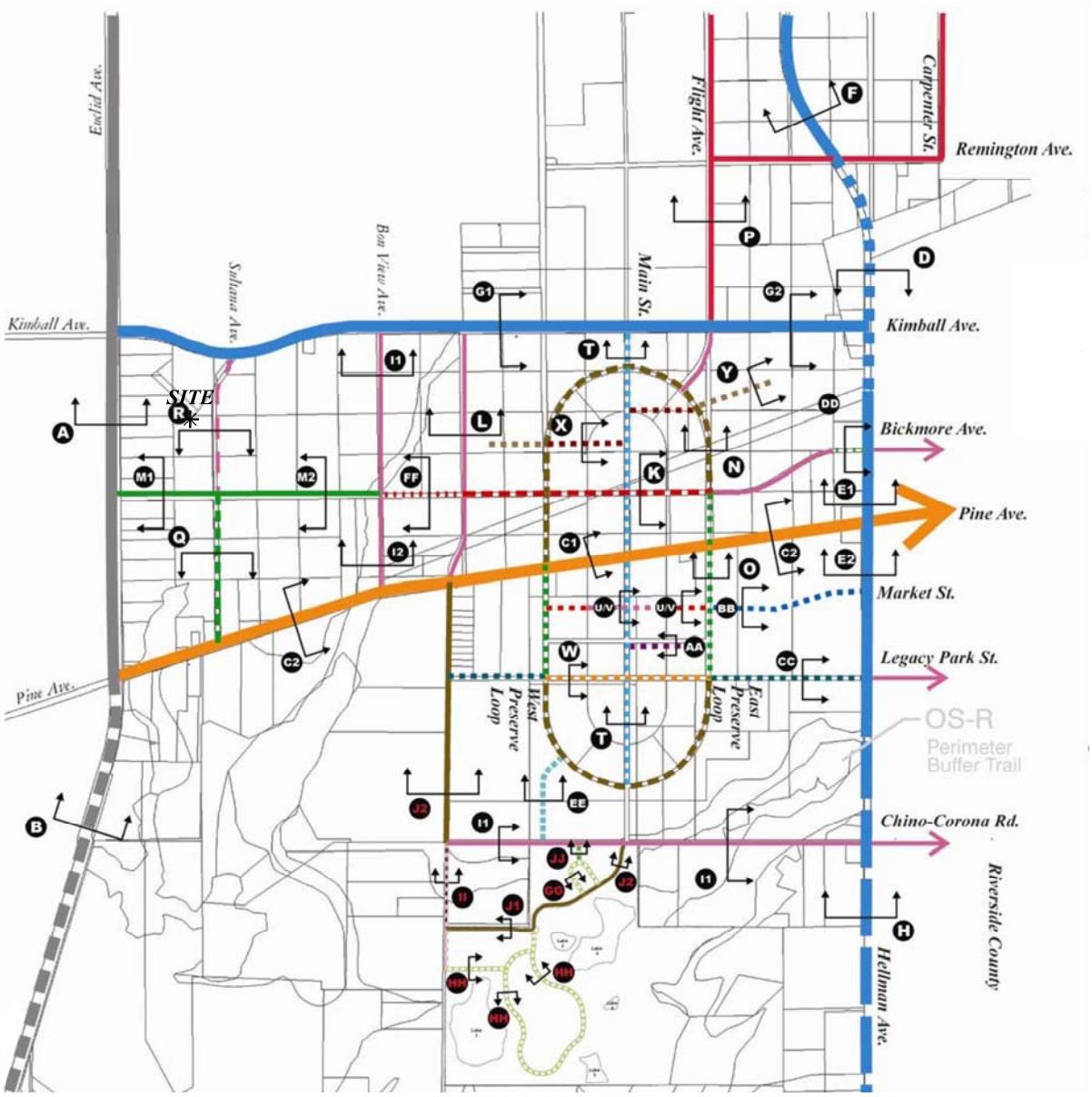
Exhibit 3-11 illustrates the existing pedestrian facilities in the intersection analysis location. Exhibit 3-12 illustrates The Preserve Specific Equestrian Plan. Euclid Avenue (SR-83), Mayhew Avenue, and Bickmore Avenue are all part of the Community Paseo and Open Space System in the vicinity of the Project site. Mayhew Avenue is proposed to have an Equestrian Trail in the vicinity of the Project site. The City of Ontario General Plan Trails and Bikeway Systems are shown on Exhibit 3-13.

3.6 TRANSIT SERVICE

The study area within the City of Chino is currently served by Omnitrans, a public transit agency serving various jurisdictions within San Bernardino County. Based on a review of the existing transit routes within the vicinity of the proposed Project, there are no existing Omnitrans routes that operate near the vicinity of the site. The closest existing Omnitrans route (Route 83) runs along Eucalyptus Avenue to Euclid Avenue (SR-83) (north). However, transit service is reviewed and updated by Omnitrans periodically to address ridership, budget and community demand needs. Changes in land use can affect these periodic adjustments which may lead to either enhanced or reduced service where appropriate. As such, it is recommended that the applicant work in conjunction with Omnitrans to potentially provide bus service to the site.

A transit system is proposed within The Preserve Specific Plan. The transit system would provide bus service in a one direction (clockwise) loop along Bickmore Avenue, E. Preserve Loop, Pine Avenue, and Mayhew Avenue.

EXHIBIT 3-4: THE PRESERVE SPECIFIC PLAN CIRCULATION PLAN



Roads

R	92' ROW	Commercial Collector, with Paseo (2 Lanes)
Q	92' ROW	Commercial Collector, with Paseo and Transit (2 Lanes)
P	74' ROW	Commercial Collector, Typical (2 Lanes)
S, T	ROW Varies	Local Collector, with Paseo (2 Lanes)
DD	95' ROW	Local Collector, with Paseo (2 Lanes)
M1, M2	94' ROW	Local Collector, with Paseo and Transit (2 Lanes)
N	83' ROW	Loop Local Collector, with Paseo (2 Lanes)
O	94' ROW	Loop Local Collector, with Paseo and Transit (2 Lanes)
M, G, L	ROW Varies	Local Collector, Typical (2 Lanes)
K	76' ROW	Local Collector, with Transit (2 Lanes)
I1 – I3	ROW Varies	Main Street Collector (2 Lanes)**
G1, G2	136' ROW	Major Arterial, with Paseo (6 Lanes)
D	123' ROW	Major Arterial, with Paseo (4 Lanes)
I, E, F, G3, C3	ROW Varies	Major Arterial, with Paseo (4 Lanes)
H	78' ROW	Major Arterial, without Paseo (4 Lanes)
A	206' ROW	Major Arterial (Expressway) North of Pine (8 Lanes)
B	200' ROW	Major Arterial (Expressway) South of Pine (6 Lanes)
U	77' ROW	Local Collector, with Paseo, inside core at commercial (2 Lanes)
V	74' ROW	Local Collector, with Paseo, inside core (2 Lanes)
W	84' ROW	Local Collector, with Paseo and Transit, inside loop (2 Lanes)
X	62' ROW	Icon Street , inside core (2 Lanes)
Y	62' ROW	Icon Street (2 Lanes)
Z	60' ROW	Local Street, inside core (2 Lanes)
AA	60' ROW	Local Street, inside core, at park (2 Lanes)
BB	68' ROW	Local Collector, outside core (2 Lanes)
CC	78' ROW	Local Collector, with Paseo (2 Lanes)
DD	75' ROW	Local Collector, with Paseo (2 Lanes)
EE	68' ROW	Local Residential, with Paseo (2 Lanes)
FF	79' ROW	Local Collector, with Paseo (2 Lanes)
GG, HH	ROW Varies	Residential Loop/Connector with Paseo (2 Lanes)
I1	92' ROW	Edgewater Residential Connector with Paseo & Equestrian Trail (2 Lanes)
J2	88' ROW	Edgewater Formative Park Entry with Paseo (2 Lanes)

Note: Cross Sections A - Z, AA - FF are from the existing Preserve Specific Plan. Cross Sections GG, HH, II & JJ are proposed by the Edgewater Specific Plan amendment.

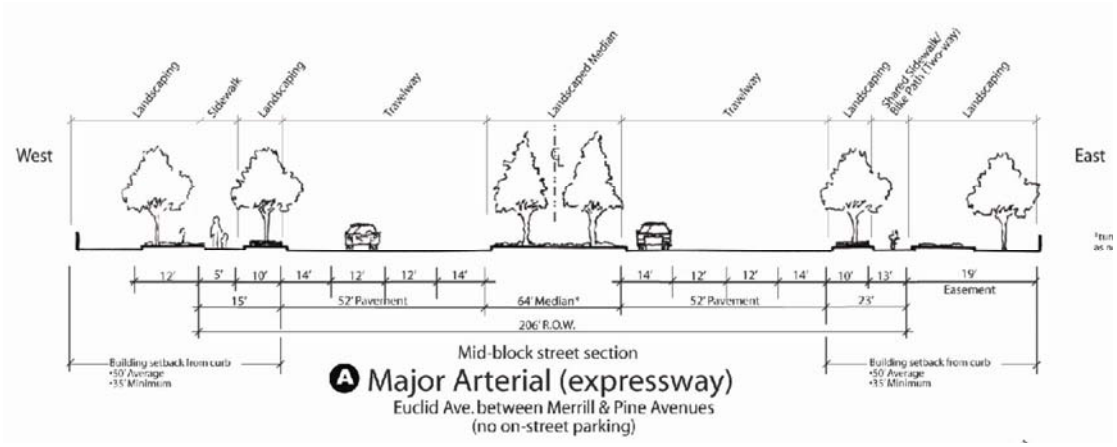
Note: Alignments on the boundaries of the planning area are either outside or partially outside the Subarea 2 boundary, and are not included in acreage calculations.

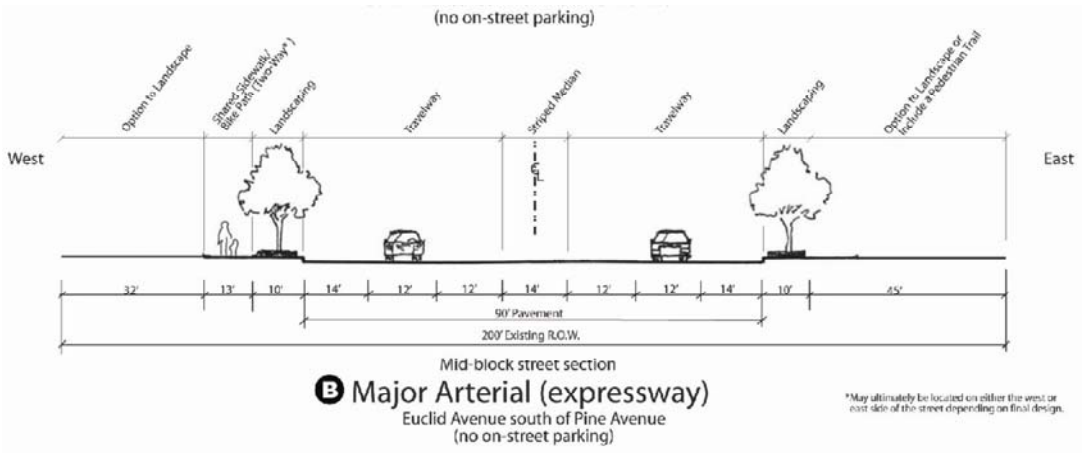
B Cross Section (See figures 10A - 10W)

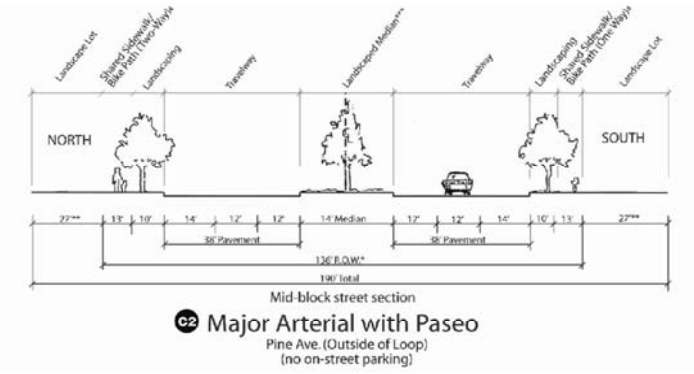
***For section locations for Main Street, please refer to Figure 11M.*

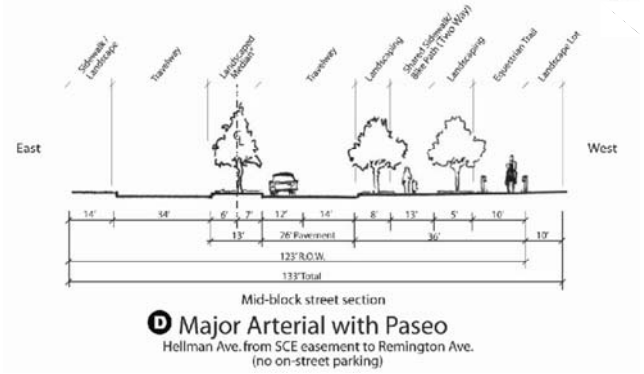
N

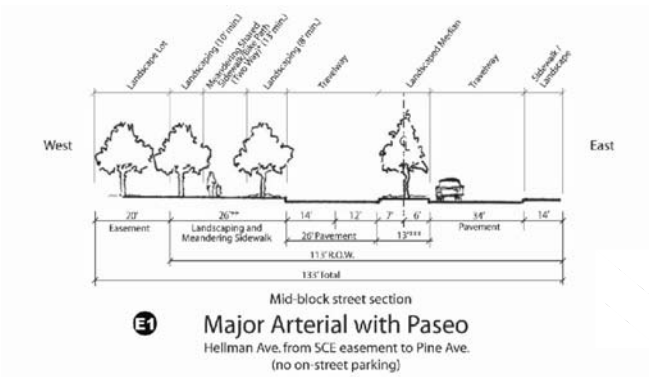
EXHIBIT 3-5 (1OF2): THE PRESERVE SPECIFIC PLAN ROADWAY CROSS-SECTIONS











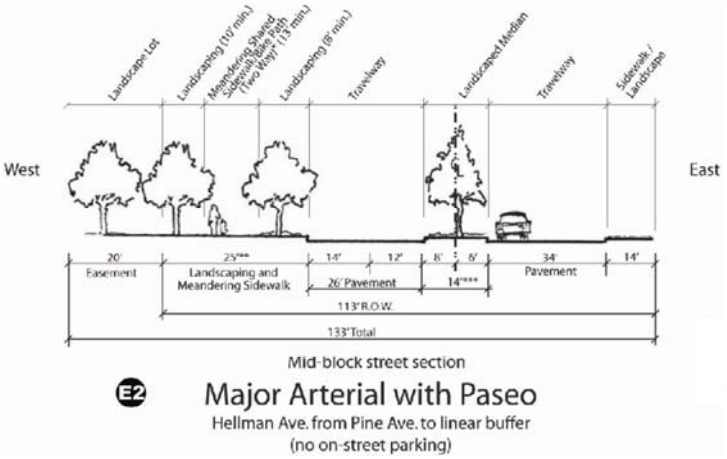
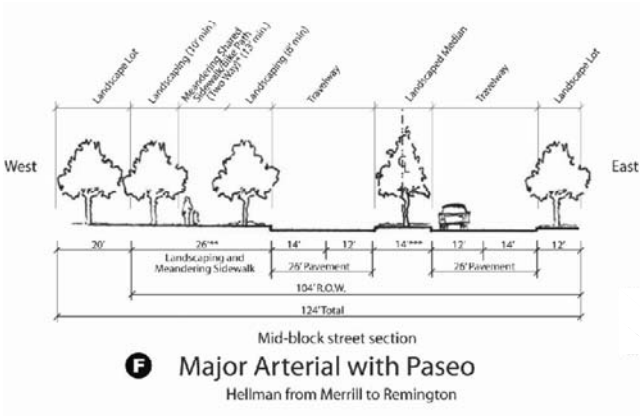


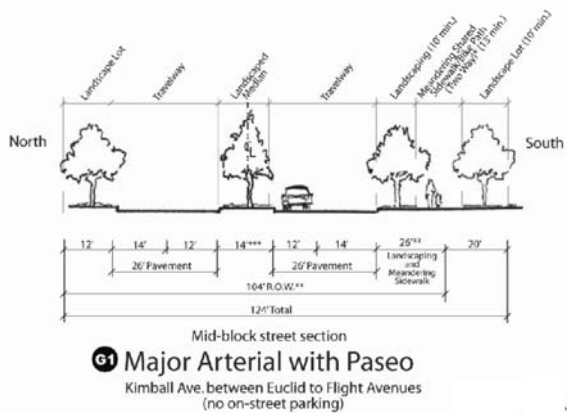
EXHIBIT 3-5 (2OF2): THE PRESERVE SPECIFIC PLAN ROADWAY CROSS-SECTIONS



Mid-block street section

F Major Arterial with Paseo

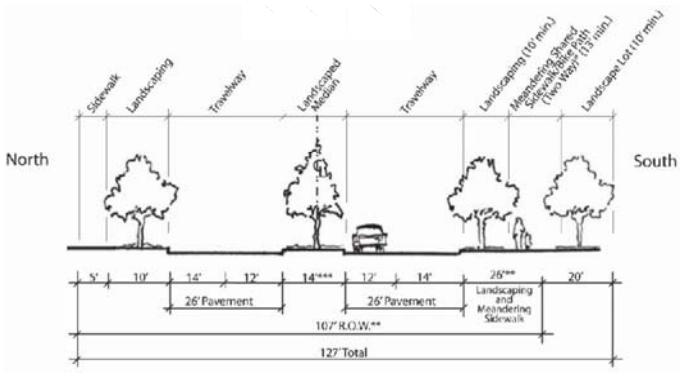
Hellman from Merrill to Remington



Mid-block street section

G1 Major Arterial with Paseo

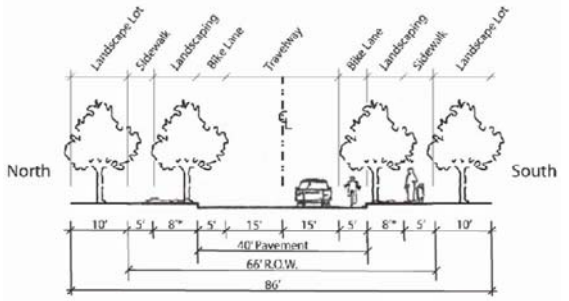
Kimball Ave. between Euclid to Flight Avenues
(no on-street parking)



Mid-block street section

G2 Major Arterial with Paseo

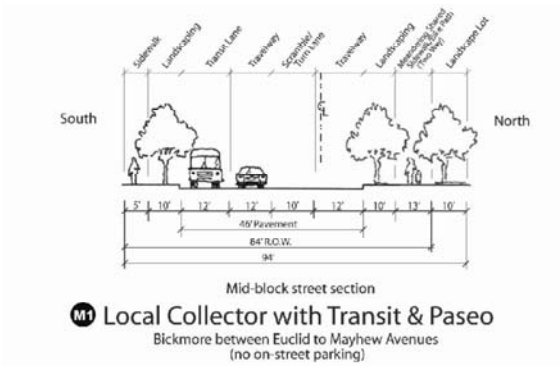
Kimball Ave. between Flight to Hellman Avenues
(no on-street parking)



Mid-block cross section

I1 Local Collector, Typical

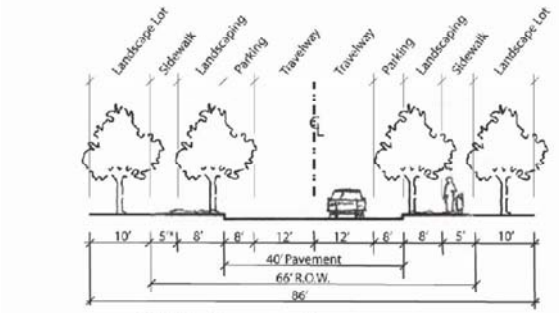
(with bike lane, no on-street parking)



Mid-block street section

M1 Local Collector with Transit & Paseo

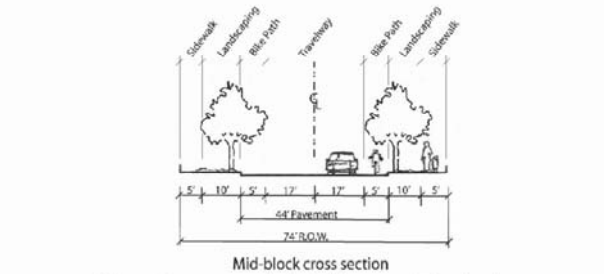
Bickmore between Euclid to Mayhew Avenues
(no on-street parking)



Mid-block cross section

L Local Collector, Typical

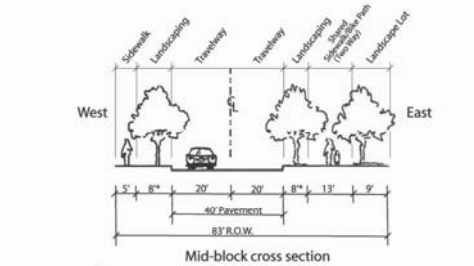
(with parking)



Mid-block cross section

P Commercial Collector, Typical

(no on-street parking)



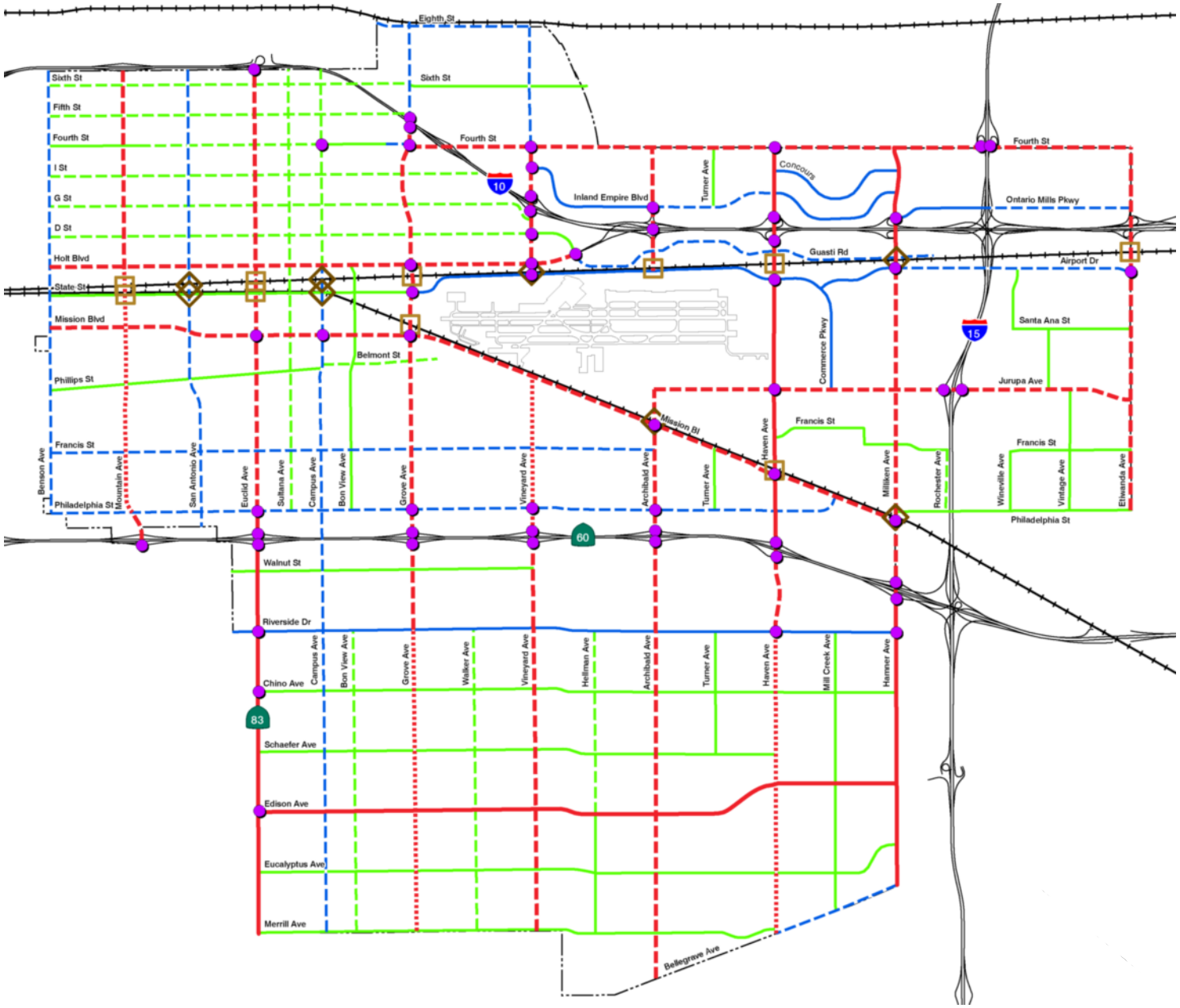
Mid-block cross section

P2 Local Collector, with Paseo

(no on-street parking)

Note: Within the Edgewater neighborhood, the roundabout is located at the south end of the street

EXHIBIT 3-6: CITY OF ONTARIO GENERAL PLAN CIRCULATION ELEMENT



Other Principal Arterial
- 8 Lanes
- 6 Lanes
- 4 Lanes

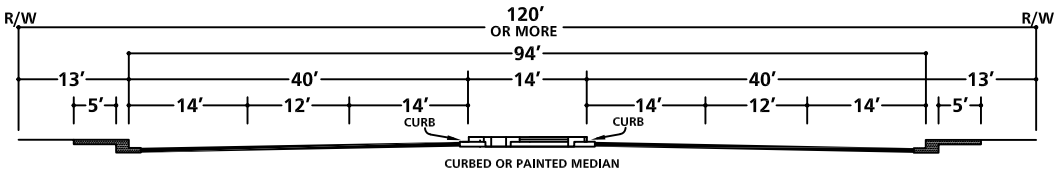
Minor Arterial
- 6 Lanes
- 4 Lanes

Collector Street
- 4 Lanes
- 2 Lanes

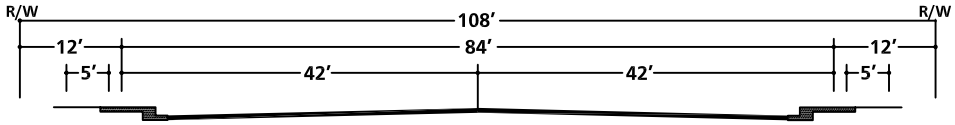
- Freeways
- Railroads
- Grade-Separated Rail Crossings
- Future Grade-Separated Rail Crossings
- Enhanced Intersections

N

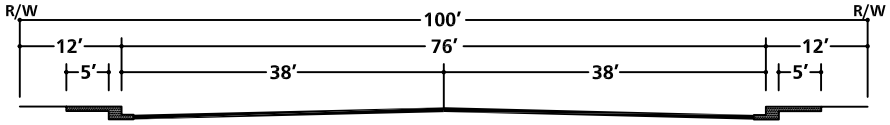
EXHIBIT 3-7: CITY OF ONTARIO GENERAL PLAN ROADWAY CROSS-SECTIONS



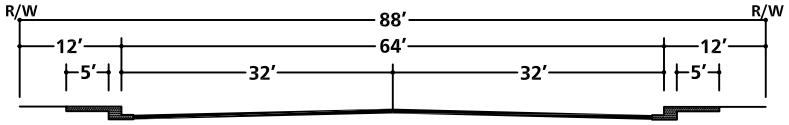
PRINCIPAL ARTERIAL



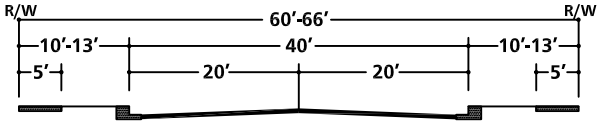
MINOR ARTERIAL



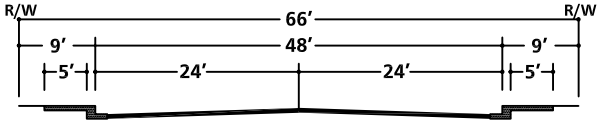
OTHER PRINCIPAL ARTERIAL



COLLECTOR STREET



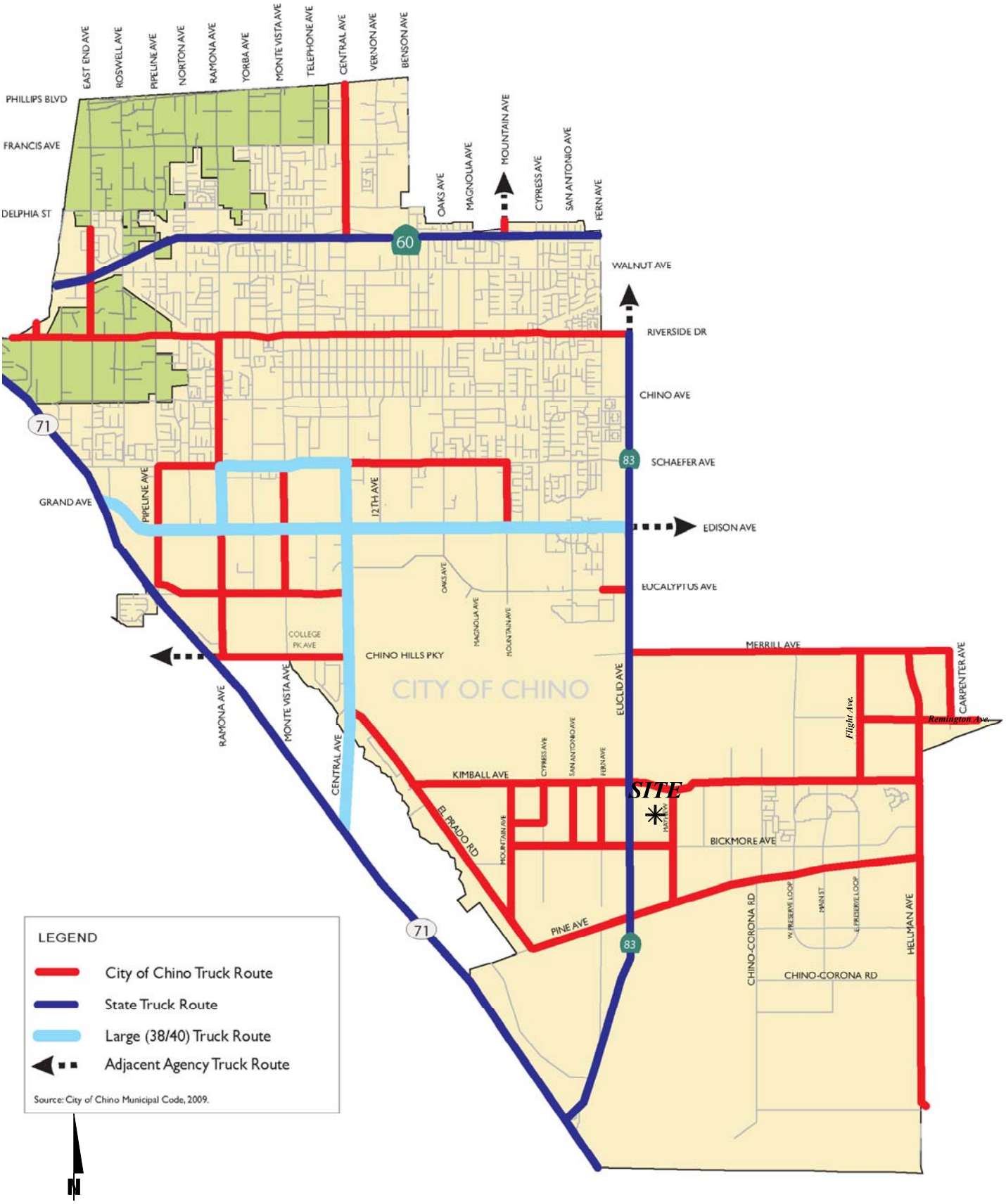
LOCAL STREET



LOCAL INDUSTRIAL STREET

SOURCE: CITY OF ONTARIO

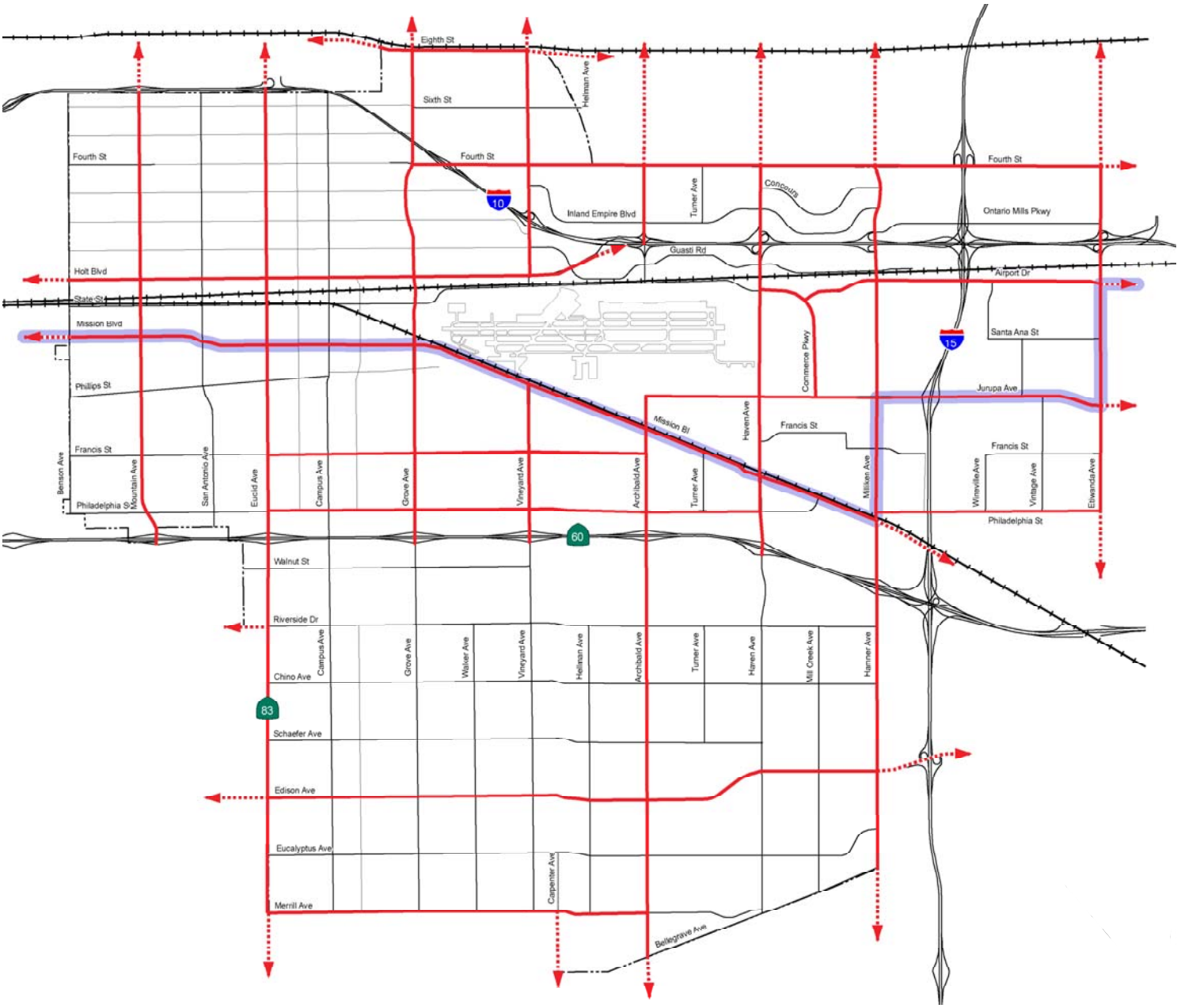
EXHIBIT 3-8: CITY OF CHINO TRUCK ROUTES



12611 - chino-trucks.dwg

URBAN CROSSROADS

EXHIBIT 3-9: CITY OF ONTARIO TRUCK ROUTES



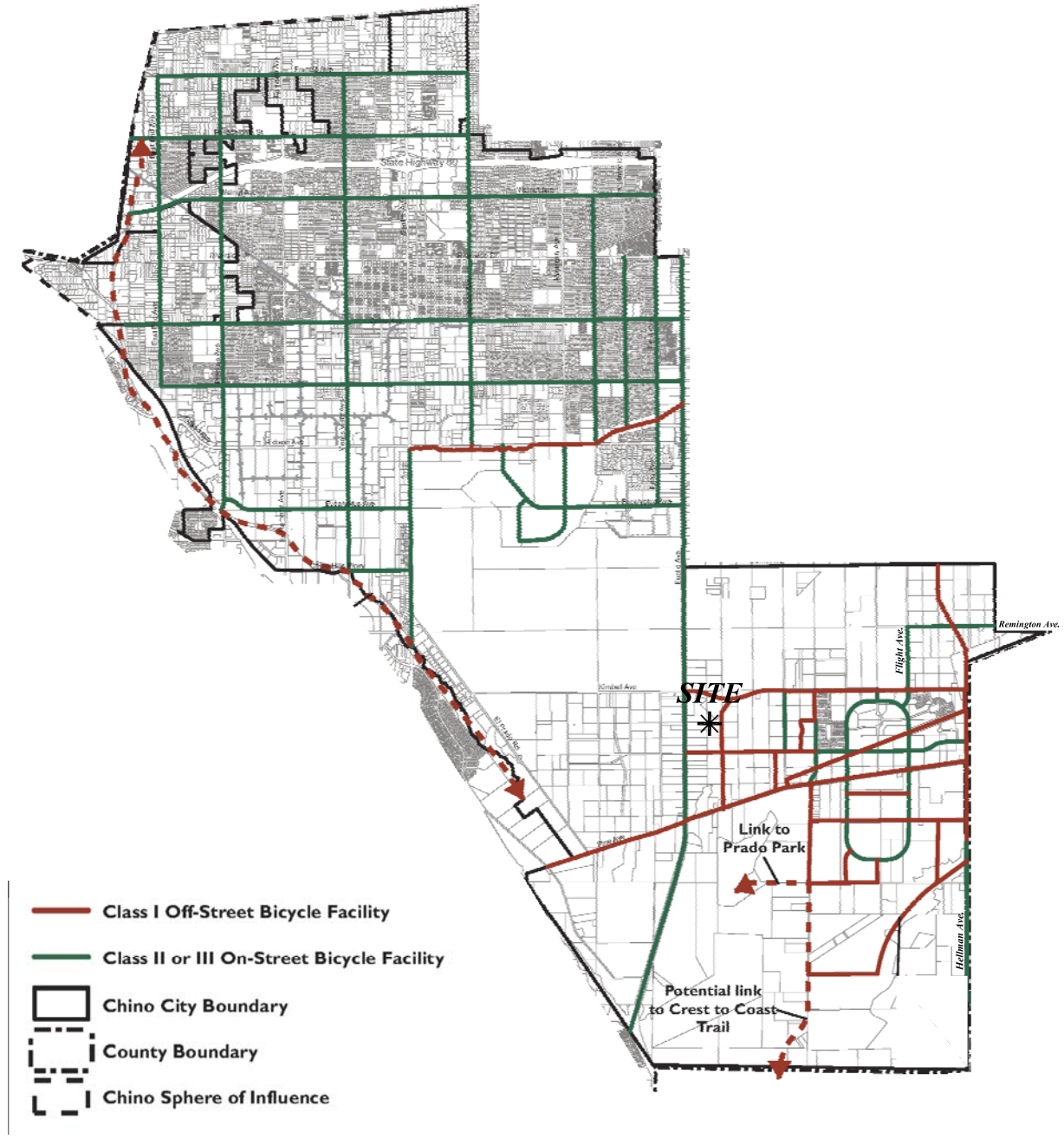
LEGEND:

- Truck Routes
- State of California DOT Extralegal Load Network
- Railroad
- Adjacent Agency Truck Route
- Exisitng Streets

N

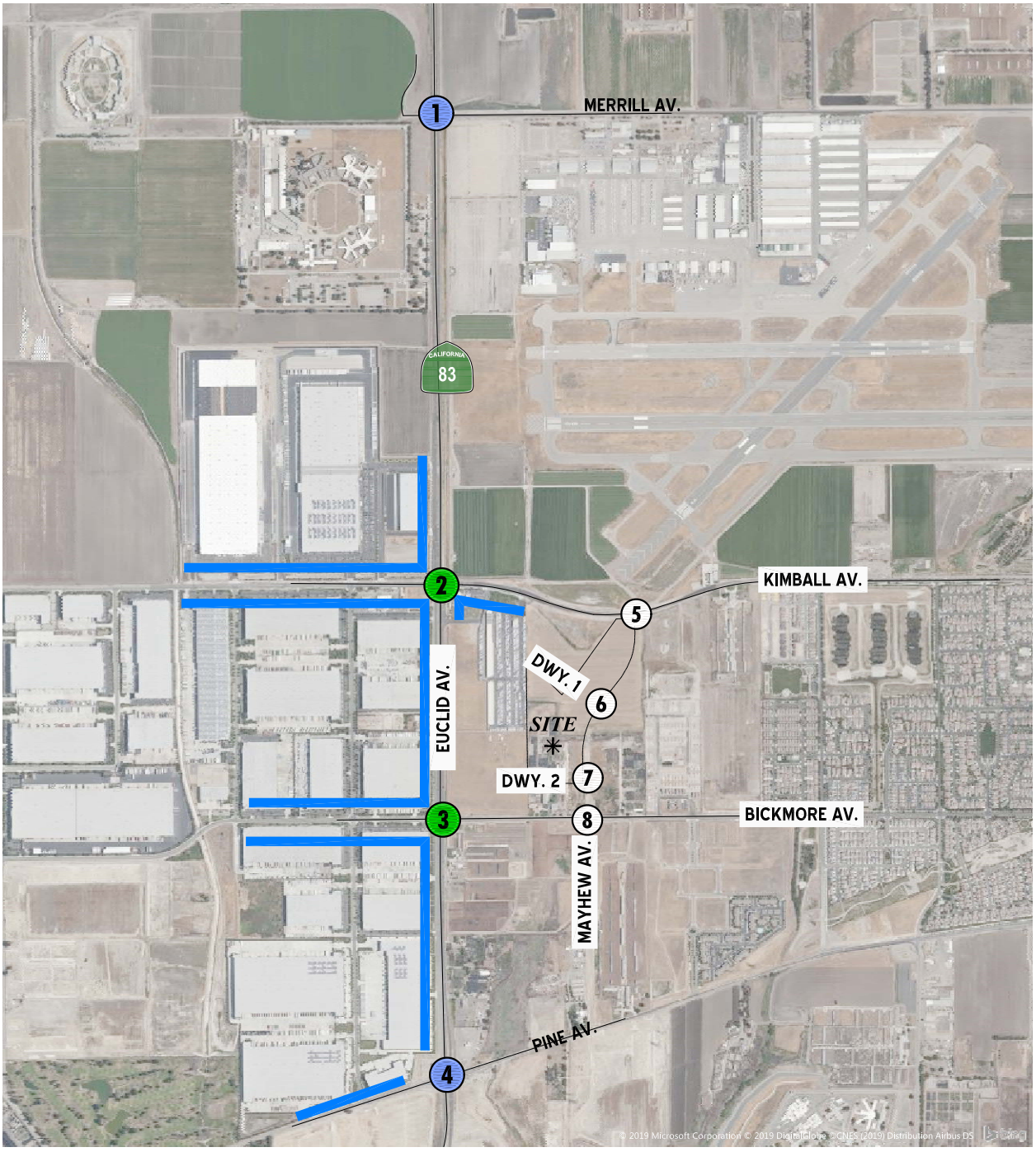
12611 - ontario truck routes.dwg

EXHIBIT 3-10: CITY OF CHINO FUTURE BICYCLE FACILITIES



12611 - chino-future-bike.dwg

EXHIBIT 3-11: EXISTING PEDESTRIAN FACILITIES



LEGEND:

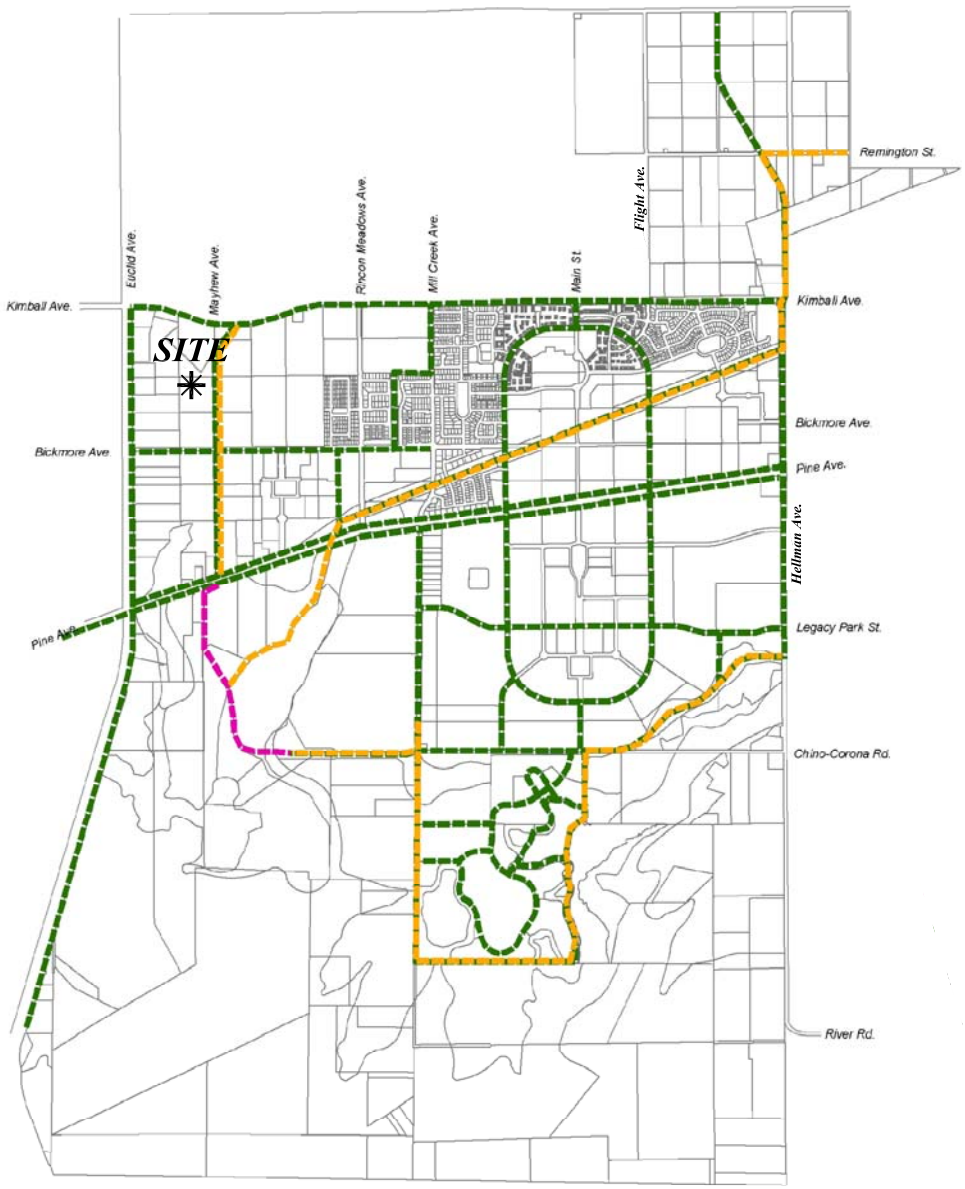
- = SIDEWALK
- 0 = FUTURE INTERSECTION
- 0 = CROSSWALK ON ALL APPROACHES
- 0 = CROSSWALK ON THREE APPROACHES

N

12611 - peds.dwg

URBAN CROSSROADS

EXHIBIT 3-12: THE PRESERVE SPECIFIC PLAN EQUESTRIAN PLAN



Equestrian Trails

Conceptual Equestrian Trails

Community Paseo and Open Space System

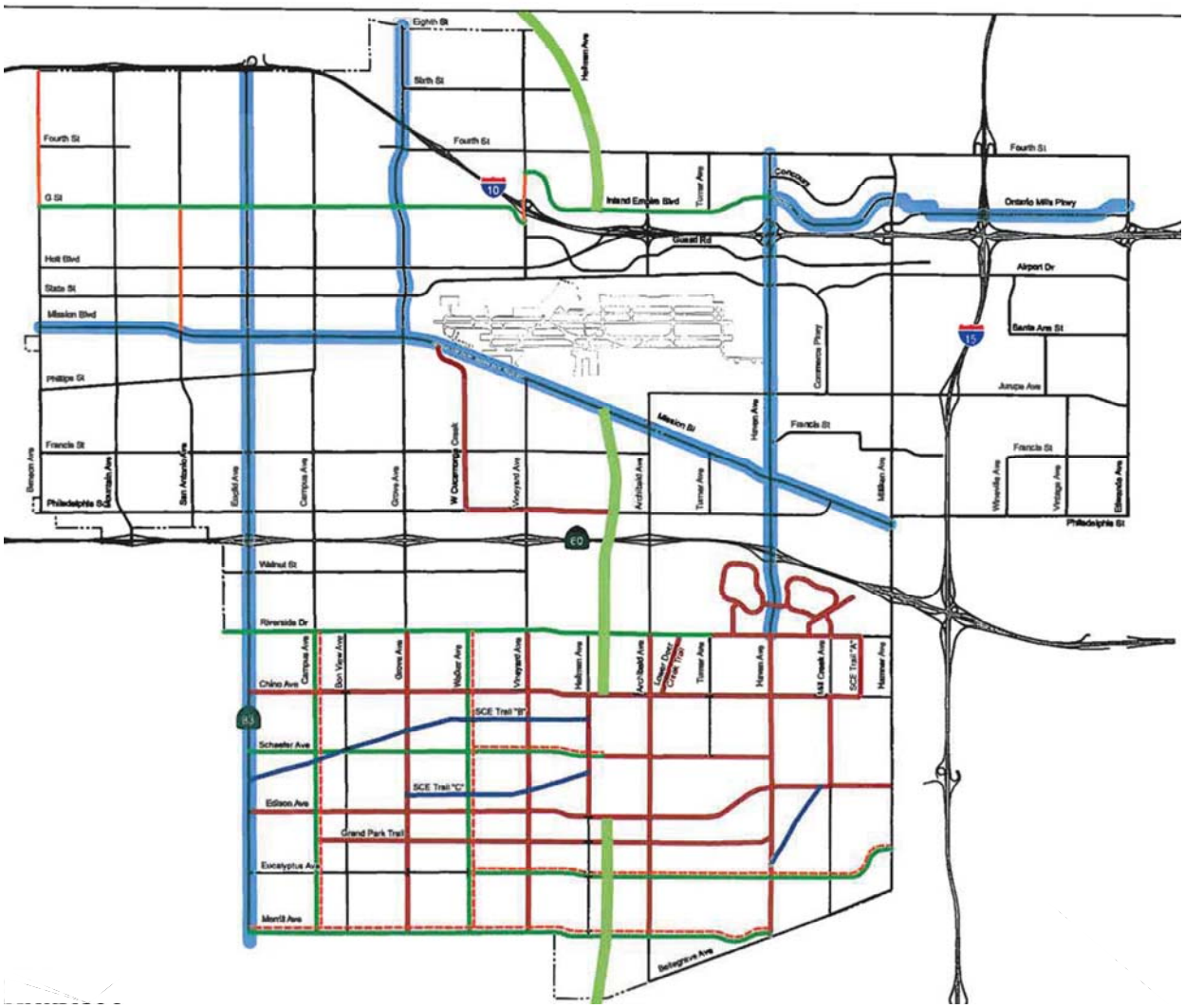
Notes:

Paseo width varies. See streeet sections for detailed information.

Refer to Landscape Structure Plan (Section VI Figure 22) for the location of the Urban Fringe Buffer within the Edgewater Neighborhood.

N

EXHIBIT 3-13: CITY OF ONTARIO GENERAL PLAN TRAILS AND BIKEWAY SYSTEMS



LEGEND:

- Freeways
- Backbone Street System
- Multipurpose Trail
- Class II & Multipurpose Trail
- Class II
- Class III
- SCE Trails
- Cucamonga Creek Multipurpose Trail
- Bicycle Corridors

N

3.7 EXISTING (2019) TRAFFIC COUNTS

The intersection LOS analysis is based on the traffic volumes observed during the peak hour conditions using traffic count data collected in November 2019 and January 2019 (for the intersection of Euclid Avenue (SR-83) and Merrill Avenue). The following peak hours were selected for analysis:

- Weekday AM Peak Hour (peak hour between 7:00 AM and 9:00 AM)
- Weekday PM Peak Hour (peak hour between 4:00 PM and 6:00 PM)

The weekday AM and weekday PM peak hour count data are representative of typical weekday peak hour traffic conditions in the study area. At the time traffic counts were collected in November 2019, portions of Merrill Avenue were closed to traffic due to construction. Since the closure of Merrill Avenue would affect traffic counts (i.e., a reduction in the volumes along Merrill Avenue), a traffic count collected in January 2019 was utilized when all portions of Merrill Avenue were open to traffic. This 2019 traffic count was utilized in an effort to conduct a conservative analysis, since the January 2019 traffic count at this intersection would reflect traffic utilizing Merrill Avenue (i.e., higher traffic volumes along Merrill Avenue).

There were no other observations made in the field that would indicate atypical traffic conditions on the count dates, such as construction activity or detour routes. Near-by schools were in session and operating on normal schedules. The raw manual peak hour turning movement traffic count data sheets are included in Appendix 3.1.

The traffic counts collected in both January and November of 2019 include the following vehicle classifications: Passenger Cars, 2-Axle Trucks, 3-Axle Trucks, and 4 or More Axle Trucks. To represent the impact large trucks, buses and recreational vehicles have on traffic flow; all trucks were converted into PCE. By their size alone, these vehicles occupy the same space as two or more passenger cars. In addition, the time it takes for them to accelerate and slow-down is much longer than for passenger cars and varies depending on the type of vehicle and number of axles. For the purpose of this analysis, a PCE factor of 1.5 has been applied to 2-axle trucks, 2.0 for 3-axle trucks, and 3.0 for 4+-axle trucks to estimate each turning movement. These factors are consistent with the values recommended for use in the CMP.

Consistent with standard engineering practice, the traffic counts were collected on either a typical Tuesday, Wednesday, or Thursday on a non-holiday. Traffic counts were also conducted when local schools were in session and operating on normal bell schedules. The purpose of this TIA is to evaluate the peak hour operations for the typical weekday peak hour. Existing weekday ADT, AM peak hour, and PM peak hour volumes are shown on Exhibit 3-14.

EXHIBIT 3-14: EXISTING (2019) TRAFFIC VOLUMES (IN PCE)



1 Euclid Av. (SR-83) & E. Facility Dr./ Merrill Av. 39(1) 981(1155) 120(251) → 228(136) ← 48(2) ← 225(183) 4(11) → 8(29) → 17(12) → 10(4) 1013(1136) 140(224)	**2** Euclid Av. (SR-83) & Kimball Av. 394(214) 593(732) 162(428) → 304(166) ← 824(296) ← 37(27) 120(378) → 205(716) → 35(76) → 155(71) 724(722) 46(38)	**3** Euclid Av. (SR-83) & Bickmore Av. 155(192) 574(685) 42(127) → 175(40) ← 195(24) ← 326(26) 96(122) → 10(103) → 44(62) → 26(34) 599(634) 30(110)	**4** Euclid Av. (SR-83) & Pine Av. 20(14) 842(632) 78(96) → 62(70) ← 390(132) ← 692(592) 4(17) → 167(404) → 64(82) → 41(65) 587(706) 913(997)	**5** Mayhew Av. & Kimball Av. Future Intersection
6 Mayhew Av. & Dwy. 1 Future Intersection	**7** Mayhew Av. & Dwy. 2 Future Intersection	**8** Mayhew Av. & Bickmore Av. Future Intersection		

LEGEND:

10.0 = ACTUAL (COUNT-BASED) VEHICLES PER DAY (1000'S)
10.0 = ESTIMATED VEHICLES PER DAY (1000'S)
10(10) = AM(PM) PEAK HOUR INTERSECTION VOLUMES

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Where actual 24-hour tube count data was not available, Existing ADT volumes were based upon factored intersection peak hour counts collected by Urban Crossroads, Inc. using the following formula for each intersection leg:

Weekday PM Peak Hour (Approach Volume + Exit Volume) x 11.62 = Leg Volume

A comparison of the PM peak hour and daily traffic volumes of various roadway segments within the study area indicated that the peak-to-daily relationship is approximately 8.61 percent. As such, the above equation utilizing a factor of 11.62 estimates the ADT volumes on the study area roadway segments assuming a peak-to-daily relationship of approximately 8.61 percent (i.e., 1/0.0861 = 11.62) and was assumed to sufficiently estimate average daily traffic (ADT) volumes for planning-level analyses.

3.8 INTERSECTION OPERATIONS ANALYSIS

Existing peak hour traffic operations have been evaluated for the study area intersections based on the analysis methodologies presented in Section 2.2 *Intersection Capacity Analysis* of this report. The intersection operations analysis results are summarized in Table 3-1, which indicates that the following existing study area intersection is currently operating at an unacceptable LOS during the PM peak hour:

- Euclid Avenue (SR-83) & Pine Avenue (#4) – LOS E PM peak hour only

Consistent with Table 3-1, a summary of the peak hour intersection LOS for Existing conditions are shown on Exhibit 3-15. The intersection operations analysis worksheets are included in Appendix 3.2 of this TIA.

3.9 ROADWAY SEGMENT ANALYSIS

Since all the study area roadway segments will be constructed by the Project, and do not exist under "Without Project" conditions, no roadway segment analysis has been conducted under Existing (2019) traffic conditions.

3.10 TRAFFIC SIGNAL WARRANTS ANALYSIS

There are no existing unsignalized study area intersections. As such, no traffic signal warrant analysis has been conducted for Existing (2019) traffic conditions.

Table 3-1

Intersection Analysis for Existing (2019) Conditions

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												Delay[2] (secs.)		Level of Service		Acceptable LOS
			Northbound			Southbound			Eastbound			Westbound							
			L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM	
1	Euclid Av. (SR-83) & Merrill Av.	TS	1	2	1	1	2	0	0	1	0	0	1	0	32.1	30.1	C	C	D
2	Euclid Av. (SR-83) & Kimball Av.	TS	1	2	1	2	2	1	2	2	0	1	2	1	40.4	46.0	D	D	D
3	Euclid Av. (SR-83) & Bickmore Av.	TS	1	2	0	1	2	1	1	1	1	1	1	0	19.5	15.6	B	B	D
4	Euclid Av. (SR-83) & Pine Av.	TS	1	2	1>	1	2	0	1	1	1	2	1	0	32.9	**61.7**	C	**E**	D
5	Mayhew Av. & Kimball Av.		Future Intersection																
6	Mayhew Av. & Driveway 1		Future Intersection																
7	Mayhew Av. & Driveway 2		Future Intersection																
8	Mayhew Av. & Bickmore Av.		Future Intersection																

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

[1] When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.

L = Left; T = Through; R = Right; > = Right-Turn Overlap Phasing

[2] Per the Highway Capacity Manual (6th Edition), overall average intersection delay and level of service are shown for intersections with a traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[3] TS = Traffic Signal

EXHIBIT 3-15: EXISTING (2019) SUMMARY OF LOS



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3.11 QUEUING ANALYSIS

A queuing analysis was conducted at two study area intersections in the vicinity of the Project site, in order to determine 95th percentile queues during the peak hours. The queuing analysis results are summarized in Table 3-2 for Existing (2019) traffic conditions, which indicates that the following movements are currently experiencing queuing issues based on the 95th percentile peak hour traffic flows:

- Euclid Avenue (SR-83) & Kimball Avenue (#3), eastbound left turn lane – PM peak hour only
- Euclid Avenue (SR-83) & Bickmore Avenue (#3), southbound left turn lane – PM peak hour only
- Euclid Avenue (SR-83) & Bickmore Avenue (#3), westbound left turn lane – AM peak hour only

Queuing worksheets for Existing (2019) traffic conditions are included in Appendix 3.3.

3.12 RECOMMENDED IMPROVEMENTS

Improvement strategies have been recommended at intersections that have been identified as deficient under Existing (2019) traffic conditions in an effort to achieve an acceptable LOS (i.e., LOS D or better) and 95th percentile queues.

3.12.1 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES AT INTERSECTIONS

Table 3-3 indicates the physical improvements needed to address LOS deficiencies at each of the study area intersections under Existing (2019) traffic conditions. The following improvement is recommended to improve the Existing (2019) deficiencies back to acceptable levels. The intersection operations analysis worksheets for Existing (2019) with improvements are included in Appendix 3.4.

Euclid Avenue (SR-83) & Pine Ave (#2) – The following improvement is necessary to improve the existing deficiency to acceptable levels:

- Add a 2nd northbound right turn lane.

3.12.2 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES FOR ROADWAY SEGMENTS

As discussed in Section 3.9 *Roadway Segment Analysis*, there are no existing study area roadway segments.

Table 3-2

Peak Hour Queuing Summary for Existing (2019) Conditions

Intersection	Movement	Available Stacking Distance (Feet)	Existing (2019)			
			95th Percentile Queue (Feet)		Acceptable? [1]	
			AM Peak	PM Peak	AM	PM
Euclid Av. (SR-83) & Kimball Av.	NBL	420	224 [2]	103	Yes	Yes
	NBR	665	10	0	Yes	Yes
	SBL	430	114 [2]	269 [2]	Yes	Yes
	SBR	335	249	32	Yes	Yes
	EBL	210	78	**243** [2]	Yes	**No**
	WBL	215	65	51	Yes	Yes
	WBR	300	110	38	Yes	Yes
Euclid Av. (SR-83) & Bickmore Av.	NBL	110	59 [2]	64 [2]	Yes	Yes
	SBL	160	98 [2]	**249** [2]	Yes	**No**
	SBR	235	56	54	Yes	Yes
	EBL	150	138	142	Yes	Yes
	EBR	150	0	3	Yes	Yes
	WBL	90	**454** [2]	46	**No**	Yes

BOLD = Inadequate 95th percentile storage.

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided. An additional 15 feet of stacking which is assumed to be provided in the transition for turn pockets is reflected in the stacking distance shown on this table, where applicable.

[2] 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

Table 3-3

Intersection Analysis for Existing (2019) Conditions With Improvements

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												Delay[2] (secs.)		Level of Service	
			Northbound			Southbound			Eastbound			Westbound						
			L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM
4	Euclid Av. (SR-83) & Pine Av.																	
	-Without Improvements	TS	1	2	1>	1	2	0	1	1	1	2	1	0	32.9	**61.7**	C	**E**
	-With Improvements	TS	1	2	**2>**	1	2	0	1	1	1	2	1	0	26.9	44.9	C	D

[1] When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.

L = Left; T = Through; R = Right; > = Right-Turn Overlap Phasing; **1** = Improvement

[2] Per the Highway Capacity Manual (6th Edition), overall average intersection delay and level of service are shown for intersections with a traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[3] TS = Traffic Signal

3.12.3 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES FOR INTERSECTION QUEUES

As shown previously in Table 3-2, there are three movements that currently experience queuing issues during the AM or PM peak hours. Recommended improvements to address queuing issues for Existing (2019) traffic conditions are described below and shown in Table 3-4.

- At the intersection of Euclid Avenue (SR-83) and Kimball Avenue, a 400-foot eastbound left turn lane is recommended in order to accommodate the 95th percentile peak hour queues for Existing (2019) traffic conditions. This recommended improvement can be accommodated through restriping of existing pavement.
- At the intersection of Euclid Avenue (SR-83) and Bickmore Avenue, a 270-foot southbound left turn lane is recommended in order to accommodate the 95th percentile peak hour queues for Existing (2019) traffic conditions. This recommended improvement can be accommodated through restriping of existing pavement.
- At the intersection of Euclid Avenue (SR-83) and Bickmore Avenue a 200-foot westbound left turn lane is recommended to accommodate the 95th percentile queue. Although the 95th percentile queue is higher than the available stacking for the westbound left turn lane, there are no anticipated queuing issues for the same movement under Horizon Year (2040) traffic conditions with the implementation of dual 200-foot left turn lanes. As such, no additional improvements have been recommended.

Table 3-4

Peak Hour Queuing Summary for Existing (2019) Conditions With Improvements

Intersection	Movement	Available Stacking Distance (Feet)	Existing (2019)			
			95th Percentile Queue (Feet)		Acceptable? [1]	
			AM Peak	PM Peak	AM	PM
Euclid Av. (SR-83) & Kimball Av.	NBL	420	224 [2]	103	Yes	Yes
	NBR	665	10	0	Yes	Yes
	SBL	430	114 [2]	269 [2]	Yes	Yes
	SBR	335	249	32	Yes	Yes
	EBL	**400**	78	243 [2]	Yes	Yes
	WBL	215	65	51	Yes	Yes
	WBR	300	110	38	Yes	Yes
Euclid Av. (SR-83) & Bickmore Av.	NBL	110	59 [2]	64 [2]	Yes	Yes
	SBL	**270**	98 [2]	249 [2]	Yes	Yes
	SBR	235	56	54	Yes	Yes
	EBL	150	138	142	Yes	Yes
	EBR	150	0	3	Yes	Yes
	WBL	**200**	**454** [2,3]	46	**No**	Yes

BOLD = Inadequate 95th percentile storage.

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided. An additional 15 feet of stacking which is assumed to be provided in the transition for turn pockets is reflected in the stacking distance shown on this table, where applicable.

[2] 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

[3] Although the 95th percentile queue is higher than the available stacking distance, there are no anticipated queuing issues for the same movement under Horizon Year (2040) traffic conditions with the future implementation of dual 200-foot left turn lanes. As such, no additional improvements have been recommended.

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4 PROJECTED FUTURE TRAFFIC

This section presents the traffic volumes estimated to be generated by the Project, as well as the Project's trip assignment onto the study area roadway network. The development of the proposed Project is to consist of up to 284,996 sf of warehousing use with a 66,779 sf sharehouse/cookout building and 24,429 sf fleet building. For the purposes of this analysis, the Project is proposed to be developed in a single phase with an anticipated Opening Year of 2022.

Regional access to the Project is available from SR-71, SR-60, and I-15 Freeways. Vehicular access will be provided via the following full access driveways (see Exhibit 1-1):

- Mayhew Avenue & Driveway 1 – Passenger Cars and Trucks
- Mayhew Avenue & Driveway 2 – Passenger Cars only

4.1 PROJECT TRIP GENERATION

4.1.1 PROPOSED PROJECT TRIP GENERATION

Trip generation represents the amount of traffic which is both attracted to and produced by a development. Determining traffic generation for a specific project is therefore based upon forecasting the amount of traffic that is expected to be both attracted to and produced by the specific land uses being proposed for a given development. The trip generation for the proposed Project is based on user-specific data supplied by the Project Applicant. The data supplied by the user is based on a combination of operational characteristics of other similar sites and anticipated operations for the proposed facility.

As shown in Table 4-1, the proposed Project is anticipated to generate a total of 1,532 actual vehicle trip-ends per day with 129 AM peak hour trips and 174 PM peak hour trips. In comparison to the actual vehicles, the proposed Project is anticipated to generate a total of 1,796 PCE trip-ends per day, 137 PCE AM peak hour trips and 187 PCE PM peak hour trips.

4.1.2 MARCH 2019 TRAFFIC STUDY TRIP GENERATION

The March 2019 Traffic Study assumed 515,000 sf of general warehousing use for Buildings 4, 5, and 6. The trip generation rates utilized in that TIA were based upon information collected by the Institute of Transportation Engineers (ITE) as provided in their Trip Generation Manual (10^{th} Edition, 2017). (6) ITE land use code 150 (Warehouse) was used to derive site specific trip generation estimates for buildings 4, 5, and 6 for the March 2019 Traffic Study.

Table 4-1

Project Trip Generation Summary: Altitude Business Centre Phase 1

Project	AM Peak Hour			PM Peak Hour			Daily
	In	Out	Total	In	Out	Total	
Actual Vehicles[1]							
Altitude Business Centre - Phase 1							
Passenger Cars:	75	50	125	50	110	160	1,370
Truck Trips:							
2-axle:	*0*	*0*	*0*	*0*	*10*	*10*	*40*
3-axle:	*0*	*0*	*0*	*0*	*0*	*0*	*0*
4+-axle:	*2*	*2*	*4*	*2*	*2*	*4*	*122*
- Truck Trips	*2*	*2*	*4*	*2*	*12*	*14*	*162*
TOTAL TRIPS (ACTUAL VEHICLES)[1]	***77***	***52***	***129***	***52***	***122***	***174***	***1,532***
Passenger Car Equivalent (PCE)							
Altitude Business Centre - Phase 1							
Passenger Cars:	75	50	125	50	110	160	1,370
Truck Trips:							
2-axle:	*0*	*0*	*0*	*0*	*15*	*15*	*60*
3-axle:	*0*	*0*	*0*	*0*	*0*	*0*	*0*
4+-axle:	*6*	*6*	*12*	*6*	*6*	*12*	*366*
- Truck Trips	*6*	*6*	*12*	*6*	*21*	*27*	*426*
TOTAL TRIPS (PCE)[1]	***81***	***56***	***137***	***56***	***131***	***187***	***1,796***

[1] Trip generation based on empirical data provided by the Project Applicant.

[2] TOTAL TRIPS = Passenger Cars + Truck Trips.

The ITE Trip Generation Manual includes very limited data regarding the types of vehicles that are generated for warehousing uses (passenger cars and various sizes of trucks). Data regarding the vehicle mix has therefore been obtained from a separate report; the City of Fontana Truck Trip Generation Study (August 2003) for the warehousing use proposed as part of the Project. (7) Buildings 4, 5, and 6 have been identified as heavy warehouses. The "Heavy Warehouse" vehicle mix data has been utilized for all 3 buildings. The trip generation rates for the March 2019 Traffic Study (Altitude Business Centre Buildings 4, 5, and 6) are provided in Table 4-2, and peak hour trip generation estimates for the proposed Project in actual vehicles and PCE are shown in Table 4-3.

As shown in Table 4-3, the project from the March 2019 Traffic Study is anticipated to generate a total of 1,842 actual vehicle trip-ends per day with 154 AM peak hour trips and 165 PM peak hour trips. In comparison to the actual vehicles, the project from the March 2019 Traffic Study is anticipated to generate a total of 2,408 PCE trip-ends per day, 202 PCE AM peak hour trips and 216 PCE PM peak hour trips.

4.1.3 TRIP GENERATION COMPARISON

A comparison of the March 2019 Traffic Study and proposed Project trip generation shows that the proposed Project is anticipated to generate 612 fewer PCE trip-ends per day with 64 fewer PCE AM peak hour trips and 30 fewer PCE PM peak hour trips (see Table 4-4).

4.2 PROJECT TRIP DISTRIBUTION

The Project trip distribution and assignment process represents the directional orientation of traffic to and from the Project site. The trip distribution pattern is heavily influenced by the geographical location of the site, the location of surrounding uses, and the proximity to the regional freeway system.

The Project trip distribution and assignment process represents the directional orientation of traffic to and from the Project site. The E+P and Opening Year Cumulative trip distribution patterns utilize the existing roadway system while the Horizon Year trip distribution patterns assumes future roadway connections based on the City of Chino and City of Ontario General Plans (and those of surrounding agencies). The following trip distribution patterns are consistent with those utilized in the Altitude Business Centre Traffic Study:

- Exhibit 4-1 illustrates the E+P and Opening Year Cumulative truck trip distribution patterns
- Exhibit 4-2 illustrates the Horizon Year truck trip distribution patterns
- Exhibit 4-3 illustrates the E+P and Opening Year Cumulative passenger car trip distribution patterns
- Exhibit 4-4 illustrates the Horizon Year passenger car trip distribution patterns

Table 4-2

Trip Generation Rates

Land Use[1]	Units[2]	ITE LU Code	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Project Trip Generation Rates (PCE)									
Warehouse[3]	TSF	150	0.240	0.060	0.300	0.080	0.240	0.320	3.560
Passenger Cars			0.191	0.048	0.239	0.064	0.191	0.255	2.833
2-Axle Trucks (PCE = 1.5)			0.012	0.003	0.016	0.004	0.012	0.017	0.185
3-Axle Trucks (PCE = 2.0)			0.022	0.006	0.028	0.007	0.022	0.030	0.330
4-Axle+ Trucks (PCE = 3.0)			0.089	0.022	0.111	0.030	0.089	0.118	1.317

Land Use[1]	Units[2]	ITE LU Code	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Project Trip Generation Rates (Actual Vehicles)									
Warehouse[3]	TSF	150	0.240	0.060	0.300	0.080	0.240	0.320	3.560
Passenger Cars			0.191	0.048	0.239	0.064	0.191	0.255	2.833
2-Axle Trucks			0.008	0.002	0.010	0.003	0.008	0.011	0.123
3-Axle Trucks			0.011	0.003	0.014	0.004	0.011	0.015	0.165
4-Axle+ Trucks			0.030	0.007	0.037	0.010	0.030	0.039	0.439

[1] Trip Generation Source: Institute of Transportation Engineers (ITE), Trip Generation Manual, Tenth Edition (2017).

[2] TSF = thousand square feet

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

Table 4-3

Trip Generation Summary: Altitude Business Centre (Buildings 4, 5, & 6)

Land Use	Quantity	Units[1]	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Actual Vehicles									
BUILDING 4									
Warehouse	185.000	TSF							
Passenger Cars:			35	9	44	12	35	47	524
Truck Trips:									
2-axle:			*2*	*0*	*2*	*1*	*2*	*2*	*24*
3-axle:			*2*	*1*	*3*	*1*	*2*	*3*	*32*
4+-axle:			*5*	*1*	*7*	*2*	*5*	*7*	*82*
- Truck Trips [2]			*10*	*2*	*12*	*3*	*10*	*12*	*138*
BUILDING 4 TOTAL TRIPS [3]			***45***	***11***	***56***	***15***	***45***	***59***	***662***
BUILDING 5									
Warehouse	200.000	TSF							
Passenger Cars:			38	10	48	13	38	51	568
Truck Trips:									
2-axle:			*2*	*0*	*2*	*1*	*2*	*2*	*26*
3-axle:			*2*	*1*	*3*	*1*	*2*	*3*	*34*
4+-axle:			*6*	*1*	*7*	*2*	*6*	*8*	*88*
- Truck Trips [2]			*10*	*2*	*12*	*3*	*10*	*13*	*148*
BUILDING 5 TOTAL TRIPS [3]			***48***	***12***	***60***	***16***	***48***	***64***	***716***
BUILDING 6									
Warehouse	130.000	TSF							
Passenger Cars:			25	6	32	8	25	33	368
Truck Trips:									
2-axle:			*1*	*0*	*1*	*0*	*1*	*1*	*16*
3-axle:			*1*	*0*	*1*	*0*	*1*	*2*	*22*
4+-axle:			*4*	*1*	*4*	*1*	*4*	*6*	*58*
- Truck Trips [2]			*6*	*1*	*6*	*2*	*7*	*9*	*96*
BUILDING 6 TOTAL TRIPS [3]			***31***	***7***	***38***	***10***	***32***	***42***	***464***
TOTAL (BUILDINGS 4, 5, & 6) (Actual Vehicles)			***125***	***30***	***154***	***41***	***125***	***165***	***1,842***

Trip Generation Summary: Altitude Business Centre (Buildings 4, 5, & 6)

Land Use	Quantity	Units[1]	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Passenger Car Equivalent (PCE)									
BUILDING 4									
Warehouse	185.000	TSF							
Passenger Cars:			35	9	44	12	35	47	524
Truck Trips:									
2-axle:			*2*	*1*	*3*	*1*	*2*	*3*	*34*
3-axle:			*4*	*1*	*5*	*1*	*4*	*5*	*62*
4+-axle:			*16*	*4*	*21*	*5*	*16*	*22*	*244*
- Truck Trips (PCE) [2]			*22*	*5*	*28*	*8*	*23*	*30*	*340*
BUILDING 4 TOTAL TRIPS (PCE) [3]			***57***	***14***	***73***	***19***	***58***	***77***	***864***
BUILDING 5									
Warehouse	200.000	TSF							
Passenger Cars:			38	10	48	13	38	51	568
Truck Trips:									
2-axle:			*2*	*1*	*3*	*1*	*2*	*3*	*38*
3-axle:			*4*	*1*	*6*	*1*	*4*	*6*	*66*
4+-axle:			*18*	*4*	*22*	*6*	*18*	*24*	*264*
- Truck Trips (PCE) [2]			*25*	*6*	*31*	*8*	*25*	*33*	*368*
BUILDING 5 TOTAL TRIPS (PCE) [3]			***63***	***16***	***79***	***21***	***63***	***84***	***936***
BUILDING 6									
Warehouse	130.000	TSF							
Passenger Cars:			25	6	31	8	25	33	368
Truck Trips:									
2-axle:			*2*	*0*	*2*	*1*	*2*	*2*	*24*
3-axle:			*3*	*1*	*4*	*1*	*3*	*4*	*44*
4+-axle:			*12*	*3*	*14*	*4*	*12*	*16*	*172*
- Truck Trips (PCE) [2]			*16*	*4*	*20*	*5*	*17*	*22*	*240*
BUILDING 6 TOTAL TRIPS (PCE) [3]			***41***	***10***	***51***	***14***	***42***	***55***	***608***
TOTAL (BUILDINGS 4, 5, & 6) (PCE)			***161***	***40***	***202***	***54***	***163***	***216***	***2,408***

[1] TSF = thousand square feet

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

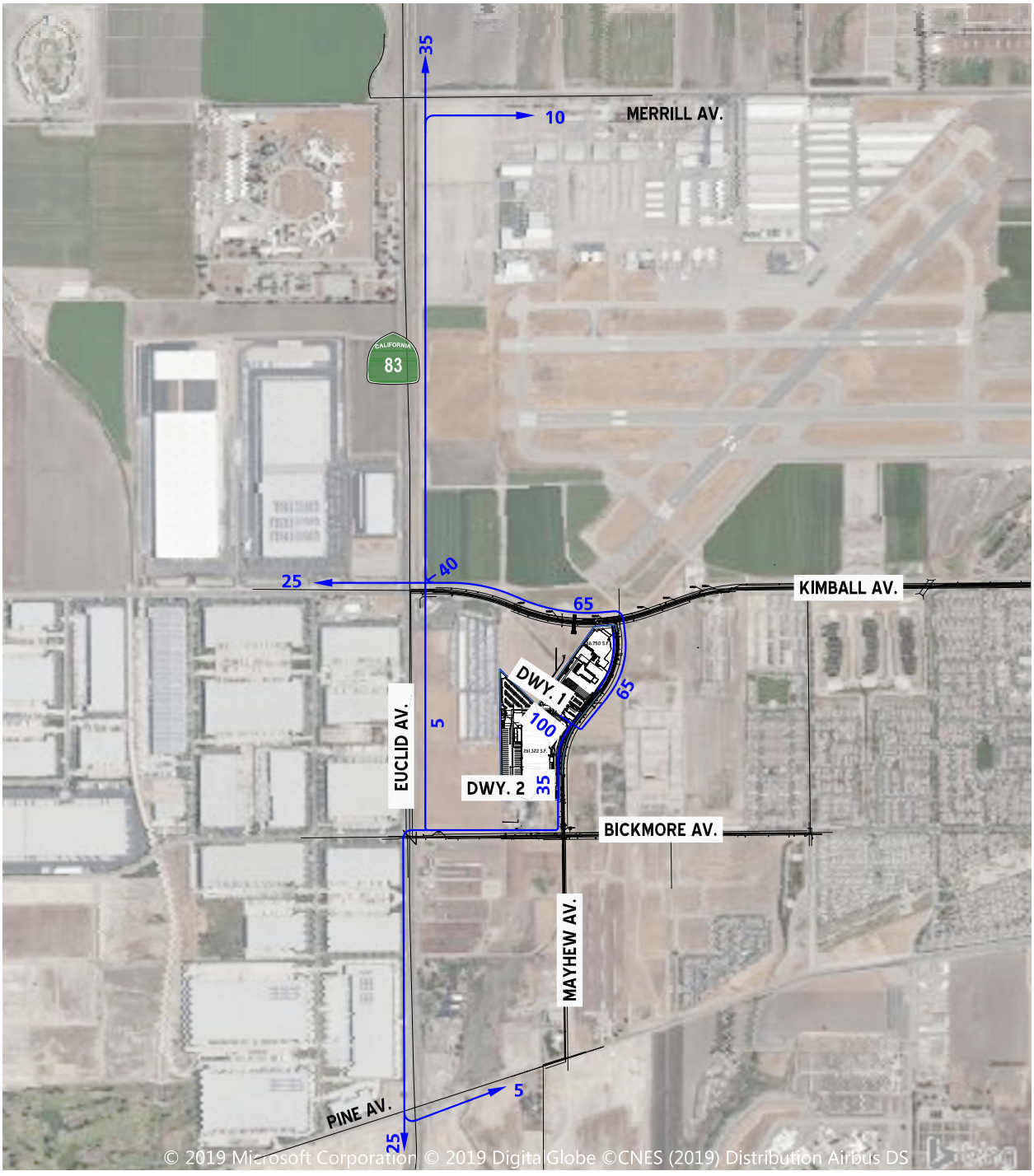
[3] TOTAL NET TRIPS (PCE) = Passenger Cars + Truck Trips (PCE).

Table 4-4

Trip Generation Comparison

Project	AM Peak Hour			PM Peak Hour			Daily
	In	Out	Total	In	Out	Total	
Actual Vehicles							
March 2019 Traffic Study	125	30	154	41	125	166	1,842
Proposed Project	77	52	129	52	122	174	1,532
Variance	***-48***	***22***	***-25***	***11***	***-3***	***8***	***-310***
Passenger Car Equivalent (PCE)							
March 2019 Traffic Study	161	40	201	54	163	217	2,408
Proposed Project	81	56	137	56	131	187	1,796
Variance	***-80***	***16***	***-64***	***2***	***-32***	***-30***	***-612***

EXHIBIT 4-1: PROJECT INTERIM YEAR (TRUCK) TRIP DISTRIBUTION



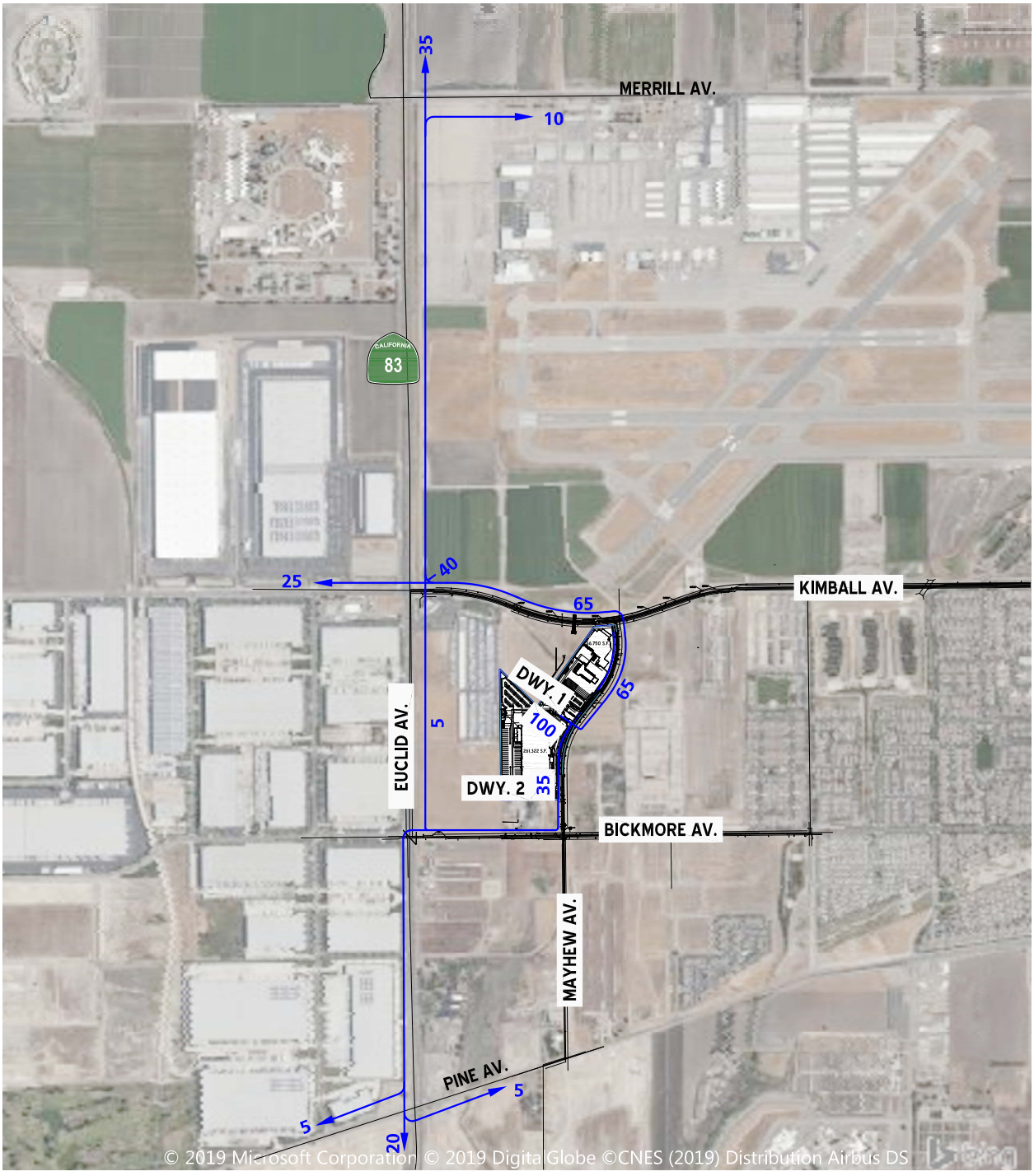
LEGEND:

10 = PERCENT TO/FROM PROJECT

N

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EXHIBIT 4-2: PROJECT HORIZON YEAR (TRUCK) TRIP DISTRIBUTION

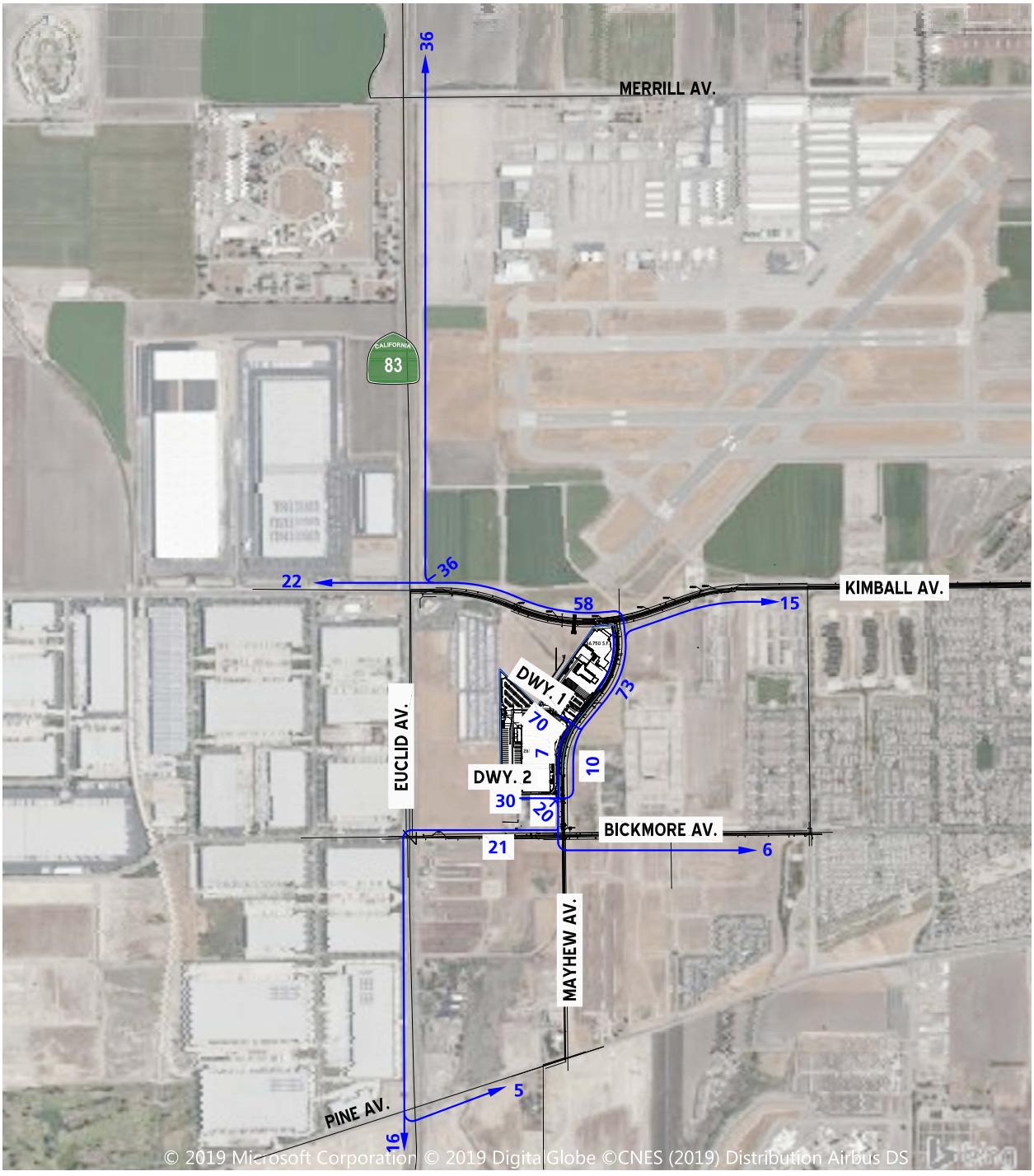


LEGEND:

10 = PERCENT TO/FROM PROJECT

N

EXHIBIT 4-3: PROJECT INTERIM YEAR (PASSENGER CAR) TRIP DISTRIBUTION

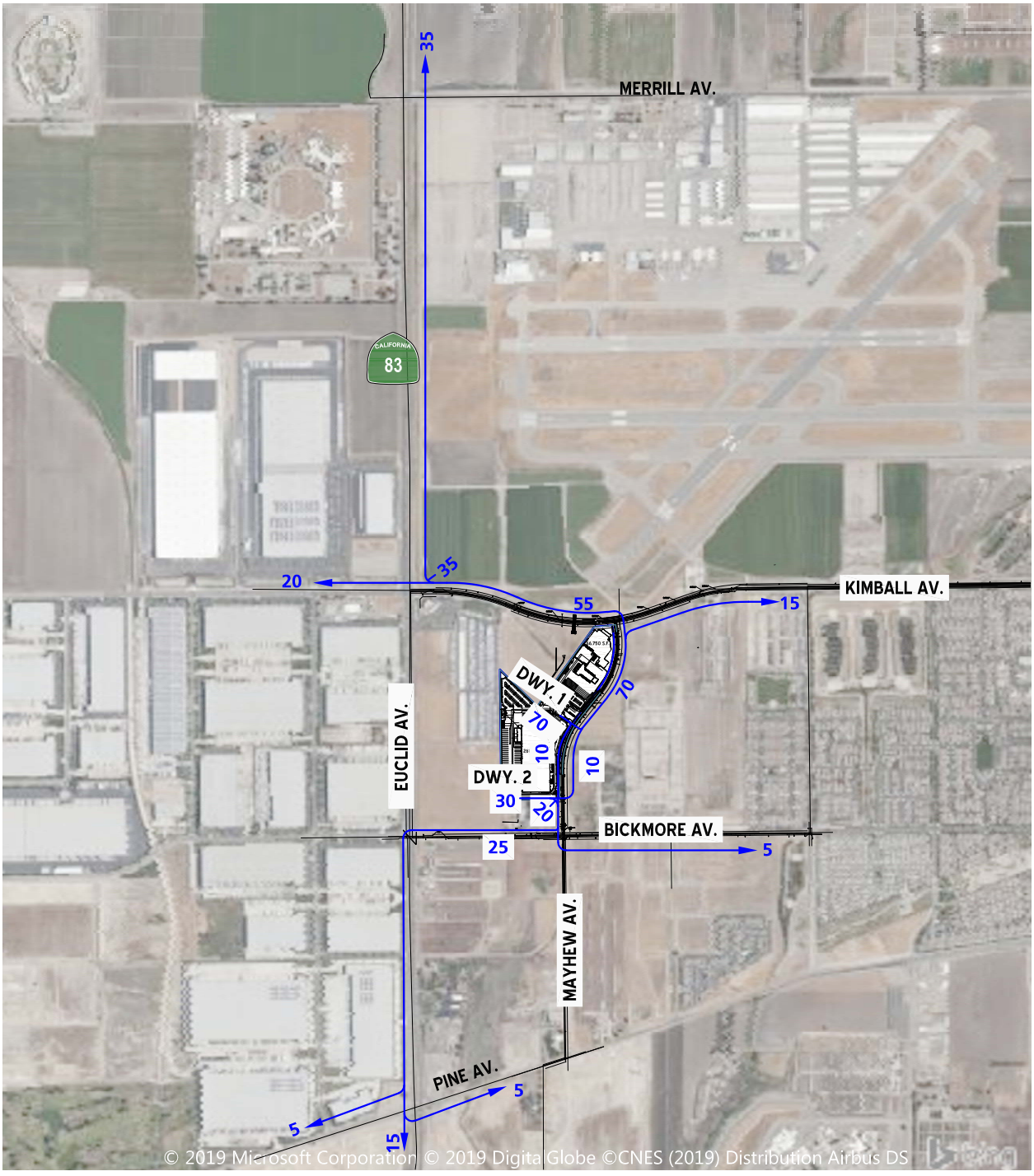


LEGEND:

10 = PERCENT TO/FROM PROJECT

N

EXHIBIT 4-4: PROJECT HORIZON YEAR (PASSENGER CAR) TRIP DISTRIBUTION



LEGEND:

10 = PERCENT TO/FROM PROJECT

N

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URBAN CROSSROADS

4.3 MODAL SPLIT

The potential for Project trips to be reduced by the use of public transit, walking or bicycling have not been included as part of the Project's estimated trip generation. Essentially, the Project's traffic projections are "conservative" in that these alternative travel modes would reduce the forecasted traffic volumes.

4.4 PROJECT TRIP ASSIGNMENT

The assignment of traffic from the Project area to the adjoining roadway system is based upon the Project trip generation, trip distribution, and the arterial highway and local street system improvements that would be in place by the time of initial occupancy of the Project. Based on the identified Project traffic generation and trip distribution patterns, Project ADT and peak hour intersection turning movement volumes are shown on Exhibit 4-5 for E+P and Opening Year traffic conditions, and Exhibit 4-6 for Horizon Year (2040) traffic conditions.

4.5 BACKGROUND TRAFFIC

4.5.1 OPENING YEAR CUMULATIVE CONDITIONS

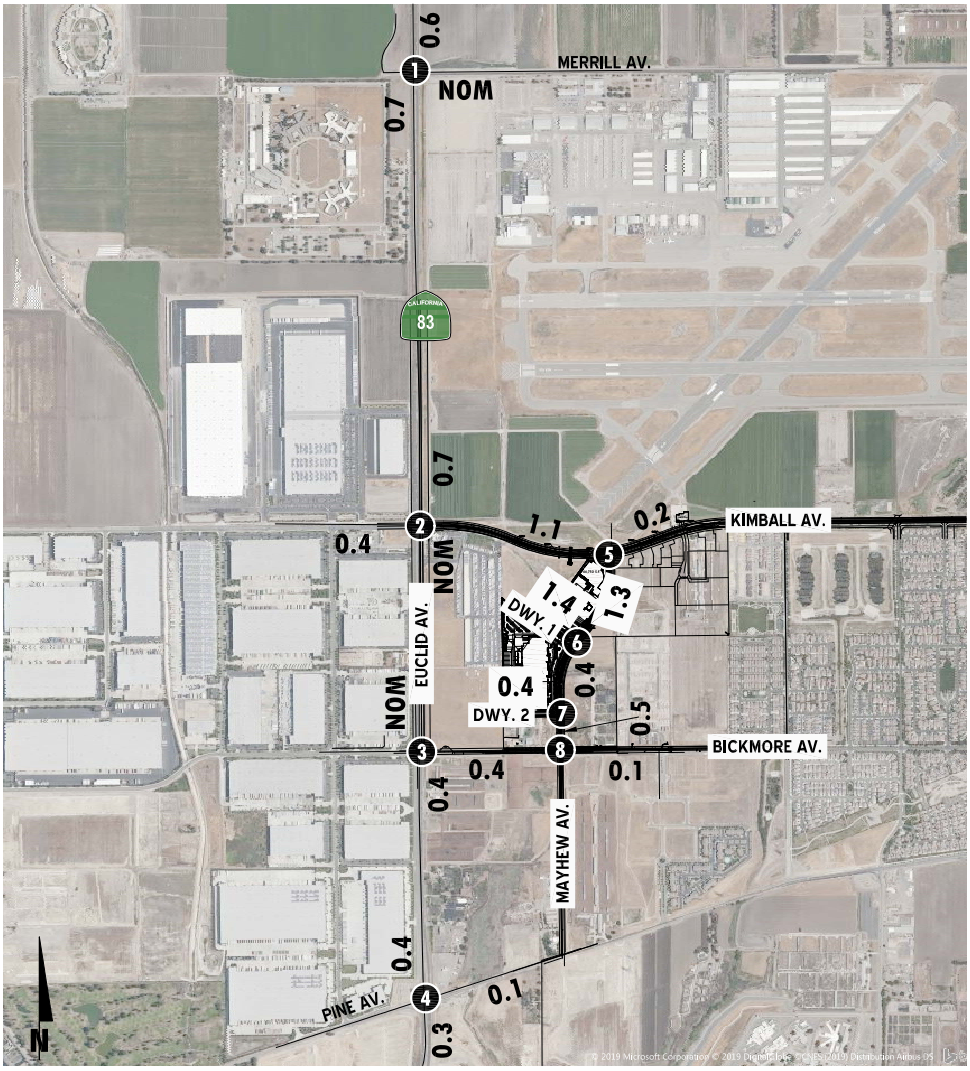
Future year traffic forecasts have been based upon background (ambient) growth at 2% per year for 2022 traffic conditions. The ambient growth factor is intended to approximate regional traffic growth. The total ambient growth is 6.12% for 2022 traffic conditions (compounded growth of 2 percent per year over 3 years or $1.02^{3\ years}$). This ambient growth rate is added to existing traffic volumes to account for area-wide growth not reflected by cumulative development projects. Ambient growth has been added to daily and peak hour traffic volumes on surrounding roadways, in addition to traffic generated by the development of future projects that have been approved but not yet built and/or for which development applications have been filed and are under consideration by governing agencies.

Opening Year Cumulative (2022) Without Project traffic volumes are provided in Section 6 *Opening Year Cumulative (2022) Traffic Conditions* of this report. The traffic generated by the proposed Project was then manually added to the base volume to determine Opening Year Cumulative (2022) With Project forecasts.

4.5.2 HORIZON YEAR (2040) CONDITIONS

The adopted Southern California Association of Governments (SCAG) 2016 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) (April 2016) growth forecasts for the City of Chino identifies projected growth in population of 79,400 in 2012 to 120,400 in 2040, or a 51.64% increase over the 28-year period. (8) The change in population equates to roughly a 1.50% growth rate, compounded annually. Similarly, growth over the same 28-year period in households is projected to increase by 61.90%, or a 1.74% annual growth rate. Finally, growth in employment over the same 28-year period is projected to increase by 18.78%, or a 0.62% annual growth rate.

EXHIBIT 4-5: PROJECT (INTERIM YEAR) TRAFFIC VOLUMES (IN PCE)



1 Euclid Av. (SR-83) & E. Facility Dr./ Merrill Av.	2 Euclid Av. (SR-83) & Kimball Av.	3 Euclid Av. (SR-83) & Bickmore Av.	4 Euclid Av. (SR-83) & Pine Av.	5 Mayhew Av. & Kimball Av.
0(0) 29(20) 0(0) → 0(0) ← 0(0) ← 1(1)	0(0) 0(0) 29(20) → 20(48) ← 13(29) ← 0(0)	0(0) 0(0) 0(0) → 0(1) ← 0(0) ← 12(29)	0(0) 10(23) 3(7) → 4(3) ← 0(0) ← 0(0)	← 0(0) ← 11(8)
0(0) → 0(0) → 0(0) → 0(0) 20(47) ← 1(2) ←	0(0) → 18(13) → 0(0) → 0(0) 0(1) ← 0(0) ←	0(0) → 0(0) → 0(0) → 0(0) 0(0) ← 18(12) ←	0(0) → 0(0) → 0(0) → 0(0) 14(10) ← 0(0) ←	0(0) → 47(33) → 33(77) ← 8(17) ←

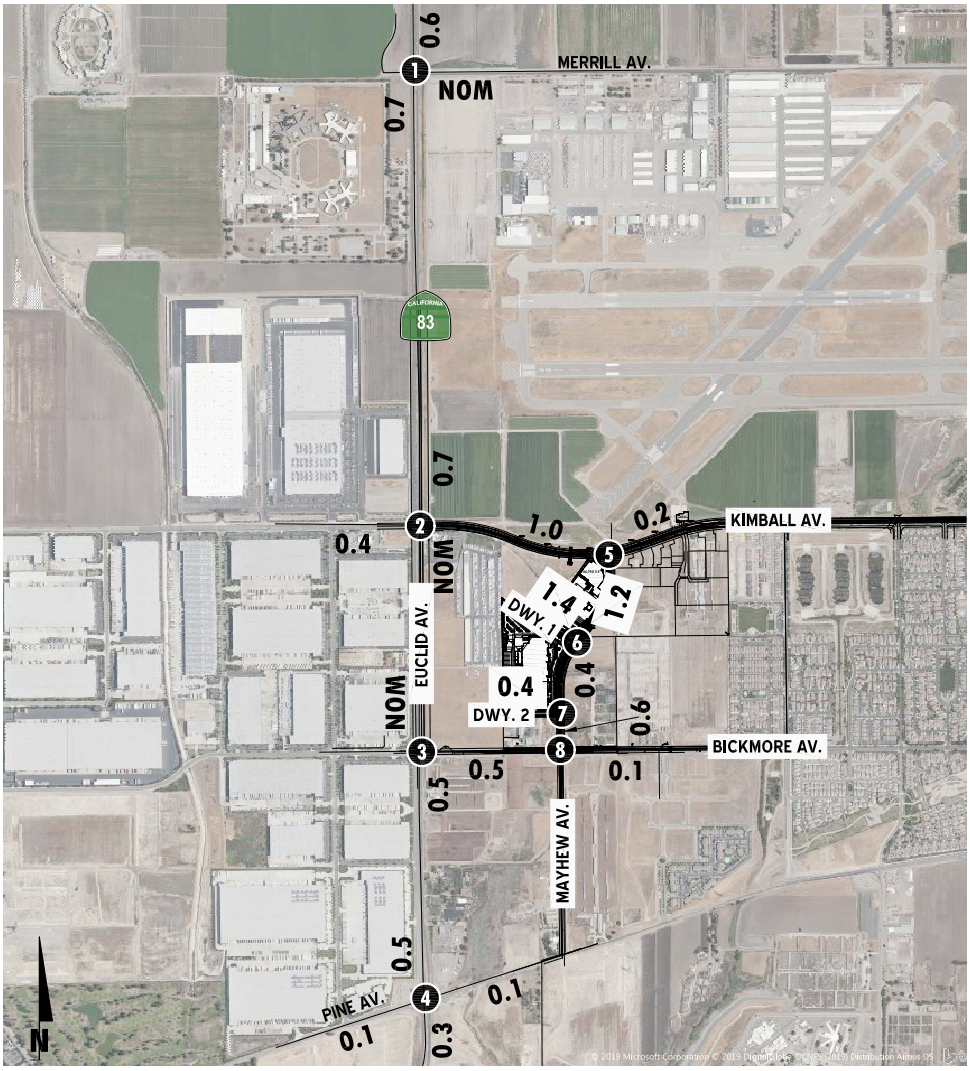
6 Mayhew Av. & Dwy. 1	7 Mayhew Av. & Dwy. 2	8 Mayhew Av. & Bickmore Av.
51(35) 8(5) →	8(5) 6(15) →	13(30) 3(7) → 5(3) ← 0(0) ←
35(83) → 6(15) → 7(6) 5(11) ←	5(11) → 10(22) → 15(10) 7(6) ←	18(13) → 0(0) →

LEGEND:

- **10(10)** = AM(PM) PEAK HOUR INTERSECTION VOLUMES
- **10.0** = VEHICLES PER DAY (1000'S)
- **NOM** = NOMINAL, LESS THAN 50 VEHICLES PER DAY

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EXHIBIT 4-6: PROJECT (HORIZON YEAR) TRAFFIC VOLUMES (IN PCE)



1 Euclid Av. (SR-83) & E. Facility Dr./ Merrill Av.	2 Euclid Av. (SR-83) & Kimball Av.	3 Euclid Av. (SR-83) & Bickmore Av.	4 Euclid Av. (SR-83) & Pine Av.	5 Mayhew Av. & Kimball Av.
0(0) 28(20) 0(0) → 0(0) ← 0(0) ← 1(1)	0(0) 0(0) 29(20) → 20(47) ← 12(27) ← 0(0)	0(0) 0(0) 0(0) → 0(1) ← 0(0) ← 14(34)	3(7) 9(21) 3(7) → 4(3) ← 0(0) ← 0(0)	← 0(0) ← 11(8)
0(0) → 0(0) → 0(0) → 0(0) 0(0) 20(46) ← 1(2) ←	0(0) → 17(12) → 0(0) → 0(0) 0(1) 0(0) ←	0(0) → 0(0) → 0(0) → 0(0) 0(0) 21(15) ←	4(3) → 0(0) → 0(0) → 0(0) 12(9) 0(0) ←	0(0) → 45(31) → 31(74) 8(17) ←

6 Mayhew Av. & Dwy. 1	7 Mayhew Av. & Dwy. 2	8 Mayhew Av. & Bickmore Av.
49(34) 8(5) →	8(5) 7(18) →	15(35) 3(6) → 4(3) ← 0(0)
34(80) → 7(18) → 10(7) 5(11) ←	5(11) → 10(22) → 15(10) 10(7) ←	21(15) → 0(0) →

LEGEND:

- **10(10)** = AM(PM) PEAK HOUR INTERSECTION VOLUMES
- **10.0** = VEHICLES PER DAY (1000'S)
- **NOM** = NOMINAL, LESS THAN 50 VEHICLES PER DAY

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Based on a comparison of Existing (2019) traffic volumes to the Horizon Year (2040) forecasts, the average growth rate is estimated at approximately 8.50%, compounded annually between Existing (2019) and 2040 traffic conditions. The annual growth rate at each individual intersection is not lower than 0.26% compounded annually to as high as 16.48% compounded annually over the same time period. Therefore, the annual growth rate utilized for the purposes of this analysis would appear to conservatively approximate the anticipated regional growth in traffic volumes in the City of Chino for Opening Year Cumulative and Horizon Year (2040) traffic conditions, especially when considered along with the addition of project-related traffic, which would tend to overstate as opposed to understate the potential impacts to traffic and circulation.

4.6 CUMULATIVE DEVELOPMENT TRAFFIC

California Environmental Quality Act (CEQA) guidelines require that other reasonably foreseeable development projects which are either approved or being processed concurrently in the study area also be included as part of a cumulative analysis scenario. A cumulative project list was developed for the purposes of this analysis through consultation with planning and engineering staff from the City of Chino. The neighboring jurisdiction of Ontario has also been contacted to include key projects in their respective city.

Exhibit 4-7 illustrates the cumulative development location map. A summary of cumulative development projects and their proposed land uses are shown in Table 4-5. If applicable, the traffic generated by individual cumulative projects was manually added to the Opening Year Cumulative forecasts to ensure that traffic generated by the listed cumulative development projects in Table 4-5 are reflected as part of the background traffic. Cumulative only ADT and peak hour intersection turning movement volumes are shown on Exhibit 4-8.

4.7 HORIZON YEAR (2040) VOLUME DEVELOPMENT

Traffic projections for Horizon Year (2040) without Project conditions were derived from the SBTAM using accepted procedures for model forecast refinement and smoothing for study area intersections located within the County of San Bernardino. The current version of the SBTAM (Version 2.20, March 2019) reflects the local input in the adopted 2016 SCAG RTP within the County of San Bernardino.

The traffic forecasts reflect the area-wide growth anticipated between Existing (2019) conditions and Horizon Year (2040) traffic conditions. In most instances the traffic model zone structure is not designed to provide accurate turning movements along arterial roadways unless refinement and reasonableness checking is performed. Therefore, the Horizon Year (2040) peak hour forecasts were refined using the model derived long range forecasts, base (validation) year model forecasts, along with existing peak hour traffic count data collected at each analysis location in September 2019. The SBTAM has a base (validation) year of 2012 and a horizon (future forecast) year of 2040. The difference in model volumes (2040-2012) defines the growth in traffic over the 28-year period.

EXHIBIT 4-7: CUMULATIVE DEVELOPMENT LOCATION MAP

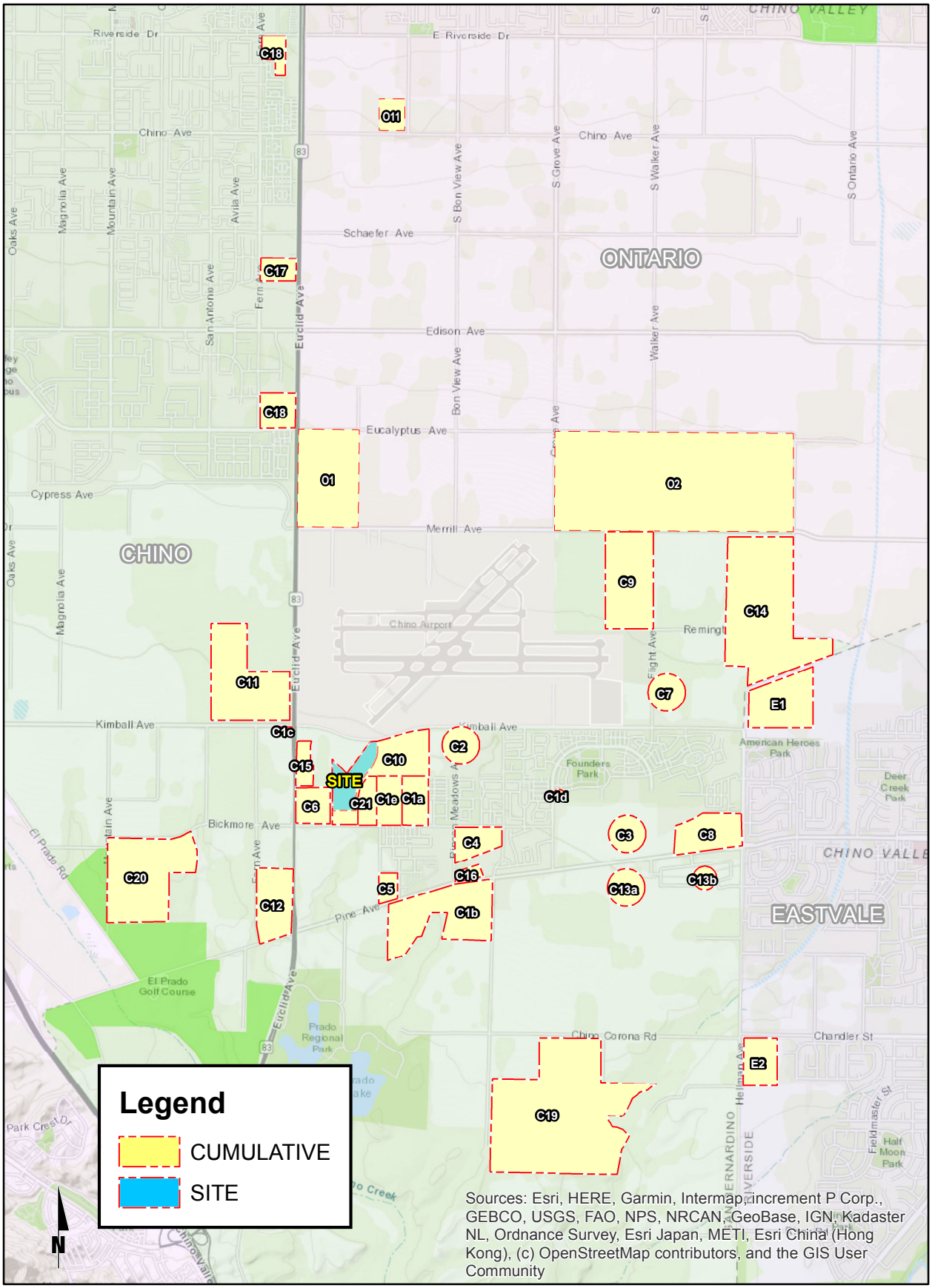
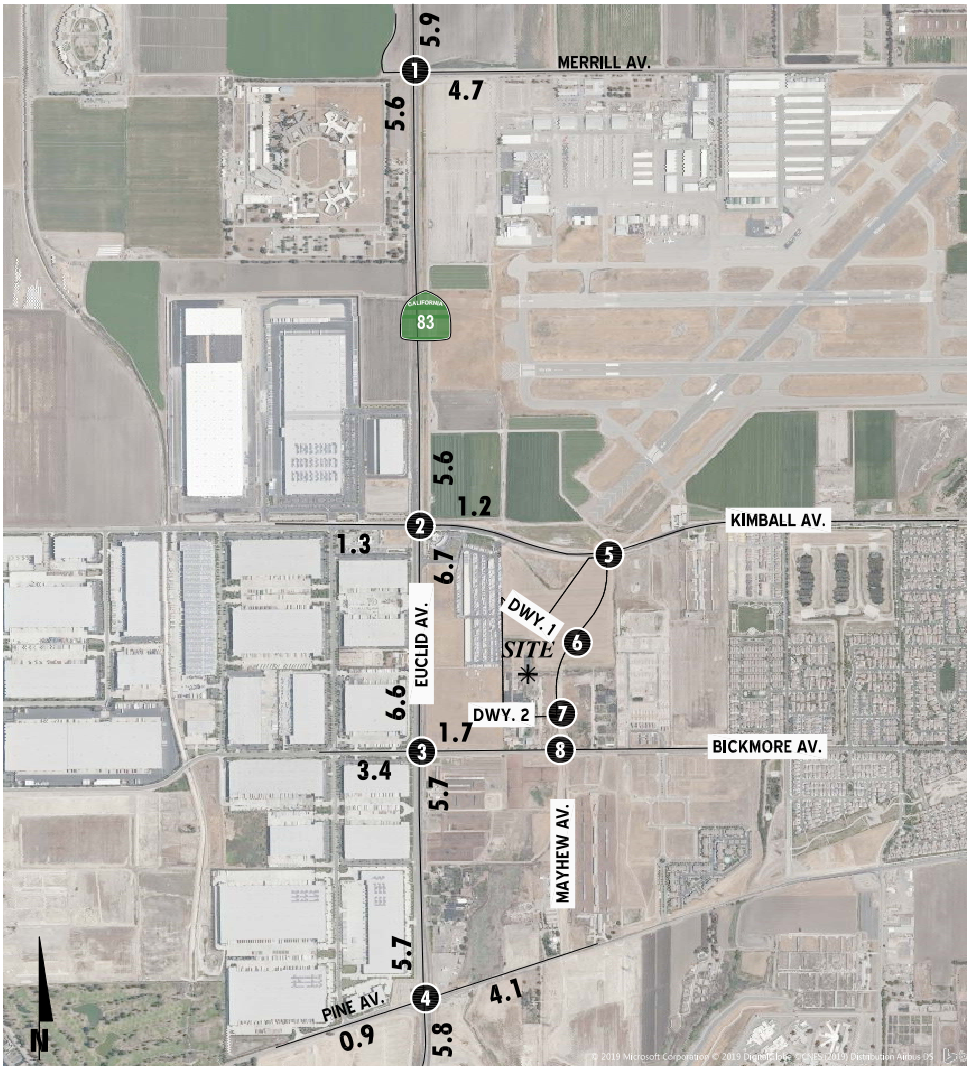


EXHIBIT 4-8: CUMULATIVE ONLY TRAFFIC VOLUMES (IN PCE)



1 Euclid Av. (SR-83) & E. Facility Dr./ Merrill Av. 0(0) 95(200) 120(45) → 35(120) ← 0(0) ← 34(121) 0(0) → 0(0) → 0(0) → 0(0) 124(147) 110(48)	**2** Euclid Av. (SR-83) & Kimball Av. 5(11) 140(307) 0(3) → 5(0) ← 21(19) ← 12(30) 5(7) → 7(26) → 12(36) → 30(23) 223(201) 28(15)	**3** Euclid Av. (SR-83) & Bickmore Av. 66(94) 73(212) 17(62) → 55(35) ← 21(21) ← 28(2) 22(93) → 6(27) → 17(88) → 59(87) 199(106) 0(30)	**4** Euclid Av. (SR-83) & Pine Av. 0(0) 83(188) 35(115) → 90(88) ← 27(38) ← 77(65) 0(0) → 8(38) → 4(18) → 12(18) 161(134) 35(92)	**5** Mayhew Av. & Kimball Av. Future Intersection
6 Mayhew Av. & Dwy. 1 Future Intersection	**7** Mayhew Av. & Dwy. 2 Future Intersection	**8** Mayhew Av. & Bickmore Av. Future Intersection		

LEGEND:

10(10) = AM(PM) PEAK HOUR INTERSECTION VOLUMES
10.0 = VEHICLES PER DAY (1000'S)

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Table 4-5

Cumulative Development Land Use Summary

#	Project/Location	Land Use[1]	Quantity	Units[2]
City of Chino				
C1a	Bickmore Street Residential (TM 18858)	SFDR	185	DU
C1b	Barthelemy	SFDR	193	DU
		Condo/Townhouse	198	DU
		Apartments	288	DU
C1c	Farmer Boys	Fast-food w/ Drive-Thru	3.218	TSF
		Shopping Center	2.300	TSF
C1d	TM17635	SFDR	67	DU
C1e	Bouma Residential	SFDR	106	DU
		Condo/Townhouse	94	DU
C2	TM17574	Condo/Townhouse	108	DU
C3	Falloncrest at the Preserve	SFDR	204	DU
		Condo/Townhouse	786	DU
		Apartments	412	DU
		Shopping Center	77.597	TSF
		General Office	77.597	TSF
C4	TM18778	SFDR	65	DU
C5	Church	Church	47.979	TSF
		Daycare	190	STU
C6	Euclid/Bickmore Warehouse	Warehouse	205.820	TSF
		General Light Industrial	51.030	TSF
		Business Park	110.620	TSF
C7	Kimball Business Park	Light Industrial	140.500	TSF
		Warehousing	564.000	TSF
		High-Cube Warehouse	352.000	TSF
		Business Park	146.550	TSF
C8	TM 18480 Harvest	SFDR	600	DU
C9	Chino Parcel Delivery	Parcel Delivery Facility	765.274	TSF
C10	Altitude Business Centre	Warehousing	200.000	TSF
		Light Industrial	255.000	TSF
		Business Park	233.000	TSF
		Self-Storage	110.000	TSF
C11	Majestic Gateway	High-Cube Warehouse	1,490.400	TSF
		Warehousing	180.000	TSF
		Specialty Retail	25.000	TSF
		Pharmacy/Drugstore with Drive-Thru	13.000	TSF
		Fast-Food with Drive-Thru	8.600	TSF
C12	PM18635	General Light Industrial	99.164	TSF
		High-Cube Warehouse	2,077.594	TSF
C13a	TM 18890	Condo/Townhouse	94	DU
C13b	TM 19980 Homecoming Phase 4 Apartments	Apartments	454	DU
C14	Watson Industrial Park	High-Cube Warehouse	3,889.900	TSF
C15	Chino Business Park	General Light Industrial	165.500	TSF
		Business Park	21.500	TSF
C16	Flores Site	Shopping Center	4.000	TSF
		Gas Station w/ convenience store	16	VFP
		Express Car Wash	5.000	TSF

Table 4-5

Cumulative Development Land Use Summary

#	Project/Location	Land Use[1]	Quantity	Units[2]
C17	Brewart Residential (TM 18923)	SFDR	127	DU
C18	Fern and Riverside Residential (TM 18901)	SFDR	94	DU
C19	Edgewater Communities	SFDR	415	DU
		Condo/Townhouse	659	DU
		Museum/Retail	6.500	TSF
		Church	15.200	TSF
		Park	15.0	AC
C20	Majestic Chino Heritage	High-Cube Fulfillment Warehouse	1,168.710	TSF
		High-Cube Cold Storage Warehouse	914.040	TSF
C21	Appesetche	SFDR	166	DU
City of Ontario				
O1	Ontario Ranch Commerce Center	High-Cube Cold Storage Warehouse	1159.200	TSF
		Warehousing	337.600	TSF
		Business Park	290.200	TSF
O2	Merrill Commerce Center	High-Cube Fulfillment Warehouse	7014.000	TSF
		Business Park	1441.000	TSF
City of Eastvale				
E1	SP00358 - The Ranch at Eastvale	Shopping Center	267.200	TSF
		General Light Industrial	801.500	TSF
		Business Park	1,121.100	TSF
E2	TR29997	SFDR	122	DU

[1] SFDR = Single Family Detached Residential

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

The refined future peak hour approach and departure volumes obtained from the model output data are then entered into a spreadsheet program consistent with the National Cooperative Highway Research Program (NCHRP) Report 255, along with initial estimates of turning movement proportions. A linear programming algorithm is used to calculate individual turning movements which match the known directional roadway segment forecast volumes computed in the previous step. This program computes a likely set of intersection turning movements from intersection approach counts and the initial turning proportions from each approach leg.

