4.10 NOISE

This section describes the existing noise environment in Chino and evaluates the potential impacts associated with the Proposed General Plan and the Focused Growth Plan. The evaluation is based on an assessment prepared by Wieland Acoustics.

A. Understanding Noise

Noise can be defined as a sound or series of sounds that are intrusive, irritating, objectionable, or disruptive to daily life. Noise varies widely in its scope, source, and volume, ranging from individual occurrences, such as a lawn mower, to the intermittent disturbances of train whistles, to the fairly constant noise generated by traffic on freeways. Noise is primarily a concern when generated in the vicinity of noise-sensitive uses such as residences, schools, places of worship, and hospitals.

The objectionable nature of sound could be caused by both its pitch and its loudness. Pitch is the height or depth of a tone or sound, depending on the relative rapidity (frequency) of the vibrations by which it is produced. Higher pitched signals sound louder to humans than sounds with a lower pitch. Loudness is intensity of sound waves combined with the reception characteristics of the ear.

In addition to the concepts of pitch and loudness, there are several noise measurement scales used to describe noise in a particular situation. These are listed in Table 4.10-1. The most basic unit of measurement is the decibel (dB), which is a unit of measurement that indicates the relative amplitude of a sound. The zero on the decibel scale is based on the lowest sound level that the healthy, unimpaired human ear can detect. Sound levels in decibels are calculated on a logarithmic basis. An increase of 10 decibels represents a 10-fold increase in acoustic energy, while 20 decibels is 100 times more intense, 30 decibels is 1,000 times more intense, and so on. However, the human ear perceives loudness according to a slightly different scale. Each 10 decibel increase in sound level is perceived as approximately a doubling of loudness over a fairly wide range of intensities. Generally, the human ear cannot

TABLE 4.10-1 **DEFINITIONS OF ACOUSTICAL TERMS**

Term	Definitions
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure.
A-Weighted Sound Level, dBA	Sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network, which de-emphasizes very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this report are A-weighted, unless reported otherwise.
L_{02}, L_{08}, L_{25}, L_{50}	The A-weighted noise levels that are exceeded 2%, 8%, 25%, and 50% (respectively) of the time during the measurement period.
Equivalent Noise Level, L_{eq}	The average A-weighted noise level during the measurement period.
Community Noise Equivalent Level, CNEL	The Average A-weighted noise level during a 24-hour day, obtained after adding 5 decibels to measurements taken in the evening (7:00 pm to 10:00 pm) and 10 decibels to measurements taken between 10:00 pm and 7:00 am.
Day/Night Noise Level, L_{dn}	The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10:00 pm and 7:00 am.
L_{max}, L_{min}	The maximum and minimum A-weighted noise level during the measurement period.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.

perceive a difference between two noises that are less than 3 decibels different from one another.

There are several methods of characterizing sound. The most common in California is the A-weighted sound level or dBA. This scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. Representative outdoor and indoor noise levels in units of dBA are shown in Table 4.10-2. Because sound levels can vary markedly over a short period of time, a method for describing either the average character of the sound or the statistical behavior of the variations must be utilized. Most commonly, environmental sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time-varying events. This energy-equivalent sound/noise descriptor is called L_{eq}. The most common averaging period is hourly, but L_{eq} can describe any series of noise events of arbitrary duration.

Since the sensitivity to noise increases during the evening and at night—because excessive noise interferes with the ability to sleep—24-hour descriptors have been developed that incorporate artificial noise penalties added to quiet-time noise events. The Community Noise Equivalent Level, CNEL, is a measure of the cumulative noise exposure in a community, with a 5 dB penalty added to evening (7:00 pm to 10:00 pm) and a 10 dB addition to nocturnal (10:00 pm to 7:00 am) noise levels. The Day/Night Average Sound Level, L_{dn}, is essentially the same as CNEL, with the exception that the evening time period is dropped and all occurrences during this three-hour period are grouped into the daytime period.

B. Regulatory Framework

Noise is addressed in regulations, standards, and policies at the federal, State and city level. This section summarizes the standards and guidelines that are relevant in Chino.

TABLE 4.10-2 **TYPICAL SOUND LEVELS MEASURED IN THE ENVIRONMENT**

Noise Generators (At a Given Distance from Noise Source)	A-Weighted Sound Level in Decibel	Noise Environments	Subjective Impression
	140		
Civil defense siren (100 feet)	130		
Jet take-off (200 feet)	120		Pain threshold
	110	Rock music concert	
Diesel pile drive (100 feet)	100		Very loud
Freight cars (50 feet)	90	Boiler room Printing press plant	
Pneumatic drill (50 feet)	80	In kitchen with garbage disposal running	Moderately loud
Freeway (100 feet) Vacuum cleaner (10 feet)	70		
	60	Data processing center	
Light traffic (100 feet) Large transformer (200 feet)	50	Department store	
	40	Private business office	Quiet
Soft whisper (5 feet)	30	Quiet bedroom	
	20	Recording studio	
	10		Threshold of hearing

1. Federal Regulations

Various federal agencies have noise requirements for all agency projects. Federal regulations relevant to Chino are summarized below.

a. Department of Housing and Urban Development

The federal Department of Housing and Urban Development (HUD) has adopted standards related to noise for all new HUD-financed housing. The HUD environmental noise standards are presented in the Code of Federal Regulations (24 CFR Part 51B). The standards evaluate the noise environment of potential housing sites on the following scale:

- Sites with 65 dBA L_{dn} or less are acceptable for housing.
- Sites that exceed 65 dBA L_{dn} but not 75 dBA L_{dn} are normally acceptable for housing only if appropriate sound attenuation measures are provided, which include 5 decibels additional attenuation over standard construction in the 65 to 70 dBA L_{dn} zone or 10 decibels of additional attenuation in the 70 to 75 dBA L_{dn} zone.
- Sites that exceed 75 dBA L_{dn} are unacceptable for housing.

Interior noise levels and attenuation requirements are geared toward achieving an interior noise level of 45 dBA L_{dn}. The HUD guidelines assume that standard construction will provide sufficient attenuation to achieve interior levels of 45 dBA L_{dn} or less if the exterior noise level is 65 dBA L_{dn} or less. For new housing developed in Chino that receives federal funding, these federal noise standards would be applicable.

b. Federal Highway Administration

The Federal Highway Administration (FHWA) requires specific procedures for noise assessment studies for federal highway projects. The FHWA requires that noise abatement measures be considered on all major transportation projects if the project will cause a significant increase in noise levels, or if projected noise levels approach or exceed the noise abatement criteria level for activities occurring on adjacent lands. These noise regulations would apply to any projects undertaken by the FHWA within Chino.

The FHWA Noise Assessment Criteria for various land use ratings are shown in Table 4.10-3. The noise criteria are assigned to both exterior and interior activities. The FHWA identifies a traffic noise impact when the predicted traffic noise levels approach or exceed the noise abatement criteria. If these criteria sound levels are predicted to be approached or exceeded during the noisiest 1-hour period, noise abatement measures must be considered and, if found to be reasonable and feasible, they must be incorporated as part of a given project.

c. Federal Transit Administration

The Federal Transit Administration (FTA) of the U.S. Department of Transportation has developed vibration impact assessment criteria for evaluating vibration impacts associated with rapid transit projects. If commuter rail service is established into downtown Chino, and if this project receives funding from the FTA, these noise regulations would apply.

Groundborne vibration impacts are associated with fast moving railroad operations, and large industrial equipment. The FTA regulations on groundborne vibration impacts on occupants inside buildings are shown in Table 4.10-4, and are based on root-mean-square (rms) average vibration levels calculated over a 1 second period to relate to average, maximum vibration levels experienced by humans.

The FTA criteria are based primarily on experience with passenger train operations, such as rapid transit and commuter rail systems. The main difference between passenger and freight operations is the time duration of individual events. A passenger train lasts few seconds whereas a long freight train may last several minutes, depending on speed and length. Although the criteria are based on shorter duration events reflected by passenger trains, they are used in this assessment to evaluate the potential of vibration annoyance on the site due to large freight trains as well. In addition, FTA criteria limits contained in Table 4.10-4 are not appropriate for evaluating the potential of building structural or cosmetic damage due to train operations. It is extremely rare that train operations can cause any such damage except in the

TABLE 4.10-3 **FEDERAL NOISE ABATEMENT CRITERIA**

Rank	A-Weighted Sound Level dBA	Suitable Locations
A	57 exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to serve its intended purpose.
B	67 exterior	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 exterior	Developed lands, properties, or activities not included in Categories A or B above.
D	–	Undeveloped lands.
E	52 interior	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

Source: Federal Highway Administration, 1982.

case of weakened structures or historic buildings. Even in such cases, structural damage is unlikely unless the buildings are located extremely close to the tracks.

d. Federal Aviation Administration

The Federal Aviation Administration (FAA) and the State of California Airport Noise Standards have established the Yearly Average Community Noise Equivalent Level (CNEL) as the noise standard by which airport noise and land compatibility is judged. The agencies have identified the 65 dBA CNEL contour for airport operations as the Noise Impact Boundary. Within this boundary airport operators are required to ensure that all land uses are compatible with the aircraft noise environment or the operator must provide noise mitigation or secure a variance from the governing agencies. Under

TABLE 4.10-4 **GROUNDBORNE VIBRATION IMPACT CRITERIA**

Land Use Category	Groundborne Vibration Impact Limits	
	Frequent Events (More than 70/day)	Infrequent Events (Fewer than 70/day)
Category 1: Buildings where low ambient is essential for interior operations	65 VdB	65 VdB
Category 2: Residences and buildings where people normally sleep	72 VdB	80 VdB
Category 3: Institutional land uses with primarily daytime uses	75 VdB	83 VdB

Source: U.S. Department of Transportation, 1995, Federal Transit Administration, Transit Noise and Vibration Impact Assessment.

most circumstances residences are considered to be an incompatible land use within the 65 dBA CNEL noise contour.