The SBTAM uses an AM peak period-to-peak hour factor of 0.35 and a PM peak period-to-peak hour factor of 0.27. These factors represent the relationship of the highest single AM peak hour to the modeled 3-hour AM peak period (an even distribution would result in a factor of 0.33) and the highest single PM peak hour to the modeled 4-hour PM peak period (an even distribution would result in a factor of 0.25).

Typically, the model growth is prorated and is subsequently added to the existing (base validation) traffic volumes to represent Horizon Year traffic conditions. In an effort to conduct a conservative analysis, reductions to traffic forecasts from either Existing or Opening Year Cumulative traffic conditions were not assumed as part of this analysis. As such, in conjunction with the addition of cumulative projects that are not consistent with the General Plan, additional growth has also been applied on a movement-by-movement basis, where applicable, to estimate reasonable Horizon Year (2040) forecasts. Horizon Year (2040) turning volumes were compared to Opening Year Cumulative (2022) volumes in order to ensure a minimum growth as a part of the refinement process. The minimum growth includes any additional growth between Opening Year Cumulative (2022) and Horizon Year (2040) traffic conditions that is not accounted for by the traffic generated by cumulative development projects and ambient growth rates assumed between Existing (2019) and Opening Year Cumulative (2022) conditions. Adjustments have not been made to study area intersections that may be affected by new future roadway connections (such as the extension of Pine Avenue or the extension of Kimball Avenue/Limonite Avenue), where travel patterns would likely get affected and forecasts may potentially decrease from the Opening Year Cumulative conditions. Future estimated peak hour traffic data was used for new intersections and intersections with an anticipated change in travel patterns to further refine the Horizon Year (2040) peak hour forecasts.

The future Horizon Year (2040) Without Project peak hour turning movements were then reviewed by Urban Crossroads, Inc. for reasonableness, and in some cases, were adjusted to achieve flow conservation, reasonable growth, and reasonable diversion between parallel routes. Flow conservation checks ensure that traffic flow between two closely spaced intersections, such as two adjacent driveway locations, is verified in order to make certain that vehicles leaving one intersection are entering the adjacent intersection and that there is no unexplained loss of vehicles. The result of this traffic forecasting procedure is a series of traffic volumes which are suitable for traffic operations analysis.

Post-processing worksheets for Horizon Year (2040) without Project traffic conditions are provided in Appendix 4.1.

5 E+P TRAFFIC CONDITIONS

This section discusses the traffic forecasts for Existing plus Project (E+P) conditions and the resulting intersection operations, queuing, and traffic signal warrant analyses.

5.1 ROADWAY IMPROVEMENTS

The lane configurations and traffic controls assumed to be in place for E+P conditions are consistent with those shown previously on Exhibit 3-1, with the exception of the following:

- Project driveways and those facilities assumed to be constructed by the Project to provide site access are also assumed to be in place for E+P conditions only (e.g., intersection and roadway improvements at the Project's frontage and driveways).

5.2 E+P TRAFFIC VOLUME FORECASTS

This scenario includes Existing traffic volumes plus Project traffic. The ADT volumes and weekday AM and PM hour intersection turning movements which can be expected for E+P traffic conditions are shown on Exhibit 5-1.

5.3 INTERSECTION OPERATIONS ANALYSIS

E+P peak hour traffic operations have been evaluated for the study area intersections based on the analysis methodologies presented in Section 2 *Methodologies* of this TIA. The intersection analysis results are summarized in Table 5-1, which indicate that with the addition of Project traffic, there are no additional study area intersections that are anticipated to operate at an unacceptable LOS, in addition to the intersection previously identified under Exiting (2019) traffic conditions. Consistent with Table 5-1, a summary of the peak hour intersection LOS for E+P conditions is shown on Exhibit 5-2 for E+P traffic conditions. The intersection operations analysis worksheets for E+P traffic conditions are included in Appendix 5.1 of this TIA.

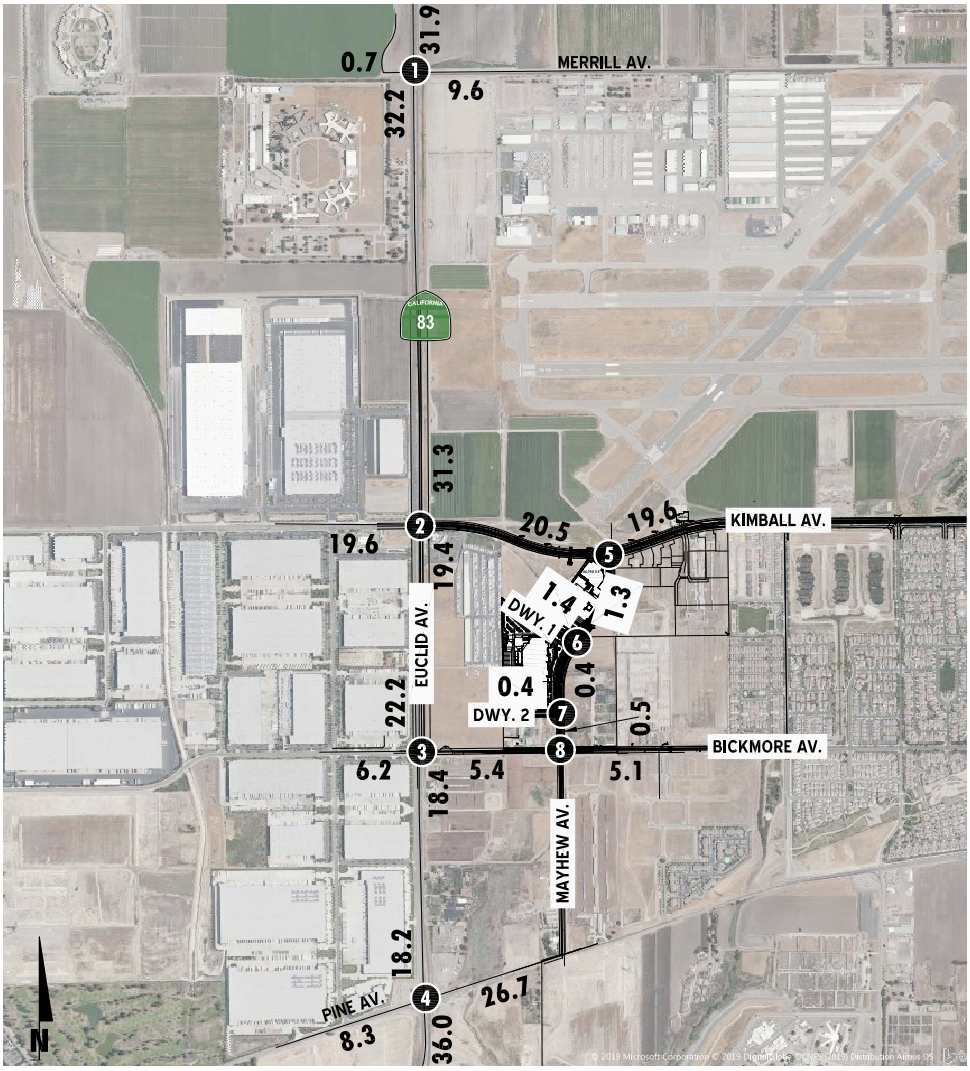
5.4 ROADWAY SEGMENT ANALYSIS

The roadway segment capacities utilized for the purposes of this analysis are approximate figures only, and are used at the General Plan level to assist in determining the roadway functional classification (number of through lanes) needed to meet traffic demand. Table 5-2 provides a summary of the E+P conditions roadway segment capacity analysis based on the applicable roadway segment capacity. As shown in Table 5-2, all the study area roadway segments are anticipated to operate at an acceptable LOS under E+P conditions.

5.5 TRAFFIC SIGNAL WARRANTS ANALYSIS

There are no study area intersections anticipated to meet planning level (ADT volume-based) traffic signal warrants for E+P traffic conditions (see Appendix 5.2).

EXHIBIT 5-1: E+P TRAFFIC VOLUMES (IN PCE)



1 Euclid Av. (SR-83) & E. Facility Dr./ Merrill Av.	2 Euclid Av. (SR-83) & Kimball Av.	3 Euclid Av. (SR-83) & Bickmore Av.	4 Euclid Av. (SR-83) & Pine Av.	5 Mayhew Av. & Kimball Av.
39(1) 1010(1175) 120(251) → 228(136) ← 48(2) ← 226(184)	394(214) 593(732) 191(448) → 324(214) ← 837(325) ← 37(27)	155(192) 574(685) 42(127) → 175(41) ← 195(24) ← 338(55)	20(14) 852(655) 81(103) → 66(73) ← 390(132) ← 692(592)	← 1164(489) ← 11(8)
4(11) → 8(29) → 17(12) → 10(4) ↑ 1033(1183) ↑ 141(226) ↑	120(378) → 223(729) → 35(76) → 155(71) ↑ 724(723) ↑ 46(38) ↑	96(122) → 10(103) → 44(62) → 26(34) ↑ 599(634) ↑ 48(122) ↑	4(17) → 167(404) → 64(82) → 41(65) ↑ 601(716) ↑ 913(997) ↑	412(1181) → 47(33) → 33(77) ↑ 8(17) ↑

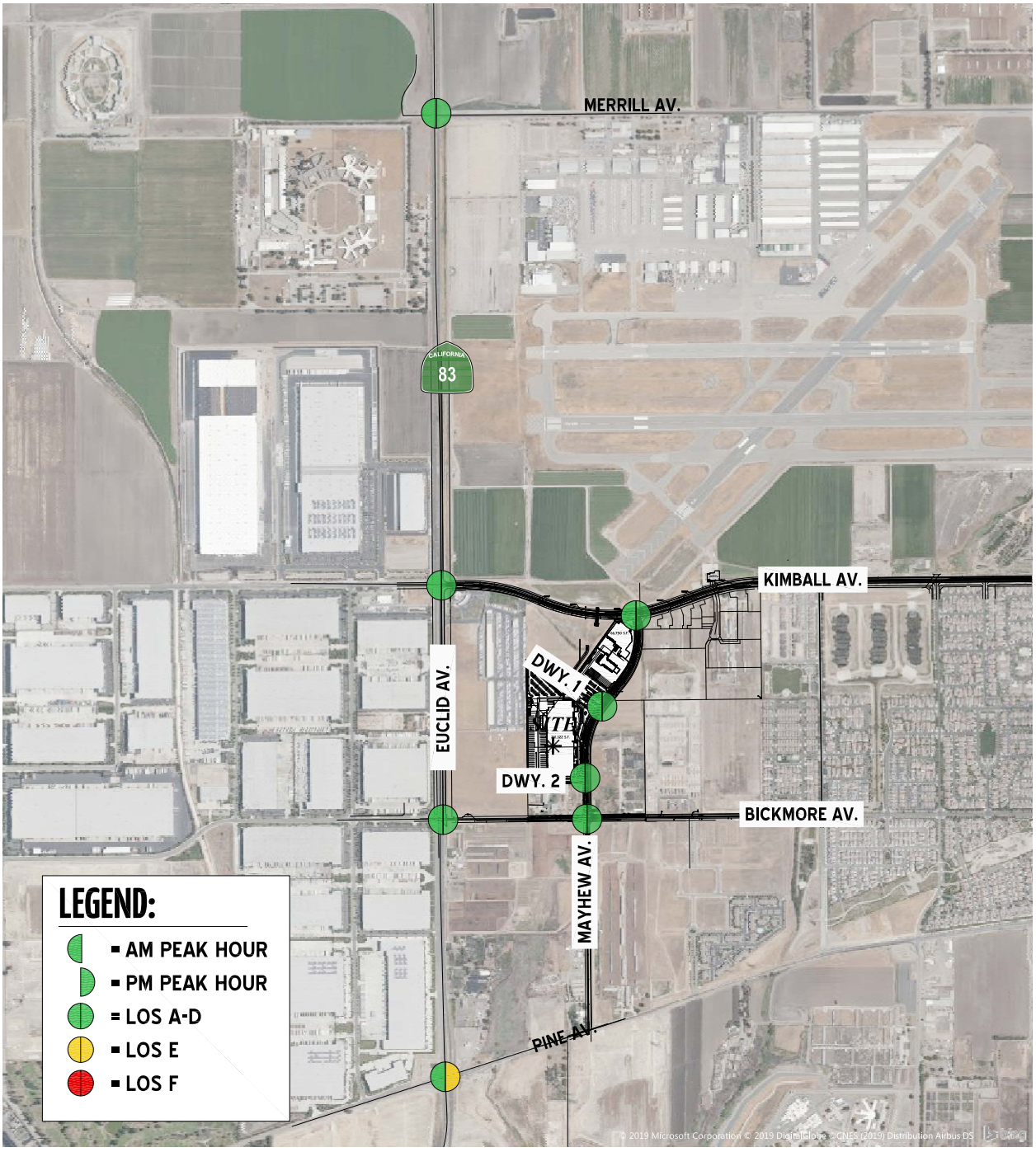
6 Mayhew Av. & Dwy. 1	7 Mayhew Av. & Dwy. 2	8 Mayhew Av. & Bickmore Av.
51(35) 8(5)	8(5) 6(15)	13(30) 3(7) → 5(3) ← 696(89)
35(83) → 6(15) → 7(6) ↑ 5(11) ↑	5(11) → 10(22) → 15(10) ↑ 7(6) ↑	18(13) → 81(340) →

LEGEND:

10(10) = AM(PM) PEAK HOUR INTERSECTION VOLUMES
10.0 = VEHICLES PER DAY (1000'S)

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EXHIBIT 5-2: E+P SUMMARY OF LOS



N

Table 5-1

Intersection Analysis for E+P Conditions

#	Intersection	Traffic Control[3]	Existing (2019)				E+P				Acceptable LOS
			Delay[1] (secs.)		LOS[2]		Delay[1] (secs.)		LOS[2]		
			AM	PM	AM	PM	AM	PM	AM	PM	
1	Euclid Av. (SR-83) & Merrill Av.	TS	32.1	30.1	C	C	32.3	32.1	C	C	D
2	Euclid Av. (SR-83) & Kimball Av.	TS	40.4	46.0	D	D	42.1	47.6	D	D	D
3	Euclid Av. (SR-83) & Bickmore Av.	TS	19.5	15.6	B	B	19.6	15.8	B	B	D
4	Euclid Av. (SR-83) & Pine Av.	TS	32.9	**61.7**	C	**E**	33.4	**62.7**	C	**E**	D
5	Mayhew Av. & Kimball Av.	**TS**	Future Intersection				14.8	25.8	B	C	D
6	Mayhew Av. & Driveway 1	**CSS**	Future Intersection				9.2	9.4	A	A	D
7	Mayhew Av. & Driveway 2	**CSS**	Future Intersection				8.6	8.7	A	A	D
8	Mayhew Av. & Bickmore Av.	**TS**	Future Intersection				7.0	7.5	A	A	D

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

[1] Per the Highway Capacity Manual (6th Edition), overall average intersection delay and level of service are shown for intersections with a traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[2] LOS = Level of Service

[3] CSS = Cross-street Stop; TS = Traffic Signal; **CSS** = Improvement

Table 5-2

Roadway Segment Capacity Analysis for E+P Conditions

#	Roadway	Segment Limits	Roadway Section	LOS Capacity[1]	Existing 2019	V/C[2]	LOS[3]	Acceptable LOS
1	Mayhew Av.	Kimball Av. to Driveway 1	2U	13,000	1,278	0.10	A	D
2		Driveway 1 to Driveway 2	2U	13,000	384	0.03	A	D
3		Driveway 2 to Bickmore Av.	2U	13,000	520	0.04	A	D

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

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

[2] V/C = Volume to Capacity Ratio

[3] LOS = Level of Service

5.6 QUEUING ANALYSIS

A queuing analysis was conducted at the study area intersections in order to determine 95th percentile queues during the peak hours. The queuing analysis results are summarized in Table 5-3 for E+P traffic conditions, which indicates that with the addition of Project traffic, there are no additional movements anticipated to experience queuing issues based on the 95th percentile peak hour traffic flows in addition to the movements previously identified under Existing (2019) traffic conditions. Queuing worksheets for Existing (2019) traffic conditions are included in Appendix 5.3.

5.7 DEFICIENCIES AND RECOMMENDED IMPROVEMENTS

This section provides a summary of potential traffic impacts and recommended improvements. Improvements necessary to improve the deficiencies are also discussed below.

5.7.1 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES AT INTERSECTIONS

It should be noted that the Project is anticipated to contribute less than 50 peak hour trips to the intersection of Euclid Avenue (SR-83) and Pine Avenue for E+P traffic conditions. As such, intersection improvements have not been recommended.

5.7.2 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES FOR ROADWAY SEGMENTS

As shown previously in Table 5-2, all study area roadway segments are anticipated to operate at an acceptable LOS under E+P traffic conditions. As such, no improvements have been recommended.

5.7.3 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES FOR INTERSECTION QUEUES

As shown previously in Table 5-3, there are three movements that are anticipated to experience queuing issues during the AM or PM peak hours under E+P traffic conditions. Recommended improvements to address queuing issues for E+P traffic conditions are consistent with Existing (2019) traffic conditions and are described below and shown in Table 5-4.

- At the intersection of Euclid Avenue (SR-83) and Kimball Avenue a 400-foot eastbound left turn lane is recommended in order to accommodate the 95th percentile peak hour queues for E+P traffic conditions. This recommended improvement can be accommodated through restriping of existing pavement.
- At the intersection of Euclid Avenue (SR-83) and Bickmore Avenue a 270-foot southbound left turn lane is recommended in order to accommodate the 95th percentile peak hour queues for E+P traffic conditions. This recommended improvement can be accommodated through restriping of existing pavement.

At the intersection of Euclid Avenue (SR-83) and Bickmore Avenue a 200-foot westbound left turn lane is recommended to accommodate the 95th percentile queue for E+P traffic conditions. Although the 95th percentile queue is higher than the available stacking for the westbound left turn lane, there are no anticipated queuing issues for the same movement under Horizon Year (2040) traffic conditions with the implementation of dual 200-foot left turn lanes. As such, no additional improvements have been recommended for E+P traffic conditions.

Table 5-3

Peak Hour Queuing Summary for E+P Conditions

Intersection	Movement	Available Stacking Distance (Feet)	Existing (2019)				E+P			
			95th Percentile Queue (Feet)		Acceptable? [1]		95th Percentile Queue (Feet)		Acceptable? [1]	
			AM Peak	PM Peak	AM	PM	AM Peak	PM Peak	AM	PM
Euclid Av. (SR-83) & Kimball Av.	NBL	420	224 [2]	103	Yes	Yes	224 [2]	103	Yes	Yes
	NBR	665	10	0	Yes	Yes	10	0	Yes	Yes
	SBL	430	114 [2]	269 [2]	Yes	Yes	144 [2]	288 [2]	Yes	Yes
	SBR	335	249	32	Yes	Yes	249	35	Yes	Yes
	EBL	210	78	**243** [2]	Yes	**No**	78	**243** [2]	Yes	**No**
	WBL	215	65	51	Yes	Yes	65	51	Yes	Yes
	WBR	300	110	38	Yes	Yes	131	67	Yes	Yes
Euclid Av. (SR-83) & Bickmore Av.	NBL	110	59 [2]	64 [2]	Yes	Yes	59 [2]	64 [2]	Yes	Yes
	SBL	160	98 [2]	**249** [2]	Yes	**No**	98 [2]	**249** [2]	Yes	**No**
	SBR	235	56	54	Yes	Yes	56	54	Yes	Yes
	EBL	150	138	142	Yes	Yes	138	142	Yes	Yes
	EBR	150	0	3	Yes	Yes	0	3	Yes	Yes
	WBL	90	**454** [2]	46	**No**	Yes	**479** [2]	77	**No**	Yes

BOLD = Inadequate 95th percentile storage.

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided. An additional 15 feet of stacking which is assumed to be provided in the transition for turn pockets is reflected in the stacking distance shown on this table, where applicable.

[2] 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

Table 5-4

Peak Hour Queuing Summary for E+P Conditions With Improvements

Intersection	Movement	Available Stacking Distance (Feet)	Existing (2019)				E+P			
			95th Percentile Queue (Feet)		Acceptable? [1]		95th Percentile Queue (Feet)		Acceptable? [1]	
			AM Peak	PM Peak	AM	PM	AM Peak	PM Peak	AM	PM
Euclid Av. (SR-83) & Kimball Av.	NBL	420	224 [2]	103	Yes	Yes	224 [2]	103	Yes	Yes
	NBR	665	10	0	Yes	Yes	10	0	Yes	Yes
	SBL	430	114 [2]	269 [2]	Yes	Yes	144 [2]	288 [2]	Yes	Yes
	SBR	335	249	32	Yes	Yes	249	35	Yes	Yes
	EBL	**400**	78	243 [2]	Yes	Yes	78	243 [2]	Yes	Yes
	WBL	215	65	51	Yes	Yes	65	51	Yes	Yes
	WBR	300	110	38	Yes	Yes	131	67	Yes	Yes
Euclid Av. (SR-83) & Bickmore Av.	NBL	110	59 [2]	64 [2]	Yes	Yes	59 [2]	64 [2]	Yes	Yes
	SBL	**270**	98 [2]	249 [2]	Yes	Yes	98 [2]	249 [2]	Yes	Yes
	SBR	235	56	54	Yes	Yes	56	54	Yes	Yes
	EBL	150	138	142	Yes	Yes	138	142	Yes	Yes
	EBR	150	0	3	Yes	Yes	0	3	Yes	Yes
	WBL	**200**	**454** [2,3]	46	**No**	Yes	**479** [2,3]	77	**No**	Yes

BOLD = Inadequate 95th percentile storage.

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided. An additional 15 feet of stacking which is assumed to be provided in the transition for turn pockets is reflected in the stacking distance shown on this table, where applicable.

[2] 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

[3] Although the 95th percentile queue is higher than the available stacking distance, there are no anticipated queuing issues for the same movement under Horizon Year (2040) traffic conditions with the future implementation of dual 200-foot left turn lanes. As such, no additional improvements have been recommended.

6 OPENING YEAR CUMULATIVE (2022) TRAFFIC CONDITIONS

This section discusses the methods used to develop Opening Year Cumulative (2022) Without and With Project traffic forecasts, and the resulting intersection operations, queuing, and traffic signal warrant analyses.

6.1 ROADWAY IMPROVEMENTS

The lane configurations and traffic controls assumed to be in place for Opening Year Cumulative (2022) conditions are consistent with those shown previously on Exhibit 3-1, with the exception of the following:

- Project driveways and those facilities assumed to be constructed by the Project to provide site access are also assumed to be in place for Opening Year Cumulative conditions only (e.g., intersection and roadway improvements along the Project's frontage and driveways).
- Driveways and those facilities assumed to be constructed by cumulative developments to provide site access are also assumed to be in place for Opening Year Cumulative conditions only (e.g., intersection and roadway improvements along the cumulative development's frontages and driveways).

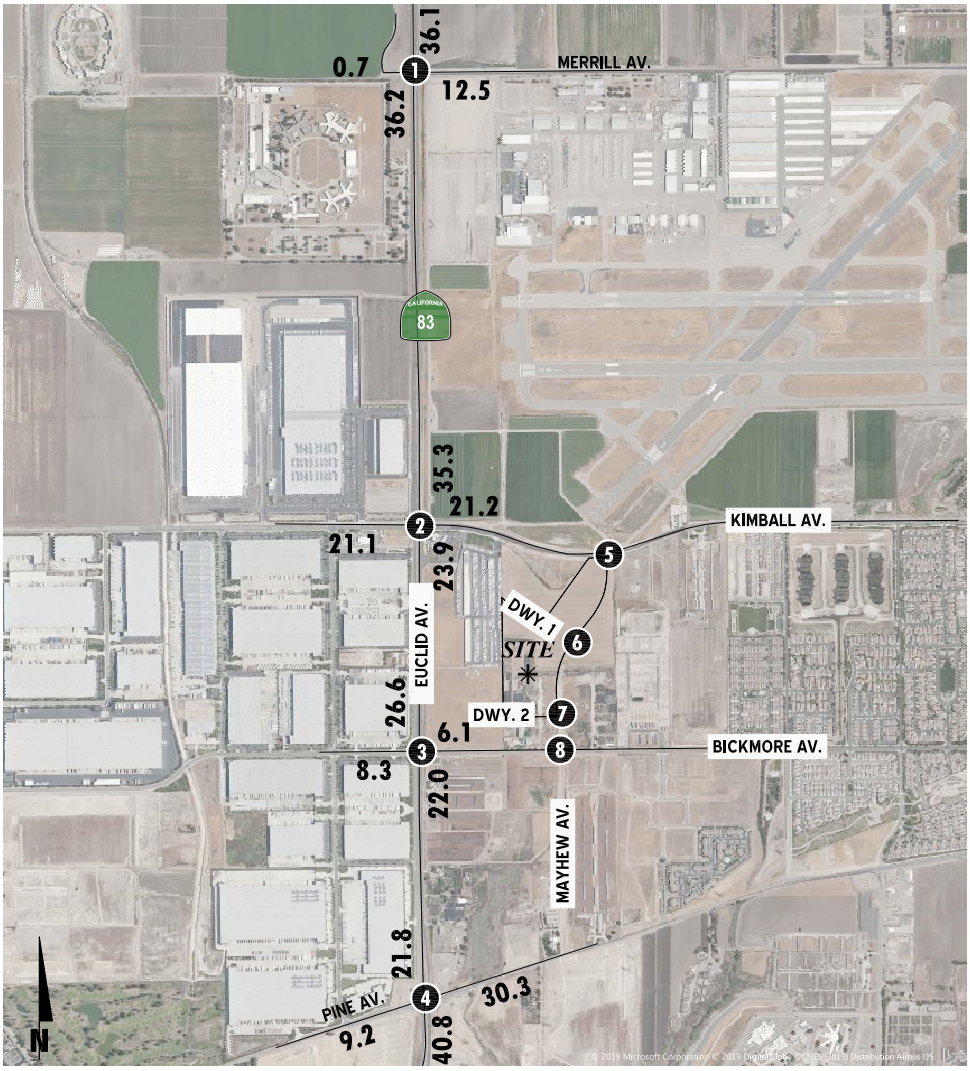
6.2 OPENING YEAR CUMULATIVE (2022) WITHOUT PROJECT TRAFFIC VOLUME FORECASTS

This scenario includes Existing traffic volumes plus an ambient growth factor of 6.12% plus traffic from pending and approved but not yet constructed known development projects in the area. The weekday ADT and weekday AM and PM peak hour volumes which can be expected for Opening Year Cumulative (2022) Without Project traffic conditions are shown on Exhibits 6-1.

6.3 OPENING YEAR CUMULATIVE (2022) WITH PROJECT TRAFFIC VOLUME FORECASTS

This scenario includes Existing traffic volumes plus an ambient growth factor of 6.12% plus traffic from pending and approved, but not yet constructed known development projects in the area in conjunction with the addition of Project traffic. The weekday ADT and weekday AM and PM peak hour volumes which can be expected for Opening Year Cumulative (2022) With Project traffic conditions are shown on Exhibit 6-2.

EXHIBIT 6-1: OPENING YEAR CUMULATIVE (2022) WITHOUT PROJECT TRAFFIC VOLUMES (IN PCE)



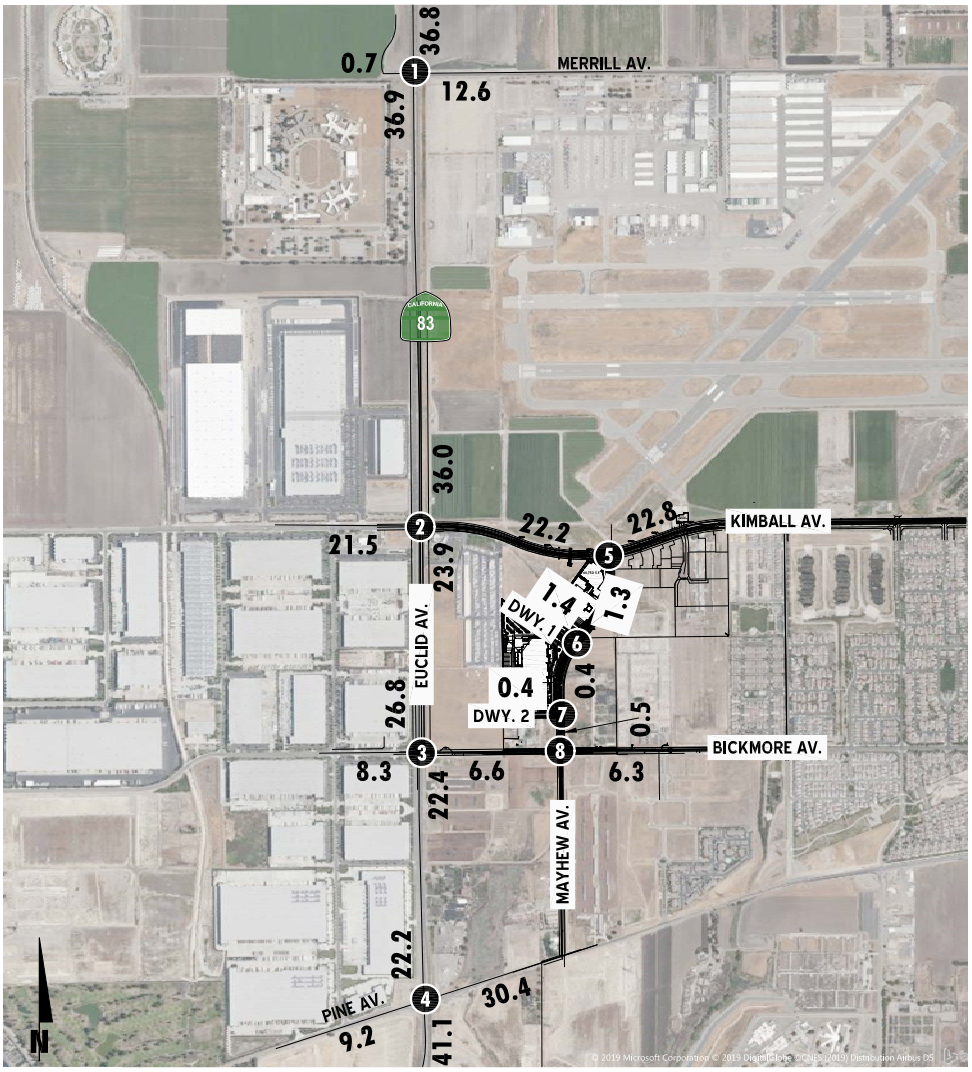
1 Euclid Av. (SR-83) & E. Facility Dr./ Merrill Av.	2 Euclid Av. (SR-83) & Kimball Av.	3 Euclid Av. (SR-83) & Bickmore Av.	4 Euclid Av. (SR-83) & Pine Av.	5 Mayhew Av. & Kimball Av.
41(1) 1088(1325) 187(288) → 259(204) ← 50(2) ← 255(255)	421(233) 699(930) 171(455) → 325(176) ← 884(324) ← 45(44)	197(250) 645(833) 53(165) → 213(59) ← 217(36) ← 360(28)	21(15) 935(764) 100(159) → 110(118) ← 427(159) ← 772(661)	Future Intersection
4(12) → 8(31) → 18(13) → 11(4) ← 1136(1279) ← 203(262) ←	130(404) → 221(772) → 43(99) → 179(86) ← 879(867) ← 62(47) ←	112(175) → 14(123) → 55(110) → 57(79) ← 735(725) ← 31(132) ←	4(18) → 181(447) → 69(96) → 50(77) ← 703(816) ← 986(1103) ←	

6 Mayhew Av. & Dwy. 1	7 Mayhew Av. & Dwy. 2	8 Mayhew Av. & Bickmore Av.
Future Intersection	Future Intersection	Future Intersection

LEGEND:

10(10) = AM(PM) PEAK HOUR INTERSECTION VOLUMES
10.0 = VEHICLES PER DAY (1000'S)

EXHIBIT 6-2: OPENING YEAR CUMULATIVE (2022) WITH PROJECT TRAFFIC VOLUMES (IN PCE)



1 Euclid Av. (SR-83) & E. Facility Dr./ Merrill Av.	2 Euclid Av. (SR-83) & Kimball Av.	3 Euclid Av. (SR-83) & Bickmore Av.	4 Euclid Av. (SR-83) & Pine Av.	5 Mayhew Av. & Kimball Av.
41(1) 1117(1345) 187(288) → 259(204) ← 50(2) ← 256(256)	421(233) 699(930) 200(475) → 345(224) ← 897(353) ← 45(44)	197(250) 645(833) 53(165) → 213(60) ← 217(36) ← 372(57)	21(15) 945(787) 103(166) → 114(121) ← 427(159) ← 772(661)	← 1254(543) ← 11(8)
4(12) → 8(31) → 18(13) → 11(4) ↑ 1156(1326) ↑ 204(264) ↑	130(404) → 239(785) → 43(99) → 179(86) ↑ 879(868) ↑ 62(47) ↑	112(175) → 14(123) → 55(110) → 57(79) ↑ 735(725) ↑ 49(144) ↑	4(18) → 181(447) → 69(96) → 50(77) ↑ 717(826) ↑ 986(1103) ↑	455(1275) → 47(33) → 33(77) ↑ 8(17) ↑

6 Mayhew Av. & Dwy. 1	7 Mayhew Av. & Dwy. 2	8 Mayhew Av. & Bickmore Av.
51(35) 8(5) →	8(5) 6(15) →	13(30) 3(7) → 5(3) ← 794(138)
35(83) → 6(15) → 7(6) ↑ 5(11) ↑	5(11) → 10(22) → 15(10) ↑ 7(6) ↑	18(13) → 112(425) →

LEGEND:

10(10) = AM(PM) PEAK HOUR INTERSECTION VOLUMES
10.0 = VEHICLES PER DAY (1000'S)

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6.4 INTERSECTION OPERATIONS ANALYSIS

6.4.1 OPENING YEAR CUMULATIVE (2022) WITHOUT PROJECT TRAFFIC CONDITIONS

LOS calculations were conducted for the study intersections to evaluate their operations under Opening Year Cumulative (2022) Without Project traffic conditions with roadway and intersection geometrics consistent with Section 6.1 *Roadway Improvements*. As shown in Table 6-1, the following study area intersections are anticipated to operate at an unacceptable LOS under Opening Year (2022) Without Project traffic conditions:

- Euclid Avenue (SR-83) & Merrill Avenue (#1) –LOS E PM peak hour only
- Euclid Avenue (SR-83) & Pine Avenue (#4) –LOS F PM peak hour only

A summary of the peak hour intersection LOS for Opening Year Cumulative (2022) Without Project conditions is shown on Exhibit 6-3. The intersection operations analysis worksheets for Opening Year Cumulative (2022) Without Project traffic conditions are included in Appendix 6.1 of this TIA.

6.4.2 OPENING YEAR CUMULATIVE (2022) WITH PROJECT TRAFFIC CONDITIONS

As shown in Table 6-1 and illustrated on Exhibit 6-4, there are no additional study area intersections anticipated to operate at a deficient LOS during one or both peak hours with the addition of Project traffic, in addition to the locations previously identified under Opening Year Cumulative (2022) Without Project traffic conditions. The intersection operations analysis worksheets for Opening Year Cumulative (2022) With Project traffic conditions are included in Appendix 6.2 of this TIA.

6.5 ROADWAY SEGMENT ANALYSIS

The roadway segment capacities utilized for the purposes of this analysis are approximate figures only, and are used at the General Plan level to assist in determining the roadway functional classification (number of through lanes) needed to meet traffic demand. Table 6-2 provides a summary of the Opening Year Cumulative (2022) conditions roadway segment capacity analysis based on the applicable roadway segment capacity. As discussed in Section 3.9 *Roadway Segment Analysis*, all the study area roadway segments will be constructed by the Project, and therefore do not existing under "Without Project" conditions. As such, no roadway segment analysis has been conducted under Opening Year Cumulative (2022) Without Project traffic conditions. As shown in Table 6-2, all the study area roadway segments are anticipated to operate at an acceptable LOS under Opening Year Cumulative (2022) With Project traffic conditions.

6.6 TRAFFIC SIGNAL WARRANTS ANALYSIS

There are no existing unsignalized study area intersections. As such, no traffic signal warrant analysis has been conducted for Opening Year Cumulative (2022) Without Project traffic conditions.

Table 6-1

Intersection Analysis for Opening Year Cumulative (2022) Conditions

#	Intersection	Traffic Control[3]	2022 Without Project				2022 With Project				Acceptable LOS
			Delay[1] (secs.)		LOS[2]		Delay[1] (secs.)		LOS[2]		
			AM	PM	AM	PM	AM	PM	AM	PM	
1	Euclid Av. (SR-83) & Merrill Av.	TS	42.5	**71.6**	D	**E**	42.9	**73.0**	D	**E**	D
2	Euclid Av. (SR-83) & Kimball Av.	TS	44.4	54.2	D	D	46.2	54.8	D	D	D
3	Euclid Av. (SR-83) & Bickmore Av.	TS	26.3	18.7	C	B	27.2	19.2	C	B	D
4	Euclid Av. (SR-83) & Pine Av.	TS	47.0	**101.5**	D	**F**	48.4	**105.3**	D	**F**	D
5	Mayhew Av. & Kimball Av.	**TS**	Future Intersection				20.2	40.1	C	D	D
6	Mayhew Av. & Driveway 1	**CSS**	Future Intersection				9.2	9.4	A	A	D
7	Mayhew Av. & Driveway 2	**CSS**	Future Intersection				8.6	8.7	A	A	D
8	Mayhew Av. & Bickmore Av.	**TS**	Future Intersection				7.5	6.6	A	A	D

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

[1] Per the Highway Capacity Manual (6th Edition), overall average intersection delay and level of service are shown for intersections with a traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[2] LOS = Level of Service

[3] CSS = Cross-street Stop; TS = Traffic Signal; **CSS** = Improvement

Table 6-2

Roadway Segment Capacity Analysis for Opening Year Cumulative (2022) Conditions

#	Roadway	Segment Limits	Roadway Section	LOS Capacity[1]	2022 With Project	V/C[2]	LOS[3]	Acceptable LOS
1	Mayhew Av.	Kimball Av. to Driveway 1	2U	13,000	1,278	0.10	A	D
2		Driveway 1 to Driveway 2	2U	13,000	384	0.03	A	D
3		Driveway 2 to Bickmore Av.	2U	13,000	520	0.04	A	D

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

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

[2] V/C = Volume to Capacity Ratio

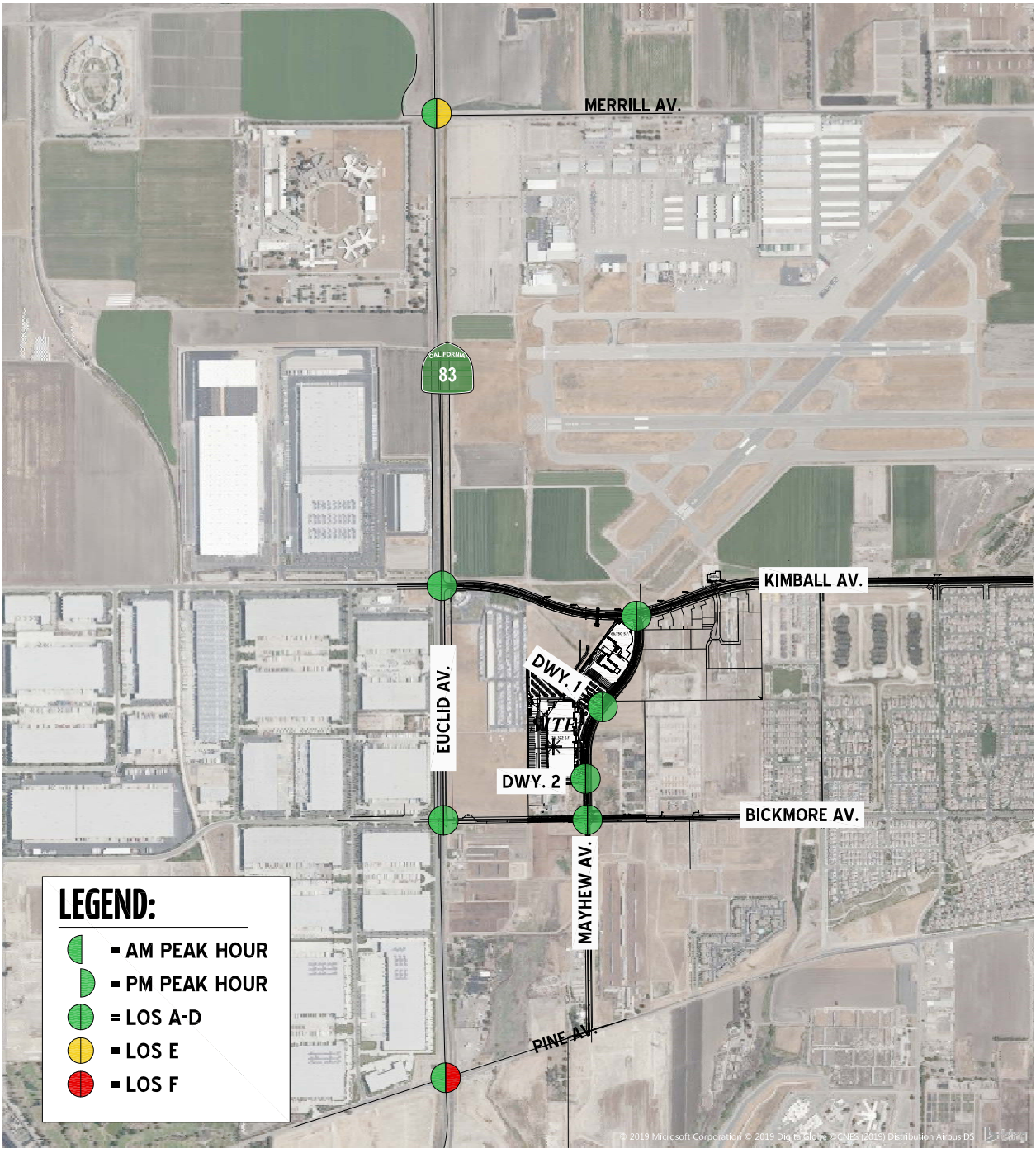
[3] LOS = Level of Service

EXHIBIT 6-3: OPENING YEAR CUMULATIVE (2022) WITHOUT PROJECT SUMMARY OF LOS



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EXHIBIT 6-4: OPENING YEAR CUMULATIVE (2022) WITH PROJECT SUMMARY OF LOS



N

There are no study area intersections anticipated to meet either peak hour or planning level (ADT volume-based) traffic signal warrants for Opening Year Cumulative (2022) With Project traffic conditions (see Appendix 6.3).

6.7 QUEUING ANALYSIS

A queuing analysis was conducted at the study area intersections in order to determine 95th percentile queues during the peak hours. The queuing analysis results are summarized in Table 6-3 for Opening Year Cumulative (2022) Without Project traffic conditions, which indicates that the following movements are anticipated to experience queuing issues based on the 95th percentile peak hour traffic flows:

- Euclid Avenue (SR-83) & Kimball Avenue (#2), eastbound left turn lane – PM peak hour only
- Euclid Avenue (SR-83) & Bickmore Avenue (#3), southbound left turn lane – PM peak hour only
- Euclid Avenue (SR-83) & Bickmore Avenue (#3), eastbound left turn lane – PM peak hour only
- Euclid Avenue (SR-83) & Bickmore Avenue (#3), westbound left turn lane – AM peak hour only

With the addition of Project traffic, there are no additional movements anticipated to experience queuing issues based on the 95th percentile peak hour traffic flows. Queuing worksheets for Opening Year Cumulative (2022) Without Project and With Project traffic conditions are included in Appendices 6.4 and 6.5, respectively.

6.8 DEFICIENCIES AND RECOMMENDED IMPROVEMENTS

6.8.1 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES AT INTERSECTIONS

The effectiveness of the recommended improvements is presented in Table 6-4 for Opening Year Cumulative (2022) traffic conditions. The intersection operations analysis worksheets for Opening Year Cumulative (2022) Without Project and With Project traffic conditions, with improvements, are included in Appendices 6.6 and 6.7, respectively.

Euclid Avenue (SR-83) & Merrill Avenue (#1) – The following improvements are necessary to increase in delay to LOS D or better Opening Year Cumulative (2022) Without and With Project traffic conditions:

- Add a 3rd northbound through lane.
- Add a 3rd southbound through lane.

Euclid Avenue (SR-83) & Pine Avenue (#4) – The following improvements are necessary to increase in delay to LOS D or better for Opening Year Cumulative (2022) Without Project traffic conditions:

- Add a 2nd northbound right turn lane.
- Add a 3rd northbound through lane.
- Add a 3rd southbound through lane.

Table 6-3

Peak Hour Queuing Summary for Opening Year Cumulative (2022) Conditions

Intersection	Movement	Available Stacking Distance (Feet)	2022 Without Project				2022 With Project			
			95th Percentile Queue (Feet)		Acceptable? [1]		95th Percentile Queue (Feet)		Acceptable? [1]	
			AM Peak	PM Peak	AM	PM	AM Peak	PM Peak	AM	PM
Euclid Av. (SR-83) & Kimball Av.	NBL	420	274 [2]	143 [2]	Yes	Yes	274 [2]	143 [2]	Yes	Yes
	NBR	665	20	0	Yes	Yes	20	0	Yes	Yes
	SBL	430	123 [2]	297 [2]	Yes	Yes	153 [2]	317 [2]	Yes	Yes
	SBR	335	276	60	Yes	Yes	276	65	Yes	Yes
	EBL	210	84	**263** [2]	Yes	**No**	84	**263** [2]	Yes	**No**
	WBL	215	74	73	Yes	Yes	74	73	Yes	Yes
	WBR	300	154	48	Yes	Yes	176	68	Yes	Yes
Euclid Av. (SR-83) & Bickmore Av.	NBL	110	115 [2]	117 [2]	Yes	Yes	115 [2]	117 [2]	Yes	Yes
	SBL	160	126 [2]	**329** [2]	Yes	**No**	126 [2]	**269** [2]	Yes	**No**
	SBR	235	64	87	Yes	Yes	64	87	Yes	Yes
	EBL	150	157	**195**	Yes	**No**	157	**195**	Yes	**No**
	EBR	150	0	17	Yes	Yes	0	32	Yes	Yes
	WBL	90	**521** [2]	50	**No**	Yes	**544** [2]	81	**No**	Yes

BOLD = Inadequate 95th percentile storage.

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided. An additional 15 feet of stacking which is assumed to be provided in the transition for turn pockets is reflected in the stacking distance shown on this table, where applicable.

[2] 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

Table 6-4

Intersection Analysis for Opening Year Cumulative (2022) Conditions With Improvements

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												Delay[2] (secs.)		Level of Service	
			Northbound			Southbound			Eastbound			Westbound						
			L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM
1	Euclid Av. (SR-83) & Merrill Av.																	
	- Without Project	TS	1	**3**	1	1	**3**	0	0	1	0	0	1	0	34.2	40.7	C	D
	- With Project	TS	1	**3**	1	1	**3**	0	0	1	0	0	1	0	34.3	41.9	C	D
4	Euclid Av. (SR-83) & Pine Av.																	
	- Without Project	TS	1	**3**	**2>**	1	**3**	0	1	1	1	2	1	0	28.4	53.2	C	D
	- With Project	Not Applicable[4]																

[1] When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.

L = Left; T = Through; R = Right; **1** = Improvement

[2] Per the Highway Capacity Manual (6th Edition), overall average intersection delay and level of service are shown for intersections with a traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[3] TS = Traffic Signal

[4] Project contributes less than 50 peak hour trips, therefore no improvements have been recommended.

The Project is anticipated to contribute less than 50 peak hour trips to the intersection of Euclid Avenue (SR-83) and Pine Avenue for Opening Year Cumulative (2022) With Project traffic conditions. As such, improvements have not been recommended for Opening Year Cumulative (2022) With Project traffic conditions.

6.8.2 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES FOR ROADWAY SEGMENTS

As shown previously in Table 6-2, all study area roadway segments are anticipated to operate at an acceptable LOS under Opening Year Cumulative (2022) traffic conditions. As such, no improvements have been recommended.

6.8.3 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES FOR INTERSECTION QUEUES

As shown previously in Table 6-3, there are four movements that are anticipated to experience queuing issues during the AM or PM peak hours under Opening Year Cumulative (2022) traffic conditions. Recommended improvements to address queuing issues for Opening Year Cumulative (2022) traffic conditions are described below and shown in Table 6-5.

- At the intersection of Euclid Avenue (SR-83) and Kimball Avenue, a 400-foot eastbound left turn lane is recommended in order to accommodate the 95th percentile peak hour queues for Opening Year Cumulative (2022) traffic conditions.
- At the intersection of Euclid Avenue (SR-83) and Bickmore Avenue, a 270-foot southbound left turn lane and a 250-foot eastbound left turn lane are recommended in order to accommodate the 95th percentile peak hour queues for Opening Year Cumulative (2022) traffic conditions. These recommended improvements can be accommodated through restriping of existing pavement.
- At the intersection of Euclid Avenue (SR-83) and Bickmore Avenue a 200-foot westbound left turn lane is recommended to accommodate the 95th percentile queue for Opening Year Cumulative (2022) traffic conditions. Although the 95th percentile queue is higher than the available stacking for the westbound left turn lane, there are no anticipated queuing issues for the same movement under Horizon Year (2040) traffic conditions with the implementation of dual 200-foot left turn lanes. As such, no additional improvements have been recommended for Opening Year Cumulative (2022) traffic conditions.

Table 6-5

Peak Hour Queuing Summary for Opening Year Cumulative (2022) Conditions With Improvements

Intersection	Movement	Available Stacking Distance (Feet)	2022 Without Project				2022 With Project			
			95th Percentile Queue (Feet)		Acceptable? [1]		95th Percentile Queue (Feet)		Acceptable? [1]	
			AM Peak	PM Peak	AM	PM	AM Peak	PM Peak	AM	PM
Euclid Av. (SR-83) & Kimball Av.	NBL	420	274 [2]	143 [2]	Yes	Yes	274 [2]	143 [2]	Yes	Yes
	NBR	665	20	0	Yes	Yes	20	0	Yes	Yes
	SBL	430	123 [2]	297 [2]	Yes	Yes	153 [2]	317 [2]	Yes	Yes
	SBR	335	276	60	Yes	Yes	276	65	Yes	Yes
	EBL	**400**	84	263 [2]	Yes	Yes	84	263 [2]	Yes	Yes
	WBL	215	74	73	Yes	Yes	74	73	Yes	Yes
	WBR	300	154	48	Yes	Yes	176	68	Yes	Yes
Euclid Av. (SR-83) & Bickmore Av.	NBL	110	115 [2]	117 [2]	Yes	Yes	115 [2]	117 [2]	Yes	Yes
	SBL	**270**	126 [2]	269 [2]	Yes	Yes	126 [2]	269 [2]	Yes	Yes
	SBR	235	64	87	Yes	Yes	64	87	Yes	Yes
	EBL	**250**	157	195	Yes	Yes	157	195	Yes	Yes
	EBR	150	0	30	Yes	Yes	0	32	Yes	Yes
	WBL	**200**	**521** [2,3]	50	**No**	Yes	**544** [2,3]	81	**No**	Yes

BOLD = Inadequate 95th percentile storage.

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided. An additional 15 feet of stacking which is assumed to be provided in the transition for turn pockets is reflected in the stacking distance shown on this table, where applicable.

[2] 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

[3] Although the 95th percentile queue is higher than the available stacking distance, there are no anticipated queuing issues for the same movement under Horizon Year (2040) traffic conditions with the future implementation of dual 200-foot left turn lanes. As such, no additional improvements have been recommended.

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7 HORIZON YEAR (2040) TRAFFIC CONDITIONS

This section discusses the methods used to develop Horizon Year (2040) Without and With Project traffic forecasts, and the resulting intersection operations, queuing, and traffic signal warrant analyses.

7.1 ROADWAY IMPROVEMENTS

The lane configurations and traffic controls assumed to be in place for Horizon Year (2040) conditions are consistent with those shown previously on Exhibit 3-1, with the exception of the following:

- Project driveways and those facilities assumed to be constructed by the Project to provide site access are also assumed to be in place for Horizon Year conditions only (e.g., intersection and roadway improvements along the Project's frontage and driveways).
- Driveways and those facilities assumed to be constructed by cumulative developments to provide site access are also assumed to be in place for Horizon Year conditions only (e.g., intersection and roadway improvements along the cumulative development's frontages and driveways).
- Other parallel facilities, that although not evaluated for the purposes of this analysis, are anticipated to be in place for Horizon Year traffic conditions and would affect the travel patterns within the study area (e.g., The Preserve Specific Plan roadway network, Pine Avenue extension to SR-71 Freeway, etc.).

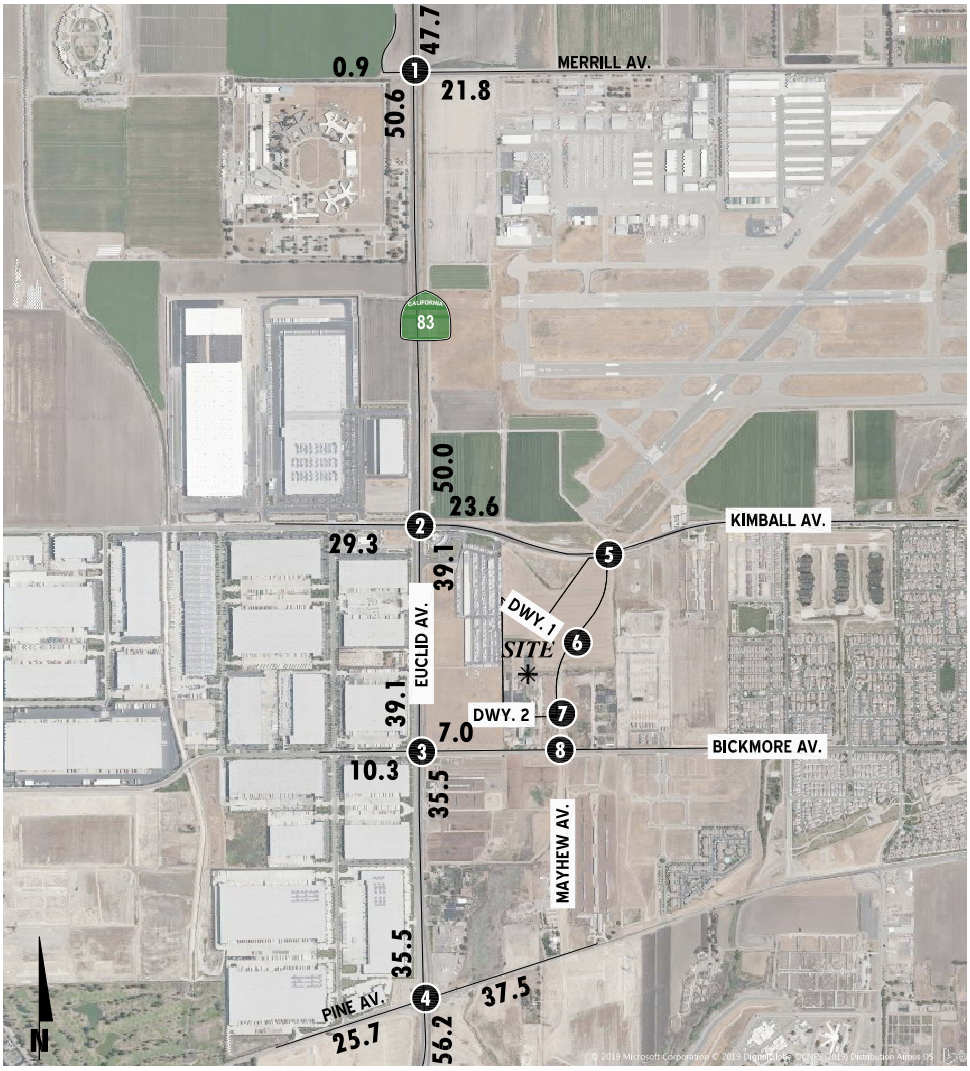
7.2 HORIZON YEAR (2040) WITHOUT PROJECT TRAFFIC VOLUME FORECASTS

The Horizon Year (2040) Without Project analysis scenario includes the refined post-process volumes obtained from the SBTAM (see Section 4.7 *Horizon Year (2040) Volume Development* of this TIA for a detailed discussion on the post-processing methodology). The weekday ADT and weekday AM and PM peak hour volumes which can be expected for Horizon Year (2040) Without Project traffic conditions are shown on Exhibit 7-1.

7.3 HORIZON YEAR (2040) WITH PROJECT TRAFFIC VOLUME FORECASTS

The Horizon Year (2040) With Project analysis scenario includes the refined post-process volumes obtained from the SBTAM, plus the traffic generated by the proposed Project (see Section 4.7 *Horizon Year (2040) Volume Development* of this TIA for a detailed discussion on the post-processing methodology). The weekday ADT and weekday AM and PM peak hour volumes which can be expected for Horizon Year (2040) With Project traffic conditions are shown on Exhibit 7-2.

EXHIBIT 7-1: HORIZON YEAR (2040) WITHOUT PROJECT TRAFFIC VOLUMES (IN PCE)



1 Euclid Av. (SR-83) & E. Facility Dr./ Merrill Av.	2 Euclid Av. (SR-83) & Kimball Av.	3 Euclid Av. (SR-83) & Bickmore Av.	4 Euclid Av. (SR-83) & Pine Av.	5 Mayhew Av. & Kimball Av.
49(1) 1446(1626) 364(392) → 458(421) ← 60(3) ← 388(633)	483(419) 1270(1418) 219(521) → 403(232) ← 931(397) ← 224(95)	245(199) 1263(1458) 104(186) → 214(163) ← 264(37) ← 234(43)	130(122) 1025(1175) 161(383) → 333(244) ← 980(611) ← 1319(712)	Future Intersection
10(14) → 10(37) → 21(15) → 13(5) ← 1284(1513) ← 443(801)	213(591) → 284(962) → 109(206) → 178(147) ← 1234(1329) ← 58(156)	81(219) → 16(143) → 47(138) → 92(55) ← 1088(1382) ← 13(117)	84(115) → 303(911) → 204(224) → 171(278) ← 1052(1064) ← 214(891)	

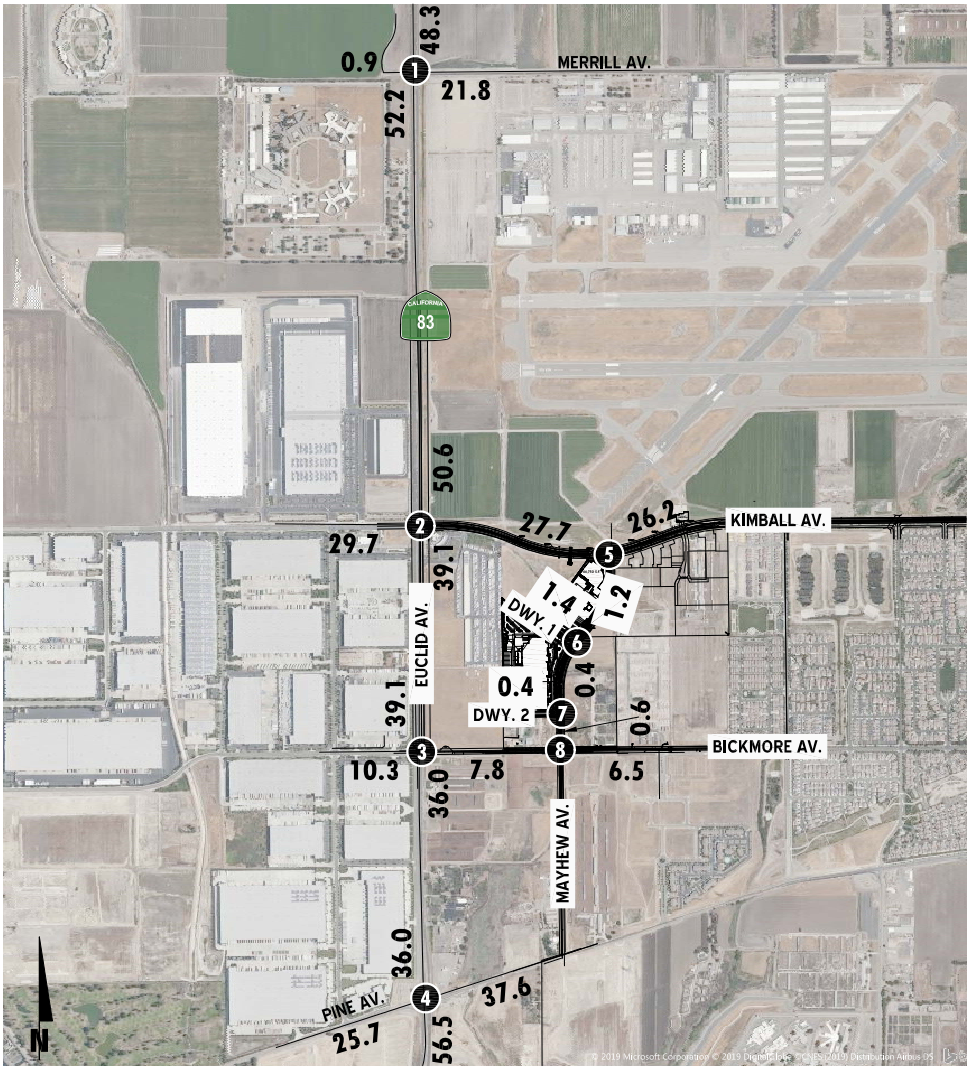
6 Mayhew Av. & Dwy. 1	7 Mayhew Av. & Dwy. 2	8 Mayhew Av. & Bickmore Av.
Future Intersection	Future Intersection	Future Intersection

LEGEND:

10(10) = AM(PM) PEAK HOUR INTERSECTION VOLUMES
10.0 = VEHICLES PER DAY (1000'S)

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EXHIBIT 7-2: HORIZON YEAR (2040) WITH PROJECT TRAFFIC VOLUMES (IN PCE)



1 Euclid Av. (SR-83) & E. Facility Dr./ Merrill Av.	2 Euclid Av. (SR-83) & Kimball Av.	3 Euclid Av. (SR-83) & Bickmore Av.	4 Euclid Av. (SR-83) & Pine Av.	5 Mayhew Av. & Kimball Av.
49(1) 1474(1646) 364(392) → 458(421) ← 60(3) ← 389(634)	483(419) 1270(1418) 248(541) → 423(279) ← 943(424) ← 224(95)	245(199) 1263(1458) 222(209) → 313(233) ← 387(54) ← 356(92)	133(129) 1034(1196) 164(390) → 337(247) ← 980(611) ← 1319(712)	← 1380(1402) ← 22(10)
10(14) → 10(37) → 21(15) →	213(591) → 301(974) → 109(206) →	81(219) → 34(160) → 47(138) →	88(118) → 303(911) → 204(224) →	1043(1358) → 138(49) →
13(5) 1304(1559)	178(147) 1234(1330)	92(55) 1088(1382)	171(278) 1064(1073)	43(157)
444(803) ↑	58(156) ↑	49(145) ↑	214(891) ↑	9(27) ↑

6 Mayhew Av. & Dwy. 1	7 Mayhew Av. & Dwy. 2	8 Mayhew Av. & Bickmore Av.
49(34) 8(5)	8(5) 7(18)	27(103) 7(30) → 20(7) ← 1030(276)
34(80) → 7(18) →	5(11) → 10(22) →	144(47) → 162(467) →
10(7) 5(11) ↑	15(10) 10(7) ↑	

LEGEND:

10(10) = AM(PM) PEAK HOUR INTERSECTION VOLUMES
10.0 = VEHICLES PER DAY (1000'S)

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7.4 INTERSECTION OPERATIONS ANALYSIS

7.4.1 HORIZON YEAR (2040) WITHOUT PROJECT TRAFFIC CONDITIONS

LOS calculations were conducted for the study intersections to evaluate their operations under Horizon Year (2040) Without Project conditions with roadway and intersection geometrics consistent with Section 7.1 *Roadway Improvements*. As shown in Table 7-1, the following study area intersections are anticipated to operate at an unacceptable LOS under Horizon Year (2040) Without Project traffic conditions:

- Euclid Avenue (SR-83) & Merrill Avenue (#1) – LOS F AM and PM peak hours
- Euclid Avenue (SR-83) & Kimball Avenue (#2) – LOS E AM peak hour; LOS F PM peak hour
- Euclid Avenue (SR-83) & Bickmore Avenue (#3) – LOS E PM peak hour only
- Euclid Avenue (SR-83) & Pine Avenue (#4) – LOS F AM and PM peak hours

A summary of the peak hour intersection LOS for Horizon Year (2040) Without Project conditions is shown on Exhibit 7-3. The intersection operations analysis worksheets for Horizon Year (2040) Without Project traffic conditions are included in Appendices 7.1 of this TIA.

7.4.2 HORIZON YEAR (2040) WITH PROJECT TRAFFIC CONDITIONS

As shown in Table 7-1 and illustrated on Exhibit 7-4, with the addition of Project traffic, the following additional study area intersection is anticipated to operate at a deficient LOS during the PM peak hour for Horizon Year (2040) With Project traffic conditions:

- Mayhew Avenue & Kimball Avenue (#5) – LOS E PM peak hour only

The intersection operations analysis worksheets for Horizon Year (2040) With Project traffic conditions are included in Appendix 7.2 of this TIA.

7.5 ROADWAY SEGMENT ANALYSIS

The roadway segment capacities utilized for the purposes of this analysis are approximate figures only, and are used at the General Plan level to assist in determining the roadway functional classification (number of through lanes) needed to meet traffic demand. Table 7-2 provides a summary of the Horizon Year (2040) traffic conditions roadway segment capacity analysis based on the applicable roadway segment capacity. As discussed in Section 3.9 *Roadway Segment Analysis*, all the study area roadway segments will be constructed by the Project, and therefore do not existing under "Without Project" conditions. As such, no roadway segment analysis has been conducted under Horizon Year (2040) Without Project traffic conditions. As shown in Table 7-2, all the study area roadway segments are anticipated to operate at an acceptable LOS under Horizon Year (2040) With Project traffic conditions.

Table 7-1

Intersection Analysis Horizon Year (2040) Conditions

#	Intersection	Traffic Control[3]	2040 Without Project				2040 With Project				Acceptable LOS
			Delay[1] (secs.)		Service		Delay[1] (secs.)		Service		
			AM	PM	AM	PM	AM	PM	AM	PM	
1	Euclid Av. (SR-83) & Merrill Av.	TS	**123.8**	**>200.0**	**F**	**F**	**125.5**	**>200.0**	**F**	**F**	D
2	Euclid Av. (SR-83) & Kimball Av.	TS	**73.0**	**112.4**	**E**	**F**	**75.3**	**115.3**	**E**	**F**	D
3	Euclid Av. (SR-83) & Bickmore Av.	TS	47.1	**57.6**	D	**E**	**131.9**	**74.3**	**F**	**E**	D
4	Euclid Av. (SR-83) & Pine Av.	TS	**>200.0**	**>200.0**	**F**	**F**	**>200.0**	**>200.0**	**F**	**F**	D
5	Mayhew Av. & Kimball Av.	**TS**	Future Intersection				24.3	**58.4**	C	**E**	D
6	Mayhew Av. & Driveway 1	**CSS**	Future Intersection				9.2	9.4	A	A	D
7	Mayhew Av. & Driveway 2	**CSS**	Future Intersection				8.7	8.7	A	A	D
8	Mayhew Av. & Bickmore Av.	**TS**	Future Intersection				25.2	13.7	C	B	D

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

[1] Per the Highway Capacity Manual (6th Edition), overall average intersection delay and level of service are shown for intersections with a traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[2] LOS = Level of Service

[3] CSS = Cross-street Stop; TS = Traffic Signal; **CSS** = Improvement

Table 7-2

Roadway Segment Capacity Analysis for Horizon Year (2040) Conditions

#	Roadway	Segment Limits	Roadway Section	LOS Capacity[1]	2040 With Project	V/C[2]	LOS[3]	Acceptable LOS
1	Mayhew Av.	Kimball Av. to Driveway 1	2U	13,000	1,996	0.15	A	D
2		Driveway 1 to Driveway 2	2U	13,000	424	0.03	A	D
3		Driveway 2 to Bickmore Av.	2U	13,000	1,801	0.14	A	D

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

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

[2] V/C = Volume to Capacity Ratio

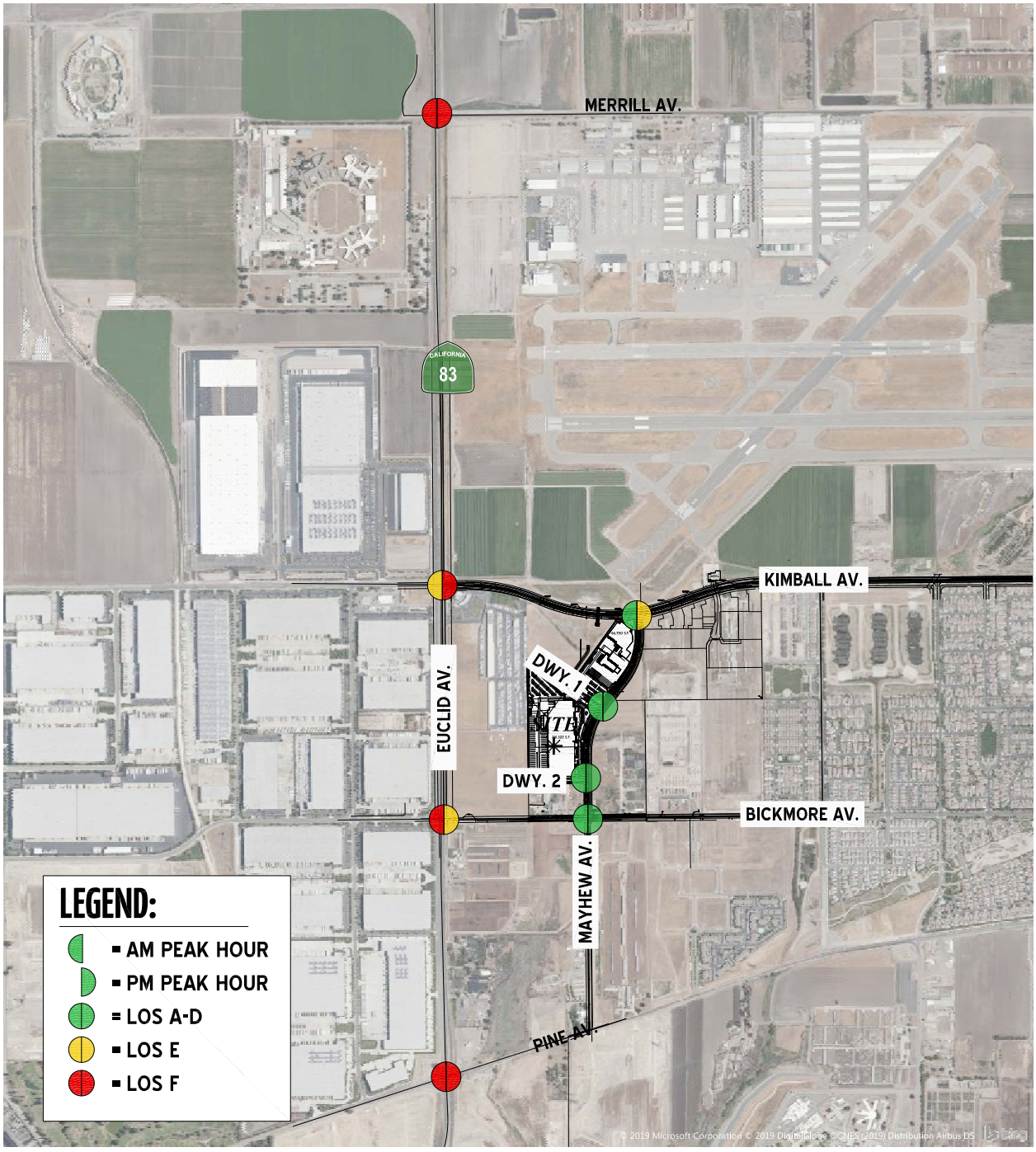
[3] LOS = Level of Service

EXHIBIT 7-3: HORIZON YEAR (2040) WITHOUT PROJECT SUMMARY OF LOS



12611 - los.dwg

EXHIBIT 7-4: HORIZON YEAR (2040) WITH PROJECT SUMMARY OF LOS



N

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7.6 TRAFFIC SIGNAL WARRANTS ANALYSIS

There are no existing unsignalized study area intersections. As such, no traffic signal warrant analysis has been conducted for Horizon Year (2040) Without Project traffic conditions. The following study area intersection is anticipated to meet a planning level (ADT volume-based) traffic signal warrant for Horizon Year (2040) With Project traffic:

- Mayhew Avenue & Kimball Avenue (#5)

Worksheets for Horizon Year (2040) With Project traffic conditions signal warrants are provided in Appendix 7.3.

7.7 QUEUING ANALYSIS

A queuing analysis was conducted at the study area intersections in order to determine 95th percentile queues during the peak hours. The queuing analysis results are summarized in Table 7-3 for Horizon Year (2040) Without Project traffic conditions, which indicates that the following movements are anticipated to experience queuing issues based on the 95th percentile peak hour traffic flows:

- Euclid Avenue (SR-83) & Kimball Avenue (#2), eastbound left turn lane – PM peak hour only
- Euclid Avenue (SR-83) & Kimball Avenue (#2), westbound left turn lane – AM peak hour only
- Euclid Avenue (SR-83) & Bickmore Avenue (#3), northbound left turn lane – AM peak hour only
- Euclid Avenue (SR-83) & Bickmore Avenue (#3), southbound left turn lane – AM and PM peak hours
- Euclid Avenue (SR-83) & Bickmore Avenue (#3), eastbound left turn lane – PM peak hour only
- Euclid Avenue (SR-83) & Bickmore Avenue (#3), westbound left turn lane – AM peak hour only

With the addition of Project traffic, there are no additional movements anticipated to experience queuing issues based on the 95th percentile peak hour traffic flows. Queuing worksheets for Horizon Year (2040) Without Project and With Project traffic conditions are included in Appendices 7.4 and 7.5, respectively.

Table 7-3

Peak Hour Queuing Summary for Horizon Year (2040) Conditions

Intersection	Movement	Available Stacking Distance (Feet)	2040 Without Project				2040 With Project			
			95th Percentile Queue (Feet)		Acceptable? [1]		95th Percentile Queue (Feet)		Acceptable? [1]	
			AM Peak	PM Peak	AM	PM	AM Peak	PM Peak	AM	PM
Euclid Av. (SR-83) & Kimball Av.	NBL	420	263 [2]	262 [2]	Yes	Yes	263 [2]	262 [2]	Yes	Yes
	NBR	665	17	55	Yes	Yes	17	55	Yes	Yes
	SBL	430	165 [2]	397 [2]	Yes	Yes	193 [2]	415 [2]	Yes	Yes
	SBR	335	340	210	Yes	Yes	340	213	Yes	Yes
	EBL	210	148 [2]	**427** [2]	Yes	**No**	148 [2]	**427** [2]	Yes	**No**
	WBL	215	**399** [2]	154 [2]	**No**	Yes	**399** [2]	154 [2]	**No**	Yes
	WBR	300	273	125	Yes	Yes	297	176	Yes	Yes
Euclid Av. (SR-83) & Bickmore Av.	NBL	110	**201** [2]	100 [2]	**No**	Yes	**201** [2]	101 [2]	**No**	Yes
	SBL	160	**204** [2]	**342** [2]	**No**	**No**	**454** [2]	**390** [2]	**No**	**No**
	SBR	235	117	106	Yes	Yes	117	106	Yes	Yes
	EBL	150	140 [2]	**325** [2]	Yes	**No**	140 [2]	**354** [2]	Yes	**No**
	EBR	150	0	40	Yes	Yes	0	44	Yes	Yes
	WBL	90	**399** [2]	68	**No**	Yes	**641** [2]	**121**	**No**	**No**

BOLD = Inadequate 95th percentile storage.

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided. An additional 15 feet of stacking which is assumed to be provided in the transition for turn pockets is reflected in the stacking distance shown on this table, where applicable.

[2] 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

7.8 HORIZON YEAR (2040) DEFICIENCIES AND RECOMMENDED IMPROVEMENTS

7.8.1 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES AT INTERSECTIONS

The effectiveness of the recommended improvements is presented in Table 7-4 for Horizon Year (2040) traffic conditions. The intersection operations analysis worksheets for Horizon Year (2040) Without Project and With Project traffic conditions with improvements are included in Appendices 7.6 and 7.7, respectively.

Euclid Avenue (SR-83) & Merrill Avenue (#1) – The following improvements are necessary to improve the peak hour operations back to acceptable levels:

- Add a 3rd northbound through lane.
- Add a 2nd southbound left turn lane.
- Add a 3rd southbound through lane.
- Add an eastbound left turn lane.
- Add a westbound left turn lane.
- Add a 2nd westbound left turn lane.
- Add a westbound right turn lane.
- Modify the traffic signal to implement overlap phasing for the westbound right turn lane.

Euclid Avenue (SR-83) & Kimball Avenue (#2) – The following improvements are necessary to improve the peak hour operations back to acceptable levels:

- Add a 3rd northbound through lane.
- Add a 3rd southbound through lane.
- Add a 2nd westbound left turn lane.
- Modify the traffic signal to implement overlap phasing for the southbound right turn lane.

Euclid Avenue (SR-83) & Bickmore Avenue (#3) – The following improvements are necessary to improve the peak hour operations back to acceptable levels:

- Add a 3rd northbound through lane.
- Add a northbound right turn lane.
- Add a 2nd southbound left turn lane.
- Add a 3rd southbound through lane.
- Add a 2nd westbound left turn lane.
- Add a westbound right turn lane.

Table 7-4

Intersection Analysis for Horizon Year (2040) Conditions With Improvements

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												Delay[2] (secs.)		Level of Service	
			Northbound			Southbound			Eastbound			Westbound						
			L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM
1	Euclid Av. (SR-83) & Merrill Av.																	
	- Without Project	TS	1	**3**	1	**2**	**3**	0	**1**	1	0	**2**	1	**1>**	25.0	31.1	C	C
	- With Project	TS	1	**3**	1	**2**	**3**	0	**1**	1	0	**2**	1	**1>**	25.0	31.3	C	C
2	Euclid Av. (SR-83) & Kimball Av.																	
	- Without Project	TS	1	**3**	1	2	**3**	**1>**	2	2	0	**2**	2	1	44.0	51.7	D	D
	- With Project	TS	1	**3**	1	2	**3**	**1>**	2	2	0	**2**	2	1	45.2	53.1	D	D
3	Euclid Av. (SR-83) & Bickmore Av.																	
	- Without Project	TS	1	**3**	**1**	**2**	**3**	1	1	1	1	**2**	1	**1**	18.5	23.1	B	C
	- With Project	TS	1	**3**	**1**	**2**	**3**	1	1	1	1	**2**	1	**1**	23.7	29.3	C	C
4	Euclid Av. (SR-83) & Pine Av.																	
	- Without Project	TS	**2**	**3**	**2>**	**2**	**3**	**1**	1	**2**	1	2	**2**	**1**	53.7	53.9	D	D
	- With Project	TS	**2**	**3**	**2>**	**2**	**3**	**1**	1	**2**	1	2	**2**	**1**	54.2	54.9	D	D
5	Mayhew Av. & Kimball Av.																	
	- Without Project		Intersection Does Not Exist															
	- With Project	**TS**	**1**	0	**1**	0	0	0	0	**2**	**1**	**1**	**2**	0	9.2	9.6	A	A

[1] When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes

L = Left; T = Through; R = Right; > = Right-Turn Overlap Phasing; **1** = Improvement

[2] Per the Highway Capacity Manual (6th Edition), overall average intersection delay and level of service are shown for intersections with a traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[3] TS = Traffic Signal; **TS** = Improvement

Euclid Avenue (SR-83) & Pine Avenue (#4) – The following improvements are necessary to improve the peak hour operations back to acceptable levels:

- Add a 2nd northbound left turn lane.
- Add a 3rd northbound through lane.
- Add a 2nd northbound right turn lane.
- Add a 2nd southbound left turn lane.
- Add a 3rd southbound through lane.
- Add a southbound right turn lane.
- Add a 2nd eastbound through lane.
- Add a 2nd westbound through lane.
- Add a westbound right turn lane.

Mayhew Avenue & Kimball Avenue (#5) – The following improvements are necessary to improve the peak hour operations back to acceptable levels:

- Install a traffic signal (Project design feature).
- Add a northbound left turn lane (Project design feature).
- Add a northbound right turn lane (Project design feature).
- Add an eastbound right turn lane (Project design feature).
- Add a westbound left turn lane (Project design feature).
- Add a 2nd eastbound through lane.
- Add a 2nd westbound through lane.

The Project is anticipated to contribute 50 or more peak hour trips to all deficient study area intersections. The intersection operations analysis worksheets for Horizon Year (2040) Without and With Project conditions with improvements are provided in Appendices 7.6 and 7.7, respectively.

The Project Applicant shall participate in the funding of off-site improvements, including traffic signals, that are needed to serve cumulative traffic conditions through the payment of City of Chino DIF (if the improvements are included in the DIF program). These fees shall be collected by the City of Chino, with the proceeds solely used as part of a funding mechanism aimed at ensuring that regional highways and arterial expansions keep pace with the projected population increases. Each of the improvements discussed above have been identified as being included as part of City DIF fee program in Section 8 *Local and Regional Funding Mechanisms* of this TIA.

7.8.2 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES FOR ROADWAY SEGMENTS

As shown previously in Table 7-2, all study area roadway segments are anticipated to operate at an acceptable LOS under Horizon Year (2040) traffic conditions. As such, no improvements have been recommended.

7.8.3 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES FOR INTERSECTION QUEUES

As shown previously in Table 7-3, there are six movements that are anticipated to experience queuing issues during the AM or PM peak hours under Horizon Year (2040) traffic conditions. In conjunction with the intersection improvements shown previously in Table 7-4, the following recommended improvements are needed to address queuing issues for Horizon Year (2040) traffic conditions (as shown in Table 7-5).

- At the intersection of Euclid Avenue (SR-83) and Kimball Avenue, a 400-foot eastbound left turn lane is recommended in order to accommodate the 95th percentile peak hour queues for Horizon Year (2040) traffic conditions. This improvement can be accommodated through restriping of existing pavement.
- At the intersection of Euclid Avenue (SR-83) and Bickmore Avenue, the following improvements are recommended:
    - A 200-foot northbound left turn lane (restripe of existing pavement).
    - A 200-foot northbound right turn lane.
    - A 270-foot southbound left turn lane (restripe of existing pavement).
    - A 200-foot southbound right turn lane (restripe of existing pavement).
    - A 250-foot eastbound left turn lane (restripe of existing pavement).
    - A 200-foot dual westbound left turn lanes.
    - A 200-foot westbound right turn lane.

Queuing worksheets for Horizon Year (2040) Without Project and With Project traffic conditions, with improvements, are included in Appendices 7.8 and 7.9, respectively.

Table 7-5

Peak Hour Queuing Summary for Horizon Year (2040) Conditions With Improvements

Intersection	Movement	Available Stacking Distance (Feet)	2040 Without Project				2040 With Project			
			95th Percentile Queue (Feet)		Acceptable? [1]		95th Percentile Queue (Feet)		Acceptable? [1]	
			AM Peak	PM Peak	AM	PM	AM Peak	PM Peak	AM	PM
Euclid Av. (SR-83) & Kimball Av.	NBL	420	276 [2]	245 [2]	Yes	Yes	276 [2]	245 [2]	Yes	Yes
	NBR	665	17	53	Yes	Yes	17	53	Yes	Yes
	SBL	430	143 [2]	348 [2]	Yes	Yes	172 [2]	366 [2]	Yes	Yes
	SBR	335	331	219	Yes	Yes	331	228	Yes	Yes
	EBL	**400**	126	390 [2]	Yes	Yes	126	390 [2]	Yes	Yes
	WBL	215	130	65	Yes	Yes	130	65	Yes	Yes
	WBR	300	239	67	Yes	Yes	263	111	Yes	Yes
Euclid Av. (SR-83) & Bickmore Av.	NBL	**200**	158 [2]	98 [2]	Yes	Yes	159 [2]	98 [2]	Yes	Yes
	NBR	**200**	0	35	Yes	Yes	0	58	Yes	Yes
	SBL	**270**	72	215	Yes	Yes	153 [2]	262 [2]	Yes	Yes
	SBR	**200**	80	81	Yes	Yes	81	81	Yes	Yes
	EBL	**250**	119	233	Yes	Yes	121	233 [2]	Yes	Yes
	EBR	150	0	37	Yes	Yes	0	38	Yes	Yes
	WBL	**200**	133	35	Yes	Yes	198 [2]	62	Yes	Yes
	WBR	**200**	78	51	Yes	Yes	170	60	Yes	Yes
Mayhew Av. & Kimball Av.	**NBL**	**150**	Future Intersection				51	155	Yes	Yes
	EBR	**100**					47	29	Yes	Yes
	WBL	**200**					54	37	Yes	Yes
Mayhew Av. & Bickmore Av.	**SBL**	**90**	Future Intersection				22	46	Yes	Yes
	EBL	**100**					76	32	Yes	Yes

BOLD = Inadequate 95th percentile storage.

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided. An additional 15 feet of stacking which is assumed to be provided in the transition for turn pockets is reflected in the stacking distance shown on this table, where applicable.

[2] 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

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8 LOCAL AND REGIONAL FUNDING MECHANISMS

Transportation improvements within the City of Chino are funded through a combination of project improvements, development impact fee programs, or fair share contributions, such as the City of Chino DIF program. Identification and timing of needed improvements is generally determined through local jurisdictions based upon a variety of factors.

8.1 CITY OF CHINO DEVELOPMENT IMPACT FEE PROGRAM

The City of Chino has created its own local DIF program to impose and collect fees from new residential, commercial and industrial development for the purpose of funding roadways and intersections necessary to accommodate City growth as identified in the City's General Plan Circulation Element. The City's DIF includes regional improvements to comply with Measure "I". The fee schedule was recently adopted on July 16, 2019. The fee schedule and project transportation impacts fees are shown in Table 8-1. Under the City's DIF program, the City may grant to developers a credit against specific components of fees when those developers construct certain facilities and landscaped medians identified in the list of improvements funded by the DIF program.

TABLE 8-1: ESTIMATED FEE OBLIGATION

Fee Reference	Light Industrial ($ PER SQ. FT.)
Streets, Signals and Bridges (Schedule 5.2)	2.188/SF

* City-wide DIF rates adopted July 16, 2019.

Fee Calculation

Building	Category	Unit Cost	Units/Sq.Ft.	Local Circulation
Altitude - Phase 1	Industrial	$2.188	328,072	$717,822

Total Transportation Impact Fees	**$717,822**

The timing to use the DIF fees is established through periodic capital improvement programs which are overseen by the City's Public Works Department. Periodic traffic counts, review of traffic accidents, and a review of traffic trends throughout the City are also periodically performed by City staff and consultants. The City uses these data to determine the timing of implementing the improvements listed in its facilities list. The City also uses these data to ensure that the improvements listed on the facilities list are constructed before the LOS falls below the

LOS performance standards adopted by the City. In this way, the improvements are constructed before the LOS falls below the City's LOS performance thresholds.

The Project Applicant will be subject to the City's DIF fee program and will pay the requisite City DIF fees at the rates then in effect pursuant to the City's ordinance. The Project Applicant's payment of the requisite DIF at the rates then in effect, pursuant to the City DIF Program, would satisfy the Project's proportional improvement requirements at potentially affected DIF-funded facilities.

8.2 MEASURE "I" FUNDS

In 2004, the voters of San Bernardino County approved the 30-year extension of Measure "I", a one-half of one percent sales tax on retail transactions, through the year 2040, for transportation projects including, but not limited to, infrastructure improvements, commuter rail, public transit, and other identified improvements. The Measure "I" extension requires that a regional traffic impact fee be created to ensure development is paying its fair share. A regional Nexus study was prepared by the SBCTA and concluded that each jurisdiction should include a regional fee component in their local programs in order to meet the Measure "I" requirement. The regional component assigns specific facilities and cost sharing formulas to each jurisdiction and was most recently updated in November 2011. Revenues collected through these programs are used in tandem with Measure "I" funds to deliver projects identified in the Nexus Study. While Measure "I" is a self-executing sales tax administered by SBCTA, it bears discussion here because the funds raised through Measure "I" have funded in the past and will continue to fund new transportation facilities in San Bernardino County.

8.3 FAIR SHARE CONTRIBUTION

Project improvements may include a combination of fee payments to established programs, construction of specific improvements, payment of a fair share contribution toward future improvements or a combination of these approaches. Improvements constructed by development may be eligible for a fee credit or reimbursement through the program where appropriate (to be determined at the City's discretion).

When off-site improvements are identified with a minor share of responsibility assigned to proposed development, the approving jurisdiction may elect to collect a fair share contribution or require the development to construct improvements. Detailed fair share calculations, for each peak hour, has been provided in Table 8-2 for the applicable deficient study area intersections.

Table 8-2

Project Fair Share Calculations for Intersections

#	Intersection	Existing	Project	2040 With Project Volume	Total New Traffic	Project % of New Traffic
1	Euclid Av. (SR-83) & Merrill Av.					
	AM:	2,828	50	4,596	1,768	2.83%
	PM:	3,143	69	5,530	2,387	**2.89%**

BOLD = Denotes highest fair share percentage.

[1] Fair share based on total traffic only.

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9 REFERENCES

1. **San Bernardino Associated Governments.** *Congestion Management Program for County of San Bernardino.* County of San Bernardino : s.n., Updated June 2016.
2. **California Department of Transportation.** *Guide for the Preparation of Traffic Impact Studies.* December 2002.
3. **Urban Crossroads, Inc.** *Altitude Business Centre Traffic Impact Analysis.* March 4, 2019.
4. **Transportation Research Board.** *Highway Capacity Manual (HCM).* 6th. s.l. : National Academy of Sciences, 2016.
5. **Caltrans.** Manual on Uniform Traffic Control Devices (MUTCD). [book auth.] California Department of Transportation. *California Manual on Uniform Traffic Control Devices (CAMUTCD).* 2014.
6. **Institute of Transportation Engineers.** *Trip Generation.* 10th Edition. 2017.
7. **City of Fontana.** *Truck Trip Generation Study.* Fontana : s.n., August 2003.
8. **Southern California Association of Governments.** *2016 Regional Transportation Plan/Sustainable Communities Strategy.* April 2016.

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APPENDIX 1.1:

APPROVED TRAFFIC STUDY SCOPING AGREEMENT

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URBAN CROSSROADS

260 E. Baker St. | Suite 200 | Costa Mesa, CA 92626 | (949) 660-1994
urbanxroads.com

November 4, 2019

Mr. Dennis Ralls
City of Chino
13220 Central Avenue
Chino, CA 91708

APPROVED
By Dennis Ralls, TE at 4:23 pm, Nov 05, 2019

SUBJECT: SCOPING ASSUMPTIONS FOR THE ALTITUDE BUSINESS CENTRE – PHASE 1

FOCUSED TRAFFIC IMPACT ANALYSIS (REVISED)

Dear Mr. Dennis Ralls:

Urban Crossroads, Inc. has conducted an initial assessment of the proposed Altitude Business Centre – Phase 1 development (**Project**) to establish a traffic impact analysis (**TIA**) scope of work that would be prepared in support of the Project. The Project is located on the southwest corner of the future Mayhew Avenue and Kimball Avenue in the City of Chino. Based on the results of this assessment, the following memo outlines the project-related trip generation, trip distribution patterns, proposed study area and analysis scenarios expected to be included in the Project traffic impact analysis. The following outlined scoping assumptions also can be utilized in the preparation of a traffic scoping agreement for the future Project TIA, which would be reviewed and approved by City staff.

PROJECT DESCRIPTION

Exhibit 1 illustrates a preliminary site plan for the Project. The proposed Project is anticipated to be developed by Year 2022. As indicated on Exhibit 1, the total development is proposed to consist of up to 284,996 square feet of warehousing use with a 66,779 square foot sharehouse/cookout building and 24,429 square foot fleet building.

Access to the proposed Project would be provided via two driveways on Mayhew Avenue. Buildings 4, 5, and 6 were previously served by 6 driveways along Mayhew Avenue. Exhibit 2 illustrates the Project location with respect to the study area. The proposed Project occupies the space previously occupied by Buildings 4, 5, and 6 in the Altitude Business Centre Traffic Impact Analysis (dated March 2019).

PROPOSED ANALYSIS SCENARIOS

The following analysis scenarios are proposed:

- Existing (2019)
- Existing plus Project
- Opening Year Cumulative (2022) Without Project
- Opening Year Cumulative (2022) With Project

- Horizon Year (2040) Without Project – With Limonite Avenue Extension
- Horizon Year (2040) With Project – With Limonite Avenue Extension

TRIP GENERATION

Trip generation represents the amount of traffic that is attracted and produced by a development, and is based upon the specific land uses planned for a given project. A trip generation summary of the Project in both actual vehicles and passenger car equivalent (PCE) is shown in Table 1. The trip generation is based on user-specific data supplied by the Project Applicant. The data supplied by the user is based on a combination of operational characteristics of other similar sites and anticipated operations for the proposed facility.

PCE factors were applied to the trip generation rates for heavy trucks (large 2-axles, 3-axles, 4+-axles). PCEs allow the typical "real-world" mix of vehicle types to be represented as a single, standardized unit, such as the passenger car, to be used for the purposes of capacity and level of service analyses. The PCE factors are consistent with the recommended PCE factors in Appendix B of the San Bernardino County Congestion Management Program (CMP), 2016 Update.

As shown in Table 1, the proposed Project is anticipated to generate a total of 1,532 actual vehicle trip-ends per day with 129 AM peak hour trips and 174 PM peak hour trips. In comparison to the actual vehicles, the proposed Project is anticipated to generate a total of 1,796 PCE trip-ends per day, 137 PCE AM peak hour trips and 187 PCE PM peak hour trips.

The Altitude Business Centre Traffic Impact Analysis (dated March 2019) assumed 515,000 square feet of general warehousing use for Buildings 4, 5, and 6. Table 2 summarizes the actual and PCE trip generation associated with Buildings 4, 5, and 6 in the Altitude Business Centre TIA. The trip generation from the Altitude Business Centre Traffic Study is shown in Table 2 for Buildings 4, 5, and 6.

A comparison of the currently approved and proposed trip generation shows that the proposed Project is anticipated to generate 612 fewer PCE trip-ends per day with 64 fewer PCE AM peak hour trips and 30 fewer PCE PM peak hour trips (see Table 3).

TRIP DISTRIBUTION

The Project trip distribution and assignment process represents the directional orientation of traffic to and from the Project site. The E+P and Opening Year Cumulative trip distribution patterns utilize the existing roadway system while the Horizon Year trip distribution patterns assumes future roadway connections based on the City of Chino and City of Ontario General Plans (and those of surrounding agencies). The following trip distribution patterns are consistent with those utilized in the Altitude Business Centre Traffic Study:

- Exhibit 3 illustrates the E+P and Opening Year Cumulative truck trip distribution patterns

- Exhibit 4 illustrates the Horizon Year truck trip distribution patterns
- Exhibit 5 illustrates the E+P and Opening Year Cumulative passenger car trip distribution patterns
- Exhibit 6 illustrates the Horizon Year passenger car trip distribution patterns

Trucks are anticipated to utilize designated truck routes such as Bickmore Avenue to Euclid Avenue (SR-83), Kimball Avenue, and Euclid Avenue (SR-83) to reach regional State highways such as the SR-71 and SR-60 Freeways.

INTERSECTION ANALYSIS LOCATIONS

Although the proposed Project is anticipated to result in a net reduction to the currently adopted uses, the recommended intersection analysis locations are shown on Exhibit 2 and listed below:

- Euclid Avenue (SR-83) & Merrill Avenue
- Euclid Avenue (SR-83) & Kimball Avenue
- Euclid Avenue (SR-83) & Bickmore Avenue
- Euclid Avenue (SR-83) & Pine Avenue
- Mayhew Avenue & Kimball Avenue – Future Intersection
- Mayhew Avenue & Driveway 1 – Future Intersection
- Mayhew Avenue & Driveway 2 – Future Intersection
- Mayhew Avenue & Bickmore Avenue – Future Intersection

The general preparation of the traffic impact study for this Project will continue to be in conformance with the typical requirements of the San Bernardino County CMP and the Altitude Business Centre Traffic Study.

ROADWAY SEGMENT ANALYSIS LOCATIONS

The recommended roadway segment analysis locations are also shown on Exhibit 2 and listed below:

- Mayhew Avenue between Kimball Avenue to Driveway 1
- Mayhew Avenue between Driveway 1 to Driveway 2
- Mayhew Avenue between Driveway 2 to Bickmore Avenue

LEVEL OF SERVICE (LOS) CRITERIA

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

CITY OF CHINO

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

CALTRANS

For the study intersections at Caltrans intersections (SR-83), LOS D is the minimum acceptable condition that should be maintained during the peak commute hours.

SPECIAL ISSUES

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

- Truck turning templates will be used to address how Project truck traffic (e.g., large trucks such as a WB-67) would enter and exit the Project site to determine radii at curb returns, radii of streets per Highway Design Manual, and widths/radii required for on-site maneuvering for two-way truck traffic. Truck turn templates will be utilized at each applicable Project driveway. Truck turn templates have already been prepared for the Altitude Business Centre project for the intersections of Mayhew Avenue at Kimball Avenue and Mayhew Avenue at Bickmore Avenue. Since no geometric changes are anticipated, no truck turn templates will be prepared for these two intersections (however, the previously prepared truck turn templates will be provided as reference in the focused traffic study).
- Sight distance will be evaluated for all Project driveways (Driveway 1 and Driveway 2 on Mayhew Avenue).
- Provide a queuing analysis for the Project driveways and site adjacent intersections along Mayhew Avenue (from Kimball Avenue to Bickmore Avenue) for Horizon Year (2040) traffic conditions to determine/verify necessary storage lengths. In addition, a queuing analysis will also be prepared for the off-site intersections of Euclid Avenue (SR-83) at Kimball Avenue and Euclid Avenue (SR-83) at Bickmore Avenue.
- Traffic signal warrant analysis will be conducted for all unsignalized study area intersections.
- "Fair-share" contributions for improvements not within the City's DIF program or located within other jurisdictions will be included in the TIA.

CUMULATIVE DEVELOPMENT PROJECTS

Exhibit 7 illustrates a cumulative development location map. A summary of the cumulative development projects is shown in Table 4. Please review to let us know if there are any projects that should be removed or provide information on new cumulative projects that should be added. Cumulative development projects will be utilized for evaluating Opening Year Cumulative traffic conditions, in conjunction with the addition of background growth (i.e., compounded growth of 2.0 percent per year over 4 years).

CONCLUSION

Urban Crossroads, Inc. is pleased to submit this letter documenting the Project trip generation, trip distribution, and the recommended intersection analysis locations for the Altitude Business Centre – Phase 1 Focused Traffic Impact Analysis. We will move forward towards completing the traffic study after receiving jurisdiction approval or comments finalizing the proposed study area.

If you have any questions, please contact me directly at (949) 336-5982.

Respectfully submitted,

URBAN CROSSROADS, INC.

Charlene So

Charlene So, PE
Associate Principal

Attachments

EXHIBIT 1: PRELIMINARY SITE PLAN

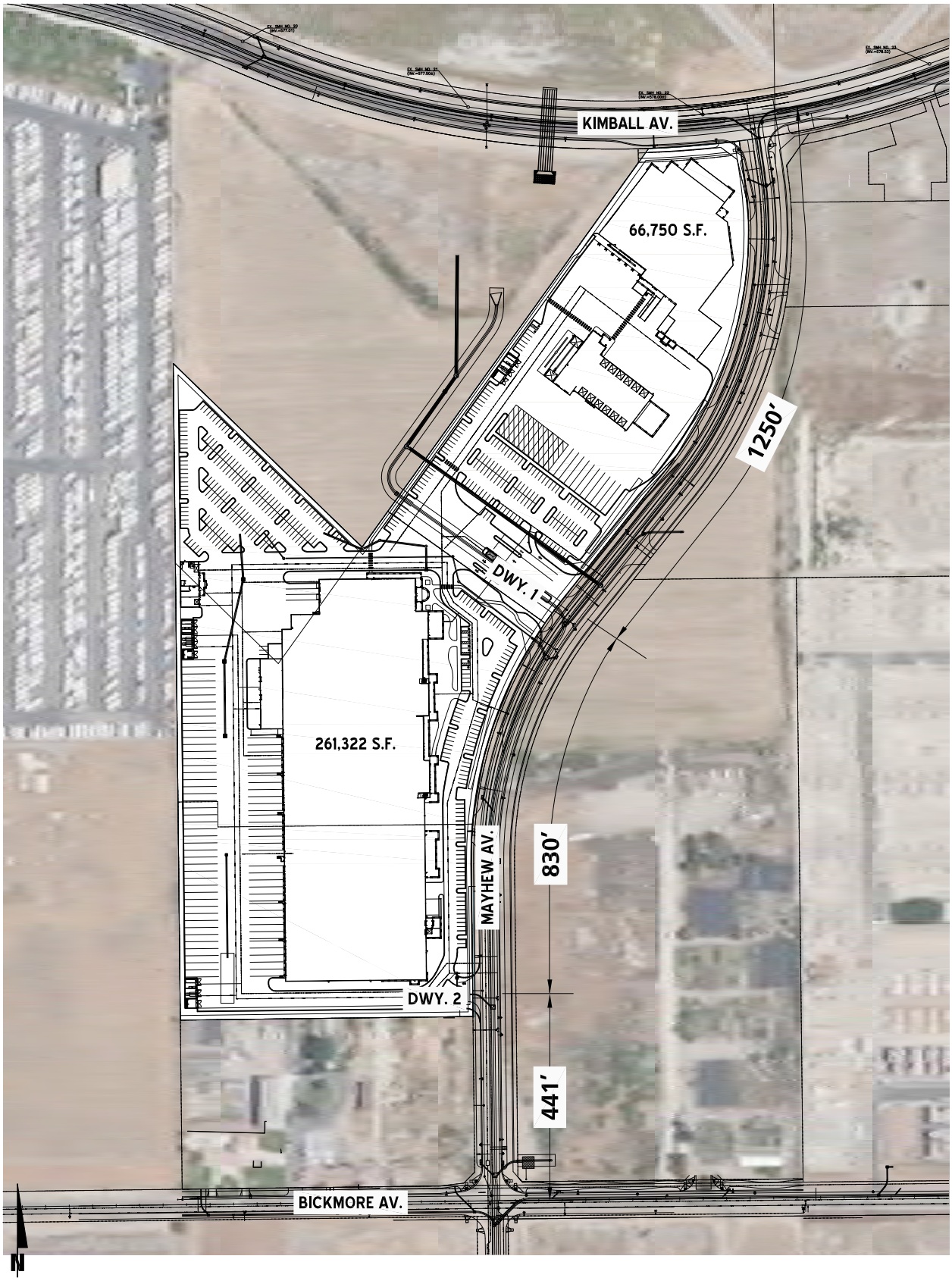
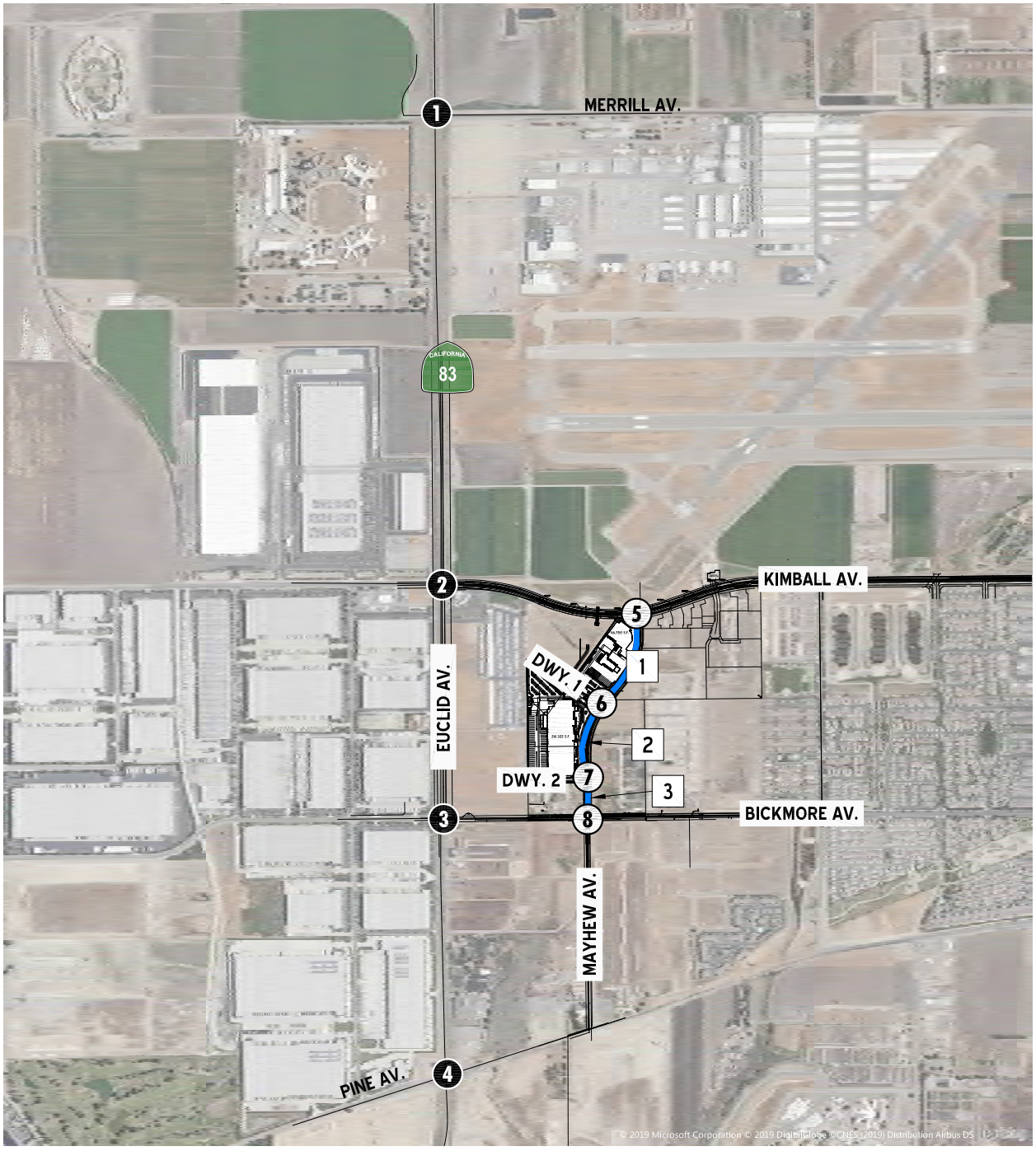


EXHIBIT 2: LOCATION MAP



LEGEND:

0 = EXISTING INTERSECTION ANALYSIS LOCATION

(0) = FUTURE INTERSECTION ANALYSIS LOCATION

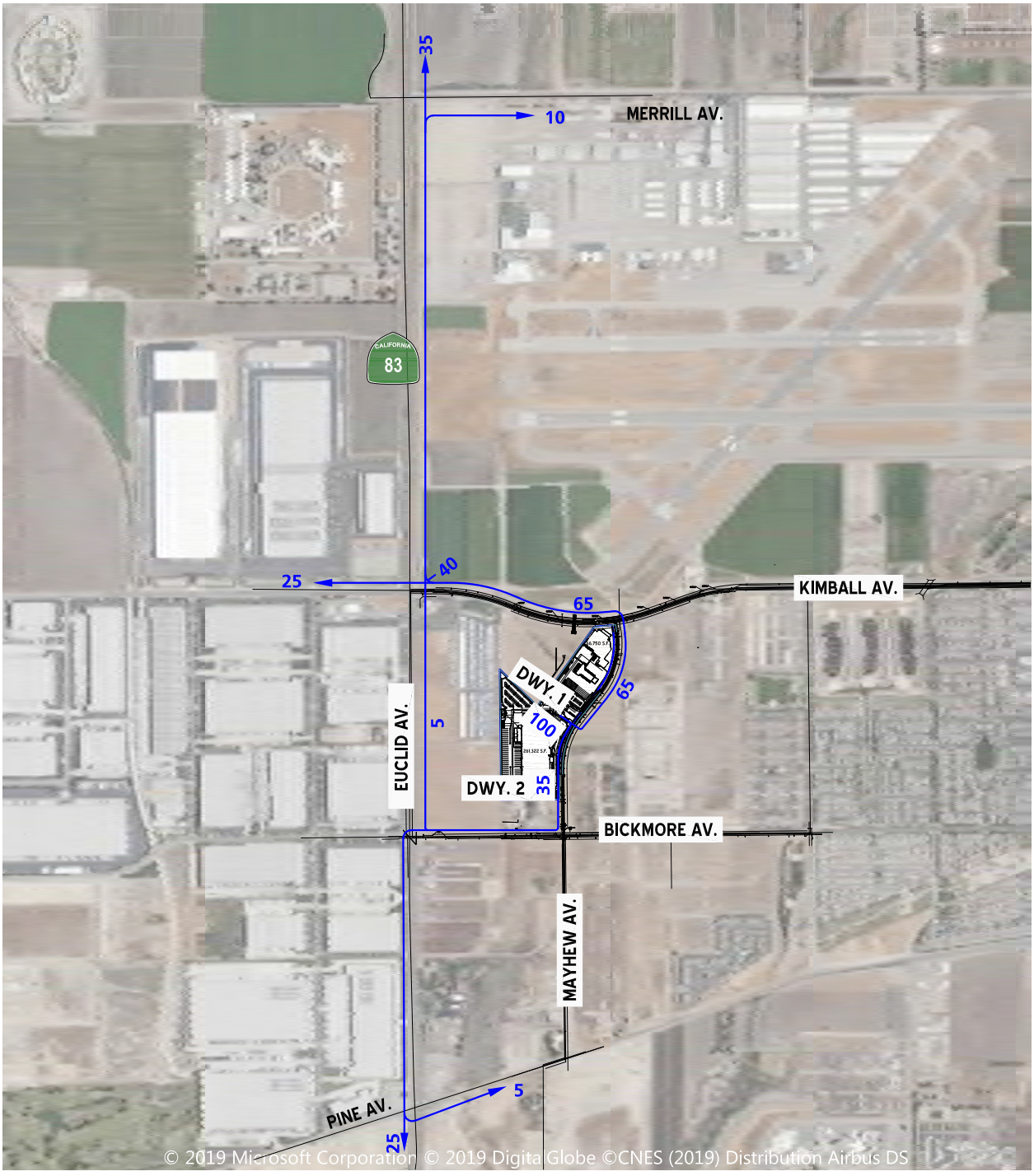
00 = ROADWAY SEGMENT ANALYSIS LOCATION

N

12611 - locmap-a.dwg

URBAN CROSSROADS

EXHIBIT 3: PROJECT INTERIM YEAR (TRUCK) TRIP DISTRIBUTION



LEGEND:

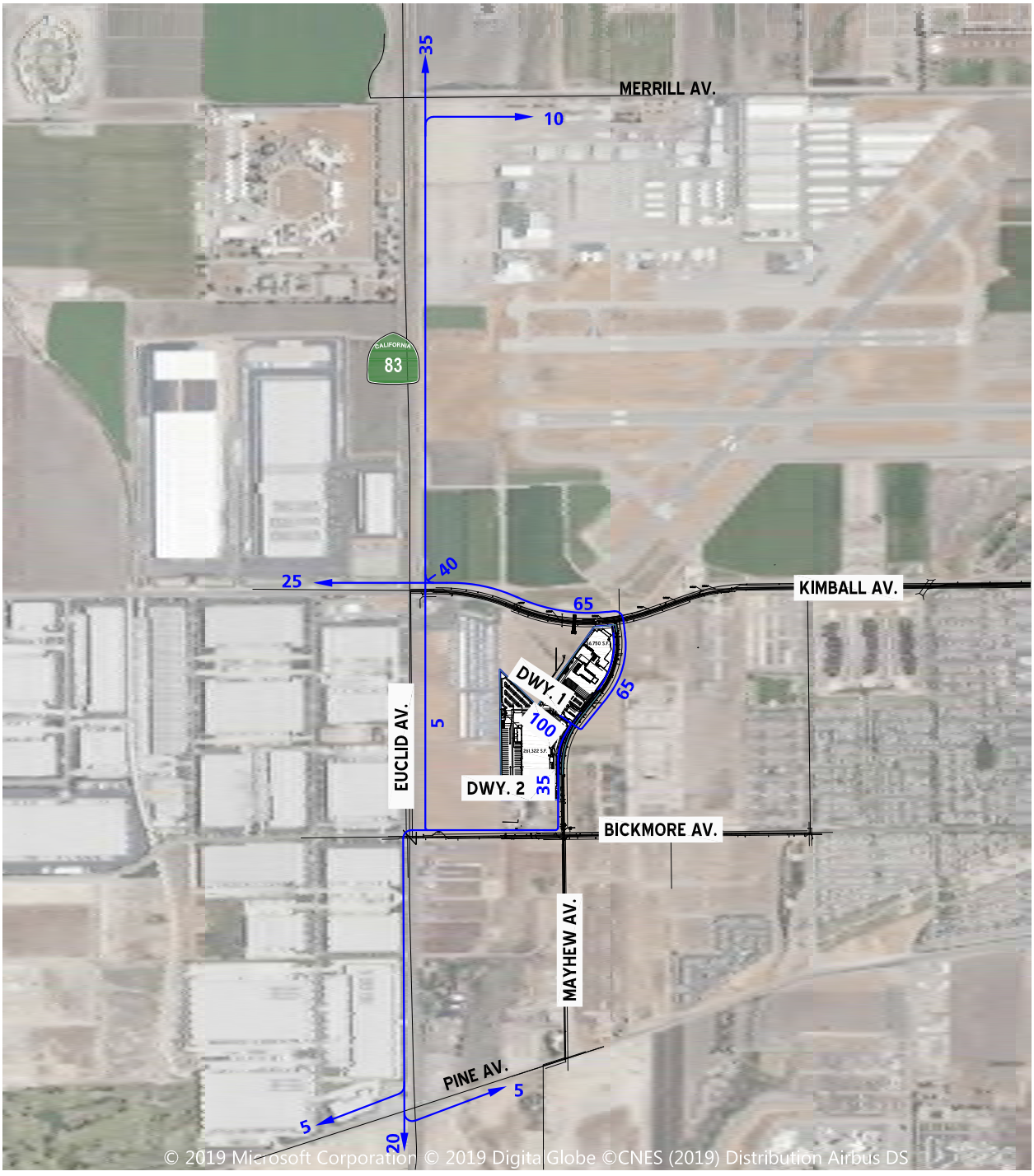
10 = PERCENT TO/FROM PROJECT

N

12611 - trip-a.dwg

URBAN CROSSROADS

EXHIBIT 4: PROJECT HORIZON YEAR (TRUCK) TRIP DISTRIBUTION



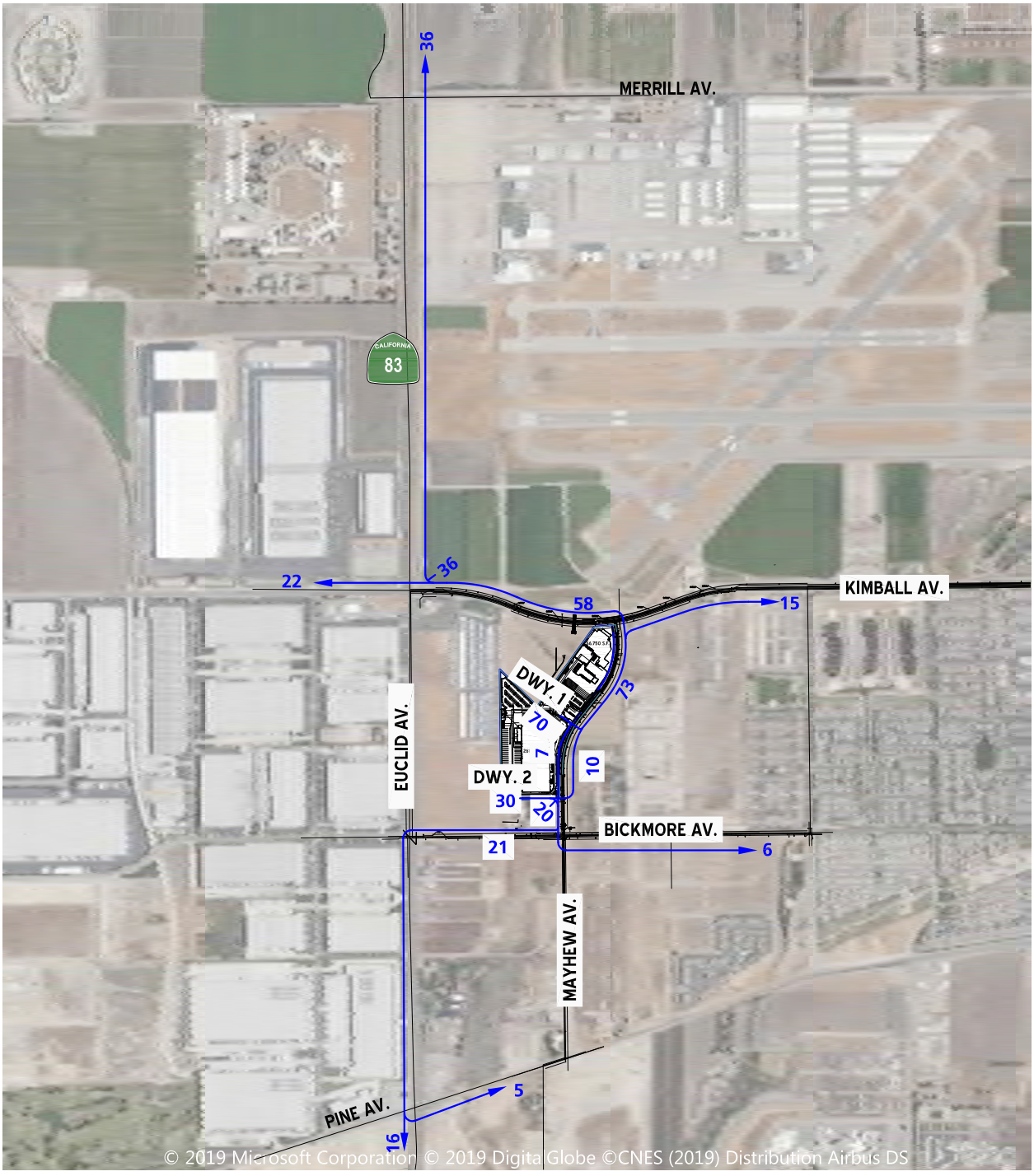
LEGEND:

10 = PERCENT TO/FROM PROJECT

N

12611 - trip-a.dwg

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



LEGEND:

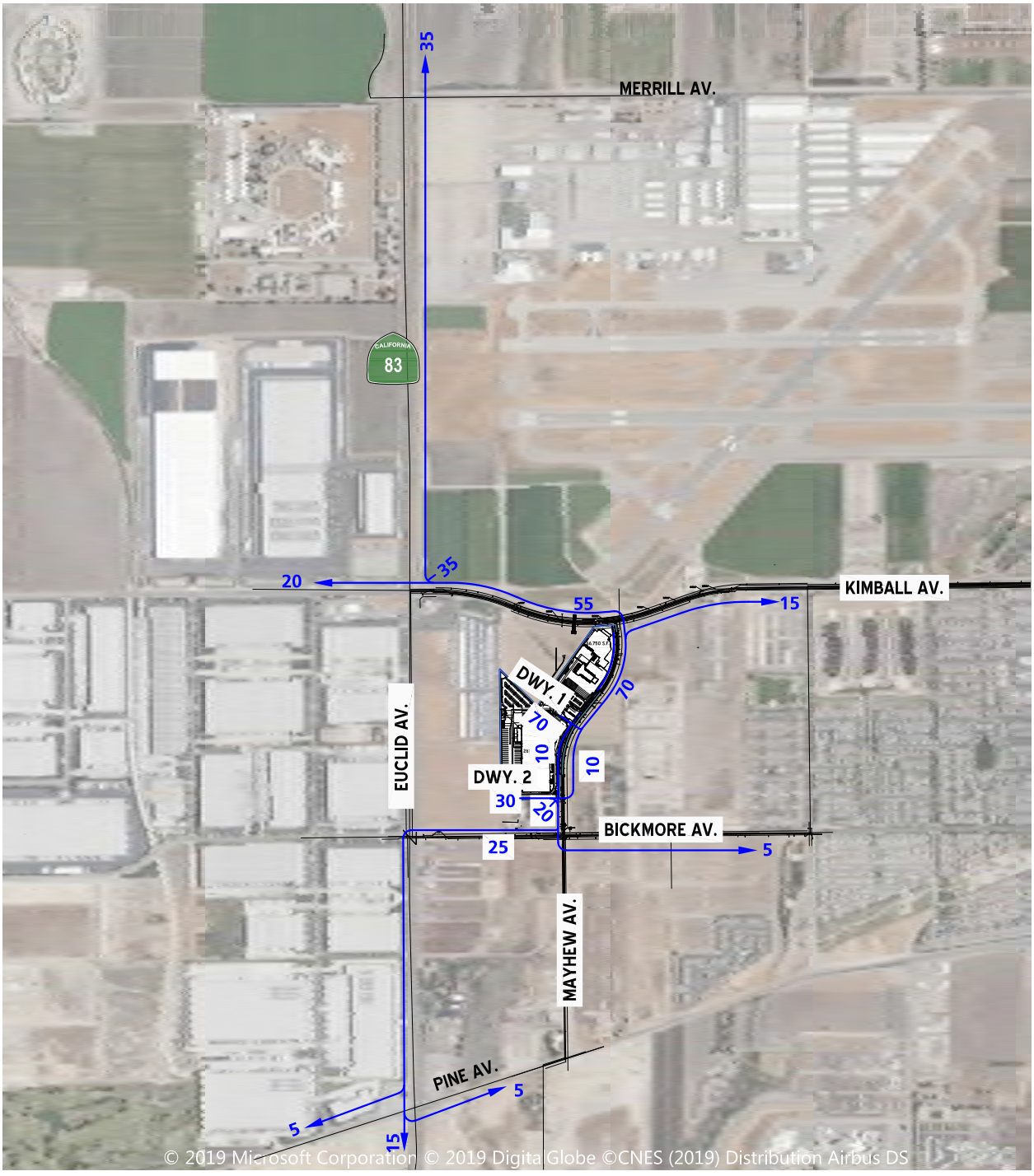
10 = PERCENT TO/FROM PROJECT

N

12611 - trip-a.dwg

URBAN CROSSROADS

EXHIBIT 6: PROJECT HORIZON YEAR (PASSENGER CAR) TRIP DISTRIBUTION



LEGEND:

10 = PERCENT TO/FROM PROJECT

N

EXHIBIT 7: CUMULATIVE DEVELOPMENT LOCATION MAP

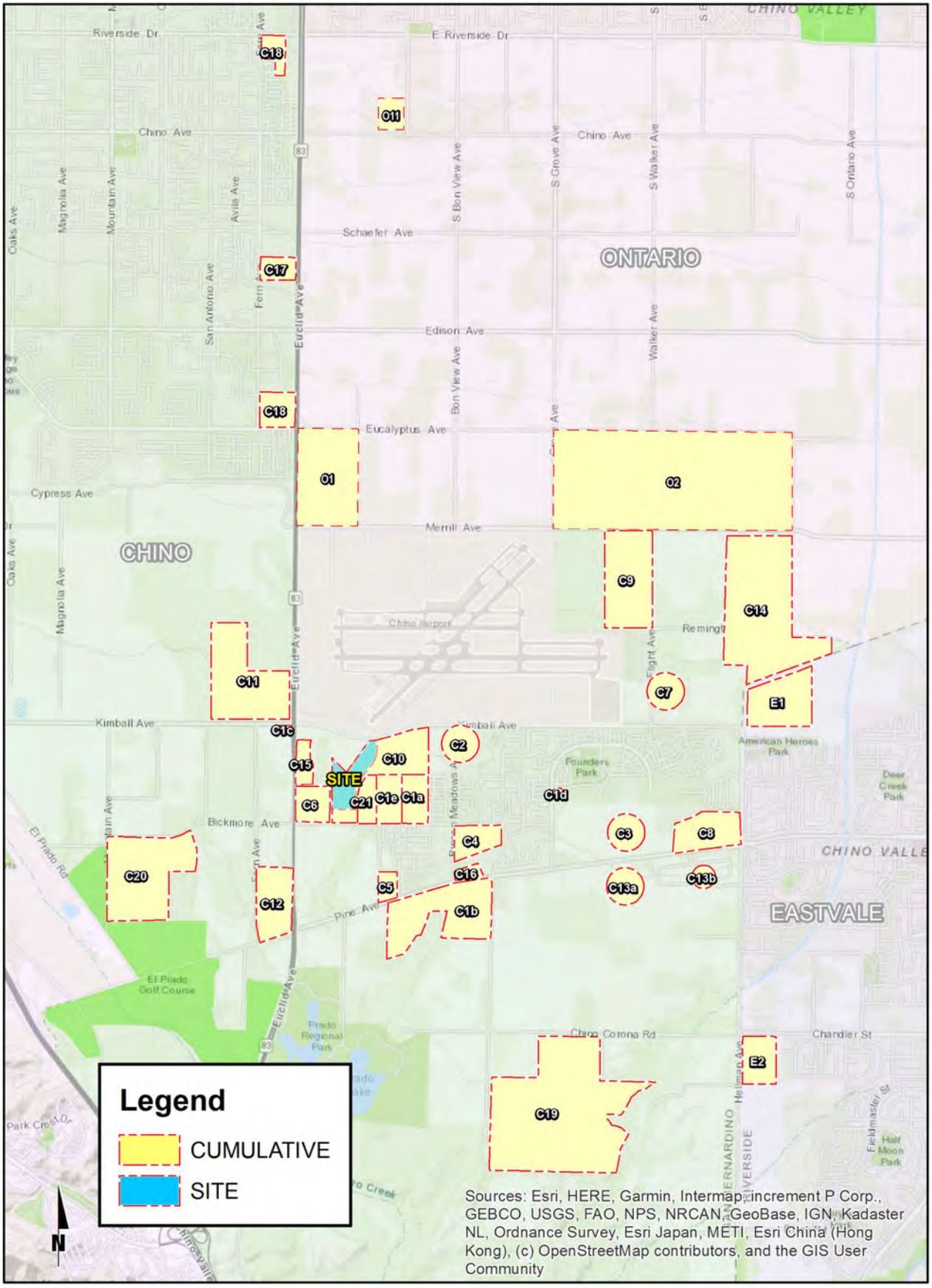


Table 1

Trip Generation Summary: Altitude Business Centre Phase 1

Project	AM Peak Hour			PM Peak Hour			Daily
	In	Out	Total	In	Out	Total	
Actual Vehicles[1]							
Altitude Business Centre - Phase 1							
Passenger Cars:	75	50	125	50	110	160	1,370
Truck Trips:							
2-axle:	*0*	*0*	*0*	*0*	*10*	*10*	*40*
3-axle:	*0*	*0*	*0*	*0*	*0*	*0*	*0*
4+-axle:	*2*	*2*	*4*	*2*	*2*	*4*	*122*
- Truck Trips	*2*	*2*	*4*	*2*	*12*	*14*	*162*
TOTAL TRIPS (ACTUAL VEHICLES)[1]	***77***	***52***	***129***	***52***	***122***	***174***	***1,532***
Passenger Car Equivalent (PCE)							
Altitude Business Centre - Phase 1							
Passenger Cars:	75	50	125	50	110	160	1,370
Truck Trips:							
2-axle:	*0*	*0*	*0*	*0*	*15*	*15*	*60*
3-axle:	*0*	*0*	*0*	*0*	*0*	*0*	*0*
4+-axle:	*6*	*6*	*12*	*6*	*6*	*12*	*366*
- Truck Trips	*6*	*6*	*12*	*6*	*21*	*27*	*426*
TOTAL TRIPS (PCE)[1]	***81***	***56***	***137***	***56***	***131***	***187***	***1,796***

[1] Trip generation based on empirical data provided by the Project Applicant.

[2] TOTAL TRIPS = Passenger Cars + Truck Trips.

Table 2

Trip Generation Summary: Altitude Business Centre (Buildings 4, 5, & 6)

Land Use	Quantity	Units[1]	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Actual Vehicles									
BUILDING 4									
Warehouse	185.000	TSF							
Passenger Cars:			35	9	44	12	35	47	524
Truck Trips:									
2-axle:			*2*	*0*	*2*	*1*	*2*	*2*	*24*
3-axle:			*2*	*1*	*3*	*1*	*2*	*3*	*32*
4+-axle:			*5*	*1*	*7*	*2*	*5*	*7*	*82*
- Truck Trips [2]			*10*	*2*	*12*	*3*	*10*	*12*	*138*
BUILDING 4 TOTAL TRIPS [3]			***45***	***11***	***56***	***15***	***45***	***59***	***662***
BUILDING 5									
Warehouse	200.000	TSF							
Passenger Cars:			38	10	48	13	38	51	568
Truck Trips:									
2-axle:			*2*	*0*	*2*	*1*	*2*	*2*	*26*
3-axle:			*2*	*1*	*3*	*1*	*2*	*3*	*34*
4+-axle:			*6*	*1*	*7*	*2*	*6*	*8*	*88*
- Truck Trips [2]			*10*	*2*	*12*	*3*	*10*	*13*	*148*
BUILDING 5 TOTAL TRIPS [3]			***48***	***12***	***60***	***16***	***48***	***64***	***716***
BUILDING 6									
Warehouse	130.000	TSF							
Passenger Cars:			25	6	32	8	25	33	368
Truck Trips:									
2-axle:			*1*	*0*	*1*	*0*	*1*	*1*	*16*
3-axle:			*1*	*0*	*1*	*0*	*1*	*2*	*22*
4+-axle:			*4*	*1*	*4*	*1*	*4*	*6*	*58*
- Truck Trips [2]			*6*	*1*	*6*	*2*	*7*	*9*	*96*
BUILDING 6 TOTAL TRIPS [3]			***31***	***7***	***38***	***10***	***32***	***42***	***464***
TOTAL (BUILDINGS 4, 5, & 6) (Actual Vehicles)			***125***	***30***	***154***	***41***	***125***	***165***	***1,842***

Trip Generation Summary: Altitude Business Centre (Buildings 4, 5, & 6)

Land Use	Quantity	Units[1]	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Passenger Car Equivalent (PCE)									
BUILDING 4									
Warehouse	185.000	TSF							
Passenger Cars:			35	9	44	12	35	47	524
Truck Trips:									
2-axle:			*2*	*1*	*3*	*1*	*2*	*3*	*34*
3-axle:			*4*	*1*	*5*	*1*	*4*	*5*	*62*
4+-axle:			*16*	*4*	*21*	*5*	*16*	*22*	*244*
- Truck Trips (PCE)[2]			*22*	*5*	*28*	*8*	*23*	*30*	*340*
BUILDING 4 TOTAL TRIPS (PCE)[3]			***57***	***14***	***73***	***19***	***58***	***77***	***864***
BUILDING 5									
Warehouse	200.000	TSF							
Passenger Cars:			38	10	48	13	38	51	568
Truck Trips:									
2-axle:			*2*	*1*	*3*	*1*	*2*	*3*	*38*
3-axle:			*4*	*1*	*6*	*1*	*4*	*6*	*66*
4+-axle:			*18*	*4*	*22*	*6*	*18*	*24*	*264*
- Truck Trips (PCE)[2]			*25*	*6*	*31*	*8*	*25*	*33*	*368*
BUILDING 5 TOTAL TRIPS (PCE)[3]			***63***	***16***	***79***	***21***	***63***	***84***	***936***
BUILDING 6									
Warehouse	130.000	TSF							
Passenger Cars:			25	6	31	8	25	33	368
Truck Trips:									
2-axle:			*2*	*0*	*2*	*1*	*2*	*2*	*24*
3-axle:			*3*	*1*	*4*	*1*	*3*	*4*	*44*
4+-axle:			*12*	*3*	*14*	*4*	*12*	*16*	*172*
- Truck Trips (PCE)[2]			*16*	*4*	*20*	*5*	*17*	*22*	*240*
BUILDING 6 TOTAL TRIPS (PCE)[3]			***41***	***10***	***51***	***14***	***42***	***55***	***608***
TOTAL (BUILDINGS 4, 5, & 6) (PCE)			***161***	***40***	***202***	***54***	***163***	***216***	***2,408***

[1] TSF = thousand square feet

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

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

Table 3

Trip Generation Comparison

Project	AM Peak Hour			PM Peak Hour			Daily
	In	Out	Total	In	Out	Total	
Actual Vehicles							
Currently Approved Project	125	30	154	41	125	166	1,842
Proposed Project	77	52	129	52	122	174	1,532
Variance	***-48***	***22***	***-25***	***11***	***-3***	***8***	***-310***
Passenger Car Equivalent (PCE)							
Currently Approved Project	161	40	201	54	163	217	2,408
Proposed Project	81	56	137	56	131	187	1,796
Variance	***-80***	***16***	***-64***	***2***	***-32***	***-30***	***-612***

Table 4

Cumulative Development Land Use Summary

#	Project/Location	Land Use[1]	Quantity	Units[2]
City of Chino				
C1a	Bickmore Street Residential (TM 18858)	SFDR	185	DU
C1b	Barthelemy	SFDR	193	DU
		Condo/Townhouse	198	DU
		Apartments	288	DU
C1c	Farmer Boys	Fast-food w/ Drive-Thru	3.218	TSF
		Shopping Center	2.300	TSF
C1d	TM17635	SFDR	67	DU
C1e	Bouma Residential	SFDR	106	DU
		Condo/Townhouse	94	DU
C2	TM17574	Condo/Townhouse	108	DU
C3	Falloncrest at the Preserve	SFDR	204	DU
		Condo/Townhouse	786	DU
		Apartments	412	DU
		Shopping Center	77.597	TSF
		General Office	77.597	TSF
C4	TM18778	SFDR	65	DU
C5	Church	Church	47.979	TSF
		Daycare	190	STU
C6	Euclid/Bickmore Warehouse	Warehouse	205.820	TSF
		General Light Industrial	51.030	TSF
		Business Park	110.620	TSF
C7	Kimball Business Park	Light Industrial	140.500	TSF
		Warehousing	564.000	TSF
		High-Cube Warehouse	352.000	TSF
		Business Park	146.550	TSF
C8	TM 18480 Harvest	SFDR	600	DU
C9	Chino Parcel Delivery	Parcel Delivery Facility	765.274	TSF
C10	Altitude Business Centre	Warehousing	200.000	TSF
		Light Industrial	255.000	TSF
		Business Park	233.000	TSF
		Self-Storage	110.000	TSF
C11	Majestic Gateway	High-Cube Warehouse	1,490.400	TSF
		Warehousing	180.000	TSF
		Specialty Retail	25.000	TSF
		Pharmacy/Drugstore with Drive-Thru	13.000	TSF
		Fast-Food with Drive-Thru	8.600	TSF
C12	PM18635	General Light Industrial	99.164	TSF
		High-Cube Warehouse	2,077.594	TSF
C13a	TM 18890	Condo/Townhouse	94	DU
C13b	TM 19980 Homecoming Phase 4 Apartments	Apartments	454	DU
C14	Watson Industrial Park	High-Cube Warehouse	3,889.900	TSF
C15	Chino Business Park	General Light Industrial	165.500	TSF
		Business Park	21.500	TSF
C16	Flores Site	Shopping Center	4.000	TSF
		Gas Station w/ convenience store	16	VFP
		Express Car Wash	5.000	TSF

Table 4

Cumulative Development Land Use Summary

#	Project/Location	Land Use[1]	Quantity	Units[2]
C17	Brewart Residential (TM 18923)	SFDR	127	DU
C18	Fern and Riverside Residential (TM 18901)	SFDR	94	DU
C19	Edgewater Communities	SFDR	415	DU
		Condo/Townhouse	659	DU
		Museum/Retail	6.500	TSF
		Church	15.200	TSF
		Park	15.0	AC
C20	Majestic Chino Heritage	High-Cube Fulfillment Warehouse	1,168.710	TSF
		High-Cube Cold Storage Warehouse	914.040	TSF
C21	Appesetche	SFDR	166	DU
City of Ontario				
O1	Ontario Ranch Commerce Center	High-Cube Cold Storage Warehouse	1159.200	TSF
		Warehousing	337.600	TSF
		Business Park	290.200	TSF
O2	Merrill Commerce Center	High-Cube Fulfillment Warehouse	7014.000	TSF
		Business Park	1441.000	TSF
City of Eastvale				
E1	SP00358 - The Ranch at Eastvale	Shopping Center	267.200	TSF
		General Light Industrial	801.500	TSF
		Business Park	1,121.100	TSF
E2	TR29997	SFDR	122	DU

[1] SFDR = Single Family Detached Residential

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

APPENDIX 1.2:

SITE ADJACENT QUEUES

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Intersection: 5: Mayhew Av. & Kimball Av.

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	190	163	57	56	183	177	58	28
Average Queue (ft)	98	61	22	23	91	75	21	4
95th Queue (ft)	166	128	47	54	154	141	51	17
Link Distance (ft)	892	892			1373	1373		544
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			300	300			200	
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 6: Mayhew Av. & Driveway 1

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	22	12
Average Queue (ft)	12	1
95th Queue (ft)	27	7
Link Distance (ft)	571	1131
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: Mayhew Av. & Driveway 2

Movement	EB
Directions Served	LR
Maximum Queue (ft)	29
Average Queue (ft)	12
95th Queue (ft)	33
Link Distance (ft)	663
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 8: Bickmore Av. & Mayhew Av.

Movement	EB	WB	SB	SB
Directions Served	L	R	L	R
Maximum Queue (ft)	84	4	28	38
Average Queue (ft)	45	0	5	13
95th Queue (ft)	76	3	22	32
Link Distance (ft)				408
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	300	300	100	
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 0

Intersection: 5: Mayhew Av. & Kimball Av.

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	251	208	34	48	194	181	171	38
Average Queue (ft)	118	83	8	12	100	79	95	11
95th Queue (ft)	203	169	29	37	170	157	155	31
Link Distance (ft)	892	892			1373	1373		544
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			300	300			200	
Storage Blk Time (%)							0	
Queuing Penalty (veh)							0	

Intersection: 6: Mayhew Av. & Driveway 1

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	36	18
Average Queue (ft)	21	1
95th Queue (ft)	29	8
Link Distance (ft)	571	1131
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: Mayhew Av. & Driveway 2

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	31	12
Average Queue (ft)	18	0
95th Queue (ft)	38	6
Link Distance (ft)	663	408
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 8: Bickmore Av. & Mayhew Av.

Movement	EB	SB	SB
Directions Served	L	L	R
Maximum Queue (ft)	31	46	57
Average Queue (ft)	10	18	25
95th Queue (ft)	32	39	46
Link Distance (ft)			408
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	300	100	
Storage Blk Time (%)			0
Queuing Penalty (veh)			0

Network Summary

Network wide Queuing Penalty: 0

APPENDIX 3.1:

EXISTING TRAFFIC COUNTS – JANUARY/NOVEMBER 2019

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INTERSECTION TURNING MOVEMENT COUNTS

T1218

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

DATE: Tue, Jan 22, 19

LOCATION: Chino
NORTH & SOUTH: Euclid
EAST & WEST: Facility

PROJECT #: SC2056
LOCATION #: 16
CONTROL: SIGNAL

NOTES:

AM
PM
MD
OTHER
OTHER

▲ N
◄ W E ►
S ▼

☑ Add U-Turns to Left Turns

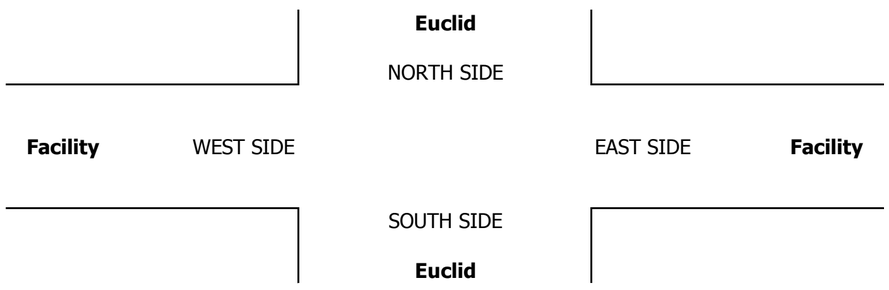
		NORTHBOUND Euclid			SOUTHBOUND Euclid			EASTBOUND Facility			WESTBOUND Facility			
	LANES:	NL 1	NT 2	NR 1	SL 1	ST 2	SR 0	EL 0	ET 1	ER 0	WL 0	WT 1	WR 0	TOTAL
AM	7:00 AM	4	171	17	15	154	22	0	0	2	52	21	47	505
	7:15 AM	3	242	30	20	222	9	0	2	2	51	10	47	638
	7:30 AM	3	236	42	26	203	8	1	1	3	40	14	65	642
	7:45 AM	1	191	23	26	205	13	2	2	2	45	12	50	572
	8:00 AM	3	240	30	32	203	8	0	1	4	57	11	38	627
	8:15 AM	2	216	23	20	211	3	1	3	0	47	0	49	575
	8:30 AM	3	232	26	27	161	3	2	0	2	40	12	66	574
	8:45 AM	6	243	31	27	151	2	0	2	0	36	3	49	550
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	25	1,771	222	193	1,510	68	6	11	15	368	83	411	4,683
	APPROACH %	1%	88%	11%	11%	85%	4%	19%	34%	47%	43%	10%	48%	
	APP/DEPART	2,018	/	2,189	1,771	/	1,893	32	/	425	862	/	176	0
	BEGIN PEAK HR		7:15 AM											
	VOLUMES	10	909	125	104	833	38	3	6	11	193	47	200	2,479
	APPROACH %	1%	87%	12%	11%	85%	4%	15%	30%	55%	44%	11%	45%	
	PEAK HR FACTOR		0.929			0.971			0.833			0.924		0.965
	APP/DEPART	1,044	/	1,112	975	/	1,037	20	/	235	440	/	95	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	230	55	29	215	0	6	12	4	18	0	23	592
	4:15 PM	0	236	48	37	198	2	1	8	4	26	1	27	588
	4:30 PM	0	273	54	41	246	1	1	9	3	44	0	31	703
	4:45 PM	0	271	49	67	229	0	5	15	3	41	2	19	701
	5:00 PM	1	214	49	43	258	0	4	5	2	32	0	32	640
	5:15 PM	1	252	45	75	320	0	1	0	2	50	0	34	780
	5:30 PM	1	204	46	58	287	2	0	0	2	47	0	22	669
	5:45 PM	0	207	28	55	200	0	1	0	0	37	0	30	558
	VOLUMES	3	1,887	374	405	1,953	5	19	49	20	295	3	218	5,231
	APPROACH %	0%	83%	17%	17%	83%	0%	22%	56%	23%	57%	1%	42%	
	APP/DEPART	2,264	/	2,124	2,363	/	2,270	88	/	828	516	/	9	0
	BEGIN PEAK HR		4:30 PM											
	VOLUMES	2	1,010	197	226	1,053	1	11	29	10	167	2	116	2,824
	APPROACH %	0%	84%	16%	18%	82%	0%	22%	58%	20%	59%	1%	41%	
	PEAK HR FACTOR		0.924			0.810			0.543			0.848		0.905
	APP/DEPART	1,209	/	1,137	1,280	/	1,231	50	/	452	285	/	4	0

U-TURNS

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

RTOR

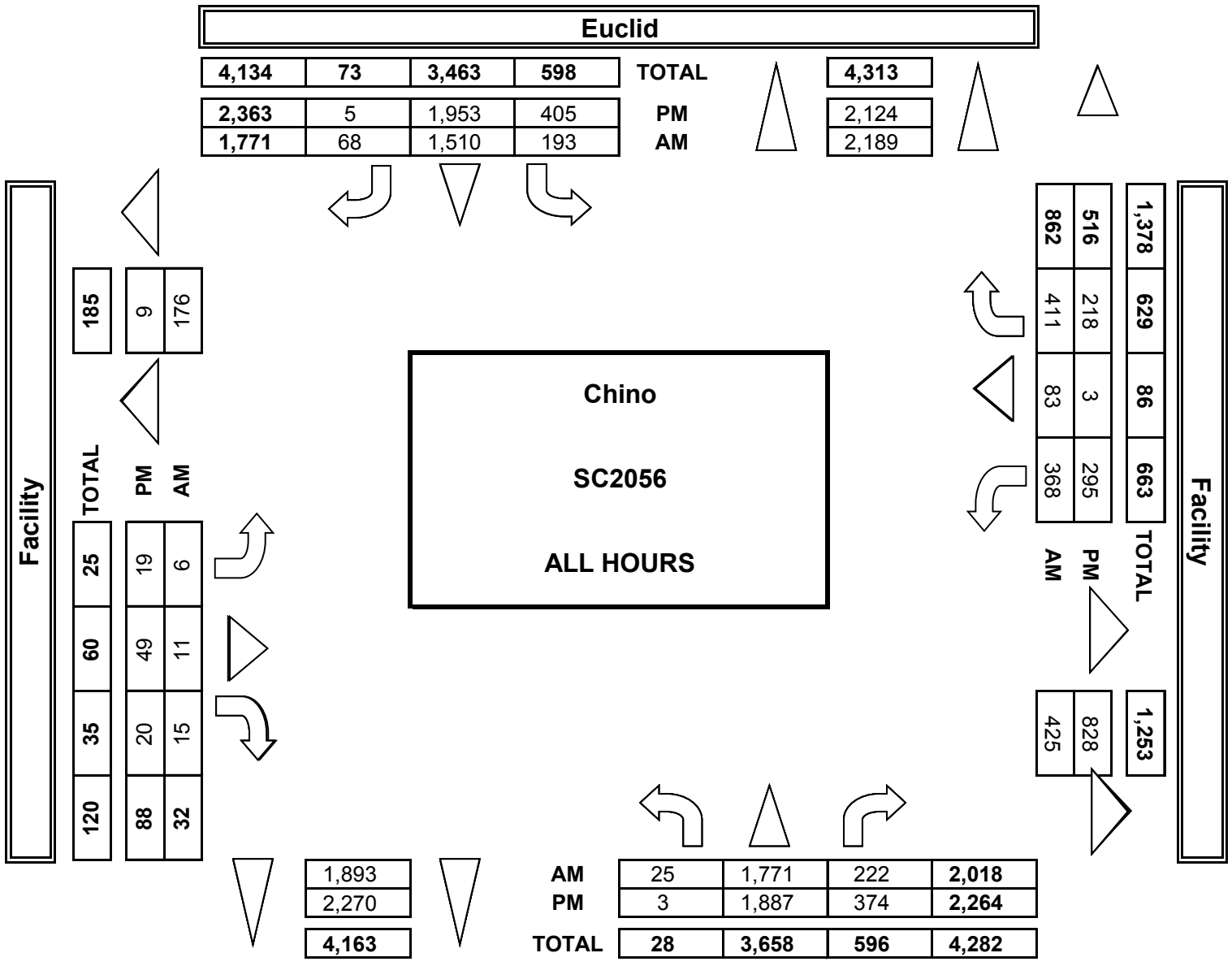
NRR	SRR	ERR	WRR
0	0	0	0
8	13	1	13
6	2	1	5
17	1	0	4
5	8	0	7
14	3	0	10
12	0	0	6
14	1	0	20
14	1	0	13
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
90	29	2	78
42	14	1	26
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
16	0	0	6
19	2	0	5
20	1	0	4
4	0	1	1
20	0	0	2
15	0	0	2
10	0	1	0
9	0	0	4
113	3	2	24
59	1	1	9

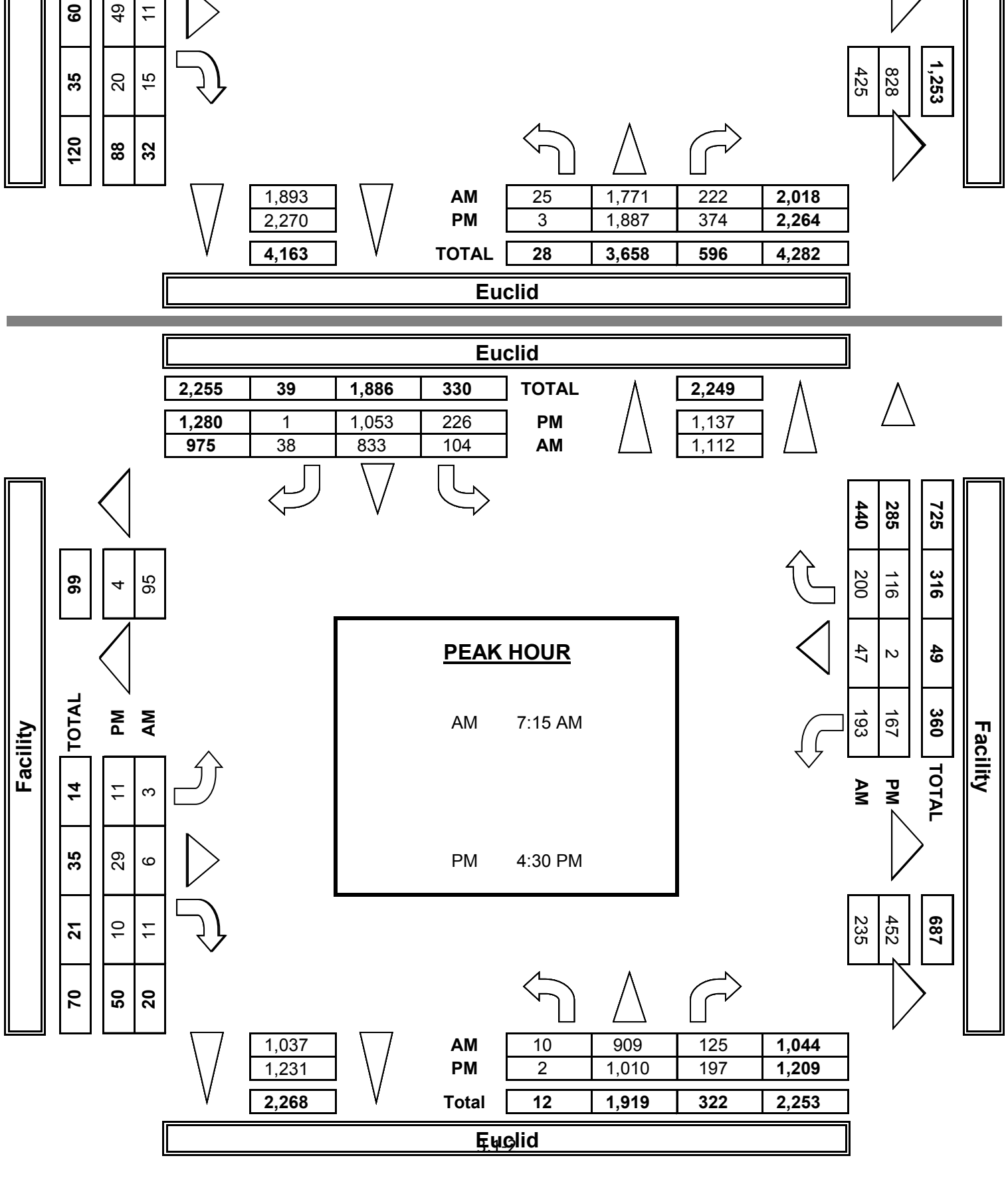


		ALL PED AND BIKE					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	ES	WS	SS	NS	TOTAL
AM	7:00 AM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1
	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:30 AM	0	2	0	0	2	0	1	0	0	1	0	1	0	0	1
	7:45 AM	0	0	0	0	0	0	0	0	0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

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

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

DATE:				
1/22/19	LOCATION:	Chino	PROJECT #:	SC2056
TUESDAY	NORTH & SOUTH:	Euclid	LOCATION #:	16
	EAST & WEST:	Facility	CONTROL:	SIGNAL

CLASS 1: PASSENGER VEHICLES

NOTES:

AM / PM / MD / OTHER / OTHER

N ▲ S ▼ W ◄ E ►

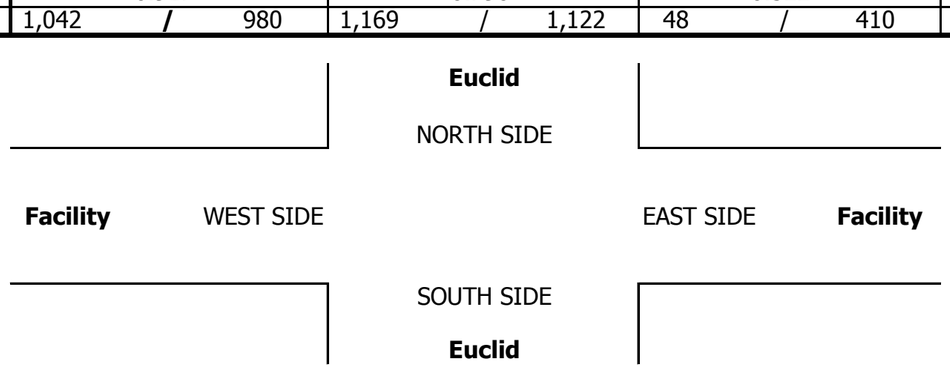
	NORTHBOUND Euclid			SOUTHBOUND Euclid			EASTBOUND Facility			WESTBOUND Facility			
LANES:	NL 1	NT 2	NR 1	SL 1	ST 2	SR 0	EL 0	ET 1	ER 0	WL 0	WT 1	WR 0	TOTAL
7:00 AM	2	153	15	10	131	21	0	0	1	45	21	42	441
7:15 AM	3	213	26	17	185	9	0	2	1	39	10	43	548
7:30 AM	3	219	36	23	174	7	1	1	0	34	14	57	569
7:45 AM	1	172	21	21	161	13	1	1	0	40	11	47	489
8:00 AM	3	203	25	25	152	8	0	0	3	44	11	33	507
8:15 AM	2	186	21	13	157	2	0	3	0	43	0	46	473
8:30 AM	3	182	23	20	145	3	0	0	1	36	9	55	477
8:45 AM	2	194	28	20	113	2	0	2	0	30	3	45	439
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	19	1,522	195	149	1,218	65	2	9	6	311	79	368	3,943
APPROACH %	1%	88%	11%	10%	85%	5%	12%	53%	35%	41%	10%	49%	
APP/DEPART	1,736	/	1,893	1,432	/	1,535	17	/	352	758	/	163	0
BEGIN PEAK HR		7:15 AM											
VOLUMES	10	807	108	86	672	37	2	4	4	157	46	180	2,113
APPROACH %	1%	87%	12%	11%	85%	5%	20%	40%	40%	41%	12%	47%	
PEAK HR FACTOR		0.896			0.942			0.833			0.912		0.928
APP/DEPART	925	/	989	795	/	833	10	/	198	383	/	93	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	202	48	28	182	0	6	12	4	16	0	22	520
4:15 PM	0	187	39	32	174	2	1	8	4	22	1	21	491
4:30 PM	0	236	48	38	216	1	1	9	3	42	0	26	620
4:45 PM	0	233	42	63	209	0	5	15	3	38	2	19	629
5:00 PM	1	183	44	36	236	0	4	5	2	29	0	26	566
5:15 PM	0	216	39	71	299	0	1	0	0	45	0	30	701
5:30 PM	0	175	38	56	268	2	0	0	2	43	0	19	603
5:45 PM	0	190	27	53	183	0	1	0	0	33	0	28	515
VOLUMES	1	1,622	325	377	1,767	5	19	49	18	268	3	191	4,645
APPROACH %	0%	83%	17%	18%	82%	0%	22%	57%	21%	58%	1%	41%	
APP/DEPART	1,948	/	1,832	2,149	/	2,053	86	/	751	462	/	9	0
BEGIN PEAK HR		4:30 PM											
VOLUMES	1	868	173	208	960	1	11	29	8	154	2	101	2,516
APPROACH %	0%	83%	17%	18%	82%	0%	23%	60%	17%	60%	1%	39%	
PEAK HR FACTOR		0.917			0.790			0.522			0.857		0.897
APP/DEPART	1,042	/	980	1,169	/	1,122	48	/	410	257	/	4	0

U-TURNS

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

RTOR

NRR	SRR	ERR	WRR
0	0	0	0
8	13	1	10
6	2	0	5
17	1	0	4
5	8	0	7
13	3	0	9
12	0	0	6
14	1	0	20
14	1	0	12
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
89	29	1	73
41	14	0	25
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
16	0	0	6
18	2	0	5
20	1	0	4
4	0	1	1
20	0	0	2
15	0	0	2
10	0	1	0
9	0	0	4
112	3	2	24
59	1	1	9



INTERSECTION TURNING MOVEMENT COUNTS

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

DATE:				
1/22/19	LOCATION:	Chino	PROJECT #:	SC2056
TUESDAY	NORTH & SOUTH:	Euclid	LOCATION #:	16
	EAST & WEST:	Facility	CONTROL:	SIGNAL

CLASS 2: 2-AXLE WORK VEHICLES/ TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER

▲ N ◄ W E ► S ▼

	NORTHBOUND Euclid			SOUTHBOUND Euclid			EASTBOUND Facility			WESTBOUND Facility			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	1	1	2	0	0	1	0	0	1	0	

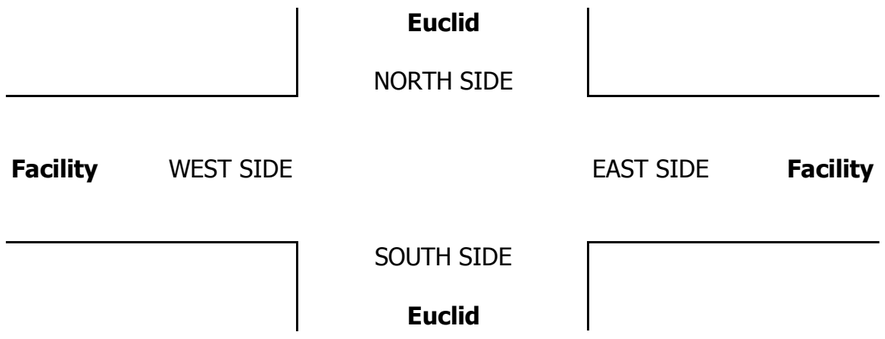
U-TURNS

NB	SB	EB	WB	TTL

RTOR

NRR	SRR	ERR	WRR
0	0	0	0

		NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND				U-TURNS					RTOR			
		NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB	TTL	NRR	SRR	ERR	WRR
AM	7:00 AM	2	11	1	2	16	0	0	0	1	2	0	2	37	0	0	0	0	0	0	0	0	1
	7:15 AM	0	17	1	1	20	0	0	0	1	6	0	1	47	0	0	0	0	0	0	0	1	0
	7:30 AM	0	7	5	2	17	1	0	0	3	4	0	3	42	0	0	0	0	0	0	0	0	0
	7:45 AM	0	5	1	3	31	0	1	0	1	3	1	2	48	0	0	0	0	0	0	0	0	0
	8:00 AM	0	26	4	5	35	0	0	0	0	12	0	1	83	0	0	0	0	0	1	0	0	0
	8:15 AM	0	17	1	4	37	1	0	0	0	1	0	2	63	0	0	0	0	0	0	0	0	0
	8:30 AM	0	26	2	2	10	0	2	0	1	0	1	5	49	0	0	0	0	0	0	0	0	0
	8:45 AM	2	29	0	2	23	0	0	0	0	6	0	2	64	0	0	0	0	0	0	0	0	0
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	4	138	15	21	189	2	3	0	7	34	2	18	433	0	0	0	0	0	1	0	1	1
	APPROACH %	3%	88%	10%	10%	89%	1%	30%	0%	70%	63%	4%	33%										
	APP/DEPART	157	/	159	212	/	230	10	/	36	54	/	8	0									
	BEGIN PEAK HR		8:00 AM																				
	VOLUMES	2	98	7	13	105	1	2	0	1	19	1	10	259						1	0	0	0
	APPROACH %	2%	92%	7%	11%	88%	1%	67%	0%	33%	63%	3%	33%										
	PEAK HR FACTOR		0.863			0.708			0.250			0.577		0.780									
	APP/DEPART	107	/	110	119	/	125	3	/	20	30	/	4	0									
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	18	5	1	16	0	0	0	0	1	0	0	41	0	0	0	0	0	0	0	0	0
	4:15 PM	0	31	6	3	14	0	0	0	0	3	0	4	61	0	0	0	0	0	1	0	0	0
	4:30 PM	0	26	5	0	15	0	0	0	0	1	0	2	49	0	0	0	0	0	0	0	0	0
	4:45 PM	0	30	2	4	10	0	0	0	0	1	0	0	47	0	0	0	0	0	0	0	0	0
	5:00 PM	0	18	3	2	14	0	0	0	0	2	0	0	39	0	0	0	0	0	0	0	0	0
	5:15 PM	0	23	4	1	12	0	0	0	0	2	0	2	44	0	0	0	0	0	0	0	0	0
	5:30 PM	0	20	2	1	11	0	0	0	0	2	0	0	36	0	0	0	0	0	0	0	0	0
	5:45 PM	0	10	0	0	10	0	0	0	0	3	0	0	23	0	0	0	0	0	0	0	0	0
	VOLUMES	0	176	27	12	102	0	0	0	0	15	0	8	340	0	0	0	0	0	1	0	0	0
	APPROACH %	0%	87%	13%	11%	89%	0%	0%	0%	0%	65%	0%	35%										
	APP/DEPART	203	/	184	114	/	117	0	/	39	23	/	0	0									
	BEGIN PEAK HR		4:00 PM																				
	VOLUMES	0	105	18	8	55	0	0	0	0	6	0	6	198						1	0	0	0
	APPROACH %	0%	85%	15%	13%	87%	0%	0%	0%	0%	50%	0%	50%										
	PEAK HR FACTOR		0.831			0.926			0.000			0.429		0.811									
	APP/DEPART	123	/	111	63	/	61	0	/	26	12	/	0	0									



INTERSECTION TURNING MOVEMENT COUNTS

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

DATE:				
1/22/19	LOCATION:	Chino	PROJECT #:	SC2056
TUESDAY	NORTH & SOUTH:	Euclid	LOCATION #:	16
	EAST & WEST:	Facility	CONTROL:	SIGNAL

CLASS 3: 3-AXLE TRUCKS

NOTES:

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

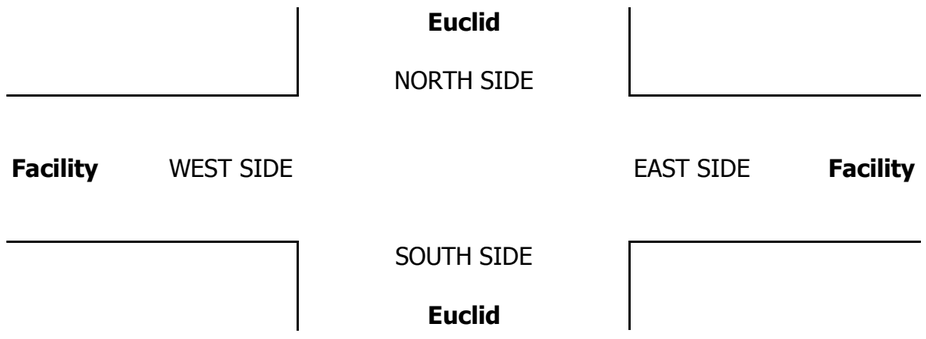
	NORTHBOUND Euclid			SOUTHBOUND Euclid			EASTBOUND Facility			WESTBOUND Facility			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	1	1	2	0	0	1	0	0	1	0	
7:00 AM	0	1	0	0	0	1	0	0	0	0	0	1	3
7:15 AM	0	4	2	1	3	0	0	0	0	1	0	0	11
7:30 AM	0	1	0	1	4	0	0	0	0	1	0	2	9
7:45 AM	0	4	0	0	3	0	0	1	1	1	0	0	10
8:00 AM	0	1	1	0	2	0	0	1	0	0	0	0	5
8:15 AM	0	2	0	1	5	0	0	0	0	0	0	0	8
8:30 AM	0	6	0	2	0	0	0	0	0	0	2	1	11
8:45 AM	0	4	0	1	2	0	0	0	0	0	0	0	7
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	0	23	3	6	19	1	0	2	1	3	2	4	64
APPROACH %	0%	88%	12%	23%	73%	4%	0%	67%	33%	33%	22%	44%	
APP/DEPART	26	/	27	26	/	23	3	/	11	9	/	3	0
BEGIN PEAK HR		7:15 AM											
VOLUMES	0	10	3	2	12	0	0	2	1	3	0	2	35
APPROACH %	0%	77%	23%	14%	86%	0%	0%	67%	33%	60%	0%	40%	
PEAK HR FACTOR		0.542			0.700			0.375			0.417		0.795
APP/DEPART	13	/	12	14	/	16	3	/	7	5	/	0	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	2	0	0	0	0	0	0	0	2
4:15 PM	0	2	1	0	3	0	0	0	0	0	0	1	7
4:30 PM	0	2	0	0	3	0	0	0	0	0	0	0	5
4:45 PM	0	0	0	0	1	0	0	0	0	0	0	0	1
5:00 PM	0	3	0	1	2	0	0	0	0	0	0	2	8
5:15 PM	0	4	0	0	2	0	0	0	2	1	0	0	9
5:30 PM	0	3	1	0	0	0	0	0	0	0	0	0	4
5:45 PM	0	2	1	0	0	0	0	0	0	0	0	0	3
VOLUMES	0	16	3	1	13	0	0	0	2	1	0	3	39
APPROACH %	0%	84%	16%	7%	93%	0%	0%	0%	100%	25%	0%	75%	
APP/DEPART	19	/	19	14	/	16	2	/	4	4	/	0	0
BEGIN PEAK HR		5:00 PM											
VOLUMES	0	12	2	1	4	0	0	0	2	1	0	2	24
APPROACH %	0%	86%	14%	20%	80%	0%	0%	0%	100%	33%	0%	67%	
PEAK HR FACTOR		0.875			0.417			0.250			0.375		0.667
APP/DEPART	14	/	14	5	/	7	2	/	3	3	/	0	0

U-TURNS

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

RTOR

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



INTERSECTION TURNING MOVEMENT COUNTS

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

DATE:				
1/22/19	LOCATION:	Chino	PROJECT #:	SC2056
TUESDAY	NORTH & SOUTH:	Euclid	LOCATION #:	16
	EAST & WEST:	Facility	CONTROL:	SIGNAL

CLASS 4: 4 OR MORE AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER

▲ N ◄ W E ► S ▼

	NORTHBOUND Euclid			SOUTHBOUND Euclid			EASTBOUND Facility			WESTBOUND Facility			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	1	1	2	0	0	1	0	0	1	0	
7:00 AM	0	5	1	3	7	0	0	0	0	5	0	2	23
7:15 AM	0	6	1	0	12	0	0	0	0	5	0	3	27
7:30 AM	0	8	1	0	7	0	0	0	0	1	0	3	20
7:45 AM	0	9	1	2	10	0	0	0	0	1	0	1	24
8:00 AM	0	10	0	2	13	0	0	0	1	1	0	4	31
8:15 AM	0	8	1	2	12	0	1	0	0	3	0	1	28
8:30 AM	0	18	1	3	6	0	0	0	0	4	0	5	37
8:45 AM	2	16	3	4	12	0	0	0	0	0	0	2	39
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	2	80	9	16	79	0	1	0	1	20	0	21	229
APPROACH %	2%	88%	10%	17%	83%	0%	50%	0%	50%	49%	0%	51%	
APP/DEPART	91	/	102	95	/	100	2	/	25	41	/	2	0
BEGIN PEAK HR		8:00 AM											
VOLUMES	2	52	5	11	43	0	1	0	1	8	0	12	135
APPROACH %	3%	88%	8%	20%	80%	0%	50%	0%	50%	40%	0%	60%	
PEAK HR FACTOR		0.702			0.844			0.500			0.556		0.865
APP/DEPART	59	/	65	54	/	52	2	/	16	20	/	2	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	8	2	0	15	0	0	0	0	1	0	1	27
4:15 PM	0	14	2	2	7	0	0	0	0	1	0	1	27
4:30 PM	0	8	1	3	12	0	0	0	0	1	0	3	28
4:45 PM	0	8	5	0	9	0	0	0	0	2	0	0	24
5:00 PM	0	9	2	4	6	0	0	0	0	1	0	4	26
5:15 PM	1	9	2	3	7	0	0	0	0	2	0	1	25
5:30 PM	0	6	5	1	8	0	0	0	0	2	0	3	25
5:45 PM	0	5	0	2	6	0	0	0	0	1	0	2	16
VOLUMES	1	67	19	15	70	0	0	0	0	11	0	15	198
APPROACH %	1%	77%	22%	18%	82%	0%	0%	0%	0%	42%	0%	58%	
APP/DEPART	87	/	82	85	/	82	0	/	34	26	/	0	0
BEGIN PEAK HR		4:00 PM											
VOLUMES	0	38	10	5	43	0	0	0	0	5	0	5	106
APPROACH %	0%	79%	21%	10%	90%	0%	0%	0%	0%	50%	0%	50%	
PEAK HR FACTOR		0.750			0.800			0.000			0.625		0.946
APP/DEPART	48	/	43	48	/	48	0	/	15	10	/	0	0

U-TURNS

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

INTERSECTION TURNING MOVEMENT COUNTS

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

DATE:				
1/22/19	LOCATION:	Chino	PROJECT #:	SC2056
TUESDAY	NORTH & SOUTH:	Euclid	LOCATION #:	16
	EAST & WEST:	Facility	CONTROL:	SIGNAL

CLASS 5: RV

NOTES:

AM / PM / MD / OTHER / OTHER

▲ N ◄ W E ► S ▼

	NORTHBOUND Euclid			SOUTHBOUND Euclid			EASTBOUND Facility			WESTBOUND Facility			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	1	1	2	0	0	1	0	0	1	0	
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	0	0	0	0	0	0	0	0	0	0	0	0	0
APPROACH %	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
APP/DEPART	0	/	0	0	/	0	0	/	0	0	/	0	0
BEGIN PEAK HR	7:00 AM												
VOLUMES	0	0	0	0	0	0	0	0	0	0	0	0	0
APPROACH %	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
PEAK HR FACTOR	0.000			0.000			0.000			0.000			0.000
APP/DEPART	0	/	0	0	/	0	0	/	0	0	/	0	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	1
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	1	0	0	0	0	0	0	0	1
VOLUMES	0	1	0	0	1	0	0	0	0	0	0	0	2
APPROACH %	0%	100%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	
APP/DEPART	1	/	1	1	/	1	0	/	0	0	/	0	0
BEGIN PEAK HR	5:00 PM												
VOLUMES	0	1	0	0	1	0	0	0	0	0	0	0	2
APPROACH %	0%	100%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	
PEAK HR FACTOR	0.250			0.250			0.000			0.000			0.500
APP/DEPART	1	/	1	1	/	1	0	/	0	0	/	0	0

U-TURNS

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

INTERSECTION TURNING MOVEMENT COUNTS

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

DATE:				
1/22/19	LOCATION:	Chino	PROJECT #:	SC2056
TUESDAY	NORTH & SOUTH:	Euclid	LOCATION #:	16
	EAST & WEST:	Facility	CONTROL:	SIGNAL

CLASS 6:	NOTES:
BUSES	

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

		NORTHBOUND Euclid			SOUTHBOUND Euclid			EASTBOUND Facility			WESTBOUND Facility			
		NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
	LANES:	1	2	1	1	2	0	0	1	0	0	1	0	
AM	7:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	1
	7:15 AM	0	2	0	1	2	0	0	0	0	0	0	0	5
	7:30 AM	0	1	0	0	1	0	0	0	0	0	0	0	2
	7:45 AM	0	1	0	0	0	0	0	0	0	0	0	0	1
	8:00 AM	0	0	0	0	1	0	0	0	0	0	0	0	1
	8:15 AM	0	3	0	0	0	0	0	0	0	0	0	0	3
	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:45 AM	0	0	0	0	1	0	0	0	0	0	0	0	1
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	0	8	0	1	5	0	0	0	0	0	0	0	14
	APPROACH %	0%	100%	0%	17%	83%	0%	0%	0%	0%	0%	0%	0%	
	APP/DEPART	8	/	8	6	/	5	0	/	1	0	/	0	0
	BEGIN PEAK HR		7:00 AM											
	VOLUMES	0	4	0	1	4	0	0	0	0	0	0	0	9
	APPROACH %	0%	100%	0%	20%	80%	0%	0%	0%	0%	0%	0%	0%	
	PEAK HR FACTOR		0.500			0.417			0.000			0.000		0.450
	APP/DEPART	4	/	4	5	/	4	0	/	1	0	/	0	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	2	0	0	0	0	0	0	0	0	0	0	2
	4:15 PM	0	2	0	0	0	0	0	0	0	0	0	0	2
	4:30 PM	0	1	0	0	0	0	0	0	0	0	0	0	1
	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	1	1
	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	0	5	0	0	0	0	0	0	0	0	0	1	6
	APPROACH %	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	
	APP/DEPART	5	/	6	0	/	0	0	/	0	1	/	0	0
	BEGIN PEAK HR		3:45 PM											
	VOLUMES	0	5	0	0	0	0	0	0	0	0	0	0	5
	APPROACH %	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
	PEAK HR FACTOR		0.625			0.000			0.000			0.000		0.625
	APP/DEPART	5	/	5	0	/	0	0	/	0	0	/	0	0

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

INTERSECTION TURNING MOVEMENT COUNTS

T1218

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

DATE: Thu, Nov 7, 19

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

PROJECT #: JN12611
LOCATION #: 2
CONTROL: SIGNAL

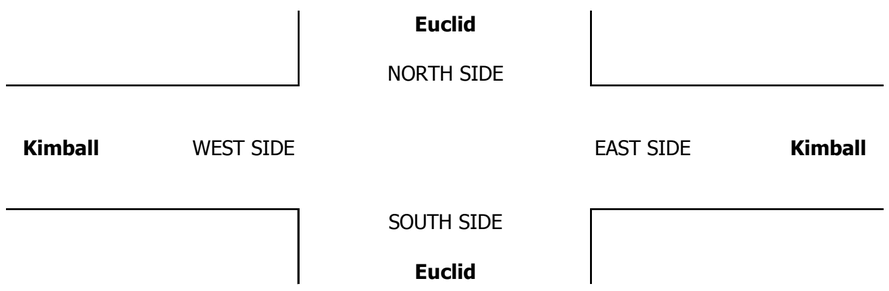
NOTES:

AM / PM / MD / OTHER / OTHER

◄ W E ► ▲ N S ▼

☑ Add U-Turns to Left Turns

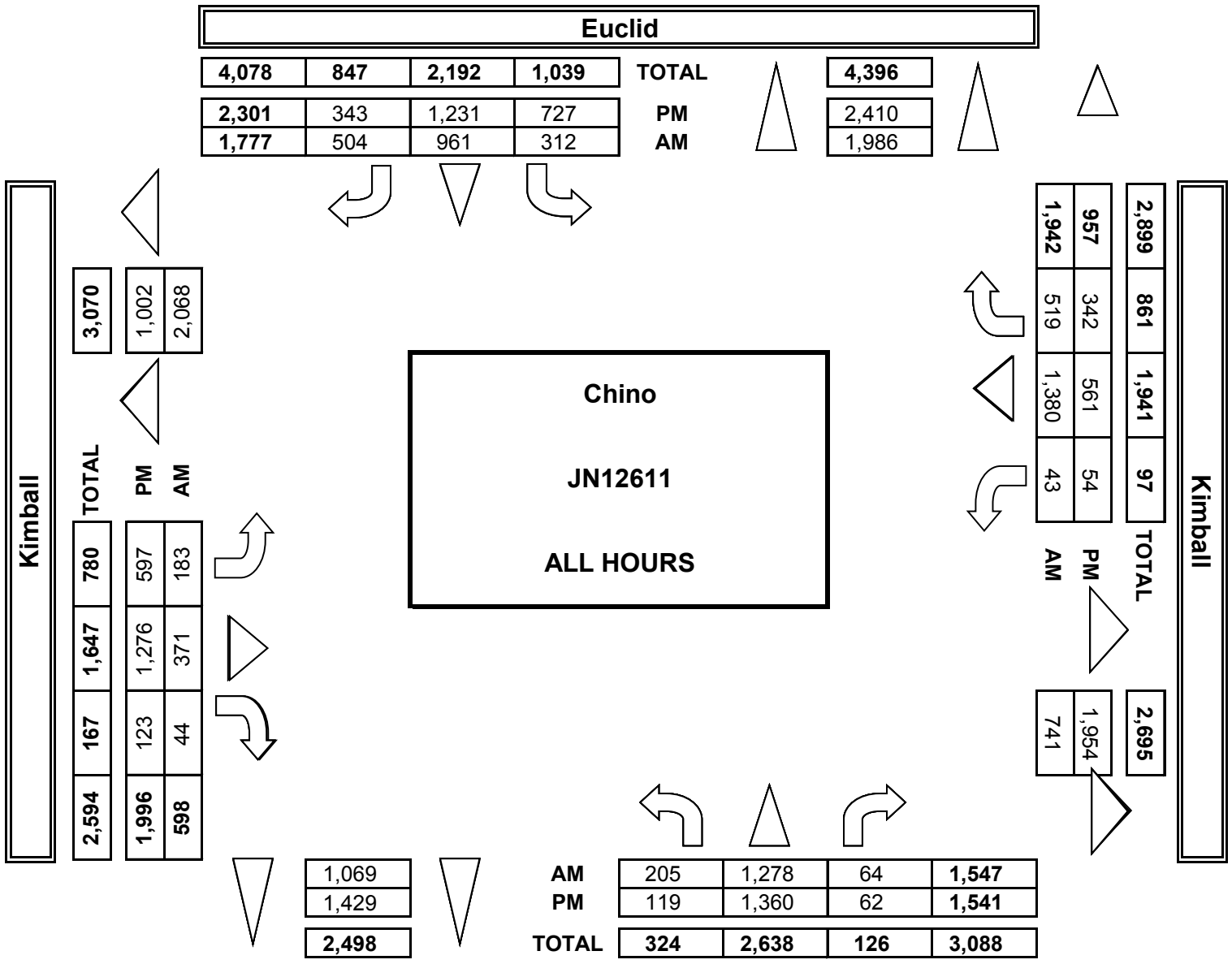
		NORTHBOUND Euclid			SOUTHBOUND Euclid			EASTBOUND Kimball			WESTBOUND Kimball				U-TURNS					RTOR			
	LANES:	NL 1	NT 2	NR 1	SL 2	ST 2	SR 1	EL 2	ET 2	ER 0	WL 1	WT 1.5	WR 0.5	TOTAL	NB 0	SB 0	EB 0	WB 0	TTL	NRR 0	SRR 0	ERR 0	WRR 0
AM	7:00 AM	42	143	9	30	114	82	25	40	6	10	228	62	791	3	0	0	0	3	2	13	2	25
	7:15 AM	32	194	8	34	118	27	18	44	8	7	195	88	773	1	2	0	0	3	6	3	0	30
	7:30 AM	28	158	15	33	112	65	15	62	4	8	193	75	768	5	0	0	0	5	6	16	1	27
	7:45 AM	29	161	4	49	117	122	15	39	6	2	186	65	795	4	0	0	0	4	2	17	2	26
	8:00 AM	29	128	5	59	120	42	23	52	5	11	173	72	719	4	2	0	0	6	3	9	1	31
	8:15 AM	17	173	6	46	156	66	27	44	2	0	164	53	754	1	2	0	0	3	2	21	0	12
	8:30 AM	13	160	11	33	115	54	24	55	6	2	137	56	666	0	0	0	0	0	1	16	1	19
	8:45 AM	15	161	6	28	109	45	36	35	7	3	104	48	597	3	0	0	0	3	1	20	0	20
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	205	1,278	64	312	961	504	183	371	44	43	1,380	519	5,864	21	6	0	0	27	23	115	7	190
	APPROACH %	13%	83%	4%	18%	54%	28%	31%	62%	7%	2%	71%	27%										
	APP/DEPART	1,547	/	1,986	1,777	/	1,069	598	/	741	1,942	/	2,068	0									
	BEGIN PEAK HR		7:00 AM																				
	VOLUMES	131	656	36	146	461	296	73	185	24	27	802	290	3,127						16	49	5	108
	APPROACH %	16%	80%	4%	16%	51%	33%	26%	66%	9%	2%	72%	26%										
	PEAK HR FACTOR		0.879			0.784			0.870			0.933		0.983									
	APP/DEPART	823	/	1,021	903	/	525	282	/	365	1,119	/	1,216	0									
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	9	162	8	77	125	33	86	129	9	6	64	47	755	1	7	0	0	8	1	13	0	19
	4:15 PM	16	199	8	74	164	34	60	167	9	7	48	39	825	4	3	0	0	7	1	7	1	17
	4:30 PM	10	177	6	79	104	55	94	150	12	9	74	51	821	1	7	0	0	8	0	21	0	11
	4:45 PM	16	161	7	78	173	57	56	137	24	12	90	46	857	3	3	0	0	6	0	19	0	17
	5:00 PM	16	160	9	107	180	37	77	165	15	9	75	24	874	3	31	0	0	34	0	16	1	8
	5:15 PM	14	177	9	93	163	35	72	190	17	5	70	61	906	0	15	0	0	15	4	11	1	20
	5:30 PM	22	174	8	112	159	48	79	162	16	5	74	37	896	6	20	0	0	26	2	19	2	17
	5:45 PM	16	150	7	107	163	44	73	176	21	1	66	37	861	3	25	0	0	28	0	15	1	20
	VOLUMES	119	1,360	62	727	1,231	343	597	1,276	123	54	561	342	6,795	21	111	0	0	132	8	121	6	129
	APPROACH %	8%	88%	4%	32%	53%	15%	30%	64%	6%	6%	59%	36%										
	APP/DEPART	1,541	/	2,410	2,301	/	1,429	1,996	/	1,954	957	/	1,002	0									
	BEGIN PEAK HR		5:00 PM																				
	VOLUMES	68	661	33	419	665	164	301	693	69	20	285	159	3,537						6	61	5	65
	APPROACH %	9%	87%	4%	34%	53%	13%	28%	65%	6%	4%	61%	34%										
	PEAK HR FACTOR		0.934			0.963			0.953			0.853		0.976									
	APP/DEPART	762	/	1,212	1,248	/	766	1,063	/	1,054	464	/	505	0									

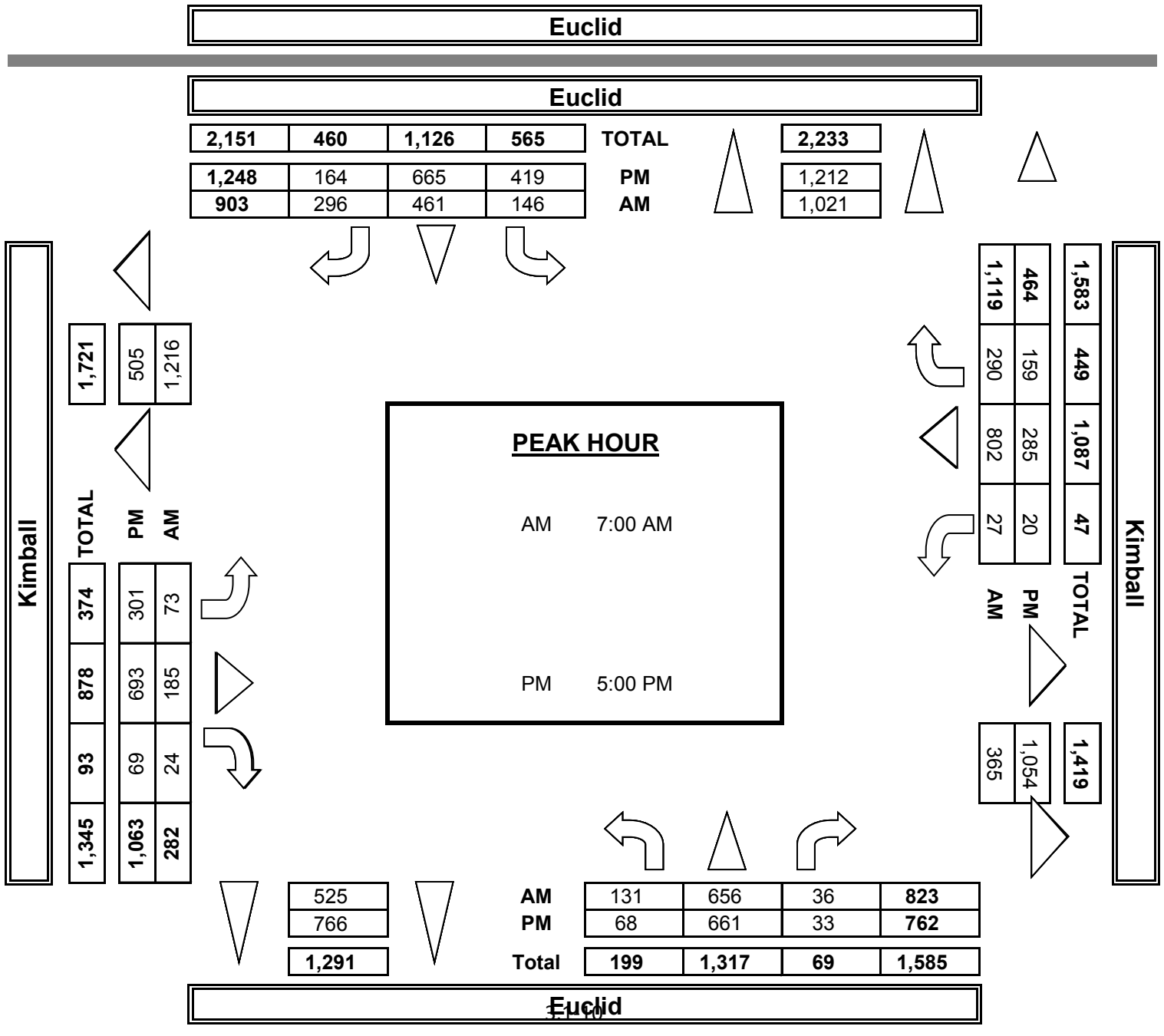


		ALL PED AND BIKE					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	ES	WS	SS	NS	TOTAL
AM	7:00 AM	1	0	0	1	2	1	0	0	1	2	0	0	0	0	0
	7:15 AM	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0
	7:30 AM	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1
	7:45 AM	0	0	0	0	0	0	0	0	0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

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

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

DATE:				
11/7/19	LOCATION:	Chino	PROJECT #:	JN12611
THURSDAY	NORTH & SOUTH:	Euclid	LOCATION #:	2
	EAST & WEST:	Kimball	CONTROL:	SIGNAL

CLASS 1: PASSENGER VEHICLES

NOTES:

AM / PM / MD / OTHER / OTHER

▲ N ◄ W E ► S ▼

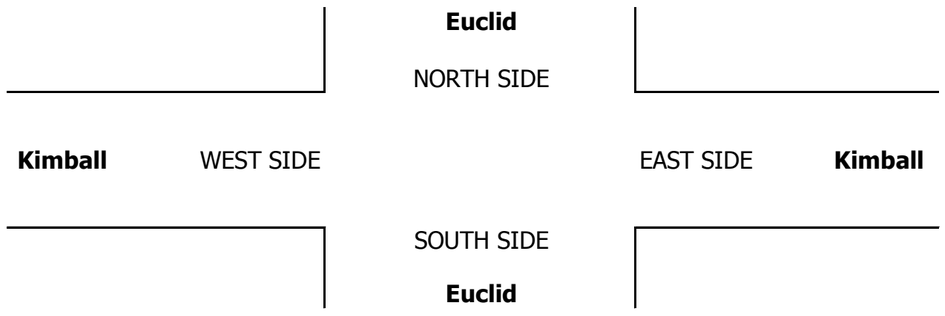
	NORTHBOUND Euclid			SOUTHBOUND Euclid			EASTBOUND Kimball			WESTBOUND Kimball			
LANES:	NL 1	NT 2	NR 1	SL 2	ST 2	SR 1	EL 2	ET 2	ER 0	WL 1	WT 1.5	WR 0.5	TOTAL
7:00 AM	37	125	5	26	78	36	9	36	3	8	219	58	640
7:15 AM	28	173	7	30	76	23	11	40	3	6	187	79	663
7:30 AM	24	140	12	30	71	43	9	56	3	4	190	69	651
7:45 AM	21	144	3	41	79	72	6	37	3	2	179	63	650
8:00 AM	27	106	5	55	84	34	9	50	3	8	167	66	614
8:15 AM	17	142	6	42	112	20	8	38	2	0	158	51	596
8:30 AM	12	127	9	29	82	35	7	42	4	2	128	51	528
8:45 AM	13	115	3	24	74	34	23	27	4	1	95	38	451
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	1	0	0	0	0	0	0	1
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	179	1,072	50	277	656	298	82	326	25	31	1,323	475	4,794
APPROACH %	14%	82%	4%	23%	53%	24%	19%	75%	6%	2%	72%	26%	
APP/DEPART	1,301	/	1,634	1,231	/	728	433	/	648	1,829	/	1,784	0
BEGIN PEAK HR		7:00 AM											
VOLUMES	101	582	27	125	304	174	35	169	12	20	775	269	2,604
APPROACH %	14%	81%	4%	21%	50%	29%	16%	78%	6%	2%	73%	25%	
PEAK HR FACTOR		0.864			0.788			0.794			0.933		0.982
APP/DEPART	719	/	888	605	/	345	216	/	321	1,064	/	1,050	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	8	137	8	73	105	19	69	125	9	4	60	42	659
4:15 PM	13	171	6	68	140	22	46	166	7	3	44	37	723
4:30 PM	10	156	4	76	89	39	75	140	10	8	68	47	722
4:45 PM	14	146	6	76	153	41	49	135	20	11	87	44	782
5:00 PM	16	142	9	103	163	26	67	155	15	8	75	21	800
5:15 PM	13	160	7	93	140	27	55	187	16	1	65	59	823
5:30 PM	21	160	7	110	142	33	68	159	12	5	72	36	825
5:45 PM	16	137	6	104	143	29	66	173	19	1	66	36	796
VOLUMES	111	1,209	53	703	1,075	236	495	1,240	108	41	537	322	6,130
APPROACH %	8%	88%	4%	35%	53%	12%	27%	67%	6%	5%	60%	36%	
APP/DEPART	1,373	/	2,137	2,014	/	1,245	1,843	/	1,885	900	/	863	0
BEGIN PEAK HR		5:00 PM											
VOLUMES	54	599	29	319	588	115	256	674	62	15	278	152	3,244
APPROACH %	8%	86%	4%	29%	53%	10%	26%	68%	6%	3%	62%	34%	
PEAK HR FACTOR		0.923			0.953			0.961			0.890		0.983
APP/DEPART	694	/	1,098	1,113	/	677	992	/	1,022	445	/	447	0

U-TURNS

NB	SB	EB	WB	TTL
2	0	0	0	2
0	2	0	0	2
3	0	0	0	3
4	0	0	0	4
3	1	0	0	4
1	2	0	0	3
0	0	0	0	0
3	0	0	0	3
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
16	5	0	0	21
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
1	7	0	0	8
4	3	0	0	7
1	7	0	0	8
3	3	0	0	6
3	31	0	0	34
0	15	0	0	15
6	20	0	0	26
3	25	0	0	28
21	111	0	0	132

RTOR

NRR	SRR	ERR	WRR
0	0	0	0
1	6	2	23
5	3	0	26
4	13	1	25
1	8	1	25
3	7	0	28
2	6	0	12
0	13	1	19
0	16	0	15
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
16	72	5	173
11	30	4	99
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
1	9	0	17
1	6	1	16
0	14	0	10
0	14	0	16
0	12	1	8
3	8	1	19
1	10	2	17
0	10	1	20
6	83	6	123
4	40	5	64



INTERSECTION TURNING MOVEMENT COUNTS

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

DATE:				
11/7/19	LOCATION:	Chino	PROJECT #:	JN12611
THURSDAY	NORTH & SOUTH:	Euclid	LOCATION #:	2
	EAST & WEST:	Kimball	CONTROL:	SIGNAL

CLASS 2:	NOTES:
2-AXLE WORK VEHICLES/ TRUCKS	

AM / PM / MD / OTHER / OTHER

▲ N ◄ W E ► S ▼

	NORTHBOUND Euclid			SOUTHBOUND Euclid			EASTBOUND Kimball			WESTBOUND Kimball			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	1	2	2	1	2	2	0	1	1.5	0.5	
7:00 AM	3	10	2	2	26	37	9	2	1	0	7	3	102
7:15 AM	0	14	0	2	32	2	5	1	5	0	6	4	71
7:30 AM	2	13	2	2	26	16	2	1	0	1	2	3	70
7:45 AM	5	10	1	5	29	41	2	1	1	0	4	2	101
8:00 AM	1	9	0	2	26	3	5	1	1	1	2	4	55
8:15 AM	0	24	0	3	36	31	12	3	0	0	4	1	114
8:30 AM	0	16	0	2	20	3	5	3	1	0	2	3	55
8:45 AM	0	30	2	2	25	2	10	3	2	2	5	5	88
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	11	126	7	20	220	135	50	15	11	4	32	25	656
APPROACH %	8%	88%	5%	5%	59%	36%	66%	20%	14%	7%	52%	41%	
APP/DEPART	144	/	202	375	/	237	76	/	41	61	/	176	0
BEGIN PEAK HR		7:00 AM											
VOLUMES	8	47	5	11	113	96	18	5	7	1	19	12	344
APPROACH %	13%	76%	8%	5%	51%	44%	60%	17%	23%	3%	59%	38%	
PEAK HR FACTOR		0.912			0.733			0.625			0.800		0.843
APP/DEPART	62	/	77	220	/	123	30	/	21	32	/	123	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	15	0	4	14	6	6	4	0	0	2	4	55
4:15 PM	2	22	1	1	19	7	4	1	0	3	2	1	63
4:30 PM	0	14	1	1	12	6	8	7	1	0	3	1	54
4:45 PM	0	11	0	0	16	9	4	2	2	0	0	1	45
5:00 PM	0	13	0	2	13	6	2	4	0	1	0	1	42
5:15 PM	0	12	0	0	15	6	1	2	0	1	2	1	40
5:30 PM	1	7	1	1	11	10	1	1	3	0	0	0	36
5:45 PM	0	8	0	2	15	10	1	2	1	0	0	1	40
VOLUMES	3	102	3	11	115	60	27	23	7	5	9	10	375
APPROACH %	3%	94%	3%	6%	62%	32%	47%	40%	12%	21%	38%	42%	
APP/DEPART	108	/	139	186	/	127	57	/	37	24	/	72	0
BEGIN PEAK HR		4:00 PM											
VOLUMES	2	62	2	6	61	28	22	14	3	3	7	7	217
APPROACH %	3%	94%	3%	6%	64%	29%	56%	36%	8%	18%	41%	41%	
PEAK HR FACTOR		0.660			0.880			0.609			0.708		0.861
APP/DEPART	66	/	91	95	/	67	39	/	22	17	/	37	0

U-TURNS

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

INTERSECTION TURNING MOVEMENT COUNTS

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

DATE:				
11/7/19	LOCATION:	Chino	PROJECT #:	JN12611
THURSDAY	NORTH & SOUTH:	Euclid	LOCATION #:	2
	EAST & WEST:	Kimball	CONTROL:	SIGNAL

CLASS 3: 3-AXLE TRUCKS

NOTES:

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

	NORTHBOUND Euclid			SOUTHBOUND Euclid			EASTBOUND Kimball			WESTBOUND Kimball			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	1	2	2	1	2	2	0	1	1.5	0.5	
7:00 AM	0	2	0	2	1	0	0	1	0	1	0	0	7
7:15 AM	1	1	0	0	3	0	0	2	0	1	2	3	13
7:30 AM	0	0	1	1	1	0	0	0	0	1	0	1	5
7:45 AM	1	1	0	1	2	0	2	0	1	0	0	0	8
8:00 AM	1	1	0	0	2	0	2	0	0	0	2	1	9
8:15 AM	0	0	0	0	0	1	2	0	0	0	2	1	6
8:30 AM	1	2	0	1	6	3	1	0	0	0	3	0	17
8:45 AM	0	5	0	2	2	1	0	1	0	0	0	2	13
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	4	12	1	7	17	5	7	4	1	3	9	8	78
APPROACH %	24%	71%	6%	24%	59%	17%	58%	33%	8%	15%	45%	40%	
APP/DEPART	17	/	27	29	/	22	12	/	12	20	/	17	0
BEGIN PEAK HR		8:00 AM											
VOLUMES	1	8	0	3	10	5	5	1	0	0	7	4	45
APPROACH %	10%	80%	0%	17%	56%	28%	83%	17%	0%	0%	64%	36%	
PEAK HR FACTOR		0.500			0.450			0.750			0.917		0.662
APP/DEPART	10	/	17	18	/	11	6	/	4	11	/	13	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	1	3	0	0	1	1	3	0	0	0	0	0	9
4:15 PM	0	0	0	4	1	0	2	0	0	0	1	1	9
4:30 PM	0	1	0	1	0	1	1	3	0	0	0	0	7
4:45 PM	0	0	1	0	0	2	0	0	1	0	2	1	7
5:00 PM	0	2	0	0	1	0	0	2	0	0	0	2	7
5:15 PM	0	0	1	0	2	0	3	0	0	0	0	1	7
5:30 PM	0	1	0	1	2	0	0	0	0	0	0	0	4
5:45 PM	0	0	1	1	1	0	1	0	1	0	0	0	5
VOLUMES	1	7	3	7	8	4	10	5	2	0	3	5	55
APPROACH %	9%	64%	27%	37%	42%	21%	59%	29%	12%	0%	38%	63%	
APP/DEPART	11	/	22	19	/	10	17	/	15	8	/	8	0
BEGIN PEAK HR		4:00 PM											
VOLUMES	1	4	1	5	2	4	6	3	1	0	3	2	32
APPROACH %	17%	67%	17%	45%	18%	36%	60%	30%	10%	0%	60%	40%	
PEAK HR FACTOR		0.375			0.550			0.625			0.417		0.889
APP/DEPART	6	/	12	11	/	3	10	/	9	5	/	8	0

U-TURNS

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

INTERSECTION TURNING MOVEMENT COUNTS

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

DATE:				
11/7/19	LOCATION:	Chino	PROJECT #:	JN12611
THURSDAY	NORTH & SOUTH:	Euclid	LOCATION #:	2
	EAST & WEST:	Kimball	CONTROL:	SIGNAL

CLASS 4: 4 OR MORE AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER

▲ N ◄ W E ► S ▼

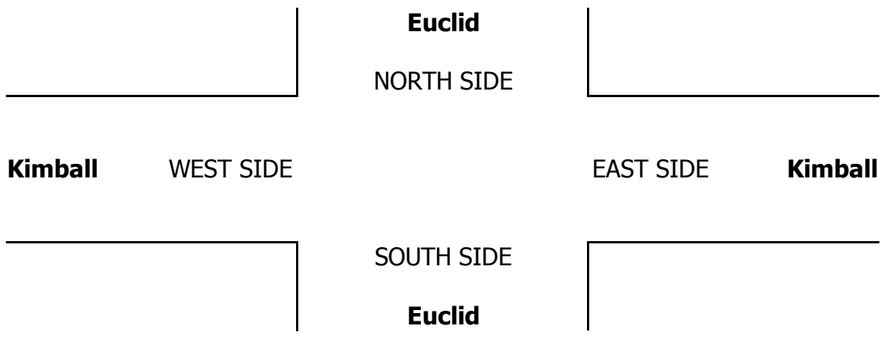
	NORTHBOUND Euclid			SOUTHBOUND Euclid			EASTBOUND Kimball			WESTBOUND Kimball			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	1	2	2	1	2	2	0	1	1.5	0.5	
7:00 AM	2	5	2	0	8	8	7	1	1	1	2	0	37
7:15 AM	3	5	1	2	7	2	2	1	0	0	0	2	25
7:30 AM	2	5	0	0	13	6	4	4	1	2	1	0	38
7:45 AM	2	5	0	1	6	9	5	1	1	0	2	0	32
8:00 AM	0	11	0	2	7	5	7	1	1	1	1	0	36
8:15 AM	0	7	0	1	8	14	5	3	0	0	0	0	38
8:30 AM	0	15	2	1	7	13	11	10	1	0	3	2	65
8:45 AM	2	11	1	0	8	8	3	3	1	0	3	3	43
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	11	64	6	7	64	65	44	24	6	4	12	7	314
APPROACH %	14%	79%	7%	5%	47%	48%	59%	32%	8%	17%	52%	30%	
APP/DEPART	81	/	115	136	/	76	74	/	37	23	/	86	0
BEGIN PEAK HR		8:00 AM											
VOLUMES	2	44	3	4	30	40	26	17	3	1	7	5	182
APPROACH %	4%	90%	6%	5%	41%	54%	57%	37%	7%	8%	54%	38%	
PEAK HR FACTOR		0.721			0.804			0.523			0.542		0.700
APP/DEPART	49	/	75	74	/	34	46	/	24	13	/	49	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	7	0	0	5	7	8	0	0	2	2	1	32
4:15 PM	1	5	1	0	4	5	8	0	2	1	1	0	28
4:30 PM	0	5	1	1	3	9	10	0	1	1	3	2	36
4:45 PM	2	4	0	2	4	5	3	0	1	1	1	0	23
5:00 PM	0	3	0	2	3	5	8	4	0	0	0	0	25
5:15 PM	1	5	1	0	6	2	13	1	1	3	3	0	36
5:30 PM	0	6	0	0	4	5	9	2	1	0	2	1	30
5:45 PM	0	5	0	0	4	5	5	1	0	0	0	0	20
VOLUMES	4	40	3	5	33	43	64	8	6	8	12	4	230
APPROACH %	9%	85%	6%	6%	41%	53%	82%	10%	8%	33%	50%	17%	
APP/DEPART	47	/	108	81	/	47	78	/	16	24	/	59	0
BEGIN PEAK HR		4:30 PM											
VOLUMES	3	17	2	5	16	21	34	5	3	5	7	2	120
APPROACH %	14%	77%	9%	12%	38%	50%	81%	12%	7%	36%	50%	14%	
PEAK HR FACTOR		0.786			0.808			0.700			0.583		0.833
APP/DEPART	22	/	53	42	/	24	42	/	12	14	/	31	0

U-TURNS

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

RTOR

NRR	SRR	ERR	WRR
0	0	0	0
1	2	0	0
1	0	0	1
0	0	0	0
0	1	0	0
0	1	1	0
0	3	0	0
1	2	0	0
1	4	0	1
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
4	13	1	2
2	10	1	1
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	17	0	0
0	9	0	0



INTERSECTION TURNING MOVEMENT COUNTS

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

DATE:				
11/7/19	LOCATION:	Chino	PROJECT #:	JN12611
THURSDAY	NORTH & SOUTH:	Euclid	LOCATION #:	2
	EAST & WEST:	Kimball	CONTROL:	SIGNAL

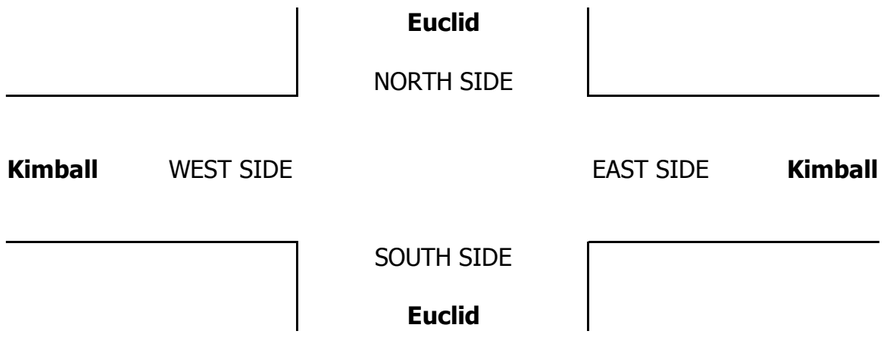
CLASS 5:	NOTES:
RV	

AM / PM / MD / OTHER / OTHER

▲ N ◄ W E ► S ▼

	NORTHBOUND Euclid			SOUTHBOUND Euclid			EASTBOUND Kimball			WESTBOUND Kimball			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	1	2	2	1	2	2	0	1	1.5	0.5	
AM 7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	1	0	0	0	0	0	0	0	0	0	0	1
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	1	0	0	1	0	2
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	0	1	0	0	0	0	0	1	0	0	1	0	3
APPROACH %	0%	100%	0%	0%	0%	0%	0%	100%	0%	0%	100%	0%	
APP/DEPART	1	/	1	0	/	0	1	/	1	1	/	1	0
BEGIN PEAK HR		8:45 AM											
VOLUMES	0	0	0	0	0	0	0	1	0	0	1	0	2
APPROACH %	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	100%	0%	
PEAK HR FACTOR		0.000			0.000			0.250			0.250		0.250
APP/DEPART	0	/	0	0	/	0	1	/	1	1	/	1	0
PM 03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	0	0	0	0	0	0	0	0	0	0	0	0	0
APPROACH %	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
APP/DEPART	0	/	0	0	/	0	0	/	0	0	/	0	0
BEGIN PEAK HR		3:00 PM											
VOLUMES	0	0	0	0	0	0	0	0	0	0	0	0	0
APPROACH %	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
PEAK HR FACTOR		0.000			0.000			0.000			0.000		0.000
APP/DEPART	0	/	0	0	/	0	0	/	0	0	/	0	0

U-TURNS					RTOR			
NB	SB	EB	WB	TTL	NRR	SRR	ERR	WRR
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0



INTERSECTION TURNING MOVEMENT COUNTS

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

DATE:				
11/7/19	LOCATION:	Chino	PROJECT #:	JN12611
THURSDAY	NORTH & SOUTH:	Euclid	LOCATION #:	2
	EAST & WEST:	Kimball	CONTROL:	SIGNAL

CLASS 6:	NOTES:
BUSES	

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

	NORTHBOUND Euclid			SOUTHBOUND Euclid			EASTBOUND Kimball			WESTBOUND Kimball			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	1	2	2	1	2	2	0	1	1.5	0.5	
7:00 AM	0	1	0	0	1	1	0	0	1	0	0	1	5
7:15 AM	0	1	0	0	0	0	0	0	0	0	0	0	1
7:30 AM	0	0	0	0	1	0	0	1	0	0	0	2	4
7:45 AM	0	0	0	1	1	0	0	0	0	0	1	0	3
8:00 AM	0	1	0	0	1	0	0	0	0	1	1	1	5
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	1	0	1
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	0	3	0	1	4	1	0	1	1	1	3	4	19
APPROACH %	0%	100%	0%	17%	67%	17%	0%	50%	50%	13%	38%	50%	
APP/DEPART	3	/	7	6	/	6	2	/	2	8	/	4	0
BEGIN PEAK HR		7:15 AM											
VOLUMES	0	2	0	1	3	0	0	1	0	1	2	3	13
APPROACH %	0%	100%	0%	25%	75%	0%	0%	100%	0%	17%	33%	50%	
PEAK HR FACTOR		0.500			0.500			0.250			0.500		0.650
APP/DEPART	2	/	5	4	/	4	1	/	2	6	/	2	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	1	0	1	0	0	0	0	0	0	0	0	2
4:30 PM	0	1	0	0	0	0	0	0	0	0	0	1	2
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	1	0	0	0	0	0	1
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	0	2	0	1	0	0	1	0	0	0	0	1	5
APPROACH %	0%	100%	0%	100%	0%	0%	100%	0%	0%	0%	0%	100%	
APP/DEPART	2	/	4	1	/	0	1	/	1	1	/	0	0
BEGIN PEAK HR		4:15 PM											
VOLUMES	0	2	0	1	0	0	0	0	0	0	0	1	4
APPROACH %	0%	100%	0%	100%	0%	0%	0%	0%	0%	0%	0%	100%	
PEAK HR FACTOR		0.500			0.250			0.000			0.250		0.500
APP/DEPART	2	/	3	1	/	0	0	/	1	1	/	0	0

U-TURNS

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

INTERSECTION TURNING MOVEMENT COUNTS

T1218

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

DATE: Thu, Nov 7, 19

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

PROJECT #: JN12611
LOCATION #: 3
CONTROL: SIGNAL

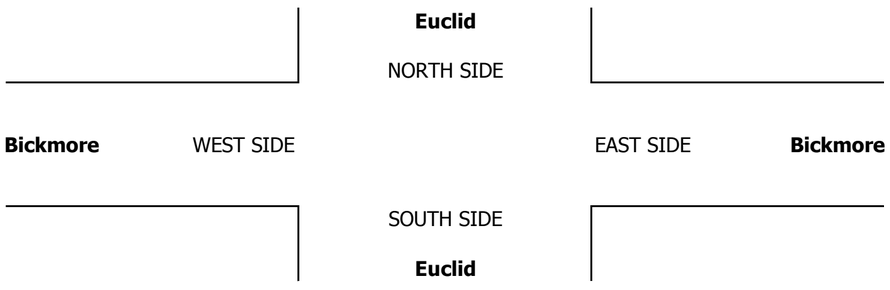
NOTES:

AM
PM
MD
OTHER
OTHER

▲ N
◄ W E ►
S ▼

☑ Add U-Turns to Left Turns

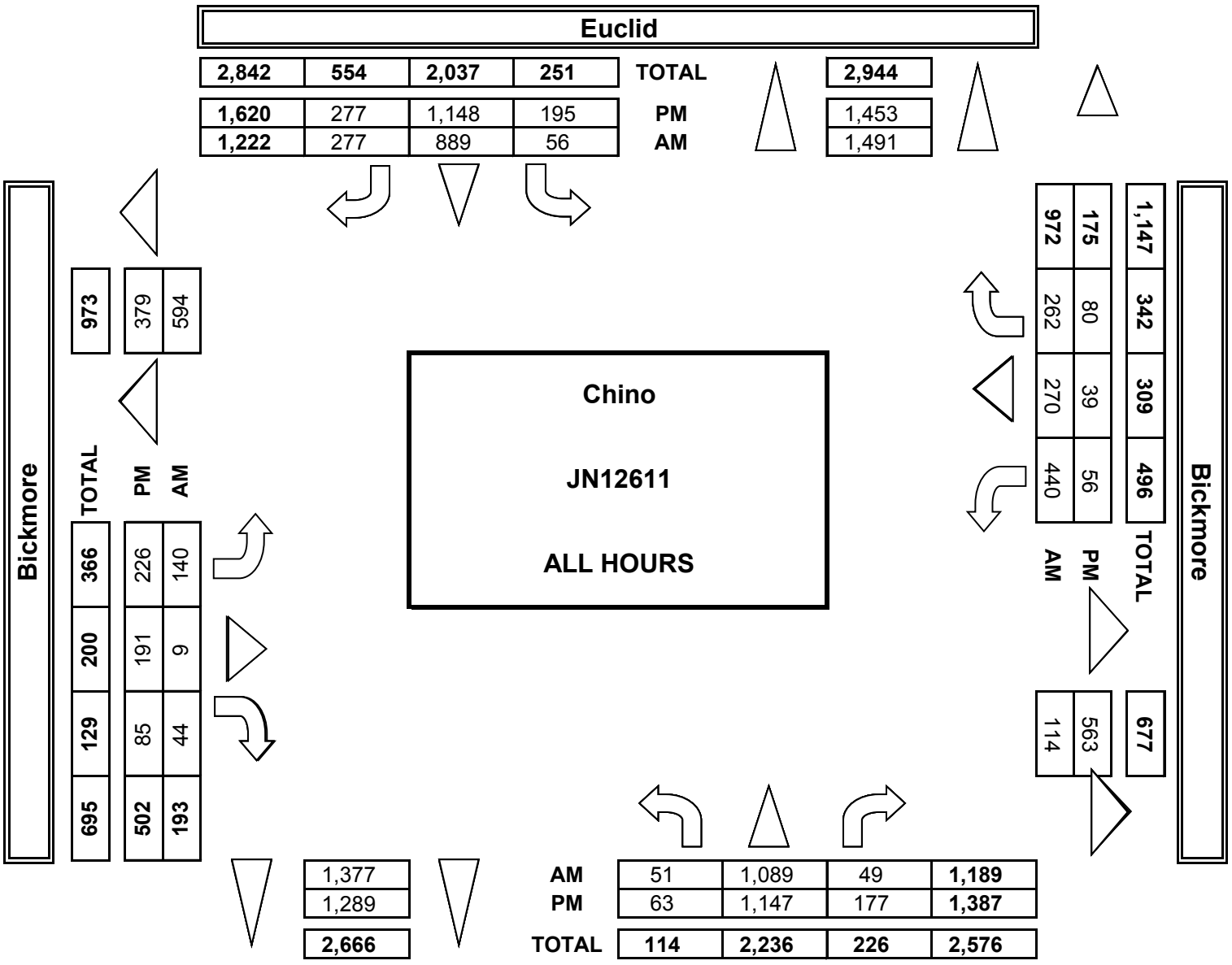
		NORTHBOUND Euclid			SOUTHBOUND Euclid			EASTBOUND Bickmore			WESTBOUND Bickmore				U-TURNS					RTOR			
	LANES:	NL 1	NT 2	NR 0	SL 1	ST 2	SR 1	EL 1	ET 1	ER 1	WL 1	WT 1	WR 0	TOTAL	NB 0	SB 0	EB 0	WB 0	TTL	NRR 0	SRR 0	ERR 0	WRR 0
AM	7:00 AM	4	112	5	10	132	31	28	1	3	114	48	61	549	0	0	0	0	0	2	6	2	8
	7:15 AM	5	152	9	5	87	34	14	3	10	114	68	42	543	0	0	0	0	0	4	6	3	4
	7:30 AM	4	147	8	9	114	22	10	3	4	47	39	34	441	0	0	0	0	0	0	2	0	3
	7:45 AM	8	141	6	10	123	26	11	0	10	48	38	27	448	0	0	0	0	0	0	2	3	10
	8:00 AM	10	112	5	5	126	26	13	1	5	50	22	32	407	1	0	0	0	1	2	4	1	9
	8:15 AM	10	134	5	6	115	46	16	1	5	30	17	29	414	3	0	0	0	3	1	6	2	6
	8:30 AM	1	168	6	3	106	28	14	0	2	24	25	21	398	0	0	0	0	0	0	4	1	5
	8:45 AM	9	123	5	8	86	64	34	0	5	13	13	16	376	0	0	0	0	0	0	17	0	4
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	51	1,089	49	56	889	277	140	9	44	440	270	262	3,576	4	0	0	0	4	9	47	12	49
	APPROACH %	4%	92%	4%	5%	73%	23%	73%	5%	23%	45%	28%	27%										
	APP/DEPART	1,189	/	1,491	1,222	/	1,377	193	/	114	972	/	594	0									
	BEGIN PEAK HR		7:00 AM																				
	VOLUMES	21	552	28	34	456	113	63	7	27	323	193	164	1,981						6	16	8	25
	APPROACH %	3%	92%	5%	6%	76%	19%	65%	7%	28%	48%	28%	24%										
	PEAK HR FACTOR		0.905			0.871			0.758			0.759		0.902									
	APP/DEPART	601	/	779	603	/	806	97	/	69	680	/	327	0									
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	9	151	21	12	122	26	38	25	10	9	2	8	433	0	0	0	0	0	2	5	4	3
	4:15 PM	4	147	10	14	127	33	22	20	3	5	5	15	405	0	0	0	0	0	2	8	1	4
	4:30 PM	12	138	14	12	129	29	53	28	17	10	3	9	454	0	0	0	0	0	4	7	9	2
	4:45 PM	9	141	25	26	164	47	17	31	11	7	4	8	490	0	0	0	0	0	1	14	3	2
	5:00 PM	5	139	33	29	173	26	18	23	9	3	3	9	470	0	0	0	0	0	8	7	5	7
	5:15 PM	5	151	22	35	166	34	27	27	15	8	4	12	506	0	0	0	0	0	3	6	4	2
	5:30 PM	8	154	29	34	144	34	33	21	13	6	11	8	495	0	0	0	0	0	6	6	4	2
	5:45 PM	11	126	23	33	123	48	18	16	7	8	7	11	431	0	0	0	0	0	5	7	1	6
	VOLUMES	63	1,147	177	195	1,148	277	226	191	85	56	39	80	3,684	0	0	0	0	0	31	60	31	28
	APPROACH %	5%	83%	13%	12%	71%	17%	45%	38%	17%	32%	22%	46%										
	APP/DEPART	1,387	/	1,453	1,620	/	1,289	502	/	563	175	/	379	0									
	BEGIN PEAK HR		4:45 PM																				
	VOLUMES	27	585	109	124	647	141	95	102	48	24	22	37	1,961						18	33	16	13
	APPROACH %	4%	81%	15%	14%	71%	15%	39%	42%	20%	29%	27%	45%										
	PEAK HR FACTOR		0.944			0.962			0.888			0.830		0.969									
	APP/DEPART	721	/	717	912	/	719	245	/	335	83	/	190	0									

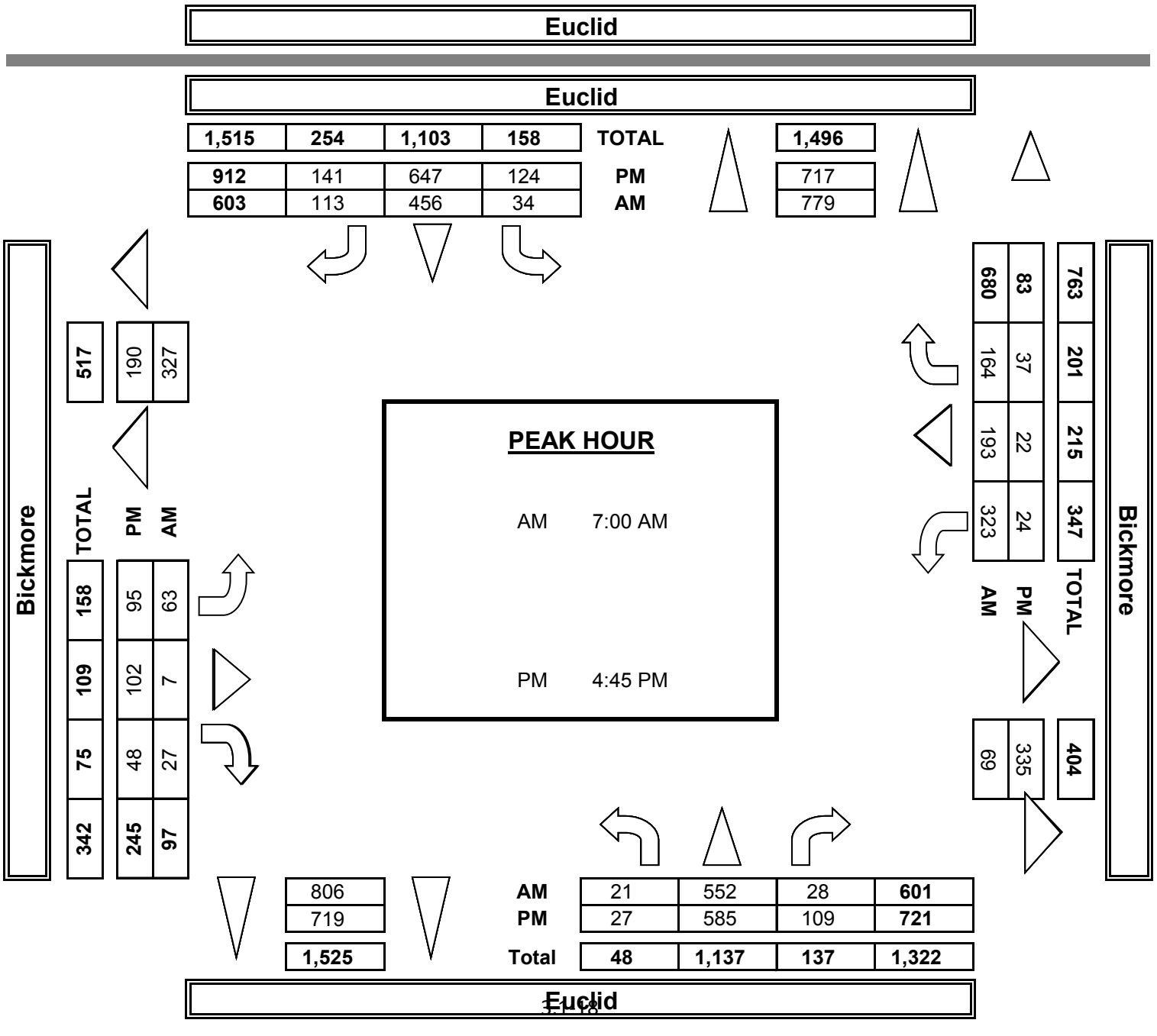


		ALL PED AND BIKE					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	ES	WS	SS	NS	TOTAL
AM	7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:30 AM	1	1	0	0	2	0	0	0	0	0	1	1	0	0	2
	7:45 AM	0	0	0	0	0	0	0	0	0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

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

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

DATE:				
11/7/19	LOCATION:	Chino	PROJECT #:	JN12611
THURSDAY	NORTH & SOUTH:	Euclid	LOCATION #:	3
	EAST & WEST:	Bickmore	CONTROL:	SIGNAL

CLASS 1: PASSENGER VEHICLES

NOTES:

AM / PM / MD / OTHER / OTHER

▲ N ◄ W E ► S ▼

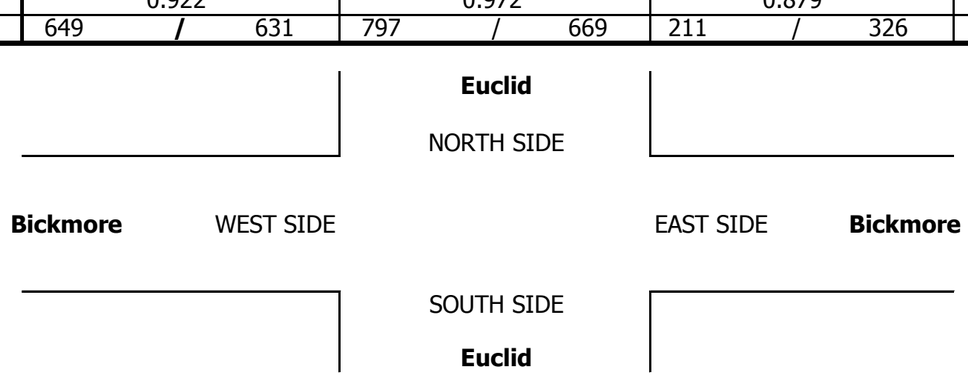
	NORTHBOUND Euclid			SOUTHBOUND Euclid			EASTBOUND Bickmore			WESTBOUND Bickmore			
LANES:	NL 1	NT 2	NR 0	SL 1	ST 2	SR 1	EL 1	ET 1	ER 1	WL 1	WT 1	WR 0	TOTAL
7:00 AM	3	96	4	8	93	19	26	1	3	112	47	55	467
7:15 AM	5	139	8	3	68	19	6	3	4	113	66	37	471
7:30 AM	4	137	8	7	70	13	1	1	1	46	39	31	358
7:45 AM	6	131	6	6	72	16	5	0	0	46	38	23	349
8:00 AM	4	99	5	4	104	15	1	1	1	50	22	30	336
8:15 AM	5	122	3	6	96	17	1	1	1	28	16	28	324
8:30 AM	0	147	5	2	84	19	4	0	1	23	25	18	328
8:45 AM	6	109	4	7	71	21	1	0	2	13	13	11	258
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	33	980	43	43	658	139	45	7	13	431	266	233	2,891
APPROACH %	3%	93%	4%	5%	78%	17%	69%	11%	20%	46%	29%	25%	
APP/DEPART	1,056	/	1,258	840	/	1,103	65	/	93	930	/	437	0
BEGIN PEAK HR		7:00 AM											
VOLUMES	18	503	26	24	303	67	38	5	8	317	190	146	1,645
APPROACH %	3%	92%	5%	6%	77%	17%	75%	10%	16%	49%	29%	22%	
PEAK HR FACTOR		0.900			0.821			0.425			0.756		0.873
APP/DEPART	547	/	687	394	/	628	51	/	55	653	/	275	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	1	127	20	12	114	9	30	24	8	9	2	6	362
4:15 PM	3	126	10	14	112	14	15	20	3	5	5	13	340
4:30 PM	6	121	13	11	121	8	48	28	15	10	2	9	392
4:45 PM	4	123	23	25	157	17	10	31	8	7	3	7	415
5:00 PM	3	126	33	27	164	13	14	23	7	2	3	7	422
5:15 PM	4	135	22	34	154	17	20	27	11	7	4	12	447
5:30 PM	4	143	29	33	133	23	28	19	13	6	8	6	445
5:45 PM	7	113	23	32	114	32	15	16	5	7	7	11	382
VOLUMES	32	1,014	173	188	1,069	133	180	188	70	53	34	71	3,205
APPROACH %	3%	83%	14%	14%	77%	10%	41%	43%	16%	34%	22%	45%	
APP/DEPART	1,219	/	1,265	1,390	/	1,192	438	/	549	158	/	199	0
BEGIN PEAK HR		4:45 PM											
VOLUMES	15	527	107	119	608	70	72	100	39	22	18	32	1,729
APPROACH %	2%	81%	16%	15%	76%	9%	34%	47%	18%	31%	25%	44%	
PEAK HR FACTOR		0.922			0.972			0.879			0.783		0.967
APP/DEPART	649	/	631	797	/	669	211	/	326	72	/	103	0