2. State Regulations

State agencies and codes have specific noise regulations as well. State regulations relevant to Chino are summarized below.

a. California Building Code

The California Building Code (CBC) requires new multi-family housing in California to meet the environmental noise limits set forth in Title 24, Part 2 of the code. The interior noise level limit of Title 24 is 45 dBA CNEL or L_{dn}, which is consistent with the HUD standard. Where exterior noise levels exceed 60 dBA L_{dn}, a report must be submitted to the local building department with the building plans describing the noise control measures that have been incorporated into the design of the proposed project to achieve an interior noise level of 45 dBA CNEL or L_{dn} in interior living spaces. If the windows must remain closed in order to meet the required noise level, an alternate means of ventilation such as air-conditioning must be provided.

The CBC also has requirements for airborne and impact noise isolation between adjacent dwelling units. The airborne and impact sound isolation requirements are typically handled in the architectural design phase versus at a General Plan level of analysis.

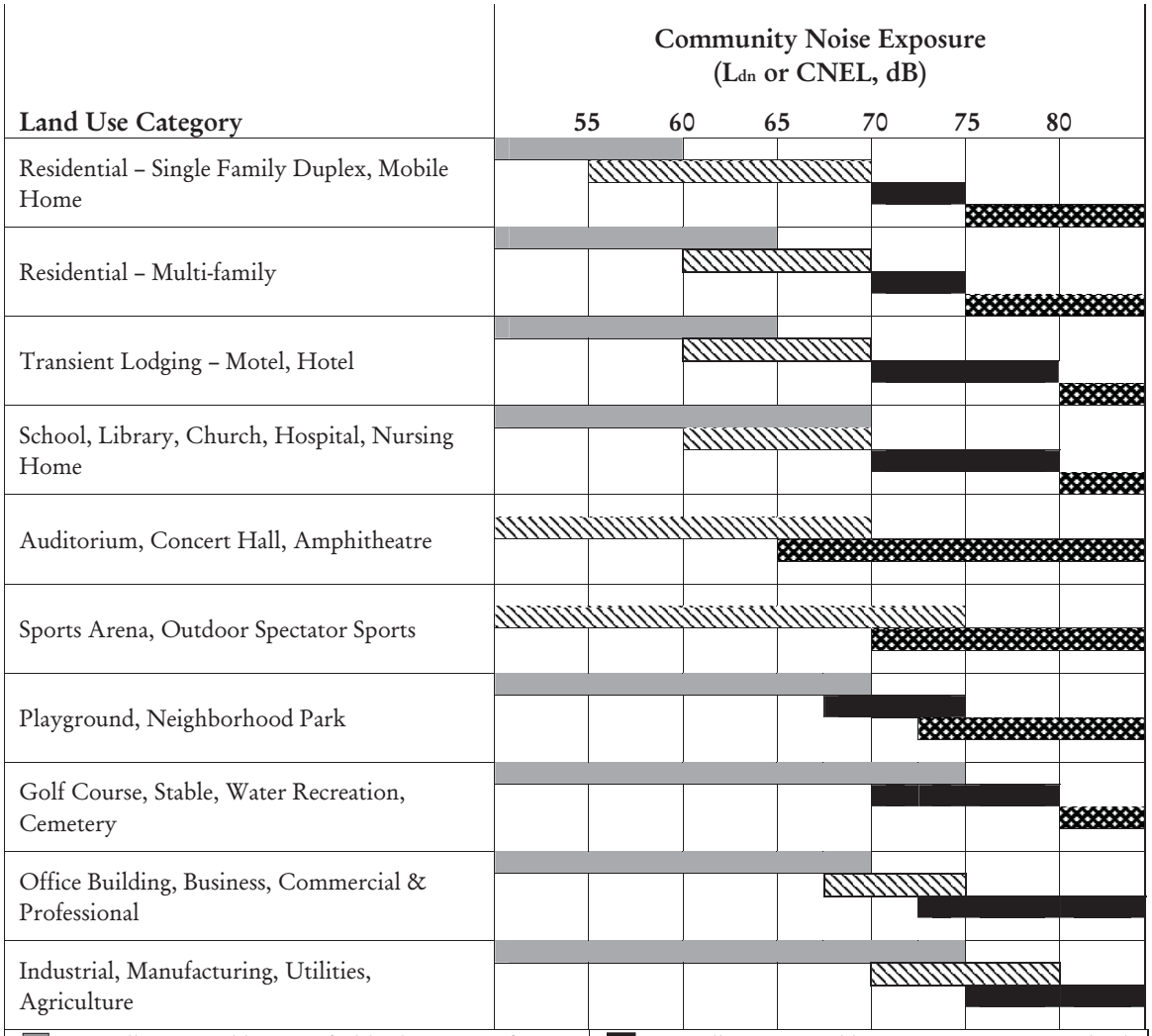
b. The California Office of Noise Control

The State Office of Noise Control (ONC) regulates noise control in California. Different types of land uses are considered to have various sensitivities to noise based on the types of activities that are expected to take place at those uses. The ONC has developed a noise/land use compatibility matrix, as shown in Figure 4.10-1, which shows varying degrees of acceptability for noise levels among different land use categories. Figure 4.10-1 is intended to provide guidelines for the development of municipal noise elements. These basic guidelines may be tailored to reflect the existing noise and land use characteristics of a particular community.

Land uses deemed noise-sensitive by ONC include residences, schools, hospitals, rest homes, long-term care, and mental care facilities. Land uses that are less sensitive to noise include some office and retail developments. There is a range of insensitive noise receptors which generate significant noise levels or where human occupancy is typically low. Examples of insensitive uses include industrial and manufacturing uses, utilities, agriculture, vacant land, parking lots, salvage yards, highway-related businesses, and transit terminals.

ONC guidelines and California Administrative Code Section 65302(f) require that certain major noise sources and areas containing noise sensitive land uses be identified and quantified by preparing generalized noise exposure contours for current and projected levels of activity within the community. Contours may be prepared in terms of either CNEL or L_{dn}, which are both descriptors of total noise exposure at a given location for an annual average day. The noise exposure information serves as a basis for achieving land use compatibility with respect to noise. Noise exposure information is used to provide baseline levels and noise source identification for use in the development and

FIGURE 4.10-1 **STATE OFFICE OF NOISE CONTROL LAND USE COMPATIBILITY STANDARDS**



Normally Acceptable. Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

Normally Unacceptable. New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

Conditionally Acceptable. New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.

Clearly Unacceptable. New construction or development should generally not be undertaken.

enforcement of a local noise control ordinance and for ensuring compliance with the State's noise insulation standards.

3. City of Chino General Plan, Noise Element

The Noise Element is included as part of both the Proposed General Plan and the Focused Growth Plan, and is an update of, but similar to, the 1995 Noise Element. The purpose of the Noise Element is to define the City's role and responsibility in safeguarding against noise pollution, and to reduce the negative impacts of noise on future developments by identifying major noise sources and compatible land uses. In order to accomplish this, the existing Noise Element provides policies and actions that define and summarize the programs to be implemented by the City to achieve the desired goals.

4. Chino Noise Ordinance

Chino's Noise Ordinance provides regulations for the control of excessive and annoying noise from stationary sources. Examples of stationary sources include industrial plants, pumps, and compressors. In order to regulate noise from these sources, the Noise Ordinance establishes noise level standards. Section 9.40.040 of the Noise Ordinance describes maximum noise levels for noise intrusion into residential properties. These are described in Table 4.10-5. These standards exempt a variety of activities, such as those occurring on public parks, playgrounds or private school grounds, and occasional outdoor gatherings. In addition, noise or vibrations associated with construction or repair or grading are exempted provided the activities do not occur outside of designated hours for construction. Noise from mechanical devices used for agricultural operations are also exempted. The Noise Ordinance also prohibits certain noise sources, and describes the manner in which the standards are to be enforced.