U-TURNS

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

RTOR

NRR	SRR	ERR	WRR
0	0	0	0
2	3	2	7
4	1	3	3
0	0	0	2
0	1	0	8
2	0	0	8
1	0	1	6
0	2	0	4
0	5	0	4
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
9	12	6	42
6	5	5	20
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
2	3	3	2
2	2	1	3
4	0	7	2
1	11	3	2
8	3	4	5
3	2	3	2
6	4	4	1
5	5	0	6
31	30	25	23
18	20	14	10



INTERSECTION TURNING MOVEMENT COUNTS

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

DATE:				
11/7/19	LOCATION:	Chino	PROJECT #:	JN12611
THURSDAY	NORTH & SOUTH:	Euclid	LOCATION #:	3
	EAST & WEST:	Bickmore	CONTROL:	SIGNAL

CLASS 2:	NOTES:
2-AXLE WORK VEHICLES/ TRUCKS	

AM / PM / MD / OTHER / OTHER

▲ N ◄ W E ► S ▼

	NORTHBOUND Euclid			SOUTHBOUND Euclid			EASTBOUND Bickmore			WESTBOUND Bickmore			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	0	1	2	1	1	1	1	1	1	0	
7:00 AM	0	9	1	1	28	10	1	0	0	2	1	4	57
7:15 AM	0	6	0	1	13	9	3	0	3	1	2	3	41
7:30 AM	0	7	0	1	27	6	6	0	1	1	0	3	52
7:45 AM	1	6	0	2	47	7	1	0	10	2	0	4	80
8:00 AM	3	7	0	0	13	11	7	0	3	0	0	2	46
8:15 AM	2	9	2	0	13	25	11	0	3	0	1	1	67
8:30 AM	0	9	0	1	9	8	3	0	0	1	0	3	34
8:45 AM	1	3	0	1	6	41	30	0	1	0	0	4	87
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	7	56	3	7	156	117	62	0	21	7	4	24	464
APPROACH %	11%	85%	5%	3%	56%	42%	75%	0%	25%	20%	11%	69%	
APP/DEPART	66	/	142	280	/	184	83	/	10	35	/	128	0
BEGIN PEAK HR		7:30 AM											
VOLUMES	6	29	2	3	100	49	25	0	17	3	1	10	245
APPROACH %	16%	78%	5%	2%	66%	32%	60%	0%	40%	21%	7%	71%	
PEAK HR FACTOR		0.712			0.679			0.750			0.583		0.766
APP/DEPART	37	/	64	152	/	120	42	/	5	14	/	56	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	6	16	0	0	3	14	6	1	1	0	0	2	49
4:15 PM	1	17	0	0	9	17	6	0	0	0	0	1	51
4:30 PM	6	9	1	1	4	20	4	0	1	0	1	0	47
4:45 PM	5	14	2	1	4	28	4	0	2	0	1	1	62
5:00 PM	1	11	0	2	5	12	3	0	0	0	0	2	36
5:15 PM	1	10	0	1	7	10	3	0	0	1	0	0	33
5:30 PM	4	6	0	1	6	11	3	2	0	0	3	2	38
5:45 PM	2	7	0	1	4	15	2	0	1	1	0	0	33
VOLUMES	26	90	3	7	42	127	31	3	5	2	5	8	349
APPROACH %	22%	76%	3%	4%	24%	72%	79%	8%	13%	13%	33%	53%	
APP/DEPART	119	/	129	176	/	49	39	/	13	15	/	158	0
BEGIN PEAK HR		4:00 PM											
VOLUMES	18	56	3	2	20	79	20	1	4	0	2	4	209
APPROACH %	23%	73%	4%	2%	20%	78%	80%	4%	16%	0%	33%	67%	
PEAK HR FACTOR		0.875			0.765			0.781			0.750		0.843
APP/DEPART	77	/	80	101	/	24	25	/	6	6	/	99	0

U-TURNS

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

INTERSECTION TURNING MOVEMENT COUNTS

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

DATE:				
11/7/19	LOCATION:	Chino	PROJECT #:	JN12611
THURSDAY	NORTH & SOUTH:	Euclid	LOCATION #:	3
	EAST & WEST:	Bickmore	CONTROL:	SIGNAL

CLASS 3: 3-AXLE TRUCKS

NOTES:

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

	NORTHBOUND Euclid			SOUTHBOUND Euclid			EASTBOUND Bickmore			WESTBOUND Bickmore			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	0	1	2	1	1	1	1	1	1	0	
7:00 AM	0	3	0	0	3	0	0	0	0	0	0	0	6
7:15 AM	0	2	1	0	4	2	1	0	0	0	0	0	10
7:30 AM	0	0	0	0	5	0	0	1	0	0	0	0	6
7:45 AM	0	0	0	1	0	0	0	0	0	0	0	0	1
8:00 AM	0	0	0	0	3	0	0	0	0	0	0	0	3
8:15 AM	0	0	0	0	0	0	0	0	0	2	0	0	2
8:30 AM	0	4	1	0	6	0	0	0	0	0	0	0	11
8:45 AM	0	1	1	0	4	0	0	0	0	0	0	0	6
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	0	10	3	1	25	2	1	1	0	2	0	0	45
APPROACH %	0%	77%	23%	4%	89%	7%	50%	50%	0%	100%	0%	0%	
APP/DEPART	13	/	11	28	/	27	2	/	5	2	/	2	0
BEGIN PEAK HR		7:00 AM											
VOLUMES	0	5	1	1	12	2	1	1	0	0	0	0	23
APPROACH %	0%	83%	17%	7%	80%	13%	50%	50%	0%	0%	0%	0%	
PEAK HR FACTOR		0.500			0.625			0.500			0.000		0.575
APP/DEPART	6	/	6	15	/	12	2	/	3	0	/	2	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	2	1	0	1	0	0	0	0	0	0	0	4
4:15 PM	0	1	0	0	0	1	0	0	0	0	0	0	2
4:30 PM	0	1	0	0	0	0	1	0	0	0	0	0	2
4:45 PM	0	1	0	0	0	0	0	0	0	0	0	0	1
5:00 PM	1	0	0	0	1	0	0	0	1	1	0	0	4
5:15 PM	0	3	0	0	2	0	0	0	0	0	0	0	5
5:30 PM	0	2	0	0	2	0	0	0	0	0	0	0	4
5:45 PM	0	1	0	0	3	1	0	0	0	0	0	0	5
VOLUMES	1	11	1	0	9	2	1	0	1	1	0	0	27
APPROACH %	8%	85%	8%	0%	82%	18%	50%	0%	50%	100%	0%	0%	
APP/DEPART	13	/	12	11	/	11	2	/	1	1	/	3	0
BEGIN PEAK HR		5:00 PM											
VOLUMES	1	6	0	0	8	1	0	0	1	1	0	0	18
APPROACH %	14%	86%	0%	0%	89%	11%	0%	0%	100%	100%	0%	0%	
PEAK HR FACTOR		0.583			0.563			0.250			0.250		0.900
APP/DEPART	7	/	6	9	/	10	1	/	0	1	/	2	0

U-TURNS

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

INTERSECTION TURNING MOVEMENT COUNTS

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

DATE:				
11/7/19	LOCATION:	Chino	PROJECT #:	JN12611
THURSDAY	NORTH & SOUTH:	Euclid	LOCATION #:	3
	EAST & WEST:	Bickmore	CONTROL:	SIGNAL

CLASS 4: 4 OR MORE AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER

▲ N ◄ W E ► S ▼

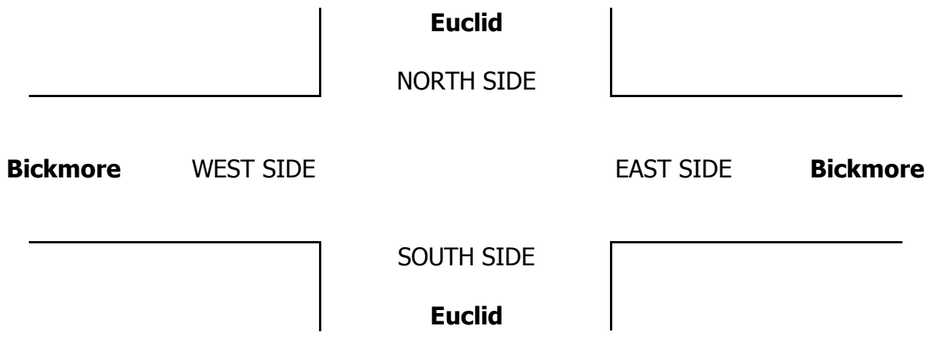
	NORTHBOUND Euclid			SOUTHBOUND Euclid			EASTBOUND Bickmore			WESTBOUND Bickmore			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	0	1	2	1	1	1	1	1	1	0	
7:00 AM	1	4	0	0	7	2	1	0	0	0	0	1	16
7:15 AM	0	4	0	0	2	4	4	0	3	0	0	1	18
7:30 AM	0	3	0	1	12	3	3	1	2	0	0	0	25
7:45 AM	1	3	0	1	3	3	5	0	0	0	0	0	16
8:00 AM	2	5	0	0	5	0	5	0	1	0	0	0	18
8:15 AM	2	3	0	0	6	4	4	0	1	0	0	0	20
8:30 AM	1	8	0	0	7	1	7	0	1	0	0	0	25
8:45 AM	2	10	0	0	5	2	3	0	2	0	0	1	25
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	9	40	0	2	47	19	32	1	10	0	0	3	163
APPROACH %	18%	82%	0%	3%	69%	28%	74%	2%	23%	0%	0%	100%	
APP/DEPART	49	/	75	68	/	58	43	/	3	3	/	27	0
BEGIN PEAK HR		8:00 AM											
VOLUMES	6	26	0	0	23	7	19	0	5	0	0	1	88
APPROACH %	18%	79%	0%	0%	77%	23%	79%	0%	21%	0%	0%	100%	
PEAK HR FACTOR		0.688			0.750			0.750			0.250		0.880
APP/DEPART	33	/	46	30	/	29	24	/	0	1	/	13	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	2	6	0	0	4	3	2	0	1	0	0	0	18
4:15 PM	0	3	0	0	6	1	1	0	0	0	0	0	11
4:30 PM	0	6	0	0	4	1	0	0	1	0	0	0	12
4:45 PM	0	3	0	0	3	2	3	0	1	0	0	0	12
5:00 PM	0	2	0	0	3	1	1	0	1	0	0	0	8
5:15 PM	0	3	0	0	2	7	4	0	4	0	0	0	20
5:30 PM	0	3	0	0	3	0	2	0	0	0	0	0	8
5:45 PM	2	5	0	0	2	0	1	0	1	0	0	0	11
VOLUMES	4	31	0	0	27	15	14	0	9	0	0	0	100
APPROACH %	11%	89%	0%	0%	64%	36%	61%	0%	39%	0%	0%	0%	
APP/DEPART	35	/	45	42	/	36	23	/	0	0	/	19	0
BEGIN PEAK HR		4:00 PM											
VOLUMES	2	18	0	0	17	7	6	0	3	0	0	0	53
APPROACH %	10%	90%	0%	0%	71%	29%	67%	0%	33%	0%	0%	0%	
PEAK HR FACTOR		0.625			0.857			0.563			0.000		0.736
APP/DEPART	20	/	24	24	/	20	9	/	0	0	/	9	0

U-TURNS

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

RTOR

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



INTERSECTION TURNING MOVEMENT COUNTS

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

DATE:				
11/7/19	LOCATION:	Chino	PROJECT #:	JN12611
THURSDAY	NORTH & SOUTH:	Euclid	LOCATION #:	3
	EAST & WEST:	Bickmore	CONTROL:	SIGNAL

CLASS 5:	NOTES:
RV	

AM / PM / MD / OTHER / OTHER

▲ N ◄ W E ► S ▼

	NORTHBOUND Euclid			SOUTHBOUND Euclid			EASTBOUND Bickmore			WESTBOUND Bickmore			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	0	1	2	1	1	1	1	1	1	0	
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	1	0	0	0	0	0	0	0	0	0	0	1
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	0	1	0	0	0	0	0	0	0	0	0	0	1
APPROACH %	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
APP/DEPART	1	/	1	0	/	0	0	/	0	0	/	0	0
BEGIN PEAK HR	7:45 AM												
VOLUMES	0	1	0	0	0	0	0	0	0	0	0	0	1
APPROACH %	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
PEAK HR FACTOR	0.250			0.000			0.000			0.000			0.250
APP/DEPART	1	/	1	0	/	0	0	/	0	0	/	0	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	1	0	0	0	0	0	0	0	1
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	0	0	0	0	1	0	0	0	0	0	0	0	1
APPROACH %	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	
APP/DEPART	0	/	0	1	/	1	0	/	0	0	/	0	0
BEGIN PEAK HR	5:15 PM												
VOLUMES	0	0	0	0	1	0	0	0	0	0	0	0	1
APPROACH %	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	
PEAK HR FACTOR	0.000			0.250			0.000			0.000			0.250
APP/DEPART	0	/	0	1	/	1	0	/	0	0	/	0	0

U-TURNS

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

INTERSECTION TURNING MOVEMENT COUNTS

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

DATE:				
11/7/19	LOCATION:	Chino	PROJECT #:	JN12611
THURSDAY	NORTH & SOUTH:	Euclid	LOCATION #:	3
	EAST & WEST:	Bickmore	CONTROL:	SIGNAL

CLASS 6:	NOTES:
BUSES	

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

		NORTHBOUND Euclid			SOUTHBOUND Euclid			EASTBOUND Bickmore			WESTBOUND Bickmore			
		NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
	LANES:	1	2	0	1	2	1	1	1	1	1	1	0	
AM	7:00 AM	0	0	0	1	1	0	0	0	0	0	0	1	3
	7:15 AM	0	1	0	1	0	0	0	0	0	0	0	1	3
	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:45 AM	0	0	0	0	1	0	0	0	0	0	0	0	1
	8:00 AM	0	1	0	1	1	0	0	0	0	0	0	0	3
	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	0	2	0	3	3	0	0	0	0	0	0	2	10
	APPROACH %	0%	100%	0%	50%	50%	0%	0%	0%	0%	0%	0%	100%	
	APP/DEPART	2	/	4	6	/	3	0	/	3	2	/	0	0
	BEGIN PEAK HR		7:15 AM											
	VOLUMES	0	2	0	2	2	0	0	0	0	0	0	1	7
	APPROACH %	0%	100%	0%	50%	50%	0%	0%	0%	0%	0%	0%	100%	
	PEAK HR FACTOR		0.500			0.500			0.000			0.250		0.583
	APP/DEPART	2	/	3	4	/	2	0	/	2	1	/	0	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	1	1
	4:30 PM	0	1	0	0	0	0	0	0	0	0	0	0	1
	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	0	1	0	0	0	0	0	0	0	0	0	1	2
	APPROACH %	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	
	APP/DEPART	1	/	2	0	/	0	0	/	0	1	/	0	0
	BEGIN PEAK HR		4:15 PM											
	VOLUMES	0	1	0	0	0	0	0	0	0	0	0	1	2
	APPROACH %	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	
	PEAK HR FACTOR		0.250			0.000			0.000			0.250		0.500
	APP/DEPART	1	/	2	0	/	0	0	/	0	1	/	0	0

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

INTERSECTION TURNING MOVEMENT COUNTS

T1218

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

DATE: Thu, Nov 7, 19

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

PROJECT #: JN12611
LOCATION #: 4
CONTROL: SIGNAL

NOTES:

Queue EB 4:08 PM

AM
PM
MD
OTHER
OTHER

N
W
E
S

☑ Add U-Turns to Left Turns

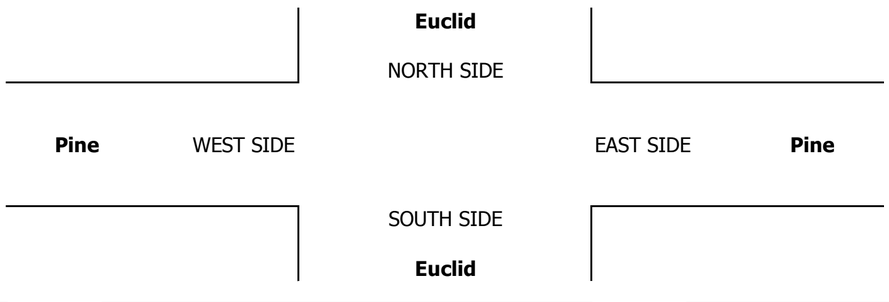
		NORTHBOUND Euclid			SOUTHBOUND Euclid			EASTBOUND Pine			WESTBOUND Pine			
	LANES:	NL 1	NT 2	NR 1	SL 1	ST 1.5	SR 0.5	EL 1	ET 1	ER 1	WL 2	WT 1	WR 0	TOTAL
AM	7:00 AM	4	116	168	16	214	7	1	35	18	183	106	11	879
	7:15 AM	9	148	196	17	198	2	0	27	9	174	71	14	865
	7:30 AM	7	136	251	16	140	4	0	41	8	169	95	20	887
	7:45 AM	18	148	246	14	169	3	1	43	14	141	97	12	906
	8:00 AM	8	119	174	21	157	8	2	41	13	180	111	19	853
	8:15 AM	10	139	148	14	131	10	0	18	13	198	82	16	779
	8:30 AM	8	157	141	19	91	5	5	21	8	225	49	9	738
	8:45 AM	7	109	121	11	98	3	1	20	7	183	54	14	628
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	71	1,072	1,445	128	1,198	42	10	246	90	1,453	665	115	6,535
	APPROACH %	3%	41%	56%	9%	88%	3%	3%	71%	26%	65%	30%	5%	
	APP/DEPART	2,588	/	1,200	1,368	/	2,746	346	/	1,816	2,233	/	773	0
	BEGIN PEAK HR		7:00 AM											
	VOLUMES	38	548	861	63	721	16	2	146	49	667	369	57	3,537
	APPROACH %	3%	38%	60%	8%	90%	2%	1%	74%	25%	61%	34%	5%	
	PEAK HR FACTOR		0.878			0.844			0.849			0.911		0.976
	APP/DEPART	1,447	/	609	800	/	1,441	197	/	1,068	1,093	/	419	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	6	155	250	11	127	4	1	78	17	159	38	18	864
	4:15 PM	7	125	251	14	121	0	1	122	12	158	19	23	853
	4:30 PM	4	168	242	18	127	0	3	94	18	146	49	23	892
	4:45 PM	14	163	238	27	157	3	2	98	15	111	26	8	862
	5:00 PM	10	148	233	27	126	2	5	99	19	156	30	14	869
	5:15 PM	12	178	250	21	178	2	5	100	13	158	19	17	953
	5:30 PM	3	155	234	16	136	0	4	100	16	138	28	15	845
	5:45 PM	15	148	261	16	127	2	2	82	7	131	34	15	840
	VOLUMES	71	1,240	1,959	150	1,099	13	23	773	117	1,157	243	133	6,978
	APPROACH %	2%	38%	60%	12%	87%	1%	3%	85%	13%	75%	16%	9%	
	APP/DEPART	3,270	/	1,398	1,262	/	2,374	913	/	2,879	1,533	/	327	0
	BEGIN PEAK HR		4:30 PM											
	VOLUMES	40	657	963	93	588	7	15	391	65	571	124	62	3,576
	APPROACH %	2%	40%	58%	14%	85%	1%	3%	83%	14%	75%	16%	8%	
	PEAK HR FACTOR		0.943			0.856			0.957			0.868		0.938
	APP/DEPART	1,660	/	735	688	/	1,225	471	/	1,445	757	/	171	0

U-TURNS

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

RTOR

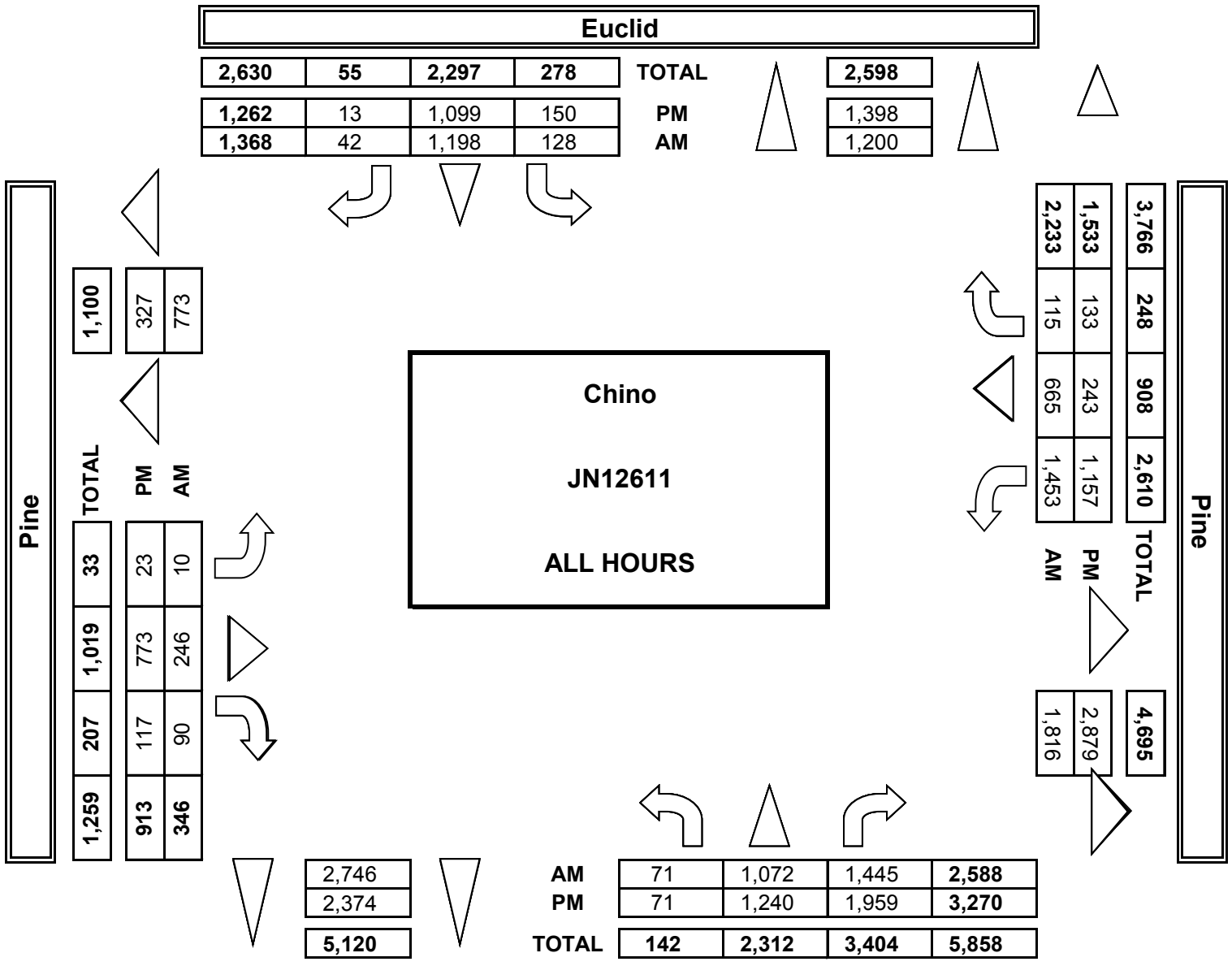
NRR	SRR	ERR	WRR
0	0	X	0
103	1	0	0
111	0	0	2
158	2	0	5
123	0	0	0
103	4	0	2
71	4	0	2
73	1	0	3
74	2	0	1
0	0	0	0
0	0	0	0
0	0	0	0
816	14	0	15
495	3	0	7
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
114	1	0	0
116	0	0	6
110	0	0	1
100	0	0	4
125	0	0	3
108	1	0	6
104	0	0	3
121	0	0	5
898	2	0	28
443	1	0	14

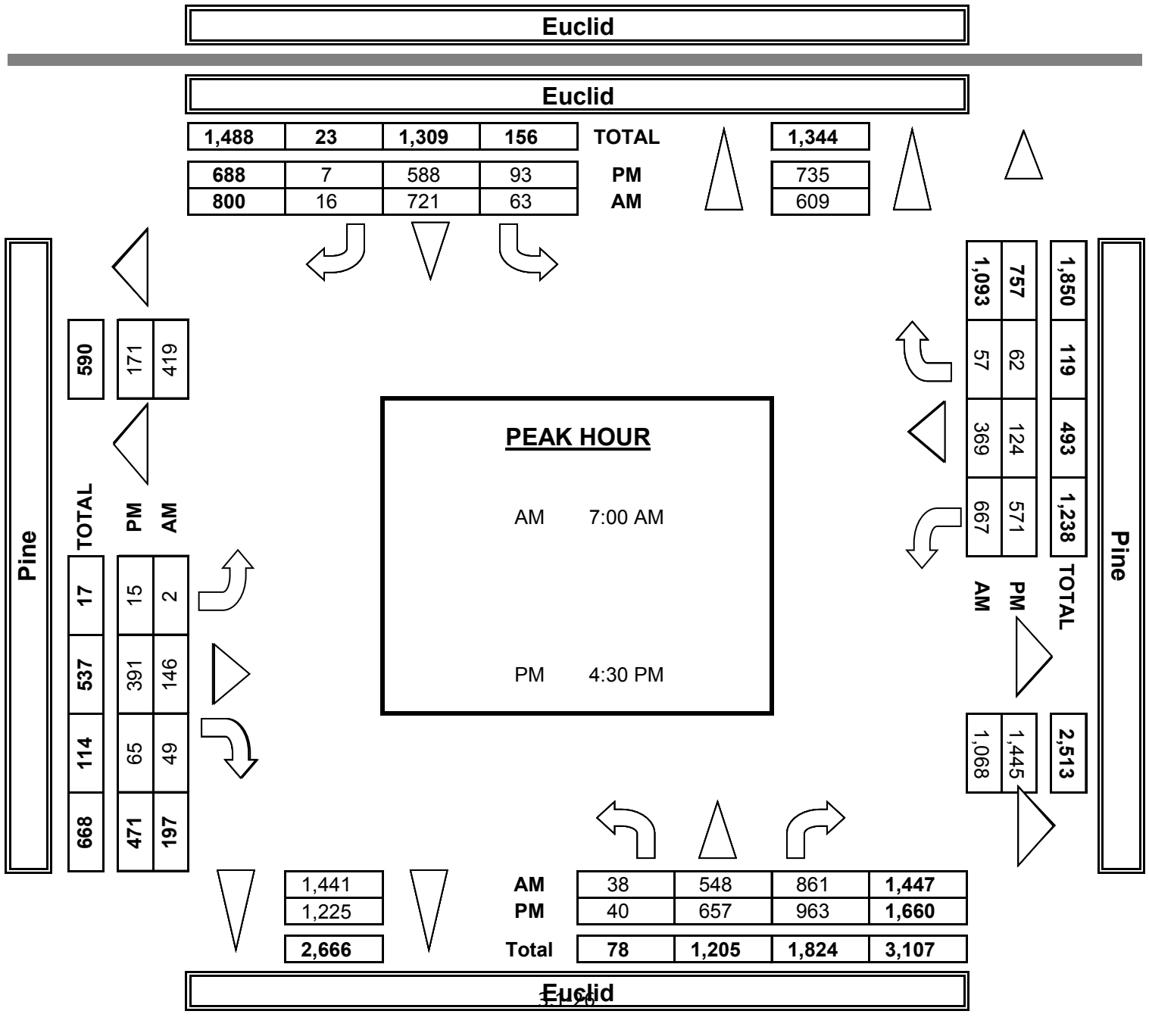


		ALL PED AND BIKE					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	ES	WS	SS	NS	TOTAL
AM	7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:45 AM	0	0	0	0	0	0	0	0	0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

AimTD LLC

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

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

DATE:				
11/7/19	LOCATION:	Chino	PROJECT #:	JN12611
THURSDAY	NORTH & SOUTH:	Euclid	LOCATION #:	4
	EAST & WEST:	Pine	CONTROL:	SIGNAL

CLASS 1: PASSENGER VEHICLES

NOTES:

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

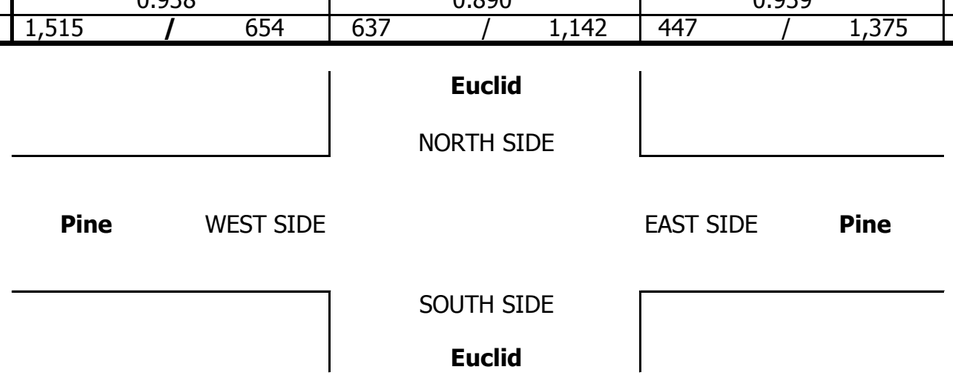
	NORTHBOUND Euclid			SOUTHBOUND Euclid			EASTBOUND Pine			WESTBOUND Pine			
LANES:	NL 1	NT 2	NR 1	SL 1	ST 1.5	SR 0.5	EL 1	ET 1	ER 1	WL 2	WT 1	WR 0	TOTAL
7:00 AM	4	105	152	12	179	6	1	30	14	180	101	9	793
7:15 AM	8	140	173	12	175	2	0	21	8	165	64	11	779
7:30 AM	7	125	231	12	94	3	0	36	5	157	88	19	777
7:45 AM	17	136	227	6	117	2	0	36	8	129	89	10	777
8:00 AM	4	101	149	15	139	8	2	36	4	176	108	15	757
8:15 AM	9	130	138	10	114	10	0	17	8	189	77	16	718
8:30 AM	5	134	126	15	73	5	3	19	4	215	47	5	651
8:45 AM	3	96	104	10	78	1	1	18	3	178	51	11	554
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	57	967	1,300	92	969	37	7	213	54	1,389	625	96	5,806
APPROACH %	2%	42%	56%	8%	88%	3%	3%	78%	20%	66%	30%	5%	
APP/DEPART	2,324	/	1,072	1,098	/	2,417	274	/	1,603	2,110	/	714	0
BEGIN PEAK HR		7:00 AM											
VOLUMES	32	506	783	40	565	13	1	123	35	631	342	49	3,126
APPROACH %	2%	38%	59%	6%	91%	2%	1%	77%	22%	62%	33%	5%	
PEAK HR FACTOR		0.872			0.787			0.883			0.881		0.985
APP/DEPART	1,325	/	558	620	/	1,235	159	/	946	1,022	/	387	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	3	127	231	10	116	4	1	73	15	153	37	15	785
4:15 PM	2	112	238	13	104	0	1	109	12	150	18	18	777
4:30 PM	1	145	229	18	115	0	3	90	17	138	45	18	819
4:45 PM	9	142	224	27	151	0	1	94	8	103	24	5	788
5:00 PM	4	135	222	26	120	1	5	97	17	149	29	14	819
5:15 PM	4	165	235	17	161	1	4	98	13	149	18	15	880
5:30 PM	2	142	224	14	126	0	3	95	12	134	28	11	791
5:45 PM	9	127	253	16	113	0	1	80	7	124	34	15	779
VOLUMES	34	1,095	1,856	141	1,006	6	19	736	101	1,100	233	111	6,438
APPROACH %	1%	37%	62%	12%	87%	1%	2%	86%	12%	76%	16%	8%	
APP/DEPART	2,985	/	1,227	1,153	/	2,208	856	/	2,731	1,444	/	272	0
BEGIN PEAK HR		4:30 PM											
VOLUMES	17	587	910	86	547	2	13	379	55	539	116	52	3,306
APPROACH %	1%	39%	60%	14%	86%	0%	3%	85%	12%	76%	16%	7%	
PEAK HR FACTOR		0.938			0.890			0.939			0.879		0.939
APP/DEPART	1,515	/	654	637	/	1,142	447	/	1,375	707	/	135	0

U-TURNS

NB	SB	EB	WB	TTL
1	1	0	0	2
1	0	0	0	1
0	1	0	0	1
2	0	0	0	2
0	0	0	0	0
1	0	0	0	1
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
5	2	0	0	7
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	1	0	0	1
1	1	0	0	2
0	0	0	0	0
0	0	0	0	0
1	2	0	0	3

RTOR

NRR	SRR	ERR	WRR
0	0	X	0
93	1	0	0
97	0	0	2
149	1	0	5
115	0	0	0
89	4	0	2
68	4	0	2
62	1	0	3
65	1	0	1
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
738	12	0	15
454	2	0	7
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
107	1	0	0
111	0	0	5
102	0	0	1
91	0	0	3
121	0	0	3
101	1	0	5
99	0	0	2
118	0	0	5
850	2	0	24
415	1	0	12



INTERSECTION TURNING MOVEMENT COUNTS

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

DATE:				
11/7/19	LOCATION:	Chino	PROJECT #:	JN12611
THURSDAY	NORTH & SOUTH:	Euclid	LOCATION #:	4
	EAST & WEST:	Pine	CONTROL:	SIGNAL

CLASS 2:	NOTES:
2-AXLE WORK VEHICLES/ TRUCKS	

AM / PM / MD / OTHER / OTHER

▲ N ◄ W E ► S ▼

	NORTHBOUND Euclid			SOUTHBOUND Euclid			EASTBOUND Pine			WESTBOUND Pine			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	1	1	1.5	0.5	1	1	1	2	1	0	
7:00 AM	0	6	14	3	25	0	0	1	2	3	1	1	56
7:15 AM	0	4	16	2	17	0	0	4	0	7	5	3	58
7:30 AM	0	9	15	2	30	0	0	2	3	10	2	1	74
7:45 AM	0	7	17	7	48	1	0	4	4	5	7	2	102
8:00 AM	0	10	20	3	12	0	0	3	5	0	1	3	57
8:15 AM	0	6	9	3	11	0	0	1	4	4	5	0	43
8:30 AM	0	9	12	1	8	0	0	1	2	9	1	3	46
8:45 AM	0	1	13	1	8	0	0	1	2	4	0	3	33
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	0	52	116	22	159	1	0	17	22	42	22	16	469
APPROACH %	0%	31%	69%	12%	87%	1%	0%	44%	56%	53%	28%	20%	
APP/DEPART	168	/	68	182	/	223	39	/	155	80	/	23	0
BEGIN PEAK HR		7:15 AM											
VOLUMES	0	30	68	14	107	1	0	13	12	22	15	9	291
APPROACH %	0%	31%	69%	11%	88%	1%	0%	52%	48%	48%	33%	20%	
PEAK HR FACTOR		0.817			0.545			0.781			0.767		0.713
APP/DEPART	98	/	39	122	/	141	25	/	95	46	/	16	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	2	17	16	0	4	0	0	2	0	6	1	3	51
4:15 PM	3	11	12	1	13	0	0	10	0	4	0	4	58
4:30 PM	1	18	11	0	6	0	0	4	1	5	2	4	52
4:45 PM	3	19	13	0	3	1	0	1	1	5	2	2	50
5:00 PM	4	9	9	0	3	1	0	1	0	5	1	0	33
5:15 PM	5	9	12	3	11	0	0	1	0	7	0	2	50
5:30 PM	0	10	10	0	5	0	0	3	2	3	0	3	36
5:45 PM	4	15	7	0	7	0	0	1	0	4	0	0	38
VOLUMES	22	108	90	4	52	2	0	23	4	39	6	18	368
APPROACH %	10%	49%	41%	7%	90%	3%	0%	85%	15%	62%	10%	29%	
APP/DEPART	220	/	127	58	/	95	27	/	116	63	/	30	0
BEGIN PEAK HR		4:00 PM											
VOLUMES	9	65	52	0	26	1	0	17	2	20	5	13	211
APPROACH %	7%	52%	41%	0%	93%	4%	0%	89%	11%	53%	13%	34%	
PEAK HR FACTOR		0.900			0.500			0.475			0.864		0.909
APP/DEPART	126	/	79	28	/	48	19	/	69	38	/	15	0

U-TURNS

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

INTERSECTION TURNING MOVEMENT COUNTS

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

DATE:				
11/7/19	LOCATION:	Chino	PROJECT #:	JN12611
THURSDAY	NORTH & SOUTH:	Euclid	LOCATION #:	4
	EAST & WEST:	Pine	CONTROL:	SIGNAL

CLASS 3: 3-AXLE TRUCKS

NOTES:

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

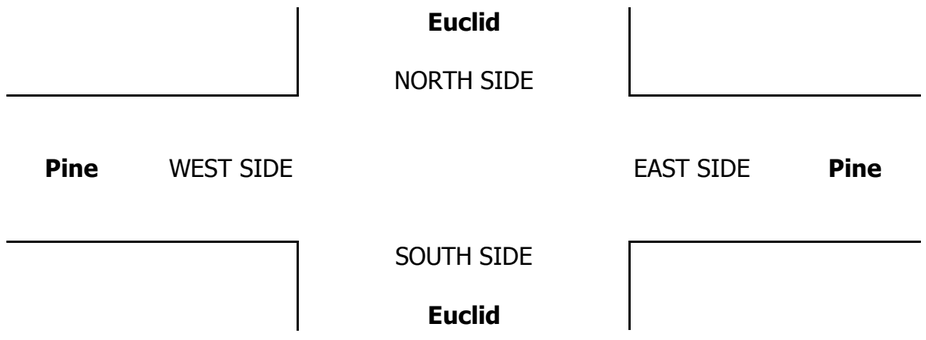
	NORTHBOUND Euclid			SOUTHBOUND Euclid			EASTBOUND Pine			WESTBOUND Pine			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	1	1	1.5	0.5	1	1	1	2	1	0	
7:00 AM	0	1	1	0	3	1	0	1	0	0	2	1	10
7:15 AM	0	0	3	2	2	0	0	1	0	2	2	0	12
7:30 AM	0	0	0	0	6	0	0	0	0	1	3	0	10
7:45 AM	1	1	1	0	0	0	0	1	0	5	0	0	9
8:00 AM	0	1	2	2	3	0	0	0	2	3	0	0	13
8:15 AM	0	0	0	0	1	0	0	0	0	0	0	0	1
8:30 AM	0	4	1	0	6	0	0	0	0	1	0	1	13
8:45 AM	0	2	2	0	2	1	0	0	1	0	2	0	10
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	1	9	10	4	23	2	0	3	3	12	9	2	78
APPROACH %	5%	45%	50%	14%	79%	7%	0%	50%	50%	52%	39%	9%	
APP/DEPART	20	/	12	29	/	38	6	/	16	23	/	12	0
BEGIN PEAK HR		7:15 AM											
VOLUMES	1	2	6	3	11	0	0	2	2	11	5	0	44
APPROACH %	11%	22%	67%	20%	73%	0%	0%	50%	50%	69%	31%	0%	
PEAK HR FACTOR		0.750			0.625			0.500			0.800		0.846
APP/DEPART	9	/	3	15	/	24	4	/	11	16	/	6	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	1	4	0	0	2	0	0	3	0	0	0	0	10
4:15 PM	0	1	1	0	0	0	0	2	0	0	0	0	4
4:30 PM	0	0	0	0	0	0	0	0	0	1	1	0	2
4:45 PM	0	1	0	0	0	0	0	0	0	3	0	0	4
5:00 PM	0	2	0	1	2	0	0	1	0	1	0	0	7
5:15 PM	0	2	1	0	2	0	0	0	0	1	0	0	6
5:30 PM	0	1	0	1	1	0	0	0	0	1	0	0	4
5:45 PM	0	2	1	0	1	0	0	1	0	0	0	0	5
VOLUMES	1	13	3	2	8	0	0	7	0	7	1	0	42
APPROACH %	6%	76%	18%	20%	80%	0%	0%	100%	0%	88%	13%	0%	
APP/DEPART	17	/	13	10	/	15	7	/	12	8	/	2	0
BEGIN PEAK HR		5:00 PM											
VOLUMES	0	7	2	2	6	0	0	2	0	3	0	0	22
APPROACH %	0%	78%	22%	25%	75%	0%	0%	100%	0%	100%	0%	0%	
PEAK HR FACTOR		0.750			0.667			0.500			0.750		0.786
APP/DEPART	9	/	7	8	/	9	2	/	6	3	/	0	0

U-TURNS

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

RTOR

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



INTERSECTION TURNING MOVEMENT COUNTS

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

DATE:				
11/7/19	LOCATION:	Chino	PROJECT #:	JN12611
THURSDAY	NORTH & SOUTH:	Euclid	LOCATION #:	4
	EAST & WEST:	Pine	CONTROL:	SIGNAL

CLASS 4: 4 OR MORE AXLE TRUCKS

NOTES:

AM / PM / MD / OTHER / OTHER

▲ N ◄ W E ► S ▼

	NORTHBOUND Euclid			SOUTHBOUND Euclid			EASTBOUND Pine			WESTBOUND Pine			
LANES:	NL 1	NT 2	NR 1	SL 1	ST 1.5	SR 0.5	EL 1	ET 1	ER 1	WL 2	WT 1	WR 0	TOTAL
7:00 AM	0	3	1	0	7	0	0	2	2	0	1	0	16
7:15 AM	1	4	4	1	4	0	0	0	1	0	0	0	15
7:30 AM	0	2	3	2	10	1	0	3	0	1	2	0	24
7:45 AM	0	3	0	0	4	0	1	1	2	1	0	0	12
8:00 AM	4	6	2	1	2	0	0	2	2	1	2	1	23
8:15 AM	1	3	1	1	5	0	0	0	1	4	0	0	16
8:30 AM	3	10	2	3	4	0	2	1	2	0	1	0	28
8:45 AM	4	10	2	0	10	1	0	0	1	1	1	0	30
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
AM VOLUMES	13	41	15	8	46	2	3	9	11	8	7	1	164
APPROACH %	19%	59%	22%	14%	82%	4%	13%	39%	48%	50%	44%	6%	
APP/DEPART	69	/	45	56	/	65	23	/	32	16	/	22	0
BEGIN PEAK HR		8:00 AM											
VOLUMES	12	29	7	5	21	1	2	3	6	6	4	1	97
APPROACH %	25%	60%	15%	19%	78%	4%	18%	27%	55%	55%	36%	9%	
PEAK HR FACTOR		0.750			0.614			0.550			0.688		0.808
APP/DEPART	48	/	32	27	/	33	11	/	15	11	/	17	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	7	3	1	5	0	0	0	2	0	0	0	18
4:15 PM	2	1	0	0	4	0	0	1	0	1	1	1	11
4:30 PM	2	4	1	0	6	0	0	0	0	2	1	1	17
4:45 PM	2	1	1	0	3	2	0	3	6	0	0	1	19
5:00 PM	2	1	2	0	1	0	0	0	2	0	0	0	8
5:15 PM	3	2	1	0	4	1	1	1	0	0	1	0	14
5:30 PM	1	2	0	1	4	0	1	2	2	0	0	1	14
5:45 PM	2	4	0	0	6	2	1	0	0	3	0	0	18
PM VOLUMES	14	22	8	2	33	5	3	7	12	6	3	4	119
APPROACH %	32%	50%	18%	5%	83%	13%	14%	32%	55%	46%	23%	31%	
APP/DEPART	44	/	29	40	/	51	22	/	17	13	/	22	0
BEGIN PEAK HR		4:00 PM											
VOLUMES	6	13	5	1	18	2	0	4	8	3	2	3	65
APPROACH %	25%	54%	21%	5%	86%	10%	0%	33%	67%	38%	25%	38%	
PEAK HR FACTOR		0.600			0.875			0.333			0.500		0.855
APP/DEPART	24	/	16	21	/	29	12	/	10	8	/	10	0

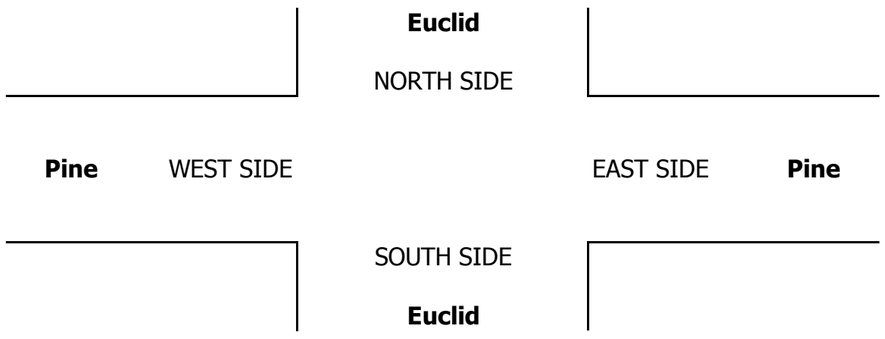
U-TURNS

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

RTOR

	NRR	SRR	ERR	WRR
7:00 AM	0	0	0	0
7:15 AM	3	0	0	0
7:30 AM	1	1	0	0
7:45 AM	0	0	0	0
8:00 AM	0	0	0	0
8:15 AM	0	0	0	0
8:30 AM	2	0	0	0
8:45 AM	2	1	0	0
9:00 AM	0	0	0	0
9:15 AM	0	0	0	0
9:30 AM	0	0	0	0
9:45 AM	0	0	0	0
AM VOLUMES	8	2	0	0
03:00 PM	0	0	0	0
3:15 PM	0	0	0	0
3:30 PM	0	0	0	0
3:45 PM	0	0	0	0
4:00 PM	2	0	0	0
4:15 PM	0	0	0	0
4:30 PM	1	0	0	0
4:45 PM	0	0	0	0
5:00 PM	0	0	0	0
5:15 PM	0	0	0	0
5:30 PM	0	0	0	0
5:45 PM	0	0	0	0
PM VOLUMES	3	0	0	0

PEAK HR VOLUMES				
	4	1	0	0
	3	0	0	0



INTERSECTION TURNING MOVEMENT COUNTS

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

DATE:				
11/7/19	LOCATION:	Chino	PROJECT #:	JN12611
THURSDAY	NORTH & SOUTH:	Euclid	LOCATION #:	4
	EAST & WEST:	Pine	CONTROL:	SIGNAL

CLASS 5:	NOTES:
RV	

AM / PM / MD / OTHER / OTHER

▲ N ▼ S ◄ W E ►

	NORTHBOUND Euclid			SOUTHBOUND Euclid			EASTBOUND Pine			WESTBOUND Pine			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	1	1	1.5	0.5	1	1	1	2	1	0	
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	1	0	0	0	0	0	0	0	0	0	0	1
8:00 AM	0	0	1	0	0	0	0	0	0	0	0	0	1
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	0	1	1	0	0	0	0	0	0	0	0	0	2
APPROACH %	0%	50%	50%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
APP/DEPART	2	/	1	0	/	0	0	/	1	0	/	0	0
BEGIN PEAK HR	7:45 AM												
VOLUMES	0	1	1	0	0	0	0	0	0	0	0	0	2
APPROACH %	0%	50%	50%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
PEAK HR FACTOR		0.500			0.000			0.000			0.000		0.500
APP/DEPART	2	/	1	0	/	0	0	/	1	0	/	0	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	1	0	0	0	0	0	0	0	0	0	1
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	1	1	0	0	0	0	0	1	0	0	3
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	0	0	2	1	0	0	0	0	0	1	0	0	4
APPROACH %	0%	0%	100%	100%	0%	0%	0%	0%	0%	100%	0%	0%	
APP/DEPART	2	/	0	1	/	1	0	/	3	1	/	0	0
BEGIN PEAK HR	4:30 PM												
VOLUMES	0	0	2	1	0	0	0	0	0	1	0	0	4
APPROACH %	0%	0%	100%	100%	0%	0%	0%	0%	0%	100%	0%	0%	
PEAK HR FACTOR		0.500			0.250			0.000			0.250		0.333
APP/DEPART	2	/	0	1	/	1	0	/	3	1	/	0	0

U-TURNS

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

INTERSECTION TURNING MOVEMENT COUNTS

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

DATE:				
11/7/19	LOCATION:	Chino	PROJECT #:	JN12611
THURSDAY	NORTH & SOUTH:	Euclid	LOCATION #:	4
	EAST & WEST:	Pine	CONTROL:	SIGNAL

CLASS 6:	NOTES:
BUSES	

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

		NORTHBOUND Euclid			SOUTHBOUND Euclid			EASTBOUND Pine			WESTBOUND Pine			
		NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
	LANES:	1	2	1	1	1.5	0.5	1	1	1	2	1	0	
AM	7:00 AM	0	1	0	1	0	0	0	1	0	0	1	0	4
	7:15 AM	0	0	0	0	0	0	0	1	0	0	0	0	1
	7:30 AM	0	0	2	0	0	0	0	0	0	0	0	0	2
	7:45 AM	0	0	1	1	0	0	0	1	0	1	1	0	5
	8:00 AM	0	1	0	0	1	0	0	0	0	0	0	0	2
	8:15 AM	0	0	0	0	0	0	0	0	0	1	0	0	1
	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:45 AM	0	0	0	0	0	0	0	1	0	0	0	0	1
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	0	2	3	2	1	0	0	4	0	2	2	0	16
	APPROACH %	0%	40%	60%	67%	33%	0%	0%	100%	0%	50%	50%	0%	
	APP/DEPART	5	/	2	3	/	3	4	/	9	4	/	2	0
	BEGIN PEAK HR		7:00 AM											
	VOLUMES	0	1	3	2	0	0	0	3	0	1	2	0	12
	APPROACH %	0%	25%	75%	100%	0%	0%	0%	100%	0%	33%	67%	0%	
	PEAK HR FACTOR		0.500			0.500			0.750			0.375		0.600
	APP/DEPART	4	/	1	2	/	1	3	/	8	3	/	2	0
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:15 PM	0	0	0	0	0	0	0	0	0	3	0	0	3
	4:30 PM	0	1	0	0	0	0	0	0	0	0	0	0	1
	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:00 PM	0	1	0	0	0	0	0	0	0	1	0	0	2
	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	0	2	0	0	0	0	0	0	0	4	0	0	6
	APPROACH %	0%	100%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	
	APP/DEPART	2	/	2	0	/	4	0	/	0	4	/	0	0
	BEGIN PEAK HR		4:15 PM											
	VOLUMES	0	2	0	0	0	0	0	0	0	4	0	0	6
	APPROACH %	0%	100%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	
	PEAK HR FACTOR		0.500			0.000			0.000			0.333		0.500
	APP/DEPART	2	/	2	0	/	4	0	/	0	4	/	0	0

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

A1019

24-HOUR ROADWAY SEGMENT COUNTS (WITH FHWA CLASSIFICATION)

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

DATE: Thursday, November 07, 2019
JOB #: JN12611

CITY# Chino
CLASS1 Kimball east of Euclid

AM	EASTBOUND														PM	EASTBOUND													
TIME	1	2	3	4	5	6	7	8	9	10	11	12	13	TOTAL	Time	1	2	3	4	5	6	7	8	9	10	11	12	13	TOTAL
0:00	0	18	2	0	2	1	0	0	0	0	0	0	0	23	12:00	1	92	6	0	3	3	2	0	1	2	0	0	0	110
0:15	0	10	4	0	1	0	0	0	0	0	0	0	0	15	12:15	1	60	6	1	1	3	3	0	1	2	0	0	0	78
0:30	0	6	1	0	1	0	0	0	0	0	0	0	0	8	12:30	0	57	3	1	1	3	0	2	1	1	0	0	0	69
0:45	0	9	2	0	0	0	0	0	0	0	0	0	0	11	12:45	2	69	2	1	3	6	2	0	2	1	0	0	0	88
1:00	0	6	1	0	3	0	0	0	0	0	0	0	0	10	13:00	2	64	2	1	1	2	3	0	0	1	0	0	1	77
1:15	0	2	1	0	0	0	0	0	0	0	0	0	0	3	13:15	2	90	2	0	0	2	2	1	0	1	0	0	0	100
1:30	0	6	0	1	1	1	0	1	1	0	0	0	0	11	13:30	0	107	5	0	2	4	0	2	1	3	0	0	0	124
1:45	0	9	1	0	0	0	0	0	0	0	0	0	0	10	13:45	1	118	9	0	2	0	3	3	1	3	1	0	0	141
2:00	0	6	0	0	0	0	0	0	1	0	0	0	0	7	14:00	0	144	10	2	0	2	1	1	1	3	0	0	0	164
2:15	0	11	0	0	0	0	0	0	1	0	0	0	0	12	14:15	3	133	13	0	3	2	2	1	0	1	0	0	0	158
2:30	0	14	3	0	0	0	0	0	0	0	0	0	0	17	14:30	0	131	11	1	1	3	0	0	3	4	0	0	0	154
2:45	0	10	1	0	0	0	0	0	0	0	0	0	0	11	14:45	1	168	9	0	3	4	5	2	0	2	0	0	1	195
3:00	0	4	1	0	0	0	0	0	0	0	0	0	0	5	15:00	3	153	10	1	0	2	1	1	1	2	0	0	1	175
3:15	0	4	0	0	0	1	0	0	0	0	0	0	0	5	15:15	0	172	9	1	3	1	2	1	2	6	1	0	1	199
3:30	0	4	0	0	0	0	0	0	0	0	0	0	0	4	15:30	1	202	11	2	1	1	3	1	1	9	0	2	1	235
3:45	0	10	1	0	2	2	0	0	0	0	0	0	0	15	15:45	1	187	6	1	2	2	1	1	0	2	0	0	0	203
4:00	0	6	0	0	2	0	0	0	0	0	0	0	0	8	16:00	1	250	13	0	4	7	4	0	0	2	0	0	1	282
4:15	0	15	4	1	0	0	0	0	0	0	0	0	0	20	16:15	2	262	16	1	3	1	2	1	2	3	0	0	0	293
4:30	1	17	4	0	0	1	1	0	1	0	0	0	0	25	16:30	1	186	14	0	5	1	3	5	3	1	0	0	2	221
4:45	0	20	1	0	0	1	0	0	1	0	0	0	0	23	16:45	0	177	15	0	4	5	0	3	0	0	0	0	1	205
5:00	0	26	1	0	1	1	0	1	0	0	0	0	0	30	17:00	1	172	16	1	2	4	2	9	1	1	0	1	1	211
5:15	1	10	5	0	2	1	1	1	0	0	0	0	0	21	17:15	3	229	17	0	3	4	2	3	3	0	1	0	0	265
5:30	0	36	5	0	4	1	0	0	1	0	0	0	1	48	17:30	0	197	20	0	7	3	1	1	1	0	0	0	0	230
5:45	0	48	7	0	3	2	1	0	0	0	0	0	0	61	17:45	3	217	12	0	4	3	3	2	0	0	0	0	0	244
6:00	0	30	5	1	2	2	1	0	0	0	0	0	0	41	18:00	2	185	9	0	1	9	0	4	0	0	1	1	0	212
6:15	0	49	7	2	4	1	0	0	1	0	0	0	0	64	18:15	2	175	12	0	4	3	1	4	1	0	0	0	0	202
6:30	1	52	9	0	9	0	0	0	4	0	0	1	0	76	18:30	1	169	11	0	6	2	0	1	0	0	1	0	0	191
6:45	0	55	7	1	8	0	0	1	0	0	0	2	0	74	18:45	0	173	7	0	2	2	0	0	0	0	0	0	0	184
7:00	0	53	8	0	6	0	0	0	1	1	0	0	0	69	19:00	1	187	9	0	1	0	0	0	0	1	1	0	0	200
7:15	0	78	6	0	6	4	0	0	3	0	0	0	0	97	19:15	1	198	10	0	4	2	0	1	0	0	1	0	0	217
7:30	1	84	7	2	4	2	0	2	0	0	1	0	0	103	19:30	0	171	10	0	3	3	0	0	1	0	0	0	1	189
7:45	1	69	7	0	1	1	0	0	0	0	0	0	0	79	19:45	1	153	8	0	2	1	1	1	1	0	0	0	0	168
8:00	2	92	3	0	7	3	0	0	1	0	0	0	0	108	20:00	0	118	5	0	4	2	0	2	0	0	0	0	0	131
8:15	0	88	4	0	6	5	0	0	0	0	0	1	0	104	20:15	0	119	6	0	2	2	0	2	0	0	0	0	1	132
8:30	2	72	6	1	5	2	0	2	5	0	1	0	1	97	20:30	1	115	7	0	2	1	1	0	1	0	0	0	0	128
8:45	2	56	9	1	1	9	0	2	0	0	0	0	0	80	20:45	0	113	3	0	4	2	0	0	0	0	0	0	1	123
9:00	1	54	3	1	1	5	0	1	1	0	0	0	0	67	21:00	2	102	7	0	2	3	0	0	1	0	0	1	0	118
9:15	0	40	5	0	5	2	0	1	3	0	0	0	0	56	21:15	0	106	1	0	2	3	0	0	1	0	0	0	0	113
9:30	0	29	6	0	3	3	1	1	1	0	1	1	0	46	21:30	0	82	2	0	2	1	1	1	0	0	0	0	0	89
9:45	1	31	8	1	2	2	0	0	4	0	0	0	0	49	21:45	0	67	3	0	1	2	0	0	0	0	0	0	0	73
10:00	1	46	2	1	2	2	0	0	2	0	0	0	0	56	22:00	0	61	2	0	1	2	0	0	0	0	0	0	0	66
10:15	1	57	5	0	8	1	0	4	2	0	0	0	0	78	22:15	0	48	5	0	2	0	0	0	0	0	0	0	0	55
10:30	0	40	2	1	3	0	0	2	3	0	1	0	0	52	22:30	0	39	6	0	0	1	0	0	0	0	0	0	0	46
10:45	0	41	6	2	2	1	1	1	0	0	0	0	0	54	22:45	0	41	5	0	1	1	0	0	0	0	0	0	0	48
11:00	2	44	6	1	6	2	0	4	1	0	0	1	0	67	23:00	1	37	4	0	1	0	0	0	0	0	0	0	0	43
11:15	2	57	2	1	2	4	0	1	0	0	0	0	0	69	23:15	0	33	1	0	0	1	0	0	0	0	0	0	0	35
11:30	1	53	7	0	3	5	2	1	1	0	0	0	0	73	23:30	0	26	1	0	1	1	0	0	1	0	0	0	0	30
11:45	3	84	6	2	1	1	1	1	3	1	0	0	0	103	23:45	1	24	0	0	1	1	0	0	0	0	0	0	0	27
TOTAL	23	1,661	181	20	119	69	9	27	42	2	4	6	2	2,165	TOTAL	42	6,179	371	14	107	113	51	56	32	51	7	5	13	7,041

AM PEAK HOUR	7:30 AM
AM PEAK VOLUME	394

PM PEAK HOUR	3:30 PM
PM PEAK VOLUME	1,013

CLASS 1	Class 1 — Motorcycles	**CLASS 8**	3 to 4 Axles, Single Trailer
CLASS 2	Passenger Cars	**CLASS 9**	5 Axles, Single Trailer
CLASS 3	2 Axles, 4-Tire Single Units	**CLASS 10**	6 or More Axles, Single Trailer
CLASS 4	Buses	**CLASS 11**	5 or Less Axles, Multi-Trailers
CLASS 5	2 Axles, 6-Tire Single Units	**CLASS 12**	6 Axles, Multi-Trailers
CLASS 6	3 Axles, Single Unit	**CLASS 13**	7 or More Axles, Multi-Trailers
CLASS 7	4 or More Axles, Single Unit		

TOTAL: AM+PM	65	7,840	552	34	226	182	60	83	74	53	11	11	15	9,206
% OF TOTAL	0.7%	85.2%	6.0%	0.4%	2.5%	2.0%	0.7%	0.9%	0.8%	0.6%	0.1%	0.1%	0.2%	100.0%

Class	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	
TOTAL: ALL	94	14,909	1,382	83	553	259	67	113	193	54	12	12	15	17,746
% OF TOTAL	0.5%	84.0%	7.8%	0.5%	3.1%	1.5%	0.4%	0.6%	1.1%	0.3%	0.1%	0.1%	0.1%	100.0%

24-HOUR ROADWAY SEGMENT COUNTS (WITH FHWA CLASSIFICATION)

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

DATE: Thursday, November 07, 2019
JOB #: JN12611

CITY# Chino
CLASS1 Kimball east of Euclid

AM	WESTBOUND													
TIME	1	2	3	4	5	6	7	8	9	10	11	12	13	TOTAL
0:00	0	3	1	0	0	0	0	0	0	0	0	0	0	4
0:15	0	2	0	0	1	0	0	0	0	0	0	0	0	3
0:30	0	4	0	0	0	0	0	0	0	0	0	0	0	4
0:45	0	4	1	0	1	0	0	0	0	0	0	0	0	6
1:00	0	3	1	0	0	0	0	0	0	0	0	0	0	4
1:15	0	4	0	0	0	0	0	0	0	0	0	0	0	4
1:30	0	3	0	0	0	0	0	0	0	0	0	0	0	3
1:45	0	0	0	0	1	0	0	0	0	0	0	0	0	1
2:00	0	2	0	0	1	0	0	0	0	0	0	0	0	3
2:15	0	0	0	0	0	1	0	0	0	0	0	0	0	1
2:30	0	1	0	0	0	0	0	0	0	0	0	0	0	1
2:45	0	1	0	0	0	2	0	0	0	0	0	0	0	3
3:00	0	7	1	0	0	0	0	0	0	0	0	0	0	8
3:15	0	7	2	0	0	0	0	0	0	0	0	0	0	9
3:30	0	7	0	0	0	0	0	0	0	0	0	0	0	7
3:45	0	15	1	0	0	0	0	0	1	0	0	0	0	17
4:00	0	22	3	0	2	0	0	0	1	0	0	0	0	28
4:15	0	22	5	0	1	0	0	0	0	0	0	0	0	28
4:30	0	36	8	0	1	0	0	0	1	0	0	0	0	46
4:45	0	71	8	0	4	0	0	0	3	0	0	0	0	86
5:00	0	91	22	0	6	1	0	0	0	0	0	0	0	120
5:15	2	171	33	0	12	1	0	2	0	0	0	0	0	221
5:30	1	179	31	1	8	1	0	0	1	0	0	0	0	222
5:45	0	207	29	0	15	0	0	1	0	0	0	0	0	252
6:00	2	192	25	1	19	1	3	1	3	0	0	0	0	247
6:15	0	197	27	0	6	0	0	0	0	0	0	0	0	230
6:30	2	204	23	1	9	0	0	1	2	0	0	0	0	242
6:45	0	251	20	2	2	6	1	0	0	0	0	0	0	282
7:00	1	273	18	0	6	2	3	1	1	1	0	0	0	306
7:15	0	256	14	0	9	6	0	0	1	0	0	1	0	287
7:30	0	238	26	1	9	0	0	0	2	0	0	0	0	276
7:45	0	229	18	0	4	0	0	0	1	0	0	0	0	252
8:00	1	225	15	1	5	3	0	0	1	0	0	0	0	251
8:15	1	206	12	0	8	3	0	0	0	0	0	0	0	230
8:30	2	162	15	3	6	1	0	0	3	0	0	0	0	192
8:45	0	120	13	0	6	2	0	0	4	0	0	0	0	145
9:00	0	117	11	0	5	2	0	0	2	0	0	0	0	137
9:15	0	102	9	0	3	1	0	0	3	0	0	0	0	118
9:30	0	90	10	1	4	2	0	0	1	0	0	0	0	108
9:45	0	85	9	1	3	1	0	0	0	0	0	0	0	99
10:00	2	68	13	2	3	8	0	1	5	0	0	0	0	102
10:15	0	61	10	0	3	2	0	1	3	0	0	0	0	80
10:30	0	74	7	0	4	3	0	0	1	0	0	0	0	89
10:45	0	70	7	2	4	2	0	2	6	0	0	0	0	93
11:00	1	53	15	0	5	2	0	0	2	0	0	0	0	78
11:15	0	85	7	1	4	2	0	1	1	0	0	0	0	101
11:30	1	60	11	0	5	2	0	1	1	0	0	0	0	81
11:45	0	56	10	1	3	0	0	0	0	0	0	0	0	70
TOTAL	16	4,336	491	18	188	57	7	12	50	1	0	1	0	5,177

PM	WESTBOUND													
Time	1	2	3	4	5	6	7	8	9	10	11	12	13	TOTAL
12:00	0	81	8	0	5	1	0	0	4	0	0	0	0	99
12:15	3	81	9	2	14	0	0	2	4	0	0	0	0	115
12:30	0	70	7	0	5	1	0	1	8	0	0	0	0	92
12:45	2	57	11	1	6	2	0	0	3	0	0	0	0	82
13:00	0	61	2	1	7	0	0	0	5	0	0	0	0	76
13:15	0	58	12	4	0	1	0	0	4	0	0	0	0	79
13:30	0	67	6	4	2	0	0	0	1	0	0	0	0	80
13:45	1	73	12	0	4	0	0	1	2	0	0	0	0	93
14:00	1	73	13	1	3	0	0	0	3	0	0	0	0	94
14:15	1	76	9	2	10	0	0	0	1	0	0	0	0	99
14:30	0	92	11	1	9	0	0	1	2	0	1	0	0	117
14:45	1	108	21	2	6	1	0	1	1	0	0	0	0	141
15:00	0	80	11	3	5	1	0	1	1	0	0	0	0	102
15:15	1	66	14	0	3	2	0	1	0	0	0	0	0	87
15:30	0	108	12	1	2	1	0	0	3	0	0	0	0	127
15:45	1	91	12	1	6	0	0	0	2	0	0	0	0	113
16:00	0	89	14	1	5	0	0	1	4	0	0	0	0	114
16:15	1	82	12	0	3	0	0	0	2	0	0	0	0	100
16:30	1	107	14	1	5	1	0	1	2	0	0	0	0	132
16:45	0	115	16	1	3	0	0	0	2	0	0	0	0	137
17:00	0	105	14	0	3	3	0	0	3	0	0	0	0	128
17:15	0	101	10	1	4	0	0	0	2	0	0	0	0	118
17:30	0	96	12	1	2	0	0	0	2	0	0	0	0	113
17:45	0	98	6	1	0	1	0	0	0	0	0	0	0	106
18:00	0	66	11	0	2	0	0	0	0	0	0	0	0	79
18:15	0	65	5	0	1	0	0	0	0	0	0	0	0	71
18:30	0	74	5	0	3	2	0	0	0	0	0	0	0	84
18:45	0	54	9	1	4	1	0	1	0	0	0	0	0	70
19:00	0	46	5	0	3	0	0	0	1	0	0	0	0	55
19:15	0	42	1	0	0	0	0	1	0	0	0	0	0	44
19:30	0	48	1	0	2	0	0	0	0	0	0	0	0	51
19:45	0	36	4	0	1	0	0	0	0	0	0	0	0	41
20:00	0	26	4	0	0	0	0	0	0	0	0	0	0	30
20:15	0	19	1	0	2	0	0	0	2	0	0	0	0	24
20:30	0	32	2	0	0	0	0	0	0	0	0	0	0	34
20:45	0	28	3	0	2	0	0	1	0	0	0	0	0	34
21:00	0	24	2	0	1	1	0	1	1	0	0	0	0	30
21:15	0	23	1	0	2	0	0	1	0	0	0	0	0	27
21:30	0	17	2	0	0	0	0	1	2	0	0	0	0	22
21:45	0	7	3	0	0	0	0	0	1	0	0	0	0	11
22:00	0	11	3	0	1	0	0	2	0	0	0	0	0	17
22:15	0	13	1	0	0	1	0	0	0	0	0	0	0	15
22:30	0	16	1	0	1	0	0	0	0	0	0	0	0	18
22:45	0	4	3	1	2	0	0	0	0	0	0	0	0	10
23:00	0	12	0	0	0	0	0	0	1	0	0	0	0	13
23:15	0	14	2	0	0	0	0	0	0	0	0	0	0	16
23:30	0	13	1	0	0	0	0	0	0	0	0	0	0	14
23:45	0	8	1	0	0	0	0	0	0	0	0	0	0	9
TOTAL	13	2,733	339	31	139	20	0	18	69	0	1	0	0	3,363

AM PEAK HOUR	6:45 AM
AM PEAK VOLUME	1,151
PM PEAK HOUR	4:30 PM
PM PEAK VOLUME	515

CLASS 1	Class 1 — Motorcycles	**CLASS 8**	3 to 4 Axles, Single Trailer
CLASS 2	Passenger Cars	**CLASS 9**	5 Axles, Single Trailer
CLASS 3	2 Axles, 4-Tire Single Units	**CLASS 10**	6 or More Axles, Single Trailer
CLASS 4	Buses	**CLASS 11**	5 or Less Axles, Multi-Trailers
CLASS 5	2 Axles, 6-Tire Single Units	**CLASS 12**	6 Axles, Multi-Trailers
CLASS 6	3 Axles, Single Unit	**CLASS 13**	7 or More Axles, Multi-Trailers
CLASS 7	4 or More Axles, Single Unit		

TOTAL: AM+PM	29	7,069	830	49	327	77	7	30	119	1	1	1	0	8,540
% OF TOTAL	0.3%	82.8%	9.7%	0.6%	3.8%	0.9%	0.1%	0.4%	1.4%	0.0%	0.0%	0.0%	0.0%	100.0%

Class	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**

A1019

24-HOUR ROADWAY SEGMENT COUNTS (WITH FHWA CLASSIFICATION)

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

DATE: Thursday, November 07, 2019
JOB #: JN12611

CITY# Chino
CLASS2 Euclid north of Bickmore

AM	NORTHBOUND														PM	NORTHBOUND													
TIME	1	2	3	4	5	6	7	8	9	10	11	12	13	TOTAL	Time	1	2	3	4	5	6	7	8	9	10	11	12	13	TOTAL
0:00	0	50	3	0	0	1	0	1	1	0	0	0	0	56	12:00	0	82	11	1	6	3	1	0	5	0	0	1	0	110
0:15	0	27	2	0	1	1	0	1	0	0	0	0	0	32	12:15	0	103	16	0	5	4	2	0	7	1	0	0	1	139
0:30	0	33	0	0	0	0	0	0	2	0	0	0	0	35	12:30	0	86	11	0	8	1	1	5	7	0	0	2	0	121
0:45	0	30	0	0	0	1	0	0	3	0	0	0	0	34	12:45	0	86	18	0	6	2	1	2	3	0	0	0	1	119
1:00	0	22	0	0	1	0	0	0	1	0	0	0	0	24	13:00	0	101	17	1	4	1	1	0	2	1	0	0	0	128
1:15	0	13	2	0	0	1	0	0	2	0	0	0	0	18	13:15	0	84	11	0	4	1	0	2	4	0	0	0	0	106
1:30	0	22	4	0	1	1	0	0	1	0	0	0	0	29	13:30	0	109	14	1	2	4	0	1	5	0	0	0	3	139
1:45	0	14	1	0	0	1	0	0	1	0	0	0	0	17	13:45	1	104	7	0	3	1	1	0	9	0	0	0	2	128
2:00	0	17	2	0	0	0	0	1	3	0	1	0	0	24	14:00	1	115	11	1	4	4	0	1	3	0	1	0	1	142
2:15	0	12	3	1	0	0	0	0	4	0	0	0	0	20	14:15	0	115	24	2	4	4	0	0	4	0	0	0	0	153
2:30	0	14	2	0	1	1	0	1	2	0	0	0	0	21	14:30	1	129	22	1	7	2	1	1	4	0	0	1	3	172
2:45	0	6	1	0	0	1	0	0	2	0	1	0	1	12	14:45	1	147	25	0	7	2	1	0	1	0	0	1	0	185
3:00	0	10	1	0	0	2	0	0	2	0	1	0	0	16	15:00	0	128	17	0	6	1	0	1	3	1	0	0	1	158
3:15	0	9	2	0	0	1	0	0	2	0	1	0	0	15	15:15	0	118	16	1	6	1	1	0	2	2	0	0	0	147
3:30	0	13	3	0	1	3	0	1	3	0	0	0	0	24	15:30	0	133	15	0	7	2	0	1	10	1	4	0	0	173
3:45	0	20	1	0	1	1	0	0	0	0	0	0	0	23	15:45	0	139	12	1	5	3	0	0	2	0	0	0	1	163
4:00	0	18	1	0	1	0	0	0	3	0	0	1	0	24	16:00	3	161	18	0	7	3	0	1	4	0	0	0	1	198
4:15	0	32	1	1	0	0	0	0	1	0	0	0	0	35	16:15	0	153	17	0	7	2	0	1	2	0	0	0	0	182
4:30	0	41	5	0	0	1	0	0	2	0	0	0	1	50	16:30	0	170	17	0	2	5	1	0	2	0	0	0	3	200
4:45	0	30	3	0	3	3	0	0	4	0	0	1	0	44	16:45	0	144	11	0	3	4	0	0	5	0	1	0	0	168
5:00	0	30	2	0	4	0	0	2	2	0	0	0	0	40	17:00	1	152	5	0	2	1	0	1	0	0	0	0	0	162
5:15	0	74	4	0	3	1	0	1	3	0	0	0	0	86	17:15	0	174	14	1	2	1	0	1	2	1	0	0	0	196
5:30	2	74	15	0	4	2	0	0	1	1	0	0	0	99	17:30	1	165	11	1	3	1	1	0	2	1	0	1	0	187
5:45	1	62	7	0	2	1	1	0	0	0	0	0	1	75	17:45	0	151	5	0	3	1	0	0	2	0	0	1	2	165
6:00	0	81	2	0	0	0	0	0	2	0	0	1	0	86	18:00	1	118	12	0	2	0	0	0	3	0	0	0	0	136
6:15	0	99	5	0	1	2	0	3	5	0	0	0	0	115	18:15	1	119	7	0	4	4	0	1	0	0	1	0	0	137
6:30	1	102	15	0	7	1	0	0	3	0	0	0	0	129	18:30	0	117	13	0	2	0	0	0	2	0	0	0	1	135
6:45	1	129	13	0	1	3	0	0	7	0	0	0	1	155	18:45	2	130	9	0	2	3	0	0	2	0	0	0	1	149
7:00	1	159	18	0	4	3	1	1	3	0	1	0	2	193	19:00	0	108	17	0	1	2	0	1	2	0	0	1	1	133
7:15	0	179	11	0	2	4	0	0	4	0	0	0	3	203	19:15	1	122	8	0	3	2	1	0	0	0	0	0	0	137
7:30	0	156	13	0	10	1	1	0	5	1	0	0	0	187	19:30	1	112	11	0	1	2	0	1	2	0	0	0	1	131
7:45	1	154	11	1	7	1	0	0	5	0	0	2	0	182	19:45	1	89	9	0	1	2	0	1	3	0	0	1	1	108
8:00	0	146	10	0	4	1	0	0	7	0	0	0	0	168	20:00	1	81	5	0	2	2	0	2	3	1	0	2	0	99
8:15	3	159	16	0	2	2	0	1	2	0	1	0	0	186	20:15	1	73	9	0	2	0	0	0	6	0	2	0	0	93
8:30	0	151	15	0	6	5	0	2	7	1	1	3	2	193	20:30	0	60	1	0	3	1	0	0	6	0	1	0	0	72
8:45	0	138	29	0	0	1	0	2	4	1	0	0	2	177	20:45	0	56	6	0	0	2	0	1	3	0	0	0	1	69
9:00	0	95	11	1	5	0	0	0	3	0	0	1	1	117	21:00	0	63	2	0	0	1	0	0	3	0	0	0	0	69
9:15	2	79	27	0	6	1	0	0	5	1	1	0	1	123	21:15	1	62	5	0	3	0	0	0	2	0	1	0	0	74
9:30	0	86	7	0	3	0	0	1	5	0	0	0	2	104	21:30	0	59	7	0	0	1	0	1	3	0	0	0	0	71
9:45	0	76	10	0	1	1	0	2	5	0	2	0	0	97	21:45	0	39	4	0	2	0	0	0	2	0	0	0	0	47
10:00	1	75	10	0	6	1	0	2	4	0	0	0	2	101	22:00	0	44	0	0	0	0	0	0	1	0	0	0	0	45
10:15	0	83	8	0	5	4	1	0	4	0	0	0	1	106	22:15	1	33	5	0	0	0	0	0	0	0	0	0	0	39
10:30	0	79	5	1	4	3	0	1	4	0	0	1	0	98	22:30	0	46	2	0	0	0	0	0	3	0	0	0	0	51
10:45	0	76	10	2	6	2	0	2	6	1	1	1	2	109	22:45	0	35	1	0	1	0	0	0	0	0	0	0	0	37
11:00	0	90	8	0	9	1	2	1	3	1	0	0	1	116	23:00	0	39	0	0	0	0	0	0	4	0	0	0	1	44
11:15	0	78	15	0	5	0	0	0	6	0	0	0	1	105	23:15	0	31	0	0	0	0	0	0	2	0	0	0	0	33
11:30	1	78	21	2	6	4	1	0	8	1	0	0	0	122	23:30	0	20	2	0	0	0	0	0	1	0	0	0	0	23
11:45	0	80	10	0	7	5	0	1	4	0	0	2	0	109	23:45	1	19	0	0	0	0	0	0	1	0	0	0	0	21
TOTAL	14	3,301	365	9	130	69	7	27	156	8	11	13	24	4,134	TOTAL	21	4,724	480	11	142	76	13	26	144	9	11	11	26	5,694

AM PEAK HOUR	7:00 AM
AM PEAK VOLUME	765

PM PEAK HOUR	4:00 PM
PM PEAK VOLUME	748

CLASS 1	Class 1 — Motorcycles	**CLASS 8**	3 to 4 Axles, Single Trailer
CLASS 2	Passenger Cars	**CLASS 9**	5 Axles, Single Trailer
CLASS 3	2 Axles, 4-Tire Single Units	**CLASS 10**	6 or More Axles, Single Trailer
CLASS 4	Buses	**CLASS 11**	5 or Less Axles, Multi-Trailers
CLASS 5	2 Axles, 6-Tire Single Units	**CLASS 12**	6 Axles, Multi-Trailers
CLASS 6	3 Axles, Single Unit	**CLASS 13**	7 or More Axles, Multi-Trailers
CLASS 7	4 or More Axles, Single Unit		

TOTAL: AM+PM	35	8,025	845	20	272	145	20	53	300	17	22	24	50	9,828
% OF TOTAL	0.4%	81.7%	8.6%	0.2%	2.8%	1.5%	0.2%	0.5%	3.1%	0.2%	0.2%	0.2%	0.5%	100.0%
Class	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	
TOTAL: ALL	74	14,365	1,891	103	1,248	334	34	136	656	36	59	53	90	19,079
% OF TOTAL	0.4%	75.3%	9.9%	0.5%	6.5%	1.8%	0.2%	0.7%	3.4%	0.2%	0.3%	0.3%	0.5%	100.0%

24-HOUR ROADWAY SEGMENT COUNTS (WITH FHWA CLASSIFICATION)

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

DATE: Thursday, November 07, 2019
JOB #: JN12611

CITY# Chino
CLASS2 Euclid north of Bickmore

AM	SOUTHBOUND														PM	SOUTHBOUND													
TIME	1	2	3	4	5	6	7	8	9	10	11	12	13	TOTAL	Time	1	2	3	4	5	6	7	8	9	10	11	12	13	TOTAL
0:00	0	10	1	0	1	1	0	0	1	0	1	0	0	15	12:00	0	70	39	0	31	3	1	2	13	0	1	0	0	160
0:15	0	13	3	0	0	1	0	1	3	0	0	0	0	21	12:15	2	60	18	1	10	3	0	0	7	1	0	0	1	103
0:30	0	13	2	0	3	0	0	0	1	0	0	0	0	19	12:30	2	62	17	2	14	0	0	3	6	0	0	0	0	106
0:45	0	9	1	0	0	0	0	0	1	0	1	0	0	12	12:45	1	60	19	0	7	2	0	1	10	0	1	1	1	103
1:00	0	6	0	0	1	0	0	0	0	0	0	0	0	7	13:00	0	62	7	0	4	4	0	2	12	0	0	0	0	91
1:15	0	10	0	1	0	0	0	2	1	0	1	0	0	15	13:15	0	65	11	4	10	3	0	1	4	0	0	0	1	99
1:30	0	9	1	5	0	1	0	0	1	0	1	0	0	18	13:30	0	64	12	2	11	1	0	4	5	1	1	0	0	101
1:45	0	7	1	2	1	0	0	1	2	0	0	1	0	15	13:45	1	69	9	3	13	0	0	2	4	1	1	0	0	103
2:00	0	7	0	1	0	0	0	0	0	0	0	1	0	9	14:00	1	92	12	2	16	5	0	1	8	0	0	0	1	138
2:15	0	7	0	4	0	1	0	1	4	0	0	2	0	19	14:15	1	70	16	0	16	2	0	4	6	0	2	0	0	117
2:30	0	4	1	0	1	1	0	0	2	0	2	0	0	11	14:30	0	95	12	3	11	5	0	1	5	0	1	1	1	135
2:45	0	14	3	2	0	0	0	1	4	0	0	0	0	24	14:45	0	109	9	0	15	4	0	0	4	0	0	0	1	142
3:00	0	7	1	1	1	0	0	1	1	1	2	1	0	16	15:00	1	80	13	1	9	4	0	1	4	0	1	0	1	115
3:15	0	10	2	1	0	2	1	0	1	0	1	0	0	18	15:15	0	97	11	2	11	0	0	0	8	1	1	0	1	132
3:30	0	15	2	1	2	2	0	0	2	0	2	1	1	28	15:30	1	108	23	1	9	3	0	0	3	0	1	0	0	149
3:45	0	26	8	0	2	0	0	0	6	0	1	0	0	43	15:45	0	102	11	0	21	4	0	1	3	0	0	0	1	143
4:00	0	36	7	1	3	2	0	1	3	0	2	0	0	55	16:00	0	124	19	0	12	2	0	0	3	1	1	1	0	163
4:15	0	43	5	0	3	2	1	2	6	0	0	1	0	63	16:15	1	128	24	0	17	3	1	0	3	0	0	0	1	178
4:30	2	54	11	0	3	3	0	0	3	0	0	0	0	76	16:30	1	140	13	1	20	1	0	1	1	0	0	0	1	179
4:45	0	97	11	0	10	2	0	1	5	0	0	0	1	127	16:45	1	192	18	0	24	4	0	1	2	0	0	1	0	243
5:00	3	86	17	0	11	2	1	1	6	0	0	1	0	128	17:00	0	170	19	1	10	3	1	0	1	0	0	0	2	207
5:15	0	98	15	1	8	3	0	1	8	0	0	0	2	136	17:15	1	181	15	0	14	4	1	0	3	3	0	0	2	224
5:30	0	86	11	0	4	4	0	1	6	0	0	1	0	113	17:30	0	170	13	2	13	5	0	1	2	0	0	0	1	207
5:45	0	108	12	0	10	4	0	1	6	1	0	0	0	142	17:45	0	166	19	2	16	5	0	0	0	0	1	1	0	210
6:00	0	77	18	0	11	5	1	1	7	3	0	2	1	126	18:00	0	131	12	1	24	1	1	0	4	0	0	1	0	175
6:15	0	69	13	2	6	4	1	2	4	1	3	1	0	106	18:15	0	104	19	1	15	5	0	2	2	0	0	0	1	149
6:30	0	78	12	3	12	1	0	0	3	0	1	2	1	113	18:30	0	93	11	1	18	2	0	0	4	0	0	0	0	129
6:45	1	94	20	0	11	4	0	0	4	1	0	0	1	136	18:45	0	76	13	1	25	3	0	1	0	0	0	1	0	120
7:00	2	103	18	1	24	2	1	0	2	1	0	0	1	155	19:00	0	86	8	0	17	1	0	0	1	0	0	0	0	113
7:15	1	94	12	0	13	4	0	0	1	0	1	1	0	127	19:15	0	87	7	0	5	2	0	2	0	0	0	0	1	104
7:30	2	87	29	1	16	2	0	0	7	1	0	1	2	148	19:30	0	58	9	0	7	0	0	0	2	0	0	1	0	77
7:45	1	99	37	0	16	1	0	2	1	0	0	1	0	158	19:45	1	52	5	0	5	1	0	1	4	0	0	0	0	69
8:00	0	108	21	2	15	4	0	1	0	1	0	0	1	153	20:00	0	43	10	0	7	0	0	2	3	0	0	0	0	65
8:15	0	102	17	1	29	4	0	3	2	0	1	1	1	161	20:15	0	53	5	0	10	0	0	3	2	0	0	0	0	73
8:30	0	111	7	1	12	5	0	1	3	0	0	0	1	141	20:30	0	46	8	0	7	0	0	0	1	0	0	0	0	62
8:45	2	101	24	2	33	2	0	1	4	0	0	0	1	170	20:45	0	29	10	0	2	1	0	1	2	0	0	0	0	45
9:00	0	60	14	1	11	2	0	0	8	0	0	0	0	96	21:00	0	34	9	1	7	0	0	2	5	0	0	0	0	58
9:15	0	51	18	1	45	0	0	1	5	0	0	1	0	122	21:15	0	54	10	0	8	0	0	1	0	0	0	0	0	73
9:30	0	76	14	0	18	3	0	0	7	0	0	0	1	119	21:30	0	38	7	0	3	0	0	1	1	0	0	0	0	50
9:45	0	57	9	1	19	2	0	1	5	0	0	0	1	95	21:45	0	38	7	0	4	0	0	0	3	0	0	0	0	52
10:00	0	55	13	1	10	5	0	2	7	0	0	0	1	94	22:00	0	28	4	0	2	0	0	0	1	0	0	0	0	35
10:15	0	57	15	2	11	3	0	2	9	0	0	0	1	100	22:15	1	26	1	0	2	2	0	0	2	0	0	0	0	34
10:30	2	74	8	1	10	2	0	0	6	0	1	0	0	104	22:30	0	20	3	0	0	0	0	0	0	0	1	0	0	24
10:45	0	67	7	4	5	1	0	5	6	1	0	0	0	96	22:45	0	16	1	0	1	1	0	1	0	0	0	0	0	20
11:00	2	54	9	1	14	4	0	0	14	0	1	0	0	99	23:00	0	19	2	0	2	0	0	0	1	0	0	0	0	24
11:15	1	65	12	2	13	1	0	1	10	0	0	2	0	107	23:15	0	13	0	0	1	1	0	0	2	0	0	0	0	17
11:30	3	61	21	3	41	3	2	0	2	0	1	0	0	137	23:30	0	13	2	0	1	0	0	0	3	0	0	0	0	19
11:45	0	59	18	1	7	4	0	1	6	0	1	0	3	100	23:45	1	13	3	0	3	0	1	1	0	0	0	0	1	23
TOTAL	22	2,634	501	51	466	99	8	39	196	11	24	21	21	4,093	TOTAL	17	3,706	545	32	510	90	6	44	160	8	13	8	19	5,158

AM PEAK HOUR	8:00 AM
AM PEAK VOLUME	625

PM PEAK HOUR	4:45 PM
PM PEAK VOLUME	881

CLASS 1	Class 1 — Motorcycles	**CLASS 8**	3 to 4 Axles, Single Trailer
CLASS 2	Passenger Cars	**CLASS 9**	5 Axles, Single Trailer
CLASS 3	2 Axles, 4-Tire Single Units	**CLASS 10**	6 or More Axles, Single Trailer
CLASS 4	Buses	**CLASS 11**	5 or Less Axles, Multi-Trailers
CLASS 5	2 Axles, 6-Tire Single Units	**CLASS 12**	6 Axles, Multi-Trailers
CLASS 6	3 Axles, Single Unit	**CLASS 13**	7 or More Axles, Multi-Trailers
CLASS 7	4 or More Axles, Single Unit		

TOTAL: AM+PM	39	6,340	1,046	83	976	189	14	83	356	19	37	29	40	9,251
% OF TOTAL	0.4%	68.5%	11.3%	0.9%	10.6%	2.0%	0.2%	0.9%	3.8%	0.2%	0.4%	0.3%	0.4%	100.0%

Class	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**

APPENDIX 3.2:

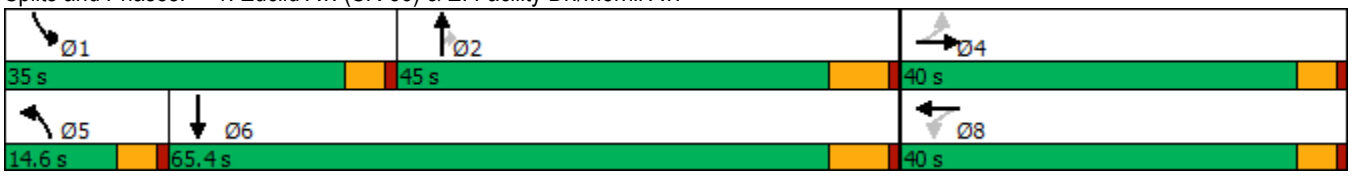
EXISTING (2019) CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS

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Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	4	8	225	48	10	1013	140	120	981
Future Volume (vph)	4	8	225	48	10	1013	140	120	981
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8				2		
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	15.0	15.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	9.6	9.6	21.6	21.6	14.6	28.5	28.5	14.6	42.5
Total Split (s)	40.0	40.0	40.0	40.0	14.6	45.0	45.0	35.0	65.4
Total Split (%)	33.3%	33.3%	33.3%	33.3%	12.2%	37.5%	37.5%	29.2%	54.5%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	5.5	5.5	3.6	5.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.6		4.6	4.6	6.5	6.5	4.6	6.5
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None	Max
Act Effct Green (s)		35.5		35.5	10.0	43.8	43.8	13.2	59.0
Actuated g/C Ratio		0.33		0.33	0.09	0.40	0.40	0.12	0.54
v/c Ratio		0.06		1.05	0.07	0.75	0.21	0.63	0.57
Control Delay		16.1		89.8	48.5	32.2	8.9	59.8	18.3
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		16.1		89.8	48.5	32.2	8.9	59.8	18.3
LOS		B		F	D	C	A	E	B
Approach Delay		16.1		89.8		29.5			22.7
Approach LOS		B		F		C			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 108.3	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.05	
Intersection Signal Delay: 37.3	Intersection LOS: D
Intersection Capacity Utilization 88.6%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 1: Euclid Av. (SR-83) & E. Facility Dr./Merrill Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	8	17	225	48	228	10	1013	140	120	981	39
Future Volume (veh/h)	4	8	17	225	48	228	10	1013	140	120	981	39
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	4	8	17	232	49	208	10	1044	101	124	1011	26
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	82	161	292	271	47	200	39	1554	693	149	1779	46
Arrive On Green	0.31	0.31	0.31	0.31	0.31	0.31	0.02	0.45	0.45	0.09	0.52	0.52
Sat Flow, veh/h	145	511	930	712	150	638	1619	3420	1525	1619	3404	88
Grp Volume(v), veh/h	29	0	0	489	0	0	10	1044	101	124	508	529
Grp Sat Flow(s),veh/h/ln	1587	0	0	1500	0	0	1619	1710	1525	1619	1710	1782
Q Serve(g_s), s	0.0	0.0	0.0	34.0	0.0	0.0	0.7	27.0	4.4	8.5	22.7	22.7
Cycle Q Clear(g_c), s	1.4	0.0	0.0	35.4	0.0	0.0	0.7	27.0	4.4	8.5	22.7	22.7
Prop In Lane	0.14		0.59	0.47		0.43	1.00		1.00	1.00		0.05
Lane Grp Cap(c), veh/h	535	0	0	518	0	0	39	1554	693	149	894	931
V/C Ratio(X)	0.05	0.00	0.00	0.94	0.00	0.00	0.26	0.67	0.15	0.83	0.57	0.57
Avail Cap(c_a), veh/h	535	0	0	518	0	0	144	1554	693	437	894	931
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.0	0.0	0.0	39.2	0.0	0.0	54.0	24.1	18.0	50.3	18.3	18.3
Incr Delay (d2), s/veh	0.0	0.0	0.0	25.8	0.0	0.0	1.3	2.3	0.4	4.5	2.6	2.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.0	16.5	0.0	0.0	0.3	10.3	1.5	3.5	8.5	8.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.0	0.0	0.0	65.0	0.0	0.0	55.3	26.5	18.4	54.8	20.9	20.8
LnGrp LOS	C	A	A	E	A	A	E	C	B	D	C	C
Approach Vol, veh/h		29			489			1155			1161	
Approach Delay, s/veh		27.0			65.0			26.0			24.4	
Approach LOS		C			E			C			C	

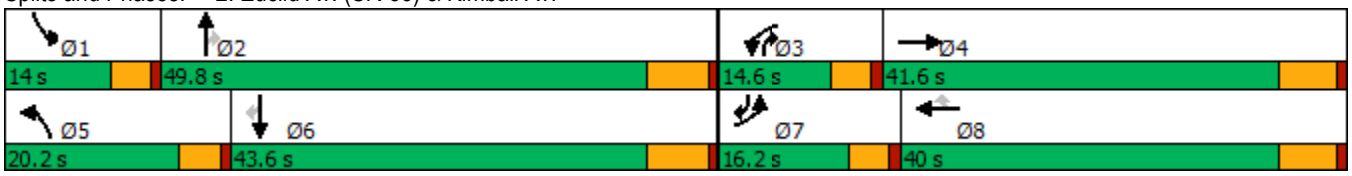
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	15.0	57.7		40.0	7.3	65.4		40.0				
Change Period (Y+Rc), s	4.6	6.5		4.6	4.6	6.5		4.6				
Max Green Setting (Gmax), s	30.4	38.5		35.4	10.0	58.9		35.4				
Max Q Clear Time (g_c+I1), s	10.5	29.0		3.4	2.7	24.7		37.4				
Green Ext Time (p_c), s	0.1	4.5		0.1	0.0	6.5		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			32.1									
HCM 6th LOS			C									

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	120	205	37	824	304	155	724	46	162	593	394
Future Volume (vph)	120	205	37	824	304	155	724	46	162	593	394
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2	3	1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	3	1	6	7
Switch Phase											
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	5.0	10.0	5.0	5.0	10.0
Minimum Split (s)	14.6	27.2	14.6	29.2	29.2	14.6	44.5	14.6	9.6	40.5	14.6
Total Split (s)	16.2	41.6	14.6	40.0	40.0	20.2	49.8	14.6	14.0	43.6	16.2
Total Split (%)	13.5%	34.7%	12.2%	33.3%	33.3%	16.8%	41.5%	12.2%	11.7%	36.3%	13.5%
Yellow Time (s)	3.6	5.2	3.6	5.2	5.2	3.6	5.5	3.6	3.6	5.5	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	4.6	6.2	6.2	4.6	6.5	4.6	4.6	6.5	4.6
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	None	Max	None
Act Effct Green (s)	10.4	36.1	10.0	32.6	32.6	14.1	43.3	59.9	9.0	38.3	50.6
Actuated g/C Ratio	0.09	0.31	0.09	0.28	0.28	0.12	0.37	0.51	0.08	0.33	0.43
v/c Ratio	0.47	0.24	0.28	0.89	0.51	0.82	0.59	0.06	0.73	0.54	0.56
Control Delay	57.5	30.0	56.9	52.9	10.2	81.3	32.4	1.7	72.4	35.3	19.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.5	30.0	56.9	52.9	10.2	81.3	32.4	1.7	72.4	35.3	19.3
LOS	E	C	E	D	B	F	C	A	E	D	B
Approach Delay		39.1		41.9			39.1			35.0	
Approach LOS		D		D			D			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 117.3	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 38.7	Intersection LOS: D
Intersection Capacity Utilization 88.6%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 2: Euclid Av. (SR-83) & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	120	205	35	37	824	304	155	724	46	162	593	394
Future Volume (veh/h)	120	205	35	37	824	304	155	724	46	162	593	394
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1600	1800	1800	1700	1800	1800	1700	1800	1800	1600	1800	1800
Adj Flow Rate, veh/h	122	209	35	38	841	283	158	739	4	165	605	388
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	252	881	145	99	943	420	183	1288	668	213	1148	635
Arrive On Green	0.09	0.30	0.30	0.06	0.28	0.28	0.11	0.38	0.38	0.07	0.34	0.34
Sat Flow, veh/h	2956	2939	484	1619	3420	1525	1619	3420	1525	2956	3420	1505
Grp Volume(v), veh/h	122	120	124	38	841	283	158	739	4	165	605	388
Grp Sat Flow(s),veh/h/ln	1478	1710	1713	1619	1710	1525	1619	1710	1525	1478	1710	1505
Q Serve(g_s), s	4.5	6.1	6.3	2.6	27.2	19.0	11.0	19.8	0.2	6.3	16.4	23.1
Cycle Q Clear(g_c), s	4.5	6.1	6.3	2.6	27.2	19.0	11.0	19.8	0.2	6.3	16.4	23.1
Prop In Lane	1.00		0.28	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	252	513	513	99	943	420	183	1288	668	213	1148	635
V/C Ratio(X)	0.48	0.23	0.24	0.38	0.89	0.67	0.86	0.57	0.01	0.77	0.53	0.61
Avail Cap(c_a), veh/h	298	526	527	141	1005	448	220	1288	668	242	1148	635
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.2	30.3	30.4	51.9	40.0	37.0	50.1	28.5	18.2	52.4	30.8	26.0
Incr Delay (d2), s/veh	0.5	0.2	0.2	0.9	9.8	3.6	22.2	1.9	0.0	10.9	1.7	4.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	2.5	2.5	1.1	12.2	7.2	5.4	7.8	0.1	2.6	6.6	8.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.7	30.6	30.6	52.8	49.8	40.7	72.3	30.4	18.2	63.3	32.6	30.3
LnGrp LOS	D	C	C	D	D	D	E	C	B	E	C	C
Approach Vol, veh/h		366			1162			901			1158	
Approach Delay, s/veh		37.3			47.7			37.7			36.2	
Approach LOS		D			D			D			D	

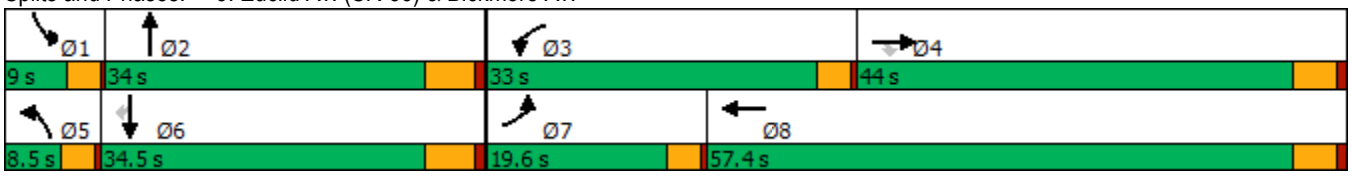
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.9	49.8	11.6	40.7	17.6	45.1	14.4	37.9
Change Period (Y+Rc), s	4.6	6.5	4.6	6.2	4.6	6.5	4.6	6.2
Max Green Setting (Gmax), s	9.4	43.3	10.0	35.4	15.6	37.1	11.6	33.8
Max Q Clear Time (g_c+I1), s	8.3	21.8	4.6	8.3	13.0	25.1	6.5	29.2
Green Ext Time (p_c), s	0.0	4.4	0.0	1.2	0.0	3.9	0.1	2.5

Intersection Summary	
HCM 6th Ctrl Delay	40.4
HCM 6th LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	96	10	44	326	195	26	599	42	574	155
Future Volume (vph)	96	10	44	326	195	26	599	42	574	155
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2	1	6	
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	5	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	44.0	44.0	8.5	44.0	8.5	26.5	8.5	30.5	30.5
Total Split (s)	19.6	44.0	44.0	33.0	57.4	8.5	34.0	9.0	34.5	34.5
Total Split (%)	16.3%	36.7%	36.7%	27.5%	47.8%	7.1%	28.3%	7.5%	28.8%	28.8%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	4.5	3.0	4.5	4.5
All-Red Time (s)	0.5	1.0	1.0	0.5	1.0	0.5	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.0	5.0	3.5	5.0	3.5	5.5	3.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	None	Min	Min
Act Effct Green (s)	10.6	11.9	11.9	27.6	26.2	5.9	22.0	6.3	26.0	26.0
Actuated g/C Ratio	0.14	0.15	0.15	0.35	0.34	0.08	0.28	0.08	0.33	0.33
v/c Ratio	0.49	0.04	0.15	0.63	0.69	0.24	0.73	0.36	0.56	0.28
Control Delay	46.9	31.0	0.9	33.2	28.1	50.9	34.3	53.1	28.0	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.9	31.0	0.9	33.2	28.1	50.9	34.3	53.1	28.0	6.8
LOS	D	C	A	C	C	D	C	D	C	A
Approach Delay		32.4			30.5		34.9		25.1	
Approach LOS		C			C		C		C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 77.8	
Natural Cycle: 105	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 30.1	Intersection LOS: C
Intersection Capacity Utilization 66.1%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 3: Euclid Av. (SR-83) & Bickmore Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	96	10	44	326	195	175	26	599	30	42	574	155
Future Volume (veh/h)	96	10	44	326	195	175	26	599	30	42	574	155
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	107	11	40	362	217	166	29	666	26	47	638	154
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	134	188	159	419	265	203	53	868	34	76	935	408
Arrive On Green	0.08	0.10	0.10	0.26	0.28	0.28	0.03	0.26	0.26	0.05	0.27	0.27
Sat Flow, veh/h	1619	1800	1525	1619	946	724	1619	3352	131	1619	3420	1493
Grp Volume(v), veh/h	107	11	40	362	0	383	29	340	352	47	638	154
Grp Sat Flow(s),veh/h/ln	1619	1800	1525	1619	0	1670	1619	1710	1773	1619	1710	1493
Q Serve(g_s), s	3.4	0.3	1.3	11.3	0.0	11.3	0.9	9.7	9.7	1.5	8.8	4.4
Cycle Q Clear(g_c), s	3.4	0.3	1.3	11.3	0.0	11.3	0.9	9.7	9.7	1.5	8.8	4.4
Prop In Lane	1.00		1.00	1.00		0.43	1.00		0.07	1.00		1.00
Lane Grp Cap(c), veh/h	134	188	159	419	0	468	53	443	459	76	935	408
V/C Ratio(X)	0.80	0.06	0.25	0.86	0.00	0.82	0.55	0.77	0.77	0.62	0.68	0.38
Avail Cap(c_a), veh/h	493	1327	1124	903	0	1653	153	921	955	168	1874	818
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.8	21.4	21.8	18.7	0.0	17.8	25.2	18.1	18.1	24.7	17.2	15.6
Incr Delay (d2), s/veh	4.1	0.0	0.3	2.1	0.0	1.4	3.2	1.1	1.0	3.0	0.3	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.1	0.4	3.8	0.0	3.8	0.3	3.0	3.2	0.5	2.7	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.0	21.4	22.1	20.8	0.0	19.1	28.4	19.2	19.2	27.7	17.5	15.8
LnGrp LOS	C	C	C	C	A	B	C	B	B	C	B	B
Approach Vol, veh/h		158			745			721			839	
Approach Delay, s/veh		26.0			20.0			19.5			17.8	
Approach LOS		C			B			B			B	

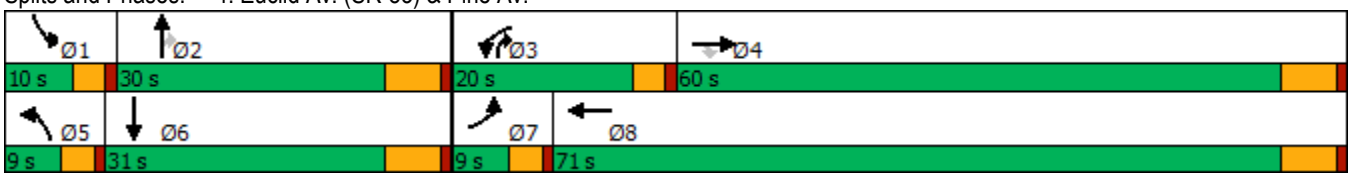
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.0	19.2	17.2	10.5	5.2	20.0	7.9	19.8
Change Period (Y+Rc), s	3.5	5.5	3.5	5.0	3.5	5.5	3.5	5.0
Max Green Setting (Gmax), s	5.5	28.5	29.5	39.0	5.0	29.0	16.1	52.4
Max Q Clear Time (g_c+I1), s	3.5	11.7	13.3	3.3	2.9	10.8	5.4	13.3
Green Ext Time (p_c), s	0.0	2.0	0.5	0.1	0.0	2.4	0.1	1.5

Intersection Summary	
HCM 6th Ctrl Delay	19.5
HCM 6th LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	4	167	64	692	390	41	587	913	78	842
Future Volume (vph)	4	167	64	692	390	41	587	913	78	842
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8	5	2	3	1	6
Permitted Phases			4					2		
Detector Phase	7	4	4	3	8	5	2	3	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	43.0	43.0	9.0	45.0	9.0	11.0	9.0	9.0	29.0
Total Split (s)	9.0	60.0	60.0	20.0	71.0	9.0	30.0	20.0	10.0	31.0
Total Split (%)	7.5%	50.0%	50.0%	16.7%	59.2%	7.5%	25.0%	16.7%	8.3%	25.8%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	3.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	6.0	4.0	4.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	None	None	Min
Act Effct Green (s)	5.1	16.5	16.5	16.4	35.6	5.1	20.5	43.0	6.1	25.8
Actuated g/C Ratio	0.06	0.21	0.21	0.20	0.44	0.06	0.26	0.54	0.08	0.32
v/c Ratio	0.04	0.46	0.15	1.17	0.58	0.41	0.68	0.84	0.65	0.80
Control Delay	42.8	31.6	0.8	125.6	20.6	53.6	32.4	14.2	65.2	34.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.8	31.6	0.8	125.6	20.6	53.6	32.4	14.2	65.2	34.0
LOS	D	C	A	F	C	D	C	B	E	C
Approach Delay		23.4			84.2		22.2			36.6
Approach LOS		C			F		C			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 80	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.17	
Intersection Signal Delay: 44.1	Intersection LOS: D
Intersection Capacity Utilization 85.4%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 4: Euclid Av. (SR-83) & Pine Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	167	64	692	390	62	41	587	913	78	842	20
Future Volume (veh/h)	4	167	64	692	390	62	41	587	913	78	842	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	4	170	0	706	398	56	42	599	427	80	859	17
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	9	250		694	569	80	65	928	772	99	1002	20
Arrive On Green	0.01	0.14	0.00	0.23	0.37	0.37	0.04	0.27	0.27	0.06	0.29	0.29
Sat Flow, veh/h	1619	1800	1525	2956	1544	217	1619	3420	1525	1619	3430	68
Grp Volume(v), veh/h	4	170	0	706	0	454	42	599	427	80	428	448
Grp Sat Flow(s),veh/h/ln	1619	1800	1525	1478	0	1761	1619	1710	1525	1619	1710	1788
Q Serve(g_s), s	0.2	6.1	0.0	16.0	0.0	14.9	1.7	10.5	13.1	3.3	16.1	16.1
Cycle Q Clear(g_c), s	0.2	6.1	0.0	16.0	0.0	14.9	1.7	10.5	13.1	3.3	16.1	16.1
Prop In Lane	1.00		1.00	1.00		0.12	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	9	250		694	0	649	65	928	772	99	500	522
V/C Ratio(X)	0.46	0.68		1.02	0.00	0.70	0.64	0.65	0.55	0.81	0.86	0.86
Avail Cap(c_a), veh/h	119	1427		694	0	1681	119	1205	896	143	628	656
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.8	27.9	0.0	26.1	0.0	18.3	32.2	21.9	11.5	31.6	22.8	22.8
Incr Delay (d2), s/veh	13.5	4.6	0.0	38.4	0.0	2.0	3.9	0.3	0.2	13.0	8.0	7.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	2.7	0.0	8.6	0.0	5.3	0.7	3.6	3.3	1.5	6.5	6.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.3	32.4	0.0	64.4	0.0	20.3	36.1	22.2	11.8	44.5	30.7	30.4
LnGrp LOS	D	C		F	A	C	D	C	B	D	C	C
Approach Vol, veh/h		174	A		1160			1068			956	
Approach Delay, s/veh		32.8			47.1			18.6			31.7	
Approach LOS		C			D			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.2	24.5	20.0	15.5	6.7	25.9	4.4	31.1
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	6.0	24.0	16.0	54.0	5.0	25.0	5.0	65.0
Max Q Clear Time (g_c+I1), s	5.3	15.1	18.0	8.1	3.7	18.1	2.2	16.9
Green Ext Time (p_c), s	0.0	2.2	0.0	1.3	0.0	1.8	0.0	4.2

Intersection Summary	
HCM 6th Ctrl Delay	32.9
HCM 6th LOS	C

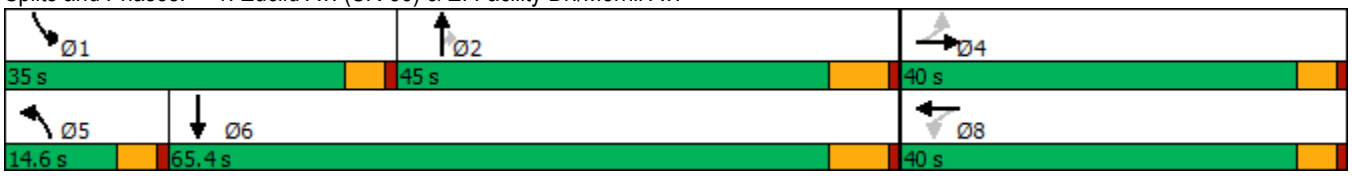
Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	11	29	183	2	4	1136	224	251	1155
Future Volume (vph)	11	29	183	2	4	1136	224	251	1155
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8				2		
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	15.0	15.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	9.6	9.6	21.6	21.6	14.6	28.5	28.5	14.6	42.5
Total Split (s)	40.0	40.0	40.0	40.0	14.6	45.0	45.0	35.0	65.4
Total Split (%)	33.3%	33.3%	33.3%	33.3%	12.2%	37.5%	37.5%	29.2%	54.5%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	5.5	5.5	3.6	5.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.6		4.6	4.6	6.5	6.5	4.6	6.5
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None	Max
Act Effct Green (s)		28.6		28.6	10.1	39.7	39.7	22.0	63.8
Actuated g/C Ratio		0.27		0.27	0.10	0.37	0.37	0.21	0.60
v/c Ratio		0.13		0.90	0.03	0.98	0.39	0.83	0.62
Control Delay		25.1		60.4	50.0	55.5	18.8	61.3	17.1
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		25.1		60.4	50.0	55.5	18.8	61.3	17.1
LOS		C		E	D	E	B	E	B
Approach Delay		25.1		60.4		49.4			25.0
Approach LOS		C		E		D			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 106.3	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.98	
Intersection Signal Delay: 39.2	Intersection LOS: D
Intersection Capacity Utilization 88.0%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 1: Euclid Av. (SR-83) & E. Facility Dr./Merrill Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	29	12	183	2	136	4	1136	224	251	1155	1
Future Volume (veh/h)	11	29	12	183	2	136	4	1136	224	251	1155	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	12	32	12	201	2	139	4	1248	181	276	1269	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	106	261	88	276	2	152	17	1376	614	306	1987	0
Arrive On Green	0.25	0.25	0.25	0.25	0.25	0.25	0.01	0.40	0.40	0.19	0.58	0.00
Sat Flow, veh/h	246	1027	347	864	9	598	1619	3420	1525	1619	3510	0
Grp Volume(v), veh/h	56	0	0	342	0	0	4	1248	181	276	1269	0
Grp Sat Flow(s),veh/h/ln	1620	0	0	1470	0	0	1619	1710	1525	1619	1710	0
Q Serve(g_s), s	0.0	0.0	0.0	20.3	0.0	0.0	0.2	34.8	8.2	16.9	25.1	0.0
Cycle Q Clear(g_c), s	2.5	0.0	0.0	22.9	0.0	0.0	0.2	34.8	8.2	16.9	25.1	0.0
Prop In Lane	0.21		0.21	0.59		0.41	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	454	0	0	430	0	0	17	1376	614	306	1987	0
V/C Ratio(X)	0.12	0.00	0.00	0.80	0.00	0.00	0.24	0.91	0.29	0.90	0.64	0.00
Avail Cap(c_a), veh/h	606	0	0	567	0	0	160	1376	614	485	1987	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	29.2	0.0	0.0	36.5	0.0	0.0	49.8	28.5	20.5	40.2	14.2	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	4.2	0.0	0.0	2.6	10.2	1.2	9.2	1.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	0.0	8.2	0.0	0.0	0.1	14.6	2.8	7.0	8.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.2	0.0	0.0	40.8	0.0	0.0	52.4	38.8	21.8	49.4	15.7	0.0
LnGrp LOS	C	A	A	D	A	A	D	D	C	D	B	A
Approach Vol, veh/h		56			342			1433			1545	
Approach Delay, s/veh		29.2			40.8			36.7			21.8	
Approach LOS		C			D			D			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	23.8	47.3		30.3	5.7	65.4		30.3				
Change Period (Y+Rc), s	4.6	6.5		4.6	4.6	6.5		4.6				
Max Green Setting (Gmax), s	30.4	38.5		35.4	10.0	58.9		35.4				
Max Q Clear Time (g_c+I1), s	18.9	36.8		4.5	2.2	27.1		24.9				
Green Ext Time (p_c), s	0.3	1.2		0.2	0.0	9.8		0.9				

Intersection Summary			
HCM 6th Ctrl Delay		30.1	
HCM 6th LOS		C	

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	378	716	27	296	166	71	722	38	428	732	214
Future Volume (vph)	378	716	27	296	166	71	722	38	428	732	214
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2	3	1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	3	1	6	7
Switch Phase											
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	5.0	10.0	5.0	5.0	10.0
Minimum Split (s)	14.6	27.2	14.6	29.2	29.2	14.6	44.5	14.6	9.6	40.5	14.6
Total Split (s)	22.0	36.6	14.6	29.2	29.2	15.9	44.8	14.6	24.0	52.9	22.0
Total Split (%)	18.3%	30.5%	12.2%	24.3%	24.3%	13.3%	37.3%	12.2%	20.0%	44.1%	18.3%
Yellow Time (s)	3.6	5.2	3.6	5.2	5.2	3.6	5.5	3.6	3.6	5.5	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	4.6	6.2	6.2	4.6	6.5	4.6	4.6	6.5	4.6
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	None	Max	None
Act Effct Green (s)	16.8	30.4	10.0	20.3	20.3	10.5	38.5	55.0	18.7	50.0	73.3
Actuated g/C Ratio	0.14	0.26	0.09	0.17	0.17	0.09	0.33	0.47	0.16	0.43	0.63
v/c Ratio	0.91	0.91	0.20	0.51	0.39	0.49	0.65	0.05	0.92	0.51	0.21
Control Delay	75.6	57.5	55.2	46.6	6.0	64.0	37.4	0.1	74.6	27.7	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.6	57.5	55.2	46.6	6.0	64.0	37.4	0.1	74.6	27.7	1.9
LOS	E	E	E	D	A	E	D	A	E	C	A
Approach Delay		63.3		33.3			37.9			38.3	
Approach LOS		E		C			D			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 116.3	
Natural Cycle: 110	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay: 45.2	Intersection LOS: D
Intersection Capacity Utilization 85.6%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 2: Euclid Av. (SR-83) & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	378	716	76	27	296	166	71	722	38	428	732	214
Future Volume (veh/h)	378	716	76	27	296	166	71	722	38	428	732	214
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1600	1800	1800	1700	1800	1800	1700	1800	1800	1600	1800	1800
Adj Flow Rate, veh/h	386	731	73	28	302	103	72	737	33	437	747	156
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	433	800	80	84	546	244	128	1153	593	484	1443	867
Arrive On Green	0.15	0.25	0.25	0.05	0.16	0.16	0.08	0.34	0.34	0.16	0.42	0.42
Sat Flow, veh/h	2956	3140	313	1619	3420	1525	1619	3420	1525	2956	3420	1525
Grp Volume(v), veh/h	386	398	406	28	302	103	72	737	33	437	747	156
Grp Sat Flow(s),veh/h/ln	1478	1710	1744	1619	1710	1525	1619	1710	1525	1478	1710	1525
Q Serve(g_s), s	14.6	25.7	25.7	1.9	9.2	6.9	4.9	20.7	1.5	16.5	18.3	5.6
Cycle Q Clear(g_c), s	14.6	25.7	25.7	1.9	9.2	6.9	4.9	20.7	1.5	16.5	18.3	5.6
Prop In Lane	1.00		0.18	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	433	435	444	84	546	244	128	1153	593	484	1443	867
V/C Ratio(X)	0.89	0.91	0.91	0.33	0.55	0.42	0.56	0.64	0.06	0.90	0.52	0.18
Avail Cap(c_a), veh/h	453	458	467	143	693	309	161	1153	593	505	1443	867
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.6	41.1	41.1	52.0	44.0	43.0	50.4	31.8	21.7	46.6	24.3	11.8
Incr Delay (d2), s/veh	18.1	22.2	22.0	0.9	0.9	1.2	1.4	2.7	0.2	18.4	1.3	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.3	13.0	13.3	0.8	3.9	2.6	1.9	8.4	0.6	7.0	7.1	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	65.7	63.3	63.1	52.8	44.8	44.2	51.9	34.5	21.9	65.0	25.6	12.2
LnGrp LOS	E	E	E	D	D	D	D	C	C	E	C	B
Approach Vol, veh/h		1190			433			842			1340	
Approach Delay, s/veh		64.0			45.2			35.5			36.9	
Approach LOS		E			D			D			D	

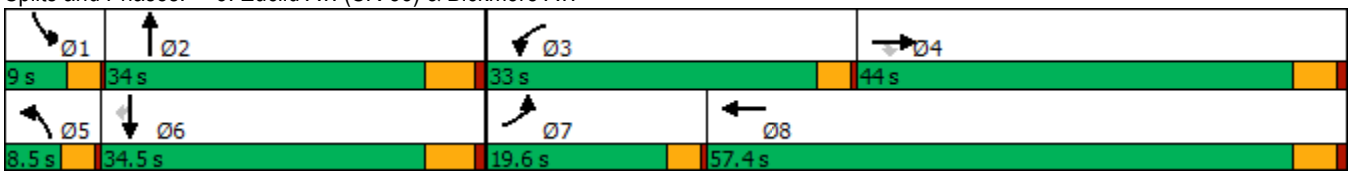
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	23.2	44.8	10.5	35.1	13.6	54.4	21.2	24.3
Change Period (Y+Rc), s	4.6	6.5	4.6	6.2	4.6	6.5	4.6	6.2
Max Green Setting (Gmax), s	19.4	38.3	10.0	30.4	11.3	46.4	17.4	23.0
Max Q Clear Time (g_c+I1), s	18.5	22.7	3.9	27.7	6.9	20.3	16.6	11.2
Green Ext Time (p_c), s	0.1	4.0	0.0	1.2	0.0	5.2	0.1	1.6

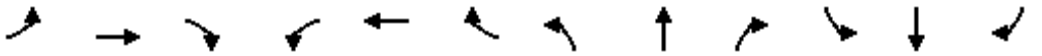
Intersection Summary	
HCM 6th Ctrl Delay	46.0
HCM 6th LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	122	103	62	26	24	34	634	127	685	192
Future Volume (vph)	122	103	62	26	24	34	634	127	685	192
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2	1	6	
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	5	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	44.0	44.0	8.5	44.0	8.5	26.5	8.5	30.5	30.5
Total Split (s)	19.6	44.0	44.0	33.0	57.4	8.5	34.0	9.0	34.5	34.5
Total Split (%)	16.3%	36.7%	36.7%	27.5%	47.8%	7.1%	28.3%	7.5%	28.8%	28.8%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	4.5	3.0	4.5	4.5
All-Red Time (s)	0.5	1.0	1.0	0.5	1.0	0.5	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.0	5.0	3.5	5.0	3.5	5.5	3.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	None	Min	Min
Act Effct Green (s)	10.3	17.7	17.7	6.6	10.2	5.8	23.6	6.4	31.7	31.7
Actuated g/C Ratio	0.16	0.28	0.28	0.10	0.16	0.09	0.37	0.10	0.50	0.50
v/c Ratio	0.48	0.21	0.13	0.16	0.22	0.24	0.61	0.80	0.41	0.23
Control Delay	36.6	19.6	0.8	37.4	14.4	41.0	22.9	72.5	19.4	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.6	19.6	0.8	37.4	14.4	41.0	22.9	72.5	19.4	4.9
LOS	D	B	A	D	B	D	C	E	B	A
Approach Delay		22.8			21.1		23.7		23.4	
Approach LOS		C			C		C		C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 63.1	
Natural Cycle: 95	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.80	
Intersection Signal Delay: 23.3	Intersection LOS: C
Intersection Capacity Utilization 57.0%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 3: Euclid Av. (SR-83) & Bickmore Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	122	103	62	26	24	40	34	634	110	127	685	192
Future Volume (veh/h)	122	103	62	26	24	40	34	634	110	127	685	192
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	126	106	48	27	25	28	35	654	94	131	706	164
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	158	319	270	52	87	97	64	881	126	161	1209	539
Arrive On Green	0.10	0.18	0.18	0.03	0.11	0.11	0.04	0.29	0.29	0.10	0.35	0.35
Sat Flow, veh/h	1619	1800	1523	1619	775	868	1619	3002	431	1619	3420	1525
Grp Volume(v), veh/h	126	106	48	27	0	53	35	372	376	131	706	164
Grp Sat Flow(s),veh/h/ln	1619	1800	1523	1619	0	1644	1619	1710	1722	1619	1710	1525
Q Serve(g_s), s	3.4	2.3	1.2	0.7	0.0	1.3	0.9	8.7	8.7	3.5	7.4	3.4
Cycle Q Clear(g_c), s	3.4	2.3	1.2	0.7	0.0	1.3	0.9	8.7	8.7	3.5	7.4	3.4
Prop In Lane	1.00		1.00	1.00		0.53	1.00		0.25	1.00		1.00
Lane Grp Cap(c), veh/h	158	319	270	52	0	184	64	502	505	161	1209	539
V/C Ratio(X)	0.80	0.33	0.18	0.52	0.00	0.29	0.55	0.74	0.74	0.81	0.58	0.30
Avail Cap(c_a), veh/h	592	1595	1350	1085	0	1957	184	1107	1116	202	2254	1005
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.4	15.8	15.4	21.0	0.0	17.9	20.7	14.0	14.1	19.4	11.6	10.3
Incr Delay (d2), s/veh	3.5	0.2	0.1	3.0	0.0	0.3	2.7	0.8	0.8	14.5	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.8	0.3	0.3	0.0	0.4	0.3	2.3	2.3	1.6	1.8	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.9	16.0	15.5	24.0	0.0	18.2	23.4	14.9	14.9	33.9	11.8	10.4
LnGrp LOS	C	B	B	C	A	B	C	B	B	C	B	B
Approach Vol, veh/h		280			80			783			1001	
Approach Delay, s/veh		19.1			20.2			15.3			14.4	
Approach LOS		B			C			B			B	

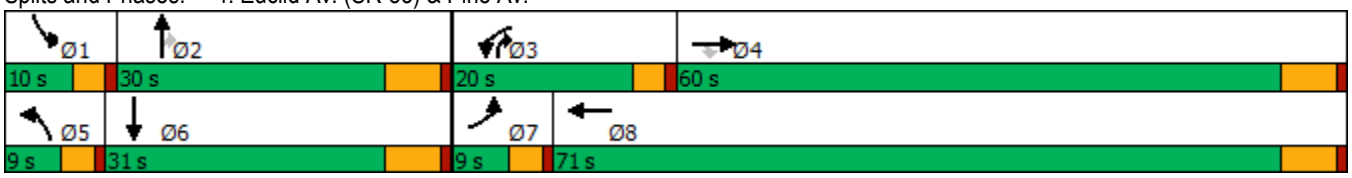
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.9	18.4	4.9	12.8	5.2	21.1	7.8	9.9
Change Period (Y+Rc), s	3.5	5.5	3.5	5.0	3.5	5.5	3.5	5.0
Max Green Setting (Gmax), s	5.5	28.5	29.5	39.0	5.0	29.0	16.1	52.4
Max Q Clear Time (g_c+I1), s	5.5	10.7	2.7	4.3	2.9	9.4	5.4	3.3
Green Ext Time (p_c), s	0.0	2.2	0.0	0.4	0.0	2.8	0.1	0.2

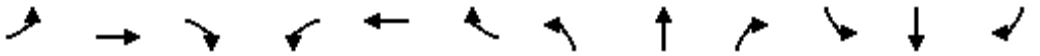
Intersection Summary	
HCM 6th Ctrl Delay	15.6
HCM 6th LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	17	404	82	592	132	65	706	997	96	632
Future Volume (vph)	17	404	82	592	132	65	706	997	96	632
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8	5	2	3	1	6
Permitted Phases			4					2		
Detector Phase	7	4	4	3	8	5	2	3	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	43.0	43.0	9.0	45.0	9.0	11.0	9.0	9.0	29.0
Total Split (s)	9.0	60.0	60.0	20.0	71.0	9.0	30.0	20.0	10.0	31.0
Total Split (%)	7.5%	50.0%	50.0%	16.7%	59.2%	7.5%	25.0%	16.7%	8.3%	25.8%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	3.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	6.0	4.0	4.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	None	None	Min
Act Effct Green (s)	5.0	28.9	28.9	16.1	45.7	5.0	24.2	46.3	6.0	25.2
Actuated g/C Ratio	0.05	0.30	0.30	0.17	0.48	0.05	0.25	0.49	0.06	0.26
v/c Ratio	0.21	0.79	0.16	1.27	0.26	0.81	0.87	1.19	1.00	0.76
Control Delay	52.7	41.2	1.6	169.6	13.6	105.0	47.2	115.1	138.7	40.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.7	41.2	1.6	169.6	13.6	105.0	47.2	115.1	138.7	40.0
LOS	D	D	A	F	B	F	D	F	F	D
Approach Delay		35.2			130.0		87.6			52.8
Approach LOS		D			F		F			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 95.3	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.27	
Intersection Signal Delay: 82.7	Intersection LOS: F
Intersection Capacity Utilization 105.2%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 4: Euclid Av. (SR-83) & Pine Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	404	82	592	132	70	65	706	997	96	632	14
Future Volume (veh/h)	17	404	82	592	132	70	65	706	997	96	632	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	18	430	0	630	140	59	69	751	590	102	672	14
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	32	515		511	528	223	86	888	660	105	930	19
Arrive On Green	0.02	0.29	0.00	0.17	0.44	0.44	0.05	0.26	0.26	0.06	0.27	0.27
Sat Flow, veh/h	1619	1800	1525	2956	1202	507	1619	3420	1525	1619	3426	71
Grp Volume(v), veh/h	18	430	0	630	0	199	69	751	590	102	335	351
Grp Sat Flow(s),veh/h/ln	1619	1800	1525	1478	0	1709	1619	1710	1525	1619	1710	1787
Q Serve(g_s), s	1.0	20.7	0.0	16.0	0.0	6.8	3.9	19.3	24.0	5.8	16.4	16.4
Cycle Q Clear(g_c), s	1.0	20.7	0.0	16.0	0.0	6.8	3.9	19.3	24.0	5.8	16.4	16.4
Prop In Lane	1.00		1.00	1.00		0.30	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	32	515		511	0	751	86	888	660	105	464	485
V/C Ratio(X)	0.56	0.83		1.23	0.00	0.27	0.80	0.85	0.89	0.97	0.72	0.72
Avail Cap(c_a), veh/h	88	1051		511	0	1201	88	888	660	105	464	485
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.9	30.9	0.0	38.2	0.0	16.5	43.3	32.5	24.3	43.1	30.5	30.5
Incr Delay (d2), s/veh	5.4	5.1	0.0	120.4	0.0	0.3	37.2	7.2	14.3	77.9	4.8	4.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	9.1	0.0	13.9	0.0	2.4	2.3	8.1	13.0	4.4	6.7	7.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.3	36.0	0.0	158.7	0.0	16.7	80.5	39.7	38.6	121.0	35.3	35.1
LnGrp LOS	D	D		F	A	B	F	D	D	F	D	D
Approach Vol, veh/h		448	A		829			1410			788	
Approach Delay, s/veh		36.6			124.6			41.2			46.3	
Approach LOS		D			F			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.0	30.0	20.0	32.5	8.9	31.1	5.9	46.6
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	6.0	24.0	16.0	54.0	5.0	25.0	5.0	65.0
Max Q Clear Time (g_c+I1), s	7.8	26.0	18.0	22.7	5.9	18.4	3.0	8.8
Green Ext Time (p_c), s	0.0	0.0	0.0	3.8	0.0	1.3	0.0	1.6

Intersection Summary	
HCM 6th Ctrl Delay	61.7
HCM 6th LOS	E

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

APPENDIX 3.3:

EXISTING (2019) CONDITIONS QUEUING ANALYSIS WORKSHEETS

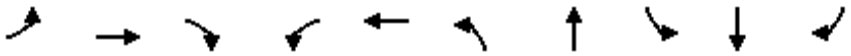
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Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	122	245	38	841	310	158	739	47	165	605	402
v/c Ratio	0.47	0.24	0.28	0.89	0.51	0.82	0.59	0.06	0.73	0.54	0.56
Control Delay	57.5	30.0	56.9	52.9	10.2	81.3	32.4	1.7	72.4	35.3	19.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.5	30.0	56.9	52.9	10.2	81.3	32.4	1.7	72.4	35.3	19.3
Queue Length 50th (ft)	46	70	28	320	28	118	238	0	64	202	154
Queue Length 95th (ft)	78	105	65	#433	110	#224	308	10	#114	267	249
Internal Link Dist (ft)		1169		1767			2587			5208	
Turn Bay Length (ft)	200		215		200	420		260	160		240
Base Capacity (vph)	291	1064	137	986	626	214	1263	815	236	1115	731
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.23	0.28	0.85	0.50	0.74	0.59	0.06	0.70	0.54	0.55

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	107	11	49	362	411	29	699	47	638	172
v/c Ratio	0.49	0.04	0.15	0.63	0.69	0.24	0.73	0.36	0.56	0.28
Control Delay	46.9	31.0	0.9	33.2	28.1	50.9	34.3	53.1	28.0	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.9	31.0	0.9	33.2	28.1	50.9	34.3	53.1	28.0	6.8
Queue Length 50th (ft)	49	5	0	148	159	14	161	22	118	0
Queue Length 95th (ft)	138	20	0	#454	303	#59	#371	#98	313	56
Internal Link Dist (ft)		814			1605		2821		2587	
Turn Bay Length (ft)	150		150	80		115		160		240
Base Capacity (vph)	395	1023	920	735	1176	122	1472	135	1519	760
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.01	0.05	0.49	0.35	0.24	0.47	0.35	0.42	0.23

Intersection Summary

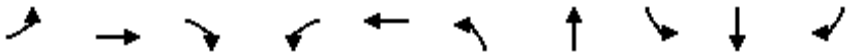
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	386	809	28	302	169	72	737	39	437	747	218
v/c Ratio	0.91	0.91	0.20	0.51	0.39	0.49	0.65	0.05	0.92	0.51	0.21
Control Delay	75.6	57.5	55.2	46.6	6.0	64.0	37.4	0.1	74.6	27.7	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.6	57.5	55.2	46.6	6.0	64.0	37.4	0.1	74.6	27.7	1.9
Queue Length 50th (ft)	153	321	21	110	0	54	260	0	173	231	0
Queue Length 95th (ft)	#243	#446	51	156	38	103	330	0	#269	298	32
Internal Link Dist (ft)		1169		1767			2587			5208	
Turn Bay Length (ft)	200		215		200	420		260	160		240
Base Capacity (vph)	442	891	139	679	463	157	1130	805	493	1470	1052
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.87	0.91	0.20	0.44	0.37	0.46	0.65	0.05	0.89	0.51	0.21

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	126	106	64	27	66	35	767	131	706	198
v/c Ratio	0.48	0.21	0.13	0.16	0.22	0.24	0.61	0.80	0.41	0.23
Control Delay	36.6	19.6	0.8	37.4	14.4	41.0	22.9	72.5	19.4	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.6	19.6	0.8	37.4	14.4	41.0	22.9	72.5	19.4	4.9
Queue Length 50th (ft)	41	27	0	9	8	12	113	47	102	0
Queue Length 95th (ft)	142	77	3	46	40	#64	#353	#249	302	54
Internal Link Dist (ft)		814			1605		2821		2587	
Turn Bay Length (ft)	150		150	80		115		160		240
Base Capacity (vph)	477	1233	1072	874	1367	148	1756	163	1820	906
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.09	0.06	0.03	0.05	0.24	0.44	0.80	0.39	0.22

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

APPENDIX 3.4:

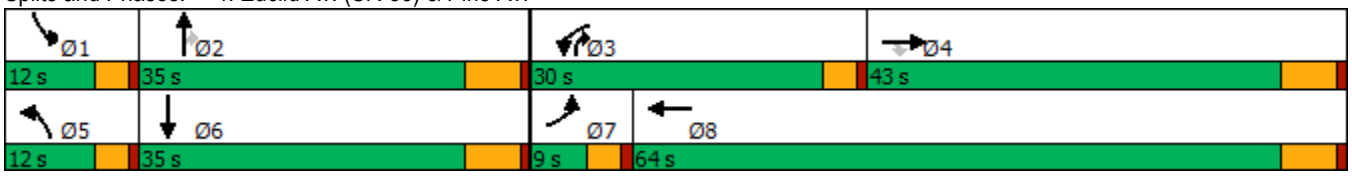
EXISTING (2019) CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS WITH IMPROVEMENTS

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Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	4	167	64	692	390	41	587	913	78	842
Future Volume (vph)	4	167	64	692	390	41	587	913	78	842
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8	5	2	3	1	6
Permitted Phases			4					2		
Detector Phase	7	4	4	3	8	5	2	3	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	43.0	43.0	9.0	45.0	9.0	11.0	9.0	9.0	29.0
Total Split (s)	9.0	43.0	43.0	30.0	64.0	12.0	35.0	30.0	12.0	35.0
Total Split (%)	7.5%	35.8%	35.8%	25.0%	53.3%	10.0%	29.2%	25.0%	10.0%	29.2%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	3.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	6.0	4.0	4.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	None	None	Min
Act Effct Green (s)	5.1	17.7	17.7	26.5	46.9	6.7	24.2	56.9	7.7	29.6
Actuated g/C Ratio	0.05	0.18	0.18	0.27	0.49	0.07	0.25	0.59	0.08	0.31
v/c Ratio	0.05	0.52	0.17	0.87	0.54	0.38	0.70	0.48	0.62	0.84
Control Delay	52.0	41.2	0.9	48.6	20.7	57.3	38.7	2.4	68.7	41.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.0	41.2	0.9	48.6	20.7	57.3	38.7	2.4	68.7	41.9
LOS	D	D	A	D	C	E	D	A	E	D
Approach Delay		30.4			37.6		17.7			44.1
Approach LOS		C			D		B			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 96.6	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.87	
Intersection Signal Delay: 30.8	Intersection LOS: C
Intersection Capacity Utilization 78.8%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 4: Euclid Av. (SR-83) & Pine Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	167	64	692	390	62	41	587	913	78	842	20
Future Volume (veh/h)	4	167	64	692	390	62	41	587	913	78	842	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	4	170	0	706	398	56	42	599	427	80	859	17
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	9	240		794	612	86	63	921	1444	99	1000	20
Arrive On Green	0.01	0.13	0.00	0.27	0.40	0.40	0.04	0.27	0.27	0.06	0.29	0.29
Sat Flow, veh/h	1619	1800	1525	2956	1544	217	1619	3420	2685	1619	3430	68
Grp Volume(v), veh/h	4	170	0	706	0	454	42	599	427	80	428	448
Grp Sat Flow(s),veh/h/ln	1619	1800	1525	1478	0	1761	1619	1710	1342	1619	1710	1788
Q Serve(g_s), s	0.2	6.8	0.0	17.2	0.0	15.7	1.9	11.6	6.5	3.6	17.7	17.7
Cycle Q Clear(g_c), s	0.2	6.8	0.0	17.2	0.0	15.7	1.9	11.6	6.5	3.6	17.7	17.7
Prop In Lane	1.00		1.00	1.00		0.12	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	9	240		794	0	698	63	921	1444	99	499	521
V/C Ratio(X)	0.46	0.71		0.89	0.00	0.65	0.67	0.65	0.30	0.81	0.86	0.86
Avail Cap(c_a), veh/h	108	891		1028	0	1366	173	1327	1762	173	663	693
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.1	31.0	0.0	26.3	0.0	18.3	35.5	24.2	9.5	34.6	25.0	25.0
Incr Delay (d2), s/veh	13.7	5.4	0.0	6.8	0.0	1.5	4.4	0.3	0.0	5.7	6.9	6.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	3.1	0.0	6.0	0.0	5.6	0.8	4.1	1.5	1.5	7.1	7.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.8	36.4	0.0	33.1	0.0	19.8	39.9	24.5	9.5	40.3	31.9	31.6
LnGrp LOS	D	D		C	A	B	D	C	A	D	C	C
Approach Vol, veh/h		174	A		1160			1068			956	
Approach Delay, s/veh		36.7			27.9			19.1			32.5	
Approach LOS		D			C			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.6	26.1	24.1	16.0	6.9	27.8	4.4	35.7
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	8.0	29.0	26.0	37.0	8.0	29.0	5.0	58.0
Max Q Clear Time (g_c+I1), s	5.6	13.6	19.2	8.8	3.9	19.7	2.2	17.7
Green Ext Time (p_c), s	0.0	2.9	0.9	1.2	0.0	2.1	0.0	4.1

Intersection Summary	
HCM 6th Ctrl Delay	26.9
HCM 6th LOS	C

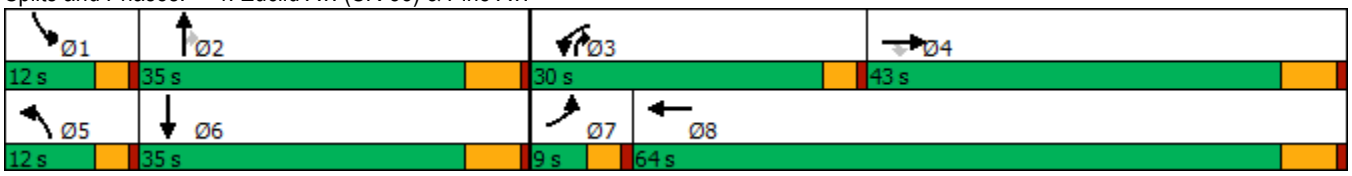
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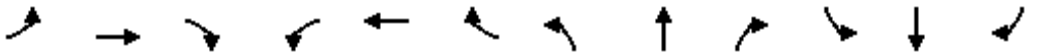
Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	17	404	82	592	132	65	706	997	96	632
Future Volume (vph)	17	404	82	592	132	65	706	997	96	632
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8	5	2	3	1	6
Permitted Phases			4					2		
Detector Phase	7	4	4	3	8	5	2	3	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	43.0	43.0	9.0	45.0	9.0	11.0	9.0	9.0	29.0
Total Split (s)	9.0	43.0	43.0	30.0	64.0	12.0	35.0	30.0	12.0	35.0
Total Split (%)	7.5%	35.8%	35.8%	25.0%	53.3%	10.0%	29.2%	25.0%	10.0%	29.2%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	3.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	6.0	4.0	4.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	None	None	Min
Act Effct Green (s)	5.0	31.7	31.7	26.2	58.5	7.4	27.1	59.3	8.0	29.9
Actuated g/C Ratio	0.04	0.28	0.28	0.23	0.52	0.07	0.24	0.52	0.07	0.26
v/c Ratio	0.25	0.85	0.17	0.93	0.24	0.65	0.92	0.68	0.89	0.76
Control Delay	64.2	55.6	1.8	64.3	14.5	81.8	59.5	16.9	113.5	46.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.2	55.6	1.8	64.3	14.5	81.8	59.5	16.9	113.5	46.3
LOS	E	E	A	E	B	F	E	B	F	D
Approach Delay		47.2			51.7		36.3			55.0
Approach LOS		D			D		D			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 113.1	
Natural Cycle: 105	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 44.6	Intersection LOS: D
Intersection Capacity Utilization 85.7%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 4: Euclid Av. (SR-83) & Pine Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	404	82	592	132	70	65	706	997	96	632	14
Future Volume (veh/h)	17	404	82	592	132	70	65	706	997	96	632	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	18	430	0	630	140	59	69	751	590	102	672	14
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	31	484		677	575	242	86	843	1276	118	913	19
Arrive On Green	0.02	0.27	0.00	0.23	0.48	0.48	0.05	0.25	0.25	0.07	0.27	0.27
Sat Flow, veh/h	1619	1800	1525	2956	1202	507	1619	3420	2685	1619	3426	71
Grp Volume(v), veh/h	18	430	0	630	0	199	69	751	590	102	335	351
Grp Sat Flow(s),veh/h/ln	1619	1800	1525	1478	0	1709	1619	1710	1342	1619	1710	1787
Q Serve(g_s), s	1.2	25.1	0.0	22.8	0.0	7.5	4.6	23.2	16.2	6.8	19.6	19.6
Cycle Q Clear(g_c), s	1.2	25.1	0.0	22.8	0.0	7.5	4.6	23.2	16.2	6.8	19.6	19.6
Prop In Lane	1.00		1.00	1.00		0.30	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	31	484		677	0	818	86	843	1276	118	456	476
V/C Ratio(X)	0.58	0.89		0.93	0.00	0.24	0.80	0.89	0.46	0.86	0.74	0.74
Avail Cap(c_a), veh/h	74	609		702	0	906	118	906	1326	118	456	476
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.2	38.4	0.0	41.3	0.0	16.8	51.2	39.8	19.3	50.2	36.6	36.6
Incr Delay (d2), s/veh	6.1	13.9	0.0	18.2	0.0	0.2	16.7	10.0	0.1	42.1	5.4	5.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	12.4	0.0	9.6	0.0	2.8	2.2	10.3	4.6	4.0	8.3	8.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.4	52.3	0.0	59.6	0.0	17.1	68.0	49.8	19.4	92.3	42.0	41.8
LnGrp LOS	E	D		E	A	B	E	D	B	F	D	D
Approach Vol, veh/h		448	A		829			1410			788	
Approach Delay, s/veh		52.6			49.4			38.0			48.5	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.0	33.0	29.1	35.4	9.8	35.2	6.1	58.4
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	8.0	29.0	26.0	37.0	8.0	29.0	5.0	58.0
Max Q Clear Time (g_c+I1), s	8.8	25.2	24.8	27.1	6.6	21.6	3.2	9.5
Green Ext Time (p_c), s	0.0	1.8	0.2	2.3	0.0	1.4	0.0	1.6

Intersection Summary	
HCM 6th Ctrl Delay	44.9
HCM 6th LOS	D

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

APPENDIX 4.1:

POST PROCESSING WORKSHEETS

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Project:	Altitude Business Centre Phase 1 TIA	Job #:	12611
Scenario:	Horizon Year (2040)	Analyst:	CP
		Date:	11/21/19

LOCATION: Euclid Avenue (SR-83) & Merrill Avenue
FORECAST YEAR: 2040

INDIVIDUAL TURN VOLUME GROWTH REVIEW

		AM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
APPROACH	TURNING MOVEMENT	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	1	0	-1	-100%	1	0	-1	-100%
	Through	5	1,158	1,153	23060%	5	1,310	1,305	26100%
	Right	2	267	265	13250%	2	735	733	36650%
	NB Total	8	1,425	1,417	17713%	8	2,045	2,037	25463%
SOUTH BOUND	Left	2	63	61	3050%	2	105	103	5150%
	Through	5	1,510	1,505	30100%	5	1,647	1,642	32840%
	Right	1	0	-1	-100%	1	0	-1	-100%
	SB Total	8	1,573	1,565	19563%	8	1,752	1,744	21800%
EAST BOUND	Left	1	0	-1	-100%	1	0	-1	-100%
	Through	1	0	-1	-100%	1	0	-1	-100%
	Right	1	0	-1	-100%	1	0	-1	-100%
	EB Total	3	0	-3	-100%	3	0	-3	-100%
WEST BOUND	Left	2	340	338	16900%	2	443	441	22050%
	Through	1	0	-1	-100%	1	0	-1	-100%
	Right	2	62	60	3000%	2	50	48	2400%
	WB Total	5	402	397	7940%	5	493	488	9760%
TOTAL ENTERING VOLUME		24	3,400	3376	14067%	24	4,290	4266	17775%

FORECAST PEAK HOUR TO ADT COMPARISON

		VOLUMES		PERCENT OF ADT		
		AM	PM	AM	PM	ADT
North Leg	Inbound	1,573	1,752			
North Leg	Outbound	1,220	1,360			
North Leg	**TOTAL**	**2,793**	**3,112**	**7%**	**8%**	**40,597**
South Leg	Inbound	1,425	2,045			
South Leg	Outbound	1,850	2,090			
South Leg	**TOTAL**	**3,275**	**4,135**	**7%**	**9%**	**46,812**
East Leg	Inbound	402	493			
East Leg	Outbound	330	840			
East Leg	**TOTAL**	**732**	**1,333**	**6%**	**12%**	**11,557**
West Leg	Inbound	0	0			
West Leg	Outbound	0	0			
West Leg	**TOTAL**	**0**	**0**	**#DIV/0!**	**#DIV/0!**	**-**
OVERALL TOTAL		***6,800***	***8,580***	***7%***	***9%***	***98,966***

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Project:	Altitude Business Centre Phase 1 TIA	Job #:	12611
Scenario:	Horizon Year (2040)	Analyst:	CP
		Date:	11/21/19

LOCATION: Euclid Avenue (SR-83) & Kimball Avenue
FORECAST YEAR: 2040

INDIVIDUAL TURN VOLUME GROWTH REVIEW

		AM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
APPROACH	TURNING MOVEMENT	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	1	178	177	17700%	1	147	146	14600%
	Through	5	883	878	17560%	5	1,270	1,265	25300%
	Right	1	62	61	6100%	1	159	158	15800%
	NB Total	7	1,123	1,116	15943%	7	1,576	1,569	22414%
SOUTH BOUND	Left	1	160	159	15900%	1	441	440	44000%
	Through	5	1,228	1,223	24460%	5	1,240	1,235	24700%
	Right	1	458	457	45700%	1	408	407	40700%
	SB Total	7	1,846	1,839	26271%	7	2,089	2,082	29743%
EAST BOUND	Left	1	203	202	20200%	1	587	586	58600%
	Through	2	128	126	6300%	2	660	658	32900%
	Right	1	109	108	10800%	1	206	205	20500%
	EB Total	4	440	436	10900%	4	1,453	1,449	36225%
WEST BOUND	Left	1	226	225	22500%	1	103	102	10200%
	Through	2	757	755	37750%	2	305	303	15150%
	Right	1	418	417	41700%	1	293	292	29200%
	WB Total	4	1,401	1,397	34925%	4	701	697	17425%
TOTAL ENTERING VOLUME		22	4,810	4788	21764%	22	5,819	5797	26350%

FORECAST PEAK HOUR TO ADT COMPARISON

		VOLUMES		PERCENT OF ADT		
		AM	PM	AM	PM	ADT
North Leg	Inbound	1,846	2,089			
North Leg	Outbound	1,504	2,150			
North Leg	**TOTAL**	**3,350**	**4,239**	**7%**	**9%**	**46,812**
South Leg	Inbound	1,123	1,576			
South Leg	Outbound	1,563	1,549			
South Leg	**TOTAL**	**2,686**	**3,125**	**7%**	**9%**	**36,201**
East Leg	Inbound	1,401	701			
East Leg	Outbound	350	1,260			
East Leg	**TOTAL**	**1,751**	**1,961**	**9%**	**10%**	**20,541**
West Leg	Inbound	440	1,453			
West Leg	Outbound	1,393	860			
West Leg	**TOTAL**	**1,833**	**2,313**	**8%**	**11%**	**21,734**
OVERALL TOTAL		***9,620***	***11,638***	**8%**	***9%***	***125,288***

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Project:	Altitude Business Centre Phase 1 TIA	Job #:	12611
Scenario:	Horizon Year (2040)	Analyst:	CP
		Date:	11/21/19

LOCATION: Euclid Avenue (SR-83) & Bickmore Avenue
FORECAST YEAR: 2040

INDIVIDUAL TURN VOLUME GROWTH REVIEW

		AM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
APPROACH	TURNING MOVEMENT	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	1	45	44	4400%	1	13	12	1200%
	Through	5	932	927	18540%	5	1,323	1,318	26360%
	Right	1	26	25	2500%	1	72	71	7100%
	NB Total	7	1,003	996	14229%	7	1,408	1,401	20014%
SOUTH BOUND	Left	1	107	106	10600%	1	187	186	18600%
	Through	5	1,220	1,215	24300%	5	1,289	1,284	25680%
	Right	1	184	183	18300%	1	33	32	3200%
	SB Total	7	1,511	1,504	21486%	7	1,509	1,502	21457%
EAST BOUND	Left	1	26	25	2500%	1	86	85	8500%
	Through	1	7	6	600%	1	42	41	4100%
	Right	1	8	7	700%	1	32	31	3100%
	EB Total	3	41	38	1267%	3	160	157	5233%
WEST BOUND	Left	1	52	51	5100%	1	62	61	6100%
	Through	1	71	70	7000%	1	14	13	1300%
	Right	1	162	161	16100%	1	166	165	16500%
	WB Total	3	285	282	9400%	3	242	239	7967%
TOTAL ENTERING VOLUME		20	2,840	2820	14100%	20	3,319	3299	16495%

FORECAST PEAK HOUR TO ADT COMPARISON

		VOLUMES		PERCENT OF ADT		
		AM	PM	AM	PM	ADT
North Leg	Inbound	1,511	1,509			
North Leg	Outbound	1,120	1,575			
North Leg	**TOTAL**	**2,631**	**3,084**	**7%**	**9%**	**36,201**
South Leg	Inbound	1,003	1,408			
South Leg	Outbound	1,280	1,383			
South Leg	**TOTAL**	**2,283**	**2,791**	**7%**	**8%**	**32,928**
East Leg	Inbound	285	242			
East Leg	Outbound	140	301			
East Leg	**TOTAL**	**425**	**543**	**7%**	**9%**	**6,166**
West Leg	Inbound	41	160			
West Leg	Outbound	300	60			
West Leg	**TOTAL**	**341**	**220**	**12%**	**8%**	**2,893**
OVERALL TOTAL		***5,680***	***6,638***	***7%***	***8%***	***78,188***

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Project:	Altitude Business Centre Phase 1 TIA	Job #:	12611
Scenario:	Horizon Year (2040)	Analyst:	CP
		Date:	11/21/19

LOCATION: Euclid Avenue (SR-83) & Pine Avenue
FORECAST YEAR: 2040

INDIVIDUAL TURN VOLUME GROWTH REVIEW

		AM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
APPROACH	TURNING MOVEMENT	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	1	171	170	17000%	1	278	277	27700%
	Through	5	535	530	10600%	5	1,011	1,006	20120%
	Right	1	214	213	21300%	1	891	890	89000%
	NB Total	7	920	913	13043%	7	2,180	2,173	31043%
SOUTH BOUND	Left	1	163	162	16200%	1	391	390	39000%
	Through	5	987	982	19640%	5	867	862	17240%
	Right	1	130	129	12900%	1	122	121	12100%
	SB Total	7	1,280	1,273	18186%	7	1,380	1,373	19614%
EAST BOUND	Left	1	84	83	8300%	1	115	114	11400%
	Through	2	303	301	15050%	2	911	909	45450%
	Right	1	204	203	20300%	1	224	223	22300%
	EB Total	4	591	587	14675%	4	1,250	1,246	31150%
WEST BOUND	Left	1	829	828	82800%	1	482	481	48100%
	Through	2	980	978	48900%	2	611	609	30450%
	Right	1	341	340	34000%	1	247	246	24600%
	WB Total	4	2,150	2,146	53650%	4	1,340	1,336	33400%
TOTAL ENTERING VOLUME		22	4,941	4919	22359%	22	6,150	6128	27855%

FORECAST PEAK HOUR TO ADT COMPARISON

		VOLUMES		PERCENT OF ADT		
		AM	PM	AM	PM	ADT
North Leg	Inbound	1,280	1,380			
North Leg	Outbound	960	1,373			
North Leg	**TOTAL**	**2,240**	**2,753**	**7%**	**8%**	**32,928**
South Leg	Inbound	920	2,180			
South Leg	Outbound	2,020	1,573			
South Leg	**TOTAL**	**2,940**	**3,753**	**8%**	**10%**	**37,354**
East Leg	Inbound	2,150	1,340			
East Leg	Outbound	680	2,193			
East Leg	**TOTAL**	**2,830**	**3,533**	**8%**	**10%**	**34,812**
West Leg	Inbound	591	1,250			
West Leg	Outbound	1,281	1,011			
West Leg	**TOTAL**	**1,872**	**2,261**	**7%**	**9%**	**25,646**
OVERALL TOTAL		***9,882***	***12,300***	**8%**	***9%***	***130,740***

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APPENDIX 5.1:

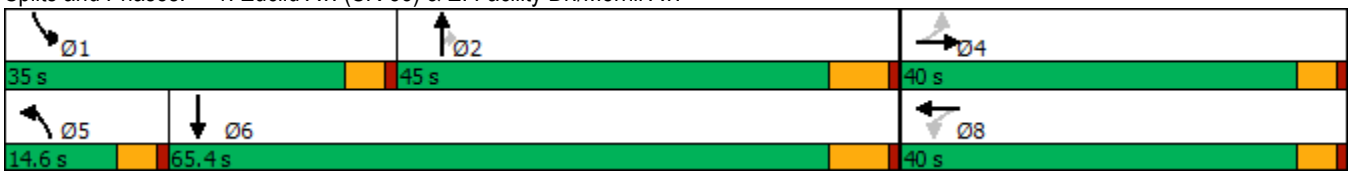
E+P CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS

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Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	4	8	226	48	10	1033	141	120	1010
Future Volume (vph)	4	8	226	48	10	1033	141	120	1010
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8				2		
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	15.0	15.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	9.6	9.6	21.6	21.6	14.6	28.5	28.5	14.6	42.5
Total Split (s)	40.0	40.0	40.0	40.0	14.6	45.0	45.0	35.0	65.4
Total Split (%)	33.3%	33.3%	33.3%	33.3%	12.2%	37.5%	37.5%	29.2%	54.5%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	5.5	5.5	3.6	5.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.6		4.6	4.6	6.5	6.5	4.6	6.5
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None	Max
Act Effct Green (s)		35.5		35.5	10.0	43.8	43.8	13.2	59.0
Actuated g/C Ratio		0.33		0.33	0.09	0.40	0.40	0.12	0.54
v/c Ratio		0.06		1.06	0.07	0.77	0.21	0.63	0.58
Control Delay		16.1		91.1	48.5	32.8	9.0	59.8	18.6
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		16.1		91.1	48.5	32.8	9.0	59.8	18.6
LOS		B		F	D	C	A	E	B
Approach Delay		16.1		91.1		30.1			22.9
Approach LOS		B		F		C			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 108.3	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.06	
Intersection Signal Delay: 37.6	Intersection LOS: D
Intersection Capacity Utilization 89.5%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 1: Euclid Av. (SR-83) & E. Facility Dr./Merrill Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	8	17	226	48	228	10	1033	141	120	1010	39
Future Volume (veh/h)	4	8	17	226	48	228	10	1033	141	120	1010	39
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	4	8	17	233	49	208	10	1065	102	124	1041	26
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	82	161	292	271	47	200	39	1554	693	149	1781	44
Arrive On Green	0.31	0.31	0.31	0.31	0.31	0.31	0.02	0.45	0.45	0.09	0.52	0.52
Sat Flow, veh/h	145	512	931	713	150	637	1619	3420	1525	1619	3407	85
Grp Volume(v), veh/h	29	0	0	490	0	0	10	1065	102	124	522	545
Grp Sat Flow(s),veh/h/ln	1588	0	0	1500	0	0	1619	1710	1525	1619	1710	1782
Q Serve(g_s), s	0.0	0.0	0.0	34.0	0.0	0.0	0.7	27.8	4.4	8.5	23.7	23.7
Cycle Q Clear(g_c), s	1.4	0.0	0.0	35.4	0.0	0.0	0.7	27.8	4.4	8.5	23.7	23.7
Prop In Lane	0.14		0.59	0.48		0.42	1.00		1.00	1.00		0.05
Lane Grp Cap(c), veh/h	535	0	0	518	0	0	39	1554	693	149	894	932
V/C Ratio(X)	0.05	0.00	0.00	0.95	0.00	0.00	0.26	0.69	0.15	0.83	0.58	0.58
Avail Cap(c_a), veh/h	535	0	0	518	0	0	144	1554	693	437	894	932
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.0	0.0	0.0	39.2	0.0	0.0	54.0	24.4	18.0	50.3	18.5	18.5
Incr Delay (d2), s/veh	0.0	0.0	0.0	26.2	0.0	0.0	1.3	2.5	0.4	4.5	2.8	2.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.0	16.6	0.0	0.0	0.3	10.6	1.5	3.5	8.9	9.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.0	0.0	0.0	65.4	0.0	0.0	55.3	26.8	18.4	54.8	21.3	21.2
LnGrp LOS	C	A	A	E	A	A	E	C	B	D	C	C
Approach Vol, veh/h		29			490			1177			1191	
Approach Delay, s/veh		27.0			65.4			26.4			24.7	
Approach LOS		C			E			C			C	

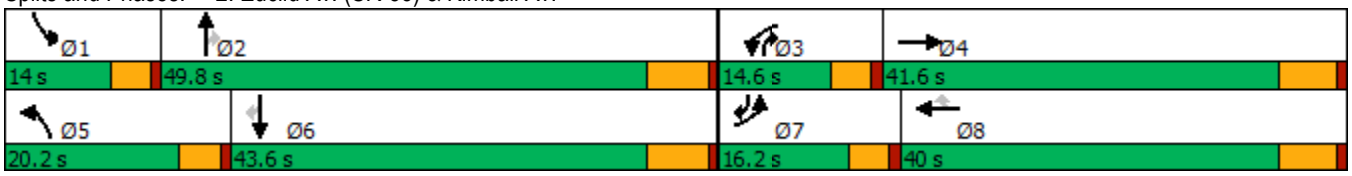
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	15.0	57.7		40.0	7.3	65.4		40.0				
Change Period (Y+Rc), s	4.6	6.5		4.6	4.6	6.5		4.6				
Max Green Setting (Gmax), s	30.4	38.5		35.4	10.0	58.9		35.4				
Max Q Clear Time (g_c+I1), s	10.5	29.8		3.4	2.7	25.7		37.4				
Green Ext Time (p_c), s	0.1	4.3		0.1	0.0	6.7		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			32.3									
HCM 6th LOS			C									

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	120	223	37	837	324	155	724	46	191	593	394
Future Volume (vph)	120	223	37	837	324	155	724	46	191	593	394
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2	3	1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	3	1	6	7
Switch Phase											
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	5.0	10.0	5.0	5.0	10.0
Minimum Split (s)	14.6	27.2	14.6	29.2	29.2	14.6	44.5	14.6	9.6	40.5	14.6
Total Split (s)	16.2	41.6	14.6	40.0	40.0	20.2	49.8	14.6	14.0	43.6	16.2
Total Split (%)	13.5%	34.7%	12.2%	33.3%	33.3%	16.8%	41.5%	12.2%	11.7%	36.3%	13.5%
Yellow Time (s)	3.6	5.2	3.6	5.2	5.2	3.6	5.5	3.6	3.6	5.5	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	4.6	6.2	6.2	4.6	6.5	4.6	4.6	6.5	4.6
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	None	Max	None
Act Effct Green (s)	10.4	36.3	10.0	32.8	32.8	14.1	43.3	59.8	9.3	38.6	50.9
Actuated g/C Ratio	0.09	0.31	0.08	0.28	0.28	0.12	0.37	0.51	0.08	0.33	0.43
v/c Ratio	0.47	0.25	0.28	0.90	0.54	0.82	0.59	0.06	0.84	0.54	0.56
Control Delay	57.6	30.6	56.9	54.2	12.1	82.0	32.6	1.7	82.8	35.2	19.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.6	30.6	56.9	54.2	12.1	82.0	32.6	1.7	82.8	35.2	19.3
LOS	E	C	E	D	B	F	C	A	F	D	B
Approach Delay		39.1		42.9			39.3			37.6	
Approach LOS		D		D			D			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 117.8	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.90	
Intersection Signal Delay: 39.9	Intersection LOS: D
Intersection Capacity Utilization 88.9%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 2: Euclid Av. (SR-83) & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	120	223	35	37	837	324	155	724	46	191	593	394
Future Volume (veh/h)	120	223	35	37	837	324	155	724	46	191	593	394
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1600	1800	1800	1700	1800	1800	1700	1800	1800	1600	1800	1800
Adj Flow Rate, veh/h	122	228	35	38	854	304	158	739	4	195	605	388
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	249	892	135	98	945	421	183	1270	659	238	1160	639
Arrive On Green	0.08	0.30	0.30	0.06	0.28	0.28	0.11	0.37	0.37	0.08	0.34	0.34
Sat Flow, veh/h	2956	2978	451	1619	3420	1525	1619	3420	1525	2956	3420	1505
Grp Volume(v), veh/h	122	130	133	38	854	304	158	739	4	195	605	388
Grp Sat Flow(s),veh/h/ln	1478	1710	1719	1619	1710	1525	1619	1710	1525	1478	1710	1505
Q Serve(g_s), s	4.6	6.7	6.9	2.6	28.1	21.0	11.2	20.2	0.2	7.6	16.6	23.4
Cycle Q Clear(g_c), s	4.6	6.7	6.9	2.6	28.1	21.0	11.2	20.2	0.2	7.6	16.6	23.4
Prop In Lane	1.00		0.26	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	249	512	515	98	945	421	183	1270	659	238	1160	639
V/C Ratio(X)	0.49	0.25	0.26	0.39	0.90	0.72	0.87	0.58	0.01	0.82	0.52	0.61
Avail Cap(c_a), veh/h	294	519	522	139	991	442	217	1270	659	238	1160	639
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.0	31.0	31.0	52.7	40.7	38.2	50.9	29.4	18.9	52.8	30.9	26.1
Incr Delay (d2), s/veh	0.6	0.3	0.3	0.9	11.2	5.4	23.0	2.0	0.0	18.5	1.7	4.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	2.7	2.8	1.1	12.7	8.1	5.5	8.1	0.1	3.3	6.7	8.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.6	31.2	31.3	53.6	51.9	43.6	73.9	31.4	18.9	71.2	32.6	30.4
LnGrp LOS	D	C	C	D	D	D	E	C	B	E	C	C
Approach Vol, veh/h		385			1196			901			1188	
Approach Delay, s/veh		37.7			49.8			38.8			38.2	
Approach LOS		D			D			D			D	

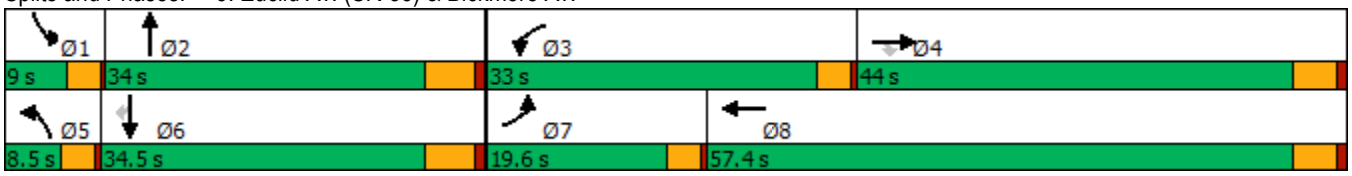
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.0	49.8	11.7	41.1	17.8	46.0	14.4	38.4
Change Period (Y+Rc), s	4.6	6.5	4.6	6.2	4.6	6.5	4.6	6.2
Max Green Setting (Gmax), s	9.4	43.3	10.0	35.4	15.6	37.1	11.6	33.8
Max Q Clear Time (g_c+I1), s	9.6	22.2	4.6	8.9	13.2	25.4	6.6	30.1
Green Ext Time (p_c), s	0.0	4.3	0.0	1.3	0.0	3.9	0.1	2.1

Intersection Summary	
HCM 6th Ctrl Delay	42.1
HCM 6th LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	96	10	44	338	195	26	599	42	574	155
Future Volume (vph)	96	10	44	338	195	26	599	42	574	155
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2	1	6	
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	5	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	44.0	44.0	8.5	44.0	8.5	26.5	8.5	30.5	30.5
Total Split (s)	19.6	44.0	44.0	33.0	57.4	8.5	34.0	9.0	34.5	34.5
Total Split (%)	16.3%	36.7%	36.7%	27.5%	47.8%	7.1%	28.3%	7.5%	28.8%	28.8%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	4.5	3.0	4.5	4.5
All-Red Time (s)	0.5	1.0	1.0	0.5	1.0	0.5	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.0	5.0	3.5	5.0	3.5	5.5	3.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	None	Min	Min
Act Effct Green (s)	10.5	11.4	11.4	28.8	27.1	5.8	22.8	6.1	26.9	26.9
Actuated g/C Ratio	0.13	0.14	0.14	0.36	0.34	0.07	0.29	0.08	0.34	0.34
v/c Ratio	0.50	0.04	0.15	0.64	0.68	0.25	0.74	0.38	0.55	0.28
Control Delay	48.1	31.8	1.0	33.7	28.3	51.7	34.4	54.5	27.8	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.1	31.8	1.0	33.7	28.3	51.7	34.4	54.5	27.8	6.7
LOS	D	C	A	C	C	D	C	D	C	A
Approach Delay		33.2			30.9		35.0		25.0	
Approach LOS		C			C		D		C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 79.4	
Natural Cycle: 105	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 30.3	Intersection LOS: C
Intersection Capacity Utilization 66.7%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 3: Euclid Av. (SR-83) & Bickmore Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	96	10	44	338	195	175	26	599	48	42	574	155
Future Volume (veh/h)	96	10	44	338	195	175	26	599	48	42	574	155
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	107	11	40	376	217	166	29	666	46	47	638	154
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	134	172	146	432	265	202	53	860	59	76	956	417
Arrive On Green	0.08	0.10	0.10	0.27	0.28	0.28	0.03	0.27	0.27	0.05	0.28	0.28
Sat Flow, veh/h	1619	1800	1525	1619	946	724	1619	3240	224	1619	3420	1493
Grp Volume(v), veh/h	107	11	40	376	0	383	29	351	361	47	638	154
Grp Sat Flow(s),veh/h/ln	1619	1800	1525	1619	0	1670	1619	1710	1754	1619	1710	1493
Q Serve(g_s), s	3.5	0.3	1.3	11.9	0.0	11.5	0.9	10.2	10.2	1.5	8.9	4.5
Cycle Q Clear(g_c), s	3.5	0.3	1.3	11.9	0.0	11.5	0.9	10.2	10.2	1.5	8.9	4.5
Prop In Lane	1.00		1.00	1.00		0.43	1.00		0.13	1.00		1.00
Lane Grp Cap(c), veh/h	134	172	146	432	0	467	53	454	465	76	956	417
V/C Ratio(X)	0.80	0.06	0.27	0.87	0.00	0.82	0.55	0.77	0.78	0.62	0.67	0.37
Avail Cap(c_a), veh/h	485	1305	1106	888	0	1627	150	906	929	166	1844	805
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.2	22.1	22.6	18.8	0.0	18.1	25.6	18.3	18.3	25.2	17.2	15.6
Incr Delay (d2), s/veh	4.1	0.1	0.4	2.2	0.0	1.4	3.3	1.1	1.1	3.0	0.3	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.1	0.4	4.0	0.0	3.9	0.4	3.2	3.3	0.6	2.7	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.4	22.2	23.0	21.0	0.0	19.5	28.9	19.3	19.3	28.2	17.5	15.8
LnGrp LOS	C	C	C	C	A	B	C	B	B	C	B	B
Approach Vol, veh/h		158			759			741			839	
Approach Delay, s/veh		26.6			20.2			19.7			17.8	
Approach LOS		C			C			B			B	

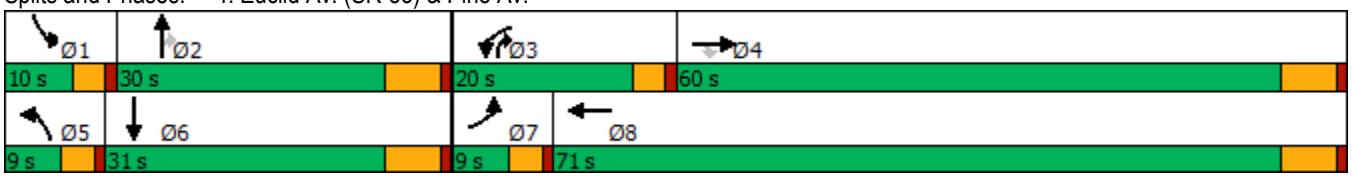
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.0	19.8	17.9	10.1	5.3	20.5	7.9	20.0
Change Period (Y+Rc), s	3.5	5.5	3.5	5.0	3.5	5.5	3.5	5.0
Max Green Setting (Gmax), s	5.5	28.5	29.5	39.0	5.0	29.0	16.1	52.4
Max Q Clear Time (g_c+I1), s	3.5	12.2	13.9	3.3	2.9	10.9	5.5	13.5
Green Ext Time (p_c), s	0.0	2.0	0.5	0.1	0.0	2.4	0.1	1.5

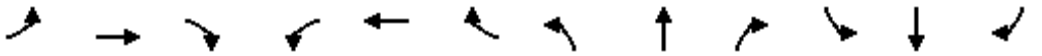
Intersection Summary	
HCM 6th Ctrl Delay	19.6
HCM 6th LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	4	167	64	692	390	41	601	913	81	852
Future Volume (vph)	4	167	64	692	390	41	601	913	81	852
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8	5	2	3	1	6
Permitted Phases			4					2		
Detector Phase	7	4	4	3	8	5	2	3	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	43.0	43.0	9.0	45.0	9.0	11.0	9.0	9.0	29.0
Total Split (s)	9.0	60.0	60.0	20.0	71.0	9.0	30.0	20.0	10.0	31.0
Total Split (%)	7.5%	50.0%	50.0%	16.7%	59.2%	7.5%	25.0%	16.7%	8.3%	25.8%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	3.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	6.0	4.0	4.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	None	None	Min
Act Effct Green (s)	5.1	16.5	16.5	16.4	35.6	5.1	20.7	43.2	6.1	25.9
Actuated g/C Ratio	0.06	0.21	0.21	0.20	0.44	0.06	0.26	0.54	0.08	0.32
v/c Ratio	0.04	0.46	0.15	1.17	0.59	0.41	0.70	0.84	0.67	0.81
Control Delay	42.8	31.7	0.8	126.7	20.8	53.7	32.8	14.2	67.8	34.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.8	31.7	0.8	126.7	20.8	53.7	32.8	14.2	67.8	34.2
LOS	D	C	A	F	C	D	C	B	E	C
Approach Delay		23.4			84.7		22.4			37.1
Approach LOS		C			F		C			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 80.2	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.17	
Intersection Signal Delay: 44.4	Intersection LOS: D
Intersection Capacity Utilization 85.6%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 4: Euclid Av. (SR-83) & Pine Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	167	64	692	390	66	41	601	913	81	852	20
Future Volume (veh/h)	4	167	64	692	390	66	41	601	913	81	852	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	4	170	0	706	398	60	42	613	427	83	869	17
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	9	250		692	561	85	65	928	771	103	1011	20
Arrive On Green	0.01	0.14	0.00	0.23	0.37	0.37	0.04	0.27	0.27	0.06	0.29	0.29
Sat Flow, veh/h	1619	1800	1525	2956	1528	230	1619	3420	1525	1619	3431	67
Grp Volume(v), veh/h	4	170	0	706	0	458	42	613	427	83	433	453
Grp Sat Flow(s),veh/h/ln	1619	1800	1525	1478	0	1759	1619	1710	1525	1619	1710	1788
Q Serve(g_s), s	0.2	6.1	0.0	16.0	0.0	15.2	1.7	10.9	13.1	3.5	16.4	16.4
Cycle Q Clear(g_c), s	0.2	6.1	0.0	16.0	0.0	15.2	1.7	10.9	13.1	3.5	16.4	16.4
Prop In Lane	1.00		1.00	1.00		0.13	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	9	250		692	0	646	65	928	771	103	504	527
V/C Ratio(X)	0.46	0.68		1.02	0.00	0.71	0.65	0.66	0.55	0.81	0.86	0.86
Avail Cap(c_a), veh/h	118	1421		692	0	1672	118	1200	892	142	625	654
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.9	28.0	0.0	26.2	0.0	18.5	32.3	22.1	11.6	31.6	22.8	22.8
Incr Delay (d2), s/veh	13.6	4.6	0.0	39.5	0.0	2.1	3.9	0.4	0.2	14.9	8.4	8.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	2.7	0.0	8.7	0.0	5.5	0.7	3.7	3.4	1.6	6.6	6.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.5	32.6	0.0	65.7	0.0	20.6	36.3	22.5	11.8	46.5	31.2	30.9
LnGrp LOS	D	C		F	A	C	D	C	B	D	C	C
Approach Vol, veh/h		174	A		1164			1082			969	
Approach Delay, s/veh		32.9			48.0			18.8			32.3	
Approach LOS		C			D			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.3	24.6	20.0	15.5	6.7	26.1	4.4	31.1
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	6.0	24.0	16.0	54.0	5.0	25.0	5.0	65.0
Max Q Clear Time (g_c+I1), s	5.5	15.1	18.0	8.1	3.7	18.4	2.2	17.2
Green Ext Time (p_c), s	0.0	2.2	0.0	1.3	0.0	1.8	0.0	4.2

Intersection Summary	
HCM 6th Ctrl Delay	33.4
HCM 6th LOS	C

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	412	47	11	1164	33	8
Future Volume (vph)	412	47	11	1164	33	8
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases		4				2
Detector Phase	4	4	3	8	2	2
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	23.2	23.2	9.6	16.2	32.1	32.1
Total Split (s)	77.7	77.7	9.6	87.3	32.7	32.7
Total Split (%)	64.8%	64.8%	8.0%	72.8%	27.3%	27.3%
Yellow Time (s)	5.2	5.2	3.6	5.2	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2	4.6	6.2	5.1	5.1
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	None	None	None	None	Min	Min
Act Effct Green (s)	79.7	79.7	5.0	81.4	13.1	13.1
Actuated g/C Ratio	0.75	0.75	0.05	0.77	0.12	0.12
v/c Ratio	0.33	0.04	0.16	0.91	0.18	0.05
Control Delay	6.6	2.2	55.9	22.7	42.6	20.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.6	2.2	55.9	22.7	42.6	20.4
LOS	A	A	E	C	D	C
Approach Delay	6.2			23.0	38.2	
Approach LOS	A			C	D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 105.8	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 18.8	Intersection LOS: B
Intersection Capacity Utilization 82.4%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 5: Mayhew Av. & Kimball Av.





Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	412	47	11	1164	33	8
Future Volume (veh/h)	412	47	11	1164	33	8
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	448	51	12	1265	36	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1237	1048	23	1358	186	176
Arrive On Green	0.69	0.69	0.01	0.75	0.12	0.12
Sat Flow, veh/h	1800	1525	1619	1800	1619	1525
Grp Volume(v), veh/h	448	51	12	1265	36	9
Grp Sat Flow(s),veh/h/ln	1800	1525	1619	1800	1619	1525
Q Serve(g_s), s	9.0	0.9	0.6	50.4	1.7	0.5
Cycle Q Clear(g_c), s	9.0	0.9	0.6	50.4	1.7	0.5
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1237	1048	23	1358	186	176
V/C Ratio(X)	0.36	0.05	0.51	0.93	0.19	0.05
Avail Cap(c_a), veh/h	1482	1256	93	1681	515	485
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	5.7	4.4	42.5	8.8	34.8	34.2
Incr Delay (d2), s/veh	0.2	0.0	6.3	8.6	0.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	0.2	0.3	12.3	0.7	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	5.8	4.4	48.8	17.4	35.3	34.3
LnGrp LOS	A	A	D	B	D	C
Approach Vol, veh/h	499			1277	45	
Approach Delay, s/veh	5.7			17.7	35.1	
Approach LOS	A			B	D	

Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		15.1	5.9	65.9		71.7
Change Period (Y+Rc), s		5.1	4.6	6.2		6.2
Max Green Setting (Gmax), s		27.6	5.0	71.5		81.1
Max Q Clear Time (g_c+I1), s		3.7	2.6	11.0		52.4
Green Ext Time (p_c), s		0.1	0.0	2.8		13.2

Intersection Summary	
HCM 6th Ctrl Delay	14.8
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	3.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	35	6	7	5	8	51
Future Vol, veh/h	35	6	7	5	8	51
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	38	7	8	5	9	55

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	58	37	64	0	-	0
Stage 1	37	-	-	-	-	-
Stage 2	21	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	954	1041	1551	-	-	-
Stage 1	991	-	-	-	-	-
Stage 2	1007	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	949	1041	1551	-	-	-
Mov Cap-2 Maneuver	887	-	-	-	-	-
Stage 1	986	-	-	-	-	-
Stage 2	1007	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.2	4.3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1551	-	907	-	-
HCM Lane V/C Ratio	0.005	-	0.049	-	-
HCM Control Delay (s)	7.3	-	9.2	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	4.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	10	15	7	6	8
Future Vol, veh/h	5	10	15	7	6	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	5	11	16	8	7	9

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	52	12	16	0	-	0
Stage 1	12	-	-	-	-	-
Stage 2	40	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	962	1074	1615	-	-	-
Stage 1	1016	-	-	-	-	-
Stage 2	988	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	952	1074	1615	-	-	-
Mov Cap-2 Maneuver	889	-	-	-	-	-
Stage 1	1006	-	-	-	-	-
Stage 2	988	-	-	-	-	-

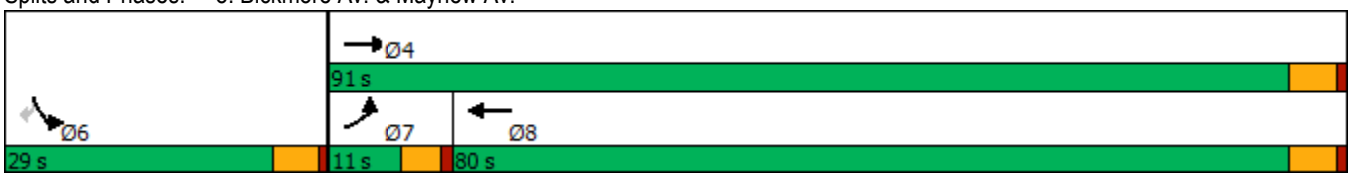
Approach	EB	NB	SB
HCM Control Delay, s	8.6	4.9	0
HCM LOS	A		

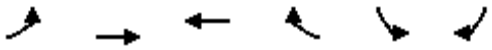
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1615	-	1004	-	-
HCM Lane V/C Ratio	0.01	-	0.016	-	-
HCM Control Delay (s)	7.3	-	8.6	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Traffic Volume (vph)	18	81	696	3	13
Future Volume (vph)	18	81	696	3	13
Turn Type	Prot	NA	NA	Prot	Perm
Protected Phases	7	4	8	6	
Permitted Phases					6
Detector Phase	7	4	8	6	6
Switch Phase					
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	15.4	22.4	27.1	27.1
Total Split (s)	11.0	91.0	80.0	29.0	29.0
Total Split (%)	9.2%	75.8%	66.7%	24.2%	24.2%
Yellow Time (s)	3.6	4.4	4.4	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	5.4	5.1	5.1
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	Max	Max	None	None
Act Effct Green (s)	6.2	95.5	91.4	12.2	12.2
Actuated g/C Ratio	0.06	0.91	0.87	0.12	0.12
v/c Ratio	0.21	0.05	0.49	0.02	0.07
Control Delay	54.6	2.4	7.4	40.7	19.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	54.6	2.4	7.4	40.7	19.2
LOS	D	A	A	D	B
Approach Delay		12.0	7.4	23.0	
Approach LOS		B	A	C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 105.4	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.49	
Intersection Signal Delay: 8.2	Intersection LOS: A
Intersection Capacity Utilization 56.1%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 8: Bickmore Av. & Mayhew Av.





Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	18	81	696	5	3	13
Future Volume (veh/h)	18	81	696	5	3	13
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1700	1800	1800	1800	1700	1800
Adj Flow Rate, veh/h	20	88	757	5	3	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	35	1543	1411	9	61	57
Arrive On Green	0.02	0.86	0.79	0.79	0.04	0.04
Sat Flow, veh/h	1619	1800	1786	12	1619	1525
Grp Volume(v), veh/h	20	88	0	762	3	14
Grp Sat Flow(s),veh/h/ln	1619	1800	0	1798	1619	1525
Q Serve(g_s), s	1.2	0.7	0.0	15.4	0.2	0.9
Cycle Q Clear(g_c), s	1.2	0.7	0.0	15.4	0.2	0.9
Prop In Lane	1.00			0.01	1.00	1.00
Lane Grp Cap(c), veh/h	35	1543	0	1420	61	57
V/C Ratio(X)	0.58	0.06	0.00	0.54	0.05	0.24
Avail Cap(c_a), veh/h	104	1543	0	1420	387	365
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.4	1.1	0.0	3.8	46.3	46.7
Incr Delay (d2), s/veh	14.4	0.1	0.0	1.5	0.1	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.1	0.0	3.9	0.1	0.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	62.8	1.1	0.0	5.3	46.4	47.5
LnGrp LOS	E	A	A	A	D	D
Approach Vol, veh/h		108	762		17	
Approach Delay, s/veh		12.6	5.3		47.3	
Approach LOS		B	A		D	

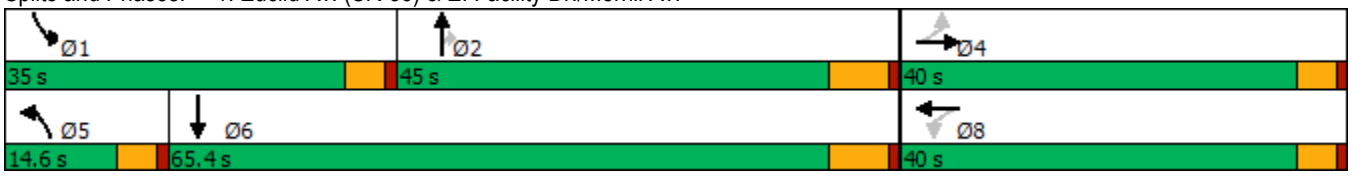
Timer - Assigned Phs	4	6	7	8
Phs Duration (G+Y+Rc), s	91.0	8.9	6.7	84.3
Change Period (Y+Rc), s	5.4	5.1	4.6	5.4
Max Green Setting (Gmax), s	85.6	23.9	6.4	74.6
Max Q Clear Time (g_c+I1), s	2.7	2.9	3.2	17.4
Green Ext Time (p_c), s	0.5	0.0	0.0	6.1

Intersection Summary	
HCM 6th Ctrl Delay	7.0
HCM 6th LOS	A

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	11	29	184	2	4	1183	226	251	1175
Future Volume (vph)	11	29	184	2	4	1183	226	251	1175
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8				2		
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	15.0	15.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	9.6	9.6	21.6	21.6	14.6	28.5	28.5	14.6	42.5
Total Split (s)	40.0	40.0	40.0	40.0	14.6	45.0	45.0	35.0	65.4
Total Split (%)	33.3%	33.3%	33.3%	33.3%	12.2%	37.5%	37.5%	29.2%	54.5%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	5.5	5.5	3.6	5.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.6		4.6	4.6	6.5	6.5	4.6	6.5
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None	Max
Act Effct Green (s)		28.7		28.7	10.1	39.7	39.7	22.1	63.8
Actuated g/C Ratio		0.27		0.27	0.09	0.37	0.37	0.21	0.60
v/c Ratio		0.13		0.90	0.03	1.02	0.39	0.83	0.63
Control Delay		25.1		60.6	50.0	65.2	18.9	61.3	17.4
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		25.1		60.6	50.0	65.2	18.9	61.3	17.4
LOS		C		E	D	E	B	E	B
Approach Delay		25.1		60.6		57.8			25.1
Approach LOS		C		E		E			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 106.4	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.02	
Intersection Signal Delay: 43.0	Intersection LOS: D
Intersection Capacity Utilization 89.5%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 1: Euclid Av. (SR-83) & E. Facility Dr./Merrill Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	29	12	184	2	136	4	1183	226	251	1175	1
Future Volume (veh/h)	11	29	12	184	2	136	4	1183	226	251	1175	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	12	32	12	202	2	139	4	1300	183	276	1291	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	106	261	88	277	2	152	17	1374	613	306	1985	0
Arrive On Green	0.25	0.25	0.25	0.25	0.25	0.25	0.01	0.40	0.40	0.19	0.58	0.00
Sat Flow, veh/h	246	1027	347	866	9	596	1619	3420	1525	1619	3510	0
Grp Volume(v), veh/h	56	0	0	343	0	0	4	1300	183	276	1291	0
Grp Sat Flow(s),veh/h/ln	1620	0	0	1470	0	0	1619	1710	1525	1619	1710	0
Q Serve(g_s), s	0.0	0.0	0.0	20.4	0.0	0.0	0.2	37.2	8.3	16.9	25.8	0.0
Cycle Q Clear(g_c), s	2.5	0.0	0.0	22.9	0.0	0.0	0.2	37.2	8.3	16.9	25.8	0.0
Prop In Lane	0.21		0.21	0.59		0.41	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	455	0	0	430	0	0	17	1374	613	306	1985	0
V/C Ratio(X)	0.12	0.00	0.00	0.80	0.00	0.00	0.24	0.95	0.30	0.90	0.65	0.00
Avail Cap(c_a), veh/h	606	0	0	566	0	0	160	1374	613	485	1985	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	29.1	0.0	0.0	36.5	0.0	0.0	49.8	29.3	20.6	40.2	14.4	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	4.3	0.0	0.0	2.6	14.4	1.2	9.3	1.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	0.0	8.2	0.0	0.0	0.1	16.3	2.9	7.1	8.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.2	0.0	0.0	40.8	0.0	0.0	52.4	43.7	21.9	49.5	16.0	0.0
LnGrp LOS	C	A	A	D	A	A	D	D	C	D	B	A
Approach Vol, veh/h		56			343			1487			1567	
Approach Delay, s/veh		29.2			40.8			41.0			21.9	
Approach LOS		C			D			D			C	

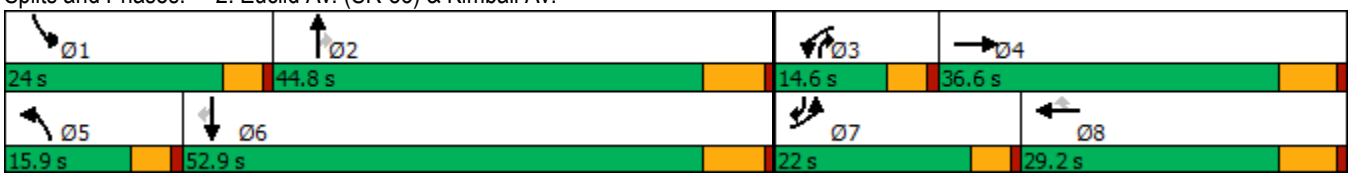
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	23.8	47.3		30.4	5.7	65.4		30.4				
Change Period (Y+Rc), s	4.6	6.5		4.6	4.6	6.5		4.6				
Max Green Setting (Gmax), s	30.4	38.5		35.4	10.0	58.9		35.4				
Max Q Clear Time (g_c+I1), s	18.9	39.2		4.5	2.2	27.8		24.9				
Green Ext Time (p_c), s	0.3	0.0		0.2	0.0	9.9		0.9				

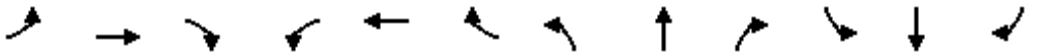
Intersection Summary												
HCM 6th Ctrl Delay			32.1									
HCM 6th LOS			C									

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	378	729	27	325	214	71	723	38	448	732	214
Future Volume (vph)	378	729	27	325	214	71	723	38	448	732	214
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2	3	1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	3	1	6	7
Switch Phase											
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	5.0	10.0	5.0	5.0	10.0
Minimum Split (s)	14.6	27.2	14.6	29.2	29.2	14.6	44.5	14.6	9.6	40.5	14.6
Total Split (s)	22.0	36.6	14.6	29.2	29.2	15.9	44.8	14.6	24.0	52.9	22.0
Total Split (%)	18.3%	30.5%	12.2%	24.3%	24.3%	13.3%	37.3%	12.2%	20.0%	44.1%	18.3%
Yellow Time (s)	3.6	5.2	3.6	5.2	5.2	3.6	5.5	3.6	3.6	5.5	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	4.6	6.2	6.2	4.6	6.5	4.6	4.6	6.5	4.6
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	None	Max	None
Act Effct Green (s)	16.8	30.6	10.0	20.5	20.5	10.5	38.4	55.0	19.2	50.4	73.7
Actuated g/C Ratio	0.14	0.26	0.09	0.18	0.18	0.09	0.33	0.47	0.16	0.43	0.63
v/c Ratio	0.91	0.93	0.20	0.55	0.49	0.50	0.66	0.05	0.94	0.51	0.21
Control Delay	76.3	59.4	55.2	47.7	9.4	64.3	37.7	0.1	78.4	27.7	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.3	59.4	55.2	47.7	9.4	64.3	37.7	0.1	78.4	27.7	2.2
LOS	E	E	E	D	A	E	D	A	E	C	A
Approach Delay		64.8		33.6			38.2			40.1	
Approach LOS		E		C			D			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 117	
Natural Cycle: 110	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.94	
Intersection Signal Delay: 46.1	Intersection LOS: D
Intersection Capacity Utilization 86.7%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 2: Euclid Av. (SR-83) & Kimball Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	378	729	76	27	325	214	71	723	38	448	732	214
Future Volume (veh/h)	378	729	76	27	325	214	71	723	38	448	732	214
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1600	1800	1800	1700	1800	1800	1700	1800	1800	1600	1800	1800
Adj Flow Rate, veh/h	386	744	73	28	332	152	72	738	33	457	747	156
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	432	805	79	83	551	246	127	1140	587	499	1450	870
Arrive On Green	0.15	0.26	0.26	0.05	0.16	0.16	0.08	0.33	0.33	0.17	0.42	0.42
Sat Flow, veh/h	2956	3146	309	1619	3420	1525	1619	3420	1525	2956	3420	1525
Grp Volume(v), veh/h	386	404	413	28	332	152	72	738	33	457	747	156
Grp Sat Flow(s),veh/h/ln	1478	1710	1744	1619	1710	1525	1619	1710	1525	1478	1710	1525
Q Serve(g_s), s	14.7	26.5	26.5	1.9	10.4	10.7	4.9	21.1	1.6	17.5	18.5	5.6
Cycle Q Clear(g_c), s	14.7	26.5	26.5	1.9	10.4	10.7	4.9	21.1	1.6	17.5	18.5	5.6
Prop In Lane	1.00		0.18	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	432	437	446	83	551	246	127	1140	587	499	1450	870
V/C Ratio(X)	0.89	0.92	0.93	0.34	0.60	0.62	0.57	0.65	0.06	0.92	0.52	0.18
Avail Cap(c_a), veh/h	448	452	462	141	685	305	159	1140	587	499	1450	870
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.2	41.7	41.7	52.6	44.8	44.9	51.1	32.6	22.2	46.9	24.4	11.8
Incr Delay (d2), s/veh	18.7	24.4	24.2	0.9	1.1	2.5	1.5	2.8	0.2	21.2	1.3	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.3	13.5	13.8	0.8	4.3	4.1	2.0	8.6	0.6	7.6	7.1	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.9	66.1	65.9	53.5	45.9	47.5	52.6	35.4	22.4	68.1	25.7	12.3
LnGrp LOS	E	E	E	D	D	D	D	D	C	E	C	B
Approach Vol, veh/h		1203			512			843			1360	
Approach Delay, s/veh		66.3			46.7			36.4			38.4	
Approach LOS		E			D			D			D	

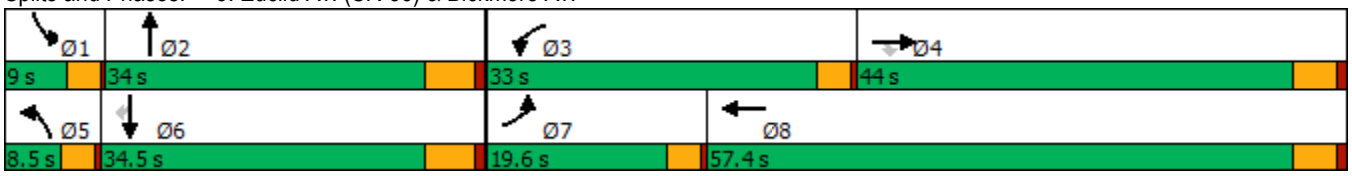
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	24.0	44.8	10.5	35.6	13.6	55.2	21.4	24.7
Change Period (Y+Rc), s	4.6	6.5	4.6	6.2	4.6	6.5	4.6	6.2
Max Green Setting (Gmax), s	19.4	38.3	10.0	30.4	11.3	46.4	17.4	23.0
Max Q Clear Time (g_c+I1), s	19.5	23.1	3.9	28.5	6.9	20.5	16.7	12.7
Green Ext Time (p_c), s	0.0	3.9	0.0	0.9	0.0	5.2	0.1	1.7

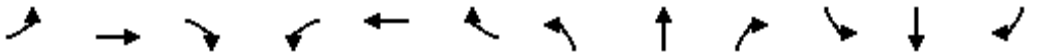
Intersection Summary	
HCM 6th Ctrl Delay	47.6
HCM 6th LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	122	103	62	55	24	34	634	127	685	192
Future Volume (vph)	122	103	62	55	24	34	634	127	685	192
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2	1	6	
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	5	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	44.0	44.0	8.5	44.0	8.5	26.5	8.5	30.5	30.5
Total Split (s)	19.6	44.0	44.0	33.0	57.4	8.5	34.0	9.0	34.5	34.5
Total Split (%)	16.3%	36.7%	36.7%	27.5%	47.8%	7.1%	28.3%	7.5%	28.8%	28.8%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	4.5	3.0	4.5	4.5
All-Red Time (s)	0.5	1.0	1.0	0.5	1.0	0.5	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.0	5.0	3.5	5.0	3.5	5.5	3.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	None	Min	Min
Act Effct Green (s)	10.3	14.9	14.9	7.7	10.3	5.8	24.5	6.4	32.5	32.5
Actuated g/C Ratio	0.16	0.23	0.23	0.12	0.16	0.09	0.38	0.10	0.51	0.51
v/c Ratio	0.48	0.25	0.15	0.29	0.22	0.24	0.61	0.82	0.41	0.23
Control Delay	37.3	23.4	1.0	37.1	14.3	41.5	22.8	75.2	19.3	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.3	23.4	1.0	37.1	14.3	41.5	22.8	75.2	19.3	4.9
LOS	D	C	A	D	B	D	C	E	B	A
Approach Delay		24.5			24.8		23.6		23.6	
Approach LOS		C			C		C		C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 64	
Natural Cycle: 95	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 23.8	Intersection LOS: C
Intersection Capacity Utilization 57.4%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 3: Euclid Av. (SR-83) & Bickmore Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	122	103	62	55	24	41	34	634	122	127	685	192
Future Volume (veh/h)	122	103	62	55	24	41	34	634	122	127	685	192
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	126	106	48	57	25	29	35	654	107	131	706	164
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	158	276	234	92	86	99	64	875	143	161	1222	545
Arrive On Green	0.10	0.15	0.15	0.06	0.11	0.11	0.04	0.30	0.30	0.10	0.36	0.36
Sat Flow, veh/h	1619	1800	1522	1619	760	881	1619	2943	481	1619	3420	1525
Grp Volume(v), veh/h	126	106	48	57	0	54	35	380	381	131	706	164
Grp Sat Flow(s),veh/h/ln	1619	1800	1522	1619	0	1641	1619	1710	1713	1619	1710	1525
Q Serve(g_s), s	3.4	2.4	1.2	1.5	0.0	1.3	0.9	8.9	9.0	3.5	7.4	3.4
Cycle Q Clear(g_c), s	3.4	2.4	1.2	1.5	0.0	1.3	0.9	8.9	9.0	3.5	7.4	3.4
Prop In Lane	1.00		1.00	1.00		0.54	1.00		0.28	1.00		1.00
Lane Grp Cap(c), veh/h	158	276	234	92	0	185	64	508	509	161	1222	545
V/C Ratio(X)	0.80	0.38	0.21	0.62	0.00	0.29	0.55	0.75	0.75	0.81	0.58	0.30
Avail Cap(c_a), veh/h	585	1576	1333	1072	0	1931	182	1094	1096	200	2226	993
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.7	17.0	16.5	20.5	0.0	18.1	21.0	14.1	14.1	19.6	11.6	10.3
Incr Delay (d2), s/veh	3.5	0.3	0.2	2.5	0.0	0.3	2.7	0.8	0.8	15.0	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.8	0.4	0.6	0.0	0.4	0.3	2.4	2.4	1.7	1.8	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.2	17.3	16.6	23.1	0.0	18.4	23.7	15.0	15.0	34.6	11.7	10.4
LnGrp LOS	C	B	B	C	A	B	C	B	B	C	B	B
Approach Vol, veh/h		280			111			796			1001	
Approach Delay, s/veh		19.8			20.8			15.4			14.5	
Approach LOS		B			C			B			B	

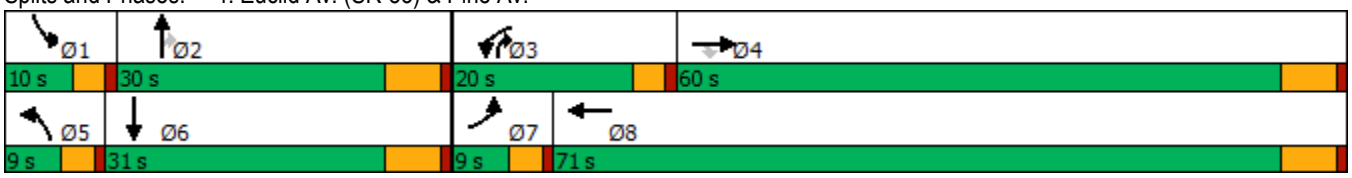
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.9	18.7	6.0	11.8	5.3	21.4	7.8	10.0
Change Period (Y+Rc), s	3.5	5.5	3.5	5.0	3.5	5.5	3.5	5.0
Max Green Setting (Gmax), s	5.5	28.5	29.5	39.0	5.0	29.0	16.1	52.4
Max Q Clear Time (g_c+I1), s	5.5	11.0	3.5	4.4	2.9	9.4	5.4	3.3
Green Ext Time (p_c), s	0.0	2.3	0.1	0.4	0.0	2.8	0.1	0.2

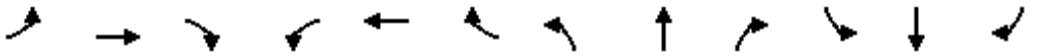
Intersection Summary	
HCM 6th Ctrl Delay	15.8
HCM 6th LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	17	404	82	592	132	65	716	997	103	655
Future Volume (vph)	17	404	82	592	132	65	716	997	103	655
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8	5	2	3	1	6
Permitted Phases			4					2		
Detector Phase	7	4	4	3	8	5	2	3	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	43.0	43.0	9.0	45.0	9.0	11.0	9.0	9.0	29.0
Total Split (s)	9.0	60.0	60.0	20.0	71.0	9.0	30.0	20.0	10.0	31.0
Total Split (%)	7.5%	50.0%	50.0%	16.7%	59.2%	7.5%	25.0%	16.7%	8.3%	25.8%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	3.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	6.0	4.0	4.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	None	None	Min
Act Effct Green (s)	5.0	28.9	28.9	16.1	45.7	5.0	24.2	46.3	6.0	25.2
Actuated g/C Ratio	0.05	0.30	0.30	0.17	0.48	0.05	0.25	0.49	0.06	0.26
v/c Ratio	0.21	0.79	0.16	1.27	0.26	0.81	0.88	1.19	1.08	0.79
Control Delay	52.7	41.2	1.6	169.6	13.6	105.0	48.4	115.5	158.4	41.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.7	41.2	1.6	169.6	13.6	105.0	48.4	115.5	158.4	41.3
LOS	D	D	A	F	B	F	D	F	F	D
Approach Delay		35.2			129.5		88.1			56.9
Approach LOS		D			F		F			E

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 95.3	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.27	
Intersection Signal Delay: 83.5	Intersection LOS: F
Intersection Capacity Utilization 105.7%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 4: Euclid Av. (SR-83) & Pine Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	404	82	592	132	73	65	716	997	103	655	14
Future Volume (veh/h)	17	404	82	592	132	73	65	716	997	103	655	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	18	430	0	630	140	63	69	762	590	110	697	14
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	32	515		511	516	232	86	888	660	105	931	19
Arrive On Green	0.02	0.29	0.00	0.17	0.44	0.44	0.05	0.26	0.26	0.06	0.27	0.27
Sat Flow, veh/h	1619	1800	1525	2956	1176	529	1619	3420	1525	1619	3429	69
Grp Volume(v), veh/h	18	430	0	630	0	203	69	762	590	110	348	363
Grp Sat Flow(s),veh/h/ln	1619	1800	1525	1478	0	1705	1619	1710	1525	1619	1710	1788
Q Serve(g_s), s	1.0	20.7	0.0	16.0	0.0	7.0	3.9	19.6	24.0	6.0	17.2	17.2
Cycle Q Clear(g_c), s	1.0	20.7	0.0	16.0	0.0	7.0	3.9	19.6	24.0	6.0	17.2	17.2
Prop In Lane	1.00		1.00	1.00		0.31	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	32	515		511	0	749	86	888	660	105	464	485
V/C Ratio(X)	0.56	0.83		1.23	0.00	0.27	0.80	0.86	0.89	1.05	0.75	0.75
Avail Cap(c_a), veh/h	88	1051		511	0	1198	88	888	660	105	464	485
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.9	30.9	0.0	38.2	0.0	16.5	43.3	32.6	24.3	43.2	30.8	30.8
Incr Delay (d2), s/veh	5.4	5.1	0.0	120.4	0.0	0.3	37.2	8.1	14.3	101.1	5.9	5.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	9.1	0.0	13.9	0.0	2.5	2.3	8.4	13.0	5.2	7.2	7.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.3	36.0	0.0	158.7	0.0	16.8	80.5	40.7	38.6	144.3	36.7	36.5
LnGrp LOS	D	D		F	A	B	F	D	D	F	D	D
Approach Vol, veh/h		448	A		833			1421			821	
Approach Delay, s/veh		36.6			124.1			41.7			51.0	
Approach LOS		D			F			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.0	30.0	20.0	32.5	8.9	31.1	5.9	46.6
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	6.0	24.0	16.0	54.0	5.0	25.0	5.0	65.0
Max Q Clear Time (g_c+I1), s	8.0	26.0	18.0	22.7	5.9	19.2	3.0	9.0
Green Ext Time (p_c), s	0.0	0.0	0.0	3.8	0.0	1.3	0.0	1.7

Intersection Summary	
HCM 6th Ctrl Delay	62.7
HCM 6th LOS	E

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1181	33	8	489	77	17
Future Volume (vph)	1181	33	8	489	77	17
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases		4				2
Detector Phase	4	4	3	8	2	2
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	23.2	23.2	9.6	16.2	32.1	32.1
Total Split (s)	77.7	77.7	9.6	87.3	32.7	32.7
Total Split (%)	64.8%	64.8%	8.0%	72.8%	27.3%	27.3%
Yellow Time (s)	5.2	5.2	3.6	5.2	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2	4.6	6.2	5.1	5.1
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	None	None	None	None	Min	Min
Act Effct Green (s)	72.2	72.2	5.1	73.8	13.3	13.3
Actuated g/C Ratio	0.73	0.73	0.05	0.75	0.14	0.14
v/c Ratio	0.97	0.03	0.11	0.39	0.39	0.08
Control Delay	34.2	3.3	52.0	6.1	44.1	16.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.2	3.3	52.0	6.1	44.1	16.5
LOS	C	A	D	A	D	B
Approach Delay	33.4			6.9	39.2	
Approach LOS	C			A	D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 98.5	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.97	
Intersection Signal Delay: 26.4	Intersection LOS: C
Intersection Capacity Utilization 83.4%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 5: Mayhew Av. & Kimball Av.



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1181	33	8	489	77	17
Future Volume (veh/h)	1181	33	8	489	77	17
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	1284	36	9	532	84	18
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1304	1105	18	1409	165	156
Arrive On Green	0.72	0.72	0.01	0.78	0.10	0.10
Sat Flow, veh/h	1800	1525	1619	1800	1619	1525
Grp Volume(v), veh/h	1284	36	9	532	84	18
Grp Sat Flow(s),veh/h/ln	1800	1525	1619	1800	1619	1525
Q Serve(g_s), s	67.2	0.7	0.5	8.9	4.8	1.1
Cycle Q Clear(g_c), s	67.2	0.7	0.5	8.9	4.8	1.1
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1304	1105	18	1409	165	156
V/C Ratio(X)	0.98	0.03	0.50	0.38	0.51	0.12
Avail Cap(c_a), veh/h	1313	1113	83	1489	456	430
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.0	3.8	48.2	3.3	41.7	40.0
Incr Delay (d2), s/veh	21.0	0.0	7.8	0.2	2.4	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	24.2	0.1	0.2	1.7	2.0	0.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	34.0	3.8	56.0	3.5	44.1	40.3
LnGrp LOS	C	A	E	A	D	D
Approach Vol, veh/h	1320			541	102	
Approach Delay, s/veh	33.2			4.3	43.4	
Approach LOS	C			A	D	

Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		15.1	5.7	77.2		82.9
Change Period (Y+Rc), s		5.1	4.6	6.2		6.2
Max Green Setting (Gmax), s		27.6	5.0	71.5		81.1
Max Q Clear Time (g_c+I1), s		6.8	2.5	69.2		10.9
Green Ext Time (p_c), s		0.2	0.0	1.9		3.3

Intersection Summary	
HCM 6th Ctrl Delay	25.8
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	6.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	83	15	6	11	5	35
Future Vol, veh/h	83	15	6	11	5	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	90	16	7	12	5	38

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	50	24	43	0	-	0
Stage 1	24	-	-	-	-	-
Stage 2	26	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	964	1058	1579	-	-	-
Stage 1	1004	-	-	-	-	-
Stage 2	1002	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	960	1058	1579	-	-	-
Mov Cap-2 Maneuver	895	-	-	-	-	-
Stage 1	1000	-	-	-	-	-
Stage 2	1002	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.4	2.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1579	-	917	-	-
HCM Lane V/C Ratio	0.004	-	0.116	-	-
HCM Control Delay (s)	7.3	-	9.4	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.4	-	-

Intersection	
Int Delay, s/veh	5.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	11	22	10	6	15	5
Future Vol, veh/h	11	22	10	6	15	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	12	24	11	7	16	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	48	19	21	0	-	0
Stage 1	19	-	-	-	-	-
Stage 2	29	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	967	1065	1608	-	-	-
Stage 1	1009	-	-	-	-	-
Stage 2	999	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	960	1065	1608	-	-	-
Mov Cap-2 Maneuver	895	-	-	-	-	-
Stage 1	1002	-	-	-	-	-
Stage 2	999	-	-	-	-	-

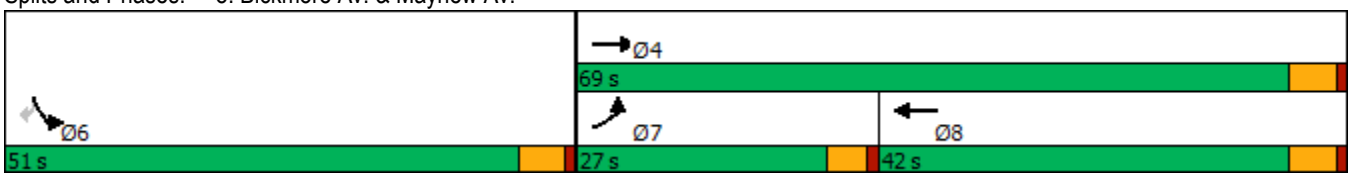
Approach	EB	NB	SB
HCM Control Delay, s	8.7	4.5	0
HCM LOS	A		

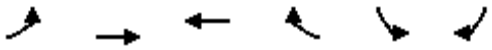
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1608	-	1002	-	-
HCM Lane V/C Ratio	0.007	-	0.036	-	-
HCM Control Delay (s)	7.3	-	8.7	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Traffic Volume (vph)	13	340	89	7	30
Future Volume (vph)	13	340	89	7	30
Turn Type	Prot	NA	NA	Prot	Perm
Protected Phases	7	4	8	6	
Permitted Phases					6
Detector Phase	7	4	8	6	6
Switch Phase					
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	15.4	23.4	27.1	27.1
Total Split (s)	27.0	69.0	42.0	51.0	51.0
Total Split (%)	22.5%	57.5%	35.0%	42.5%	42.5%
Yellow Time (s)	3.6	4.4	4.4	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	5.4	5.1	5.1
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	Max	Max	None	None
Act Effct Green (s)	6.3	72.2	70.0	12.2	12.2
Actuated g/C Ratio	0.07	0.83	0.81	0.14	0.14
v/c Ratio	0.12	0.25	0.07	0.04	0.14
Control Delay	41.1	4.0	5.5	31.1	12.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	41.1	4.0	5.5	31.1	12.4
LOS	D	A	A	C	B
Approach Delay		5.3	5.5	16.0	
Approach LOS		A	A	B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 86.5	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.25	
Intersection Signal Delay: 6.2	Intersection LOS: A
Intersection Capacity Utilization 36.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 8: Bickmore Av. & Mayhew Av.





Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	13	340	89	3	7	30
Future Volume (veh/h)	13	340	89	3	7	30
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1700	1800	1800	1800	1700	1800
Adj Flow Rate, veh/h	14	370	97	3	8	33
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	27	1430	1250	39	121	114
Arrive On Green	0.02	0.79	0.72	0.72	0.07	0.07
Sat Flow, veh/h	1619	1800	1737	54	1619	1525
Grp Volume(v), veh/h	14	370	0	100	8	33
Grp Sat Flow(s),veh/h/ln	1619	1800	0	1790	1619	1525
Q Serve(g_s), s	0.7	4.3	0.0	1.3	0.4	1.6
Cycle Q Clear(g_c), s	0.7	4.3	0.0	1.3	0.4	1.6
Prop In Lane	1.00			0.03	1.00	1.00
Lane Grp Cap(c), veh/h	27	1430	0	1289	121	114
V/C Ratio(X)	0.52	0.26	0.00	0.08	0.07	0.29
Avail Cap(c_a), veh/h	453	1430	0	1289	928	874
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.1	2.1	0.0	3.3	34.5	35.0
Incr Delay (d2), s/veh	14.5	0.4	0.0	0.1	0.1	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.7	0.0	0.3	0.1	1.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	53.5	2.6	0.0	3.4	34.5	35.6
LnGrp LOS	D	A	A	A	C	D
Approach Vol, veh/h		384	100		41	
Approach Delay, s/veh		4.4	3.4		35.4	
Approach LOS		A	A		D	

Timer - Assigned Phs	4	6	7	8
Phs Duration (G+Y+Rc), s	69.0	11.1	5.9	63.1
Change Period (Y+Rc), s	5.4	5.1	4.6	5.4
Max Green Setting (Gmax), s	63.6	45.9	22.4	36.6
Max Q Clear Time (g_c+I1), s	6.3	3.6	2.7	3.3
Green Ext Time (p_c), s	2.3	0.1	0.0	0.5

Intersection Summary	
HCM 6th Ctrl Delay	6.7
HCM 6th LOS	A

APPENDIX 5.2:

E+P CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS

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Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

DIST	CO	RTE	PM	TRAFFIC CONDITIONS	E+P
				CALC CP	DATE 11/22/19
Jurisdiction: City of Chino				CHK CP	DATE 11/22/19
Major Street: Kimball Av.				Critical Approach Speed (Major)	45 mph
Minor Street: Mayhew Av.				Critical Approach Speed (Minor)	25 mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes = **1** lane

Major Street Future ADT = **20,029** vpd Minor Street Future ADT = **639** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……... [√]

or

In built up area of isolated community of < 10,000 population …….. [ ]

RURAL (R)

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
	XX				
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **20,029**	*1* **639**	8,000	5,600 *	2,400	1,680
2 +	*1*	9,600	6,720	2,400	1,680
2 +	*2* +	9,600	6,720	3,200	2,240
1	*2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **20,029**	*1* **639**	12,000	8,400 *	1,200	850
2 +	*1*	14,400	10,080	1,200	850
2 +	*2* +	14,400	10,080	1,600	1,120
1	*2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more …..	A 38% B 75%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
(Average Traffic Estimate Form)

DIST	CO	RTE	PM	TRAFFIC CONDITIONS		E+P
				CALC CP	DATE	11/22/19
Jurisdiction: **City of Chino**				CHK CP	DATE	11/22/19
Major Street: **Mayhew Av.**				Critical Approach Speed (Major)		35 mph
Minor Street: **Driveway 1**				Critical Approach Speed (Minor)		25 mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes **1** lane

Major Street Future ADT = **831** vpd Minor Street Future ADT = **693** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); …….. [ ]

or **URBAN (U)**

In built up area of isolated community of < 10,000 population …….. [ ]

(Based on Estimated Average Daily Traffic - See Note)

URBAN / RURAL	Minimum Requirements EADT			
	Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
CONDITION A - Minimum Vehicular Volume	Urban	Rural	Urban	Rural
XX Satisfied / XX Not Satisfied				
Number of lanes for moving traffic on each approach				
Major Street / Minor Street				
1 **831** / *1* **693**	8,000	5,600	2,400	1,680
2 + / *1*	9,600	6,720	2,400	1,680
2 + / *2* +	9,600	6,720	3,200	2,240
1 / *2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic	Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied / XX Not Satisfied				
Number of lanes for moving traffic on each approach				
Major Street / Minor Street	Urban	Rural	Urban	Rural
1 **831** / *1* **693**	12,000	8,400	1,200	850
2 + / *1*	14,400	10,080	1,200	850
2 + / *2* +	14,400	10,080	1,600	1,120
1 / *2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B				
Satisfied / XX Not Satisfied				
No one condition satisfied, but following conditions fulfilled 80% of more ….. A **10%** B **7%**	2 CONDITIONS 80%		2 CONDITIONS 80%	

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

DIST	CO	RTE	PM	TRAFFIC CONDITIONS	E+P
				CALC CP	DATE 11/22/19
Jurisdiction: **City of Chino**				CHK CP	DATE 11/22/19
Major Street: **Mayhew Av.**				Critical Approach Speed (Major)	35 mph
Minor Street: **Driveway 2**				Critical Approach Speed (Minor)	25 mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes = **1** lane

Major Street Future ADT = **452** vpd Minor Street Future ADT = **206** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); …….. [ ]

or **URBAN (U)**

In built up area of isolated community of < 10,000 population …….. [ ]

(Based on Estimated Average Daily Traffic - See Note)

URBAN / RURAL	Minimum Requirements EADT: Vehicles Per Day on Major Street (Total of Both Approaches)		Minimum Requirements EADT: Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
	Urban	Rural	Urban	Rural
CONDITION A - Minimum Vehicular Volume				
Satisfied / Not Satisfied: XX / XX				
Number of lanes for moving traffic on each approach				
Major Street / Minor Street				
1 **452** / *1* **206**	8,000	5,600	2,400	1,680
2 + / *1*	9,600	6,720	2,400	1,680
2 + / *2* +	9,600	6,720	3,200	2,240
1 / *2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic	Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied / Not Satisfied: XX				
Number of lanes for moving traffic on each approach				
Major Street / Minor Street	Urban	Rural	Urban	Rural
1 **452** / *1* **206**	12,000	8,400	1,200	850
2 + / *1*	14,400	10,080	1,200	850
2 + / *2* +	14,400	10,080	1,600	1,120
1 / *2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B				
Satisfied / Not Satisfied: XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more ….. A: 6% B: 4%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

DIST	CO	RTE	PM	TRAFFIC CONDITIONS	E+P
				CALC CP	DATE 11/22/19
Jurisdiction: **City of Chino**				CHK CP	DATE 11/22/19
Major Street: **Mayhew Av.**				Critical Approach Speed (Major)	45 mph
Minor Street: **Bickmore Av.**				Critical Approach Speed (Minor)	25 mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes = **1** lane

Major Street Future ADT = **259** vpd Minor Street Future ADT = **5,237** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); …….. √

or

In built up area of isolated community of < 10,000 population ……..