C. Existing Conditions

The most significant sources of noise in Chino are traffic on State Route 60 and Highway 71, arterial traffic, and aircraft operations at Chino Airport and Ontario International Airport. Noise is also generated at the Union Pacific

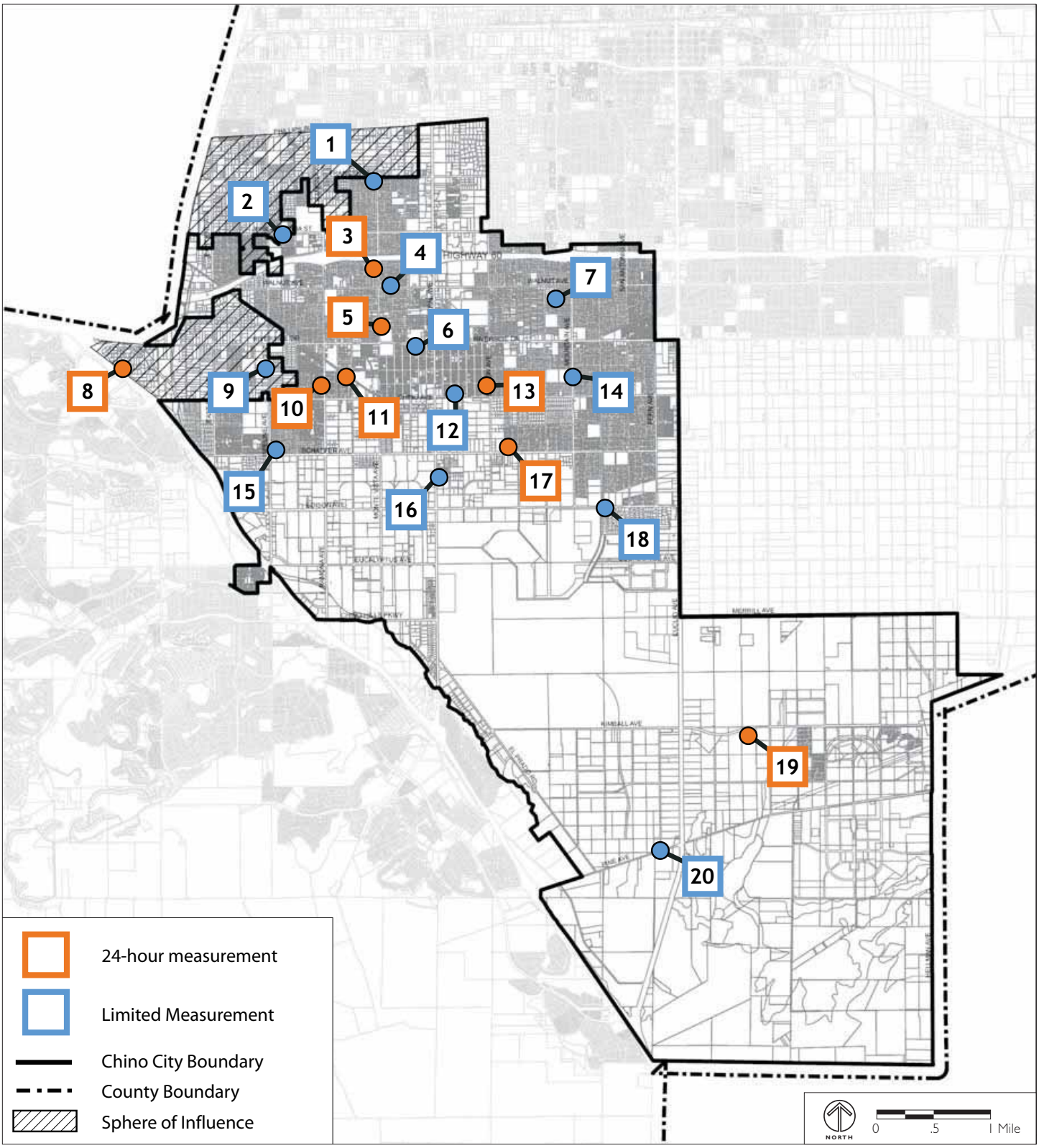
TABLE 4.10-5 **CHINO EXTERIOR NOISE ORDINANCE STANDARDS**

Maximum Time of Exposure	Level Not to Exceed, 7 a.m. to 10 p.m.	Level Not to Exceed, 10 p.m. to 7 a.m.
30 min/hr (L_{50})	55 dBA	50 dBA
15 min/hr (L_{25})	60 dBA	55 dBA
5 min/hr (L_{08})	65 dBA	60 dBA
1 min/hr (L_{02})	70 dBA	65 dBA
Any period of time (L_{max})	75 dBA	70 dBA

Rail line and on individual commercial and industrial parcels throughout the City. An evaluation of the existing noise environment in Chino includes 24-hour and limited noise measurements, described below.

- **24-Hour Noise Measurements.** Monitoring of 24-hour noise levels was conducted at eight locations in Chino over a period of three days in November 2008.
- **Limited Noise Measurements.** Twelve limited noise measurements were made at ten locations throughout Chino in November 2008. L_{02}, L_{08}, L_{25}, and L_{50} are the noise levels exceeded for more than 2, 8, 25, and 50 percent of the time, respectively, during the measurement period. L_{max} is the maximum noise level during the measurement period. L_{dn} is the average the average A-weighted noise level for the 24-hour day, after 10 dB have been added to levels measured between 10:00 p.m. and 7:00 a.m.

Noise measurement locations are identified in Figure 4.10-2 and measurement levels are shown in Table 4.10-6.



Source: DC&E, City of Chino and Wieland Acoustics

FIGURE 4.10-2

NOISE MEASUREMENT LOCATIONS

TABLE 4.10-6 **SUMMARY OF EXISTING NOISE MEASUREMENT LEVELS**

Site	Location	Date	Time	L_{02}	L_{08}	L_{25}	L_{50}	L_{max}	L_{dn}
Long-Term Measurements									
1	Front yard of 11711 Crystal Avenue	11/5/2008	11:05 a.m. to 11:38 a.m.	69.5	64.9	60.5	55.1	75.6	**N/A**
2	In front of 12102 Olive Place	11/6/2008	1:12 p.m. to 1:37 p.m.	59.2	54.2	50.5	48.2	67.2	**N/A**
3	Rear yard of 4878 Harrison Street	11/4/2008 to 11/5/2008	24 hours	65.5 – 687.7	64.0 – 67.8	62.0 – 66.8	59.7 – 66.0	68.1 – 75.9	**70.1**
4	Adjacent to 12495 Baca Avenue	11/4/2008	4:38 p.m. to 5:02 p.m.	72.2	69.8	67.8	65.6	78.0	**N/A**
5	Rear yard of 4888 Lincoln Avenue	11/4/2008 to 11/5/2008	24 hours	59.7 – 75.3	52.3 – 65.1	40.8 – 63.1	38.6 – 60.7	66.6 – 92.3	**63.8**
6	Adjacent to 5201 Riverside Avenue	11/4/2008	3:46 p.m. to 4:09 p.m.	71.2	68.7	66.6	64.5	82.8	**N/A**
7	Adjacent to 12614 Magnolia Avenue	11/6/2008	3:45 p.m. to 4:08 p.m.	67.8	63.1	55.5	49.2	79.4	**N/A**
8	Rear yard of 3017 Biscayne Street	11/4/2008 to 11/5/2008	24 hours	59.0 – 65.9	57.0 – 65.1	54.8 – 64.4	52.9 – 63.6	61.5 – 76.1	**65.7**
9	Adjacent to 4016 Biscayne Street	11/6/2008	11:44 a.m. to 12:05 p.m.	73.3	71.0	68.7	64.7	77.1	**N/A**
10	Rear yard of 4497 Juanita Avenue	11/5/2008 to 11/6/2008	24 hours	59.8 – 68.6	54.1 – 66.0	44.4 – 63.6	41.3 – 60.7	69.5 to 87.4	**64.5**
11	Rear yard of 13111 Bay Meadow Court	11/4/2008 to 11/5/2008	24 hours	41.8 – 69.9	40.4 – 66.8	38.4 – 55.7	36.9 – 49.6	47.2 – 98.1	**66.3**
12	Front yard of 13285 Tenth Street	11/4/2008	2:38 p.m. to 2:59 p.m.	72.4	70.0	67.0	63.4	76.8	**N/A**
13	Side yard of 13172 Benson Avenue	11/5/2008 to 11/6/2008	24 hours	50.2 – 64.8	43.2 – 58.4	39.6 – 54.8	38.1 – 52.2	63.0 – 89.0	**55.8**
14	In front of school field on Mountain Avenue	11/6/2008	3:06 p.m. to 3:26 p.m.	74.9	72.3	69.4	65.9	82.6	**N/A**
15	Adjacent to Unit #24, 4150 Schaefer Avenue	11/6/2008	11:01 a.m. to 11:22 a.m.	69.5	66.1	62.7	58.2	77.2	**N/A**

TABLE 4.10-6 **SUMMARY OF EXISTING NOISE MEASUREMENT LEVELS** (CONTINUED)

Site	Location	Date	Time	L_{02}	L_{08}	L_{25}	L_{50}	L_{max}	L_{dn}
16	Adjacent to 5311 Anderson Street	11/6/2008	2:14 p.m. to 2:30 p.m.	75.5	72.8	70.5	66.8	80.2	**N/A**
17	Rear yard of 13640 Amber Road	11/4/2008 – 11/5/2008	24 hours	40.0 – 57.5	38.8 – 55.9	37.8 – 54.3	36.6 – 53.1	44.8 – 71.3	**52.1**
18	Adjacent to 6522 Edison Avenue	11/6/2008	9:57 a.m. to 10:29 a.m.	74.0	70.4	66.0	61.1	82.9	**N/A**
19	Side yard of 7653 Kimball Avenue	11/5/2008 to 11/6/2008	24 hours	58.3 – 68.5	50.3 – 63.6	39.4 – 60.6	36.0 – 58.2	66.4 – 87.8	**61.6**
20	Front yard of 6800 Pine Avenue	11/5/2008	10:05 a.m. to 10:38 a.m.	67.9	60.8	53.8	47.0	75.3	**N/A**

Note: L_n is the noise level exceeded for more than n percent of the time during the measurement period. For example, L_{50} is the noise level exceeded for more than 50 percent of the measurement period. L_{max} is the maximum noise level during the measurement period. L_{dn} is the average A-weighted noise level for a 24-hour period.
Source: Wieland Acoustics , 2009, Noise Element: Technical Memorandum for the City of Chino General Plan, page 9.