RURAL (R)

(Based on Estimated Average Daily Traffic - See Note)

URBAN / RURAL: XX

CONDITION A - Minimum Vehicular Volume

Satisfied / Not Satisfied: XX

Number of lanes for moving traffic on each approach

Major Street	Minor Street	Minimum Requirements EADT: Vehicles Per Day on Major Street (Total of Both Approaches) Urban	Rural	Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only) Urban	Rural
1 **259**	1 **5,237**	8,000	5,600	2,400	1,680 *
2 +	1	9,600	6,720	2,400	1,680
2 +	2 +	9,600	6,720	3,200	2,240
1	2 +	8,000	5,600	3,200	2,240

CONDITION B - Interruption of Continuous Traffic

Satisfied / Not Satisfied: XX

Number of lanes for moving traffic on each approach

Major Street	Minor Street	Vehicles Per Day on Major Street (Total of Both Approaches) Urban	Rural	Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only) Urban	Rural
1 **259**	1 **5,237**	12,000	8,400	1,200	850 *
2 +	1	14,400	10,080	1,200	850
2 +	2 +	14,400	10,080	1,600	1,120
1	2 +	12,000	8,400	1,600	1,120

Combination of CONDITIONS A + B

Satisfied / Not Satisfied: XX

No one condition satisfied, but following conditions fulfilled 80% of more ….. A: 5% B: 3%

2 CONDITIONS 80%

2 CONDITIONS 80%

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

APPENDIX 5.3:

E+P CONDITIONS QUEUING ANALYSIS WORKSHEETS

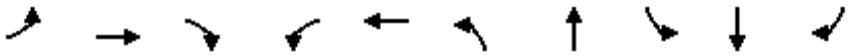
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Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	122	264	38	854	331	158	739	47	195	605	402
v/c Ratio	0.47	0.25	0.28	0.90	0.54	0.82	0.59	0.06	0.84	0.54	0.56
Control Delay	57.6	30.6	56.9	54.2	12.1	82.0	32.6	1.7	82.8	35.2	19.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.6	30.6	56.9	54.2	12.1	82.0	32.6	1.7	82.8	35.2	19.3
Queue Length 50th (ft)	46	77	28	326	41	118	238	0	76	202	154
Queue Length 95th (ft)	78	114	65	#444	131	#224	308	10	#144	267	249
Internal Link Dist (ft)		1169		1767			2587			5208	
Turn Bay Length (ft)	200		215		200	420		260	160		240
Base Capacity (vph)	290	1065	137	982	624	213	1258	812	235	1119	731
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.25	0.28	0.87	0.53	0.74	0.59	0.06	0.83	0.54	0.55

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	107	11	49	376	411	29	719	47	638	172
v/c Ratio	0.50	0.04	0.15	0.64	0.68	0.25	0.74	0.38	0.55	0.28
Control Delay	48.1	31.8	1.0	33.7	28.3	51.7	34.4	54.5	27.8	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.1	31.8	1.0	33.7	28.3	51.7	34.4	54.5	27.8	6.7
Queue Length 50th (ft)	50	5	0	154	163	14	166	23	118	0
Queue Length 95th (ft)	138	20	0	#479	303	#59	#390	#98	313	56
Internal Link Dist (ft)		814			1605		2821		2587	
Turn Bay Length (ft)	150		150	80		115		160		240
Base Capacity (vph)	378	1012	912	705	1164	117	1404	129	1465	739
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.01	0.05	0.53	0.35	0.25	0.51	0.36	0.44	0.23

Intersection Summary

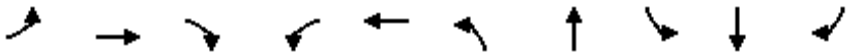
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	386	822	28	332	218	72	738	39	457	747	218
v/c Ratio	0.91	0.93	0.20	0.55	0.49	0.50	0.66	0.05	0.94	0.51	0.21
Control Delay	76.3	59.4	55.2	47.7	9.4	64.3	37.7	0.1	78.4	27.7	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.3	59.4	55.2	47.7	9.4	64.3	37.7	0.1	78.4	27.7	2.2
Queue Length 50th (ft)	153	328	21	122	0	54	260	0	182	231	3
Queue Length 95th (ft)	#243	#457	51	170	67	103	330	0	#288	298	35
Internal Link Dist (ft)		1169		1767			2587			5208	
Turn Bay Length (ft)	200		215		200	420		260	160		240
Base Capacity (vph)	439	888	138	674	476	156	1122	800	490	1472	1047
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.88	0.93	0.20	0.49	0.46	0.46	0.66	0.05	0.93	0.51	0.21

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	126	106	64	57	67	35	780	131	706	198
v/c Ratio	0.48	0.25	0.15	0.29	0.22	0.24	0.61	0.82	0.41	0.23
Control Delay	37.3	23.4	1.0	37.1	14.3	41.5	22.8	75.2	19.3	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.3	23.4	1.0	37.1	14.3	41.5	22.8	75.2	19.3	4.9
Queue Length 50th (ft)	43	36	0	20	9	12	116	48	102	0
Queue Length 95th (ft)	142	81	3	77	40	#64	#363	#249	302	54
Internal Link Dist (ft)		814			1605		2821		2587	
Turn Bay Length (ft)	150		150	80		115		160		240
Base Capacity (vph)	469	1207	1052	860	1347	145	1725	160	1790	895
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.09	0.06	0.07	0.05	0.24	0.45	0.82	0.39	0.22

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

APPENDIX 6.1:

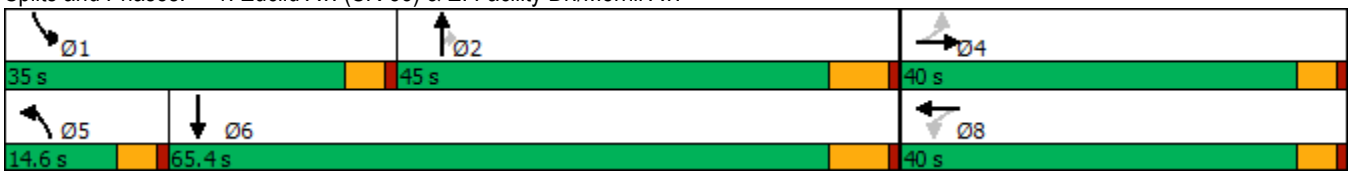
OPENING YEAR CUMULATIVE (2022) WITHOUT PROJECT CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS

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Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	4	8	255	50	11	1136	203	187	1088
Future Volume (vph)	4	8	255	50	11	1136	203	187	1088
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8				2		
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	15.0	15.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	9.6	9.6	21.6	21.6	14.6	28.5	28.5	14.6	42.5
Total Split (s)	40.0	40.0	40.0	40.0	14.6	45.0	45.0	35.0	65.4
Total Split (%)	33.3%	33.3%	33.3%	33.3%	12.2%	37.5%	37.5%	29.2%	54.5%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	5.5	5.5	3.6	5.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.6		4.6	4.6	6.5	6.5	4.6	6.5
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None	Max
Act Effct Green (s)		35.5		35.5	10.0	40.8	40.8	17.4	60.1
Actuated g/C Ratio		0.32		0.32	0.09	0.37	0.37	0.16	0.55
v/c Ratio		0.06		1.20	0.07	0.92	0.33	0.75	0.62
Control Delay		16.2		141.9	49.4	45.9	15.1	62.2	19.3
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		16.2		141.9	49.4	45.9	15.1	62.2	19.3
LOS		B		F	D	D	B	E	B
Approach Delay		16.2		141.9		41.3			25.4
Approach LOS		B		F		D			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 109.4	
Natural Cycle: 110	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.20	
Intersection Signal Delay: 52.1	Intersection LOS: D
Intersection Capacity Utilization 98.9%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 1: Euclid Av. (SR-83) & E. Facility Dr./Merrill Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	8	18	255	50	259	11	1136	203	187	1088	41
Future Volume (veh/h)	4	8	18	255	50	259	11	1136	203	187	1088	41
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	4	8	18	263	52	240	11	1171	166	193	1122	28
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	80	156	299	270	44	203	42	1407	628	220	1777	44
Arrive On Green	0.31	0.31	0.31	0.31	0.31	0.31	0.03	0.41	0.41	0.14	0.52	0.52
Sat Flow, veh/h	139	497	955	710	140	648	1619	3420	1525	1619	3407	85
Grp Volume(v), veh/h	30	0	0	555	0	0	11	1171	166	193	563	587
Grp Sat Flow(s),veh/h/ln	1591	0	0	1498	0	0	1619	1710	1525	1619	1710	1782
Q Serve(g_s), s	0.0	0.0	0.0	33.9	0.0	0.0	0.8	34.6	8.1	13.2	26.5	26.5
Cycle Q Clear(g_c), s	1.5	0.0	0.0	35.4	0.0	0.0	0.8	34.6	8.1	13.2	26.5	26.5
Prop In Lane	0.13		0.60	0.47		0.43	1.00		1.00	1.00		0.05
Lane Grp Cap(c), veh/h	535	0	0	517	0	0	42	1407	628	220	892	930
V/C Ratio(X)	0.06	0.00	0.00	1.07	0.00	0.00	0.26	0.83	0.26	0.88	0.63	0.63
Avail Cap(c_a), veh/h	535	0	0	517	0	0	143	1407	628	436	892	930
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.1	0.0	0.0	40.3	0.0	0.0	53.9	29.7	21.9	47.8	19.3	19.3
Incr Delay (d2), s/veh	0.0	0.0	0.0	61.0	0.0	0.0	1.2	5.9	1.0	4.3	3.4	3.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.0	22.7	0.0	0.0	0.3	14.0	2.9	5.3	10.1	10.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.1	0.0	0.0	101.2	0.0	0.0	55.2	35.6	23.0	52.2	22.6	22.5
LnGrp LOS	C	A	A	F	A	A	E	D	C	D	C	C
Approach Vol, veh/h		30			555			1348			1343	
Approach Delay, s/veh		27.1			101.2			34.2			26.8	
Approach LOS		C			F			C			C	

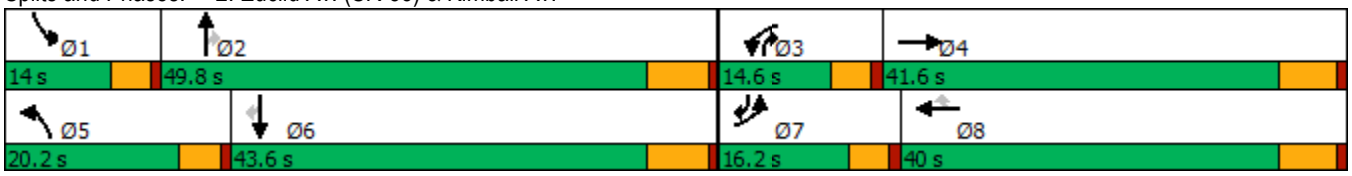
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	20.0	53.0		40.0	7.5	65.4		40.0				
Change Period (Y+Rc), s	4.6	6.5		4.6	4.6	6.5		4.6				
Max Green Setting (Gmax), s	30.4	38.5		35.4	10.0	58.9		35.4				
Max Q Clear Time (g_c+I1), s	15.2	36.6		3.5	2.8	28.5		37.4				
Green Ext Time (p_c), s	0.2	1.3		0.1	0.0	7.4		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			42.5									
HCM 6th LOS			D									

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	130	221	45	884	325	179	879	62	171	699	421
Future Volume (vph)	130	221	45	884	325	179	879	62	171	699	421
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2	3	1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	3	1	6	7
Switch Phase											
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	5.0	10.0	5.0	5.0	10.0
Minimum Split (s)	14.6	27.2	14.6	29.2	29.2	14.6	44.5	14.6	9.6	40.5	14.6
Total Split (s)	16.2	41.6	14.6	40.0	40.0	20.2	49.8	14.6	14.0	43.6	16.2
Total Split (%)	13.5%	34.7%	12.2%	33.3%	33.3%	16.8%	41.5%	12.2%	11.7%	36.3%	13.5%
Yellow Time (s)	3.6	5.2	3.6	5.2	5.2	3.6	5.5	3.6	3.6	5.5	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	4.6	6.2	6.2	4.6	6.5	4.6	4.6	6.5	4.6
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	None	Max	None
Act Effct Green (s)	10.5	36.9	10.0	33.4	33.4	15.0	43.3	59.8	9.1	37.4	49.8
Actuated g/C Ratio	0.09	0.31	0.08	0.28	0.28	0.13	0.37	0.51	0.08	0.32	0.42
v/c Ratio	0.51	0.26	0.34	0.93	0.55	0.90	0.72	0.08	0.77	0.66	0.61
Control Delay	58.7	30.0	58.9	58.7	14.8	92.2	36.3	3.3	75.9	38.7	21.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.7	30.0	58.9	58.7	14.8	92.2	36.3	3.3	75.9	38.7	21.3
LOS	E	C	E	E	B	F	D	A	E	D	C
Approach Delay		39.5		47.3			43.4			37.9	
Approach LOS		D		D			D			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 118.2	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 42.5	Intersection LOS: D
Intersection Capacity Utilization 91.8%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 2: Euclid Av. (SR-83) & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	130	221	43	45	884	325	179	879	62	171	699	421
Future Volume (veh/h)	130	221	43	45	884	325	179	879	62	171	699	421
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1600	1800	1800	1700	1800	1800	1700	1800	1800	1600	1800	1800
Adj Flow Rate, veh/h	133	226	43	46	902	305	183	897	20	174	713	416
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	249	867	162	107	969	432	207	1266	666	221	1084	606
Arrive On Green	0.08	0.30	0.30	0.07	0.28	0.28	0.13	0.37	0.37	0.07	0.32	0.32
Sat Flow, veh/h	2956	2875	538	1619	3420	1525	1619	3420	1525	2956	3420	1505
Grp Volume(v), veh/h	133	133	136	46	902	305	183	897	20	174	713	416
Grp Sat Flow(s),veh/h/ln	1478	1710	1703	1619	1710	1525	1619	1710	1525	1478	1710	1505
Q Serve(g_s), s	5.0	6.9	7.1	3.2	30.0	21.0	13.0	26.2	0.9	6.8	21.0	26.8
Cycle Q Clear(g_c), s	5.0	6.9	7.1	3.2	30.0	21.0	13.0	26.2	0.9	6.8	21.0	26.8
Prop In Lane	1.00		0.32	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	249	515	513	107	969	432	207	1266	666	221	1084	606
V/C Ratio(X)	0.53	0.26	0.27	0.43	0.93	0.71	0.88	0.71	0.03	0.79	0.66	0.69
Avail Cap(c_a), veh/h	293	517	515	138	988	441	216	1266	666	237	1084	606
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.4	31.0	31.0	52.5	40.8	37.5	50.2	31.5	18.8	53.2	34.5	29.0
Incr Delay (d2), s/veh	0.7	0.3	0.3	1.0	14.6	5.0	30.0	3.4	0.1	13.4	3.1	6.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	2.8	2.8	1.3	13.9	8.0	6.7	10.6	0.3	2.8	8.7	10.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.0	31.2	31.3	53.5	55.4	42.5	80.2	34.8	18.9	66.6	37.6	35.2
LnGrp LOS	D	C	C	D	E	D	F	C	B	E	D	D
Approach Vol, veh/h		402			1253			1100			1303	
Approach Delay, s/veh		38.1			52.2			42.1			40.7	
Approach LOS		D			D			D			D	

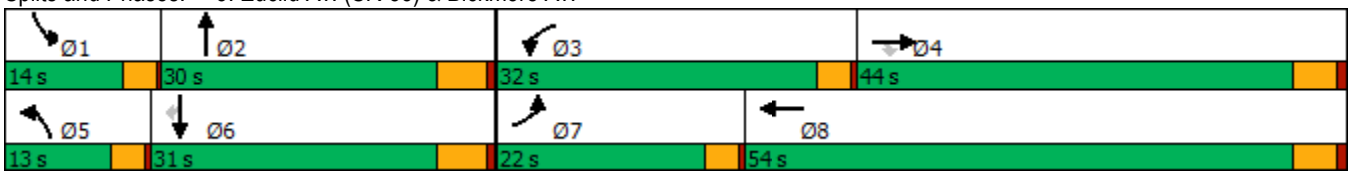
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.4	49.8	12.4	41.5	19.6	43.6	14.5	39.4
Change Period (Y+Rc), s	4.6	6.5	4.6	6.2	4.6	6.5	4.6	6.2
Max Green Setting (Gmax), s	9.4	43.3	10.0	35.4	15.6	37.1	11.6	33.8
Max Q Clear Time (g_c+I1), s	8.8	28.2	5.2	9.1	15.0	28.8	7.0	32.0
Green Ext Time (p_c), s	0.0	4.8	0.0	1.3	0.0	3.6	0.1	1.1

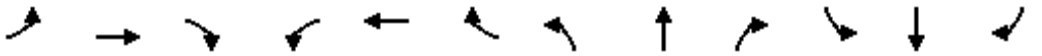
Intersection Summary	
HCM 6th Ctrl Delay	44.4
HCM 6th LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	175	123	110	28	36	79	725	165	833	250
Future Volume (vph)	175	123	110	28	36	79	725	165	833	250
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2	1	6	
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	5	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	44.0	44.0	8.5	44.0	8.5	26.5	8.5	30.5	30.5
Total Split (s)	22.0	44.0	44.0	32.0	54.0	13.0	30.0	14.0	31.0	31.0
Total Split (%)	18.3%	36.7%	36.7%	26.7%	45.0%	10.8%	25.0%	11.7%	25.8%	25.8%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	4.5	3.0	4.5	4.5
All-Red Time (s)	0.5	1.0	1.0	0.5	1.0	0.5	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.0	5.0	3.5	5.0	3.5	5.5	3.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	None	Min	Min
Act Effct Green (s)	12.2	20.1	20.1	6.3	10.7	8.1	25.8	11.0	31.2	31.2
Actuated g/C Ratio	0.16	0.27	0.27	0.08	0.14	0.11	0.34	0.15	0.41	0.41
v/c Ratio	0.66	0.27	0.23	0.21	0.35	0.47	0.77	0.68	0.61	0.34
Control Delay	44.6	22.3	5.1	42.3	16.5	46.2	30.8	50.9	25.8	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.6	22.3	5.1	42.3	16.5	46.2	30.8	50.9	25.8	7.0
LOS	D	C	A	D	B	D	C	D	C	A
Approach Delay		27.3			22.4		32.1		25.3	
Approach LOS		C			C		C		C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 75.4	
Natural Cycle: 105	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 27.8	Intersection LOS: C
Intersection Capacity Utilization 67.9%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 3: Euclid Av. (SR-83) & Bickmore Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	175	123	110	28	36	59	79	725	132	165	833	250
Future Volume (veh/h)	175	123	110	28	36	59	79	725	132	165	833	250
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	180	127	97	29	37	48	81	747	117	170	859	224
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	223	364	308	53	69	90	106	920	144	209	1281	571
Arrive On Green	0.14	0.20	0.20	0.03	0.10	0.10	0.07	0.31	0.31	0.13	0.37	0.37
Sat Flow, veh/h	1619	1800	1523	1619	711	923	1619	2963	464	1619	3420	1525
Grp Volume(v), veh/h	180	127	97	29	0	85	81	431	433	170	859	224
Grp Sat Flow(s),veh/h/ln	1619	1800	1523	1619	0	1634	1619	1710	1717	1619	1710	1525
Q Serve(g_s), s	5.8	3.3	2.9	0.9	0.0	2.7	2.7	12.5	12.5	5.5	11.3	5.8
Cycle Q Clear(g_c), s	5.8	3.3	2.9	0.9	0.0	2.7	2.7	12.5	12.5	5.5	11.3	5.8
Prop In Lane	1.00		1.00	1.00		0.56	1.00		0.27	1.00		1.00
Lane Grp Cap(c), veh/h	223	364	308	53	0	159	106	531	533	209	1281	571
V/C Ratio(X)	0.81	0.35	0.31	0.55	0.00	0.54	0.77	0.81	0.81	0.81	0.67	0.39
Avail Cap(c_a), veh/h	556	1304	1103	857	0	1487	286	778	781	316	1620	723
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.5	18.4	18.3	25.6	0.0	23.1	24.8	17.1	17.1	22.8	14.1	12.3
Incr Delay (d2), s/veh	2.6	0.2	0.2	3.3	0.0	1.0	4.3	2.5	2.6	5.3	0.4	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	1.2	0.9	0.4	0.0	1.0	1.0	4.0	4.0	2.0	3.1	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.1	18.6	18.5	28.9	0.0	24.2	29.1	19.7	19.7	28.1	14.4	12.5
LnGrp LOS	C	B	B	C	A	C	C	B	B	C	B	B
Approach Vol, veh/h		404			114			945			1253	
Approach Delay, s/veh		21.5			25.4			20.5			15.9	
Approach LOS		C			C			C			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.5	22.2	5.3	15.9	7.0	25.7	10.9	10.2
Change Period (Y+Rc), s	3.5	5.5	3.5	5.0	3.5	5.5	3.5	5.0
Max Green Setting (Gmax), s	10.5	24.5	28.5	39.0	9.5	25.5	18.5	49.0
Max Q Clear Time (g_c+I1), s	7.5	14.5	2.9	5.3	4.7	13.3	7.8	4.7
Green Ext Time (p_c), s	0.1	2.2	0.0	0.6	0.0	3.1	0.2	0.3

Intersection Summary	
HCM 6th Ctrl Delay	18.7
HCM 6th LOS	B

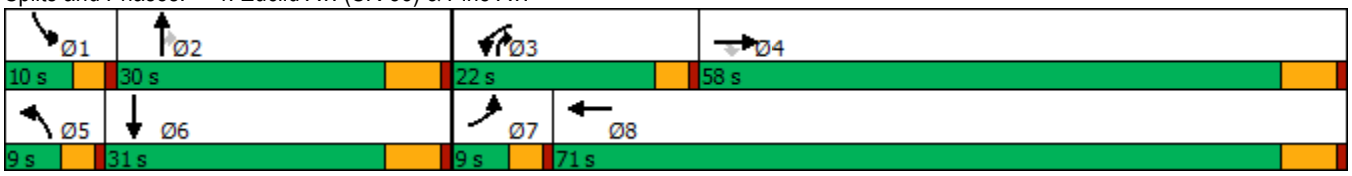
Notes

User approved pedestrian interval to be less than phase max green.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	4	181	69	772	427	50	703	986	100	935
Future Volume (vph)	4	181	69	772	427	50	703	986	100	935
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8	5	2	3	1	6
Permitted Phases			4					2		
Detector Phase	7	4	4	3	8	5	2	3	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	43.0	43.0	9.0	45.0	9.0	11.0	9.0	9.0	29.0
Total Split (s)	9.0	58.0	58.0	22.0	71.0	9.0	30.0	22.0	10.0	31.0
Total Split (%)	7.5%	48.3%	48.3%	18.3%	59.2%	7.5%	25.0%	18.3%	8.3%	25.8%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	3.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	6.0	4.0	4.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	None	None	Min
Act Effct Green (s)	5.1	17.4	17.4	18.2	38.2	5.1	24.3	48.6	6.1	27.3
Actuated g/C Ratio	0.06	0.20	0.20	0.21	0.44	0.06	0.28	0.56	0.07	0.32
v/c Ratio	0.04	0.51	0.17	1.27	0.70	0.54	0.74	0.90	0.90	0.90
Control Delay	44.2	34.6	0.9	163.6	24.5	64.6	35.4	20.7	105.5	43.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.2	34.6	0.9	163.6	24.5	64.6	35.4	20.7	105.5	43.4
LOS	D	C	A	F	C	E	D	C	F	D
Approach Delay		25.7			106.5		27.9			49.2
Approach LOS		C			F		C			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 86.2	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.27	
Intersection Signal Delay: 56.6	Intersection LOS: E
Intersection Capacity Utilization 92.4%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 4: Euclid Av. (SR-83) & Pine Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	181	69	772	427	110	50	703	986	100	935	21
Future Volume (veh/h)	4	181	69	772	427	110	50	703	986	100	935	21
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	4	185	0	788	436	105	51	717	501	102	954	18
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	9	267		689	527	127	70	966	786	126	1089	21
Arrive On Green	0.01	0.15	0.00	0.23	0.38	0.38	0.04	0.28	0.28	0.08	0.32	0.32
Sat Flow, veh/h	1619	1800	1525	2956	1402	338	1619	3420	1525	1619	3434	65
Grp Volume(v), veh/h	4	185	0	788	0	541	51	717	501	102	475	497
Grp Sat Flow(s),veh/h/ln	1619	1800	1525	1478	0	1739	1619	1710	1525	1619	1710	1788
Q Serve(g_s), s	0.2	7.5	0.0	18.0	0.0	21.8	2.4	14.7	18.3	4.8	20.3	20.3
Cycle Q Clear(g_c), s	0.2	7.5	0.0	18.0	0.0	21.8	2.4	14.7	18.3	4.8	20.3	20.3
Prop In Lane	1.00		1.00	1.00		0.19	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	9	267		689	0	654	70	966	786	126	542	567
V/C Ratio(X)	0.46	0.69		1.14	0.00	0.83	0.73	0.74	0.64	0.81	0.88	0.88
Avail Cap(c_a), veh/h	105	1211		689	0	1463	105	1062	829	126	553	578
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.3	31.3	0.0	29.6	0.0	21.9	36.5	25.2	13.5	35.1	25.0	25.0
Incr Delay (d2), s/veh	13.7	4.6	0.0	81.5	0.0	3.9	5.4	2.1	1.1	29.8	13.9	13.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	3.4	0.0	13.5	0.0	8.3	1.0	5.5	5.2	2.8	9.1	9.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.1	35.8	0.0	111.2	0.0	25.7	41.9	27.3	14.6	64.9	38.9	38.4
LnGrp LOS	D	D		F	A	C	D	C	B	E	D	D
Approach Vol, veh/h		189	A		1329			1269			1074	
Approach Delay, s/veh		36.2			76.4			22.9			41.1	
Approach LOS		D			E			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.0	27.8	22.0	17.4	7.3	30.5	4.4	35.0
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	6.0	24.0	18.0	52.0	5.0	25.0	5.0	65.0
Max Q Clear Time (g_c+I1), s	6.8	20.3	20.0	9.5	4.4	22.3	2.2	23.8
Green Ext Time (p_c), s	0.0	1.5	0.0	1.5	0.0	1.0	0.0	5.3

Intersection Summary	
HCM 6th Ctrl Delay	47.0
HCM 6th LOS	D

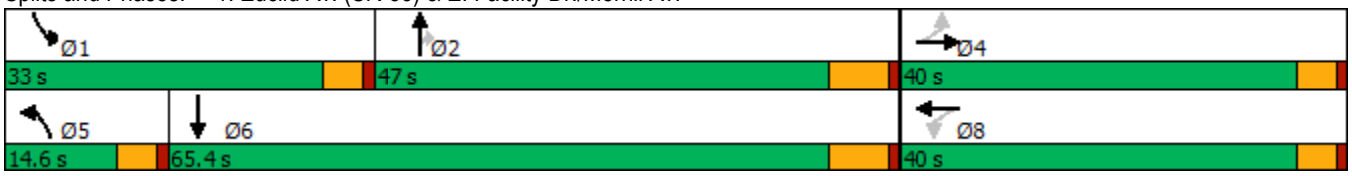
Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	12	31	255	2	4	1279	262	288	1325
Future Volume (vph)	12	31	255	2	4	1279	262	288	1325
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8				2		
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	15.0	15.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	9.6	9.6	21.6	21.6	14.6	28.5	28.5	14.6	42.5
Total Split (s)	40.0	40.0	40.0	40.0	14.6	47.0	47.0	33.0	65.4
Total Split (%)	33.3%	33.3%	33.3%	33.3%	12.2%	39.2%	39.2%	27.5%	54.5%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	5.5	5.5	3.6	5.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.6		4.6	4.6	6.5	6.5	4.6	6.5
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None	Max
Act Effct Green (s)		35.4		35.4	10.0	40.5	40.5	25.4	67.7
Actuated g/C Ratio		0.30		0.30	0.09	0.35	0.35	0.22	0.58
v/c Ratio		0.13		1.16	0.03	1.19	0.49	0.90	0.74
Control Delay		25.9		128.5	51.2	128.1	23.0	73.7	21.9
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		25.9		128.5	51.2	128.1	23.0	73.7	21.9
LOS		C		F	D	F	C	E	C
Approach Delay		25.9		128.5		110.1			31.2
Approach LOS		C		F		F			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 117.1	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.19	
Intersection Signal Delay: 76.5	Intersection LOS: E
Intersection Capacity Utilization 103.1%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 1: Euclid Av. (SR-83) & E. Facility Dr./Merrill Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	31	13	255	2	204	4	1279	262	288	1325	1
Future Volume (veh/h)	12	31	13	255	2	204	4	1279	262	288	1325	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	13	34	13	280	2	214	4	1405	223	316	1456	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	119	297	105	301	2	193	17	1194	533	341	1878	0
Arrive On Green	0.31	0.31	0.31	0.31	0.31	0.31	0.01	0.35	0.35	0.21	0.55	0.00
Sat Flow, veh/h	267	972	343	828	6	633	1619	3420	1525	1619	3510	0
Grp Volume(v), veh/h	60	0	0	496	0	0	4	1405	223	316	1456	0
Grp Sat Flow(s),veh/h/ln	1581	0	0	1466	0	0	1619	1710	1525	1619	1710	0
Q Serve(g_s), s	0.0	0.0	0.0	32.5	0.0	0.0	0.3	40.5	12.9	22.2	38.8	0.0
Cycle Q Clear(g_c), s	2.9	0.0	0.0	35.4	0.0	0.0	0.3	40.5	12.9	22.2	38.8	0.0
Prop In Lane	0.22		0.22	0.56		0.43	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	520	0	0	496	0	0	17	1194	533	341	1878	0
V/C Ratio(X)	0.12	0.00	0.00	1.00	0.00	0.00	0.24	1.18	0.42	0.93	0.78	0.00
Avail Cap(c_a), veh/h	520	0	0	496	0	0	140	1194	533	396	1878	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	29.0	0.0	0.0	41.8	0.0	0.0	56.9	37.8	28.8	44.9	20.5	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	40.5	0.0	0.0	2.6	88.5	2.4	24.3	3.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	0.0	19.5	0.0	0.0	0.1	30.3	4.8	10.7	14.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.0	0.0	0.0	82.2	0.0	0.0	59.6	126.3	31.2	69.3	23.7	0.0
LnGrp LOS	C	A	A	F	A	A	E	F	C	E	C	A
Approach Vol, veh/h		60			496			1632			1772	
Approach Delay, s/veh		29.0			82.2			113.1			31.9	
Approach LOS		C			F			F			C	

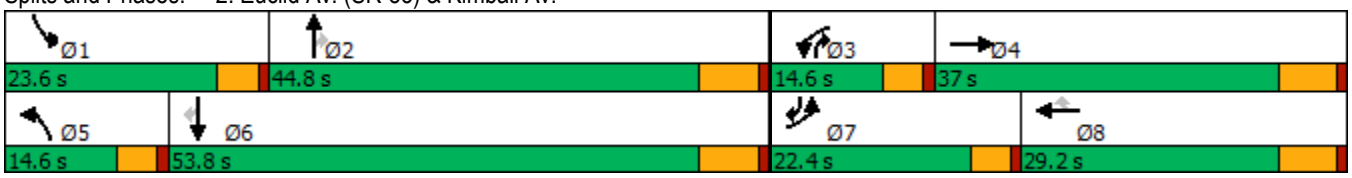
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	29.0	47.0		40.0	5.8	70.2		40.0				
Change Period (Y+Rc), s	4.6	6.5		4.6	4.6	6.5		4.6				
Max Green Setting (Gmax), s	28.4	40.5		35.4	10.0	58.9		35.4				
Max Q Clear Time (g_c+I1), s	24.2	42.5		4.9	2.3	40.8		37.4				
Green Ext Time (p_c), s	0.2	0.0		0.2	0.0	9.2		0.0				

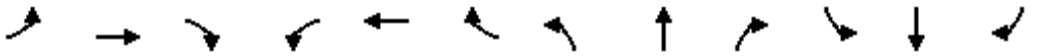
Intersection Summary			
HCM 6th Ctrl Delay		71.6	
HCM 6th LOS		E	

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	404	772	44	324	176	86	867	47	455	930	233
Future Volume (vph)	404	772	44	324	176	86	867	47	455	930	233
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2	3	1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	3	1	6	7
Switch Phase											
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	5.0	10.0	5.0	5.0	10.0
Minimum Split (s)	14.6	27.2	14.6	29.2	29.2	14.6	44.5	14.6	9.6	40.5	14.6
Total Split (s)	22.4	37.0	14.6	29.2	29.2	14.6	44.8	14.6	23.6	53.8	22.4
Total Split (%)	18.7%	30.8%	12.2%	24.3%	24.3%	12.2%	37.3%	12.2%	19.7%	44.8%	18.7%
Yellow Time (s)	3.6	5.2	3.6	5.2	5.2	3.6	5.5	3.6	3.6	5.5	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	4.6	6.2	6.2	4.6	6.5	4.6	4.6	6.5	4.6
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	None	Max	None
Act Effct Green (s)	17.6	31.3	10.0	20.6	20.6	10.0	38.4	54.9	19.0	47.4	71.5
Actuated g/C Ratio	0.15	0.27	0.09	0.18	0.18	0.09	0.33	0.47	0.16	0.40	0.61
v/c Ratio	0.93	0.98	0.33	0.55	0.42	0.64	0.79	0.06	0.97	0.69	0.24
Control Delay	79.6	69.4	58.9	47.8	7.3	74.7	42.7	0.1	84.8	32.7	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	79.6	69.4	58.9	47.8	7.3	74.7	42.7	0.1	84.8	32.7	4.4
LOS	E	E	E	D	A	E	D	A	F	C	A
Approach Delay		72.6		35.6			43.5			43.2	
Approach LOS		E		D			D			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 117.5	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.98	
Intersection Signal Delay: 50.8	Intersection LOS: D
Intersection Capacity Utilization 93.2%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 2: Euclid Av. (SR-83) & Kimball Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	404	772	99	44	324	176	86	867	47	455	930	233
Future Volume (veh/h)	404	772	99	44	324	176	86	867	47	455	930	233
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1600	1800	1800	1700	1800	1800	1700	1800	1800	1600	1800	1800
Adj Flow Rate, veh/h	412	788	96	45	331	114	88	885	42	464	949	176
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	447	803	98	106	602	268	130	1113	596	477	1391	851
Arrive On Green	0.15	0.26	0.26	0.07	0.18	0.18	0.08	0.33	0.33	0.16	0.41	0.41
Sat Flow, veh/h	2956	3069	374	1619	3420	1525	1619	3420	1525	2956	3420	1525
Grp Volume(v), veh/h	412	439	445	45	331	114	88	885	42	464	949	176
Grp Sat Flow(s),veh/h/ln	1478	1710	1733	1619	1710	1525	1619	1710	1525	1478	1710	1525
Q Serve(g_s), s	16.2	30.0	30.0	3.1	10.4	7.8	6.2	27.7	2.0	18.4	26.8	6.8
Cycle Q Clear(g_c), s	16.2	30.0	30.0	3.1	10.4	7.8	6.2	27.7	2.0	18.4	26.8	6.8
Prop In Lane	1.00		0.22	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	447	447	453	106	602	268	130	1113	596	477	1391	851
V/C Ratio(X)	0.92	0.98	0.98	0.42	0.55	0.42	0.68	0.80	0.07	0.97	0.68	0.21
Avail Cap(c_a), veh/h	447	447	453	138	668	298	138	1113	596	477	1391	851
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.3	43.2	43.2	52.9	44.3	43.2	52.7	36.1	22.5	49.1	28.7	13.0
Incr Delay (d2), s/veh	24.1	37.5	37.3	1.0	0.8	1.1	9.3	5.9	0.2	33.8	2.7	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.2	16.7	16.9	1.3	4.3	2.9	2.8	11.7	0.7	8.7	10.6	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	73.3	80.6	80.5	53.9	45.0	44.3	61.9	42.0	22.7	82.9	31.4	13.6
LnGrp LOS	E	F	F	D	D	D	E	D	C	F	C	B
Approach Vol, veh/h		1296			490			1015			1589	
Approach Delay, s/veh		78.3			45.7			43.0			44.5	
Approach LOS		E			D			D			D	

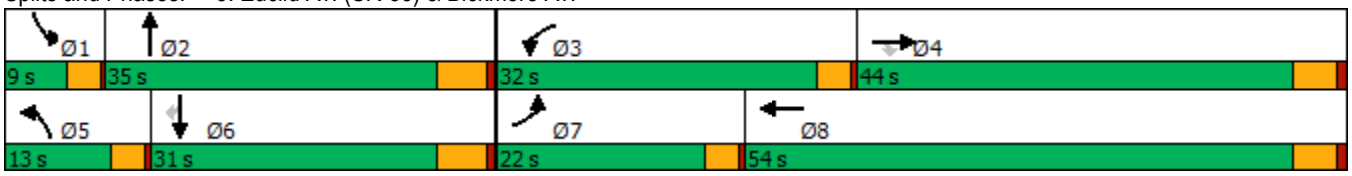
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	23.6	44.8	12.3	37.0	14.0	54.4	22.4	26.9
Change Period (Y+Rc), s	4.6	6.5	4.6	6.2	4.6	6.5	4.6	6.2
Max Green Setting (Gmax), s	19.0	38.3	10.0	30.8	10.0	47.3	17.8	23.0
Max Q Clear Time (g_c+I1), s	20.4	29.7	5.1	32.0	8.2	28.8	18.2	12.4
Green Ext Time (p_c), s	0.0	3.5	0.0	0.0	0.0	6.2	0.0	1.6

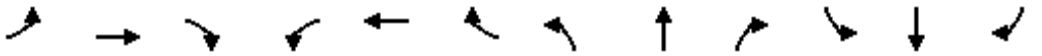
Intersection Summary	
HCM 6th Ctrl Delay	54.2
HCM 6th LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	175	123	110	28	36	79	725	165	833	250
Future Volume (vph)	175	123	110	28	36	79	725	165	833	250
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2	1	6	
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	5	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	44.0	44.0	8.5	44.0	8.5	26.5	8.5	30.5	30.5
Total Split (s)	22.0	44.0	44.0	32.0	54.0	13.0	35.0	9.0	31.0	31.0
Total Split (%)	18.3%	36.7%	36.7%	26.7%	45.0%	10.8%	29.2%	7.5%	25.8%	25.8%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	4.5	3.0	4.5	4.5
All-Red Time (s)	0.5	1.0	1.0	0.5	1.0	0.5	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.0	5.0	3.5	5.0	3.5	5.5	3.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	None	Min	Min
Act Effct Green (s)	12.2	20.1	20.1	6.3	10.7	8.1	30.9	5.8	31.1	31.1
Actuated g/C Ratio	0.16	0.27	0.27	0.08	0.14	0.11	0.41	0.08	0.41	0.41
v/c Ratio	0.65	0.26	0.22	0.21	0.35	0.47	0.64	1.37	0.61	0.34
Control Delay	44.5	22.2	2.4	42.2	16.5	46.1	24.1	244.4	25.8	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.5	22.2	2.4	42.2	16.5	46.1	24.1	244.4	25.8	7.0
LOS	D	C	A	D	B	D	C	F	C	A
Approach Delay		26.5			22.3		26.0		50.9	
Approach LOS		C			C		C		D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 75.3	
Natural Cycle: 105	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.37	
Intersection Signal Delay: 37.4	Intersection LOS: D
Intersection Capacity Utilization 67.9%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 3: Euclid Av. (SR-83) & Bickmore Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	175	123	110	28	36	59	79	725	132	165	833	250
Future Volume (veh/h)	175	123	110	28	36	59	79	725	132	165	833	250
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	180	127	97	29	37	48	81	747	117	170	859	224
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	224	371	314	53	71	93	107	943	148	172	1224	546
Arrive On Green	0.14	0.21	0.21	0.03	0.10	0.10	0.07	0.32	0.32	0.11	0.36	0.36
Sat Flow, veh/h	1619	1800	1523	1619	711	923	1619	2963	464	1619	3420	1525
Grp Volume(v), veh/h	180	127	97	29	0	85	81	431	433	170	859	224
Grp Sat Flow(s),veh/h/ln	1619	1800	1523	1619	0	1634	1619	1710	1717	1619	1710	1525
Q Serve(g_s), s	5.6	3.1	2.8	0.9	0.0	2.6	2.6	11.9	11.9	5.4	11.2	5.7
Cycle Q Clear(g_c), s	5.6	3.1	2.8	0.9	0.0	2.6	2.6	11.9	11.9	5.4	11.2	5.7
Prop In Lane	1.00		1.00	1.00		0.56	1.00		0.27	1.00		1.00
Lane Grp Cap(c), veh/h	224	371	314	53	0	164	107	544	546	172	1224	546
V/C Ratio(X)	0.80	0.34	0.31	0.54	0.00	0.52	0.75	0.79	0.79	0.99	0.70	0.41
Avail Cap(c_a), veh/h	577	1352	1144	889	0	1542	296	972	975	172	1680	749
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.7	17.6	17.5	24.7	0.0	22.2	23.8	16.1	16.1	23.2	14.3	12.5
Incr Delay (d2), s/veh	2.6	0.2	0.2	3.2	0.0	0.9	4.0	1.0	1.0	65.9	0.3	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	1.1	0.9	0.4	0.0	0.9	0.9	3.5	3.5	4.8	3.1	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.2	17.8	17.7	27.9	0.0	23.1	27.8	17.1	17.1	89.1	14.6	12.7
LnGrp LOS	C	B	B	C	A	C	C	B	B	F	B	B
Approach Vol, veh/h		404			114			945			1253	
Approach Delay, s/veh		20.6			24.3			18.0			24.4	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.0	22.0	5.2	15.7	6.9	24.1	10.7	10.2
Change Period (Y+Rc), s	3.5	5.5	3.5	5.0	3.5	5.5	3.5	5.0
Max Green Setting (Gmax), s	5.5	29.5	28.5	39.0	9.5	25.5	18.5	49.0
Max Q Clear Time (g_c+I1), s	7.4	13.9	2.9	5.1	4.6	13.2	7.6	4.6
Green Ext Time (p_c), s	0.0	2.6	0.0	0.6	0.0	3.1	0.2	0.3

Intersection Summary	
HCM 6th Ctrl Delay	21.6
HCM 6th LOS	C

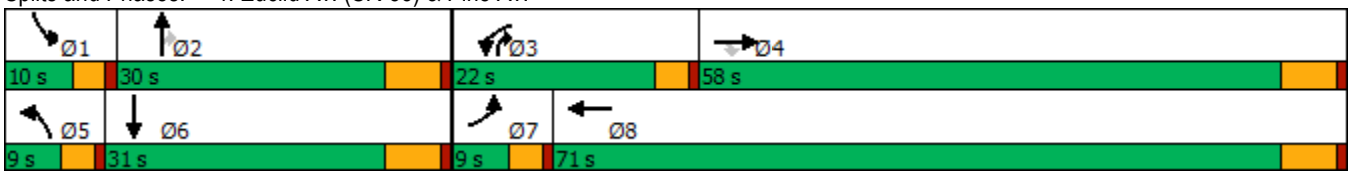
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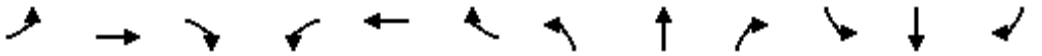
User approved pedestrian interval to be less than phase max green.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	18	447	96	661	159	77	816	1103	159	764
Future Volume (vph)	18	447	96	661	159	77	816	1103	159	764
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8	5	2	3	1	6
Permitted Phases			4					2		
Detector Phase	7	4	4	3	8	5	2	3	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	43.0	43.0	9.0	45.0	9.0	11.0	9.0	9.0	29.0
Total Split (s)	9.0	58.0	58.0	22.0	71.0	9.0	30.0	22.0	10.0	31.0
Total Split (%)	7.5%	48.3%	48.3%	18.3%	59.2%	7.5%	25.0%	18.3%	8.3%	25.8%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	3.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	6.0	4.0	4.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	None	None	Min
Act Effct Green (s)	5.0	33.3	33.3	18.1	52.2	5.0	24.2	48.3	6.0	25.2
Actuated g/C Ratio	0.05	0.33	0.33	0.18	0.51	0.05	0.24	0.47	0.06	0.25
v/c Ratio	0.24	0.81	0.17	1.34	0.33	1.04	1.07	1.38	1.78	0.98
Control Delay	57.9	42.4	2.2	200.3	13.5	161.1	90.5	199.1	416.4	66.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.9	42.4	2.2	200.3	13.5	161.1	90.5	199.1	416.4	66.7
LOS	E	D	A	F	B	F	F	F	F	E
Approach Delay		36.0			145.1		153.2			126.0
Approach LOS		D			F		F			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 101.8	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.78	
Intersection Signal Delay: 130.9	Intersection LOS: F
Intersection Capacity Utilization 118.4%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 4: Euclid Av. (SR-83) & Pine Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	447	96	661	159	118	77	816	1103	159	764	15
Future Volume (veh/h)	18	447	96	661	159	118	77	816	1103	159	764	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	19	476	0	703	169	111	82	868	702	169	813	15
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	33	558		540	479	314	82	833	650	99	872	16
Arrive On Green	0.02	0.31	0.00	0.18	0.47	0.47	0.05	0.24	0.24	0.06	0.25	0.25
Sat Flow, veh/h	1619	1800	1525	2956	1014	666	1619	3420	1525	1619	3435	63
Grp Volume(v), veh/h	19	476	0	703	0	280	82	868	702	169	405	423
Grp Sat Flow(s),veh/h/ln	1619	1800	1525	1478	0	1680	1619	1710	1525	1619	1710	1789
Q Serve(g_s), s	1.1	24.4	0.0	18.0	0.0	10.4	5.0	24.0	24.0	6.0	22.8	22.8
Cycle Q Clear(g_c), s	1.1	24.4	0.0	18.0	0.0	10.4	5.0	24.0	24.0	6.0	22.8	22.8
Prop In Lane	1.00		1.00	1.00		0.40	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	33	558		540	0	793	82	833	650	99	434	454
V/C Ratio(X)	0.57	0.85		1.30	0.00	0.35	1.00	1.04	1.08	1.71	0.93	0.93
Avail Cap(c_a), veh/h	82	950		540	0	1109	82	833	650	99	434	454
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.8	31.9	0.0	40.3	0.0	16.5	46.8	37.3	28.3	46.3	35.9	35.9
Incr Delay (d2), s/veh	5.6	5.4	0.0	148.8	0.0	0.4	98.5	42.6	58.7	360.3	26.7	25.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	10.7	0.0	17.3	0.0	3.7	4.1	14.1	24.1	12.1	11.9	12.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.4	37.3	0.0	189.0	0.0	16.9	145.2	79.8	86.9	406.5	62.6	61.9
LnGrp LOS	D	D		F	A	B	F	F	F	F	E	E
Approach Vol, veh/h		495	A		983			1652			997	
Approach Delay, s/veh		37.9			140.0			86.1			120.6	
Approach LOS		D			F			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.0	30.0	22.0	36.5	9.0	31.0	6.0	52.5
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	6.0	24.0	18.0	52.0	5.0	25.0	5.0	65.0
Max Q Clear Time (g_c+I1), s	8.0	26.0	20.0	26.4	7.0	24.8	3.1	12.4
Green Ext Time (p_c), s	0.0	0.0	0.0	4.1	0.0	0.1	0.0	2.4

Intersection Summary	
HCM 6th Ctrl Delay	101.5
HCM 6th LOS	F

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

APPENDIX 6.2:

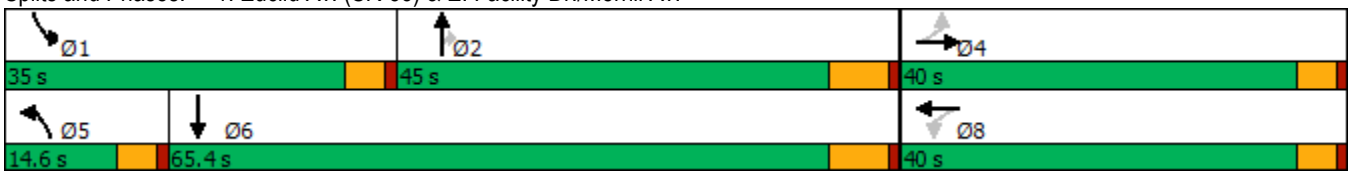
OPENING YEAR CUMULATIVE (2022) WITH PROJECT CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS

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Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	4	8	256	50	11	1156	204	187	1117
Future Volume (vph)	4	8	256	50	11	1156	204	187	1117
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8				2		
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	15.0	15.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	9.6	9.6	21.6	21.6	14.6	28.5	28.5	14.6	42.5
Total Split (s)	40.0	40.0	40.0	40.0	14.6	45.0	45.0	35.0	65.4
Total Split (%)	33.3%	33.3%	33.3%	33.3%	12.2%	37.5%	37.5%	29.2%	54.5%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	5.5	5.5	3.6	5.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.6		4.6	4.6	6.5	6.5	4.6	6.5
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None	Max
Act Effct Green (s)		35.5		35.5	10.0	40.8	40.8	17.4	60.1
Actuated g/C Ratio		0.32		0.32	0.09	0.37	0.37	0.16	0.55
v/c Ratio		0.06		1.20	0.07	0.93	0.33	0.75	0.64
Control Delay		16.2		142.7	49.4	48.0	15.2	62.2	19.7
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		16.2		142.7	49.4	48.0	15.2	62.2	19.7
LOS		B		F	D	D	B	E	B
Approach Delay		16.2		142.7		43.1			25.6
Approach LOS		B		F		D			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 109.4	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.20	
Intersection Signal Delay: 52.8	Intersection LOS: D
Intersection Capacity Utilization 99.5%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 1: Euclid Av. (SR-83) & E. Facility Dr./Merrill Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	8	18	256	50	259	11	1156	204	187	1117	41
Future Volume (veh/h)	4	8	18	256	50	259	11	1156	204	187	1117	41
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	4	8	18	264	52	240	11	1192	167	193	1152	28
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	80	156	299	270	44	203	42	1407	628	220	1779	43
Arrive On Green	0.31	0.31	0.31	0.31	0.31	0.31	0.03	0.41	0.41	0.14	0.52	0.52
Sat Flow, veh/h	139	498	955	711	140	647	1619	3420	1525	1619	3410	83
Grp Volume(v), veh/h	30	0	0	556	0	0	11	1192	167	193	578	602
Grp Sat Flow(s),veh/h/ln	1591	0	0	1498	0	0	1619	1710	1525	1619	1710	1783
Q Serve(g_s), s	0.0	0.0	0.0	33.9	0.0	0.0	0.8	35.6	8.2	13.2	27.5	27.6
Cycle Q Clear(g_c), s	1.5	0.0	0.0	35.4	0.0	0.0	0.8	35.6	8.2	13.2	27.5	27.6
Prop In Lane	0.13		0.60	0.47		0.43	1.00		1.00	1.00		0.05
Lane Grp Cap(c), veh/h	535	0	0	517	0	0	42	1407	628	220	892	930
V/C Ratio(X)	0.06	0.00	0.00	1.08	0.00	0.00	0.26	0.85	0.27	0.88	0.65	0.65
Avail Cap(c_a), veh/h	535	0	0	517	0	0	143	1407	628	436	892	930
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.1	0.0	0.0	40.3	0.0	0.0	53.9	30.0	22.0	47.8	19.5	19.5
Incr Delay (d2), s/veh	0.0	0.0	0.0	61.6	0.0	0.0	1.2	6.5	1.0	4.3	3.6	3.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.0	22.8	0.0	0.0	0.3	14.5	2.9	5.3	10.5	10.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.1	0.0	0.0	101.9	0.0	0.0	55.2	36.5	23.0	52.2	23.1	23.0
LnGrp LOS	C	A	A	F	A	A	E	D	C	D	C	C
Approach Vol, veh/h		30			556			1370			1373	
Approach Delay, s/veh		27.1			101.9			35.0			27.2	
Approach LOS		C			F			D			C	

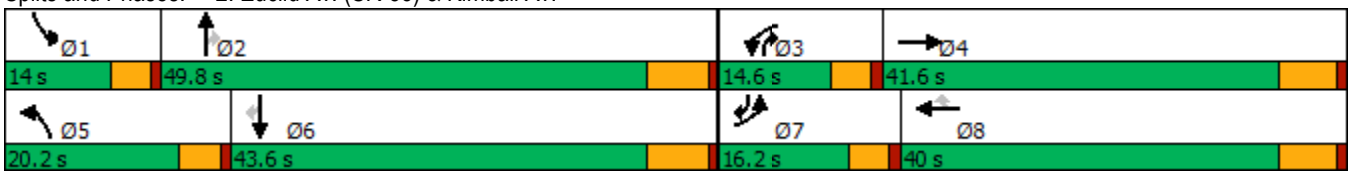
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	20.0	53.0		40.0	7.5	65.4		40.0				
Change Period (Y+Rc), s	4.6	6.5		4.6	4.6	6.5		4.6				
Max Green Setting (Gmax), s	30.4	38.5		35.4	10.0	58.9		35.4				
Max Q Clear Time (g_c+I1), s	15.2	37.6		3.5	2.8	29.6		37.4				
Green Ext Time (p_c), s	0.2	0.7		0.1	0.0	7.6		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			42.9									
HCM 6th LOS			D									

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	130	239	45	897	345	179	879	62	200	699	421
Future Volume (vph)	130	239	45	897	345	179	879	62	200	699	421
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2	3	1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	3	1	6	7
Switch Phase											
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	5.0	10.0	5.0	5.0	10.0
Minimum Split (s)	14.6	27.2	14.6	29.2	29.2	14.6	44.5	14.6	9.6	40.5	14.6
Total Split (s)	16.2	41.6	14.6	40.0	40.0	20.2	49.8	14.6	14.0	43.6	16.2
Total Split (%)	13.5%	34.7%	12.2%	33.3%	33.3%	16.8%	41.5%	12.2%	11.7%	36.3%	13.5%
Yellow Time (s)	3.6	5.2	3.6	5.2	5.2	3.6	5.5	3.6	3.6	5.5	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	4.6	6.2	6.2	4.6	6.5	4.6	4.6	6.5	4.6
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	None	Max	None
Act Effct Green (s)	10.5	37.2	10.0	33.7	33.7	15.1	43.3	59.8	9.4	37.7	50.1
Actuated g/C Ratio	0.09	0.31	0.08	0.28	0.28	0.13	0.36	0.50	0.08	0.32	0.42
v/c Ratio	0.51	0.27	0.34	0.94	0.59	0.90	0.72	0.08	0.88	0.66	0.61
Control Delay	59.0	30.6	59.0	60.1	16.5	92.7	36.7	3.3	88.6	38.8	21.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.0	30.6	59.0	60.1	16.5	92.7	36.7	3.3	88.6	38.8	21.3
LOS	E	C	E	E	B	F	D	A	F	D	C
Approach Delay		39.6		48.4			43.8			40.8	
Approach LOS		D		D			D			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 118.9	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.94	
Intersection Signal Delay: 43.8	Intersection LOS: D
Intersection Capacity Utilization 92.2%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 2: Euclid Av. (SR-83) & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	130	239	43	45	897	345	179	879	62	200	699	421
Future Volume (veh/h)	130	239	43	45	897	345	179	879	62	200	699	421
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1600	1800	1800	1700	1800	1800	1700	1800	1800	1600	1800	1800
Adj Flow Rate, veh/h	133	244	43	46	915	325	183	897	20	204	713	416
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	247	879	153	107	971	433	207	1255	661	236	1091	607
Arrive On Green	0.08	0.30	0.30	0.07	0.28	0.28	0.13	0.37	0.37	0.08	0.32	0.32
Sat Flow, veh/h	2956	2913	506	1619	3420	1525	1619	3420	1525	2956	3420	1505
Grp Volume(v), veh/h	133	142	145	46	915	325	183	897	20	204	713	416
Grp Sat Flow(s),veh/h/ln	1478	1710	1709	1619	1710	1525	1619	1710	1525	1478	1710	1505
Q Serve(g_s), s	5.1	7.4	7.7	3.2	30.9	22.9	13.1	26.5	0.9	8.0	21.2	26.9
Cycle Q Clear(g_c), s	5.1	7.4	7.7	3.2	30.9	22.9	13.1	26.5	0.9	8.0	21.2	26.9
Prop In Lane	1.00		0.30	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	247	516	515	107	971	433	207	1255	661	236	1091	607
V/C Ratio(X)	0.54	0.27	0.28	0.43	0.94	0.75	0.88	0.71	0.03	0.87	0.65	0.68
Avail Cap(c_a), veh/h	291	516	515	137	980	437	214	1255	661	236	1091	607
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.9	31.4	31.4	53.0	41.3	38.4	50.6	32.0	19.2	53.7	34.6	29.1
Incr Delay (d2), s/veh	0.7	0.3	0.3	1.0	16.6	7.0	30.6	3.5	0.1	26.0	3.1	6.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	3.0	3.1	1.3	14.5	9.0	6.8	10.8	0.3	3.7	8.7	10.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.5	31.7	31.7	54.0	57.9	45.5	81.2	35.5	19.3	79.7	37.6	35.3
LnGrp LOS	D	C	C	D	E	D	F	D	B	E	D	D
Approach Vol, veh/h		420			1286			1100			1333	
Approach Delay, s/veh		38.3			54.6			42.8			43.3	
Approach LOS		D			D			D			D	

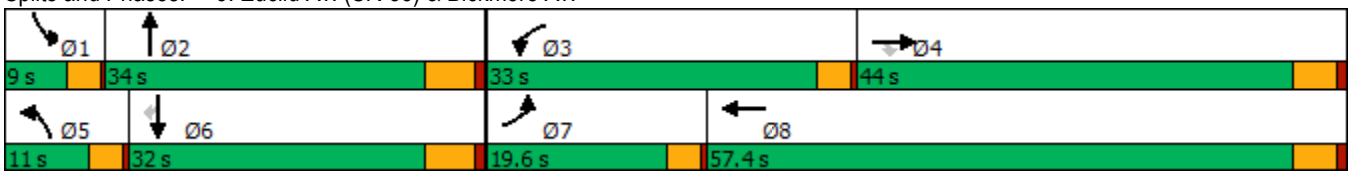
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.0	49.8	12.4	41.8	19.7	44.1	14.5	39.7
Change Period (Y+Rc), s	4.6	6.5	4.6	6.2	4.6	6.5	4.6	6.2
Max Green Setting (Gmax), s	9.4	43.3	10.0	35.4	15.6	37.1	11.6	33.8
Max Q Clear Time (g_c+I1), s	10.0	28.5	5.2	9.7	15.1	28.9	7.1	32.9
Green Ext Time (p_c), s	0.0	4.8	0.0	1.4	0.0	3.6	0.1	0.6

Intersection Summary	
HCM 6th Ctrl Delay	46.2
HCM 6th LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	112	14	55	372	217	57	735	53	645	197
Future Volume (vph)	112	14	55	372	217	57	735	53	645	197
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2	1	6	
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	5	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	44.0	44.0	8.5	44.0	8.5	26.5	8.5	30.5	30.5
Total Split (s)	19.6	44.0	44.0	33.0	57.4	11.0	34.0	9.0	32.0	32.0
Total Split (%)	16.3%	36.7%	36.7%	27.5%	47.8%	9.2%	28.3%	7.5%	26.7%	26.7%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	4.5	3.0	4.5	4.5
All-Red Time (s)	0.5	1.0	1.0	0.5	1.0	0.5	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.0	5.0	3.5	5.0	3.5	5.5	3.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	None	Min	Min
Act Effct Green (s)	11.1	14.2	14.2	30.6	30.9	7.0	29.6	5.7	28.2	28.2
Actuated g/C Ratio	0.12	0.15	0.15	0.33	0.33	0.08	0.32	0.06	0.30	0.30
v/c Ratio	0.64	0.06	0.18	0.78	0.81	0.52	0.81	0.60	0.69	0.36
Control Delay	58.1	31.7	1.2	43.9	37.0	63.0	39.1	73.3	36.5	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.1	31.7	1.2	43.9	37.0	63.0	39.1	73.3	36.5	6.8
LOS	E	C	A	D	D	E	D	E	D	A
Approach Delay		38.8			40.2		40.7		32.2	
Approach LOS		D			D		D		C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 93	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 37.6	Intersection LOS: D
Intersection Capacity Utilization 75.4%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 3: Euclid Av. (SR-83) & Bickmore Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	112	14	55	372	217	213	57	735	49	53	645	197
Future Volume (veh/h)	112	14	55	372	217	213	57	735	49	53	645	197
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	124	16	52	413	241	209	63	817	47	59	717	201
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	155	225	191	456	277	240	82	965	56	79	1000	436
Arrive On Green	0.10	0.12	0.12	0.28	0.31	0.31	0.05	0.29	0.29	0.05	0.29	0.29
Sat Flow, veh/h	1619	1800	1525	1619	890	772	1619	3282	189	1619	3420	1493
Grp Volume(v), veh/h	124	16	52	413	0	450	63	426	438	59	717	201
Grp Sat Flow(s),veh/h/ln	1619	1800	1525	1619	0	1661	1619	1710	1761	1619	1710	1493
Q Serve(g_s), s	5.2	0.5	2.2	17.2	0.0	17.9	2.7	16.3	16.3	2.5	13.1	7.7
Cycle Q Clear(g_c), s	5.2	0.5	2.2	17.2	0.0	17.9	2.7	16.3	16.3	2.5	13.1	7.7
Prop In Lane	1.00		1.00	1.00		0.46	1.00		0.11	1.00		1.00
Lane Grp Cap(c), veh/h	155	225	191	456	0	517	82	503	518	79	1000	436
V/C Ratio(X)	0.80	0.07	0.27	0.91	0.00	0.87	0.77	0.85	0.85	0.75	0.72	0.46
Avail Cap(c_a), veh/h	374	1006	853	684	0	1247	174	698	719	128	1299	567
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.9	27.0	27.7	24.2	0.0	22.7	32.7	23.2	23.2	32.8	22.1	20.2
Incr Delay (d2), s/veh	3.6	0.0	0.3	8.6	0.0	1.8	5.6	5.2	5.0	5.1	0.8	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	0.2	0.7	7.0	0.0	6.4	1.1	6.2	6.4	1.0	4.5	2.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.6	27.0	27.9	32.8	0.0	24.6	38.3	28.3	28.2	37.9	22.9	20.5
LnGrp LOS	C	C	C	C	A	C	D	C	C	D	C	C
Approach Vol, veh/h		192			863			927			977	
Approach Delay, s/veh		32.1			28.5			28.9			23.3	
Approach LOS		C			C			C			C	

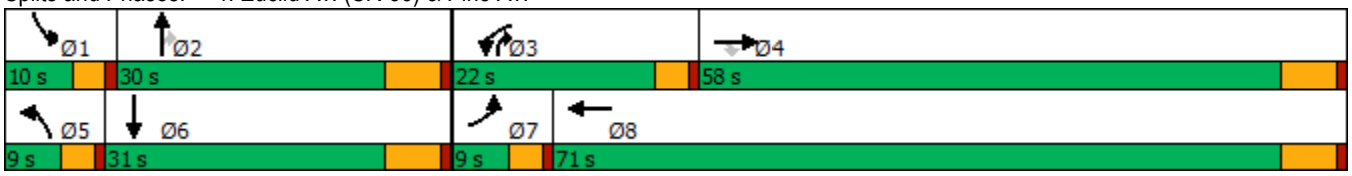
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.9	26.0	23.1	13.7	7.0	25.9	10.2	26.7
Change Period (Y+Rc), s	3.5	5.5	3.5	5.0	3.5	5.5	3.5	5.0
Max Green Setting (Gmax), s	5.5	28.5	29.5	39.0	7.5	26.5	16.1	52.4
Max Q Clear Time (g_c+I1), s	4.5	18.3	19.2	4.2	4.7	15.1	7.2	19.9
Green Ext Time (p_c), s	0.0	2.2	0.5	0.1	0.0	2.5	0.1	1.8

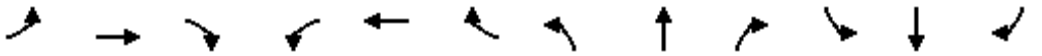
Intersection Summary	
HCM 6th Ctrl Delay	27.2
HCM 6th LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	4	181	69	772	427	50	717	986	103	945
Future Volume (vph)	4	181	69	772	427	50	717	986	103	945
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8	5	2	3	1	6
Permitted Phases			4					2		
Detector Phase	7	4	4	3	8	5	2	3	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	43.0	43.0	9.0	45.0	9.0	11.0	9.0	9.0	29.0
Total Split (s)	9.0	58.0	58.0	22.0	71.0	9.0	30.0	22.0	10.0	31.0
Total Split (%)	7.5%	48.3%	48.3%	18.3%	59.2%	7.5%	25.0%	18.3%	8.3%	25.8%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	3.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	6.0	4.0	4.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	None	None	Min
Act Effct Green (s)	5.1	17.4	17.4	18.2	38.2	5.1	24.3	48.6	6.1	27.3
Actuated g/C Ratio	0.06	0.20	0.20	0.21	0.44	0.06	0.28	0.56	0.07	0.32
v/c Ratio	0.04	0.51	0.17	1.27	0.71	0.54	0.76	0.90	0.93	0.91
Control Delay	44.2	34.6	0.9	163.6	24.7	64.6	36.0	20.8	111.3	44.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.2	34.6	0.9	163.6	24.7	64.6	36.0	20.8	111.3	44.4
LOS	D	C	A	F	C	E	D	C	F	D
Approach Delay		25.7			106.4		28.3			50.8
Approach LOS		C			F		C			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 86.2	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.27	
Intersection Signal Delay: 57.0	Intersection LOS: E
Intersection Capacity Utilization 92.5%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 4: Euclid Av. (SR-83) & Pine Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	181	69	772	427	114	50	717	986	103	945	21
Future Volume (veh/h)	4	181	69	772	427	114	50	717	986	103	945	21
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	4	185	0	788	436	109	51	732	501	105	964	18
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	9	274		684	526	131	69	966	784	125	1088	20
Arrive On Green	0.01	0.15	0.00	0.23	0.38	0.38	0.04	0.28	0.28	0.08	0.32	0.32
Sat Flow, veh/h	1619	1800	1525	2956	1390	347	1619	3420	1525	1619	3434	64
Grp Volume(v), veh/h	4	185	0	788	0	545	51	732	501	105	480	502
Grp Sat Flow(s),veh/h/ln	1619	1800	1525	1478	0	1737	1619	1710	1525	1619	1710	1788
Q Serve(g_s), s	0.2	7.6	0.0	18.0	0.0	22.1	2.4	15.2	18.5	5.0	20.8	20.8
Cycle Q Clear(g_c), s	0.2	7.6	0.0	18.0	0.0	22.1	2.4	15.2	18.5	5.0	20.8	20.8
Prop In Lane	1.00		1.00	1.00		0.20	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	9	274		684	0	657	69	966	784	125	542	566
V/C Ratio(X)	0.46	0.68		1.15	0.00	0.83	0.73	0.76	0.64	0.84	0.89	0.89
Avail Cap(c_a), veh/h	104	1203		684	0	1451	104	1055	823	125	549	574
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.6	31.2	0.0	29.9	0.0	21.9	36.8	25.5	13.7	35.4	25.3	25.3
Incr Delay (d2), s/veh	13.7	4.1	0.0	84.8	0.0	3.9	5.5	2.5	1.1	36.0	15.3	14.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	3.3	0.0	13.8	0.0	8.4	1.0	5.7	5.3	3.0	9.5	9.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.3	35.3	0.0	114.7	0.0	25.8	42.3	28.0	14.8	71.4	40.6	40.0
LnGrp LOS	D	D		F	A	C	D	C	B	E	D	D
Approach Vol, veh/h		189	A		1333			1284			1087	
Approach Delay, s/veh		35.6			78.4			23.4			43.3	
Approach LOS		D			E			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.0	28.0	22.0	17.8	7.3	30.6	4.4	35.4
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	6.0	24.0	18.0	52.0	5.0	25.0	5.0	65.0
Max Q Clear Time (g_c+I1), s	7.0	20.5	20.0	9.6	4.4	22.8	2.2	24.1
Green Ext Time (p_c), s	0.0	1.5	0.0	1.5	0.0	0.9	0.0	5.3

Intersection Summary	
HCM 6th Ctrl Delay	48.4
HCM 6th LOS	D

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	455	47	11	1254	33	8
Future Volume (vph)	455	47	11	1254	33	8
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases		4				2
Detector Phase	4	4	3	8	2	2
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	23.2	23.2	9.6	16.2	32.1	32.1
Total Split (s)	77.7	77.7	9.6	87.3	32.7	32.7
Total Split (%)	64.8%	64.8%	8.0%	72.8%	27.3%	27.3%
Yellow Time (s)	5.2	5.2	3.6	5.2	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2	4.6	6.2	5.1	5.1
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	None	None	None	None	Min	Min
Act Effct Green (s)	79.7	79.7	5.0	81.4	13.1	13.1
Actuated g/C Ratio	0.75	0.75	0.05	0.77	0.12	0.12
v/c Ratio	0.37	0.04	0.16	0.98	0.18	0.05
Control Delay	7.0	2.2	55.9	34.5	42.6	20.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.0	2.2	55.9	34.5	42.6	20.4
LOS	A	A	E	C	D	C
Approach Delay	6.5			34.7	38.2	
Approach LOS	A			C	D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 105.8	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.98	
Intersection Signal Delay: 26.9	Intersection LOS: C
Intersection Capacity Utilization 87.4%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 5: Mayhew Av. & Kimball Av.





Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	455	47	11	1254	33	8
Future Volume (veh/h)	455	47	11	1254	33	8
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	495	51	12	1363	36	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1301	1103	23	1411	164	155
Arrive On Green	0.72	0.72	0.01	0.78	0.10	0.10
Sat Flow, veh/h	1800	1525	1619	1800	1619	1525
Grp Volume(v), veh/h	495	51	12	1363	36	9
Grp Sat Flow(s),veh/h/ln	1800	1525	1619	1800	1619	1525
Q Serve(g_s), s	10.4	0.9	0.7	66.4	2.0	0.5
Cycle Q Clear(g_c), s	10.4	0.9	0.7	66.4	2.0	0.5
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1301	1103	23	1411	164	155
V/C Ratio(X)	0.38	0.05	0.52	0.97	0.22	0.06
Avail Cap(c_a), veh/h	1306	1107	82	1481	453	427
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	5.2	3.9	48.2	9.5	40.7	40.0
Incr Delay (d2), s/veh	0.2	0.0	6.6	15.7	0.7	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	0.2	0.3	18.3	0.8	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	5.4	3.9	54.9	25.1	41.4	40.2
LnGrp LOS	A	A	D	C	D	D
Approach Vol, veh/h	546			1375	45	
Approach Delay, s/veh	5.3			25.4	41.1	
Approach LOS	A			C	D	

Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		15.1	6.0	77.5		83.5
Change Period (Y+Rc), s		5.1	4.6	6.2		6.2
Max Green Setting (Gmax), s		27.6	5.0	71.5		81.1
Max Q Clear Time (g_c+I1), s		4.0	2.7	12.4		68.4
Green Ext Time (p_c), s		0.1	0.0	3.1		8.8

Intersection Summary	
HCM 6th Ctrl Delay	20.2
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	3.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	35	6	7	5	8	51
Future Vol, veh/h	35	6	7	5	8	51
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	38	7	8	5	9	55

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	58	37	64	0	-	0
Stage 1	37	-	-	-	-	-
Stage 2	21	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	954	1041	1551	-	-	-
Stage 1	991	-	-	-	-	-
Stage 2	1007	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	949	1041	1551	-	-	-
Mov Cap-2 Maneuver	887	-	-	-	-	-
Stage 1	986	-	-	-	-	-
Stage 2	1007	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.2	4.3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1551	-	907	-	-
HCM Lane V/C Ratio	0.005	-	0.049	-	-
HCM Control Delay (s)	7.3	-	9.2	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	4.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	10	15	7	6	8
Future Vol, veh/h	5	10	15	7	6	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	5	11	16	8	7	9

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	52	12	16	0	-	0
Stage 1	12	-	-	-	-	-
Stage 2	40	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	962	1074	1615	-	-	-
Stage 1	1016	-	-	-	-	-
Stage 2	988	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	952	1074	1615	-	-	-
Mov Cap-2 Maneuver	889	-	-	-	-	-
Stage 1	1006	-	-	-	-	-
Stage 2	988	-	-	-	-	-

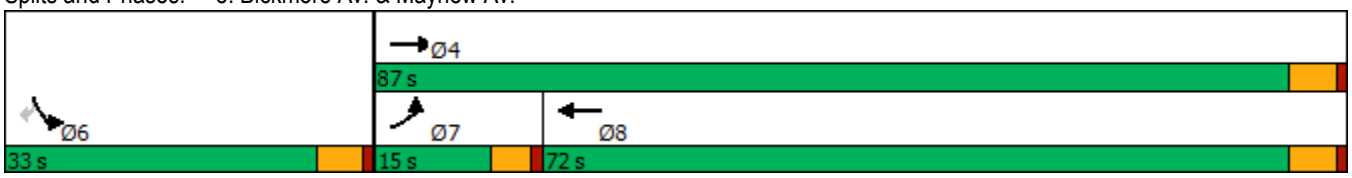
Approach	EB	NB	SB
HCM Control Delay, s	8.6	4.9	0
HCM LOS	A		

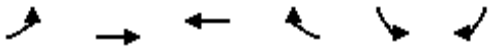
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1615	-	1004	-	-
HCM Lane V/C Ratio	0.01	-	0.016	-	-
HCM Control Delay (s)	7.3	-	8.6	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Traffic Volume (vph)	18	112	794	3	13
Future Volume (vph)	18	112	794	3	13
Turn Type	Prot	NA	NA	Prot	Perm
Protected Phases	7	4	8	6	
Permitted Phases					6
Detector Phase	7	4	8	6	6
Switch Phase					
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	15.4	22.4	27.1	27.1
Total Split (s)	15.0	87.0	72.0	33.0	33.0
Total Split (%)	12.5%	72.5%	60.0%	27.5%	27.5%
Yellow Time (s)	3.6	4.4	4.4	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	5.4	5.1	5.1
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	Max	Max	None	None
Act Effct Green (s)	6.9	91.6	86.7	12.2	12.2
Actuated g/C Ratio	0.07	0.90	0.86	0.12	0.12
v/c Ratio	0.18	0.08	0.56	0.02	0.07
Control Delay	49.6	2.4	9.8	38.7	19.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	49.6	2.4	9.8	38.7	19.1
LOS	D	A	A	D	B
Approach Delay		9.1	9.8	22.5	
Approach LOS		A	A	C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 101.4	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.56	
Intersection Signal Delay: 9.9	Intersection LOS: A
Intersection Capacity Utilization 61.5%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 8: Bickmore Av. & Mayhew Av.





Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	18	112	794	5	3	13
Future Volume (veh/h)	18	112	794	5	3	13
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1700	1800	1800	1800	1700	1800
Adj Flow Rate, veh/h	20	122	863	5	3	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	35	1534	1399	8	62	58
Arrive On Green	0.02	0.85	0.78	0.78	0.04	0.04
Sat Flow, veh/h	1619	1800	1788	10	1619	1525
Grp Volume(v), veh/h	20	122	0	868	3	14
Grp Sat Flow(s),veh/h/ln	1619	1800	0	1798	1619	1525
Q Serve(g_s), s	1.2	1.0	0.0	19.4	0.2	0.9
Cycle Q Clear(g_c), s	1.2	1.0	0.0	19.4	0.2	0.9
Prop In Lane	1.00			0.01	1.00	1.00
Lane Grp Cap(c), veh/h	35	1534	0	1407	62	58
V/C Ratio(X)	0.57	0.08	0.00	0.62	0.05	0.24
Avail Cap(c_a), veh/h	176	1534	0	1407	472	445
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.4	1.1	0.0	4.4	44.4	44.7
Incr Delay (d2), s/veh	14.0	0.1	0.0	2.0	0.1	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.1	0.0	4.9	0.1	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	60.4	1.2	0.0	6.4	44.5	45.5
LnGrp LOS	E	A	A	A	D	D
Approach Vol, veh/h		142	868		17	
Approach Delay, s/veh		9.6	6.4		45.3	
Approach LOS		A	A		D	

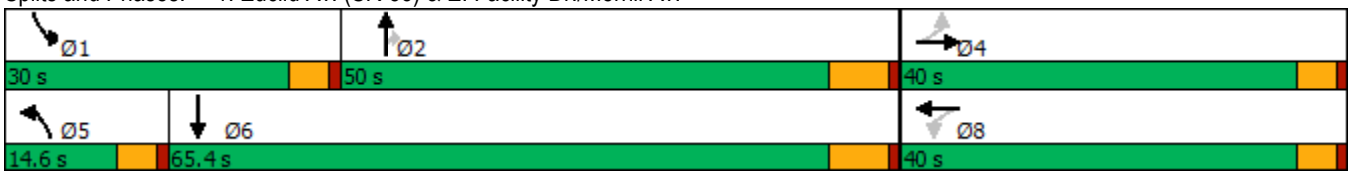
Timer - Assigned Phs	4	6	7	8
Phs Duration (G+Y+Rc), s	87.0	8.7	6.7	80.3
Change Period (Y+Rc), s	5.4	5.1	4.6	5.4
Max Green Setting (Gmax), s	81.6	27.9	10.4	66.6
Max Q Clear Time (g_c+I1), s	3.0	2.9	3.2	21.4
Green Ext Time (p_c), s	0.7	0.0	0.0	7.6

Intersection Summary	
HCM 6th Ctrl Delay	7.5
HCM 6th LOS	A

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	12	31	256	2	4	1326	264	288	1345
Future Volume (vph)	12	31	256	2	4	1326	264	288	1345
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8				2		
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	15.0	15.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	9.6	9.6	21.6	21.6	14.6	28.5	28.5	14.6	42.5
Total Split (s)	40.0	40.0	40.0	40.0	14.6	50.0	50.0	30.0	65.4
Total Split (%)	33.3%	33.3%	33.3%	33.3%	12.2%	41.7%	41.7%	25.0%	54.5%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	5.5	5.5	3.6	5.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.6		4.6	4.6	6.5	6.5	4.6	6.5
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None	Max
Act Effct Green (s)		35.4		35.4	10.0	43.5	43.5	24.7	69.9
Actuated g/C Ratio		0.30		0.30	0.08	0.36	0.36	0.21	0.59
v/c Ratio		0.13		1.18	0.03	1.17	0.47	0.95	0.74
Control Delay		26.0		138.4	51.2	119.9	21.7	85.1	21.9
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		26.0		138.4	51.2	119.9	21.7	85.1	21.9
LOS		C		F	D	F	C	F	C
Approach Delay		26.0		138.4		103.5			33.0
Approach LOS		C		F		F			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 119.3	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.18	
Intersection Signal Delay: 75.9	Intersection LOS: E
Intersection Capacity Utilization 104.5%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 1: Euclid Av. (SR-83) & E. Facility Dr./Merrill Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	31	13	256	2	204	4	1326	264	288	1345	1
Future Volume (veh/h)	12	31	13	256	2	204	4	1326	264	288	1345	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	13	34	13	281	2	214	4	1457	225	316	1478	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	116	288	101	293	2	187	17	1244	555	338	1923	0
Arrive On Green	0.30	0.30	0.30	0.30	0.30	0.30	0.01	0.36	0.36	0.21	0.56	0.00
Sat Flow, veh/h	267	972	343	829	6	632	1619	3420	1525	1619	3510	0
Grp Volume(v), veh/h	60	0	0	497	0	0	4	1457	225	316	1478	0
Grp Sat Flow(s),veh/h/ln	1582	0	0	1467	0	0	1619	1710	1525	1619	1710	0
Q Serve(g_s), s	0.0	0.0	0.0	32.4	0.0	0.0	0.3	43.5	13.2	22.9	39.8	0.0
Cycle Q Clear(g_c), s	3.0	0.0	0.0	35.4	0.0	0.0	0.3	43.5	13.2	22.9	39.8	0.0
Prop In Lane	0.22		0.22	0.57		0.43	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	505	0	0	481	0	0	17	1244	555	338	1923	0
V/C Ratio(X)	0.12	0.00	0.00	1.03	0.00	0.00	0.24	1.17	0.41	0.93	0.77	0.00
Avail Cap(c_a), veh/h	505	0	0	481	0	0	135	1244	555	344	1923	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	30.7	0.0	0.0	43.6	0.0	0.0	58.7	38.0	28.4	46.5	20.2	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	49.6	0.0	0.0	2.6	85.8	2.2	31.4	3.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.0	0.0	20.7	0.0	0.0	0.1	31.6	4.9	11.7	14.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.7	0.0	0.0	93.1	0.0	0.0	61.3	123.9	30.6	77.9	23.2	0.0
LnGrp LOS	C	A	A	F	A	A	E	F	C	E	C	A
Approach Vol, veh/h		60			497			1686			1794	
Approach Delay, s/veh		30.7			93.1			111.3			32.8	
Approach LOS		C			F			F			C	

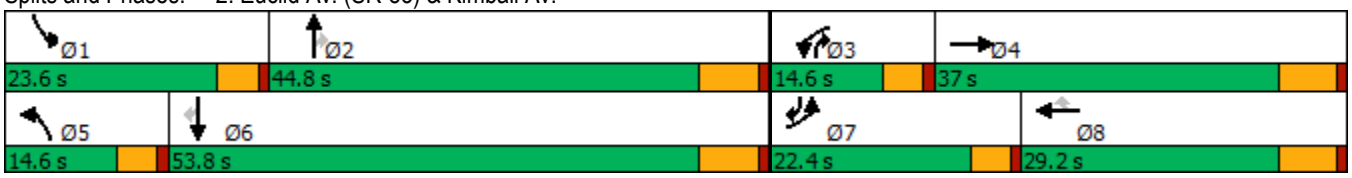
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	29.6	50.0		40.0	5.8	73.7		40.0				
Change Period (Y+Rc), s	4.6	6.5		4.6	4.6	6.5		4.6				
Max Green Setting (Gmax), s	25.4	43.5		35.4	10.0	58.9		35.4				
Max Q Clear Time (g_c+I1), s	24.9	45.5		5.0	2.3	41.8		37.4				
Green Ext Time (p_c), s	0.0	0.0		0.2	0.0	9.0		0.0				

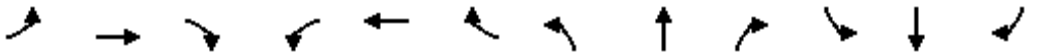
Intersection Summary			
HCM 6th Ctrl Delay		73.0	
HCM 6th LOS		E	

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	404	785	44	353	224	86	868	47	475	930	233
Future Volume (vph)	404	785	44	353	224	86	868	47	475	930	233
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2	3	1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	3	1	6	7
Switch Phase											
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	5.0	10.0	5.0	5.0	10.0
Minimum Split (s)	14.6	27.2	14.6	29.2	29.2	14.6	44.5	14.6	9.6	40.5	14.6
Total Split (s)	22.4	37.0	14.6	29.2	29.2	14.6	44.8	14.6	23.6	53.8	22.4
Total Split (%)	18.7%	30.8%	12.2%	24.3%	24.3%	12.2%	37.3%	12.2%	19.7%	44.8%	18.7%
Yellow Time (s)	3.6	5.2	3.6	5.2	5.2	3.6	5.5	3.6	3.6	5.5	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	4.6	6.2	6.2	4.6	6.5	4.6	4.6	6.5	4.6
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	None	Max	None
Act Effct Green (s)	17.6	31.5	10.0	20.8	20.8	10.0	38.4	54.9	19.0	47.4	71.5
Actuated g/C Ratio	0.15	0.27	0.08	0.18	0.18	0.08	0.33	0.47	0.16	0.40	0.61
v/c Ratio	0.94	0.99	0.33	0.60	0.50	0.64	0.80	0.06	1.02	0.69	0.24
Control Delay	79.7	71.7	58.9	48.9	9.4	74.9	42.9	0.1	95.4	32.8	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	79.7	71.7	58.9	48.9	9.4	74.9	42.9	0.1	95.4	32.8	5.0
LOS	E	E	E	D	A	E	D	A	F	C	A
Approach Delay		74.2		35.3			43.6			47.0	
Approach LOS		E		D			D			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 117.7	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.02	
Intersection Signal Delay: 52.4	Intersection LOS: D
Intersection Capacity Utilization 94.2%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 2: Euclid Av. (SR-83) & Kimball Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	404	785	99	44	353	224	86	868	47	475	930	233
Future Volume (veh/h)	404	785	99	44	353	224	86	868	47	475	930	233
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1600	1800	1800	1700	1800	1800	1700	1800	1800	1600	1800	1800
Adj Flow Rate, veh/h	412	801	73	45	360	158	88	886	36	485	949	176
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	447	829	76	106	602	268	130	1113	596	477	1391	851
Arrive On Green	0.15	0.26	0.26	0.07	0.18	0.18	0.08	0.33	0.33	0.16	0.41	0.41
Sat Flow, veh/h	2956	3169	289	1619	3420	1525	1619	3420	1525	2956	3420	1525
Grp Volume(v), veh/h	412	432	442	45	360	158	88	886	36	485	949	176
Grp Sat Flow(s),veh/h/ln	1478	1710	1748	1619	1710	1525	1619	1710	1525	1478	1710	1525
Q Serve(g_s), s	16.2	29.4	29.4	3.1	11.4	11.2	6.2	27.8	1.7	19.0	26.8	6.8
Cycle Q Clear(g_c), s	16.2	29.4	29.4	3.1	11.4	11.2	6.2	27.8	1.7	19.0	26.8	6.8
Prop In Lane	1.00		0.17	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	447	447	457	106	602	268	130	1113	596	477	1391	851
V/C Ratio(X)	0.92	0.97	0.97	0.42	0.60	0.59	0.68	0.80	0.06	1.02	0.68	0.21
Avail Cap(c_a), veh/h	447	447	457	138	668	298	138	1113	596	477	1391	851
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.3	42.9	42.9	52.9	44.7	44.6	52.7	36.1	22.4	49.4	28.7	13.0
Incr Delay (d2), s/veh	24.1	33.7	33.3	1.0	1.2	2.5	9.3	5.9	0.2	45.4	2.7	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.2	16.0	16.3	1.3	4.8	4.3	2.8	11.7	0.6	9.7	10.6	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	73.3	76.6	76.3	53.9	45.9	47.1	61.9	42.1	22.6	94.7	31.4	13.6
LnGrp LOS	E	E	E	D	D	D	E	D	C	F	C	B
Approach Vol, veh/h		1286			563			1010			1610	
Approach Delay, s/veh		75.4			46.9			43.1			48.5	
Approach LOS		E			D			D			D	

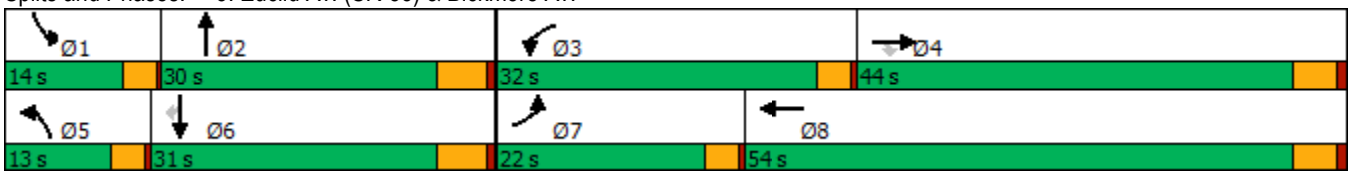
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	23.6	44.8	12.3	37.0	14.0	54.4	22.4	26.9
Change Period (Y+Rc), s	4.6	6.5	4.6	6.2	4.6	6.5	4.6	6.2
Max Green Setting (Gmax), s	19.0	38.3	10.0	30.8	10.0	47.3	17.8	23.0
Max Q Clear Time (g_c+I1), s	21.0	29.8	5.1	31.4	8.2	28.8	18.2	13.4
Green Ext Time (p_c), s	0.0	3.5	0.0	0.0	0.0	6.2	0.0	1.8

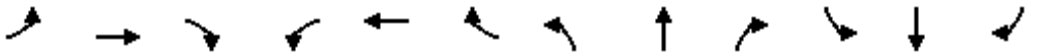
Intersection Summary	
HCM 6th Ctrl Delay	54.8
HCM 6th LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	175	123	110	57	36	79	725	165	833	250
Future Volume (vph)	175	123	110	57	36	79	725	165	833	250
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2	1	6	
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	5	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	44.0	44.0	8.5	44.0	8.5	26.5	8.5	30.5	30.5
Total Split (s)	22.0	44.0	44.0	32.0	54.0	13.0	30.0	14.0	31.0	31.0
Total Split (%)	18.3%	36.7%	36.7%	26.7%	45.0%	10.8%	25.0%	11.7%	25.8%	25.8%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	4.5	3.0	4.5	4.5
All-Red Time (s)	0.5	1.0	1.0	0.5	1.0	0.5	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.0	5.0	3.5	5.0	3.5	5.5	3.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	None	Min	Min
Act Effct Green (s)	12.2	17.1	17.1	7.6	10.7	8.1	25.8	11.1	31.2	31.2
Actuated g/C Ratio	0.16	0.23	0.23	0.10	0.14	0.11	0.34	0.15	0.41	0.41
v/c Ratio	0.65	0.31	0.26	0.37	0.35	0.47	0.78	0.68	0.61	0.34
Control Delay	44.6	25.9	5.8	43.1	16.4	46.3	31.2	51.0	25.8	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.6	25.9	5.8	43.1	16.4	46.3	31.2	51.0	25.8	7.0
LOS	D	C	A	D	B	D	C	D	C	A
Approach Delay		28.5			26.4		32.4		25.4	
Approach LOS		C			C		C		C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 75.5	
Natural Cycle: 105	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 28.3	Intersection LOS: C
Intersection Capacity Utilization 68.4%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 3: Euclid Av. (SR-83) & Bickmore Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	175	123	110	57	36	60	79	725	144	165	833	250
Future Volume (veh/h)	175	123	110	57	36	60	79	725	144	165	833	250
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	180	127	97	59	37	49	81	747	129	170	859	224
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	223	325	275	88	68	90	105	915	158	209	1293	577
Arrive On Green	0.14	0.18	0.18	0.05	0.10	0.10	0.06	0.31	0.31	0.13	0.38	0.38
Sat Flow, veh/h	1619	1800	1523	1619	702	930	1619	2916	503	1619	3420	1525
Grp Volume(v), veh/h	180	127	97	59	0	86	81	438	438	170	859	224
Grp Sat Flow(s),veh/h/ln	1619	1800	1523	1619	0	1633	1619	1710	1709	1619	1710	1525
Q Serve(g_s), s	5.9	3.4	3.0	1.9	0.0	2.7	2.7	12.8	12.8	5.5	11.3	5.8
Cycle Q Clear(g_c), s	5.9	3.4	3.0	1.9	0.0	2.7	2.7	12.8	12.8	5.5	11.3	5.8
Prop In Lane	1.00		1.00	1.00		0.57	1.00		0.29	1.00		1.00
Lane Grp Cap(c), veh/h	223	325	275	88	0	158	105	537	536	209	1293	577
V/C Ratio(X)	0.81	0.39	0.35	0.67	0.00	0.54	0.77	0.82	0.82	0.81	0.66	0.39
Avail Cap(c_a), veh/h	551	1292	1093	849	0	1473	283	771	771	313	1605	716
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.7	19.6	19.5	25.2	0.0	23.4	25.0	17.2	17.2	23.0	14.0	12.3
Incr Delay (d2), s/veh	2.6	0.3	0.3	3.3	0.0	1.1	4.4	3.0	3.0	5.6	0.4	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	1.3	1.0	0.7	0.0	1.0	1.0	4.2	4.2	2.1	3.1	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.3	19.9	19.8	28.5	0.0	24.5	29.4	20.1	20.2	28.6	14.4	12.5
LnGrp LOS	C	B	B	C	A	C	C	C	C	C	B	B
Approach Vol, veh/h		404			145			957			1253	
Approach Delay, s/veh		22.3			26.1			20.9			16.0	
Approach LOS		C			C			C			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.5	22.5	6.4	14.8	7.0	26.0	11.0	10.3
Change Period (Y+Rc), s	3.5	5.5	3.5	5.0	3.5	5.5	3.5	5.0
Max Green Setting (Gmax), s	10.5	24.5	28.5	39.0	9.5	25.5	18.5	49.0
Max Q Clear Time (g_c+I1), s	7.5	14.8	3.9	5.4	4.7	13.3	7.9	4.7
Green Ext Time (p_c), s	0.1	2.2	0.1	0.6	0.0	3.1	0.2	0.3

Intersection Summary	
HCM 6th Ctrl Delay	19.2
HCM 6th LOS	B

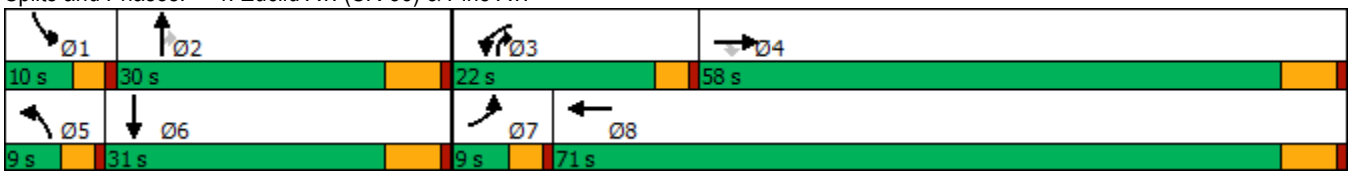
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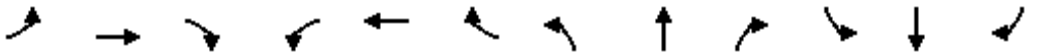
User approved pedestrian interval to be less than phase max green.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	18	447	96	661	159	77	826	1103	166	787
Future Volume (vph)	18	447	96	661	159	77	826	1103	166	787
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8	5	2	3	1	6
Permitted Phases			4					2		
Detector Phase	7	4	4	3	8	5	2	3	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	43.0	43.0	9.0	45.0	9.0	11.0	9.0	9.0	29.0
Total Split (s)	9.0	58.0	58.0	22.0	71.0	9.0	30.0	22.0	10.0	31.0
Total Split (%)	7.5%	48.3%	48.3%	18.3%	59.2%	7.5%	25.0%	18.3%	8.3%	25.8%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	3.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	6.0	4.0	4.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	None	None	Min
Act Effct Green (s)	5.0	33.3	33.3	18.1	52.2	5.0	24.2	48.3	6.0	25.2
Actuated g/C Ratio	0.05	0.33	0.33	0.18	0.51	0.05	0.24	0.47	0.06	0.25
v/c Ratio	0.24	0.81	0.17	1.34	0.34	1.04	1.08	1.38	1.86	1.01
Control Delay	57.9	42.4	2.2	200.3	13.5	161.1	94.8	199.1	451.2	73.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.9	42.4	2.2	200.3	13.5	161.1	94.8	199.1	451.2	73.3
LOS	E	D	A	F	B	F	F	F	F	E
Approach Delay		36.0			144.7		154.7			138.3
Approach LOS		D			F		F			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 101.8	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.86	
Intersection Signal Delay: 134.2	Intersection LOS: F
Intersection Capacity Utilization 118.9%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 4: Euclid Av. (SR-83) & Pine Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	447	96	661	159	121	77	826	1103	166	787	15
Future Volume (veh/h)	18	447	96	661	159	121	77	826	1103	166	787	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	19	476	0	703	169	114	82	879	702	177	837	15
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	33	558		540	473	319	82	833	650	99	872	16
Arrive On Green	0.02	0.31	0.00	0.18	0.47	0.47	0.05	0.24	0.24	0.06	0.25	0.25
Sat Flow, veh/h	1619	1800	1525	2956	1002	676	1619	3420	1525	1619	3437	62
Grp Volume(v), veh/h	19	476	0	703	0	283	82	879	702	177	416	436
Grp Sat Flow(s),veh/h/ln	1619	1800	1525	1478	0	1678	1619	1710	1525	1619	1710	1789
Q Serve(g_s), s	1.1	24.4	0.0	18.0	0.0	10.6	5.0	24.0	24.0	6.0	23.7	23.7
Cycle Q Clear(g_c), s	1.1	24.4	0.0	18.0	0.0	10.6	5.0	24.0	24.0	6.0	23.7	23.7
Prop In Lane	1.00		1.00	1.00		0.40	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	33	558		540	0	792	82	833	650	99	434	454
V/C Ratio(X)	0.57	0.85		1.30	0.00	0.36	1.00	1.05	1.08	1.79	0.96	0.96
Avail Cap(c_a), veh/h	82	950		540	0	1107	82	833	650	99	434	454
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.8	31.9	0.0	40.3	0.0	16.5	46.8	37.3	28.3	46.3	36.3	36.3
Incr Delay (d2), s/veh	5.6	5.4	0.0	148.8	0.0	0.4	98.5	46.7	58.7	395.0	32.6	31.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	10.7	0.0	17.3	0.0	3.7	4.1	14.6	24.1	13.1	13.0	13.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.4	37.3	0.0	189.0	0.0	16.9	145.2	84.0	86.9	441.3	68.9	68.0
LnGrp LOS	D	D		F	A	B	F	F	F	F	E	E
Approach Vol, veh/h		495	A		986			1663			1029	
Approach Delay, s/veh		37.9			139.6			88.2			132.6	
Approach LOS		D			F			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.0	30.0	22.0	36.5	9.0	31.0	6.0	52.5
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	6.0	24.0	18.0	52.0	5.0	25.0	5.0	65.0
Max Q Clear Time (g_c+I1), s	8.0	26.0	20.0	26.4	7.0	25.7	3.1	12.6
Green Ext Time (p_c), s	0.0	0.0	0.0	4.1	0.0	0.0	0.0	2.5

Intersection Summary	
HCM 6th Ctrl Delay	105.3
HCM 6th LOS	F

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1275	33	8	543	77	17
Future Volume (vph)	1275	33	8	543	77	17
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases		4				2
Detector Phase	4	4	3	8	2	2
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	23.2	23.2	9.6	16.2	32.1	32.1
Total Split (s)	77.7	77.7	9.6	87.3	32.7	32.7
Total Split (%)	64.8%	64.8%	8.0%	72.8%	27.3%	27.3%
Yellow Time (s)	5.2	5.2	3.6	5.2	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2	4.6	6.2	5.1	5.1
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	None	None	None	None	Min	Min
Act Effct Green (s)	72.2	72.2	5.1	73.8	13.3	13.3
Actuated g/C Ratio	0.73	0.73	0.05	0.75	0.14	0.14
v/c Ratio	1.05	0.03	0.11	0.44	0.39	0.08
Control Delay	55.3	3.5	52.0	6.6	44.1	16.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.3	3.5	52.0	6.6	44.1	16.5
LOS	E	A	D	A	D	B
Approach Delay	54.0			7.3	39.2	
Approach LOS	D			A	D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 98.5	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.05	
Intersection Signal Delay: 40.1	Intersection LOS: D
Intersection Capacity Utilization 88.6%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 5: Mayhew Av. & Kimball Av.





Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1275	33	8	543	77	17
Future Volume (veh/h)	1275	33	8	543	77	17
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1800	1800	1700	1800	1700	1800
Adj Flow Rate, veh/h	1386	36	9	590	84	18
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1307	1107	18	1411	164	155
Arrive On Green	0.73	0.73	0.01	0.78	0.10	0.10
Sat Flow, veh/h	1800	1525	1619	1800	1619	1525
Grp Volume(v), veh/h	1386	36	9	590	84	18
Grp Sat Flow(s),veh/h/ln	1800	1525	1619	1800	1619	1525
Q Serve(g_s), s	71.5	0.7	0.5	10.4	4.8	1.1
Cycle Q Clear(g_c), s	71.5	0.7	0.5	10.4	4.8	1.1
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1307	1107	18	1411	164	155
V/C Ratio(X)	1.06	0.03	0.50	0.42	0.51	0.12
Avail Cap(c_a), veh/h	1307	1107	82	1482	454	427
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.5	3.8	48.4	3.4	41.9	40.2
Incr Delay (d2), s/veh	42.7	0.0	7.8	0.2	2.4	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	33.2	0.1	0.2	1.9	2.0	0.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	56.2	3.8	56.3	3.6	44.4	40.6
LnGrp LOS	F	A	E	A	D	D
Approach Vol, veh/h	1422			599	102	
Approach Delay, s/veh	54.9			4.4	43.7	
Approach LOS	D			A	D	

Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		15.1	5.7	77.7		83.4
Change Period (Y+Rc), s		5.1	4.6	6.2		6.2
Max Green Setting (Gmax), s		27.6	5.0	71.5		81.1
Max Q Clear Time (g_c+I1), s		6.8	2.5	73.5		12.4
Green Ext Time (p_c), s		0.2	0.0	0.0		3.8

Intersection Summary		
HCM 6th Ctrl Delay		40.1
HCM 6th LOS		D

Intersection	
Int Delay, s/veh	6.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	83	15	6	11	5	35
Future Vol, veh/h	83	15	6	11	5	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	90	16	7	12	5	38

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	50	24	43	0	-	0
Stage 1	24	-	-	-	-	-
Stage 2	26	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	964	1058	1579	-	-	-
Stage 1	1004	-	-	-	-	-
Stage 2	1002	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	960	1058	1579	-	-	-
Mov Cap-2 Maneuver	895	-	-	-	-	-
Stage 1	1000	-	-	-	-	-
Stage 2	1002	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.4	2.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1579	-	917	-	-
HCM Lane V/C Ratio	0.004	-	0.116	-	-
HCM Control Delay (s)	7.3	-	9.4	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.4	-	-

Intersection	
Int Delay, s/veh	5.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	11	22	10	6	15	5
Future Vol, veh/h	11	22	10	6	15	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	12	24	11	7	16	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	48	19	21	0	-	0
Stage 1	19	-	-	-	-	-
Stage 2	29	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	967	1065	1608	-	-	-
Stage 1	1009	-	-	-	-	-
Stage 2	999	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	960	1065	1608	-	-	-
Mov Cap-2 Maneuver	895	-	-	-	-	-
Stage 1	1002	-	-	-	-	-
Stage 2	999	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.7	4.5	0
HCM LOS	A		

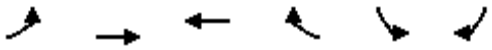
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1608	-	1002	-	-
HCM Lane V/C Ratio	0.007	-	0.036	-	-
HCM Control Delay (s)	7.3	-	8.7	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Traffic Volume (vph)	13	425	138	7	30
Future Volume (vph)	13	425	138	7	30
Turn Type	Prot	NA	NA	Prot	Perm
Protected Phases	7	4	8	6	
Permitted Phases					6
Detector Phase	7	4	8	6	6
Switch Phase					
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	15.4	22.4	27.1	27.1
Total Split (s)	11.0	91.0	80.0	29.0	29.0
Total Split (%)	9.2%	75.8%	66.7%	24.2%	24.2%
Yellow Time (s)	3.6	4.4	4.4	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	5.4	5.1	5.1
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	Max	Max	None	None
Act Effct Green (s)	6.0	94.1	89.9	12.2	12.2
Actuated g/C Ratio	0.06	0.87	0.83	0.11	0.11
v/c Ratio	0.16	0.30	0.10	0.04	0.16
Control Delay	54.5	3.5	4.8	42.1	15.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	54.5	3.5	4.8	42.1	15.8
LOS	D	A	A	D	B
Approach Delay		5.0	4.8	21.0	
Approach LOS		A	A	C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 108.5	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.30	
Intersection Signal Delay: 5.9	Intersection LOS: A
Intersection Capacity Utilization 40.7%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 8: Bickmore Av. & Mayhew Av.





Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	13	425	138	3	7	30
Future Volume (veh/h)	13	425	138	3	7	30
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1700	1800	1800	1800	1700	1800
Adj Flow Rate, veh/h	14	462	150	3	8	33
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	26	1496	1355	27	109	102
Arrive On Green	0.02	0.83	0.77	0.77	0.07	0.07
Sat Flow, veh/h	1619	1800	1758	35	1619	1525
Grp Volume(v), veh/h	14	462	0	153	8	33
Grp Sat Flow(s),veh/h/ln	1619	1800	0	1794	1619	1525
Q Serve(g_s), s	0.9	6.0	0.0	2.2	0.5	2.1
Cycle Q Clear(g_c), s	0.9	6.0	0.0	2.2	0.5	2.1
Prop In Lane	1.00			0.02	1.00	1.00
Lane Grp Cap(c), veh/h	26	1496	0	1382	109	102
V/C Ratio(X)	0.54	0.31	0.00	0.11	0.07	0.32
Avail Cap(c_a), veh/h	101	1496	0	1382	376	354
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.3	2.0	0.0	3.0	45.1	45.8
Incr Delay (d2), s/veh	16.3	0.5	0.0	0.2	0.1	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	1.1	0.0	0.6	0.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	66.6	2.5	0.0	3.1	45.2	46.5
LnGrp LOS	E	A	A	A	D	D
Approach Vol, veh/h		476	153		41	
Approach Delay, s/veh		4.4	3.1		46.2	
Approach LOS		A	A		D	

Timer - Assigned Phs			4		6	7	8
Phs Duration (G+Y+Rc), s			91.0		12.0	6.3	84.7
Change Period (Y+Rc), s			5.4		5.1	4.6	5.4
Max Green Setting (Gmax), s			85.6		23.9	6.4	74.6
Max Q Clear Time (g_c+I1), s			8.0		4.1	2.9	4.2
Green Ext Time (p_c), s			3.0		0.0	0.0	0.9

Intersection Summary		
HCM 6th Ctrl Delay	6.7	
HCM 6th LOS	A	

APPENDIX 6.3:

OPENING YEAR CUMULATIVE (2022) WITH PROJECT CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS

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Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
(Average Traffic Estimate Form)

DIST	CO	RTE	PM	TRAFFIC CONDITIONS		2022 WP
				CALC CP	DATE	11/22/19
Jurisdiction: **City of Chino**				CHK CP	DATE	11/22/19
Major Street: **Kimball Av.**				Critical Approach Speed (Major)		45 mph
Minor Street: **Mayhew Av.**				Critical Approach Speed (Minor)		25 mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes = **1** lane

Major Street Future ADT = **22,521** vpd Minor Street Future ADT = **639** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); …….. √

or

In built up area of isolated community of < 10,000 population ……..

RURAL (R)

(Based on Estimated Average Daily Traffic - See Note)

URBAN / RURAL	Minimum Requirements EADT: Vehicles Per Day on Major Street (Total of Both Approaches)		Minimum Requirements EADT: Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
	Urban	Rural	Urban	Rural
CONDITION A - Minimum Vehicular Volume				
Satisfied / Not Satisfied: XX				
Number of lanes for moving traffic on each approach				
Major Street / Minor Street				
1 **22,521** / *1* **639**	8,000	5,600 *	2,400	1,680
2 + / *1*	9,600	6,720	2,400	1,680
2 + / *2* +	9,600	6,720	3,200	2,240
1 / *2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic	Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied / Not Satisfied: XX				
Number of lanes for moving traffic on each approach				
Major Street / Minor Street	Urban	Rural	Urban	Rural
1 **22,521** / *1* **639**	12,000	8,400 *	1,200	850
2 + / *1*	14,400	10,080	1,200	850
2 + / *2* +	14,400	10,080	1,600	1,120
1 / *2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B				
Satisfied / Not Satisfied: XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more ….. A: 38% B: 75%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
(Average Traffic Estimate Form)

DIST	CO	RTE	PM	TRAFFIC CONDITIONS		2022 WP
				CALC CP	DATE	11/22/19
Jurisdiction: **City of Chino**				CHK CP	DATE	11/22/19
Major Street: **Mayhew Av.**				Critical Approach Speed (Major)		35 mph
Minor Street: **Driveway 1**				Critical Approach Speed (Minor)		25 mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes = **1** lane

Major Street Future ADT = **831** vpd Minor Street Future ADT = **693** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); …….. [ ]

or **URBAN (U)**

In built up area of isolated community of < 10,000 population …….. [ ]

(Based on Estimated Average Daily Traffic - See Note)

URBAN / RURAL	Minimum Requirements EADT			
	Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
CONDITION A - Minimum Vehicular Volume	Urban	Rural	Urban	Rural
Satisfied / Not Satisfied: XX				
Number of lanes for moving traffic on each approach				
Major Street / Minor Street				
1 **831** / *1* **693**	8,000	5,600	2,400	1,680
2 + / *1*	9,600	6,720	2,400	1,680
2 + / *2* +	9,600	6,720	3,200	2,240
1 / *2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic	Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied / Not Satisfied: XX				
Number of lanes for moving traffic on each approach				
Major Street / Minor Street	Urban	Rural	Urban	Rural
1 **831** / *1* **693**	12,000	8,400	1,200	850
2 + / *1*	14,400	10,080	1,200	850
2 + / *2* +	14,400	10,080	1,600	1,120
1 / *2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B				
Satisfied / Not Satisfied: XX				
No one condition satisfied, but following conditions fulfilled 80% of more ….. A: 10% B: 7%	2 CONDITIONS 80%		2 CONDITIONS 80%	

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
(Average Traffic Estimate Form)

DIST	CO	RTE	PM	TRAFFIC CONDITIONS		2022 WP
				CALC CP	DATE	11/22/19
Jurisdiction: **City of Chino**				CHK CP	DATE	11/22/19
Major Street: **Mayhew Av.**				Critical Approach Speed (Major)		35 mph
Minor Street: **Driveway 2**				Critical Approach Speed (Minor)		25 mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes = **1** lane

Major Street Future ADT = **452** vpd Minor Street Future ADT = **206** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); …….. [ ]

or **URBAN (U)**

In built up area of isolated community of < 10,000 population …….. [ ]

(Based on Estimated Average Daily Traffic - See Note)

URBAN / RURAL	Minimum Requirements EADT			
XX	Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
CONDITION A - Minimum Vehicular Volume	Urban	Rural	Urban	Rural
Satisfied / Not Satisfied: XX				
Number of lanes for moving traffic on each approach				
Major Street / Minor Street				
1 **452** / *1* **206**	8,000	5,600	2,400	1,680
2 + / *1*	9,600	6,720	2,400	1,680
2 + / *2* +	9,600	6,720	3,200	2,240
1 / *2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic	Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied / Not Satisfied: XX				
Number of lanes for moving traffic on each approach				
Major Street / Minor Street	Urban	Rural	Urban	Rural
1 **452** / *1* **206**	12,000	8,400	1,200	850
2 + / *1*	14,400	10,080	1,200	850
2 + / *2* +	14,400	10,080	1,600	1,120
1 / *2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B				
Satisfied / Not Satisfied: XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more ….. **A** 6% **B** 4%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
(Average Traffic Estimate Form)

DIST	CO	RTE	PM	TRAFFIC CONDITIONS		2022 WP
				CALC CP	DATE	11/22/19
Jurisdiction: **City of Chino**				CHK CP	DATE	11/22/19
Major Street: **Mayhew Av.**				Critical Approach Speed (Major)		45 mph
Minor Street: **Bickmore Av.**				Critical Approach Speed (Minor)		25 mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes = **1** lane

Major Street Future ADT = **259** vpd Minor Street Future ADT = **6,236** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); …….. √

or

In built up area of isolated community of < 10,000 population ……..

RURAL (R)

(Based on Estimated Average Daily Traffic - See Note)

URBAN / RURAL	Minimum Requirements EADT: Vehicles Per Day on Major Street (Total of Both Approaches)		Minimum Requirements EADT: Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
CONDITION A - Minimum Vehicular Volume				
Satisfied / Not Satisfied: XX				
Number of lanes for moving traffic on each approach	Urban	Rural	Urban	Rural
Major Street / Minor Street				
1 **259** / *1* **6,236**	8,000	5,600	2,400	1,680 *
2 + / *1*	9,600	6,720	2,400	1,680
2 + / *2* +	9,600	6,720	3,200	2,240
1 / *2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic				
Satisfied / Not Satisfied: XX				
Number of lanes for moving traffic on each approach	Urban	Rural	Urban	Rural
Major Street / Minor Street				
1 **259** / *1* **6,236**	12,000	8,400	1,200	850 *
2 + / *1*	14,400	10,080	1,200	850
2 + / *2* +	14,400	10,080	1,600	1,120
1 / *2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B				
Satisfied / Not Satisfied: XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more ….. A: 5% B: 3%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

APPENDIX 6.4:

OPENING YEAR CUMULATIVE (2022) WITHOUT PROJECT CONDITIONS QUEUING ANALYSIS WORKSHEETS

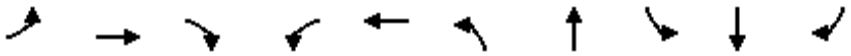
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Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	133	270	46	902	332	183	897	63	174	713	430
v/c Ratio	0.51	0.26	0.34	0.93	0.55	0.90	0.72	0.08	0.77	0.66	0.61
Control Delay	58.7	30.0	58.9	58.7	14.8	92.2	36.3	3.3	75.9	38.7	21.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.7	30.0	58.9	58.7	14.8	92.2	36.3	3.3	75.9	38.7	21.3
Queue Length 50th (ft)	51	77	34	352	58	139	306	0	68	247	174
Queue Length 95th (ft)	84	115	74	#487	154	#274	391	20	#123	322	276
Internal Link Dist (ft)		1169		1767			2587			5208	
Turn Bay Length (ft)	200		215		200	420		260	160		240
Base Capacity (vph)	289	1076	136	978	603	212	1252	809	234	1081	716
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.25	0.34	0.92	0.55	0.86	0.72	0.08	0.74	0.66	0.60

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	124	16	61	400	478	63	851	59	717	219
v/c Ratio	0.64	0.06	0.18	0.77	0.83	0.52	0.78	0.59	0.68	0.36
Control Delay	57.7	31.7	1.2	43.3	38.4	62.6	37.7	72.3	36.2	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.7	31.7	1.2	43.3	38.4	62.6	37.7	72.3	36.2	6.8
Queue Length 50th (ft)	69	8	0	207	233	36	235	34	195	0
Queue Length 95th (ft)	157	25	0	#521	371	#115	#509	#126	#411	64
Internal Link Dist (ft)		814			1605		2821		2587	
Turn Bay Length (ft)	150		150	80		115		160		240
Base Capacity (vph)	293	793	740	538	1008	136	1096	100	1050	611
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.02	0.08	0.74	0.47	0.46	0.78	0.59	0.68	0.36

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

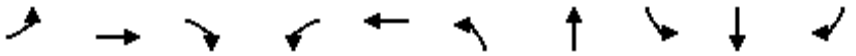


Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	412	889	45	331	180	88	885	48	464	949	238
v/c Ratio	0.93	0.98	0.33	0.55	0.42	0.64	0.79	0.06	0.97	0.69	0.24
Control Delay	79.6	69.4	58.9	47.8	7.3	74.7	42.7	0.1	84.8	32.7	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	79.6	69.4	58.9	47.8	7.3	74.7	42.7	0.1	84.8	32.7	4.4
Queue Length 50th (ft)	164	~381	33	122	0	67	330	0	187	320	24
Queue Length 95th (ft)	#263	#513	73	170	48	#143	412	0	#297	397	60
Internal Link Dist (ft)		1169		1767			2587			5208	
Turn Bay Length (ft)	200		215		200	420		260	160		240
Base Capacity (vph)	447	904	137	670	460	137	1116	797	477	1379	996
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.98	0.33	0.49	0.39	0.64	0.79	0.06	0.97	0.69	0.24

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	180	127	113	29	98	81	883	170	859	258
v/c Ratio	0.66	0.27	0.23	0.21	0.35	0.47	0.77	0.68	0.61	0.34
Control Delay	44.6	22.3	5.1	42.3	16.5	46.2	30.8	50.9	25.8	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.6	22.3	5.1	42.3	16.5	46.2	30.8	50.9	25.8	7.0
Queue Length 50th (ft)	74	41	0	12	15	33	172	71	159	8
Queue Length 95th (ft)	195	92	30	50	54	#117	#517	#269	#484	87
Internal Link Dist (ft)		814			1605		2821		2587	
Turn Bay Length (ft)	150		150	80		115		160		240
Base Capacity (vph)	438	1010	899	642	1136	214	1152	249	1413	767
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.13	0.13	0.05	0.09	0.38	0.77	0.68	0.61	0.34

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

APPENDIX 6.5:

OPENING YEAR CUMULATIVE (2022) WITH PROJECT CONDITIONS QUEUING ANALYSIS WORKSHEETS

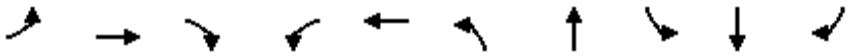
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Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	133	288	46	915	352	183	897	63	204	713	430
v/c Ratio	0.51	0.27	0.34	0.94	0.59	0.90	0.72	0.08	0.88	0.66	0.61
Control Delay	59.0	30.6	59.0	60.1	16.5	92.7	36.7	3.3	88.6	38.8	21.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.0	30.6	59.0	60.1	16.5	92.7	36.7	3.3	88.6	38.8	21.3
Queue Length 50th (ft)	51	84	34	358	72	139	306	0	80	247	174
Queue Length 95th (ft)	84	123	74	#498	176	#274	391	20	#153	322	276
Internal Link Dist (ft)		1169		1767			2587			5208	
Turn Bay Length (ft)	200		215		200	420		260	160		240
Base Capacity (vph)	287	1077	135	972	601	211	1245	805	233	1083	715
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.27	0.34	0.94	0.59	0.87	0.72	0.08	0.88	0.66	0.60

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	124	16	61	413	478	63	871	59	717	219
v/c Ratio	0.64	0.06	0.18	0.78	0.81	0.52	0.81	0.60	0.69	0.36
Control Delay	58.1	31.7	1.2	43.9	37.0	63.0	39.1	73.3	36.5	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.1	31.7	1.2	43.9	37.0	63.0	39.1	73.3	36.5	6.8
Queue Length 50th (ft)	69	8	0	216	233	36	242	34	195	0
Queue Length 95th (ft)	157	25	0	#544	371	#115	#526	#126	#411	64
Internal Link Dist (ft)		814			1605		2821		2587	
Turn Bay Length (ft)	150		150	80		115		160		240
Base Capacity (vph)	290	783	732	531	996	134	1079	99	1036	606
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.02	0.08	0.78	0.48	0.47	0.81	0.60	0.69	0.36

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

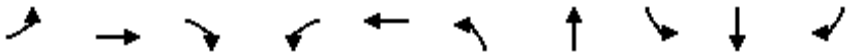


Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	412	902	45	360	229	88	886	48	485	949	238
v/c Ratio	0.94	0.99	0.33	0.60	0.50	0.64	0.80	0.06	1.02	0.69	0.24
Control Delay	79.7	71.7	58.9	48.9	9.4	74.9	42.9	0.1	95.4	32.8	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	79.7	71.7	58.9	48.9	9.4	74.9	42.9	0.1	95.4	32.8	5.0
Queue Length 50th (ft)	164	~392	33	133	0	67	331	0	~208	320	29
Queue Length 95th (ft)	#263	#525	73	184	68	#143	413	0	#317	397	65
Internal Link Dist (ft)		1169		1767			2587			5208	
Turn Bay Length (ft)	200		215		200	420		260	160		240
Base Capacity (vph)	446	908	137	669	483	137	1114	796	476	1377	989
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.99	0.33	0.54	0.47	0.64	0.80	0.06	1.02	0.69	0.24

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	180	127	113	59	99	81	895	170	859	258
v/c Ratio	0.65	0.31	0.26	0.37	0.35	0.47	0.78	0.68	0.61	0.34
Control Delay	44.6	25.9	5.8	43.1	16.4	46.3	31.2	51.0	25.8	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.6	25.9	5.8	43.1	16.4	46.3	31.2	51.0	25.8	7.0
Queue Length 50th (ft)	74	51	0	24	15	33	175	71	159	8
Queue Length 95th (ft)	195	97	32	81	54	#117	#526	#269	#484	87
Internal Link Dist (ft)		814			1605		2821		2587	
Turn Bay Length (ft)	150		150	80		115		160		240
Base Capacity (vph)	438	1000	891	641	1134	213	1150	249	1413	767
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.13	0.13	0.09	0.09	0.38	0.78	0.68	0.61	0.34

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

APPENDIX 6.6

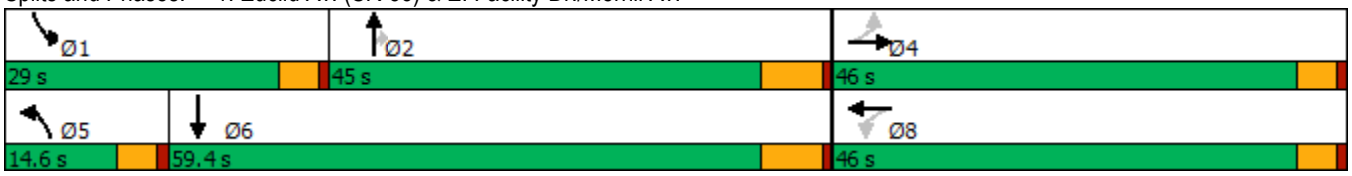
OPENING YEAR CUMULATIVE (2022) WITHOUT PROJECT CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS WITH IMPROVEMENTS

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Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	4	8	255	50	11	1136	203	187	1088
Future Volume (vph)	4	8	255	50	11	1136	203	187	1088
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8				2		
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	15.0	15.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	9.6	9.6	21.6	21.6	14.6	28.5	28.5	14.6	42.5
Total Split (s)	46.0	46.0	46.0	46.0	14.6	45.0	45.0	29.0	59.4
Total Split (%)	38.3%	38.3%	38.3%	38.3%	12.2%	37.5%	37.5%	24.2%	49.5%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	5.5	5.5	3.6	5.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.6		4.6	4.6	6.5	6.5	4.6	6.5
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None	Max
Act Effct Green (s)		41.5		41.5	10.0	38.6	38.6	17.5	57.9
Actuated g/C Ratio		0.37		0.37	0.09	0.34	0.34	0.15	0.51
v/c Ratio		0.05		1.07	0.08	0.70	0.36	0.78	0.47
Control Delay		14.5		92.7	51.1	35.7	17.2	66.5	19.0
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		14.5		92.7	51.1	35.7	17.2	66.5	19.0
LOS		B		F	D	D	B	E	B
Approach Delay		14.5		92.7		33.0			25.7
Approach LOS		B		F		C			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 113.3	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.07	
Intersection Signal Delay: 40.2	Intersection LOS: D
Intersection Capacity Utilization 92.5%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 1: Euclid Av. (SR-83) & E. Facility Dr./Merrill Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	8	18	255	50	259	11	1136	203	187	1088	41
Future Volume (veh/h)	4	8	18	255	50	259	11	1136	203	187	1088	41
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	4	8	18	263	52	240	11	1171	166	193	1122	28
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	90	179	349	307	51	237	42	1762	547	220	2309	58
Arrive On Green	0.37	0.37	0.37	0.37	0.37	0.37	0.03	0.36	0.36	0.14	0.47	0.47
Sat Flow, veh/h	147	488	952	709	140	647	1619	4914	1525	1619	4928	123
Grp Volume(v), veh/h	30	0	0	555	0	0	11	1171	166	193	746	404
Grp Sat Flow(s),veh/h/ln	1586	0	0	1496	0	0	1619	1638	1525	1619	1638	1775
Q Serve(g_s), s	0.0	0.0	0.0	40.1	0.0	0.0	0.8	22.7	8.8	13.2	17.7	17.7
Cycle Q Clear(g_c), s	1.3	0.0	0.0	41.4	0.0	0.0	0.8	22.7	8.8	13.2	17.7	17.7
Prop In Lane	0.13		0.60	0.47		0.43	1.00		1.00	1.00		0.07
Lane Grp Cap(c), veh/h	618	0	0	595	0	0	42	1762	547	220	1535	831
V/C Ratio(X)	0.05	0.00	0.00	0.93	0.00	0.00	0.26	0.66	0.30	0.88	0.49	0.49
Avail Cap(c_a), veh/h	618	0	0	595	0	0	143	1762	547	350	1535	831
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.1	0.0	0.0	35.9	0.0	0.0	53.9	30.5	26.1	47.9	20.7	20.7
Incr Delay (d2), s/veh	0.0	0.0	0.0	21.4	0.0	0.0	1.2	2.0	1.4	8.9	1.1	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.0	17.7	0.0	0.0	0.3	8.6	3.2	5.6	6.3	7.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.1	0.0	0.0	57.2	0.0	0.0	55.2	32.5	27.5	56.8	21.8	22.7
LnGrp LOS	C	A	A	E	A	A	E	C	C	E	C	C
Approach Vol, veh/h		30			555			1348			1343	
Approach Delay, s/veh		23.1			57.2			32.1			27.1	
Approach LOS		C			E			C			C	

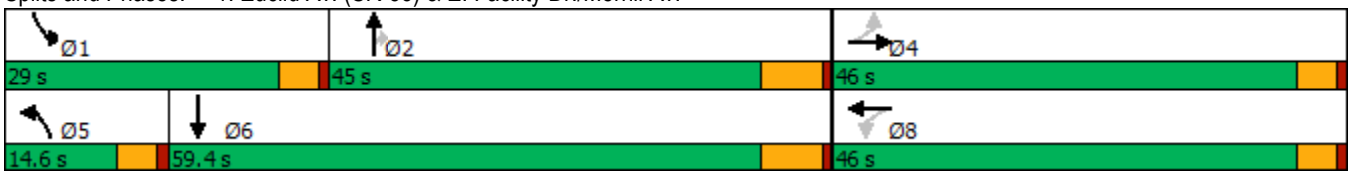
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	19.9	47.0		46.0	7.5	59.4		46.0				
Change Period (Y+Rc), s	4.6	6.5		4.6	4.6	6.5		4.6				
Max Green Setting (Gmax), s	24.4	38.5		41.4	10.0	52.9		41.4				
Max Q Clear Time (g_c+I1), s	15.2	24.7		3.3	2.8	19.7		43.4				
Green Ext Time (p_c), s	0.2	6.5		0.1	0.0	7.6		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		34.2	
HCM 6th LOS		C	

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	12	31	255	2	4	1279	262	288	1325
Future Volume (vph)	12	31	255	2	4	1279	262	288	1325
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8				2		
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	15.0	15.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	9.6	9.6	21.6	21.6	14.6	28.5	28.5	14.6	42.5
Total Split (s)	46.0	46.0	46.0	46.0	14.6	45.0	45.0	29.0	59.4
Total Split (%)	38.3%	38.3%	38.3%	38.3%	12.2%	37.5%	37.5%	24.2%	49.5%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	5.5	5.5	3.6	5.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.6		4.6	4.6	6.5	6.5	4.6	6.5
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None	Max
Act Effct Green (s)		41.4		41.4	10.0	38.5	38.5	24.3	64.5
Actuated g/C Ratio		0.35		0.35	0.08	0.32	0.32	0.20	0.54
v/c Ratio		0.11		1.02	0.03	0.89	0.51	0.97	0.55
Control Delay		21.9		82.8	51.2	47.1	23.6	89.6	20.0
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		21.9		82.8	51.2	47.1	23.6	89.6	20.0
LOS		C		F	D	D	C	F	B
Approach Delay		21.9		82.8		43.1			32.4
Approach LOS		C		F		D			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 119.9	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.02	
Intersection Signal Delay: 43.0	Intersection LOS: D
Intersection Capacity Utilization 91.9%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 1: Euclid Av. (SR-83) & E. Facility Dr./Merrill Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	31	13	255	2	204	4	1279	262	288	1325	1
Future Volume (veh/h)	12	31	13	255	2	204	4	1279	262	288	1325	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	13	34	13	280	2	214	4	1405	223	316	1456	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	132	331	118	332	2	218	17	1577	489	329	2525	0
Arrive On Green	0.34	0.34	0.34	0.34	0.34	0.34	0.01	0.32	0.32	0.20	0.51	0.00
Sat Flow, veh/h	276	958	341	825	6	631	1619	4914	1525	1619	5076	0
Grp Volume(v), veh/h	60	0	0	496	0	0	4	1405	223	316	1456	0
Grp Sat Flow(s),veh/h/ln	1576	0	0	1462	0	0	1619	1638	1525	1619	1638	0
Q Serve(g_s), s	0.0	0.0	0.0	37.5	0.0	0.0	0.3	32.6	14.0	23.2	24.6	0.0
Cycle Q Clear(g_c), s	2.8	0.0	0.0	40.3	0.0	0.0	0.3	32.6	14.0	23.2	24.6	0.0
Prop In Lane	0.22		0.22	0.56		0.43	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	580	0	0	551	0	0	17	1577	489	329	2525	0
V/C Ratio(X)	0.10	0.00	0.00	0.90	0.00	0.00	0.24	0.89	0.46	0.96	0.58	0.00
Avail Cap(c_a), veh/h	580	0	0	551	0	0	135	1577	489	329	2525	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	26.7	0.0	0.0	38.7	0.0	0.0	58.9	38.8	32.4	47.3	20.2	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	17.3	0.0	0.0	2.7	8.0	3.0	38.6	1.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	0.0	16.1	0.0	0.0	0.1	13.4	5.3	12.4	8.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.7	0.0	0.0	56.0	0.0	0.0	61.6	46.8	35.5	85.9	21.1	0.0
LnGrp LOS	C	A	A	E	A	A	E	D	D	F	C	A
Approach Vol, veh/h		60			496			1632			1772	
Approach Delay, s/veh		26.7			56.0			45.3			32.7	
Approach LOS		C			E			D			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	29.0	45.0		46.0	5.8	68.2		46.0				
Change Period (Y+Rc), s	4.6	6.5		4.6	4.6	6.5		4.6				
Max Green Setting (Gmax), s	24.4	38.5		41.4	10.0	52.9		41.4				
Max Q Clear Time (g_c+I1), s	25.2	34.6		4.8	2.3	26.6		42.3				
Green Ext Time (p_c), s	0.0	2.9		0.2	0.0	10.6		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		40.7	
HCM 6th LOS		D	

APPENDIX 6.7:

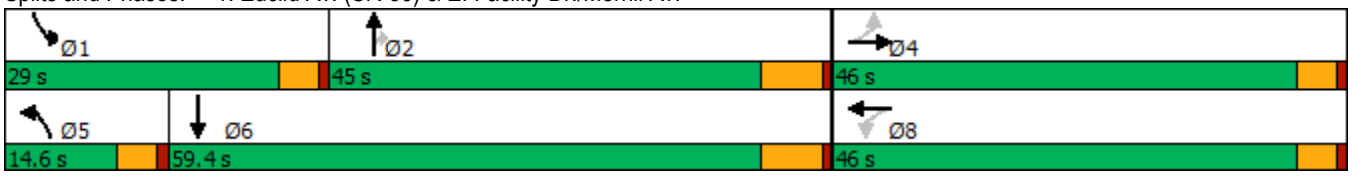
OPENING YEAR CUMULATIVE (2022) WITH PROJECT CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS WITH IMPROVEMENTS

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Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	4	8	256	50	11	1156	204	187	1117
Future Volume (vph)	4	8	256	50	11	1156	204	187	1117
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8				2		
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	15.0	15.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	9.6	9.6	21.6	21.6	14.6	28.5	28.5	14.6	42.5
Total Split (s)	46.0	46.0	46.0	46.0	14.6	45.0	45.0	29.0	59.4
Total Split (%)	38.3%	38.3%	38.3%	38.3%	12.2%	37.5%	37.5%	24.2%	49.5%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	5.5	5.5	3.6	5.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.6		4.6	4.6	6.5	6.5	4.6	6.5
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None	Max
Act Effct Green (s)		41.5		41.5	10.0	38.6	38.6	17.5	57.9
Actuated g/C Ratio		0.37		0.37	0.09	0.34	0.34	0.15	0.51
v/c Ratio		0.05		1.07	0.08	0.71	0.36	0.78	0.48
Control Delay		14.5		93.3	51.1	36.0	17.3	66.5	19.1
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		14.5		93.3	51.1	36.0	17.3	66.5	19.1
LOS		B		F	D	D	B	E	B
Approach Delay		14.5		93.3		33.3			25.7
Approach LOS		B		F		C			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 113.3	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.07	
Intersection Signal Delay: 40.3	Intersection LOS: D
Intersection Capacity Utilization 92.6%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 1: Euclid Av. (SR-83) & E. Facility Dr./Merrill Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	8	18	256	50	259	11	1156	204	187	1117	41
Future Volume (veh/h)	4	8	18	256	50	259	11	1156	204	187	1117	41
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	4	8	18	264	52	240	11	1192	167	193	1152	28
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	90	179	349	307	51	237	42	1762	547	220	2310	56
Arrive On Green	0.37	0.37	0.37	0.37	0.37	0.37	0.03	0.36	0.36	0.14	0.47	0.47
Sat Flow, veh/h	147	488	952	710	140	646	1619	4914	1525	1619	4931	120
Grp Volume(v), veh/h	30	0	0	556	0	0	11	1192	167	193	765	415
Grp Sat Flow(s),veh/h/ln	1587	0	0	1496	0	0	1619	1638	1525	1619	1638	1775
Q Serve(g_s), s	0.0	0.0	0.0	40.1	0.0	0.0	0.8	23.2	8.9	13.2	18.3	18.3
Cycle Q Clear(g_c), s	1.3	0.0	0.0	41.4	0.0	0.0	0.8	23.2	8.9	13.2	18.3	18.3
Prop In Lane	0.13		0.60	0.47		0.43	1.00		1.00	1.00		0.07
Lane Grp Cap(c), veh/h	618	0	0	595	0	0	42	1762	547	220	1535	832
V/C Ratio(X)	0.05	0.00	0.00	0.93	0.00	0.00	0.26	0.68	0.31	0.88	0.50	0.50
Avail Cap(c_a), veh/h	618	0	0	595	0	0	143	1762	547	350	1535	832
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.1	0.0	0.0	35.9	0.0	0.0	53.9	30.7	26.1	47.9	20.8	20.8
Incr Delay (d2), s/veh	0.0	0.0	0.0	21.7	0.0	0.0	1.2	2.1	1.4	8.9	1.2	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.0	17.8	0.0	0.0	0.3	8.8	3.2	5.6	6.6	7.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.1	0.0	0.0	57.6	0.0	0.0	55.2	32.8	27.5	56.8	22.0	22.9
LnGrp LOS	C	A	A	E	A	A	E	C	C	E	C	C
Approach Vol, veh/h		30			556			1370			1373	
Approach Delay, s/veh		23.1			57.6			32.3			27.2	
Approach LOS		C			E			C			C	

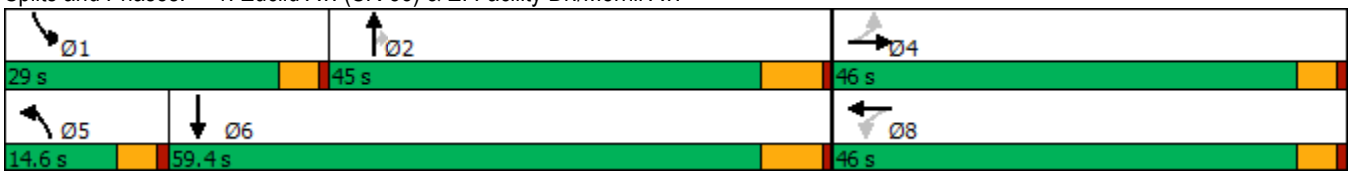
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	19.9	47.0		46.0	7.5	59.4		46.0				
Change Period (Y+Rc), s	4.6	6.5		4.6	4.6	6.5		4.6				
Max Green Setting (Gmax), s	24.4	38.5		41.4	10.0	52.9		41.4				
Max Q Clear Time (g_c+I1), s	15.2	25.2		3.3	2.8	20.3		43.4				
Green Ext Time (p_c), s	0.2	6.5		0.1	0.0	7.9		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		34.3	
HCM 6th LOS		C	

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	12	31	256	2	4	1326	264	288	1345
Future Volume (vph)	12	31	256	2	4	1326	264	288	1345
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8				2		
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	15.0	15.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	9.6	9.6	21.6	21.6	14.6	28.5	28.5	14.6	42.5
Total Split (s)	46.0	46.0	46.0	46.0	14.6	45.0	45.0	29.0	59.4
Total Split (%)	38.3%	38.3%	38.3%	38.3%	12.2%	37.5%	37.5%	24.2%	49.5%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	5.5	5.5	3.6	5.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.6		4.6	4.6	6.5	6.5	4.6	6.5
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None	Max
Act Effct Green (s)		41.4		41.4	10.0	38.5	38.5	24.3	64.5
Actuated g/C Ratio		0.35		0.35	0.08	0.32	0.32	0.20	0.54
v/c Ratio		0.11		1.02	0.03	0.92	0.52	0.97	0.56
Control Delay		21.9		83.3	51.2	50.2	24.2	89.6	20.1
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		21.9		83.3	51.2	50.2	24.2	89.6	20.1
LOS		C		F	D	D	C	F	C
Approach Delay		21.9		83.3		45.9			32.3
Approach LOS		C		F		D			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 119.9	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.02	
Intersection Signal Delay: 44.2	Intersection LOS: D
Intersection Capacity Utilization 92.9%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 1: Euclid Av. (SR-83) & E. Facility Dr./Merrill Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	31	13	256	2	204	4	1326	264	288	1345	1
Future Volume (veh/h)	12	31	13	256	2	204	4	1326	264	288	1345	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	13	34	13	281	2	214	4	1457	225	316	1478	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	132	331	118	332	2	217	17	1577	489	329	2525	0
Arrive On Green	0.34	0.34	0.34	0.34	0.34	0.34	0.01	0.32	0.32	0.20	0.51	0.00
Sat Flow, veh/h	276	958	342	826	6	629	1619	4914	1525	1619	5076	0
Grp Volume(v), veh/h	60	0	0	497	0	0	4	1457	225	316	1478	0
Grp Sat Flow(s),veh/h/ln	1577	0	0	1462	0	0	1619	1638	1525	1619	1638	0
Q Serve(g_s), s	0.0	0.0	0.0	37.7	0.0	0.0	0.3	34.3	14.1	23.2	25.1	0.0
Cycle Q Clear(g_c), s	2.8	0.0	0.0	40.5	0.0	0.0	0.3	34.3	14.1	23.2	25.1	0.0
Prop In Lane	0.22		0.22	0.57		0.43	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	580	0	0	551	0	0	17	1577	489	329	2525	0
V/C Ratio(X)	0.10	0.00	0.00	0.90	0.00	0.00	0.24	0.92	0.46	0.96	0.59	0.00
Avail Cap(c_a), veh/h	580	0	0	551	0	0	135	1577	489	329	2525	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	26.7	0.0	0.0	38.7	0.0	0.0	58.9	39.3	32.5	47.3	20.3	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	17.6	0.0	0.0	2.7	10.6	3.1	38.6	1.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	0.0	16.2	0.0	0.0	0.1	14.4	5.3	12.4	8.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.7	0.0	0.0	56.3	0.0	0.0	61.6	50.0	35.6	85.9	21.3	0.0
LnGrp LOS	C	A	A	E	A	A	E	D	D	F	C	A
Approach Vol, veh/h		60			497			1686			1794	
Approach Delay, s/veh		26.7			56.3			48.1			32.7	
Approach LOS		C			E			D			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	29.0	45.0		46.0	5.8	68.2		46.0				
Change Period (Y+Rc), s	4.6	6.5		4.6	4.6	6.5		4.6				
Max Green Setting (Gmax), s	24.4	38.5		41.4	10.0	52.9		41.4				
Max Q Clear Time (g_c+I1), s	25.2	36.3		4.8	2.3	27.1		42.5				
Green Ext Time (p_c), s	0.0	1.7		0.2	0.0	10.7		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		41.9	
HCM 6th LOS		D	

APPENDIX 7.1:

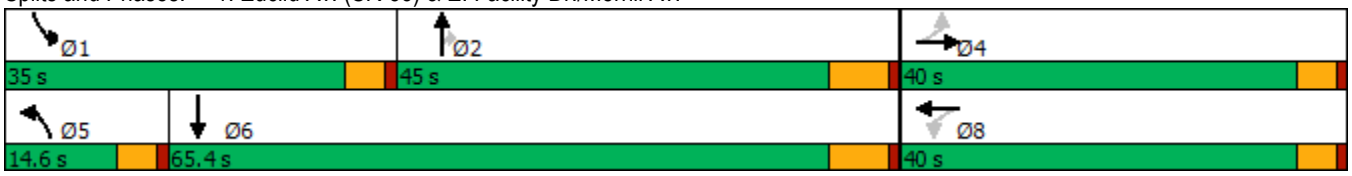
HORIZON YEAR (2040) WITHOUT PROJECT CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS

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Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	10	10	388	60	13	1284	443	364	1446
Future Volume (vph)	10	10	388	60	13	1284	443	364	1446
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8				2		
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	15.0	15.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	9.6	9.6	21.6	21.6	14.6	28.5	28.5	14.6	42.5
Total Split (s)	40.0	40.0	40.0	40.0	14.6	45.0	45.0	35.0	65.4
Total Split (%)	33.3%	33.3%	33.3%	33.3%	12.2%	37.5%	37.5%	29.2%	54.5%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	5.5	5.5	3.6	5.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.6		4.6	4.6	6.5	6.5	4.6	6.5
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None	Max
Act Effct Green (s)		35.4		35.4	10.0	38.5	38.5	28.0	65.4
Actuated g/C Ratio		0.30		0.30	0.08	0.33	0.33	0.24	0.56
v/c Ratio		0.09		1.95	0.09	1.12	0.74	0.92	0.77
Control Delay		18.5		460.6	52.4	103.4	34.1	73.0	25.0
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		18.5		460.6	52.4	103.4	34.1	73.0	25.0
LOS		B		F	D	F	C	E	C
Approach Delay		18.5		460.6		85.4			34.4
Approach LOS		B		F		F			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 117.7	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.95	
Intersection Signal Delay: 138.7	Intersection LOS: F
Intersection Capacity Utilization 129.3%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 1: Euclid Av. (SR-83) & E. Facility Dr./Merrill Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	10	21	388	60	458	13	1284	443	364	1446	49
Future Volume (veh/h)	10	10	21	388	60	458	13	1284	443	364	1446	49
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	10	10	21	400	62	445	13	1324	414	375	1491	37
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	127	134	234	256	33	235	50	1189	530	400	1919	48
Arrive On Green	0.30	0.30	0.30	0.30	0.30	0.30	0.03	0.33	0.33	0.23	0.53	0.53
Sat Flow, veh/h	294	441	771	697	108	776	1714	3610	1610	1714	3597	89
Grp Volume(v), veh/h	41	0	0	907	0	0	13	1324	414	375	747	781
Grp Sat Flow(s),veh/h/ln	1506	0	0	1581	0	0	1714	1805	1610	1714	1805	1882
Q Serve(g_s), s	0.0	0.0	0.0	33.4	0.0	0.0	0.9	38.5	27.1	25.1	38.5	38.7
Cycle Q Clear(g_c), s	2.0	0.0	0.0	35.4	0.0	0.0	0.9	38.5	27.1	25.1	38.5	38.7
Prop In Lane	0.24		0.51	0.44		0.49	1.00		1.00	1.00		0.05
Lane Grp Cap(c), veh/h	494	0	0	523	0	0	50	1189	530	400	963	1004
V/C Ratio(X)	0.08	0.00	0.00	1.73	0.00	0.00	0.26	1.11	0.78	0.94	0.78	0.78
Avail Cap(c_a), veh/h	494	0	0	523	0	0	147	1189	530	446	963	1004
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.1	0.0	0.0	42.1	0.0	0.0	55.5	39.2	35.4	44.0	21.7	21.8
Incr Delay (d2), s/veh	0.0	0.0	0.0	338.0	0.0	0.0	1.0	63.1	10.9	25.1	6.1	5.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.0	63.9	0.0	0.0	0.4	26.2	11.5	12.8	15.8	16.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.1	0.0	0.0	380.1	0.0	0.0	56.5	102.3	46.3	69.0	27.8	27.7
LnGrp LOS	C	A	A	F	A	A	E	F	D	E	C	C
Approach Vol, veh/h		41			907			1751			1903	
Approach Delay, s/veh		29.1			380.1			88.7			35.9	
Approach LOS		C			F			F			D	

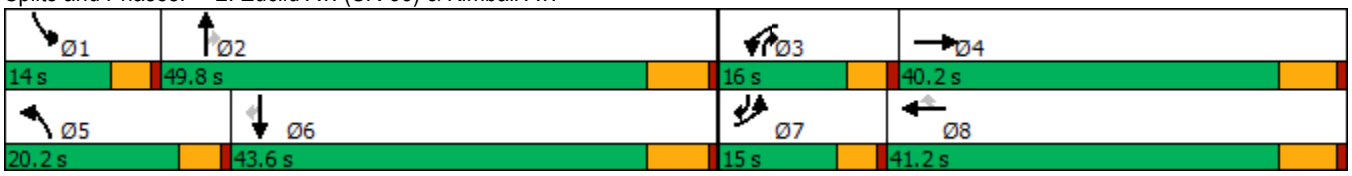
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	31.9	45.0		40.0	8.0	68.8		40.0				
Change Period (Y+Rc), s	4.6	6.5		4.6	4.6	6.5		4.6				
Max Green Setting (Gmax), s	30.4	38.5		35.4	10.0	58.9		35.4				
Max Q Clear Time (g_c+I1), s	27.1	40.5		4.0	2.9	40.7		37.4				
Green Ext Time (p_c), s	0.2	0.0		0.1	0.0	9.1		0.0				

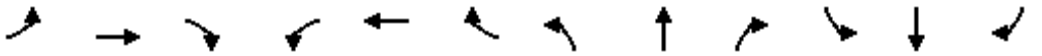
Intersection Summary			
HCM 6th Ctrl Delay		123.8	
HCM 6th LOS		F	

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	213	284	224	931	403	178	1234	58	219	1270	483
Future Volume (vph)	213	284	224	931	403	178	1234	58	219	1270	483
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2	3	1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	3	1	6	7
Switch Phase											
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	5.0	10.0	5.0	5.0	10.0
Minimum Split (s)	14.6	27.2	14.6	29.2	29.2	14.6	44.5	14.6	9.6	40.5	14.6
Total Split (s)	15.0	40.2	16.0	41.2	41.2	20.2	49.8	16.0	14.0	43.6	15.0
Total Split (%)	12.5%	33.5%	13.3%	34.3%	34.3%	16.8%	41.5%	13.3%	11.7%	36.3%	12.5%
Yellow Time (s)	3.6	5.2	3.6	5.2	5.2	3.6	5.5	3.6	3.6	5.5	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	4.6	6.2	6.2	4.6	6.5	4.6	4.6	6.5	4.6
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	None	Max	None
Act Effct Green (s)	10.3	33.3	11.4	34.4	34.4	14.8	43.3	61.2	9.4	37.9	50.1
Actuated g/C Ratio	0.09	0.28	0.10	0.29	0.29	0.12	0.36	0.51	0.08	0.32	0.42
v/c Ratio	0.80	0.40	1.40	0.91	0.69	0.86	0.96	0.07	0.91	1.13	0.67
Control Delay	75.8	32.0	254.4	54.9	26.5	85.8	54.9	2.8	92.2	108.0	24.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.8	32.0	254.4	54.9	26.5	85.8	54.9	2.8	92.2	108.0	24.1
LOS	E	C	F	D	C	F	D	A	F	F	C
Approach Delay		47.4		76.3			56.6			85.7	
Approach LOS		D		E			E			F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 119.3	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.40	
Intersection Signal Delay: 71.3	Intersection LOS: E
Intersection Capacity Utilization 97.8%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 2: Euclid Av. (SR-83) & Kimball Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	213	284	109	224	931	403	178	1234	58	219	1270	483
Future Volume (veh/h)	213	284	109	224	931	403	178	1234	58	219	1270	483
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1700	1900	1900	1800	1900	1900	1800	1900	1900	1700	1900	1900
Adj Flow Rate, veh/h	217	290	110	229	950	384	182	1259	16	223	1296	479
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	266	710	263	165	1035	462	208	1317	742	249	1165	649
Arrive On Green	0.08	0.28	0.28	0.10	0.29	0.29	0.12	0.36	0.36	0.08	0.32	0.32
Sat Flow, veh/h	3141	2577	956	1714	3610	1610	1714	3610	1610	3141	3610	1588
Grp Volume(v), veh/h	217	201	199	229	950	384	182	1259	16	223	1296	479
Grp Sat Flow(s),veh/h/ln	1570	1805	1728	1714	1805	1610	1714	1805	1610	1570	1805	1588
Q Serve(g_s), s	8.1	10.8	11.2	11.4	30.2	26.5	12.4	40.4	0.6	8.4	38.3	30.4
Cycle Q Clear(g_c), s	8.1	10.8	11.2	11.4	30.2	26.5	12.4	40.4	0.6	8.4	38.3	30.4
Prop In Lane	1.00		0.55	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	266	497	476	165	1035	462	208	1317	742	249	1165	649
V/C Ratio(X)	0.81	0.40	0.42	1.39	0.92	0.83	0.88	0.96	0.02	0.90	1.11	0.74
Avail Cap(c_a), veh/h	275	517	495	165	1064	475	225	1317	742	249	1165	649
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.4	35.1	35.2	53.7	41.0	39.6	51.3	36.8	17.4	54.2	40.2	29.8
Incr Delay (d2), s/veh	15.3	0.5	0.6	208.8	12.1	11.7	26.8	16.3	0.1	30.7	62.9	7.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	4.6	4.6	14.3	14.4	11.4	6.6	19.4	0.2	4.2	25.9	12.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	68.7	35.6	35.8	262.5	53.1	51.3	78.1	53.1	17.5	84.8	103.1	37.2
LnGrp LOS	E	D	D	F	D	D	E	D	B	F	F	D
Approach Vol, veh/h		617			1563			1457			1998	
Approach Delay, s/veh		47.3			83.3			55.8			85.3	
Approach LOS		D			F			E			F	

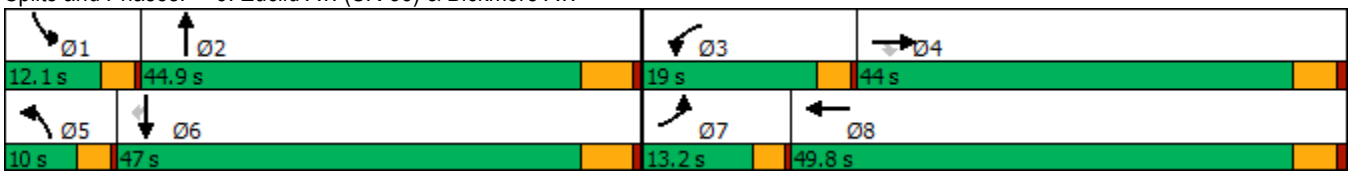
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.0	49.8	16.0	38.9	19.0	44.8	14.7	40.3
Change Period (Y+Rc), s	4.6	6.5	4.6	6.2	4.6	6.5	4.6	6.2
Max Green Setting (Gmax), s	9.4	43.3	11.4	34.0	15.6	37.1	10.4	35.0
Max Q Clear Time (g_c+I1), s	10.4	42.4	13.4	13.2	14.4	40.3	10.1	32.2
Green Ext Time (p_c), s	0.0	0.7	0.0	2.0	0.0	0.0	0.0	1.8

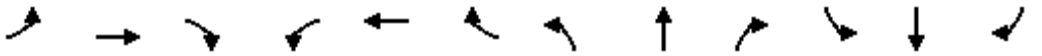
Intersection Summary	
HCM 6th Ctrl Delay	73.0
HCM 6th LOS	E

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	81	16	47	234	264	92	1088	104	1263	245
Future Volume (vph)	81	16	47	234	264	92	1088	104	1263	245
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2	1	6	
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	5	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	44.0	44.0	8.5	44.0	8.5	26.5	8.5	30.5	30.5
Total Split (s)	13.2	44.0	44.0	19.0	49.8	10.0	44.9	12.1	47.0	47.0
Total Split (%)	11.0%	36.7%	36.7%	15.8%	41.5%	8.3%	37.4%	10.1%	39.2%	39.2%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	4.5	3.0	4.5	4.5
All-Red Time (s)	0.5	1.0	1.0	0.5	1.0	0.5	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.0	5.0	3.5	5.0	3.5	5.5	3.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	None	Min	Min
Act Effct Green (s)	8.6	24.5	24.5	17.6	33.3	6.6	40.0	8.7	42.2	42.2
Actuated g/C Ratio	0.08	0.23	0.23	0.17	0.31	0.06	0.38	0.08	0.40	0.40
v/c Ratio	0.64	0.04	0.11	0.90	0.89	0.94	0.88	0.81	0.96	0.36
Control Delay	71.4	29.0	0.5	80.1	50.8	126.9	41.8	89.3	49.1	10.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.4	29.0	0.5	80.1	50.8	126.9	41.8	89.3	49.1	10.7
LOS	E	C	A	F	D	F	D	F	D	B
Approach Delay		43.6			60.4		48.4		45.8	
Approach LOS		D			E		D		D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 106.1	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.96	
Intersection Signal Delay: 49.4	Intersection LOS: D
Intersection Capacity Utilization 87.4%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 3: Euclid Av. (SR-83) & Bickmore Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	81	16	47	234	264	214	92	1088	13	104	1263	245
Future Volume (veh/h)	81	16	47	234	264	214	92	1088	13	104	1263	245
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	88	17	42	254	287	206	100	1183	7	113	1373	249
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	111	417	353	257	314	225	108	1397	8	139	1436	627
Arrive On Green	0.06	0.22	0.22	0.15	0.31	0.31	0.06	0.38	0.38	0.08	0.40	0.40
Sat Flow, veh/h	1714	1900	1610	1714	1029	738	1714	3679	22	1714	3610	1576
Grp Volume(v), veh/h	88	17	42	254	0	493	100	580	610	113	1373	249
Grp Sat Flow(s),veh/h/ln	1714	1900	1610	1714	0	1767	1714	1805	1896	1714	1805	1576
Q Serve(g_s), s	5.2	0.7	2.2	15.3	0.0	27.8	6.0	30.3	30.3	6.7	38.2	11.7
Cycle Q Clear(g_c), s	5.2	0.7	2.2	15.3	0.0	27.8	6.0	30.3	30.3	6.7	38.2	11.7
Prop In Lane	1.00		1.00	1.00		0.42	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	111	417	353	257	0	539	108	686	720	139	1436	627
V/C Ratio(X)	0.80	0.04	0.12	0.99	0.00	0.91	0.93	0.85	0.85	0.81	0.96	0.40
Avail Cap(c_a), veh/h	161	718	608	257	0	767	108	689	723	143	1451	634
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.6	31.7	32.3	43.8	0.0	34.6	48.1	29.3	29.3	46.7	30.2	22.2
Incr Delay (d2), s/veh	9.5	0.0	0.1	52.1	0.0	9.8	62.7	9.1	8.7	26.6	14.3	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	0.3	0.8	10.0	0.0	12.8	4.3	13.5	14.1	3.7	17.5	4.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.1	31.7	32.3	95.9	0.0	44.3	110.8	38.3	38.0	73.3	44.5	22.4
LnGrp LOS	E	C	C	F	A	D	F	D	D	E	D	C
Approach Vol, veh/h		147			747			1290			1735	
Approach Delay, s/veh		47.1			61.9			43.8			43.2	
Approach LOS		D			E			D			D	

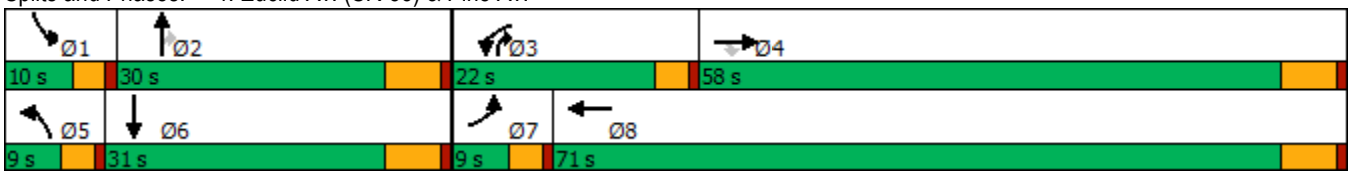
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.9	44.7	19.0	27.7	10.0	46.6	10.2	36.5
Change Period (Y+Rc), s	3.5	5.5	3.5	5.0	3.5	5.5	3.5	5.0
Max Green Setting (Gmax), s	8.6	39.4	15.5	39.0	6.5	41.5	9.7	44.8
Max Q Clear Time (g_c+I1), s	8.7	32.3	17.3	4.2	8.0	40.2	7.2	29.8
Green Ext Time (p_c), s	0.0	2.6	0.0	0.1	0.0	0.9	0.0	1.7

Intersection Summary	
HCM 6th Ctrl Delay	47.1
HCM 6th LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	84	303	204	1319	980	171	1052	214	161	1025
Future Volume (vph)	84	303	204	1319	980	171	1052	214	161	1025
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8	5	2	3	1	6
Permitted Phases			4					2		
Detector Phase	7	4	4	3	8	5	2	3	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	43.0	43.0	9.0	45.0	9.0	11.0	9.0	9.0	29.0
Total Split (s)	9.0	58.0	58.0	22.0	71.0	9.0	30.0	22.0	10.0	31.0
Total Split (%)	7.5%	48.3%	48.3%	18.3%	59.2%	7.5%	25.0%	18.3%	8.3%	25.8%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	3.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	6.0	4.0	4.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	None	None	Min
Act Effct Green (s)	5.0	52.0	52.0	18.0	65.0	5.0	24.0	48.0	6.0	25.0
Actuated g/C Ratio	0.04	0.43	0.43	0.15	0.54	0.04	0.20	0.40	0.05	0.21
v/c Ratio	1.21	0.38	0.27	2.87	1.34	2.45	1.49	0.29	1.93	1.58
Control Delay	222.3	24.7	8.7	867.1	186.1	717.2	261.1	5.9	488.6	299.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	222.3	24.7	8.7	867.1	186.1	717.2	261.1	5.9	488.6	299.4
LOS	F	C	A	F	F	F	F	A	F	F
Approach Delay		47.4			527.4		277.3			322.5
Approach LOS		D			F		F			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 2.87	
Intersection Signal Delay: 374.7	Intersection LOS: F
Intersection Capacity Utilization 135.9%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 4: Euclid Av. (SR-83) & Pine Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	84	303	204	1319	980	333	171	1052	214	161	1025	130
Future Volume (veh/h)	84	303	204	1319	980	333	171	1052	214	161	1025	130
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1800	1900	1900	1700	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	86	309	0	1346	1000	333	174	1073	-287	164	1046	130
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	71	823		471	739	246	71	722	564	86	673	84
Arrive On Green	0.04	0.43	0.00	0.15	0.54	0.54	0.04	0.20	0.00	0.05	0.21	0.21
Sat Flow, veh/h	1714	1900	1610	3141	1364	454	1714	3610	1610	1714	3232	401
Grp Volume(v), veh/h	86	309	0	1346	0	1333	174	1073	-287	164	584	592
Grp Sat Flow(s),veh/h/ln	1714	1900	1610	1570	0	1818	1714	1805	1610	1714	1805	1828
Q Serve(g_s), s	5.0	13.2	0.0	18.0	0.0	65.0	5.0	24.0	0.0	6.0	25.0	25.0
Cycle Q Clear(g_c), s	5.0	13.2	0.0	18.0	0.0	65.0	5.0	24.0	0.0	6.0	25.0	25.0
Prop In Lane	1.00		1.00	1.00		0.25	1.00		1.00	1.00		0.22
Lane Grp Cap(c), veh/h	71	823		471	0	985	71	722	564	86	376	381
V/C Ratio(X)	1.20	0.38		2.86	0.00	1.35	2.44	1.49	-0.51	1.91	1.55	1.56
Avail Cap(c_a), veh/h	71	823		471	0	985	71	722	564	86	376	381
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	57.5	23.0	0.0	51.0	0.0	27.5	57.5	48.0	0.0	57.0	47.5	47.5
Incr Delay (d2), s/veh	171.4	0.4	0.0	841.4	0.0	165.8	686.4	226.1	0.0	451.1	261.4	262.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	5.7	0.0	61.9	0.0	70.0	15.7	32.9	0.0	13.2	37.9	38.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	228.9	23.4	0.0	892.4	0.0	193.3	743.9	274.1	0.0	508.1	308.9	309.9
LnGrp LOS	F	C		F	A	F	F	F	A	F	F	F
Approach Vol, veh/h		395	A		2679			960			1340	
Approach Delay, s/veh		68.2			544.6			441.2			333.7	
Approach LOS		E			F			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.0	30.0	22.0	58.0	9.0	31.0	9.0	71.0
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	6.0	24.0	18.0	52.0	5.0	25.0	5.0	65.0
Max Q Clear Time (g_c+I1), s	8.0	26.0	20.0	15.2	7.0	27.0	7.0	67.0
Green Ext Time (p_c), s	0.0	0.0	0.0	2.6	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	438.5
HCM 6th LOS	F

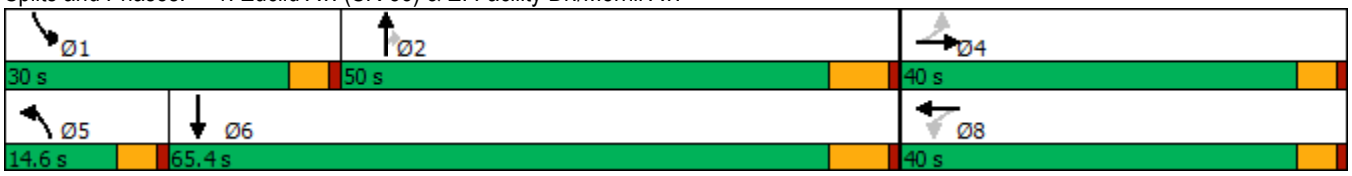
Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	14	37	633	3	5	1513	801	392	1626
Future Volume (vph)	14	37	633	3	5	1513	801	392	1626
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8				2		
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	15.0	15.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	9.6	9.6	21.6	21.6	14.6	28.5	28.5	14.6	42.5
Total Split (s)	40.0	40.0	40.0	40.0	14.6	50.0	50.0	30.0	65.4
Total Split (%)	33.3%	33.3%	33.3%	33.3%	12.2%	41.7%	41.7%	25.0%	54.5%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	5.5	5.5	3.6	5.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.6		4.6	4.6	6.5	6.5	4.6	6.5
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None	Max
Act Effct Green (s)		35.4		35.4	10.0	43.5	43.5	25.4	70.6
Actuated g/C Ratio		0.30		0.30	0.08	0.36	0.36	0.21	0.59
v/c Ratio		0.14		2.64	0.04	1.26	1.21	1.18	0.83
Control Delay		26.7		762.3	51.4	156.2	135.7	147.8	25.3
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		26.7		762.3	51.4	156.2	135.7	147.8	25.3
LOS		C		F	D	F	F	F	C
Approach Delay		26.7		762.3		148.9			49.1
Approach LOS		C		F		F			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Natural Cycle: 110	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 2.64	
Intersection Signal Delay: 229.3	Intersection LOS: F
Intersection Capacity Utilization 145.5%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 1: Euclid Av. (SR-83) & E. Facility Dr./Merrill Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	37	15	633	3	421	5	1513	801	392	1626	1
Future Volume (veh/h)	14	37	15	633	3	421	5	1513	801	392	1626	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	15	40	15	688	3	448	5	1645	807	426	1767	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	120	310	107	322	1	179	22	1309	584	363	2027	0
Arrive On Green	0.29	0.29	0.29	0.29	0.29	0.29	0.01	0.36	0.36	0.21	0.56	0.00
Sat Flow, veh/h	284	1051	364	930	4	606	1714	3610	1610	1714	3705	0
Grp Volume(v), veh/h	70	0	0	1139	0	0	5	1645	807	426	1767	0
Grp Sat Flow(s),veh/h/ln	1700	0	0	1540	0	0	1714	1805	1610	1714	1805	0
Q Serve(g_s), s	0.0	0.0	0.0	32.0	0.0	0.0	0.3	43.5	43.5	25.4	50.5	0.0
Cycle Q Clear(g_c), s	3.4	0.0	0.0	35.4	0.0	0.0	0.3	43.5	43.5	25.4	50.5	0.0
Prop In Lane	0.21		0.21	0.60		0.39	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	538	0	0	502	0	0	22	1309	584	363	2027	0
V/C Ratio(X)	0.13	0.00	0.00	2.27	0.00	0.00	0.23	1.26	1.38	1.17	0.87	0.00
Avail Cap(c_a), veh/h	538	0	0	502	0	0	143	1309	584	363	2027	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	31.0	0.0	0.0	43.7	0.0	0.0	58.6	38.2	38.3	47.3	22.6	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	576.7	0.0	0.0	1.9	122.0	182.7	103.6	5.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	0.0	95.2	0.0	0.0	0.2	39.9	45.4	20.7	20.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.0	0.0	0.0	620.4	0.0	0.0	60.6	160.3	220.9	150.9	28.1	0.0
LnGrp LOS	C	A	A	F	A	A	E	F	F	F	C	A
Approach Vol, veh/h		70			1139			2457			2193	
Approach Delay, s/veh		31.0			620.4			180.0			52.0	
Approach LOS		C			F			F			D	

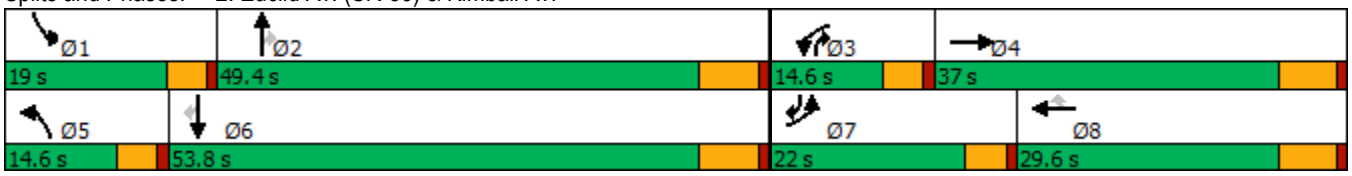
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	30.0	50.0		40.0	6.1	73.9		40.0				
Change Period (Y+Rc), s	4.6	6.5		4.6	4.6	6.5		4.6				
Max Green Setting (Gmax), s	25.4	43.5		35.4	10.0	58.9		35.4				
Max Q Clear Time (g_c+I1), s	27.4	45.5		5.4	2.3	52.5		37.4				
Green Ext Time (p_c), s	0.0	0.0		0.3	0.0	5.0		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			215.9									
HCM 6th LOS			F									

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	591	962	95	397	232	147	1329	156	521	1418	419
Future Volume (vph)	591	962	95	397	232	147	1329	156	521	1418	419
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2	3	1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	3	1	6	7
Switch Phase											
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	5.0	10.0	5.0	5.0	10.0
Minimum Split (s)	14.6	27.2	14.6	29.2	29.2	14.6	44.5	14.6	9.6	40.5	14.6
Total Split (s)	22.0	37.0	14.6	29.6	29.6	14.6	49.4	14.6	19.0	53.8	22.0
Total Split (%)	18.3%	30.8%	12.2%	24.7%	24.7%	12.2%	41.2%	12.2%	15.8%	44.8%	18.3%
Yellow Time (s)	3.6	5.2	3.6	5.2	5.2	3.6	5.5	3.6	3.6	5.5	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	4.6	6.2	6.2	4.6	6.5	4.6	4.6	6.5	4.6
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	None	Max	None
Act Effct Green (s)	17.4	30.8	10.0	23.4	23.4	10.0	42.9	59.4	14.4	47.3	71.2
Actuated g/C Ratio	0.14	0.26	0.08	0.20	0.20	0.08	0.36	0.50	0.12	0.39	0.59
v/c Ratio	1.33	1.30	0.68	0.58	0.53	1.06	1.05	0.19	1.42	1.02	0.43
Control Delay	202.5	179.4	77.7	47.6	17.9	143.9	77.4	6.1	242.2	64.7	12.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	202.5	179.4	77.7	47.6	17.9	143.9	77.4	6.1	242.2	64.7	12.2
LOS	F	F	E	D	B	F	E	A	F	E	B
Approach Delay		187.2		42.0			76.6			94.6	
Approach LOS		F		D			E			F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.42	
Intersection Signal Delay: 109.3	Intersection LOS: F
Intersection Capacity Utilization 113.1%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 2: Euclid Av. (SR-83) & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	591	962	206	95	397	232	147	1329	156	521	1418	419
Future Volume (veh/h)	591	962	206	95	397	232	147	1329	156	521	1418	419
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1700	1900	1900	1800	1900	1900	1800	1900	1900	1700	1900	1900
Adj Flow Rate, veh/h	603	982	182	97	405	166	150	1356	147	532	1447	366
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	457	783	145	138	694	310	143	1295	707	378	1428	871
Arrive On Green	0.15	0.26	0.26	0.08	0.19	0.19	0.08	0.36	0.36	0.12	0.40	0.40
Sat Flow, veh/h	3141	3041	563	1714	3610	1610	1714	3610	1610	3141	3610	1610
Grp Volume(v), veh/h	603	582	582	97	405	166	150	1356	147	532	1447	366
Grp Sat Flow(s),veh/h/ln	1570	1805	1799	1714	1805	1610	1714	1805	1610	1570	1805	1610
Q Serve(g_s), s	17.4	30.8	30.8	6.6	12.2	11.1	10.0	42.9	6.7	14.4	47.3	16.2
Cycle Q Clear(g_c), s	17.4	30.8	30.8	6.6	12.2	11.1	10.0	42.9	6.7	14.4	47.3	16.2
Prop In Lane	1.00		0.31	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	457	465	463	138	694	310	143	1295	707	378	1428	871
V/C Ratio(X)	1.32	1.25	1.26	0.70	0.58	0.54	1.05	1.05	0.21	1.41	1.01	0.42
Avail Cap(c_a), veh/h	457	465	463	143	706	315	143	1295	707	378	1428	871
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.1	44.4	44.4	53.6	43.9	43.5	54.8	38.4	20.7	52.6	36.2	16.3
Incr Delay (d2), s/veh	158.6	130.6	131.7	11.6	1.2	1.7	88.1	38.3	0.7	198.2	27.2	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	16.6	29.9	30.0	3.2	5.4	4.4	7.6	24.4	2.5	15.8	24.4	5.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	209.7	175.0	176.1	65.3	45.1	45.2	142.9	76.7	21.4	250.8	63.4	17.8
LnGrp LOS	F	F	F	E	D	D	F	F	C	F	F	B
Approach Vol, veh/h		1767			668			1653			2345	
Approach Delay, s/veh		187.2			48.1			77.8			98.8	
Approach LOS		F			D			E			F	

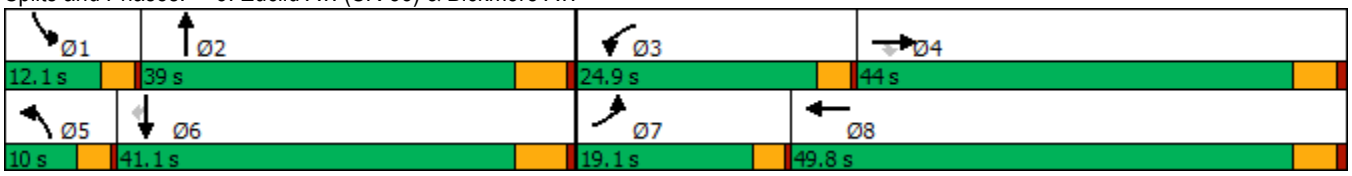
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.0	49.4	14.2	37.0	14.6	53.8	22.0	29.2
Change Period (Y+Rc), s	4.6	6.5	4.6	6.2	4.6	6.5	4.6	6.2
Max Green Setting (Gmax), s	14.4	42.9	10.0	30.8	10.0	47.3	17.4	23.4
Max Q Clear Time (g_c+I1), s	16.4	44.9	8.6	32.8	12.0	49.3	19.4	14.2
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0

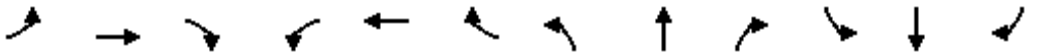
Intersection Summary	
HCM 6th Ctrl Delay	112.4
HCM 6th LOS	F

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	219	143	138	43	37	55	1382	186	1458	199
Future Volume (vph)	219	143	138	43	37	55	1382	186	1458	199
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2	1	6	
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	5	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	44.0	44.0	8.5	44.0	8.5	26.5	8.5	30.5	30.5
Total Split (s)	19.1	44.0	44.0	24.9	49.8	10.0	39.0	12.1	41.1	41.1
Total Split (%)	15.9%	36.7%	36.7%	20.8%	41.5%	8.3%	32.5%	10.1%	34.3%	34.3%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	4.5	3.0	4.5	4.5
All-Red Time (s)	0.5	1.0	1.0	0.5	1.0	0.5	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.0	5.0	3.5	5.0	3.5	5.5	3.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	None	Min	Min
Act Effct Green (s)	15.9	24.5	24.5	6.9	11.6	6.3	34.1	8.8	38.5	38.5
Actuated g/C Ratio	0.18	0.28	0.28	0.08	0.13	0.07	0.39	0.10	0.44	0.44
v/c Ratio	0.74	0.28	0.26	0.33	0.58	0.47	1.12	1.14	0.95	0.23
Control Delay	52.0	27.2	5.6	48.2	15.7	56.3	90.9	148.8	41.3	10.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.0	27.2	5.6	48.2	15.7	56.3	90.9	148.8	41.3	10.1
LOS	D	C	A	D	B	E	F	F	D	B
Approach Delay		32.1			21.4		89.7		48.8	
Approach LOS		C			C		F		D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 88.2	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.14	
Intersection Signal Delay: 60.6	Intersection LOS: E
Intersection Capacity Utilization 93.0%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 3: Euclid Av. (SR-83) & Bickmore Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	219	143	138	43	37	163	55	1382	117	186	1458	199
Future Volume (veh/h)	219	143	138	43	37	163	55	1382	117	186	1458	199
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	226	147	142	44	38	168	57	1425	121	192	1503	205
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	261	514	435	65	48	211	74	1310	111	171	1608	717
Arrive On Green	0.15	0.27	0.27	0.04	0.16	0.16	0.04	0.39	0.39	0.10	0.45	0.45
Sat Flow, veh/h	1714	1900	1608	1714	306	1351	1714	3369	285	1714	3610	1610
Grp Volume(v), veh/h	226	147	142	44	0	206	57	760	786	192	1503	205
Grp Sat Flow(s),veh/h/ln	1714	1900	1608	1714	0	1657	1714	1805	1849	1714	1805	1610
Q Serve(g_s), s	11.1	5.3	6.1	2.2	0.0	10.3	2.8	33.5	33.5	8.6	34.1	7.0
Cycle Q Clear(g_c), s	11.1	5.3	6.1	2.2	0.0	10.3	2.8	33.5	33.5	8.6	34.1	7.0
Prop In Lane	1.00		1.00	1.00		0.82	1.00		0.15	1.00		1.00
Lane Grp Cap(c), veh/h	261	514	435	65	0	258	74	702	719	171	1608	717
V/C Ratio(X)	0.87	0.29	0.33	0.68	0.00	0.80	0.77	1.08	1.09	1.12	0.93	0.29
Avail Cap(c_a), veh/h	310	860	728	426	0	862	129	702	719	171	1608	717
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.7	24.9	25.2	40.9	0.0	35.0	40.8	26.3	26.3	38.8	22.7	15.2
Incr Delay (d2), s/veh	17.3	0.1	0.2	4.6	0.0	2.2	6.1	58.6	61.8	105.3	10.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.7	2.3	2.2	1.0	0.0	4.1	1.2	23.6	24.8	8.3	14.2	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.0	25.0	25.3	45.5	0.0	37.2	46.9	84.9	88.1	144.0	33.1	15.3
LnGrp LOS	D	C	C	D	A	D	D	F	F	F	C	B
Approach Vol, veh/h		515			250			1603			1900	
Approach Delay, s/veh		37.3			38.7			85.1			42.4	
Approach LOS		D			D			F			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.1	39.0	6.8	28.3	7.2	43.9	16.6	18.4
Change Period (Y+Rc), s	3.5	5.5	3.5	5.0	3.5	5.5	3.5	5.0
Max Green Setting (Gmax), s	8.6	33.5	21.4	39.0	6.5	35.6	15.6	44.8
Max Q Clear Time (g_c+I1), s	10.6	35.5	4.2	8.1	4.8	36.1	13.1	12.3
Green Ext Time (p_c), s	0.0	0.0	0.0	0.7	0.0	0.0	0.1	0.8

Intersection Summary	
HCM 6th Ctrl Delay	57.6
HCM 6th LOS	E

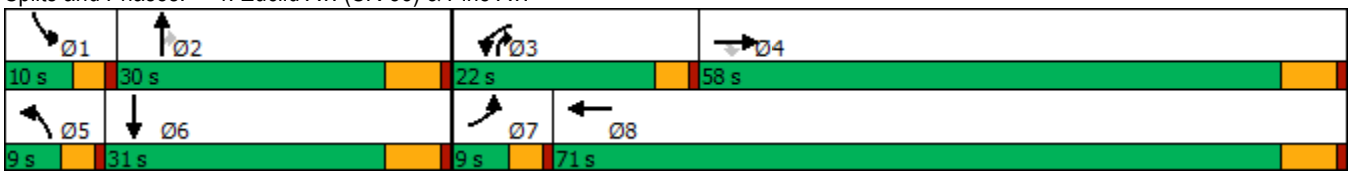
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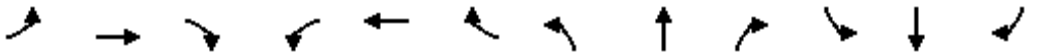
User approved pedestrian interval to be less than phase max green.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	115	911	224	712	611	278	1064	891	383	1175
Future Volume (vph)	115	911	224	712	611	278	1064	891	383	1175
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8	5	2	3	1	6
Permitted Phases			4					2		
Detector Phase	7	4	4	3	8	5	2	3	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	43.0	43.0	9.0	45.0	9.0	11.0	9.0	9.0	29.0
Total Split (s)	9.0	58.0	58.0	22.0	71.0	9.0	30.0	22.0	10.0	31.0
Total Split (%)	7.5%	48.3%	48.3%	18.3%	59.2%	7.5%	25.0%	18.3%	8.3%	25.8%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	3.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	6.0	4.0	4.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	None	None	Min
Act Effct Green (s)	5.0	52.0	52.0	18.0	65.0	5.0	24.0	48.0	6.0	25.0
Actuated g/C Ratio	0.04	0.43	0.43	0.15	0.54	0.04	0.20	0.40	0.05	0.21
v/c Ratio	1.72	1.18	0.31	1.61	0.91	4.17	1.57	1.39	4.79	1.85
Control Delay	409.5	124.6	10.4	319.8	39.2	1472.9	295.6	211.7	1743.5	415.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	409.5	124.6	10.4	319.8	39.2	1472.9	295.6	211.7	1743.5	415.2
LOS	F	F	B	F	D	F	F	F	F	F
Approach Delay		130.3			166.6		408.8			717.7
Approach LOS		F			F		F			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 4.79	
Intersection Signal Delay: 377.8	Intersection LOS: F
Intersection Capacity Utilization 139.9%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 4: Euclid Av. (SR-83) & Pine Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	115	911	224	712	611	244	278	1064	891	383	1175	122
Future Volume (veh/h)	115	911	224	712	611	244	278	1064	891	383	1175	122
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1800	1900	1900	1700	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	122	969	0	757	650	245	296	1132	477	407	1250	129
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	71	823		471	712	268	71	722	564	86	688	71
Arrive On Green	0.04	0.43	0.00	0.15	0.54	0.54	0.04	0.20	0.20	0.05	0.21	0.21
Sat Flow, veh/h	1714	1900	1610	3141	1315	496	1714	3610	1610	1714	3304	340
Grp Volume(v), veh/h	122	969	0	757	0	895	296	1132	477	407	681	698
Grp Sat Flow(s),veh/h/ln	1714	1900	1610	1570	0	1811	1714	1805	1610	1714	1805	1839
Q Serve(g_s), s	5.0	52.0	0.0	18.0	0.0	53.8	5.0	24.0	24.0	6.0	25.0	25.0
Cycle Q Clear(g_c), s	5.0	52.0	0.0	18.0	0.0	53.8	5.0	24.0	24.0	6.0	25.0	25.0
Prop In Lane	1.00		1.00	1.00		0.27	1.00		1.00	1.00		0.18
Lane Grp Cap(c), veh/h	71	823		471	0	981	71	722	564	86	376	383
V/C Ratio(X)	1.71	1.18		1.61	0.00	0.91	4.14	1.57	0.85	4.75	1.81	1.82
Avail Cap(c_a), veh/h	71	823		471	0	981	71	722	564	86	376	383
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	57.5	34.0	0.0	51.0	0.0	24.9	57.5	48.0	36.0	57.0	47.5	47.5
Incr Delay (d2), s/veh	370.8	92.2	0.0	282.8	0.0	12.7	1447.3	262.2	10.9	1712.9	375.5	379.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.5	43.4	0.0	25.3	0.0	23.8	30.8	36.5	13.8	43.3	49.8	51.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	428.3	126.2	0.0	333.8	0.0	37.6	1504.8	310.2	46.9	1769.9	423.0	427.4
LnGrp LOS	F	F		F	A	D	F	F	D	F	F	F
Approach Vol, veh/h		1091	A		1652			1905			1786	
Approach Delay, s/veh		160.0			173.3			429.9			731.7	
Approach LOS		F			F			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.0	30.0	22.0	58.0	9.0	31.0	9.0	71.0
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	6.0	24.0	18.0	52.0	5.0	25.0	5.0	65.0
Max Q Clear Time (g_c+I1), s	8.0	26.0	20.0	54.0	7.0	27.0	7.0	55.8
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.2

Intersection Summary	
HCM 6th Ctrl Delay	402.0
HCM 6th LOS	F

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

APPENDIX 7.2:

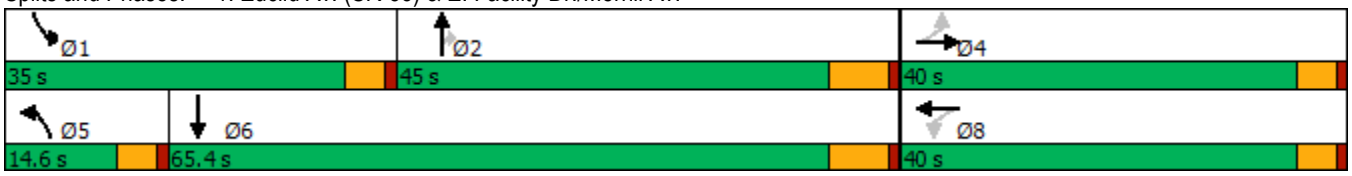
HORIZON YEAR (2040) WITH PROJECT CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS

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Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	10	10	389	60	13	1304	444	364	1474
Future Volume (vph)	10	10	389	60	13	1304	444	364	1474
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8				2		
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	15.0	15.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	9.6	9.6	21.6	21.6	14.6	28.5	28.5	14.6	42.5
Total Split (s)	40.0	40.0	40.0	40.0	14.6	45.0	45.0	35.0	65.4
Total Split (%)	33.3%	33.3%	33.3%	33.3%	12.2%	37.5%	37.5%	29.2%	54.5%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	5.5	5.5	3.6	5.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.6		4.6	4.6	6.5	6.5	4.6	6.5
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None	Max
Act Effct Green (s)		35.4		35.4	10.0	38.5	38.5	28.0	65.4
Actuated g/C Ratio		0.30		0.30	0.08	0.33	0.33	0.24	0.56
v/c Ratio		0.09		1.95	0.09	1.14	0.75	0.92	0.79
Control Delay		18.5		461.5	52.4	109.7	34.3	73.0	25.5
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		18.5		461.5	52.4	109.7	34.3	73.0	25.5
LOS		B		F	D	F	C	E	C
Approach Delay		18.5		461.5		90.3			34.7
Approach LOS		B		F		F			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 117.7	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.95	
Intersection Signal Delay: 140.1	Intersection LOS: F
Intersection Capacity Utilization 129.9%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 1: Euclid Av. (SR-83) & E. Facility Dr./Merrill Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	10	21	389	60	458	13	1304	444	364	1474	49
Future Volume (veh/h)	10	10	21	389	60	458	13	1304	444	364	1474	49
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	10	10	21	401	62	445	13	1344	415	375	1520	37
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	127	134	234	256	33	235	50	1189	530	400	1920	47
Arrive On Green	0.30	0.30	0.30	0.30	0.30	0.30	0.03	0.33	0.33	0.23	0.53	0.53
Sat Flow, veh/h	294	441	772	698	108	775	1714	3610	1610	1714	3600	87
Grp Volume(v), veh/h	41	0	0	908	0	0	13	1344	415	375	761	796
Grp Sat Flow(s),veh/h/ln	1507	0	0	1581	0	0	1714	1805	1610	1714	1805	1882
Q Serve(g_s), s	0.0	0.0	0.0	33.4	0.0	0.0	0.9	38.5	27.2	25.1	39.8	40.0
Cycle Q Clear(g_c), s	2.0	0.0	0.0	35.4	0.0	0.0	0.9	38.5	27.2	25.1	39.8	40.0
Prop In Lane	0.24		0.51	0.44		0.49	1.00		1.00	1.00		0.05
Lane Grp Cap(c), veh/h	495	0	0	523	0	0	50	1189	530	400	963	1004
V/C Ratio(X)	0.08	0.00	0.00	1.74	0.00	0.00	0.26	1.13	0.78	0.94	0.79	0.79
Avail Cap(c_a), veh/h	495	0	0	523	0	0	147	1189	530	446	963	1004
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.1	0.0	0.0	42.1	0.0	0.0	55.5	39.2	35.4	44.0	22.0	22.1
Incr Delay (d2), s/veh	0.0	0.0	0.0	338.9	0.0	0.0	1.0	69.7	11.0	25.1	6.6	6.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.0	64.0	0.0	0.0	0.4	27.3	11.6	12.8	16.4	17.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.1	0.0	0.0	381.0	0.0	0.0	56.5	108.9	46.4	69.0	28.6	28.5
LnGrp LOS	C	A	A	F	A	A	E	F	D	E	C	C
Approach Vol, veh/h		41			908			1772			1932	
Approach Delay, s/veh		29.1			381.0			93.9			36.4	
Approach LOS		C			F			F			D	

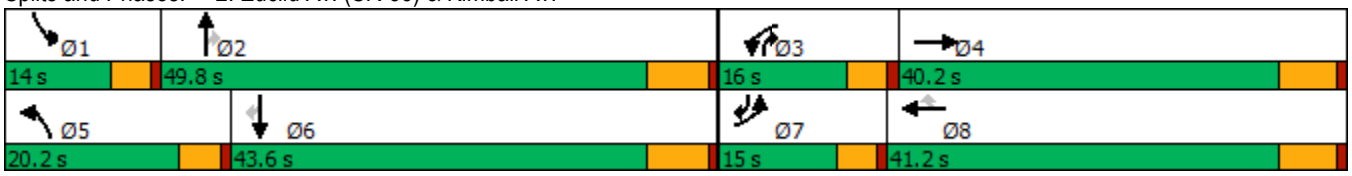
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	31.9	45.0		40.0	8.0	68.8		40.0				
Change Period (Y+Rc), s	4.6	6.5		4.6	4.6	6.5		4.6				
Max Green Setting (Gmax), s	30.4	38.5		35.4	10.0	58.9		35.4				
Max Q Clear Time (g_c+I1), s	27.1	40.5		4.0	2.9	42.0		37.4				
Green Ext Time (p_c), s	0.2	0.0		0.1	0.0	8.9		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			125.5									
HCM 6th LOS			F									

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	213	301	224	943	423	178	1234	58	248	1270	483
Future Volume (vph)	213	301	224	943	423	178	1234	58	248	1270	483
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2	3	1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	3	1	6	7
Switch Phase											
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	5.0	10.0	5.0	5.0	10.0
Minimum Split (s)	14.6	27.2	14.6	29.2	29.2	14.6	44.5	14.6	9.6	40.5	14.6
Total Split (s)	15.0	40.2	16.0	41.2	41.2	20.2	49.8	16.0	14.0	43.6	15.0
Total Split (%)	12.5%	33.5%	13.3%	34.3%	34.3%	16.8%	41.5%	13.3%	11.7%	36.3%	12.5%
Yellow Time (s)	3.6	5.2	3.6	5.2	5.2	3.6	5.5	3.6	3.6	5.5	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	4.6	6.2	6.2	4.6	6.5	4.6	4.6	6.5	4.6
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	None	Max	None
Act Effct Green (s)	10.3	33.5	11.4	34.6	34.6	14.8	43.3	61.2	9.4	37.9	50.1
Actuated g/C Ratio	0.09	0.28	0.10	0.29	0.29	0.12	0.36	0.51	0.08	0.32	0.42
v/c Ratio	0.80	0.42	1.40	0.92	0.72	0.86	0.96	0.07	1.03	1.13	0.67
Control Delay	75.9	32.7	255.2	56.0	28.6	86.0	55.2	2.8	118.9	108.6	24.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.9	32.7	255.2	56.0	28.6	86.0	55.2	2.8	118.9	108.6	24.1
LOS	E	C	F	E	C	F	E	A	F	F	C
Approach Delay		47.5		76.8			56.8			89.5	
Approach LOS		D		E			E			F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 119.5	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.40	
Intersection Signal Delay: 72.9	Intersection LOS: E
Intersection Capacity Utilization 98.2%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 2: Euclid Av. (SR-83) & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	213	301	109	224	943	423	178	1234	58	248	1270	483
Future Volume (veh/h)	213	301	109	224	943	423	178	1234	58	248	1270	483
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1700	1900	1900	1800	1900	1900	1800	1900	1900	1700	1900	1900
Adj Flow Rate, veh/h	217	307	110	229	962	405	182	1259	16	253	1296	479
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	266	726	255	164	1040	464	208	1314	740	248	1162	648
Arrive On Green	0.08	0.28	0.28	0.10	0.29	0.29	0.12	0.36	0.36	0.08	0.32	0.32
Sat Flow, veh/h	3141	2619	920	1714	3610	1610	1714	3610	1610	3141	3610	1588
Grp Volume(v), veh/h	217	210	207	229	962	405	182	1259	16	253	1296	479
Grp Sat Flow(s),veh/h/ln	1570	1805	1734	1714	1805	1610	1714	1805	1610	1570	1805	1588
Q Serve(g_s), s	8.1	11.3	11.7	11.4	30.8	28.5	12.4	40.5	0.6	9.4	38.3	30.5
Cycle Q Clear(g_c), s	8.1	11.3	11.7	11.4	30.8	28.5	12.4	40.5	0.6	9.4	38.3	30.5
Prop In Lane	1.00		0.53	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	266	500	481	164	1040	464	208	1314	740	248	1162	648
V/C Ratio(X)	0.81	0.42	0.43	1.39	0.92	0.87	0.88	0.96	0.02	1.02	1.12	0.74
Avail Cap(c_a), veh/h	275	516	496	164	1062	474	225	1314	740	248	1162	648
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.5	35.2	35.3	53.8	41.1	40.3	51.4	37.0	17.5	54.8	40.3	30.0
Incr Delay (d2), s/veh	15.4	0.6	0.6	210.1	13.1	16.1	26.9	16.7	0.1	62.2	64.1	7.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	4.8	4.8	14.3	14.8	12.7	6.6	19.5	0.2	5.7	26.1	12.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	68.9	35.7	35.9	263.9	54.2	56.3	78.3	53.6	17.6	117.0	104.5	37.4
LnGrp LOS	E	D	D	F	D	E	E	D	B	F	F	D
Approach Vol, veh/h		634			1596			1457			2028	
Approach Delay, s/veh		47.2			84.8			56.3			90.2	
Approach LOS		D			F			E			F	

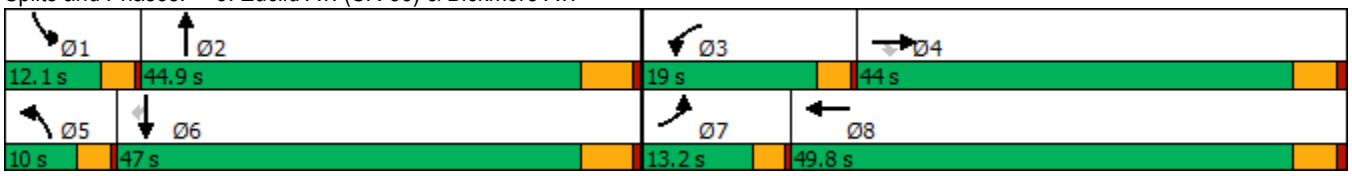
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.0	49.8	16.0	39.2	19.0	44.8	14.7	40.5
Change Period (Y+Rc), s	4.6	6.5	4.6	6.2	4.6	6.5	4.6	6.2
Max Green Setting (Gmax), s	9.4	43.3	11.4	34.0	15.6	37.1	10.4	35.0
Max Q Clear Time (g_c+I1), s	11.4	42.5	13.4	13.7	14.4	40.3	10.1	32.8
Green Ext Time (p_c), s	0.0	0.6	0.0	2.1	0.0	0.0	0.0	1.5

Intersection Summary	
HCM 6th Ctrl Delay	75.3
HCM 6th LOS	E

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	81	34	47	356	387	92	1088	222	1263	245
Future Volume (vph)	81	34	47	356	387	92	1088	222	1263	245
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2	1	6	
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	5	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	44.0	44.0	8.5	44.0	8.5	26.5	8.5	30.5	30.5
Total Split (s)	13.2	44.0	44.0	19.0	49.8	10.0	44.9	12.1	47.0	47.0
Total Split (%)	11.0%	36.7%	36.7%	15.8%	41.5%	8.3%	37.4%	10.1%	39.2%	39.2%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	4.5	3.0	4.5	4.5
All-Red Time (s)	0.5	1.0	1.0	0.5	1.0	0.5	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.0	5.0	3.5	5.0	3.5	5.5	3.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	None	Min	Min
Act Effct Green (s)	8.8	31.9	31.9	23.8	44.8	6.5	39.4	8.6	41.5	41.5
Actuated g/C Ratio	0.07	0.27	0.27	0.20	0.38	0.05	0.33	0.07	0.35	0.35
v/c Ratio	0.70	0.07	0.10	1.13	1.10	1.08	1.04	1.96	1.09	0.40
Control Delay	81.5	28.5	0.4	135.9	99.7	169.0	76.4	489.1	91.7	11.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	81.5	28.5	0.4	135.9	99.7	169.0	76.4	489.1	91.7	11.8
LOS	F	C	A	F	F	F	E	F	F	B
Approach Delay		46.9			111.9		83.4		131.4	
Approach LOS		D			F		F		F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 119.1	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.96	
Intersection Signal Delay: 109.1	Intersection LOS: F
Intersection Capacity Utilization 104.3%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 3: Euclid Av. (SR-83) & Bickmore Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	81	34	47	356	387	313	92	1088	49	222	1263	245
Future Volume (veh/h)	81	34	47	356	387	313	92	1088	49	222	1263	245
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	88	37	42	387	421	313	100	1183	46	241	1373	249
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	110	594	503	225	385	286	95	1183	46	125	1271	555
Arrive On Green	0.06	0.31	0.31	0.13	0.38	0.38	0.06	0.33	0.33	0.07	0.35	0.35
Sat Flow, veh/h	1714	1900	1610	1714	1012	752	1714	3539	138	1714	3610	1576
Grp Volume(v), veh/h	88	37	42	387	0	734	100	603	626	241	1373	249
Grp Sat Flow(s),veh/h/ln	1714	1900	1610	1714	0	1765	1714	1805	1872	1714	1805	1576
Q Serve(g_s), s	6.0	1.6	2.2	15.5	0.0	44.8	6.5	39.4	39.4	8.6	41.5	14.3
Cycle Q Clear(g_c), s	6.0	1.6	2.2	15.5	0.0	44.8	6.5	39.4	39.4	8.6	41.5	14.3
Prop In Lane	1.00		1.00	1.00		0.43	1.00		0.07	1.00		1.00
Lane Grp Cap(c), veh/h	110	594	503	225	0	671	95	604	626	125	1271	555
V/C Ratio(X)	0.80	0.06	0.08	1.72	0.00	1.09	1.06	1.00	1.00	1.93	1.08	0.45
Avail Cap(c_a), veh/h	141	629	533	225	0	671	95	604	626	125	1271	555
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.4	28.4	28.6	51.2	0.0	36.5	55.7	39.2	39.2	54.6	38.2	29.4
Incr Delay (d2), s/veh	17.2	0.0	0.0	340.4	0.0	63.2	109.0	36.4	36.0	444.8	49.8	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	0.7	0.8	27.8	0.0	30.1	5.6	22.2	23.0	19.0	25.7	5.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	71.6	28.4	28.6	391.6	0.0	99.7	164.6	75.6	75.2	499.4	87.9	29.6
LnGrp LOS	E	C	C	F	A	F	F	E	F	F	F	C
Approach Vol, veh/h		167			1121			1329			1863	
Approach Delay, s/veh		51.2			200.5			82.1			133.4	
Approach LOS		D			F			F			F	

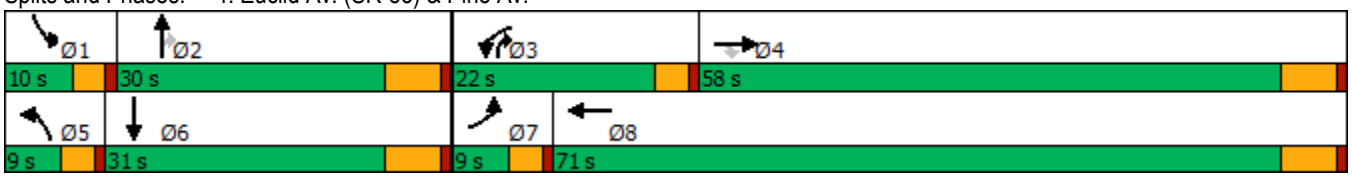
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.1	44.9	19.0	41.8	10.0	47.0	11.0	49.8
Change Period (Y+Rc), s	3.5	5.5	3.5	5.0	3.5	5.5	3.5	5.0
Max Green Setting (Gmax), s	8.6	39.4	15.5	39.0	6.5	41.5	9.7	44.8
Max Q Clear Time (g_c+I1), s	10.6	41.4	17.5	4.2	8.5	43.5	8.0	46.8
Green Ext Time (p_c), s	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0

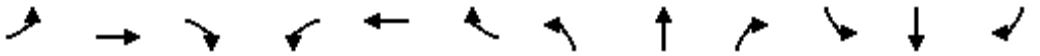
Intersection Summary			
HCM 6th Ctrl Delay		131.9	
HCM 6th LOS		F	

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	88	303	204	1319	980	171	1064	214	164	1034
Future Volume (vph)	88	303	204	1319	980	171	1064	214	164	1034
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8	5	2	3	1	6
Permitted Phases			4					2		
Detector Phase	7	4	4	3	8	5	2	3	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	43.0	43.0	9.0	45.0	9.0	11.0	9.0	9.0	29.0
Total Split (s)	9.0	58.0	58.0	22.0	71.0	9.0	30.0	22.0	10.0	31.0
Total Split (%)	7.5%	48.3%	48.3%	18.3%	59.2%	7.5%	25.0%	18.3%	8.3%	25.8%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	3.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	6.0	4.0	4.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	None	None	Min
Act Effct Green (s)	5.0	52.0	52.0	18.0	65.0	5.0	24.0	48.0	6.0	25.0
Actuated g/C Ratio	0.04	0.43	0.43	0.15	0.54	0.04	0.20	0.40	0.05	0.21
v/c Ratio	1.27	0.38	0.27	2.87	1.34	2.45	1.50	0.29	1.96	1.59
Control Delay	240.6	24.7	8.7	867.1	187.8	717.2	268.7	6.1	503.4	306.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	240.6	24.7	8.7	867.1	187.8	717.2	268.7	6.1	503.4	306.2
LOS	F	C	A	F	F	F	F	A	F	F
Approach Delay		51.2			527.7		282.7			330.5
Approach LOS		D			F		F			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 2.87	
Intersection Signal Delay: 377.9	Intersection LOS: F
Intersection Capacity Utilization 136.7%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 4: Euclid Av. (SR-83) & Pine Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	88	303	204	1319	980	337	171	1064	214	164	1034	133
Future Volume (veh/h)	88	303	204	1319	980	337	171	1064	214	164	1034	133
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1800	1900	1900	1700	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	90	309	0	1346	1000	337	174	1086	-287	167	1055	133
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	71	823		471	736	248	71	722	564	86	672	85
Arrive On Green	0.04	0.43	0.00	0.15	0.54	0.54	0.04	0.20	0.00	0.05	0.21	0.21
Sat Flow, veh/h	1714	1900	1610	3141	1359	458	1714	3610	1610	1714	3226	406
Grp Volume(v), veh/h	90	309	0	1346	0	1337	174	1086	-287	167	590	598
Grp Sat Flow(s),veh/h/ln	1714	1900	1610	1570	0	1818	1714	1805	1610	1714	1805	1827
Q Serve(g_s), s	5.0	13.2	0.0	18.0	0.0	65.0	5.0	24.0	0.0	6.0	25.0	25.0
Cycle Q Clear(g_c), s	5.0	13.2	0.0	18.0	0.0	65.0	5.0	24.0	0.0	6.0	25.0	25.0
Prop In Lane	1.00		1.00	1.00		0.25	1.00		1.00	1.00		0.22
Lane Grp Cap(c), veh/h	71	823		471	0	984	71	722	564	86	376	381
V/C Ratio(X)	1.26	0.38		2.86	0.00	1.36	2.44	1.50	-0.51	1.95	1.57	1.57
Avail Cap(c_a), veh/h	71	823		471	0	984	71	722	564	86	376	381
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	57.5	23.0	0.0	51.0	0.0	27.5	57.5	48.0	0.0	57.0	47.5	47.5
Incr Delay (d2), s/veh	191.6	0.4	0.0	841.4	0.0	167.8	686.4	234.1	0.0	466.2	268.5	269.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.9	5.7	0.0	61.9	0.0	70.6	15.7	33.7	0.0	13.6	38.7	39.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	249.1	23.4	0.0	892.4	0.0	195.3	743.9	282.1	0.0	523.2	316.0	317.1
LnGrp LOS	F	C		F	A	F	F	F	A	F	F	F
Approach Vol, veh/h		399	A		2683			973			1355	
Approach Delay, s/veh		74.3			545.0			447.9			342.0	
Approach LOS		E			F			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.0	30.0	22.0	58.0	9.0	31.0	9.0	71.0
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	6.0	24.0	18.0	52.0	5.0	25.0	5.0	65.0
Max Q Clear Time (g_c+I1), s	8.0	26.0	20.0	15.2	7.0	27.0	7.0	67.0
Green Ext Time (p_c), s	0.0	0.0	0.0	2.6	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	442.0
HCM 6th LOS	F

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1043	138	22	1380	43	9
Future Volume (vph)	1043	138	22	1380	43	9
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases		4				2
Detector Phase	4	4	3	8	2	2
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	23.2	23.2	9.6	16.2	32.1	32.1
Total Split (s)	77.7	77.7	9.6	87.3	32.7	32.7
Total Split (%)	64.8%	64.8%	8.0%	72.8%	27.3%	27.3%
Yellow Time (s)	5.2	5.2	3.6	5.2	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2	4.6	6.2	5.1	5.1
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	None	None	None	None	Min	Min
Act Effct Green (s)	77.7	77.7	5.0	81.4	13.1	13.1
Actuated g/C Ratio	0.73	0.73	0.05	0.77	0.12	0.12
v/c Ratio	0.81	0.12	0.30	1.03	0.22	0.05
Control Delay	18.1	2.2	60.6	45.0	43.4	20.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.1	2.2	60.6	45.0	43.4	20.0
LOS	B	A	E	D	D	B
Approach Delay	16.3			45.2	39.3	
Approach LOS	B			D	D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 105.8	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.03	
Intersection Signal Delay: 32.1	Intersection LOS: C
Intersection Capacity Utilization 90.4%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 5: Mayhew Av. & Kimball Av.





Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1043	138	22	1380	43	9
Future Volume (veh/h)	1043	138	22	1380	43	9
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1900	1900	1800	1900	1800	1900
Adj Flow Rate, veh/h	1134	150	24	1500	47	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1374	1164	41	1505	167	157
Arrive On Green	0.72	0.72	0.02	0.79	0.10	0.10
Sat Flow, veh/h	1900	1610	1714	1900	1714	1610
Grp Volume(v), veh/h	1134	150	24	1500	47	10
Grp Sat Flow(s),veh/h/ln	1900	1610	1714	1900	1714	1610
Q Serve(g_s), s	42.0	2.9	1.4	79.9	2.6	0.6
Cycle Q Clear(g_c), s	42.0	2.9	1.4	79.9	2.6	0.6
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1374	1164	41	1505	167	157
V/C Ratio(X)	0.83	0.13	0.58	1.00	0.28	0.06
Avail Cap(c_a), veh/h	1374	1164	84	1505	462	434
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	9.8	4.3	49.4	10.5	42.9	41.9
Incr Delay (d2), s/veh	4.3	0.0	4.7	22.4	0.9	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.2	0.7	0.6	24.6	1.1	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	14.0	4.4	54.1	32.9	43.8	42.1
LnGrp LOS	B	A	D	C	D	D
Approach Vol, veh/h	1284			1524	57	
Approach Delay, s/veh	12.9			33.3	43.5	
Approach LOS	B			C	D	

Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		15.1	7.1	80.2		87.3
Change Period (Y+Rc), s		5.1	4.6	6.2		6.2
Max Green Setting (Gmax), s		27.6	5.0	71.5		81.1
Max Q Clear Time (g_c+I1), s		4.6	3.4	44.0		81.9
Green Ext Time (p_c), s		0.1	0.0	10.9		0.0

Intersection Summary	
HCM 6th Ctrl Delay	24.3
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	34	7	10	5	8	49
Future Vol, veh/h	34	7	10	5	8	49
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	37	8	11	5	9	53

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	63	36	62	0	-	0
Stage 1	36	-	-	-	-	-
Stage 2	27	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	948	1042	1554	-	-	-
Stage 1	992	-	-	-	-	-
Stage 2	1001	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	941	1042	1554	-	-	-
Mov Cap-2 Maneuver	882	-	-	-	-	-
Stage 1	985	-	-	-	-	-
Stage 2	1001	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.2	4.9	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1554	-	906	-	-
HCM Lane V/C Ratio	0.007	-	0.049	-	-
HCM Control Delay (s)	7.3	-	9.2	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	4.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	10	15	10	7	8
Future Vol, veh/h	5	10	15	10	7	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	5	11	16	11	8	9

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	56	13	17	0	-	0
Stage 1	13	-	-	-	-	-
Stage 2	43	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	957	1073	1613	-	-	-
Stage 1	1015	-	-	-	-	-
Stage 2	985	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	947	1073	1613	-	-	-
Mov Cap-2 Maneuver	885	-	-	-	-	-
Stage 1	1005	-	-	-	-	-
Stage 2	985	-	-	-	-	-

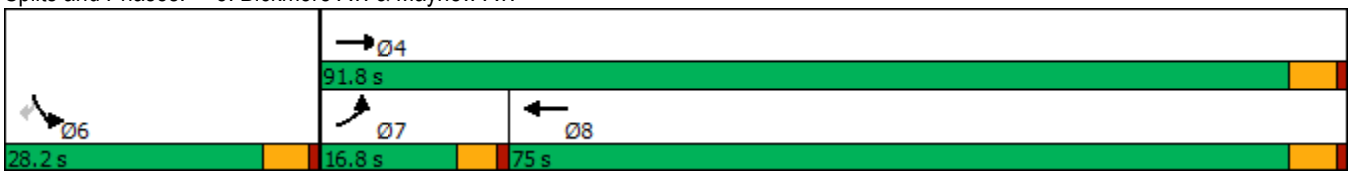
Approach	EB	NB	SB
HCM Control Delay, s	8.7	4.4	0
HCM LOS	A		

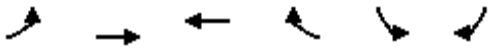
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1613	-	1002	-	-
HCM Lane V/C Ratio	0.01	-	0.016	-	-
HCM Control Delay (s)	7.3	-	8.7	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Traffic Volume (vph)	144	162	1030	7	27
Future Volume (vph)	144	162	1030	7	27
Turn Type	Prot	NA	NA	Prot	Perm
Protected Phases	7	4	8	6	
Permitted Phases					6
Detector Phase	7	4	8	6	6
Switch Phase					
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	15.4	22.4	27.1	27.1
Total Split (s)	16.8	91.8	75.0	28.2	28.2
Total Split (%)	14.0%	76.5%	62.5%	23.5%	23.5%
Yellow Time (s)	3.6	4.4	4.4	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	5.4	5.1	5.1
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	Max	Max	None	None
Act Effct Green (s)	12.0	89.7	70.7	12.2	12.2
Actuated g/C Ratio	0.12	0.87	0.68	0.12	0.12
v/c Ratio	0.79	0.11	0.88	0.04	0.13
Control Delay	74.2	2.7	25.7	42.4	16.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	74.2	2.7	25.7	42.4	16.1
LOS	E	A	C	D	B
Approach Delay		36.4	25.7	21.8	
Approach LOS		D	C	C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 103.3	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 28.0	Intersection LOS: C
Intersection Capacity Utilization 84.8%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 8: Bickmore Av. & Mayhew Av.





Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	144	162	1030	20	7	27
Future Volume (veh/h)	144	162	1030	20	7	27
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1800	1900	1900	1900	1800	1900
Adj Flow Rate, veh/h	157	176	1120	22	8	29
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	186	1587	1267	25	108	102
Arrive On Green	0.11	0.84	0.68	0.68	0.06	0.06
Sat Flow, veh/h	1714	1900	1857	36	1714	1610
Grp Volume(v), veh/h	157	176	0	1142	8	29
Grp Sat Flow(s),veh/h/ln	1714	1900	0	1893	1714	1610
Q Serve(g_s), s	9.3	1.7	0.0	49.9	0.5	1.8
Cycle Q Clear(g_c), s	9.3	1.7	0.0	49.9	0.5	1.8
Prop In Lane	1.00			0.02	1.00	1.00
Lane Grp Cap(c), veh/h	186	1587	0	1292	108	102
V/C Ratio(X)	0.85	0.11	0.00	0.88	0.07	0.28
Avail Cap(c_a), veh/h	202	1587	0	1292	383	360
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.3	1.5	0.0	13.1	45.6	46.2
Incr Delay (d2), s/veh	23.5	0.1	0.0	9.0	0.3	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	0.3	0.0	19.9	0.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	68.8	1.7	0.0	22.2	45.9	47.7
LnGrp LOS	E	A	A	C	D	D
Approach Vol, veh/h		333	1142		37	
Approach Delay, s/veh		33.3	22.2		47.3	
Approach LOS		C	C		D	

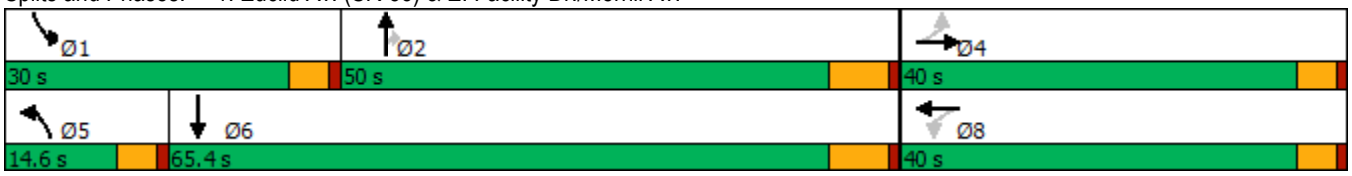
Timer - Assigned Phs	4	6	7	8
Phs Duration (G+Y+Rc), s	91.8	11.6	15.8	76.0
Change Period (Y+Rc), s	5.4	5.1	4.6	5.4
Max Green Setting (Gmax), s	86.4	23.1	12.2	69.6
Max Q Clear Time (g_c+I1), s	3.7	3.8	11.3	51.9
Green Ext Time (p_c), s	1.0	0.1	0.0	9.0

Intersection Summary	
HCM 6th Ctrl Delay	25.2
HCM 6th LOS	C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	14	37	634	3	5	1559	803	392	1646
Future Volume (vph)	14	37	634	3	5	1559	803	392	1646
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8				2		
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	15.0	15.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	9.6	9.6	21.6	21.6	14.6	28.5	28.5	14.6	42.5
Total Split (s)	40.0	40.0	40.0	40.0	14.6	50.0	50.0	30.0	65.4
Total Split (%)	33.3%	33.3%	33.3%	33.3%	12.2%	41.7%	41.7%	25.0%	54.5%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	5.5	5.5	3.6	5.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.6		4.6	4.6	6.5	6.5	4.6	6.5
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None	Max
Act Effct Green (s)		35.4		35.4	10.0	43.5	43.5	25.4	70.6
Actuated g/C Ratio		0.30		0.30	0.08	0.36	0.36	0.21	0.59
v/c Ratio		0.14		2.64	0.04	1.30	1.22	1.18	0.84
Control Delay		26.7		763.3	51.4	172.2	139.8	147.8	25.8
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		26.7		763.3	51.4	172.2	139.8	147.8	25.8
LOS		C		F	D	F	F	F	C
Approach Delay		26.7		763.3		161.0			49.3
Approach LOS		C		F		F			D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 2.64	
Intersection Signal Delay: 233.5	Intersection LOS: F
Intersection Capacity Utilization 146.8%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 1: Euclid Av. (SR-83) & E. Facility Dr./Merrill Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	37	15	634	3	421	5	1559	803	392	1646	1
Future Volume (veh/h)	14	37	15	634	3	421	5	1559	803	392	1646	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	15	40	15	689	3	448	5	1695	809	426	1789	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	120	310	107	323	1	178	22	1309	584	363	2027	0
Arrive On Green	0.29	0.29	0.29	0.29	0.29	0.29	0.01	0.36	0.36	0.21	0.56	0.00
Sat Flow, veh/h	284	1051	364	930	4	605	1714	3610	1610	1714	3705	0
Grp Volume(v), veh/h	70	0	0	1140	0	0	5	1695	809	426	1789	0
Grp Sat Flow(s),veh/h/ln	1700	0	0	1540	0	0	1714	1805	1610	1714	1805	0
Q Serve(g_s), s	0.0	0.0	0.0	32.0	0.0	0.0	0.3	43.5	43.5	25.4	51.7	0.0
Cycle Q Clear(g_c), s	3.4	0.0	0.0	35.4	0.0	0.0	0.3	43.5	43.5	25.4	51.7	0.0
Prop In Lane	0.21		0.21	0.60		0.39	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	538	0	0	502	0	0	22	1309	584	363	2027	0
V/C Ratio(X)	0.13	0.00	0.00	2.27	0.00	0.00	0.23	1.30	1.39	1.17	0.88	0.00
Avail Cap(c_a), veh/h	538	0	0	502	0	0	143	1309	584	363	2027	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	31.0	0.0	0.0	43.7	0.0	0.0	58.6	38.2	38.3	47.3	22.9	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	577.6	0.0	0.0	1.9	138.6	184.2	103.6	6.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	0.0	95.3	0.0	0.0	0.2	42.9	45.6	20.7	20.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.0	0.0	0.0	621.3	0.0	0.0	60.6	176.9	222.4	150.9	28.9	0.0
LnGrp LOS	C	A	A	F	A	A	E	F	F	F	C	A
Approach Vol, veh/h		70			1140			2509			2215	
Approach Delay, s/veh		31.0			621.3			191.3			52.4	
Approach LOS		C			F			F			D	

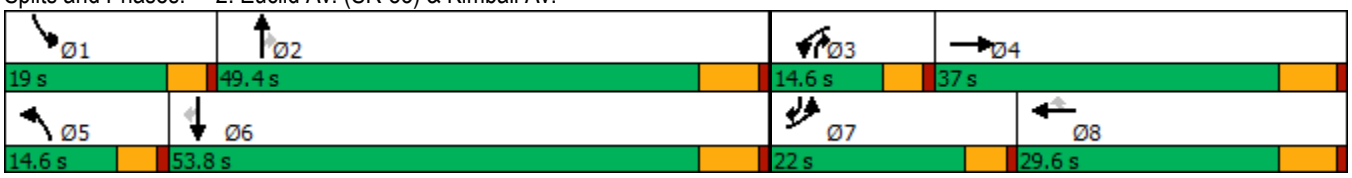
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	30.0	50.0		40.0	6.1	73.9		40.0				
Change Period (Y+Rc), s	4.6	6.5		4.6	4.6	6.5		4.6				
Max Green Setting (Gmax), s	25.4	43.5		35.4	10.0	58.9		35.4				
Max Q Clear Time (g_c+I1), s	27.4	45.5		5.4	2.3	53.7		37.4				
Green Ext Time (p_c), s	0.0	0.0		0.3	0.0	4.2		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			220.2									
HCM 6th LOS			F									

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	591	974	95	424	279	147	1330	156	541	1418	419
Future Volume (vph)	591	974	95	424	279	147	1330	156	541	1418	419
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2	3	1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	3	1	6	7
Switch Phase											
Minimum Initial (s)	10.0	10.0	10.0	5.0	5.0	10.0	5.0	10.0	5.0	5.0	10.0
Minimum Split (s)	14.6	27.2	14.6	29.2	29.2	14.6	44.5	14.6	9.6	40.5	14.6
Total Split (s)	22.0	37.0	14.6	29.6	29.6	14.6	49.4	14.6	19.0	53.8	22.0
Total Split (%)	18.3%	30.8%	12.2%	24.7%	24.7%	12.2%	41.2%	12.2%	15.8%	44.8%	18.3%
Yellow Time (s)	3.6	5.2	3.6	5.2	5.2	3.6	5.5	3.6	3.6	5.5	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	4.6	6.2	6.2	4.6	6.5	4.6	4.6	6.5	4.6
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	None	Max	None
Act Effct Green (s)	17.4	30.8	10.0	23.4	23.4	10.0	42.9	59.4	14.4	47.3	71.2
Actuated g/C Ratio	0.14	0.26	0.08	0.20	0.20	0.08	0.36	0.50	0.12	0.39	0.59
v/c Ratio	1.33	1.31	0.68	0.62	0.63	1.06	1.05	0.19	1.47	1.02	0.43
Control Delay	202.5	184.8	77.7	48.5	24.5	143.9	77.7	6.1	263.9	64.7	12.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	202.5	184.8	77.7	48.5	24.5	143.9	77.7	6.1	263.9	64.7	12.5
LOS	F	F	E	D	C	F	E	A	F	E	B
Approach Delay		190.7		43.6			76.8			100.8	
Approach LOS		F		D			E			F	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.47	
Intersection Signal Delay: 112.1	Intersection LOS: F
Intersection Capacity Utilization 114.1%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 2: Euclid Av. (SR-83) & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	591	974	206	95	424	279	147	1330	156	541	1418	419
Future Volume (veh/h)	591	974	206	95	424	279	147	1330	156	541	1418	419
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1700	1900	1900	1800	1900	1900	1800	1900	1900	1700	1900	1900
Adj Flow Rate, veh/h	603	994	182	97	433	214	150	1357	147	552	1447	366
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	457	785	143	138	694	310	143	1295	707	378	1428	871
Arrive On Green	0.15	0.26	0.26	0.08	0.19	0.19	0.08	0.36	0.36	0.12	0.40	0.40
Sat Flow, veh/h	3141	3047	557	1714	3610	1610	1714	3610	1610	3141	3610	1610
Grp Volume(v), veh/h	603	588	588	97	433	214	150	1357	147	552	1447	366
Grp Sat Flow(s),veh/h/ln	1570	1805	1800	1714	1805	1610	1714	1805	1610	1570	1805	1610
Q Serve(g_s), s	17.4	30.8	30.8	6.6	13.2	14.8	10.0	42.9	6.7	14.4	47.3	16.2
Cycle Q Clear(g_c), s	17.4	30.8	30.8	6.6	13.2	14.8	10.0	42.9	6.7	14.4	47.3	16.2
Prop In Lane	1.00		0.31	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	457	465	463	138	694	310	143	1295	707	378	1428	871
V/C Ratio(X)	1.32	1.27	1.27	0.70	0.62	0.69	1.05	1.05	0.21	1.46	1.01	0.42
Avail Cap(c_a), veh/h	457	465	463	143	706	315	143	1295	707	378	1428	871
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.1	44.4	44.4	53.6	44.3	45.0	54.8	38.4	20.7	52.6	36.2	16.3
Incr Delay (d2), s/veh	158.6	135.7	136.9	11.6	1.7	6.2	88.1	38.6	0.7	221.0	27.2	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	16.6	30.6	30.7	3.2	5.8	6.2	7.6	24.4	2.5	17.0	24.4	5.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	209.7	180.1	181.3	65.3	46.0	51.2	142.9	76.9	21.4	273.6	63.4	17.8
LnGrp LOS	F	F	F	E	D	D	F	F	C	F	F	B
Approach Vol, veh/h		1779			744			1654			2365	
Approach Delay, s/veh		190.5			50.0			78.0			105.4	
Approach LOS		F			D			E			F	

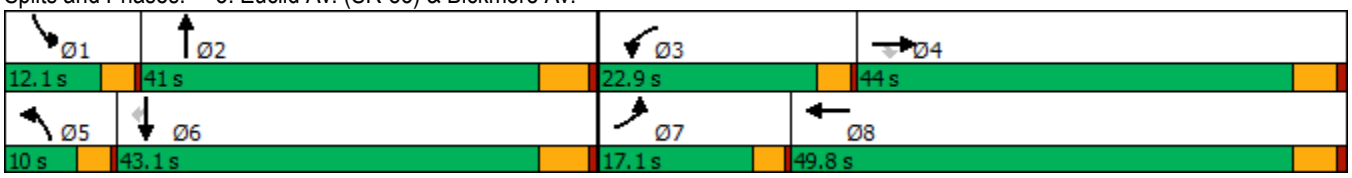
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.0	49.4	14.2	37.0	14.6	53.8	22.0	29.2
Change Period (Y+Rc), s	4.6	6.5	4.6	6.2	4.6	6.5	4.6	6.2
Max Green Setting (Gmax), s	14.4	42.9	10.0	30.8	10.0	47.3	17.4	23.4
Max Q Clear Time (g_c+I1), s	16.4	44.9	8.6	32.8	12.0	49.3	19.4	16.8
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8

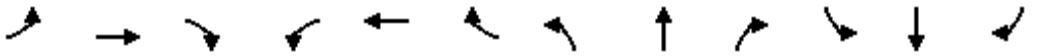
Intersection Summary	
HCM 6th Ctrl Delay	115.3
HCM 6th LOS	F

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	219	160	138	92	54	55	1382	209	1458	199
Future Volume (vph)	219	160	138	92	54	55	1382	209	1458	199
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2	1	6	
Permitted Phases			4							6
Detector Phase	7	4	4	3	8	5	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	44.0	44.0	8.5	44.0	8.5	26.5	8.5	30.5	30.5
Total Split (s)	17.1	44.0	44.0	22.9	49.8	10.0	41.0	12.1	43.1	43.1
Total Split (%)	14.3%	36.7%	36.7%	19.1%	41.5%	8.3%	34.2%	10.1%	35.9%	35.9%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	4.5	3.0	4.5	4.5
All-Red Time (s)	0.5	1.0	1.0	0.5	1.0	0.5	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.0	5.0	3.5	5.0	3.5	5.5	3.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	None	Min	Min
Act Effct Green (s)	13.8	22.3	22.3	9.5	15.9	6.3	36.1	8.7	40.5	40.5
Actuated g/C Ratio	0.15	0.24	0.24	0.10	0.17	0.07	0.39	0.09	0.44	0.44
v/c Ratio	0.89	0.36	0.29	0.54	0.72	0.50	1.13	1.34	0.95	0.26
Control Delay	75.0	32.3	6.5	52.8	27.1	60.3	95.9	221.8	41.6	10.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.0	32.3	6.5	52.8	27.1	60.3	95.9	221.8	41.6	10.5
LOS	E	C	A	D	C	E	F	F	D	B
Approach Delay		43.5			33.4		94.7		58.4	
Approach LOS		D			C		F		E	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 92.3	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.34	
Intersection Signal Delay: 67.7	Intersection LOS: E
Intersection Capacity Utilization 100.5%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 3: Euclid Av. (SR-83) & Bickmore Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	219	160	138	92	54	233	55	1382	145	209	1458	199
Future Volume (veh/h)	219	160	138	92	54	233	55	1382	145	209	1458	199
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	226	165	126	95	56	227	57	1425	130	215	1503	171
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	248	522	442	120	66	267	72	1264	115	157	1541	688
Arrive On Green	0.14	0.27	0.27	0.07	0.20	0.20	0.04	0.38	0.38	0.09	0.43	0.43
Sat Flow, veh/h	1714	1900	1608	1714	329	1332	1714	3347	304	1714	3610	1610
Grp Volume(v), veh/h	226	165	126	95	0	283	57	765	790	215	1503	171
Grp Sat Flow(s),veh/h/ln	1714	1900	1608	1714	0	1660	1714	1805	1845	1714	1805	1610
Q Serve(g_s), s	12.2	6.5	5.8	5.1	0.0	15.5	3.1	35.5	35.5	8.6	38.4	6.4
Cycle Q Clear(g_c), s	12.2	6.5	5.8	5.1	0.0	15.5	3.1	35.5	35.5	8.6	38.4	6.4
Prop In Lane	1.00		1.00	1.00		0.80	1.00		0.16	1.00		1.00
Lane Grp Cap(c), veh/h	248	522	442	120	0	332	72	681	697	157	1541	688
V/C Ratio(X)	0.91	0.32	0.29	0.79	0.00	0.85	0.79	1.12	1.13	1.37	0.98	0.25
Avail Cap(c_a), veh/h	248	788	667	354	0	791	119	681	697	157	1541	688
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.6	27.1	26.8	43.0	0.0	36.3	44.6	29.3	29.3	42.7	26.4	17.3
Incr Delay (d2), s/veh	33.8	0.1	0.1	4.3	0.0	2.4	7.1	73.3	77.4	202.1	17.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.3	2.8	2.1	2.2	0.0	6.2	1.4	27.3	28.7	12.2	17.8	2.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	73.5	27.2	27.0	47.3	0.0	38.7	51.7	102.5	106.6	244.8	43.6	17.3
LnGrp LOS	E	C	C	D	A	D	D	F	F	F	D	B
Approach Vol, veh/h		517			378			1612			1889	
Approach Delay, s/veh		47.4			40.8			102.7			64.2	
Approach LOS		D			D			F			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.1	41.0	10.1	30.8	7.5	45.6	17.1	23.8
Change Period (Y+Rc), s	3.5	5.5	3.5	5.0	3.5	5.5	3.5	5.0
Max Green Setting (Gmax), s	8.6	35.5	19.4	39.0	6.5	37.6	13.6	44.8
Max Q Clear Time (g_c+I1), s	10.6	37.5	7.1	8.5	5.1	40.4	14.2	17.5
Green Ext Time (p_c), s	0.0	0.0	0.1	0.7	0.0	0.0	0.0	1.1

Intersection Summary	
HCM 6th Ctrl Delay	74.3
HCM 6th LOS	E

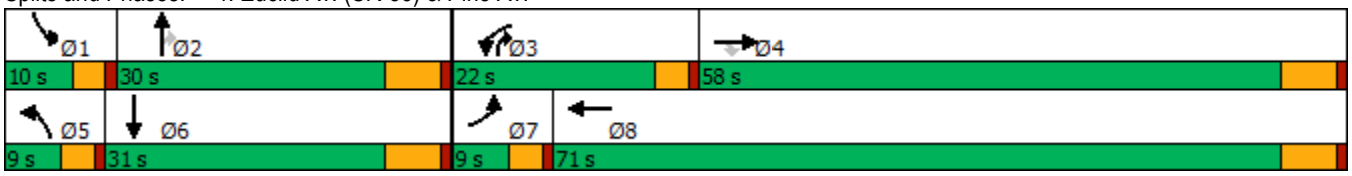
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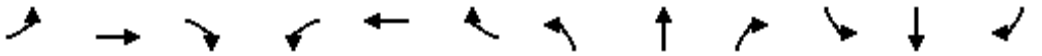
User approved pedestrian interval to be less than phase max green.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	118	911	224	712	611	278	1073	891	390	1196
Future Volume (vph)	118	911	224	712	611	278	1073	891	390	1196
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA
Protected Phases	7	4		3	8	5	2	3	1	6
Permitted Phases			4					2		
Detector Phase	7	4	4	3	8	5	2	3	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	43.0	43.0	9.0	45.0	9.0	11.0	9.0	9.0	29.0
Total Split (s)	9.0	58.0	58.0	22.0	71.0	9.0	30.0	22.0	10.0	31.0
Total Split (%)	7.5%	48.3%	48.3%	18.3%	59.2%	7.5%	25.0%	18.3%	8.3%	25.8%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	3.0	3.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	6.0	4.0	4.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	None	None	Min
Act Effct Green (s)	5.0	52.0	52.0	18.0	65.0	5.0	24.0	48.0	6.0	25.0
Actuated g/C Ratio	0.04	0.43	0.43	0.15	0.54	0.04	0.20	0.40	0.05	0.21
v/c Ratio	1.77	1.18	0.31	1.61	0.92	4.17	1.58	1.39	4.88	1.89
Control Delay	432.3	124.6	10.4	319.8	39.6	1472.9	300.9	211.7	1785.5	432.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	432.3	124.6	10.4	319.8	39.6	1472.9	300.9	211.7	1785.5	432.0
LOS	F	F	B	F	D	F	F	F	F	F
Approach Delay		133.3			166.6		410.9			739.9
Approach LOS		F			F		F			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 4.88	
Intersection Signal Delay: 386.2	Intersection LOS: F
Intersection Capacity Utilization 140.7%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 4: Euclid Av. (SR-83) & Pine Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	118	911	224	712	611	247	278	1073	891	390	1196	129
Future Volume (veh/h)	118	911	224	712	611	247	278	1073	891	390	1196	129
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1800	1900	1900	1700	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	126	969	0	757	650	248	296	1141	477	415	1272	136
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	71	823		471	710	271	71	722	564	86	686	73
Arrive On Green	0.04	0.43	0.00	0.15	0.54	0.54	0.04	0.20	0.20	0.05	0.21	0.21
Sat Flow, veh/h	1714	1900	1610	3141	1310	500	1714	3610	1610	1714	3291	351
Grp Volume(v), veh/h	126	969	0	757	0	898	296	1141	477	415	695	713
Grp Sat Flow(s),veh/h/ln	1714	1900	1610	1570	0	1810	1714	1805	1610	1714	1805	1837
Q Serve(g_s), s	5.0	52.0	0.0	18.0	0.0	54.2	5.0	24.0	24.0	6.0	25.0	25.0
Cycle Q Clear(g_c), s	5.0	52.0	0.0	18.0	0.0	54.2	5.0	24.0	24.0	6.0	25.0	25.0
Prop In Lane	1.00		1.00	1.00		0.28	1.00		1.00	1.00		0.19
Lane Grp Cap(c), veh/h	71	823		471	0	980	71	722	564	86	376	383
V/C Ratio(X)	1.76	1.18		1.61	0.00	0.92	4.14	1.58	0.85	4.84	1.85	1.86
Avail Cap(c_a), veh/h	71	823		471	0	980	71	722	564	86	376	383
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	57.5	34.0	0.0	51.0	0.0	25.0	57.5	48.0	36.0	57.0	47.5	47.5
Incr Delay (d2), s/veh	394.5	92.2	0.0	282.8	0.0	13.1	1447.3	267.8	10.9	1754.8	392.4	397.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.9	43.4	0.0	25.3	0.0	24.0	30.8	37.1	13.8	44.3	51.6	53.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	452.0	126.2	0.0	333.8	0.0	38.1	1504.8	315.8	46.9	1811.8	439.9	445.2
LnGrp LOS	F	F		F	A	D	F	F	D	F	F	F
Approach Vol, veh/h		1095	A		1655			1914			1823	
Approach Delay, s/veh		163.7			173.4			432.6			754.3	
Approach LOS		F			F			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.0	30.0	22.0	58.0	9.0	31.0	9.0	71.0
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	6.0	24.0	18.0	52.0	5.0	25.0	5.0	65.0
Max Q Clear Time (g_c+I1), s	8.0	26.0	20.0	54.0	7.0	27.0	7.0	56.2
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0

Intersection Summary	
HCM 6th Ctrl Delay	411.5
HCM 6th LOS	F

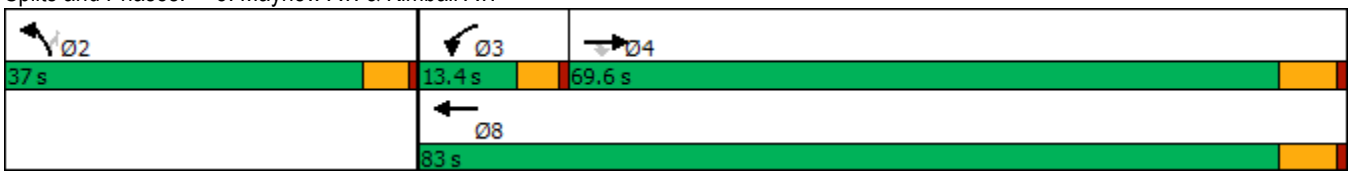
Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1358	49	10	1402	157	27
Future Volume (vph)	1358	49	10	1402	157	27
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases		4				2
Detector Phase	4	4	3	8	2	2
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	23.2	23.2	9.6	16.2	32.1	32.1
Total Split (s)	69.6	69.6	13.4	83.0	37.0	37.0
Total Split (%)	58.0%	58.0%	11.2%	69.2%	30.8%	30.8%
Yellow Time (s)	5.2	5.2	3.6	5.2	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2	4.6	6.2	5.1	5.1
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	Max	Max	None	Max	None	None
Act Effct Green (s)	74.9	74.9	5.5	77.0	16.5	16.5
Actuated g/C Ratio	0.71	0.71	0.05	0.73	0.16	0.16
v/c Ratio	1.09	0.05	0.12	1.09	0.64	0.10
Control Delay	69.6	4.3	52.8	70.5	52.1	13.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.6	4.3	52.8	70.5	52.1	13.3
LOS	E	A	D	E	D	B
Approach Delay	67.4			70.4	46.4	
Approach LOS	E			E	D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 104.8	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.09	
Intersection Signal Delay: 67.5	Intersection LOS: E
Intersection Capacity Utilization 92.4%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 5: Mayhew Av. & Kimball Av.





Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1358	49	10	1402	157	27
Future Volume (veh/h)	1358	49	10	1402	157	27
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1900	1900	1800	1900	1800	1900
Adj Flow Rate, veh/h	1476	53	11	1524	171	29
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1342	1138	23	1454	209	196
Arrive On Green	0.71	0.71	0.01	0.77	0.12	0.12
Sat Flow, veh/h	1900	1610	1714	1900	1714	1610
Grp Volume(v), veh/h	1476	53	11	1524	171	29
Grp Sat Flow(s),veh/h/ln	1900	1610	1714	1900	1714	1610
Q Serve(g_s), s	70.9	1.0	0.6	76.8	9.8	1.6
Cycle Q Clear(g_c), s	70.9	1.0	0.6	76.8	9.8	1.6
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1342	1138	23	1454	209	196
V/C Ratio(X)	1.10	0.05	0.49	1.05	0.82	0.15
Avail Cap(c_a), veh/h	1342	1138	150	1454	545	512
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.7	4.5	49.2	11.8	43.0	39.4
Incr Delay (d2), s/veh	56.6	0.1	5.9	37.2	7.7	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	41.2	0.3	0.3	32.2	4.5	0.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	71.3	4.5	55.1	49.0	50.6	39.7
LnGrp LOS	F	A	E	F	D	D
Approach Vol, veh/h	1529			1535	200	
Approach Delay, s/veh	69.0			49.0	49.0	
Approach LOS	E			D	D	

Timer - Assigned Phs	2	3	4	8
Phs Duration (G+Y+Rc), s	17.3	5.9	77.1	83.0
Change Period (Y+Rc), s	5.1	4.6	6.2	6.2
Max Green Setting (Gmax), s	31.9	8.8	63.4	76.8
Max Q Clear Time (g_c+I1), s	11.8	2.6	72.9	78.8
Green Ext Time (p_c), s	0.5	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	58.4
HCM 6th LOS	E

Intersection	
Int Delay, s/veh	6.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	80	18	7	11	5	34
Future Vol, veh/h	80	18	7	11	5	34
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	87	20	8	12	5	37

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	52	24	42	0	-	0
Stage 1	24	-	-	-	-	-
Stage 2	28	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	962	1058	1580	-	-	-
Stage 1	1004	-	-	-	-	-
Stage 2	1000	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	957	1058	1580	-	-	-
Mov Cap-2 Maneuver	893	-	-	-	-	-
Stage 1	999	-	-	-	-	-
Stage 2	1000	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.4	2.8	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1580	-	919	-	-
HCM Lane V/C Ratio	0.005	-	0.116	-	-
HCM Control Delay (s)	7.3	-	9.4	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.4	-	-

Intersection	
Int Delay, s/veh	4.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	11	22	10	7	18	5
Future Vol, veh/h	11	22	10	7	18	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	12	24	11	8	20	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	53	23	25	0	-	0
Stage 1	23	-	-	-	-	-
Stage 2	30	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	960	1060	1603	-	-	-
Stage 1	1005	-	-	-	-	-
Stage 2	998	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	953	1060	1603	-	-	-
Mov Cap-2 Maneuver	890	-	-	-	-	-
Stage 1	998	-	-	-	-	-
Stage 2	998	-	-	-	-	-

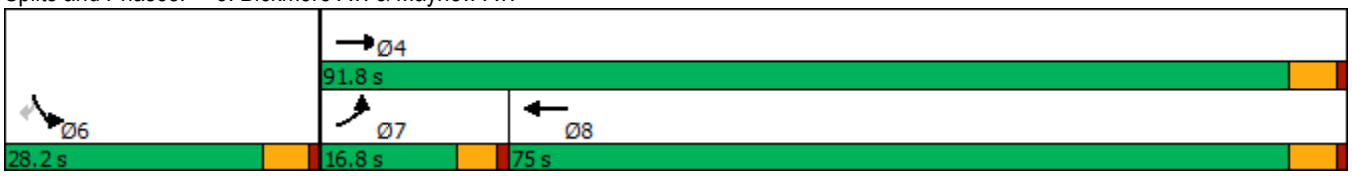
Approach	EB	NB	SB
HCM Control Delay, s	8.7	4.3	0
HCM LOS	A		

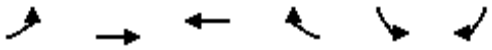
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1603	-	997	-	-
HCM Lane V/C Ratio	0.007	-	0.036	-	-
HCM Control Delay (s)	7.3	-	8.7	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Traffic Volume (vph)	47	467	276	30	103
Future Volume (vph)	47	467	276	30	103
Turn Type	Prot	NA	NA	Prot	Perm
Protected Phases	7	4	8	6	
Permitted Phases					6
Detector Phase	7	4	8	6	6
Switch Phase					
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	15.4	22.4	27.1	27.1
Total Split (s)	16.8	91.8	75.0	28.2	28.2
Total Split (%)	14.0%	76.5%	62.5%	23.5%	23.5%
Yellow Time (s)	3.6	4.4	4.4	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	5.4	5.1	5.1
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	Max	Max	None	None
Act Effct Green (s)	7.8	86.6	76.1	12.2	12.2
Actuated g/C Ratio	0.07	0.79	0.70	0.11	0.11
v/c Ratio	0.42	0.34	0.23	0.17	0.40
Control Delay	59.5	4.4	7.9	45.3	12.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	59.5	4.4	7.9	45.3	12.4
LOS	E	A	A	D	B
Approach Delay		9.4	7.9	19.9	
Approach LOS		A	A	B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 109.3	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.42	
Intersection Signal Delay: 10.4	Intersection LOS: B
Intersection Capacity Utilization 41.7%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 8: Bickmore Av. & Mayhew Av.





Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	47	467	276	7	30	103
Future Volume (veh/h)	47	467	276	7	30	103
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1800	1900	1900	1900	1800	1900
Adj Flow Rate, veh/h	51	508	300	8	33	112
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	65	1538	1342	36	158	149
Arrive On Green	0.04	0.81	0.73	0.73	0.09	0.09
Sat Flow, veh/h	1714	1900	1842	49	1714	1610
Grp Volume(v), veh/h	51	508	0	308	33	112
Grp Sat Flow(s),veh/h/ln	1714	1900	0	1891	1714	1610
Q Serve(g_s), s	3.2	7.4	0.0	5.6	1.9	7.2
Cycle Q Clear(g_c), s	3.2	7.4	0.0	5.6	1.9	7.2
Prop In Lane	1.00			0.03	1.00	1.00
Lane Grp Cap(c), veh/h	65	1538	0	1378	158	149
V/C Ratio(X)	0.79	0.33	0.00	0.22	0.21	0.75
Avail Cap(c_a), veh/h	196	1538	0	1378	371	348
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.9	2.7	0.0	4.7	44.8	47.3
Incr Delay (d2), s/veh	7.7	0.6	0.0	0.4	0.6	7.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	1.8	0.0	1.9	0.8	6.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	58.6	3.2	0.0	5.1	45.5	54.7
LnGrp LOS	E	A	A	A	D	D
Approach Vol, veh/h		559	308		145	
Approach Delay, s/veh		8.3	5.1		52.6	
Approach LOS		A	A		D	

Timer - Assigned Phs	4	6	7	8
Phs Duration (G+Y+Rc), s	91.8	15.0	8.6	83.2
Change Period (Y+Rc), s	5.4	5.1	4.6	5.4
Max Green Setting (Gmax), s	86.4	23.1	12.2	69.6
Max Q Clear Time (g_c+I1), s	9.4	9.2	5.2	7.6
Green Ext Time (p_c), s	3.4	0.3	0.0	1.8

Intersection Summary	
HCM 6th Ctrl Delay	13.7
HCM 6th LOS	B

APPENDIX 7.3:

HORIZON YEAR (2040) WITH PROJECT CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS

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Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

DIST	CO	RTE	PM	TRAFFIC CONDITIONS		HY WP
				CALC CP	DATE	11/22/19
Jurisdiction: City of Chino				CHK CP	DATE	11/22/19
Major Street: Kimball Av.				Critical Approach Speed (Major)		45 mph
Minor Street: Mayhew Av.				Critical Approach Speed (Minor)		25 mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes = **1** lane

Major Street Future ADT = **26,933** vpd Minor Street Future ADT = **998** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); …….. √

or

In built up area of isolated community of < 10,000 population ……..