In compliance with California Government Code Section 65302(f), L_{dn} contours were developed for the existing noise conditions within Chino. The L_{dn} contours for the major arterials, the freeways, and the railroad within Chino were developed using SoundPLAN version 6.5 software and the Traffic Noise Model (TNM) lookup tables developed by the FHWA. The models are based on traffic data from Caltrans and Iteris, Inc. These contour maps are shown in the following subsections.

a. Freeway and Arterial Traffic

Freeway traffic is the dominant noise source in Chino. The main contributor is State Route 60 (Pomona Freeway), which runs through the northern parts of Chino. With between 224,000 and 228,000 vehicles per day, State Route 60 generates an unmitigated L_{dn} of up to 86 dB at noise-sensitive locations next to the freeway. The City's exterior noise standard is 65 dB, as defined in the Noise Ordinance. In other noise-sensitive areas along the freeway that are mitigated by existing soundwalls, topography, or buildings, the L_{dn} was lower, although these measurements still exceed the Noise Ordinance standard of 65 dB.

The other major source of freeway traffic noise is created by State Route 71, which runs along the southwest edge of Chino. State Route 71, with 57,000 to 92,000 vehicles per day, generates an unmitigated L_{dn} of up to 81 dB at noise-sensitive locations adjacent to the freeway. At noise-sensitive locations mitigated by existing soundwalls, topography, or buildings, the L_{dn} is substantially lower, but still exceeds the City's Noise Element standard of 65 dB.

Other sources of noise in Chino are the major and secondary arterials that are within or adjacent to noise-sensitive areas. Examples of such areas might be residential communities, hospitals and parks near major and second arterials.

The following roadway segments may exceed the 65 dB standard:

- Benson Avenue, from Phillips Boulevard to Chino Avenue
- Central Avenue, from Phillips Boulevard to Highway 71
- Chino Avenue, from Highway 71 to Central Avenue

- Chino Avenue, from Central Avenue to Benson Avenue
- Chino Avenue, from Benson Avenue to Euclid Avenue
- Chino Corona Road, from Pine Avenue to Hellman Avenue
- Chino Hills Parkway, from Highway 71 to Central Avenue
- East End Avenue, from Phillips Avenue to Schaefer Avenue
- Edison Avenue, from Pipeline Avenue to Euclid Avenue
- El Prado Road, from Central Avenue to Kimball Avenue
- El Prado Road, from Kimball Avenue to Pine Avenue
- Eucalyptus Avenue, west of Highway 71
- Eucalyptus Avenue, from Pipeline Avenue to Central Avenue
- Eucalyptus Avenue, from College Park Avenue to Euclid Avenue
- Euclid Avenue, from Riverside Drive to Highway 71
- Francis Avenue, from Monte Vista Avenue to Central Avenue
- Grand Avenue, from the City limits to Pipeline Avenue
- Merrill Avenue, from Euclid Avenue to Carpenter Avenue
- Monte Vista Avenue, from Phillips to Chino Hills Avenue
- Mountain Avenue, from Philadelphia Street to Edison Avenue
- Philadelphia Street, from Reservoir Street to Benson Avenue
- Philadelphia Street, east of Benson Avenue
- Phillips Boulevard, from East End to Pipeline Avenue
- Pine Avenue, from Highway 71 to Euclid Avenue
- Pine Avenue, from Euclid Avenue to east of Grove Avenue
- Pine Avenue, from east of Grove Avenue to Hellman Avenue
- Pipeline Avenue, from Phillips Avenue to Philadelphia Street
- Pipeline Avenue, from Philadelphia Street to Eucalyptus Avenue
- Pipeline Avenue, from Eucalyptus Avenue to Highway 71
- Ramona Avenue, from Phillips Boulevard to Chino Hills Parkway
- Riverside Drive, from Highway 71 to Euclid Avenue
- Roswell Street, from Schaefer Avenue to Grand Avenue
- San Antonio Avenue, from Philadelphia Avenue to Walnut Avenue
- Schaefer Avenue, from East End Avenue to Euclid Avenue
- Walnut Avenue, from Pipeline Avenue to Ramona Avenue
- Walnut Avenue, from Ramona Avenue to Euclid Avenue

Figure 4.10-3 identifies existing noise contours for Chino roadways ranging from 60 to 80 dB in 5 dB increments.

b. Chino Airport

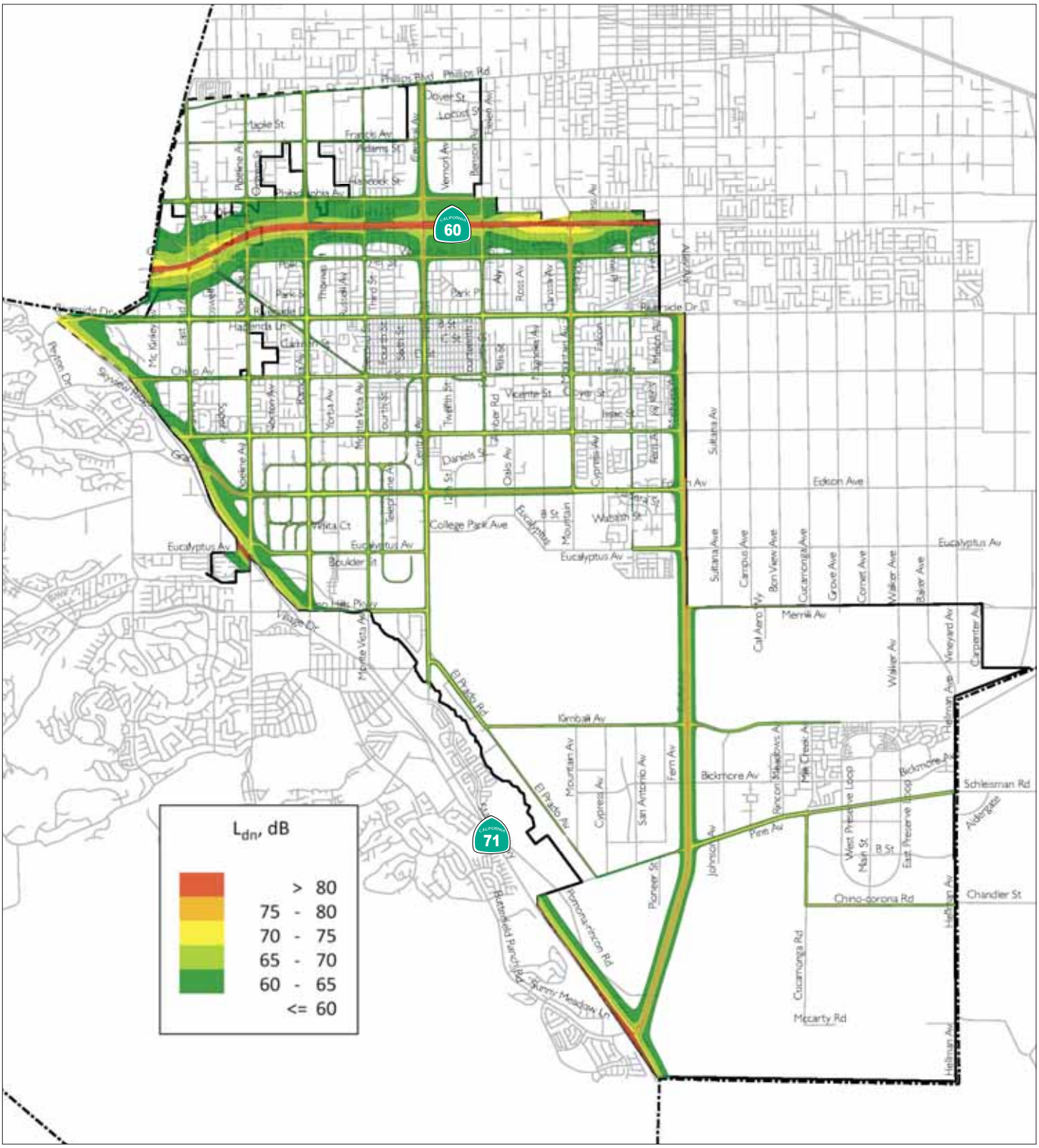
The Chino Airport is located in the southeastern portion of the City. Its primary noise impacts occur in the vicinity of the airport, but there are few areas in the City that are not subject to flyovers to and from the airport. Figure 4.10-4 shows the existing noise contours for the Chino Airport. As shown in Figure 4.10-4, the 65 dB noise contour in general does not extend beyond the Chino Airport boundaries and, more importantly, does not cover any residential properties. Near the airport, 24-hour noise measurements were taken which revealed an L_{dn} of 61.6 dB, not exceeding the Noise Ordinance exterior noise standard of 65 dB.