RURAL (R)

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
	XX				
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **26,933**	*1* **998**	8,000	5,600 *	2,400	1,680
2 +	*1*	9,600	6,720	2,400	1,680
2 +	*2* +	9,600	6,720	3,200	2,240
1	*2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
XX					
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1 **26,933**	*1* **998**	12,000	8,400 *	1,200	850 *
2 +	*1*	14,400	10,080	1,200	850
2 +	*2* +	14,400	10,080	1,600	1,120
1	*2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied				
	XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more …..	A: 59% B: 100%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

DIST	CO	RTE	PM	TRAFFIC CONDITIONS		HY WP
				CALC CP	DATE	11/22/19
Jurisdiction: **City of Chino**				CHK CP	DATE	11/22/19
Major Street: **Mayhew Av.**				Critical Approach Speed (Major)		35 mph
Minor Street: **Driveway 1**				Critical Approach Speed (Minor)		25 mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes = **1** lane

Major Street Future ADT = **831** vpd Minor Street Future ADT = **693** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); …….. [ ]

or **URBAN (U)**

In built up area of isolated community of < 10,000 population …….. [ ]

(Based on Estimated Average Daily Traffic - See Note)

URBAN / RURAL	Minimum Requirements EADT			
	Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
CONDITION A - Minimum Vehicular Volume	Urban	Rural	Urban	Rural
Satisfied: XX				
Not Satisfied: XX				
Number of lanes for moving traffic on each approach				
Major Street: *1* **831** / Minor Street: *1* **693**	8,000	5,600	2,400	1,680
Major Street: *2* + / Minor Street: *1*	9,600	6,720	2,400	1,680
Major Street: *2* + / Minor Street: *2* +	9,600	6,720	3,200	2,240
Major Street: *1* / Minor Street: *2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic	Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Urban	Rural	Urban	Rural
Not Satisfied: XX				
Number of lanes for moving traffic on each approach				
Major Street: *1* **831** / Minor Street: *1* **693**	12,000	8,400	1,200	850
Major Street: *2* + / Minor Street: *1*	14,400	10,080	1,200	850
Major Street: *2* + / Minor Street: *2* +	14,400	10,080	1,600	1,120
Major Street: *1* / Minor Street: *2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B				
Satisfied				
Not Satisfied: XX				
No one condition satisfied, but following conditions fulfilled 80% of more ….. A: 10% B: 7%	2 CONDITIONS 80%		2 CONDITIONS 80%	

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

DIST	CO	RTE	PM	TRAFFIC CONDITIONS		HY WP
				CALC CP	DATE	11/22/19
Jurisdiction: **City of Chino**				CHK CP	DATE	11/22/19
Major Street: **Mayhew Av.**				Critical Approach Speed (Major)		35 mph
Minor Street: **Driveway 2**				Critical Approach Speed (Minor)		25 mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes = **1** lane

Major Street Future ADT = **492** vpd Minor Street Future ADT = **206** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); …….. [ ]

or **URBAN (U)**

In built up area of isolated community of < 10,000 population …….. [ ]

(Based on Estimated Average Daily Traffic - See Note)

URBAN / RURAL	Minimum Requirements EADT			
	Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
	Urban	Rural	Urban	Rural
CONDITION A - Minimum Vehicular Volume				
Satisfied / Not Satisfied (XX)				
Number of lanes for moving traffic on each approach: Major Street / Minor Street				
1 **492** / 1 **206**	8,000	5,600	2,400	1,680
2 + / 1	9,600	6,720	2,400	1,680
2 + / 2 +	9,600	6,720	3,200	2,240
1 / 2 +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic	Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied / Not Satisfied (XX)				
Number of lanes for moving traffic on each approach: Major Street / Minor Street				
1 **492** / 1 **206**	12,000	8,400	1,200	850
2 + / 1	14,400	10,080	1,200	850
2 + / 2 +	14,400	10,080	1,600	1,120
1 / 2 +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B				
Satisfied / Not Satisfied (XX)	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more ….. A: 6% B: 4%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
(Average Traffic Estimate Form)

DIST	CO	RTE	PM	TRAFFIC CONDITIONS		HY WP
				CALC CP	DATE	11/22/19
Jurisdiction: **City of Chino**				CHK CP	DATE	11/22/19
Major Street: **Mayhew Av.**				Critical Approach Speed (Major)		45 mph
Minor Street: **Bickmore Av.**				Critical Approach Speed (Minor)		25 mph

Major Street Approach Lanes = **1** lane Minor Street Approach Lanes = **1** lane

Major Street Future ADT = **901** vpd Minor Street Future ADT = **7,105** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); …….. √

or

In built up area of isolated community of < 10,000 population ……..

RURAL (R)

(Based on Estimated Average Daily Traffic - See Note)

URBAN / RURAL: XX

CONDITION A - Minimum Vehicular Volume

Satisfied / Not Satisfied: XX

Number of lanes for moving traffic on each approach

Major Street	Minor Street	Minimum Requirements EADT: Vehicles Per Day on Major Street (Total of Both Approaches) Urban	Rural	Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only) Urban	Rural
1 **901**	*1* **7,105**	8,000	5,600	2,400	1,680 *
2 +	*1*	9,600	6,720	2,400	1,680
2 +	*2* +	9,600	6,720	3,200	2,240
1	*2* +	8,000	5,600	3,200	2,240

CONDITION B - Interruption of Continuous Traffic

Satisfied / Not Satisfied: XX

Number of lanes for moving traffic on each approach

Major Street	Minor Street	Vehicles Per Day on Major Street (Total of Both Approaches) Urban	Rural	Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only) Urban	Rural
1 **901**	*1* **7,105**	12,000	8,400	1,200	850 *
2 +	*1*	14,400	10,080	1,200	850
2 +	*2* +	14,400	10,080	1,600	1,120
1	*2* +	12,000	8,400	1,600	1,120

Combination of CONDITIONS A + B

Satisfied / Not Satisfied: XX

No one condition satisfied, but following conditions fulfilled 80% of more ….. A: 16% B: 11%

2 CONDITIONS 80%

2 CONDITIONS 80%

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

APPENDIX 7.4:

HORIZON YEAR (2040) WITHOUT PROJECT CONDITIONS QUEUING ANALYSIS WORKSHEETS

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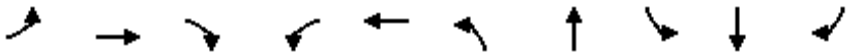


Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	217	401	229	950	411	182	1259	59	223	1296	493
v/c Ratio	0.80	0.40	1.40	0.91	0.69	0.86	0.96	0.07	0.91	1.13	0.67
Control Delay	75.8	32.0	254.4	54.9	26.5	85.8	54.9	2.8	92.2	108.0	24.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.8	32.0	254.4	54.9	26.5	85.8	54.9	2.8	92.2	108.0	24.1
Queue Length 50th (ft)	86	116	~238	372	154	139	499	0	89	~626	221
Queue Length 95th (ft)	#148	163	#399	#490	273	#263	#653	17	#165	#763	340
Internal Link Dist (ft)		1169		1767			2587			5208	
Turn Bay Length (ft)	200		215		200	420		260	160		240
Base Capacity (vph)	273	1018	163	1058	606	223	1309	862	246	1147	738
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.39	1.40	0.90	0.68	0.82	0.96	0.07	0.91	1.13	0.67

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	88	17	51	254	520	100	1197	113	1373	266
v/c Ratio	0.64	0.04	0.11	0.90	0.89	0.94	0.88	0.81	0.96	0.36
Control Delay	71.4	29.0	0.5	80.1	50.8	126.9	41.8	89.3	49.1	10.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.4	29.0	0.5	80.1	50.8	126.9	41.8	89.3	49.1	10.7
Queue Length 50th (ft)	61	9	0	~195	325	72	420	80	~505	40
Queue Length 95th (ft)	#140	26	0	#399	465	#201	#652	#204	#773	117
Internal Link Dist (ft)		814			1605		2821		2587	
Turn Bay Length (ft)	150		150	80		115		160		240
Base Capacity (vph)	158	709	677	283	783	106	1360	140	1435	736
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.02	0.08	0.90	0.66	0.94	0.88	0.81	0.96	0.36

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

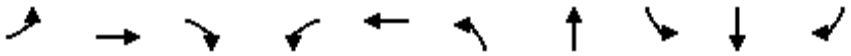


Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	603	1192	97	405	237	150	1356	159	532	1447	428
v/c Ratio	1.33	1.30	0.68	0.58	0.53	1.06	1.05	0.19	1.42	1.02	0.43
Control Delay	202.5	179.4	77.7	47.6	17.9	143.9	77.4	6.1	242.2	64.7	12.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	202.5	179.4	77.7	47.6	17.9	143.9	77.4	6.1	242.2	64.7	12.2
Queue Length 50th (ft)	~312	~619	74	151	44	~127	~603	18	~286	~605	138
Queue Length 95th (ft)	#427	#758	#154	204	125	#262	#741	55	#397	#763	210
Internal Link Dist (ft)		1169		1767			2587			5208	
Turn Bay Length (ft)	200		215		200	420		260	160		240
Base Capacity (vph)	454	917	142	703	451	142	1290	856	375	1422	989
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.33	1.30	0.68	0.58	0.53	1.06	1.05	0.19	1.42	1.02	0.43

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	226	147	142	44	206	57	1546	192	1503	205
v/c Ratio	0.74	0.28	0.26	0.33	0.58	0.47	1.12	1.14	0.95	0.23
Control Delay	52.0	27.2	5.6	48.2	15.7	56.3	90.9	148.8	41.3	10.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.0	27.2	5.6	48.2	15.7	56.3	90.9	148.8	41.3	10.1
Queue Length 50th (ft)	110	67	0	22	23	29	~466	~111	381	26
Queue Length 95th (ft)	#325	118	40	68	78	#100	#968	#342	#896	106
Internal Link Dist (ft)		814			1605		2821		2587	
Turn Bay Length (ft)	150		150	80		115		160		240
Base Capacity (vph)	307	872	808	422	939	128	1383	169	1574	894
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.17	0.18	0.10	0.22	0.45	1.12	1.14	0.95	0.23

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

APPENDIX 7.5:

HORIZON YEAR (2040) WITH PROJECT CONDITIONS QUEUING ANALYSIS WORKSHEETS

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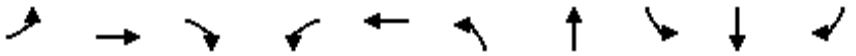


Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	217	418	229	962	432	182	1259	59	253	1296	493
v/c Ratio	0.80	0.42	1.40	0.92	0.72	0.86	0.96	0.07	1.03	1.13	0.67
Control Delay	75.9	32.7	255.2	56.0	28.6	86.0	55.2	2.8	118.9	108.6	24.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.9	32.7	255.2	56.0	28.6	86.0	55.2	2.8	118.9	108.6	24.1
Queue Length 50th (ft)	86	123	~238	378	172	139	499	0	~108	~626	221
Queue Length 95th (ft)	#148	171	#399	#501	297	#263	#653	17	#193	#763	340
Internal Link Dist (ft)		1169		1767			2587			5208	
Turn Bay Length (ft)	200		215		200	420		260	160		240
Base Capacity (vph)	272	1016	163	1057	606	223	1308	861	246	1145	737
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.80	0.41	1.40	0.91	0.71	0.82	0.96	0.07	1.03	1.13	0.67

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	88	37	51	387	761	100	1236	241	1373	266
v/c Ratio	0.70	0.07	0.10	1.13	1.10	1.08	1.04	1.96	1.09	0.40
Control Delay	81.5	28.5	0.4	135.9	99.7	169.0	76.4	489.1	91.7	11.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	81.5	28.5	0.4	135.9	99.7	169.0	76.4	489.1	91.7	11.8
Queue Length 50th (ft)	67	20	0	~446	~655	~87	~547	~290	~635	46
Queue Length 95th (ft)	#140	45	0	#641	#898	#201	#687	#454	#773	117
Internal Link Dist (ft)		814			1605		2821		2587	
Turn Bay Length (ft)	150		150	80		115		160		240
Base Capacity (vph)	139	622	608	341	691	93	1188	123	1257	667
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.06	0.08	1.13	1.10	1.08	1.04	1.96	1.09	0.40

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

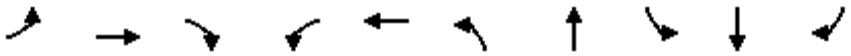


Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	603	1204	97	433	285	150	1357	159	552	1447	428
v/c Ratio	1.33	1.31	0.68	0.62	0.63	1.06	1.05	0.19	1.47	1.02	0.43
Control Delay	202.5	184.8	77.7	48.5	24.5	143.9	77.7	6.1	263.9	64.7	12.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	202.5	184.8	77.7	48.5	24.5	143.9	77.7	6.1	263.9	64.7	12.5
Queue Length 50th (ft)	~312	~630	74	163	79	~127	~603	18	~302	~605	140
Queue Length 95th (ft)	#427	#768	#154	218	176	#262	#742	55	#415	#763	213
Internal Link Dist (ft)		1169		1767			2587			5208	
Turn Bay Length (ft)	200		215		200	420		260	160		240
Base Capacity (vph)	454	917	142	703	451	142	1290	856	375	1422	987
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.33	1.31	0.68	0.62	0.63	1.06	1.05	0.19	1.47	1.02	0.43

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	226	165	142	95	296	57	1574	215	1503	205
v/c Ratio	0.89	0.36	0.29	0.54	0.72	0.50	1.13	1.34	0.95	0.26
Control Delay	75.0	32.3	6.5	52.8	27.1	60.3	95.9	221.8	41.6	10.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.0	32.3	6.5	52.8	27.1	60.3	95.9	221.8	41.6	10.5
Queue Length 50th (ft)	124	81	0	51	80	31	~525	~154	418	28
Queue Length 95th (ft)	#354	145	44	121	159	#101	#985	#390	#888	106
Internal Link Dist (ft)		814			1605		2821		2587	
Turn Bay Length (ft)	150		150	80		115		160		240
Base Capacity (vph)	255	815	765	365	896	122	1395	161	1582	775
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.20	0.19	0.26	0.33	0.47	1.13	1.34	0.95	0.26

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

APPENDIX 7.6:

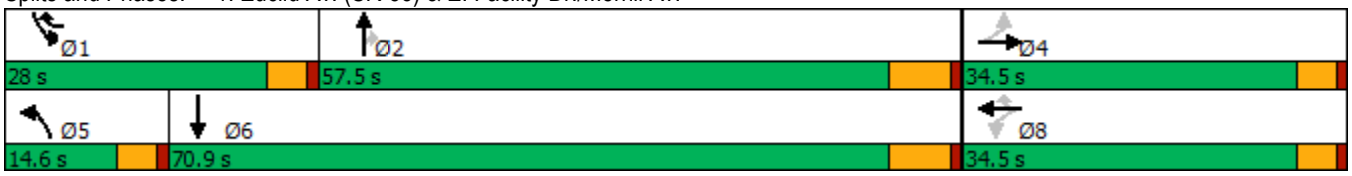
HORIZON YEAR (2040) WITHOUT PROJECT CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS WITH IMPROVEMENTS

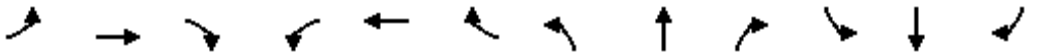
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Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	10	10	388	60	458	13	1284	443	364	1446
Future Volume (vph)	10	10	388	60	458	13	1284	443	364	1446
Turn Type	Perm	NA	Perm	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	1	5	2		1	6
Permitted Phases	4		8		8			2		
Detector Phase	4	4	8	8	1	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	15.0	15.0	10.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	9.6	9.6	21.6	21.6	14.6	14.6	28.5	28.5	14.6	42.5
Total Split (s)	34.5	34.5	34.5	34.5	28.0	14.6	57.5	57.5	28.0	70.9
Total Split (%)	28.8%	28.8%	28.8%	28.8%	23.3%	12.2%	47.9%	47.9%	23.3%	59.1%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	3.6	5.5	5.5	3.6	5.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	4.6	4.6	4.6	4.6	6.5	6.5	4.6	6.5
Lead/Lag					Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	Max	None	Max
Act Effct Green (s)	21.0	21.0	21.0	21.0	42.0	10.1	51.4	51.4	16.4	69.9
Actuated g/C Ratio	0.20	0.20	0.20	0.20	0.40	0.10	0.49	0.49	0.16	0.67
v/c Ratio	0.04	0.09	0.78	0.16	0.71	0.08	0.52	0.51	0.72	0.45
Control Delay	34.6	18.5	51.0	36.1	30.1	48.8	20.4	12.5	50.8	10.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.6	18.5	51.0	36.1	30.1	48.8	20.4	12.5	50.8	10.0
LOS	C	B	D	D	C	D	C	B	D	B
Approach Delay		22.3		39.5			18.6			18.0
Approach LOS		C		D			B			B

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 104.6	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 22.5	Intersection LOS: C
Intersection Capacity Utilization 70.4%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1: Euclid Av. (SR-83) & E. Facility Dr./Merrill Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	10	21	388	60	458	13	1284	443	364	1446	49
Future Volume (veh/h)	10	10	21	388	60	458	13	1284	443	364	1446	49
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	10	10	21	400	62	445	13	1324	414	375	1491	37
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	273	140	293	785	486	625	51	2448	760	440	2989	74
Arrive On Green	0.26	0.26	0.26	0.26	0.26	0.26	0.03	0.47	0.47	0.13	0.57	0.57
Sat Flow, veh/h	906	546	1147	2716	1900	1610	1714	5187	1610	3326	5202	129
Grp Volume(v), veh/h	10	0	31	400	62	445	13	1324	414	375	991	537
Grp Sat Flow(s),veh/h/ln	906	0	1694	1358	1900	1610	1714	1729	1610	1663	1729	1873
Q Serve(g_s), s	1.0	0.0	1.6	14.7	2.8	26.2	0.8	20.3	20.5	12.4	19.2	19.2
Cycle Q Clear(g_c), s	3.8	0.0	1.6	16.2	2.8	26.2	0.8	20.3	20.5	12.4	19.2	19.2
Prop In Lane	1.00		0.68	1.00		1.00	1.00		1.00	1.00		0.07
Lane Grp Cap(c), veh/h	273	0	433	785	486	625	51	2448	760	440	1987	1076
V/C Ratio(X)	0.04	0.00	0.07	0.51	0.13	0.71	0.26	0.54	0.54	0.85	0.50	0.50
Avail Cap(c_a), veh/h	283	0	452	815	507	643	153	2448	760	694	1987	1076
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.5	0.0	31.6	37.8	32.1	29.0	53.2	21.0	21.0	47.6	14.2	14.2
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.2	0.0	3.0	1.0	0.9	2.8	3.4	0.9	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.7	4.7	1.2	9.9	0.4	7.6	7.5	5.1	6.7	7.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.6	0.0	31.7	38.0	32.1	32.0	54.1	21.9	23.8	51.0	15.1	15.9
LnGrp LOS	C	A	C	D	C	C	D	C	C	D	B	B
Approach Vol, veh/h		41			907			1751			1903	
Approach Delay, s/veh		32.1			34.7			22.6			22.4	
Approach LOS		C			C			C			C	

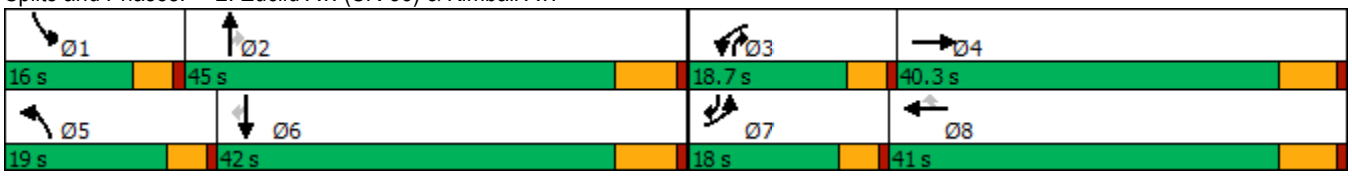
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	19.4	59.4		33.3	7.9	70.9		33.3				
Change Period (Y+Rc), s	4.6	6.5		4.6	4.6	6.5		4.6				
Max Green Setting (Gmax), s	23.4	51.0		29.9	10.0	64.4		29.9				
Max Q Clear Time (g_c+I1), s	14.4	22.5		5.8	2.8	21.2		28.2				
Green Ext Time (p_c), s	0.5	11.8		0.1	0.0	12.2		0.5				

Intersection Summary			
HCM 6th Ctrl Delay		25.0	
HCM 6th LOS		C	

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	213	284	224	931	403	178	1234	58	219	1270	483
Future Volume (vph)	213	284	224	931	403	178	1234	58	219	1270	483
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2	3	1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	3	1	6	7
Switch Phase											
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0	5.0	5.0	5.0	5.0	10.0
Minimum Split (s)	14.6	38.2	14.6	38.2	38.2	14.6	36.5	14.6	9.6	33.5	14.6
Total Split (s)	18.0	40.3	18.7	41.0	41.0	19.0	45.0	18.7	16.0	42.0	18.0
Total Split (%)	15.0%	33.6%	15.6%	34.2%	34.2%	15.8%	37.5%	15.6%	13.3%	35.0%	15.0%
Yellow Time (s)	3.6	5.2	3.6	5.2	5.2	3.6	5.5	3.6	3.6	5.5	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	4.6	6.2	6.2	4.6	6.5	4.6	4.6	6.5	4.6
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	None	Max	None
Act Effct Green (s)	12.0	34.1	12.0	34.0	34.0	14.0	38.6	57.1	10.9	35.5	49.5
Actuated g/C Ratio	0.10	0.29	0.10	0.29	0.29	0.12	0.33	0.49	0.09	0.30	0.42
v/c Ratio	0.68	0.39	0.68	0.91	0.65	0.90	0.74	0.07	0.77	0.83	0.59
Control Delay	62.4	30.8	61.6	53.8	21.4	93.1	38.5	3.0	70.6	43.9	23.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.4	30.8	61.6	53.8	21.4	93.1	38.5	3.0	70.6	43.9	23.0
LOS	E	C	E	D	C	F	D	A	E	D	C
Approach Delay		41.9		46.5			43.7			41.7	
Approach LOS		D		D			D			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 117.5	
Natural Cycle: 105	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 43.6	Intersection LOS: D
Intersection Capacity Utilization 87.3%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 2: Euclid Av. (SR-83) & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	213	284	109	224	931	403	178	1234	58	219	1270	483
Future Volume (veh/h)	213	284	109	224	931	403	178	1234	58	219	1270	483
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1700	1900	1900	1800	1900	1900	1800	1900	1900	1700	1900	1900
Adj Flow Rate, veh/h	217	290	110	229	950	384	182	1259	16	223	1296	479
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	273	752	279	287	1051	469	208	1781	692	275	1605	631
Arrive On Green	0.09	0.29	0.29	0.09	0.29	0.29	0.12	0.34	0.34	0.09	0.31	0.31
Sat Flow, veh/h	3141	2577	956	3326	3610	1610	1714	5187	1610	3141	5187	1588
Grp Volume(v), veh/h	217	201	199	229	950	384	182	1259	16	223	1296	479
Grp Sat Flow(s),veh/h/ln	1570	1805	1728	1663	1805	1610	1714	1729	1610	1570	1729	1588
Q Serve(g_s), s	7.8	10.2	10.6	7.8	29.0	25.5	12.0	24.2	0.7	8.0	26.4	29.9
Cycle Q Clear(g_c), s	7.8	10.2	10.6	7.8	29.0	25.5	12.0	24.2	0.7	8.0	26.4	29.9
Prop In Lane	1.00		0.55	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	273	527	505	287	1051	469	208	1781	692	275	1605	631
V/C Ratio(X)	0.79	0.38	0.39	0.80	0.90	0.82	0.87	0.71	0.02	0.81	0.81	0.76
Avail Cap(c_a), veh/h	367	536	513	409	1095	488	215	1781	692	312	1605	631
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.4	32.4	32.5	51.4	39.1	37.8	49.5	32.7	18.9	51.4	36.5	29.9
Incr Delay (d2), s/veh	5.9	0.5	0.5	4.5	10.3	10.2	28.5	2.4	0.1	11.7	4.5	8.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	4.3	4.3	3.3	13.6	10.8	6.5	9.8	0.2	3.5	11.0	12.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.3	32.8	33.0	55.9	49.4	48.1	78.1	35.1	18.9	63.1	41.0	38.2
LnGrp LOS	E	C	C	E	D	D	E	D	B	E	D	D
Approach Vol, veh/h		617			1563			1457			1998	
Approach Delay, s/veh		41.5			50.0			40.3			42.8	
Approach LOS		D			D			D			D	

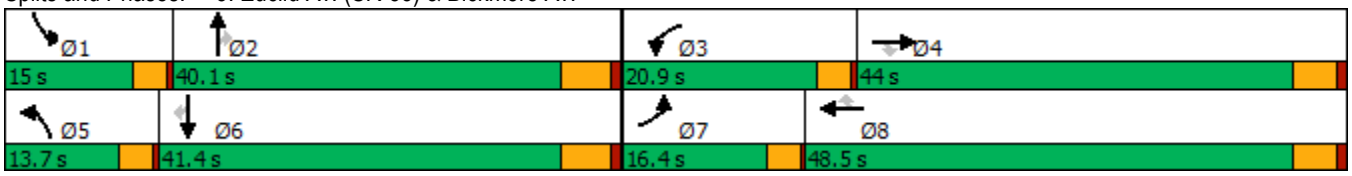
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.7	45.9	14.5	39.7	18.5	42.0	14.6	39.6
Change Period (Y+Rc), s	4.6	6.5	4.6	6.2	4.6	6.5	4.6	6.2
Max Green Setting (Gmax), s	11.4	38.5	14.1	34.1	14.4	35.5	13.4	34.8
Max Q Clear Time (g_c+I1), s	10.0	26.2	9.8	12.6	14.0	31.9	9.8	31.0
Green Ext Time (p_c), s	0.1	6.1	0.2	2.0	0.0	2.7	0.1	2.4

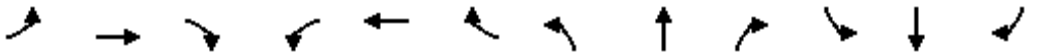
Intersection Summary	
HCM 6th Ctrl Delay	44.0
HCM 6th LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	81	16	47	234	264	214	92	1088	13	104	1263	245
Future Volume (vph)	81	16	47	234	264	214	92	1088	13	104	1263	245
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	44.0	44.0	8.5	44.0	44.0	8.5	26.5	26.5	8.5	30.5	30.5
Total Split (s)	16.4	44.0	44.0	20.9	48.5	48.5	13.7	40.1	40.1	15.0	41.4	41.4
Total Split (%)	13.7%	36.7%	36.7%	17.4%	40.4%	40.4%	11.4%	33.4%	33.4%	12.5%	34.5%	34.5%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.5	4.5	3.0	4.5	4.5
All-Red Time (s)	0.5	1.0	1.0	0.5	1.0	1.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.5	5.5	3.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
Act Effct Green (s)	9.3	17.1	17.1	13.5	20.7	20.7	9.7	31.2	31.2	8.2	30.1	30.1
Actuated g/C Ratio	0.11	0.21	0.21	0.16	0.25	0.25	0.12	0.38	0.38	0.10	0.37	0.37
v/c Ratio	0.45	0.04	0.12	0.43	0.60	0.42	0.50	0.60	0.02	0.34	0.72	0.36
Control Delay	49.9	28.7	0.6	40.7	35.7	9.9	52.1	25.4	0.1	45.5	28.4	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.9	28.7	0.6	40.7	35.7	9.9	52.1	25.4	0.1	45.5	28.4	6.7
LOS	D	C	A	D	D	A	D	C	A	D	C	A
Approach Delay		31.5			29.6			27.2			26.2	
Approach LOS		C			C			C			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 82.1	
Natural Cycle: 95	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.72	
Intersection Signal Delay: 27.4	Intersection LOS: C
Intersection Capacity Utilization 63.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 3: Euclid Av. (SR-83) & Bickmore Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	81	16	47	234	264	214	92	1088	13	104	1263	245
Future Volume (veh/h)	81	16	47	234	264	214	92	1088	13	104	1263	245
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	88	17	42	254	287	206	100	1183	7	113	1373	249
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	112	294	249	374	377	319	127	1921	584	237	1906	579
Arrive On Green	0.07	0.15	0.15	0.11	0.20	0.20	0.07	0.37	0.37	0.07	0.37	0.37
Sat Flow, veh/h	1714	1900	1610	3429	1900	1610	1714	5187	1576	3326	5187	1576
Grp Volume(v), veh/h	88	17	42	254	287	206	100	1183	7	113	1373	249
Grp Sat Flow(s),veh/h/ln	1714	1900	1610	1714	1900	1610	1714	1729	1576	1663	1729	1576
Q Serve(g_s), s	3.0	0.5	1.3	4.2	8.5	7.0	3.4	11.0	0.2	1.9	13.5	7.0
Cycle Q Clear(g_c), s	3.0	0.5	1.3	4.2	8.5	7.0	3.4	11.0	0.2	1.9	13.5	7.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	112	294	249	374	377	319	127	1921	584	237	1906	579
V/C Ratio(X)	0.79	0.06	0.17	0.68	0.76	0.64	0.79	0.62	0.01	0.48	0.72	0.43
Avail Cap(c_a), veh/h	373	1249	1058	1005	1393	1180	295	3024	919	644	3138	954
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.3	21.4	21.8	25.4	22.5	21.9	27.0	15.2	11.8	26.5	16.1	14.1
Incr Delay (d2), s/veh	4.6	0.0	0.1	0.8	1.2	0.8	4.0	0.1	0.0	0.6	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.2	0.5	1.6	3.5	2.4	1.3	3.3	0.0	0.7	4.0	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.9	21.4	21.9	26.3	23.7	22.7	31.1	15.4	11.8	27.1	16.3	14.3
LnGrp LOS	C	C	C	C	C	C	C	B	B	C	B	B
Approach Vol, veh/h		147			747			1290			1735	
Approach Delay, s/veh		27.8			24.3			16.6			16.7	
Approach LOS		C			C			B			B	

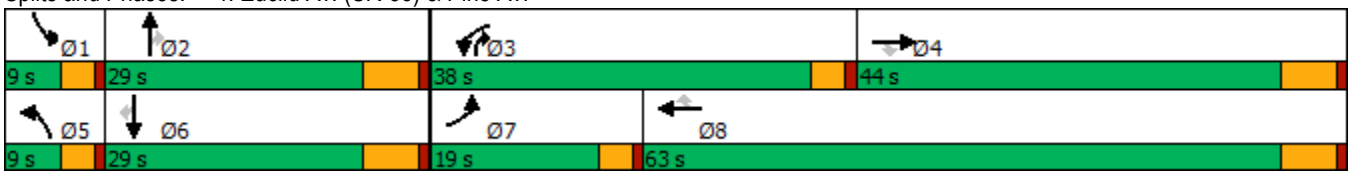
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.7	27.5	10.0	14.2	7.9	27.3	7.4	16.8
Change Period (Y+Rc), s	3.5	5.5	3.5	5.0	3.5	5.5	3.5	5.0
Max Green Setting (Gmax), s	11.5	34.6	17.4	39.0	10.2	35.9	12.9	43.5
Max Q Clear Time (g_c+I1), s	3.9	13.0	6.2	3.3	5.4	15.5	5.0	10.5
Green Ext Time (p_c), s	0.1	4.9	0.3	0.1	0.0	6.3	0.0	1.3

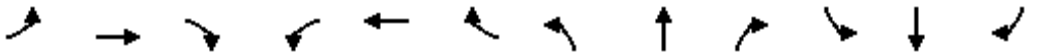
Intersection Summary	
HCM 6th Ctrl Delay	18.5
HCM 6th LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	84	303	204	1319	980	333	171	1052	214	161	1025	130
Future Volume (vph)	84	303	204	1319	980	333	171	1052	214	161	1025	130
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	3	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	43.0	43.0	9.0	45.0	45.0	9.0	11.0	9.0	9.0	29.0	29.0
Total Split (s)	19.0	44.0	44.0	38.0	63.0	63.0	9.0	29.0	38.0	9.0	29.0	29.0
Total Split (%)	15.8%	36.7%	36.7%	31.7%	52.5%	52.5%	7.5%	24.2%	31.7%	7.5%	24.2%	24.2%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	3.0	3.0	5.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	4.0	4.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min	Min
Act Effct Green (s)	9.5	19.3	19.3	34.3	46.2	46.2	5.0	23.2	63.5	5.0	23.2	23.2
Actuated g/C Ratio	0.09	0.19	0.19	0.34	0.45	0.45	0.05	0.23	0.62	0.05	0.23	0.23
v/c Ratio	0.54	0.45	0.50	1.28	0.61	0.38	1.06	0.87	0.12	1.00	0.85	0.28
Control Delay	58.2	37.8	17.0	163.8	23.8	5.2	136.4	47.9	1.9	121.9	46.5	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.2	37.8	17.0	163.8	23.8	5.2	136.4	47.9	1.9	121.9	46.5	8.0
LOS	E	D	B	F	C	A	F	D	A	F	D	A
Approach Delay		33.5			91.6			51.6			51.9	
Approach LOS		C			F			D			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 102	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.28	
Intersection Signal Delay: 67.5	Intersection LOS: E
Intersection Capacity Utilization 92.3%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 4: Euclid Av. (SR-83) & Pine Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	84	303	204	1319	980	333	171	1052	214	161	1025	130
Future Volume (veh/h)	84	303	204	1319	980	333	171	1052	214	161	1025	130
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1800	1900	1900	1700	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	86	309	0	1346	1000	254	174	1073	109	164	1046	99
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	109	475		1158	1576	703	180	1238	1693	180	1238	368
Arrive On Green	0.06	0.13	0.00	0.37	0.44	0.44	0.07	0.29	0.29	0.07	0.29	0.29
Sat Flow, veh/h	1714	3610	1610	3141	3610	1610	3326	5415	2834	3326	5415	1610
Grp Volume(v), veh/h	86	309	0	1346	1000	254	174	1073	109	164	1046	99
Grp Sat Flow(s),veh/h/ln	1714	1805	1610	1570	1805	1610	1663	1805	1417	1663	1805	1610
Q Serve(g_s), s	4.6	7.5	0.0	34.0	19.9	9.7	4.8	17.3	1.4	4.5	16.8	4.4
Cycle Q Clear(g_c), s	4.6	7.5	0.0	34.0	19.9	9.7	4.8	17.3	1.4	4.5	16.8	4.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	109	475		1158	1576	703	180	1238	1693	180	1238	368
V/C Ratio(X)	0.79	0.65		1.16	0.63	0.36	0.96	0.87	0.06	0.91	0.85	0.27
Avail Cap(c_a), veh/h	279	1488		1158	2232	996	180	1351	1752	180	1351	402
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.25	1.25	1.25	1.25	1.25	1.25
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.5	38.0	0.0	29.1	20.2	17.4	42.9	31.6	7.2	42.7	31.4	27.0
Incr Delay (d2), s/veh	4.7	2.2	0.0	82.7	0.6	0.4	56.2	5.4	0.0	41.4	4.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	3.3	0.0	24.7	7.5	3.3	3.2	7.0	0.3	2.8	6.7	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.2	40.2	0.0	111.8	20.9	17.8	99.1	37.0	7.2	84.1	35.8	27.1
LnGrp LOS	D	D		F	C	B	F	D	A	F	D	C
Approach Vol, veh/h		395	A		2600			1356			1309	
Approach Delay, s/veh		41.7			67.6			42.6			41.2	
Approach LOS		D			E			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.0	27.1	38.0	18.1	9.0	27.1	9.9	46.2
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	5.0	23.0	34.0	38.0	5.0	23.0	15.0	57.0
Max Q Clear Time (g_c+I1), s	6.5	19.3	36.0	9.5	6.8	18.8	6.6	21.9
Green Ext Time (p_c), s	0.0	1.7	0.0	2.6	0.0	1.9	0.0	13.0

Intersection Summary	
HCM 6th Ctrl Delay	53.7
HCM 6th LOS	D

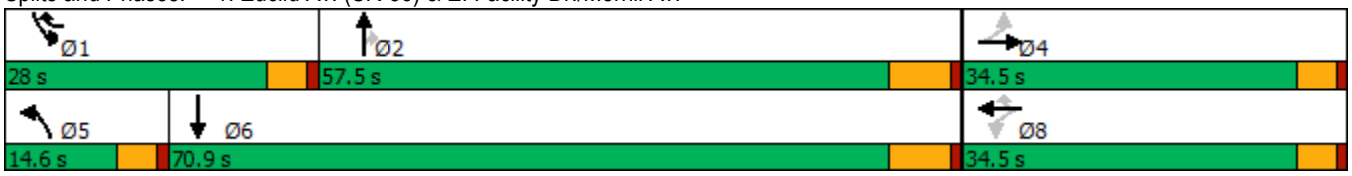
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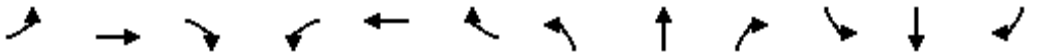
Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	14	37	633	3	421	5	1513	801	392	1626
Future Volume (vph)	14	37	633	3	421	5	1513	801	392	1626
Turn Type	Perm	NA	Perm	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	1	5	2		1	6
Permitted Phases	4		8		8			2		
Detector Phase	4	4	8	8	1	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	15.0	15.0	10.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	9.6	9.6	21.6	21.6	14.6	14.6	28.5	28.5	14.6	42.5
Total Split (s)	34.5	34.5	34.5	34.5	28.0	14.6	57.5	57.5	28.0	70.9
Total Split (%)	28.8%	28.8%	28.8%	28.8%	23.3%	12.2%	47.9%	47.9%	23.3%	59.1%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	3.6	5.5	5.5	3.6	5.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	4.6	4.6	4.6	4.6	6.5	6.5	4.6	6.5
Lead/Lag					Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	Max	None	Max
Act Effct Green (s)	29.9	29.9	29.9	29.9	53.3	10.0	51.1	51.1	18.8	71.6
Actuated g/C Ratio	0.26	0.26	0.26	0.26	0.46	0.09	0.44	0.44	0.16	0.62
v/c Ratio	0.04	0.12	1.06	0.01	0.60	0.03	0.72	0.97	0.79	0.55
Control Delay	34.1	26.7	93.0	33.7	25.2	50.6	28.9	44.0	57.7	14.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.1	26.7	93.0	33.7	25.2	50.6	28.9	44.0	57.7	14.1
LOS	C	C	F	C	C	D	C	D	E	B
Approach Delay		28.3		65.8			34.1			22.5
Approach LOS		C		E			C			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 115.5	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.06	
Intersection Signal Delay: 35.9	Intersection LOS: D
Intersection Capacity Utilization 79.8%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: Euclid Av. (SR-83) & E. Facility Dr./Merrill Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	37	15	633	3	421	5	1513	801	392	1626	1
Future Volume (veh/h)	14	37	15	633	3	421	5	1513	801	392	1626	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	15	40	12	688	3	344	5	1645	654	426	1767	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	339	370	111	773	501	662	22	2335	725	490	3033	0
Arrive On Green	0.26	0.26	0.26	0.26	0.26	0.26	0.01	0.45	0.45	0.15	0.58	0.00
Sat Flow, veh/h	1050	1403	421	2665	1900	1610	1714	5187	1610	3326	5358	0
Grp Volume(v), veh/h	15	0	52	688	3	344	5	1645	654	426	1767	0
Grp Sat Flow(s),veh/h/ln	1050	0	1824	1333	1900	1610	1714	1729	1610	1663	1729	0
Q Serve(g_s), s	1.2	0.0	2.4	27.5	0.1	18.1	0.3	28.9	42.6	14.2	24.3	0.0
Cycle Q Clear(g_c), s	1.3	0.0	2.4	29.9	0.1	18.1	0.3	28.9	42.6	14.2	24.3	0.0
Prop In Lane	1.00		0.23	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	339	0	481	773	501	662	22	2335	725	490	3033	0
V/C Ratio(X)	0.04	0.00	0.11	0.89	0.01	0.52	0.23	0.70	0.90	0.87	0.58	0.00
Avail Cap(c_a), veh/h	339	0	481	773	501	662	151	2335	725	687	3033	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	31.2	0.0	31.6	43.8	30.7	25.0	55.4	25.1	28.8	47.2	14.8	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	12.1	0.0	0.3	1.9	1.8	16.6	6.6	0.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	1.1	10.6	0.1	6.5	0.1	11.1	18.0	6.0	8.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.3	0.0	31.6	55.8	30.7	25.3	57.3	26.9	45.5	53.9	15.6	0.0
LnGrp LOS	C	A	C	E	C	C	E	C	D	D	B	A
Approach Vol, veh/h		67			1035			2304			2193	
Approach Delay, s/veh		31.5			45.6			32.2			23.1	
Approach LOS		C			D			C			C	

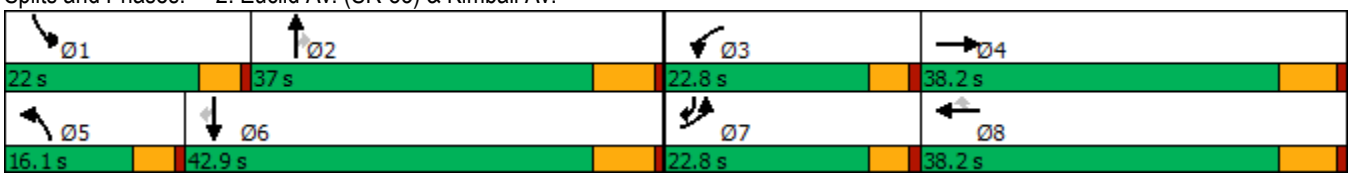
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	21.3	57.5		34.5	6.1	72.7		34.5				
Change Period (Y+Rc), s	4.6	6.5		4.6	4.6	6.5		4.6				
Max Green Setting (Gmax), s	23.4	51.0		29.9	10.0	64.4		29.9				
Max Q Clear Time (g_c+I1), s	16.2	44.6		4.4	2.3	26.3		31.9				
Green Ext Time (p_c), s	0.5	5.3		0.2	0.0	16.1		0.0				

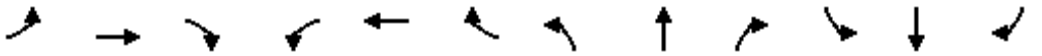
Intersection Summary												
HCM 6th Ctrl Delay			31.1									
HCM 6th LOS			C									

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	591	962	95	397	232	147	1329	156	521	1418	419
Future Volume (vph)	591	962	95	397	232	147	1329	156	521	1418	419
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2		1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	2	1	6	7
Switch Phase											
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.6	38.2	9.6	38.2	38.2	14.6	36.5	36.5	9.6	33.5	9.6
Total Split (s)	22.8	38.2	22.8	38.2	38.2	16.1	37.0	37.0	22.0	42.9	22.8
Total Split (%)	19.0%	31.8%	19.0%	31.8%	31.8%	13.4%	30.8%	30.8%	18.3%	35.8%	19.0%
Yellow Time (s)	3.6	5.2	3.6	5.2	5.2	3.6	5.5	5.5	3.6	5.5	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	4.6	6.2	6.2	4.6	6.5	6.5	4.6	6.5	4.6
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	Max	None	Max	None
Act Effct Green (s)	18.2	33.5	7.7	22.9	22.9	11.5	30.6	30.6	17.4	36.5	61.3
Actuated g/C Ratio	0.16	0.30	0.07	0.21	0.21	0.10	0.28	0.28	0.16	0.33	0.55
v/c Ratio	1.08	1.05	0.43	0.54	0.46	0.85	0.86	0.28	1.05	0.77	0.45
Control Delay	106.2	79.4	55.8	42.1	8.3	88.0	45.6	6.7	99.8	37.4	11.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	106.2	79.4	55.8	42.1	8.3	88.0	45.6	6.7	99.8	37.4	11.6
LOS	F	E	E	D	A	F	D	A	F	D	B
Approach Delay		88.4		33.1			45.7			46.6	
Approach LOS		F		C			D			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 111.1	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.08	
Intersection Signal Delay: 56.2	Intersection LOS: E
Intersection Capacity Utilization 97.9%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 2: Euclid Av. (SR-83) & Kimball Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	591	962	206	95	397	232	147	1329	156	521	1418	419
Future Volume (veh/h)	591	962	206	95	397	232	147	1329	156	521	1418	419
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1700	1900	1900	1800	1900	1900	1800	1900	1900	1700	1900	1900
Adj Flow Rate, veh/h	603	982	105	97	405	99	150	1356	77	532	1447	321
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	552	1012	108	152	632	282	177	1630	460	528	1972	832
Arrive On Green	0.17	0.30	0.30	0.05	0.18	0.18	0.13	0.36	0.36	0.20	0.43	0.43
Sat Flow, veh/h	3238	3374	361	3326	3610	1610	1714	5700	1610	3238	5700	1610
Grp Volume(v), veh/h	603	553	534	97	405	99	150	1356	77	532	1447	321
Grp Sat Flow(s),veh/h/ln	1619	1900	1835	1663	1805	1610	1714	1900	1610	1619	1900	1610
Q Serve(g_s), s	18.2	30.6	30.7	3.1	11.1	5.8	9.1	23.2	3.5	17.4	22.5	11.9
Cycle Q Clear(g_c), s	18.2	30.6	30.7	3.1	11.1	5.8	9.1	23.2	3.5	17.4	22.5	11.9
Prop In Lane	1.00		0.20	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	552	570	551	152	632	282	177	1630	460	528	1972	832
V/C Ratio(X)	1.09	0.97	0.97	0.64	0.64	0.35	0.85	0.83	0.17	1.01	0.73	0.39
Avail Cap(c_a), veh/h	552	570	551	567	1083	483	185	1630	460	528	1972	832
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.25	1.25	1.25	1.25	1.25	1.25
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.2	36.9	36.9	50.0	40.9	38.7	45.6	31.9	25.6	42.5	26.2	13.3
Incr Delay (d2), s/veh	65.5	30.1	30.8	1.7	1.1	0.7	26.7	5.1	0.8	40.9	2.5	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.0	18.0	17.5	1.3	4.8	2.2	4.9	9.8	1.4	9.2	8.8	3.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	109.8	66.9	67.7	51.7	42.0	39.4	72.3	37.0	26.4	83.4	28.7	14.7
LnGrp LOS	F	E	E	D	D	D	E	D	C	F	C	B
Approach Vol, veh/h		1690			601			1583			2300	
Approach Delay, s/veh		82.5			43.1			39.9			39.4	
Approach LOS		F			D			D			D	

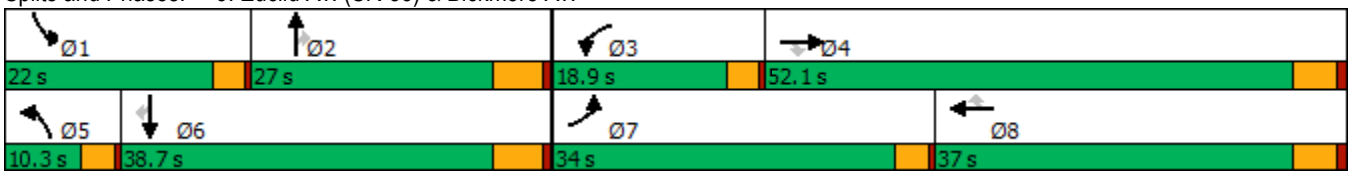
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	22.0	37.0	9.5	38.2	15.6	43.4	22.8	24.9
Change Period (Y+Rc), s	4.6	6.5	4.6	6.2	4.6	6.5	4.6	6.2
Max Green Setting (Gmax), s	17.4	30.5	18.2	32.0	11.5	36.4	18.2	32.0
Max Q Clear Time (g_c+I1), s	19.4	25.2	5.1	32.7	11.1	24.5	20.2	13.1
Green Ext Time (p_c), s	0.0	3.5	0.1	0.0	0.0	7.5	0.0	2.5

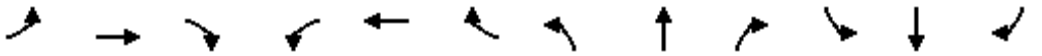
Intersection Summary	
HCM 6th Ctrl Delay	51.7
HCM 6th LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	219	143	138	43	37	163	55	1382	117	186	1458	199
Future Volume (vph)	219	143	138	43	37	163	55	1382	117	186	1458	199
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	37.0	37.0	8.5	37.0	37.0	8.5	26.5	26.5	8.5	30.5	30.5
Total Split (s)	34.0	52.1	52.1	18.9	37.0	37.0	10.3	27.0	27.0	22.0	38.7	38.7
Total Split (%)	28.3%	43.4%	43.4%	15.8%	30.8%	30.8%	8.6%	22.5%	22.5%	18.3%	32.3%	32.3%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.5	4.5	3.0	4.5	4.5
All-Red Time (s)	0.5	1.0	1.0	0.5	1.0	1.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.5	5.5	3.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
Act Effct Green (s)	14.7	22.7	22.7	5.9	9.7	9.7	6.5	26.0	26.0	12.8	34.6	34.6
Actuated g/C Ratio	0.18	0.28	0.28	0.07	0.12	0.12	0.08	0.32	0.32	0.16	0.42	0.42
v/c Ratio	0.70	0.28	0.26	0.18	0.17	0.49	0.42	0.86	0.20	0.68	0.68	0.26
Control Delay	45.0	25.2	5.2	43.1	34.5	10.7	51.5	35.2	5.0	48.0	24.4	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.0	25.2	5.2	43.1	34.5	10.7	51.5	35.2	5.0	48.0	24.4	7.4
LOS	D	C	A	D	C	B	D	D	A	D	C	A
Approach Delay		28.4			20.0			33.5			25.0	
Approach LOS		C			C			C			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 81.5	
Natural Cycle: 105	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 28.3	Intersection LOS: C
Intersection Capacity Utilization 69.4%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 3: Euclid Av. (SR-83) & Bickmore Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	219	143	138	43	37	163	55	1382	117	186	1458	199
Future Volume (veh/h)	219	143	138	43	37	163	55	1382	117	186	1458	199
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	226	147	126	44	38	155	57	1425	102	192	1503	171
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	273	472	400	139	249	211	84	1612	500	235	2069	642
Arrive On Green	0.16	0.25	0.25	0.04	0.13	0.13	0.05	0.31	0.31	0.14	0.40	0.40
Sat Flow, veh/h	1714	1900	1608	3326	1900	1610	1714	5187	1610	1714	5187	1610
Grp Volume(v), veh/h	226	147	126	44	38	155	57	1425	102	192	1503	171
Grp Sat Flow(s),veh/h/ln	1714	1900	1608	1663	1900	1610	1714	1729	1610	1714	1729	1610
Q Serve(g_s), s	8.5	4.2	4.3	0.9	1.2	6.2	2.2	17.4	3.1	7.3	16.4	4.8
Cycle Q Clear(g_c), s	8.5	4.2	4.3	0.9	1.2	6.2	2.2	17.4	3.1	7.3	16.4	4.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	273	472	400	139	249	211	84	1612	500	235	2069	642
V/C Ratio(X)	0.83	0.31	0.32	0.32	0.15	0.74	0.68	0.88	0.20	0.82	0.73	0.27
Avail Cap(c_a), veh/h	783	1339	1134	767	910	771	174	1669	518	475	2578	800
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.2	20.4	20.5	31.1	25.7	27.9	31.3	21.9	16.9	28.0	17.0	13.5
Incr Delay (d2), s/veh	2.5	0.1	0.2	0.5	0.1	1.9	3.6	5.6	0.1	2.7	0.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	1.7	1.5	0.3	0.5	2.3	0.9	6.6	1.0	2.8	5.1	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.7	20.6	20.6	31.6	25.8	29.8	34.8	27.5	17.0	30.7	17.5	13.6
LnGrp LOS	C	C	C	C	C	C	C	C	B	C	B	B
Approach Vol, veh/h		499			237			1584			1866	
Approach Delay, s/veh		24.7			29.5			27.1			18.5	
Approach LOS		C			C			C			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.7	26.3	6.3	21.6	6.8	32.2	14.1	13.7
Change Period (Y+Rc), s	3.5	5.5	3.5	5.0	3.5	5.5	3.5	5.0
Max Green Setting (Gmax), s	18.5	21.5	15.4	47.1	6.8	33.2	30.5	32.0
Max Q Clear Time (g_c+I1), s	9.3	19.4	2.9	6.3	4.2	18.4	10.5	8.2
Green Ext Time (p_c), s	0.2	1.3	0.0	0.7	0.0	6.0	0.3	0.3

Intersection Summary	
HCM 6th Ctrl Delay	23.1
HCM 6th LOS	C

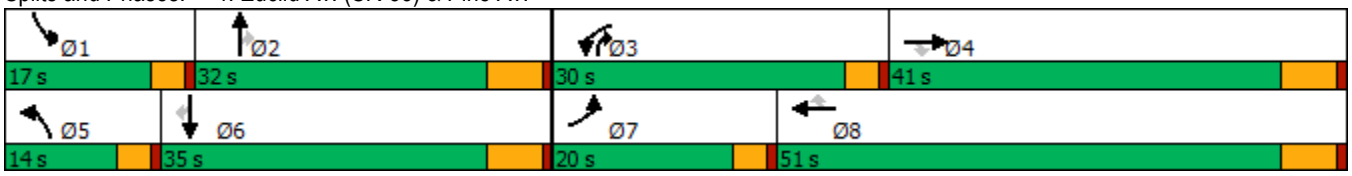
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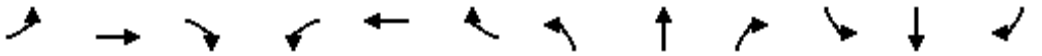
User approved pedestrian interval to be less than phase max green.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	115	911	224	712	611	244	278	1064	891	383	1175	122
Future Volume (vph)	115	911	224	712	611	244	278	1064	891	383	1175	122
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	3	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	41.0	41.0	9.0	43.0	43.0	9.0	11.0	9.0	9.0	29.0	29.0
Total Split (s)	20.0	41.0	41.0	30.0	51.0	51.0	14.0	32.0	30.0	17.0	35.0	35.0
Total Split (%)	16.7%	34.2%	34.2%	25.0%	42.5%	42.5%	11.7%	26.7%	25.0%	14.2%	29.2%	29.2%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	3.0	3.0	5.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	4.0	4.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min	Min
Act Effct Green (s)	12.4	34.5	34.5	26.0	48.1	48.1	10.0	25.6	57.6	13.0	28.6	28.6
Actuated g/C Ratio	0.10	0.29	0.29	0.22	0.40	0.40	0.08	0.21	0.48	0.11	0.24	0.24
v/c Ratio	0.69	0.88	0.40	1.07	0.42	0.32	1.03	0.92	0.59	1.09	0.91	0.26
Control Delay	70.8	51.0	10.6	100.0	27.2	4.1	114.7	58.9	22.5	122.9	55.1	6.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.8	51.0	10.6	100.0	27.2	4.1	114.7	58.9	22.5	122.9	55.1	6.9
LOS	E	D	B	F	C	A	F	E	C	F	E	A
Approach Delay		45.6			56.7			51.4			67.0	
Approach LOS		D			E			D			E	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 119.1	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.09	
Intersection Signal Delay: 55.4	Intersection LOS: E
Intersection Capacity Utilization 96.6%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 4: Euclid Av. (SR-83) & Pine Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	115	911	224	712	611	244	278	1064	891	383	1175	122
Future Volume (veh/h)	115	911	224	712	611	244	278	1064	891	383	1175	122
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1800	1900	1900	1700	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	122	969	0	757	650	194	296	1132	709	407	1250	73
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	147	1075		714	1587	672	291	1235	1408	378	1380	390
Arrive On Green	0.09	0.35	0.00	0.22	0.52	0.42	0.11	0.32	0.27	0.14	0.36	0.30
Sat Flow, veh/h	1714	3800	1610	3238	3800	1610	3429	5700	3220	3429	5700	1610
Grp Volume(v), veh/h	122	969	0	757	650	194	296	1132	709	407	1250	73
Grp Sat Flow(s),veh/h/ln	1714	1900	1610	1619	1900	1610	1714	1900	1610	1714	1900	1610
Q Serve(g_s), s	8.3	28.5	0.0	26.0	12.3	9.4	10.0	22.5	18.8	13.0	24.5	4.0
Cycle Q Clear(g_c), s	8.3	28.5	0.0	26.0	12.3	9.4	10.0	22.5	18.8	13.0	24.5	4.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	147	1075		714	1587	672	291	1235	1408	378	1380	390
V/C Ratio(X)	0.83	0.90		1.06	0.41	0.29	1.02	0.92	0.50	1.08	0.91	0.19
Avail Cap(c_a), veh/h	233	1128		714	1587	672	291	1257	1420	378	1402	396
HCM Platoon Ratio	1.00	1.25	1.00	1.00	1.25	1.00	1.25	1.50	1.25	1.25	1.50	1.25
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.0	36.5	0.0	46.0	19.3	22.7	52.7	38.8	22.3	50.8	36.3	32.5
Incr Delay (d2), s/veh	6.8	10.0	0.0	50.8	0.2	0.3	57.4	10.3	0.1	68.3	8.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	13.4	0.0	15.0	4.8	3.4	6.3	9.8	6.1	8.7	10.3	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.8	46.6	0.0	96.7	19.6	23.1	110.2	49.1	22.4	119.1	44.7	32.6
LnGrp LOS	E	D		F	B	C	F	D	C	F	D	C
Approach Vol, veh/h		1091	A		1601			2137			1730	
Approach Delay, s/veh		48.0			56.5			48.7			61.7	
Approach LOS		D			E			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.0	31.5	30.0	39.4	14.0	34.5	14.1	55.2
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	13.0	26.0	26.0	35.0	10.0	29.0	16.0	45.0
Max Q Clear Time (g_c+I1), s	15.0	24.5	28.0	30.5	12.0	26.5	10.3	14.3
Green Ext Time (p_c), s	0.0	1.0	0.0	2.8	0.0	1.4	0.1	7.4

Intersection Summary	
HCM 6th Ctrl Delay	53.9
HCM 6th LOS	D

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

APPENDIX 7.7:

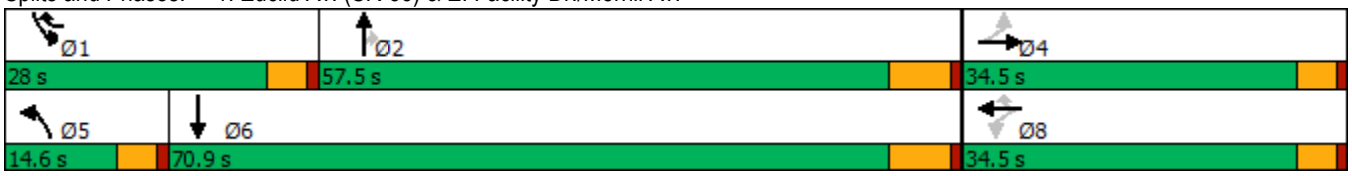
HORIZON YEAR (2040) WITH PROJECT CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS WITH IMPROVEMENTS

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Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	10	10	389	60	458	13	1304	444	364	1474
Future Volume (vph)	10	10	389	60	458	13	1304	444	364	1474
Turn Type	Perm	NA	Perm	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	1	5	2		1	6
Permitted Phases	4		8		8			2		
Detector Phase	4	4	8	8	1	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	15.0	15.0	10.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	9.6	9.6	21.6	21.6	14.6	14.6	28.5	28.5	14.6	42.5
Total Split (s)	34.5	34.5	34.5	34.5	28.0	14.6	57.5	57.5	28.0	70.9
Total Split (%)	28.8%	28.8%	28.8%	28.8%	23.3%	12.2%	47.9%	47.9%	23.3%	59.1%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	3.6	5.5	5.5	3.6	5.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	4.6	4.6	4.6	4.6	6.5	6.5	4.6	6.5
Lead/Lag					Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	Max	None	Max
Act Effct Green (s)	21.0	21.0	21.0	21.0	42.1	10.1	51.4	51.4	16.4	69.9
Actuated g/C Ratio	0.20	0.20	0.20	0.20	0.40	0.10	0.49	0.49	0.16	0.67
v/c Ratio	0.04	0.09	0.78	0.16	0.71	0.08	0.53	0.51	0.72	0.46
Control Delay	34.6	18.5	51.0	36.0	30.1	48.8	20.5	12.6	50.9	10.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.6	18.5	51.0	36.0	30.1	48.8	20.5	12.6	50.9	10.1
LOS	C	B	D	D	C	D	C	B	D	B
Approach Delay		22.3		39.5			18.7			18.0
Approach LOS		C		D			B			B

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 104.7	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 22.5	Intersection LOS: C
Intersection Capacity Utilization 70.8%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1: Euclid Av. (SR-83) & E. Facility Dr./Merrill Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	10	21	389	60	458	13	1304	444	364	1474	49
Future Volume (veh/h)	10	10	21	389	60	458	13	1304	444	364	1474	49
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	10	10	21	401	62	445	13	1344	415	375	1520	37
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	273	140	293	785	486	625	51	2448	760	440	2991	73
Arrive On Green	0.26	0.26	0.26	0.26	0.26	0.26	0.03	0.47	0.47	0.13	0.57	0.57
Sat Flow, veh/h	906	546	1147	2716	1900	1610	1714	5187	1610	3326	5205	127
Grp Volume(v), veh/h	10	0	31	401	62	445	13	1344	415	375	1010	547
Grp Sat Flow(s),veh/h/ln	906	0	1694	1358	1900	1610	1714	1729	1610	1663	1729	1874
Q Serve(g_s), s	1.0	0.0	1.6	14.7	2.8	26.2	0.8	20.7	20.6	12.4	19.7	19.7
Cycle Q Clear(g_c), s	3.8	0.0	1.6	16.3	2.8	26.2	0.8	20.7	20.6	12.4	19.7	19.7
Prop In Lane	1.00		0.68	1.00		1.00	1.00		1.00	1.00		0.07
Lane Grp Cap(c), veh/h	273	0	433	785	486	625	51	2448	760	440	1987	1077
V/C Ratio(X)	0.04	0.00	0.07	0.51	0.13	0.71	0.26	0.55	0.55	0.85	0.51	0.51
Avail Cap(c_a), veh/h	283	0	452	815	507	643	153	2448	760	694	1987	1077
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.5	0.0	31.6	37.8	32.1	29.0	53.2	21.1	21.1	47.6	14.3	14.3
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.2	0.0	3.0	1.0	0.9	2.8	3.4	0.9	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.7	4.7	1.2	9.9	0.4	7.7	7.5	5.1	6.8	7.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.6	0.0	31.7	38.0	32.1	32.0	54.1	22.0	23.9	51.0	15.3	16.0
LnGrp LOS	C	A	C	D	C	C	D	C	C	D	B	B
Approach Vol, veh/h		41			908			1772			1932	
Approach Delay, s/veh		32.1			34.7			22.7			22.4	
Approach LOS		C			C			C			C	

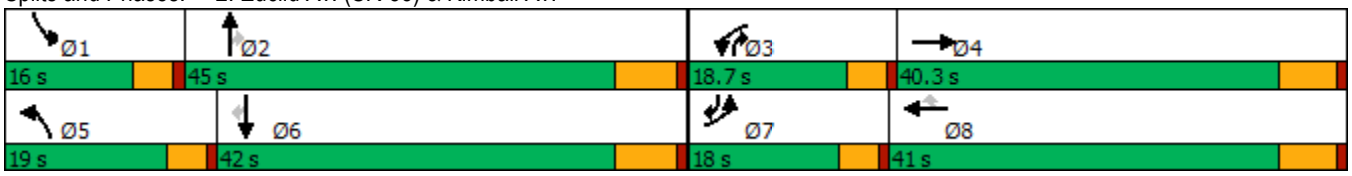
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	19.4	59.4		33.3	7.9	70.9		33.3				
Change Period (Y+Rc), s	4.6	6.5		4.6	4.6	6.5		4.6				
Max Green Setting (Gmax), s	23.4	51.0		29.9	10.0	64.4		29.9				
Max Q Clear Time (g_c+I1), s	14.4	22.7		5.8	2.8	21.7		28.2				
Green Ext Time (p_c), s	0.5	12.0		0.1	0.0	12.6		0.5				

Intersection Summary			
HCM 6th Ctrl Delay		25.0	
HCM 6th LOS		C	

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	213	301	224	943	423	178	1234	58	248	1270	483
Future Volume (vph)	213	301	224	943	423	178	1234	58	248	1270	483
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2	3	1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	3	1	6	7
Switch Phase											
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0	5.0	5.0	5.0	5.0	10.0
Minimum Split (s)	14.6	38.2	14.6	38.2	38.2	14.6	36.5	14.6	9.6	33.5	14.6
Total Split (s)	18.0	40.3	18.7	41.0	41.0	19.0	45.0	18.7	16.0	42.0	18.0
Total Split (%)	15.0%	33.6%	15.6%	34.2%	34.2%	15.8%	37.5%	15.6%	13.3%	35.0%	15.0%
Yellow Time (s)	3.6	5.2	3.6	5.2	5.2	3.6	5.5	3.6	3.6	5.5	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	4.6	6.2	6.2	4.6	6.5	4.6	4.6	6.5	4.6
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	None	None	Max	None
Act Effct Green (s)	12.0	34.3	12.0	34.2	34.2	14.0	38.5	57.0	11.2	35.7	49.7
Actuated g/C Ratio	0.10	0.29	0.10	0.29	0.29	0.12	0.33	0.48	0.09	0.30	0.42
v/c Ratio	0.68	0.40	0.68	0.92	0.69	0.90	0.74	0.07	0.85	0.82	0.59
Control Delay	62.6	31.6	61.8	54.9	23.5	93.6	38.8	3.0	78.6	43.9	23.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.6	31.6	61.8	54.9	23.5	93.6	38.8	3.0	78.6	43.9	23.0
LOS	E	C	E	D	C	F	D	A	E	D	C
Approach Delay		42.2		47.5			44.1			43.1	
Approach LOS		D		D			D			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 117.9	
Natural Cycle: 105	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay: 44.5	Intersection LOS: D
Intersection Capacity Utilization 87.6%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 2: Euclid Av. (SR-83) & Kimball Av.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	213	301	109	224	943	423	178	1234	58	248	1270	483
Future Volume (veh/h)	213	301	109	224	943	423	178	1234	58	248	1270	483
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1700	1900	1900	1800	1900	1900	1800	1900	1900	1700	1900	1900
Adj Flow Rate, veh/h	217	307	110	229	962	405	182	1259	16	253	1296	479
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	272	767	270	287	1056	471	208	1733	677	303	1604	631
Arrive On Green	0.09	0.29	0.29	0.09	0.29	0.29	0.12	0.33	0.33	0.10	0.31	0.31
Sat Flow, veh/h	3141	2619	920	3326	3610	1610	1714	5187	1610	3141	5187	1588
Grp Volume(v), veh/h	217	210	207	229	962	405	182	1259	16	253	1296	479
Grp Sat Flow(s),veh/h/ln	1570	1805	1734	1663	1805	1610	1714	1729	1610	1570	1729	1588
Q Serve(g_s), s	7.8	10.7	11.1	7.8	29.6	27.4	12.0	24.6	0.7	9.1	26.5	30.1
Cycle Q Clear(g_c), s	7.8	10.7	11.1	7.8	29.6	27.4	12.0	24.6	0.7	9.1	26.5	30.1
Prop In Lane	1.00		0.53	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	272	529	508	287	1056	471	208	1733	677	303	1604	631
V/C Ratio(X)	0.80	0.40	0.41	0.80	0.91	0.86	0.87	0.73	0.02	0.83	0.81	0.76
Avail Cap(c_a), veh/h	365	534	513	407	1090	486	214	1733	677	311	1604	631
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.6	32.6	32.7	51.7	39.3	38.5	49.8	33.7	19.6	51.1	36.6	30.1
Incr Delay (d2), s/veh	6.2	0.5	0.5	4.6	11.1	14.1	28.8	2.7	0.1	16.1	4.5	8.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	4.5	4.5	3.3	14.0	12.1	6.6	10.0	0.3	4.1	11.1	12.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.8	33.1	33.2	56.3	50.4	52.7	78.6	36.4	19.6	67.3	41.1	38.5
LnGrp LOS	E	C	C	E	D	D	E	D	B	E	D	D
Approach Vol, veh/h		634			1596			1457			2028	
Approach Delay, s/veh		41.6			51.8			41.5			43.8	
Approach LOS		D			D			D			D	

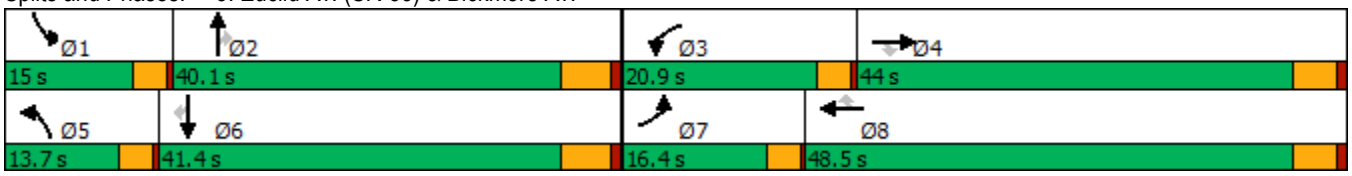
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.7	45.0	14.5	40.0	18.6	42.1	14.6	39.9
Change Period (Y+Rc), s	4.6	6.5	4.6	6.2	4.6	6.5	4.6	6.2
Max Green Setting (Gmax), s	11.4	38.5	14.1	34.1	14.4	35.5	13.4	34.8
Max Q Clear Time (g_c+I1), s	11.1	26.6	9.8	13.1	14.0	32.1	9.8	31.6
Green Ext Time (p_c), s	0.0	6.0	0.2	2.1	0.0	2.6	0.1	2.1

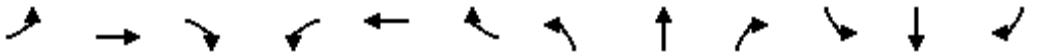
Intersection Summary	
HCM 6th Ctrl Delay	45.2
HCM 6th LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	81	34	47	356	387	313	92	1088	49	222	1263	245
Future Volume (vph)	81	34	47	356	387	313	92	1088	49	222	1263	245
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	44.0	44.0	8.5	44.0	44.0	8.5	26.5	26.5	8.5	30.5	30.5
Total Split (s)	16.4	44.0	44.0	20.9	48.5	48.5	13.7	40.1	40.1	15.0	41.4	41.4
Total Split (%)	13.7%	36.7%	36.7%	17.4%	40.4%	40.4%	11.4%	33.4%	33.4%	12.5%	34.5%	34.5%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.5	4.5	3.0	4.5	4.5
All-Red Time (s)	0.5	1.0	1.0	0.5	1.0	1.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.5	5.5	3.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
Act Effct Green (s)	9.3	20.0	20.0	16.7	27.0	27.0	9.3	29.2	29.2	10.8	30.7	30.7
Actuated g/C Ratio	0.10	0.22	0.22	0.18	0.29	0.29	0.10	0.32	0.32	0.12	0.33	0.33
v/c Ratio	0.51	0.09	0.12	0.59	0.76	0.56	0.58	0.72	0.09	0.62	0.80	0.39
Control Delay	56.6	30.1	0.5	44.0	40.8	16.8	61.0	32.7	0.3	51.6	34.0	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.6	30.1	0.5	44.0	40.8	16.8	61.0	32.7	0.3	51.6	34.0	7.3
LOS	E	C	A	D	D	B	E	C	A	D	C	A
Approach Delay		34.8			34.8			33.5			32.5	
Approach LOS		C			C			C			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 92.2	
Natural Cycle: 95	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.80	
Intersection Signal Delay: 33.5	Intersection LOS: C
Intersection Capacity Utilization 70.3%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 3: Euclid Av. (SR-83) & Bickmore Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	81	34	47	356	387	313	92	1088	49	222	1263	245
Future Volume (veh/h)	81	34	47	356	387	313	92	1088	49	222	1263	245
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	88	37	42	387	421	313	100	1183	46	241	1373	249
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	112	356	302	494	506	428	127	1666	506	333	1801	547
Arrive On Green	0.07	0.19	0.19	0.14	0.27	0.27	0.07	0.32	0.32	0.10	0.35	0.35
Sat Flow, veh/h	1714	1900	1610	3429	1900	1610	1714	5187	1576	3326	5187	1576
Grp Volume(v), veh/h	88	37	42	387	421	313	100	1183	46	241	1373	249
Grp Sat Flow(s),veh/h/ln	1714	1900	1610	1714	1900	1610	1714	1729	1576	1663	1729	1576
Q Serve(g_s), s	3.6	1.1	1.5	7.7	14.8	12.5	4.1	14.2	1.4	5.0	16.6	8.7
Cycle Q Clear(g_c), s	3.6	1.1	1.5	7.7	14.8	12.5	4.1	14.2	1.4	5.0	16.6	8.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	112	356	302	494	506	428	127	1666	506	333	1801	547
V/C Ratio(X)	0.78	0.10	0.14	0.78	0.83	0.73	0.79	0.71	0.09	0.72	0.76	0.45
Avail Cap(c_a), veh/h	312	1047	887	843	1168	990	247	2536	770	540	2631	800
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.6	23.8	24.0	29.2	24.5	23.7	32.2	21.1	16.8	30.9	20.5	17.9
Incr Delay (d2), s/veh	4.5	0.0	0.1	1.1	1.4	0.9	4.1	0.2	0.0	1.1	0.4	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.5	0.6	3.0	6.2	4.4	1.6	4.8	0.5	1.8	5.5	2.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.1	23.9	24.1	30.3	25.9	24.6	36.3	21.3	16.8	32.0	20.9	18.1
LnGrp LOS	D	C	C	C	C	C	D	C	B	C	C	B
Approach Vol, veh/h		167			1121			1329			1863	
Approach Delay, s/veh		30.9			27.0			22.3			22.0	
Approach LOS		C			C			C			C	

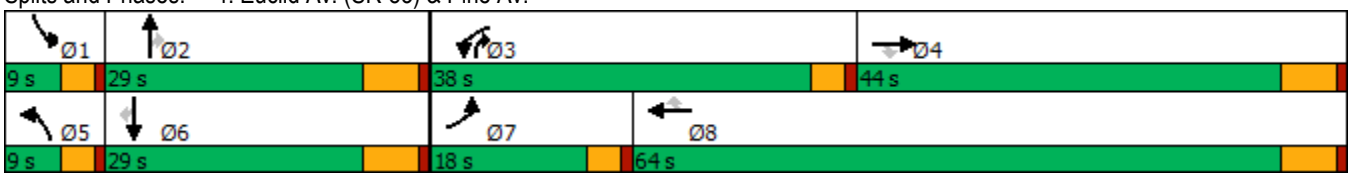
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.6	28.2	13.7	18.3	8.7	30.1	8.1	23.8
Change Period (Y+Rc), s	3.5	5.5	3.5	5.0	3.5	5.5	3.5	5.0
Max Green Setting (Gmax), s	11.5	34.6	17.4	39.0	10.2	35.9	12.9	43.5
Max Q Clear Time (g_c+I1), s	7.0	16.2	9.7	3.5	6.1	18.6	5.6	16.8
Green Ext Time (p_c), s	0.2	4.7	0.5	0.2	0.0	5.9	0.0	2.0

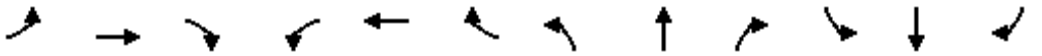
Intersection Summary	
HCM 6th Ctrl Delay	23.7
HCM 6th LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	88	303	204	1319	980	337	171	1064	214	164	1034	133
Future Volume (vph)	88	303	204	1319	980	337	171	1064	214	164	1034	133
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	3	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	43.0	43.0	9.0	45.0	45.0	9.0	11.0	9.0	9.0	29.0	29.0
Total Split (s)	18.0	44.0	44.0	38.0	64.0	64.0	9.0	29.0	38.0	9.0	29.0	29.0
Total Split (%)	15.0%	36.7%	36.7%	31.7%	53.3%	53.3%	7.5%	24.2%	31.7%	7.5%	24.2%	24.2%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	3.0	3.0	5.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	4.0	4.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min	Min
Act Effct Green (s)	9.6	19.3	19.3	34.3	46.2	46.2	5.0	23.2	63.5	5.0	23.2	23.2
Actuated g/C Ratio	0.09	0.19	0.19	0.34	0.45	0.45	0.05	0.23	0.62	0.05	0.23	0.23
v/c Ratio	0.56	0.45	0.50	1.28	0.61	0.39	1.07	0.88	0.12	1.02	0.86	0.29
Control Delay	59.5	37.8	17.0	163.9	23.7	6.2	136.8	48.7	1.8	126.3	47.0	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.5	37.8	17.0	163.9	23.7	6.2	136.8	48.7	1.8	126.3	47.0	8.4
LOS	E	D	B	F	C	A	F	D	A	F	D	A
Approach Delay		33.9			91.6			52.2			52.9	
Approach LOS		C			F			D			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 102	
Natural Cycle: 115	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.28	
Intersection Signal Delay: 67.8	Intersection LOS: E
Intersection Capacity Utilization 92.6%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 4: Euclid Av. (SR-83) & Pine Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	88	303	204	1319	980	337	171	1064	214	164	1034	133
Future Volume (veh/h)	88	303	204	1319	980	337	171	1064	214	164	1034	133
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1800	1900	1900	1700	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	90	309	0	1346	1000	258	174	1086	109	167	1055	102
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	114	474		1156	1562	697	180	1246	1695	180	1246	370
Arrive On Green	0.07	0.13	0.00	0.37	0.43	0.43	0.07	0.29	0.29	0.07	0.29	0.29
Sat Flow, veh/h	1714	3610	1610	3141	3610	1610	3326	5415	2834	3326	5415	1610
Grp Volume(v), veh/h	90	309	0	1346	1000	258	174	1086	109	167	1055	102
Grp Sat Flow(s),veh/h/ln	1714	1805	1610	1570	1805	1610	1663	1805	1417	1663	1805	1610
Q Serve(g_s), s	4.8	7.5	0.0	34.0	20.1	10.0	4.8	17.6	1.4	4.6	17.0	4.5
Cycle Q Clear(g_c), s	4.8	7.5	0.0	34.0	20.1	10.0	4.8	17.6	1.4	4.6	17.0	4.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	114	474		1156	1562	697	180	1246	1695	180	1246	370
V/C Ratio(X)	0.79	0.65		1.16	0.64	0.37	0.97	0.87	0.06	0.93	0.85	0.28
Avail Cap(c_a), veh/h	260	1485		1156	2266	1011	180	1348	1748	180	1348	401
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.25	1.25	1.25	1.25	1.25	1.25
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.5	38.1	0.0	29.2	20.6	17.7	43.0	31.6	7.2	42.9	31.4	27.0
Incr Delay (d2), s/veh	4.5	2.2	0.0	83.8	0.6	0.5	56.9	5.7	0.0	46.1	4.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	3.3	0.0	24.8	7.6	3.4	3.3	7.1	0.3	2.9	6.8	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.0	40.3	0.0	113.0	21.2	18.2	99.9	37.3	7.2	89.0	35.9	27.1
LnGrp LOS	D	D		F	C	B	F	D	A	F	D	C
Approach Vol, veh/h		399	A		2604			1369			1324	
Approach Delay, s/veh		41.8			68.3			42.9			41.9	
Approach LOS		D			E			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.0	27.3	38.0	18.1	9.0	27.3	10.1	46.0
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	5.0	23.0	34.0	38.0	5.0	23.0	14.0	58.0
Max Q Clear Time (g_c+I1), s	6.6	19.6	36.0	9.5	6.8	19.0	6.8	22.1
Green Ext Time (p_c), s	0.0	1.6	0.0	2.6	0.0	1.8	0.0	13.1

Intersection Summary	
HCM 6th Ctrl Delay	54.2
HCM 6th LOS	D

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1043	138	22	1380	43	9
Future Volume (vph)	1043	138	22	1380	43	9
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases		4				2
Detector Phase	4	4	3	8	2	2
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	23.2	23.2	9.6	16.2	32.1	32.1
Total Split (s)	77.7	77.7	9.6	87.3	32.7	32.7
Total Split (%)	64.8%	64.8%	8.0%	72.8%	27.3%	27.3%
Yellow Time (s)	5.2	5.2	3.6	5.2	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2	4.6	6.2	5.1	5.1
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	None	None	None	None	Min	Min
Act Effct Green (s)	32.1	32.1	5.4	33.3	12.9	12.9
Actuated g/C Ratio	0.55	0.55	0.09	0.57	0.22	0.22
v/c Ratio	0.57	0.16	0.15	0.73	0.12	0.03
Control Delay	11.1	2.5	34.5	11.8	21.7	12.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.1	2.5	34.5	11.8	21.7	12.6
LOS	B	A	C	B	C	B
Approach Delay	10.1			12.2	20.1	
Approach LOS	B			B	C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 58.3	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 11.4	Intersection LOS: B
Intersection Capacity Utilization 55.9%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 5: Mayhew Av. & Kimball Av.





Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1043	138	22	1380	43	9
Future Volume (veh/h)	1043	138	22	1380	43	9
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1900	1900	1800	1900	1800	1900
Adj Flow Rate, veh/h	1134	150	24	1500	47	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	1773	791	48	2182	318	299
Arrive On Green	0.49	0.49	0.03	0.60	0.19	0.19
Sat Flow, veh/h	3705	1610	1714	3705	1714	1610
Grp Volume(v), veh/h	1134	150	24	1500	47	10
Grp Sat Flow(s),veh/h/ln	1805	1610	1714	1805	1714	1610
Q Serve(g_s), s	12.6	2.8	0.7	15.1	1.2	0.3
Cycle Q Clear(g_c), s	12.6	2.8	0.7	15.1	1.2	0.3
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1773	791	48	2182	318	299
V/C Ratio(X)	0.64	0.19	0.50	0.69	0.15	0.03
Avail Cap(c_a), veh/h	4792	2137	159	5436	878	825
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.2	7.7	25.8	7.2	18.4	18.0
Incr Delay (d2), s/veh	0.4	0.1	3.0	0.4	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	0.7	0.3	2.9	0.5	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	10.6	7.8	28.8	7.6	18.6	18.0
LnGrp LOS	B	A	C	A	B	B
Approach Vol, veh/h	1284			1524	57	
Approach Delay, s/veh	10.2			7.9	18.5	
Approach LOS	B			A	B	

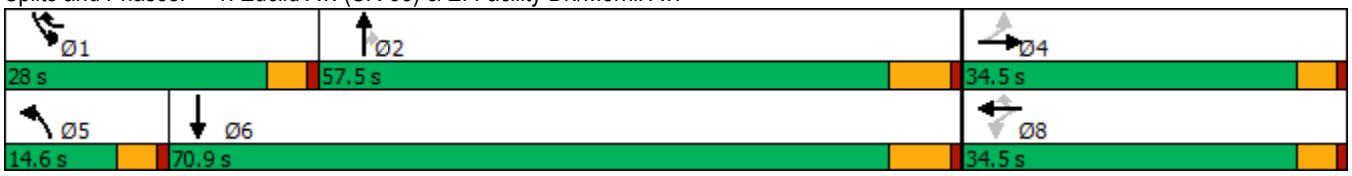
Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		15.1	6.1	32.7		38.8
Change Period (Y+Rc), s		5.1	4.6	6.2		6.2
Max Green Setting (Gmax), s		27.6	5.0	71.5		81.1
Max Q Clear Time (g_c+I1), s		3.2	2.7	14.6		17.1
Green Ext Time (p_c), s		0.1	0.0	10.2		15.4

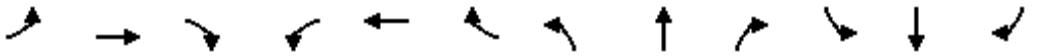
Intersection Summary	
HCM 6th Ctrl Delay	9.2
HCM 6th LOS	A

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	14	37	634	3	421	5	1559	803	392	1646
Future Volume (vph)	14	37	634	3	421	5	1559	803	392	1646
Turn Type	Perm	NA	Perm	NA	pm+ov	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	1	5	2		1	6
Permitted Phases	4		8		8			2		
Detector Phase	4	4	8	8	1	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	15.0	15.0	10.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	9.6	9.6	21.6	21.6	14.6	14.6	28.5	28.5	14.6	42.5
Total Split (s)	34.5	34.5	34.5	34.5	28.0	14.6	57.5	57.5	28.0	70.9
Total Split (%)	28.8%	28.8%	28.8%	28.8%	23.3%	12.2%	47.9%	47.9%	23.3%	59.1%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	3.6	5.5	5.5	3.6	5.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	4.6	4.6	4.6	4.6	6.5	6.5	4.6	6.5
Lead/Lag					Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	Max	None	Max
Act Effct Green (s)	29.9	29.9	29.9	29.9	53.3	10.0	51.1	51.1	18.8	71.6
Actuated g/C Ratio	0.26	0.26	0.26	0.26	0.46	0.09	0.44	0.44	0.16	0.62
v/c Ratio	0.04	0.12	1.06	0.01	0.60	0.03	0.74	0.98	0.79	0.56
Control Delay	34.1	26.7	93.4	33.7	25.2	50.6	29.5	46.0	57.7	14.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.1	26.7	93.4	33.7	25.2	50.6	29.5	46.0	57.7	14.2
LOS	C	C	F	C	C	D	C	D	E	B
Approach Delay		28.3		66.1			35.2			22.5
Approach LOS		C		E			D			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 115.5	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.06	
Intersection Signal Delay: 36.3	Intersection LOS: D
Intersection Capacity Utilization 80.8%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: Euclid Av. (SR-83) & E. Facility Dr./Merrill Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	37	15	634	3	421	5	1559	803	392	1646	1
Future Volume (veh/h)	14	37	15	634	3	421	5	1559	803	392	1646	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	15	40	12	689	3	344	5	1695	656	426	1789	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	339	370	111	773	501	662	22	2335	725	490	3033	0
Arrive On Green	0.26	0.26	0.26	0.26	0.26	0.26	0.01	0.45	0.45	0.15	0.58	0.00
Sat Flow, veh/h	1050	1403	421	2665	1900	1610	1714	5187	1610	3326	5358	0
Grp Volume(v), veh/h	15	0	52	689	3	344	5	1695	656	426	1789	0
Grp Sat Flow(s),veh/h/ln	1050	0	1824	1333	1900	1610	1714	1729	1610	1663	1729	0
Q Serve(g_s), s	1.2	0.0	2.4	27.5	0.1	18.1	0.3	30.2	42.8	14.2	24.8	0.0
Cycle Q Clear(g_c), s	1.3	0.0	2.4	29.9	0.1	18.1	0.3	30.2	42.8	14.2	24.8	0.0
Prop In Lane	1.00		0.23	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	339	0	481	773	501	662	22	2335	725	490	3033	0
V/C Ratio(X)	0.04	0.00	0.11	0.89	0.01	0.52	0.23	0.73	0.91	0.87	0.59	0.00
Avail Cap(c_a), veh/h	339	0	481	773	501	662	151	2335	725	687	3033	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	31.2	0.0	31.6	43.8	30.7	25.0	55.4	25.4	28.9	47.2	14.9	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	12.2	0.0	0.3	1.9	2.0	16.9	6.6	0.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	1.1	10.6	0.1	6.5	0.1	11.6	18.1	6.0	8.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.3	0.0	31.6	56.0	30.7	25.3	57.3	27.4	45.8	53.9	15.8	0.0
LnGrp LOS	C	A	C	E	C	C	E	C	D	D	B	A
Approach Vol, veh/h		67			1036			2356			2215	
Approach Delay, s/veh		31.5			45.7			32.6			23.1	
Approach LOS		C			D			C			C	

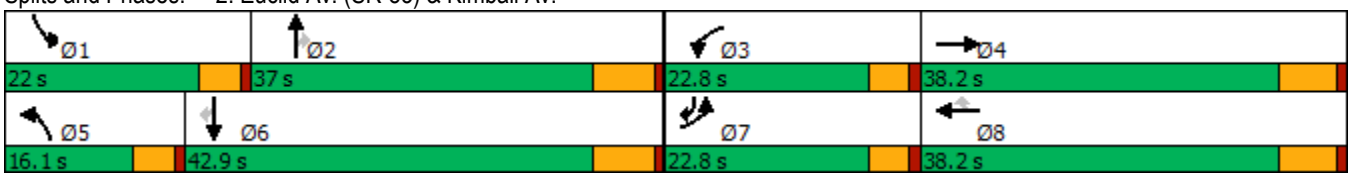
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	21.3	57.5		34.5	6.1	72.7		34.5				
Change Period (Y+Rc), s	4.6	6.5		4.6	4.6	6.5		4.6				
Max Green Setting (Gmax), s	23.4	51.0		29.9	10.0	64.4		29.9				
Max Q Clear Time (g_c+I1), s	16.2	44.8		4.4	2.3	26.8		31.9				
Green Ext Time (p_c), s	0.5	5.2		0.2	0.0	16.3		0.0				

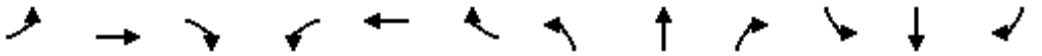
Intersection Summary												
HCM 6th Ctrl Delay			31.3									
HCM 6th LOS			C									

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	591	974	95	424	279	147	1330	156	541	1418	419
Future Volume (vph)	591	974	95	424	279	147	1330	156	541	1418	419
Turn Type	Prot	NA	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	7	4	3	8		5	2		1	6	7
Permitted Phases					8			2			6
Detector Phase	7	4	3	8	8	5	2	2	1	6	7
Switch Phase											
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.6	38.2	9.6	38.2	38.2	14.6	36.5	36.5	9.6	33.5	9.6
Total Split (s)	22.8	38.2	22.8	38.2	38.2	16.1	37.0	37.0	22.0	42.9	22.8
Total Split (%)	19.0%	31.8%	19.0%	31.8%	31.8%	13.4%	30.8%	30.8%	18.3%	35.8%	19.0%
Yellow Time (s)	3.6	5.2	3.6	5.2	5.2	3.6	5.5	5.5	3.6	5.5	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	4.6	6.2	6.2	4.6	6.5	6.5	4.6	6.5	4.6
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	Max	None	Max	None
Act Effct Green (s)	18.2	33.5	7.7	22.9	22.9	11.5	30.6	30.6	17.4	36.5	61.3
Actuated g/C Ratio	0.16	0.30	0.07	0.21	0.21	0.10	0.28	0.28	0.16	0.33	0.55
v/c Ratio	1.08	1.06	0.43	0.58	0.55	0.85	0.87	0.28	1.09	0.77	0.45
Control Delay	106.2	82.8	55.8	42.9	13.3	88.0	45.6	6.7	111.2	37.4	12.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	106.2	82.8	55.8	42.9	13.3	88.0	45.6	6.7	111.2	37.4	12.2
LOS	F	F	E	D	B	F	D	A	F	D	B
Approach Delay		90.6		34.1			45.7			49.7	
Approach LOS		F		C			D			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 111.1	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.09	
Intersection Signal Delay: 57.8	Intersection LOS: E
Intersection Capacity Utilization 98.9%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 2: Euclid Av. (SR-83) & Kimball Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	591	974	206	95	424	279	147	1330	156	541	1418	419
Future Volume (veh/h)	591	974	206	95	424	279	147	1330	156	541	1418	419
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1700	1900	1900	1800	1900	1900	1800	1900	1900	1700	1900	1900
Adj Flow Rate, veh/h	603	994	105	97	433	147	150	1357	77	552	1447	321
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	552	1014	107	152	632	282	177	1630	460	528	1972	832
Arrive On Green	0.17	0.30	0.30	0.05	0.18	0.18	0.13	0.36	0.36	0.20	0.43	0.43
Sat Flow, veh/h	3238	3379	357	3326	3610	1610	1714	5700	1610	3238	5700	1610
Grp Volume(v), veh/h	603	559	540	97	433	147	150	1357	77	552	1447	321
Grp Sat Flow(s),veh/h/ln	1619	1900	1836	1663	1805	1610	1714	1900	1610	1619	1900	1610
Q Serve(g_s), s	18.2	31.1	31.1	3.1	12.0	8.8	9.1	23.2	3.5	17.4	22.5	11.9
Cycle Q Clear(g_c), s	18.2	31.1	31.1	3.1	12.0	8.8	9.1	23.2	3.5	17.4	22.5	11.9
Prop In Lane	1.00		0.19	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	552	570	551	152	632	282	177	1630	460	528	1972	832
V/C Ratio(X)	1.09	0.98	0.98	0.64	0.69	0.52	0.85	0.83	0.17	1.05	0.73	0.39
Avail Cap(c_a), veh/h	552	570	551	567	1083	483	185	1630	460	528	1972	832
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.25	1.25	1.25	1.25	1.25	1.25
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.2	37.0	37.0	50.0	41.2	39.9	45.6	31.9	25.6	42.5	26.2	13.3
Incr Delay (d2), s/veh	65.5	32.6	33.4	1.7	1.3	1.5	26.7	5.1	0.8	51.4	2.5	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.0	18.6	18.1	1.3	5.2	3.5	4.9	9.8	1.4	9.9	8.8	3.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	109.8	69.6	70.4	51.7	42.6	41.4	72.3	37.1	26.4	93.9	28.7	14.7
LnGrp LOS	F	E	E	D	D	D	E	D	C	F	C	B
Approach Vol, veh/h		1702			677			1584			2320	
Approach Delay, s/veh		84.1			43.6			39.9			42.2	
Approach LOS		F			D			D			D	

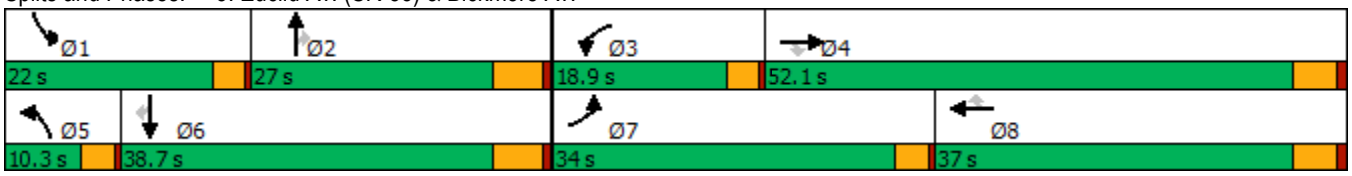
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	22.0	37.0	9.5	38.2	15.6	43.4	22.8	24.9
Change Period (Y+Rc), s	4.6	6.5	4.6	6.2	4.6	6.5	4.6	6.2
Max Green Setting (Gmax), s	17.4	30.5	18.2	32.0	11.5	36.4	18.2	32.0
Max Q Clear Time (g_c+I1), s	19.4	25.2	5.1	33.1	11.1	24.5	20.2	14.0
Green Ext Time (p_c), s	0.0	3.5	0.1	0.0	0.0	7.5	0.0	2.8

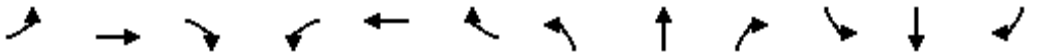
Intersection Summary	
HCM 6th Ctrl Delay	53.1
HCM 6th LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	219	160	138	92	54	233	55	1382	145	209	1458	199
Future Volume (vph)	219	160	138	92	54	233	55	1382	145	209	1458	199
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	8.5	37.0	37.0	8.5	37.0	37.0	8.5	26.5	26.5	8.5	30.5	30.5
Total Split (s)	34.0	52.1	52.1	18.9	37.0	37.0	10.3	27.0	27.0	22.0	38.7	38.7
Total Split (%)	28.3%	43.4%	43.4%	15.8%	30.8%	30.8%	8.6%	22.5%	22.5%	18.3%	32.3%	32.3%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.5	4.5	3.0	4.5	4.5
All-Red Time (s)	0.5	1.0	1.0	0.5	1.0	1.0	0.5	1.0	1.0	0.5	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.5	5.5	3.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
Act Effct Green (s)	14.8	20.3	20.3	7.0	10.2	10.2	6.5	24.9	24.9	14.1	34.8	34.8
Actuated g/C Ratio	0.18	0.25	0.25	0.09	0.12	0.12	0.08	0.30	0.30	0.17	0.42	0.42
v/c Ratio	0.70	0.35	0.28	0.34	0.24	0.59	0.43	0.91	0.25	0.70	0.69	0.26
Control Delay	45.4	28.3	5.7	43.2	35.5	10.7	52.0	39.9	7.8	47.6	24.8	7.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.4	28.3	5.7	43.2	35.5	10.7	52.0	39.9	7.8	47.6	24.8	7.5
LOS	D	C	A	D	D	B	D	D	A	D	C	A
Approach Delay		29.6			22.2			37.4			25.5	
Approach LOS		C			C			D			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 82.3	
Natural Cycle: 105	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 30.0	Intersection LOS: C
Intersection Capacity Utilization 71.3%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 3: Euclid Av. (SR-83) & Bickmore Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	219	160	138	92	54	233	55	1382	145	209	1458	199
Future Volume (veh/h)	219	160	138	92	54	233	55	1382	145	209	1458	199
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1800	1900	1900	1800	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	226	165	126	95	56	227	57	1425	130	215	1503	171
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	269	516	437	191	327	277	80	1492	463	256	2025	629
Arrive On Green	0.16	0.27	0.27	0.06	0.17	0.17	0.05	0.29	0.29	0.15	0.39	0.39
Sat Flow, veh/h	1714	1900	1608	3326	1900	1610	1714	5187	1610	1714	5187	1610
Grp Volume(v), veh/h	226	165	126	95	56	227	57	1425	130	215	1503	171
Grp Sat Flow(s),veh/h/ln	1714	1900	1608	1663	1900	1610	1714	1729	1610	1714	1729	1610
Q Serve(g_s), s	9.6	5.2	4.6	2.1	1.9	10.2	2.5	20.2	4.7	9.1	18.6	5.4
Cycle Q Clear(g_c), s	9.6	5.2	4.6	2.1	1.9	10.2	2.5	20.2	4.7	9.1	18.6	5.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	269	516	437	191	327	277	80	1492	463	256	2025	629
V/C Ratio(X)	0.84	0.32	0.29	0.50	0.17	0.82	0.72	0.96	0.28	0.84	0.74	0.27
Avail Cap(c_a), veh/h	699	1197	1013	685	813	689	156	1492	463	424	2303	715
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.6	21.7	21.5	34.2	26.4	29.8	35.2	26.2	20.6	30.9	19.6	15.5
Incr Delay (d2), s/veh	2.7	0.1	0.1	0.7	0.1	2.3	4.4	14.0	0.1	3.3	0.9	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	2.1	1.6	0.8	0.8	3.8	1.0	9.0	1.6	3.6	6.3	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.3	21.9	21.7	34.9	26.5	32.1	39.6	40.1	20.8	34.2	20.5	15.6
LnGrp LOS	C	C	C	C	C	C	D	D	C	C	C	B
Approach Vol, veh/h		517			378			1612			1889	
Approach Delay, s/veh		26.8			32.0			38.5			21.6	
Approach LOS		C			C			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.7	27.0	7.8	25.3	7.0	34.7	15.2	17.9
Change Period (Y+Rc), s	3.5	5.5	3.5	5.0	3.5	5.5	3.5	5.0
Max Green Setting (Gmax), s	18.5	21.5	15.4	47.1	6.8	33.2	30.5	32.0
Max Q Clear Time (g_c+I1), s	11.1	22.2	4.1	7.2	4.5	20.6	11.6	12.2
Green Ext Time (p_c), s	0.2	0.0	0.1	0.7	0.0	5.5	0.3	0.5

Intersection Summary	
HCM 6th Ctrl Delay	29.3
HCM 6th LOS	C

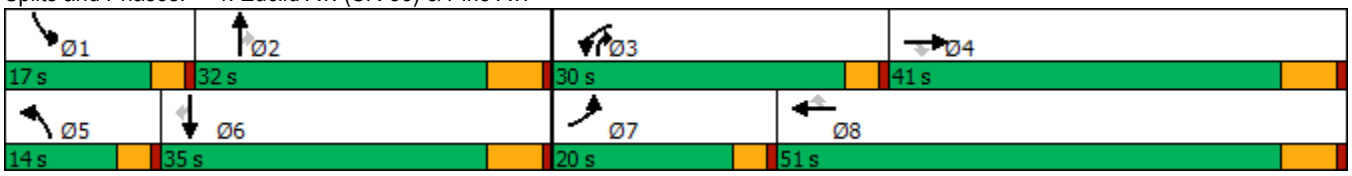
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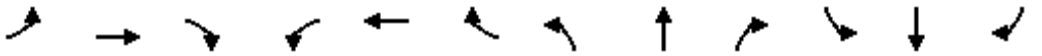
User approved pedestrian interval to be less than phase max green.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	118	911	224	712	611	247	278	1073	891	390	1196	129
Future Volume (vph)	118	911	224	712	611	247	278	1073	891	390	1196	129
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	3	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	41.0	41.0	9.0	43.0	43.0	9.0	11.0	9.0	9.0	29.0	29.0
Total Split (s)	20.0	41.0	41.0	30.0	51.0	51.0	14.0	32.0	30.0	17.0	35.0	35.0
Total Split (%)	16.7%	34.2%	34.2%	25.0%	42.5%	42.5%	11.7%	26.7%	25.0%	14.2%	29.2%	29.2%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	3.0	3.0	5.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	4.0	4.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min	Min
Act Effct Green (s)	12.6	34.5	34.5	26.0	47.9	47.9	10.0	25.7	57.7	13.0	28.7	28.7
Actuated g/C Ratio	0.11	0.29	0.29	0.22	0.40	0.40	0.08	0.22	0.48	0.11	0.24	0.24
v/c Ratio	0.70	0.88	0.40	1.08	0.43	0.33	1.03	0.93	0.59	1.11	0.93	0.28
Control Delay	71.2	51.0	10.6	100.4	27.4	4.2	114.9	59.6	22.5	129.5	56.8	7.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.2	51.0	10.6	100.4	27.4	4.2	114.9	59.6	22.5	129.5	56.8	7.5
LOS	E	D	B	F	C	A	F	E	C	F	E	A
Approach Delay		45.7			56.8			51.7			69.6	
Approach LOS		D			E			D			E	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 119.2	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.11	
Intersection Signal Delay: 56.3	Intersection LOS: E
Intersection Capacity Utilization 97.0%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 4: Euclid Av. (SR-83) & Pine Av.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	118	911	224	712	611	247	278	1073	891	390	1196	129
Future Volume (veh/h)	118	911	224	712	611	247	278	1073	891	390	1196	129
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1800	1900	1900	1700	1900	1900	1800	1900	1900	1800	1900	1900
Adj Flow Rate, veh/h	126	969	0	757	650	197	296	1141	709	415	1272	80
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	151	1075		713	1576	668	291	1238	1409	378	1383	391
Arrive On Green	0.09	0.35	0.00	0.22	0.52	0.41	0.11	0.33	0.27	0.14	0.36	0.30
Sat Flow, veh/h	1714	3800	1610	3238	3800	1610	3429	5700	3220	3429	5700	1610
Grp Volume(v), veh/h	126	969	0	757	650	197	296	1141	709	415	1272	80
Grp Sat Flow(s),veh/h/ln	1714	1900	1610	1619	1900	1610	1714	1900	1610	1714	1900	1610
Q Serve(g_s), s	8.5	28.6	0.0	26.0	12.4	9.6	10.0	22.8	18.8	13.0	25.2	4.4
Cycle Q Clear(g_c), s	8.5	28.6	0.0	26.0	12.4	9.6	10.0	22.8	18.8	13.0	25.2	4.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	151	1075		713	1576	668	291	1238	1409	378	1383	391
V/C Ratio(X)	0.83	0.90		1.06	0.41	0.29	1.02	0.92	0.50	1.10	0.92	0.20
Avail Cap(c_a), veh/h	232	1127		713	1576	668	291	1256	1419	378	1401	396
HCM Platoon Ratio	1.00	1.25	1.00	1.00	1.25	1.00	1.25	1.50	1.25	1.25	1.50	1.25
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.9	36.6	0.0	46.0	19.6	23.0	52.8	38.8	22.3	50.9	36.4	32.7
Incr Delay (d2), s/veh	8.4	10.1	0.0	51.1	0.2	0.3	57.7	10.9	0.1	75.6	9.8	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	13.4	0.0	15.0	4.8	3.5	6.3	10.0	6.1	9.1	10.7	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.3	46.7	0.0	97.1	19.8	23.4	110.5	49.7	22.4	126.5	46.2	32.7
LnGrp LOS	E	D		F	B	C	F	D	C	F	D	C
Approach Vol, veh/h		1095	A		1604			2146			1767	
Approach Delay, s/veh		48.3			56.7			49.0			64.4	
Approach LOS		D			E			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.0	31.6	30.0	39.4	14.0	34.6	14.4	55.0
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	13.0	26.0	26.0	35.0	10.0	29.0	16.0	45.0
Max Q Clear Time (g_c+I1), s	15.0	24.8	28.0	30.6	12.0	27.2	10.5	14.4
Green Ext Time (p_c), s	0.0	0.9	0.0	2.8	0.0	1.1	0.1	7.4

Intersection Summary	
HCM 6th Ctrl Delay	54.9
HCM 6th LOS	D

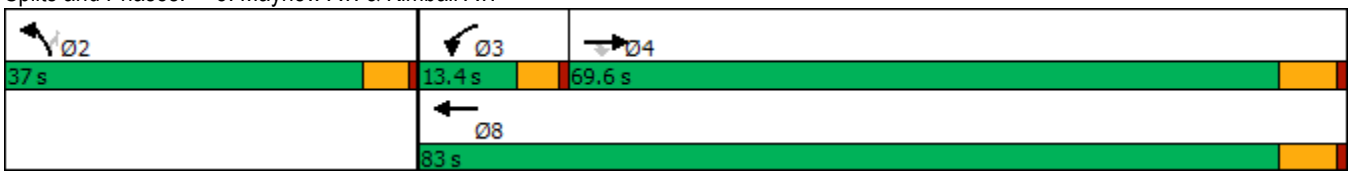
Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1358	49	10	1402	157	27
Future Volume (vph)	1358	49	10	1402	157	27
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases		4				2
Detector Phase	4	4	3	8	2	2
Switch Phase						
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	23.2	23.2	9.6	16.2	32.1	32.1
Total Split (s)	69.6	69.6	13.4	83.0	37.0	37.0
Total Split (%)	58.0%	58.0%	11.2%	69.2%	30.8%	30.8%
Yellow Time (s)	5.2	5.2	3.6	5.2	4.1	4.1
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2	4.6	6.2	5.1	5.1
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	Max	Max	None	Max	None	None
Act Effct Green (s)	74.9	74.9	5.5	77.0	16.5	16.5
Actuated g/C Ratio	0.71	0.71	0.05	0.73	0.16	0.16
v/c Ratio	0.57	0.05	0.12	0.57	0.64	0.10
Control Delay	10.0	2.6	52.8	8.2	52.1	13.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.0	2.6	52.8	8.2	52.1	13.3
LOS	B	A	D	A	D	B
Approach Delay	9.8			8.5	46.4	
Approach LOS	A			A	D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 104.8	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay: 11.4	Intersection LOS: B
Intersection Capacity Utilization 57.4%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 5: Mayhew Av. & Kimball Av.





Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1358	49	10	1402	157	27
Future Volume (veh/h)	1358	49	10	1402	157	27
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1900	1900	1800	1900	1800	1900
Adj Flow Rate, veh/h	1476	53	11	1524	171	29
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	2550	1138	23	2763	209	196
Arrive On Green	0.71	0.71	0.01	0.77	0.12	0.12
Sat Flow, veh/h	3705	1610	1714	3705	1714	1610
Grp Volume(v), veh/h	1476	53	11	1524	171	29
Grp Sat Flow(s),veh/h/ln	1805	1610	1714	1805	1714	1610
Q Serve(g_s), s	20.4	1.0	0.6	17.2	9.8	1.6
Cycle Q Clear(g_c), s	20.4	1.0	0.6	17.2	9.8	1.6
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2550	1138	23	2763	209	196
V/C Ratio(X)	0.58	0.05	0.49	0.55	0.82	0.15
Avail Cap(c_a), veh/h	2550	1138	150	2763	545	512
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.3	4.5	49.2	4.8	43.0	39.4
Incr Delay (d2), s/veh	1.0	0.1	5.9	0.8	7.7	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.8	0.3	0.3	3.9	4.5	0.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	8.3	4.5	55.1	5.6	50.6	39.7
LnGrp LOS	A	A	E	A	D	D
Approach Vol, veh/h	1529			1535	200	
Approach Delay, s/veh	8.1			5.9	49.0	
Approach LOS	A			A	D	

Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		17.3	5.9	77.1		83.0
Change Period (Y+Rc), s		5.1	4.6	6.2		6.2
Max Green Setting (Gmax), s		31.9	8.8	63.4		76.8
Max Q Clear Time (g_c+I1), s		11.8	2.6	22.4		19.2
Green Ext Time (p_c), s		0.5	0.0	14.0		15.7

Intersection Summary	
HCM 6th Ctrl Delay	9.6
HCM 6th LOS	A

APPENDIX 7.8:

HORIZON YEAR (2040) WITHOUT PROJECT CONDITIONS QUEUING ANALYSIS WORKSHEETS WITH IMPROVEMENTS

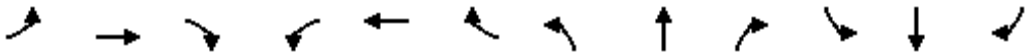
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Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	217	401	229	950	411	182	1259	59	223	1296	493
v/c Ratio	0.68	0.39	0.68	0.91	0.65	0.90	0.74	0.07	0.77	0.83	0.59
Control Delay	62.4	30.8	61.6	53.8	21.4	93.1	38.5	3.0	70.6	43.9	23.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.4	30.8	61.6	53.8	21.4	93.1	38.5	3.0	70.6	43.9	23.0
Queue Length 50th (ft)	84	113	88	369	122	140	316	0	87	341	228
Queue Length 95th (ft)	126	162	130	#493	239	#276	376	17	#143	405	331
Internal Link Dist (ft)		1169		1767			2587			5208	
Turn Bay Length (ft)	200		215		200	420		260	160		240
Base Capacity (vph)	357	1046	398	1069	638	209	1705	849	304	1568	854
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.38	0.58	0.89	0.64	0.87	0.74	0.07	0.73	0.83	0.58

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	88	17	51	254	287	233	100	1183	14	113	1373	266
v/c Ratio	0.45	0.04	0.12	0.43	0.60	0.42	0.50	0.60	0.01	0.34	0.72	0.36
Control Delay	49.9	28.7	0.6	40.7	35.7	9.9	52.1	25.4	0.0	45.5	28.4	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.9	28.7	0.6	40.7	35.7	9.9	52.1	25.4	0.0	45.5	28.4	6.7
Queue Length 50th (ft)	45	7	0	65	144	18	51	179	0	29	232	9
Queue Length 95th (ft)	119	26	0	133	245	78	#158	359	0	72	427	80
Internal Link Dist (ft)		814			1605			2821			2587	
Turn Bay Length (ft)	150		150	80		100	115			160		240
Base Capacity (vph)	313	1034	932	891	1109	1022	248	2586	1444	542	2650	925
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.02	0.05	0.29	0.26	0.23	0.40	0.46	0.01	0.21	0.52	0.29

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

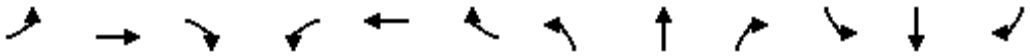


Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	603	1192	97	405	237	150	1356	159	532	1447	428
v/c Ratio	1.08	1.05	0.43	0.54	0.46	0.85	0.86	0.28	1.05	0.77	0.45
Control Delay	106.2	79.4	55.8	42.1	8.3	88.0	45.6	6.7	99.8	37.4	11.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	106.2	79.4	55.8	42.1	8.3	88.0	45.6	6.7	99.8	37.4	11.6
Queue Length 50th (ft)	~234	~466	34	136	5	105	300	0	~201	301	105
Queue Length 95th (ft)	#390	#585	65	185	67	#245	#427	53	#348	403	219
Internal Link Dist (ft)		1169		1767			2587			5208	
Turn Bay Length (ft)	200		215		200	420		260	160		240
Base Capacity (vph)	558	1131	544	1041	629	177	1568	559	506	1873	955
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.08	1.05	0.18	0.39	0.38	0.85	0.86	0.28	1.05	0.77	0.45

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	226	147	142	44	38	168	57	1425	121	192	1503	205
v/c Ratio	0.70	0.28	0.26	0.18	0.17	0.49	0.42	0.86	0.20	0.68	0.68	0.26
Control Delay	45.0	25.2	5.2	43.1	34.5	10.7	51.5	35.2	5.0	48.0	24.4	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.0	25.2	5.2	43.1	34.5	10.7	51.5	35.2	5.0	48.0	24.4	7.4
Queue Length 50th (ft)	103	63	0	10	18	0	26	221	0	88	206	11
Queue Length 95th (ft)	233	109	37	35	48	51	#98	#626	35	215	#521	81
Internal Link Dist (ft)		814			1605			2821			2587	
Turn Bay Length (ft)	150		150	80			115			160		240
Base Capacity (vph)	702	1154	1024	653	778	760	149	1654	614	426	2205	780
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.13	0.14	0.07	0.05	0.22	0.38	0.86	0.20	0.45	0.68	0.26

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

APPENDIX 7.9:

HORIZON YEAR (2040) WITH PROJECT CONDITIONS QUEUING ANALYSIS WORKSHEETS WITH IMPROVEMENTS

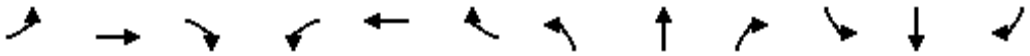
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Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	217	418	229	962	432	182	1259	59	253	1296	493
v/c Ratio	0.68	0.40	0.68	0.92	0.69	0.90	0.74	0.07	0.85	0.82	0.59
Control Delay	62.6	31.6	61.8	54.9	23.5	93.6	38.8	3.0	78.6	43.9	23.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.6	31.6	61.8	54.9	23.5	93.6	38.8	3.0	78.6	43.9	23.0
Queue Length 50th (ft)	84	121	88	375	140	140	316	0	100	341	228
Queue Length 95th (ft)	126	171	130	#503	263	#276	376	17	#172	405	331
Internal Link Dist (ft)		1169		1767			2587			5208	
Turn Bay Length (ft)	200		215		200	420		260	160		240
Base Capacity (vph)	356	1041	396	1065	636	209	1694	845	302	1571	854
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.40	0.58	0.90	0.68	0.87	0.74	0.07	0.84	0.82	0.58

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	88	37	51	387	421	340	100	1183	53	241	1373	266
v/c Ratio	0.51	0.09	0.12	0.59	0.76	0.56	0.58	0.72	0.06	0.62	0.80	0.39
Control Delay	56.6	30.1	0.5	44.0	40.8	16.8	61.0	32.7	0.1	51.6	34.0	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.6	30.1	0.5	44.0	40.8	16.8	61.0	32.7	0.1	51.6	34.0	7.3
Queue Length 50th (ft)	53	19	0	116	244	76	60	232	0	75	277	11
Queue Length 95th (ft)	121	45	0	198	374	170	#159	366	0	#153	433	81
Internal Link Dist (ft)		814			1605			2821			2587	
Turn Bay Length (ft)	150		150	80		100	115			160		240
Base Capacity (vph)	260	874	806	739	975	921	205	2117	1203	450	2197	808
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.04	0.06	0.52	0.43	0.37	0.49	0.56	0.04	0.54	0.62	0.33

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

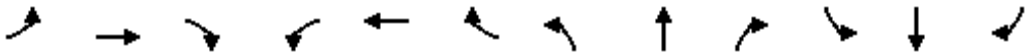


Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	603	1204	97	433	285	150	1357	159	552	1447	428
v/c Ratio	1.08	1.06	0.43	0.58	0.55	0.85	0.87	0.28	1.09	0.77	0.45
Control Delay	106.2	82.8	55.8	42.9	13.3	88.0	45.6	6.7	111.2	37.4	12.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	106.2	82.8	55.8	42.9	13.3	88.0	45.6	6.7	111.2	37.4	12.2
Queue Length 50th (ft)	~234	~475	34	147	33	105	300	0	~216	301	112
Queue Length 95th (ft)	#390	#595	65	197	111	#245	#427	53	#366	403	228
Internal Link Dist (ft)		1169		1767			2587			5208	
Turn Bay Length (ft)	200		215		200	420		260	160		240
Base Capacity (vph)	558	1131	544	1041	629	177	1568	559	506	1873	948
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.08	1.06	0.18	0.42	0.45	0.85	0.87	0.28	1.09	0.77	0.45

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	226	165	142	95	56	240	57	1425	149	215	1503	205
v/c Ratio	0.70	0.35	0.28	0.34	0.24	0.59	0.43	0.91	0.25	0.70	0.69	0.26
Control Delay	45.4	28.3	5.7	43.2	35.5	10.7	52.0	39.9	7.8	47.6	24.8	7.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.4	28.3	5.7	43.2	35.5	10.7	52.0	39.9	7.8	47.6	24.8	7.5
Queue Length 50th (ft)	105	73	0	23	26	0	27	233	1	99	211	12
Queue Length 95th (ft)	233	126	38	62	64	60	#98	#626	58	#262	#521	81
Internal Link Dist (ft)		814			1605			2821			2587	
Turn Bay Length (ft)	150		150	80			115			160		240
Base Capacity (vph)	695	1133	1008	646	769	797	147	1569	589	421	2193	777
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.15	0.14	0.15	0.07	0.30	0.39	0.91	0.25	0.51	0.69	0.26

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.