c. The Ontario International Airport

The Ontario International Airport is a commercial air facility two miles northeast of Chino. Existing noise contours for Ontario International Airport are shown in Figure 4.10-5. While the Ontario International Airport noise contours do not extend into Chino, the takeoff patterns direct the aircraft over central and eastern portions of Chino, exposing residents in these areas to single-event takeoff noise. The City of Chino has a Letter of Understanding with Los Angeles World Airports, the entity that operates the Ontario Airport. This agreement provides for a modified flight path for certain aircraft to ensure that they do not create additional noise impacts to Chino's residential areas. This agreement is in effect until 2011.

d. Union Pacific Rail Line

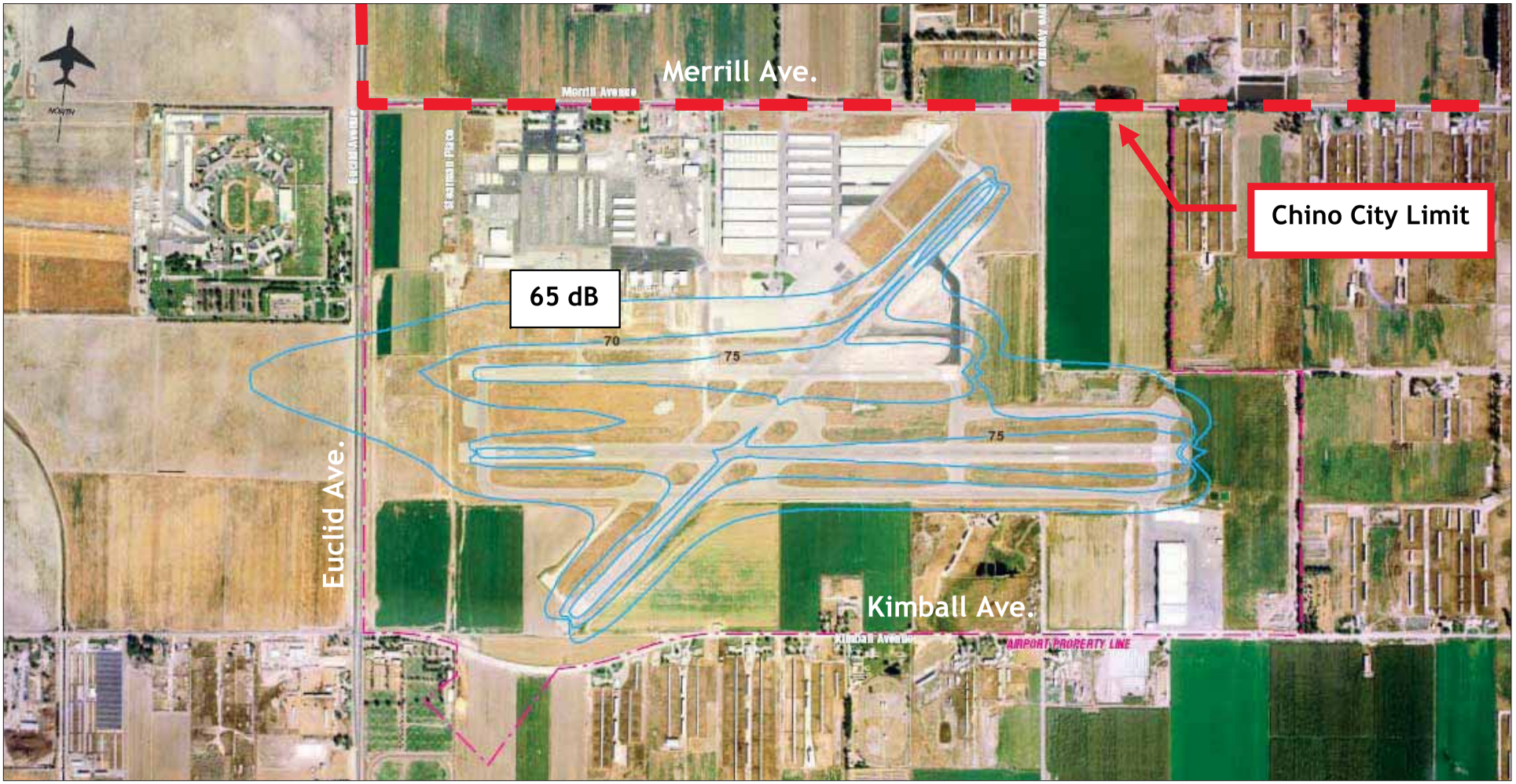
The Union Pacific operates a spur line that runs in the City of Chino. While the line is only used to service local industries and runs about four times a day, it does stop at a siding between Ramona and Monte Vista Avenues in a residential area. When stopping here, the freight train generates high noise levels, which have generated noise complaints. A continuous 24-hour measurement was obtained in the surrounding residential community to identify the existing noise environment in this area (refer to Figure 4.10-2, location



Source: Wieland Acoustics

FIGURE 4.10-3

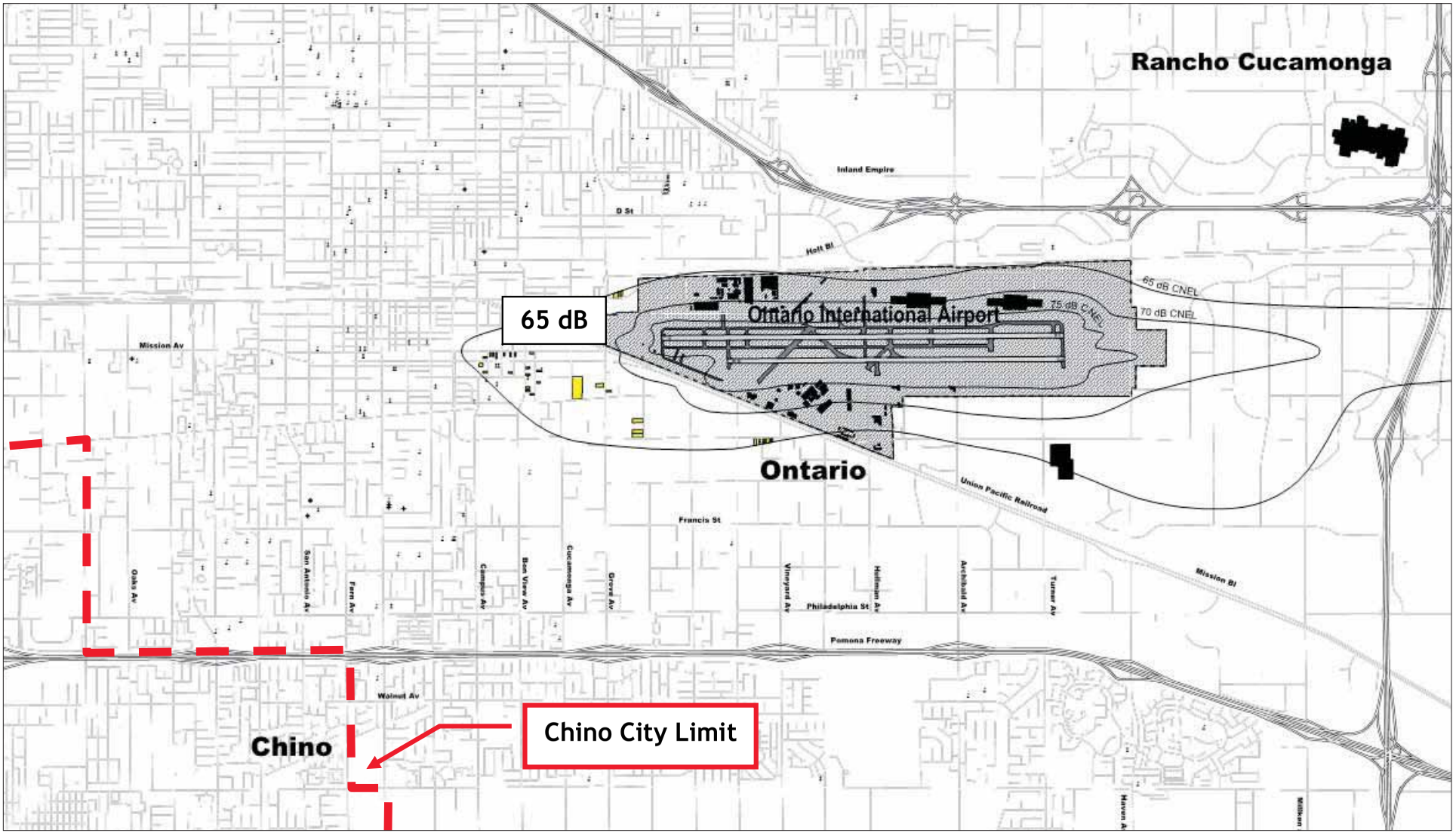
EXISTING L_{dn} CONTOUR LINES FOR CHINO ROADWAYS



Source: Airport Master Plan for Chino Airport. December 2003

FIGURE 4.10-4

EXISTING (2001) NOISE CONTOURS FOR CHINO AIRPORT



Source: http://www.lawa.org/uploadedFiles/ONT/pdf/ont4q7community.pdf

FIGURE 4.10-5

EXISTING (4TH QUARTER 2007) NOISE CONTOURS FOR ONTARIO INTERNATIONAL AIRPORT

#11). The results of the measurement, provided in Table 4.10-7, indicate an L_{dn} of 66.3 dB. This exceeds the City's Noise Element standard of 65 dB. The maximum noise level at this location was as high as 98.1 dBA. Data for future rail operations on the spur line is not available; however, it has been assumed that they will remain essentially the same as the existing operations, based on the best available information.

e. Commercial/Industrial Properties

Large industrial and commercial areas in Chino have the potential to generate noise. The primary noise-generating activities in these areas are loading dock operations, trucks entering and leaving the area, and mechanical equipment located both inside and outside the buildings. Industrial areas in Chino are mainly concentrated in the center of the City, while the main commercial corridor is located along Central Avenue.

Residential areas and other noise-sensitive activities that are located close to these commercial/industrial operations are generally at risk for noise disturbances. However, in general there are relatively few areas where industrial uses are located immediately adjacent to residential areas in Chino. Noise levels for one such residential/industrial interface area, a residence at 13640 Amber Road (location #17 in Table 4.10-6), are shown in Table 4.10-7.

The table compares the highest noise levels measured during daytime and nighttime hours with the maximum allowed noise levels in the Noise Ordinance.

Table 4.10-7 shows that noise levels generated by activities at the commercial use comply with the City's Noise Ordinance standard.

TABLE 4.10-7 **SUMMARY OF NOISE LEVELS MEASURED AT THE RESIDENTIAL/INDUSTRIAL INTERFACE AT 13640 AMBER ROAD**

Maximum Time of Exposure	Daytime Measured Noise Level	Daytime Noise Standard	Nighttime Measured Noise Level	Nighttime Noise Standard
30 min/hr (L_{50})	53.1 dBA	55 dBA	49.5 dBA	50 dBA
15 min/hr (L_{25})	54.3 dBA	60 dBA	50.3 dBA	55 dBA
5 min/hr (L_{08})	55.9 dBA	65 dBA	51.3 dBA	60 dBA
1 min/hr (L_{02})	57.5 dBA	70 dBA	52.7 dBA	65 dBA
Any period of time (L_{max})	71.3 dBA	75 dBA	67.7 dBA	70 dBA

D. Standards of Significance

The City of Chino's General Plan would create a significant noise impact if it would:

- Expose people to or generate noise levels in excess of standards established in the local general plan or noise ordinance, or other applicable standards.
- Create a substantial temporary, periodic or permanent increase in ambient noise levels in the project vicinity above levels existing without the project.
- Expose people to or generate excessive groundborne vibration or groundborne noise levels.
- Expose people living or working in the project area to excessive noise from a public or private airport.

E. Impact Discussion

This section discusses the potential changes in the noise conditions and noise exposure that could result from implementation of the Proposed General Plan or the Focused Growth Plan. The proposed projects are discussed together because the noise impacts of implementation would be very similar. Differences are called out where they exist.

To summarize, the standards in the updated City of Chino Noise Element for the normally acceptable interior noise levels are as follows:

- Residential developments – 45 L_{dn}
- Institutional uses – 45 L_{dn}
- Office uses – 50 L_{dn}
- Commercial retail – 55 L_{dn}
- Manufacturing and warehouses – 65 L_{dn}

Noise Element standards for normally acceptable exterior noise levels are as follows:

- Residential developments – 65 L_{dn}
- Parks – 65 L_{dn}

1. Noise Levels in Excess of Standards

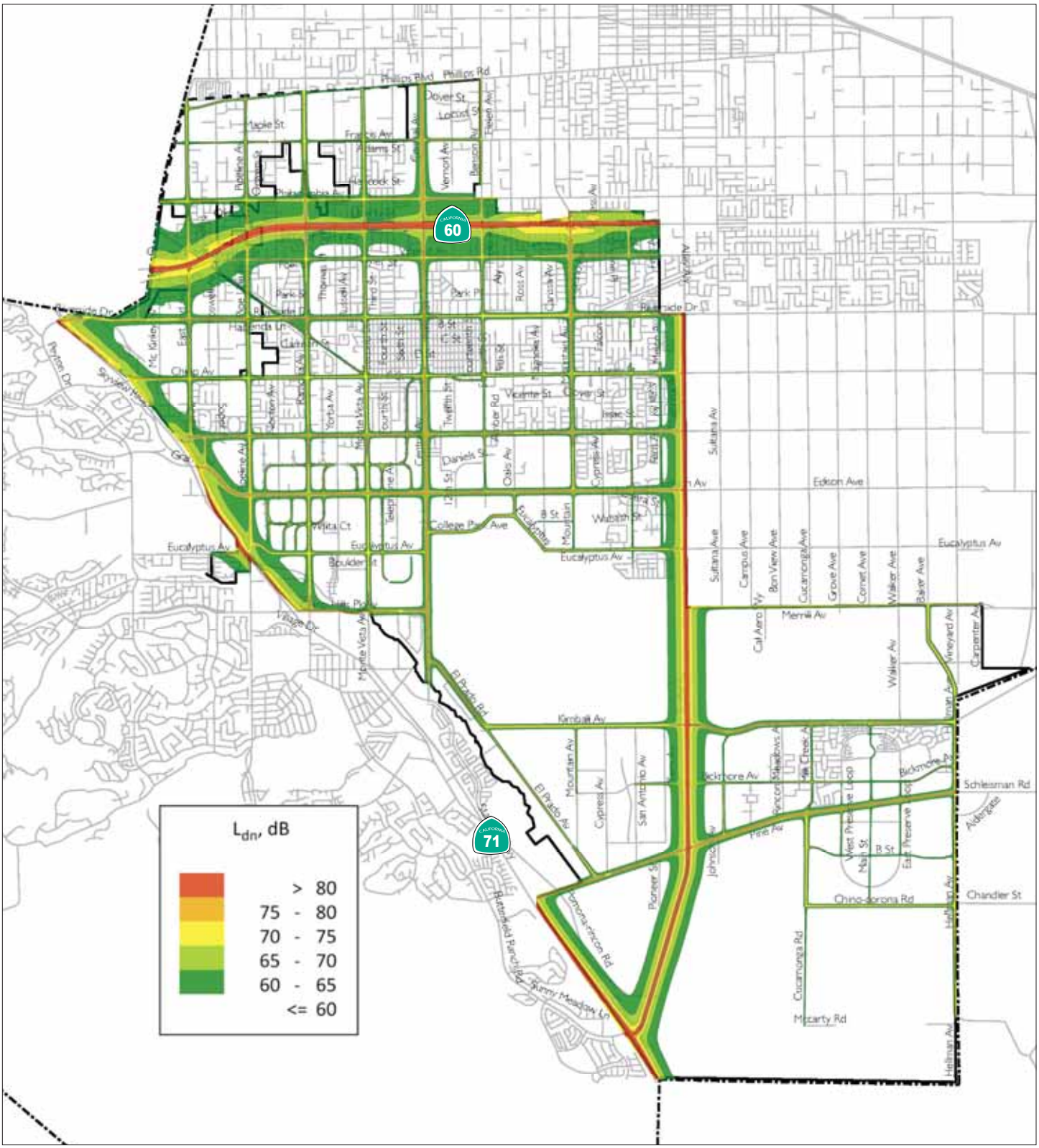
Single-family residential development, schools, libraries, hospitals, convalescent homes, and places of worship are among the most noise-sensitive uses. Multi-family residential, commercial, and industrial development is less noise-sensitive because associated activities occur primarily indoors, and noise exposure is mitigated through building design and construction.

Noise exposure along many roadways in Chino could exceed normally acceptable levels for noise-sensitive uses. When exterior noise levels exceed 60 dBA L_{dn} in new residential development, interior levels may exceed 45 dBA L_{dn}. Interior noise levels within residential units with the windows partially open are approximately 10 to 15 dB lower than exterior noise levels, and interior noise levels within residential units with the windows closed are approximately 20 to 25 dB lower than exterior noise levels, assuming typical

California construction methods. Acoustical analyses would need to be conducted to design mitigating features that would reduce noise as much as feasible in exterior use areas to the normally acceptable interior noise level of 45 L_{dn}. Where exterior day-night average noise levels are 60 to 70 dBA L_{dn}, interior noise levels can typically be maintained below 45 dBA L_{dn} with the incorporation of an adequate forced air mechanical ventilation system in the residential units to allow residents the option of controlling noise by keeping the windows closed. In areas exceeding 70 dBA L_{dn}, the inclusion of windows and doors with high Sound Transmission Class (STC) ratings, and the incorporation of forced-air mechanical ventilation systems, may be necessary to meet 45 dBA L_{dn}.

L_{dn} contours were developed for Year 2025 noise conditions for major arterials, the freeways, and the railroad under the Proposed General Plan and the Focused Growth Plan. The measured noise levels discussed in Table 4.10-6 were used to calibrate the noise model for the City. Figure 4.10-6 shows future noise levels between 60 and 80 dB for roadways under the Proposed General Plan, and Figure 4.10-7 shows future noise levels under the Focused Growth Plan.

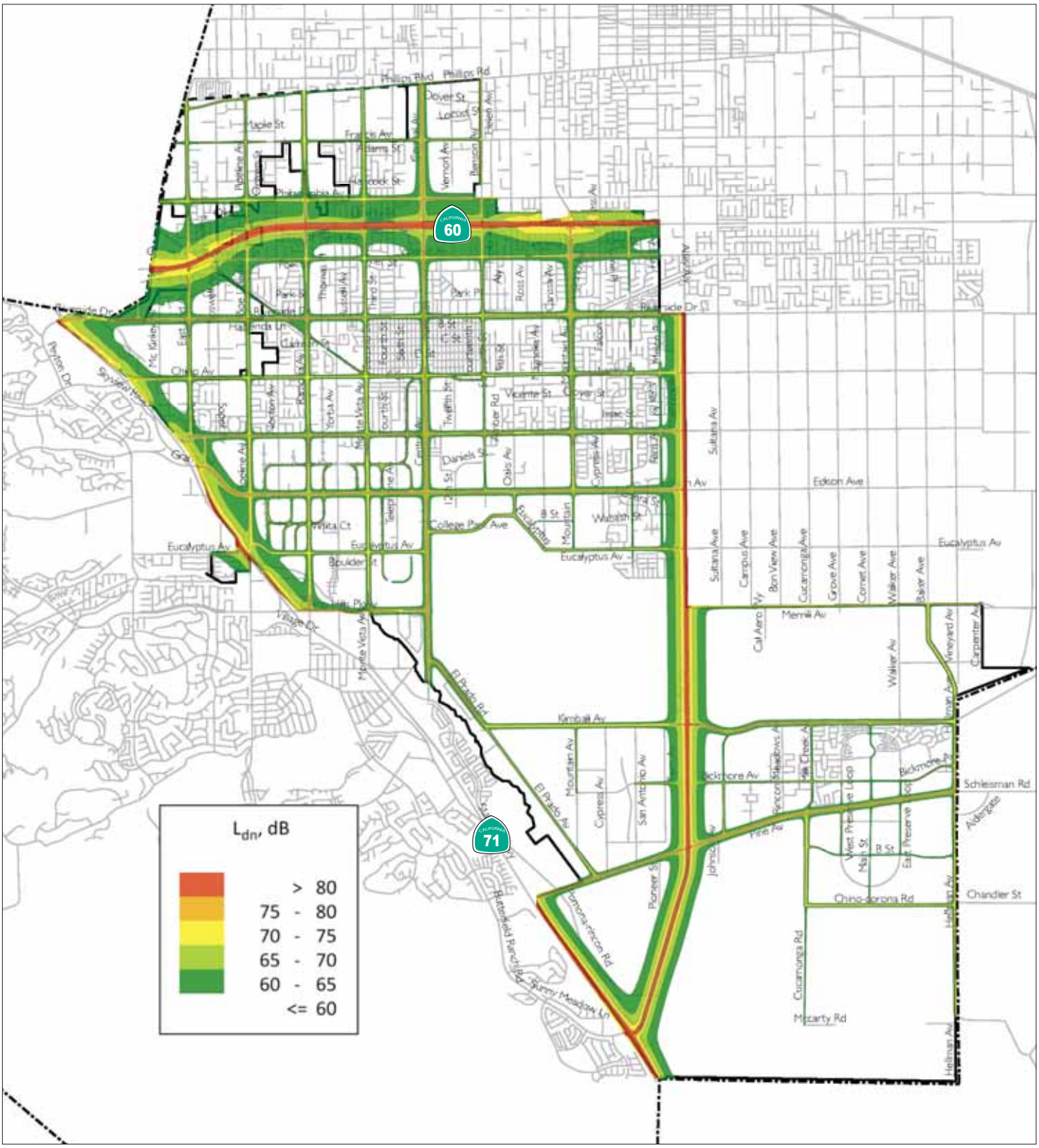
Objective N-1.1 of the Noise Element requires the City to ensure appropriate exterior and interior noise levels for existing and new land uses. Policy P1 under this Objective dictates that the City not locate noise-sensitive land uses in areas with noise levels that exceed normally acceptable levels for each land use unless measures can be implemented to reduce noise to acceptable levels. Policy P3 would require new development projects to incorporate attenuation measures for indoor and outdoor noise levels where current or future noise levels may be unacceptable. Policy P5 would require an acoustical study for all new residential developments within the 65 L_{dn} noise contour on the Future Noise Contour Map to ensure indoor levels do not exceed City standards. Policy P7 would require noise reduction features to be incorporated into the site planning process for new development projects where current or future noise levels may be unacceptable. Implementation of these policies of the Noise Element would be sufficient to reduce potential impacts



Source: Wieland Acoustics

FIGURE 4.10-6

L_{dn} CONTOUR LINES FOR FUTURE NOISE CONDITIONS UNDER THE GENERAL PLAN



Source: Wieland Acoustics

FIGURE 4.10-7

L_{dn} CONTOUR LINES FOR FUTURE NOISE CONDITIONS UNDER THE FOCUSED GROWTH ALTERNATIVE

associated with noise exposure and land use compatibility to a *less-than-significant* level.

2. Increased Ambient Noise

a. Construction Noise

Residences and other noise-sensitive uses located adjacent to proposed development areas would be affected by construction noise under the Proposed General Plan or Focused Growth Plan. Construction activities can generate considerable amounts of noise, especially during demolition and the construction of project infrastructure when heavy equipment is used.

Construction-related noise levels typically range from about 80 to 90 dBA at a distance of 50 feet from the noise source. Pile driving can cause levels up to 100 to 105 dBA at 50 feet. Typical hourly average construction generated noise levels are about 81 dBA to 89 dBA measured at a distance of 50 feet from the center of the site during busy construction periods. Construction-generated noise levels drop off at a rate of about 6 dBA per doubling of the distance between the source and receptor.

Construction impacts primarily occur when construction is conducted during noise-sensitive times of day (e.g. early morning, evening, or nighttime hours), occurs in areas immediately adjoining noise-sensitive land uses, or when lasting for extended periods of time.

Policy P1 under Objective N-1.3 of the Noise Element of the Proposed General Plan requires the preparation of a noise monitoring plan for all construction projects that identifies noise control measures that will be incorporated. Policy P2 limits construction in the vicinity of noise-sensitive uses to the hours between 7:00 a.m. and 7:00 p.m., stipulates that noise-generating stationary sources be located away from sensitive receptors, and requires the use of exhaust mufflers and temporary noise barriers for construction equipment. Adoption and implementation of this policy would reduce noise exposure for adjacent land uses. With compliance with Chino's Noise Ordinance and im-

plementation of these policies, there would be a *less-than-significant* impact with regard to temporary increases in ambient noise due to construction.

b. Project-Generated Traffic Noise

Chino is traversed by several major and secondary arterials that are within, or adjacent to, noise-sensitive areas. Traffic noise levels were modeled to determine how changes in vehicular traffic volumes under the Proposed General Plan and Focused Growth Plan would affect future noise conditions. At noise-sensitive areas adjacent to the following arterial segments, the traffic volume would be sufficient to result in an unmitigated L_{dn} that may exceed the City's Noise Element standard of 65 dB. Table 4.10-8 shows the arterial segments where the L_{dn} would exceed 65 dB under existing conditions, the Proposed General Plan, and the Focused Growth Plan.

As shown in Table 4.10-8, there are two segments, along Francis Avenue and Phillips Boulevard, where L_{dn} under the Focused Growth Alternative would exceed 65 dB, while L_{dn} under the Proposed General Plan would not, and for which there is no data for existing noise levels. Generally, the differences between existing noise levels and future noise levels under the Proposed General Plan and Focused Growth Plan are minor. As shown in Table 4.10-8, the segments on which noise under the two plans would exceed 65 L_{dn} already exceed acceptable noise level under existing conditions. Between the Proposed General Plan and the Focused Growth Plan, differences in future noise levels would also be minor (i.e. ranging from a decrease of 0.4 dB to an increase of 0.8 dB). Such small differences are not discernible by the average person. The largest increases, relative to the General Plan buildout, under the Focused Growth Alternative would occur on segments of Central Avenue, Francis Avenue, and Riverside Drive. The largest increases, relative to the Focused Growth Alternative, under the Proposed General Plan would occur on segments of Benson Avenue and Reservoir Street.

Under the Proposed General Plan, traffic on State Route 60 would increase to between 235,400 and 246,800 vehicles per day. This additional traffic would

TABLE 4.10-8 **ARTERIAL SEGMENTS WHERE THE L_{DN} WOULD EXCEED 65 DB**

Arterial	Segment	Existing	Year 2025 – Proposed General Plan	Year 2025 – Focused Growth Plan
Benson Avenue	Phillips – Chino	X	X	X
Central Avenue	Phillips – Hwy 71	X	X	X
Chino Avenue	Hwy 71 – Central Central – Benson Benson – Euclid	X	X	X
Chino Corona Road	Pine – Hellman	X	X	X
Chino Hills Pkwy	Hwy 71 – Central	X	X	X
College Park Avenue	Central – Oaks	No data	X	X
East End Avenue	Phillips – Schaefer	X	X	X
Edison Avenue	Pipeline – Euclid	X	X	X
El Prado Road	Cental – Kimball Kimball – Pine	X	X	X
Eucalyptus Avenue	West of Hwy 71 Pipeline – Central College Park – Euclid	X	X	X
Euclid Avenue (Hwy 83)	Riverside – Hwy 71	X	X	X
Francis Avenue	Monte Vista - Central	X		X
Grand Avenue	City limit – Pipeline	X	X	X
Hellman Avenue	Merrill – River	No data	X	X
Kimball Avenue	El Prado – Grove Grove – Hellman	X	X	X
Merrill Avenue	Euclid – Carpenter	X	X	X
Monte Vista Avenue	Phillips – Chino Hills	X	X	X
Mountain Avenue	Philadelphia – Edison	X	X	X
Oaks Avenue	Edison – College Park	No data	X	X

TABLE 4.10-8 **ARTERIAL SEGMENTS WHERE THE L_{DN} WOULD EXCEED 65 DB** (CONTINUED)

Arterial	Segment	Existing	Year 2025 – Proposed General Plan	Year 2025 – Focused Growth Plan
Philadelphia Street	Reservoir – Benson East of Benson	X	X	X
Phillips Boulevard	East End – Pipeline	X		X
Pine Avenue	Hwy 71 – Euclid Euclid – E/O Grove East of Grove – Hellman	X	X	X
Pipeline Avenue	Phillips – Philadelphia Philadelphia – Eucalyptus Eucalyptus – Hwy 71	X	X	X
Ramona Avenue	Phillips – Chino Hills	X	X	X
Riverside Drive	Hwy 71 – Euclid	X	X	X
Roswell Street	Schaefer – Grand	X	X	X
San Antonio Avenue	Philadelphia – Walnut	X	X	X
Schaefer Avenue	East End – Euclid	X	X	X
Walnut Avenue	Pipeline – Ramona Ramona – Euclid	X	X	X

Source: Wieland Acoustics , 2009, *Noise Element: Technical Memorandum for the City of Chino General Plan*, page 14.

increase the L_{dn} at adjoining properties by about 0.2 to 0.3 dB, an indiscernible amount. Under the Focused Growth Alternative, the L_{dn} would be about 0.1 dB less than under buildout of the General Plan.

Traffic on Highway 71 would increase to between 92,400 and 147,900 vehicles per day under the Proposed General Plan, which would increase the L_{dn} at adjoining properties by about 2 dB, an indiscernible amount. Under the Focused Growth Plan, the L_{dn} would be the same as or about 0.1 dB higher than under the Proposed General Plan.

The Noise Element of the General Plan contains policies to control excessive noise from traffic sources. Policy P1 under Objective N-1.2 is to minimize transportation noise through street and right-of-way design or route coordination (e.g. reducing street limits or planting street trees). Policy P6 under Objective N-1.1 is to approve only those projects that comply with adopted noise standards or meet the provisions of the California Environmental Quality Act. With adoption and implementation of these policies, the Proposed General Plan and Focused Growth Plan would result in a *less-than-significant* impact on ambient noise relative to existing noise conditions.

3. Groundborne Vibration

Development under the Proposed General Plan or the Focused Growth Plan with the potential to generate groundborne vibration would be subject to environmental review. Groundborne vibration caused by trains passing through Chino could exceed the guidelines set forth by the FTA if new buildings would be constructed within 100 feet of the railroad tracks. The proposed locations of buildings and their specific sensitivity to vibration are not presently known. Policy P4 under Objective N-1.2 would require that vibration-sensitive development be constructed at least 100 feet from the railroad centerline when feasible. For any development proposed within 100 feet of the railroad, a study would be required to demonstrate that vibration-issues associated with rail operations are adequately addressed through building siting, foundation design, or construction techniques. With adoption and implementation of this policy, there would be a *less-than-significant* impact re-

lated to groundborne vibration for both the Proposed General Plan and Focused Growth Plan.

4. Airport Noise Exposure

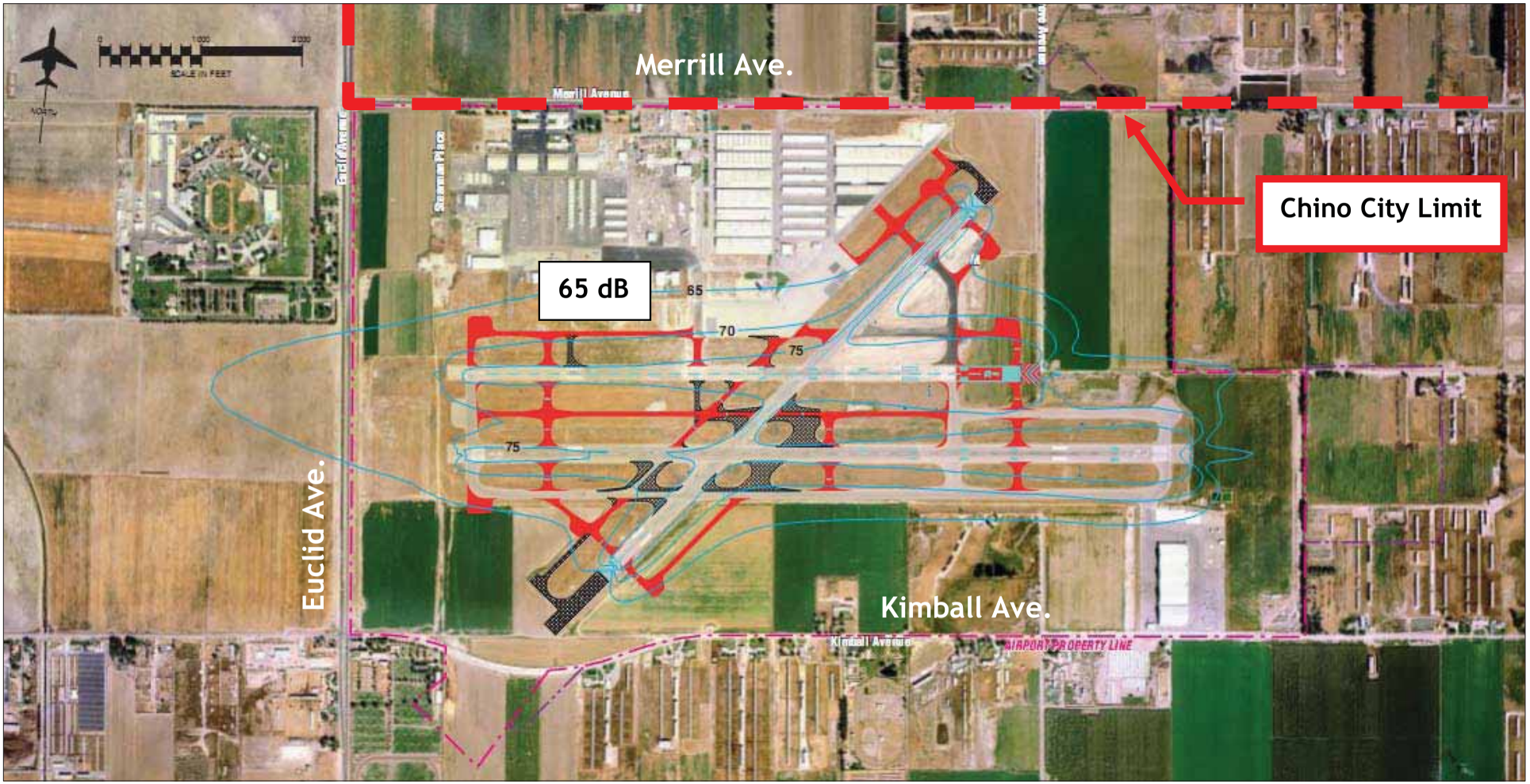
The 2003 Master Plan for Chino Airport focuses on meeting design and safety standards for each runway, improving instrument approach capability, extending Runway 8L-26R, and the eventual development of new taxiways to improve airfield capacity, safety, and efficiency. Over time, these improvements together with general growth are expected to increase annual operations at the airport from 145,491 in 2001 to 209,400 by 2025. Figure 4.10-8 shows the 2025 noise contours for Chino Airport. As shown, the 65 dB noise contour is not expected to extend much beyond the boundaries of the airport, and is not expected to encompass any land proposed for residential use under either the Proposed General Plan or the Focused Growth Plan.

Future noise contours for the Ontario International Airport are shown in Figure 4.10-9. As indicated in this figure, the noise contours do not intrude into the City of Chino. Takeoff patterns from the airport do direct the aircraft over the central and eastern portions of Chino, exposing residents in these areas to single-event takeoff noise levels. However, buildout under the General Plan or Focused Growth Plan would not expose residents to excessive noise associated with the Ontario Airport.

Since no residential or other noise-sensitive uses are proposed in areas subject to elevated aircraft noise in either the Proposed General Plan or the Focused Growth Plan, there would be a *less-than-significant* impact with regard to airport noise.

5. Cumulative Impacts

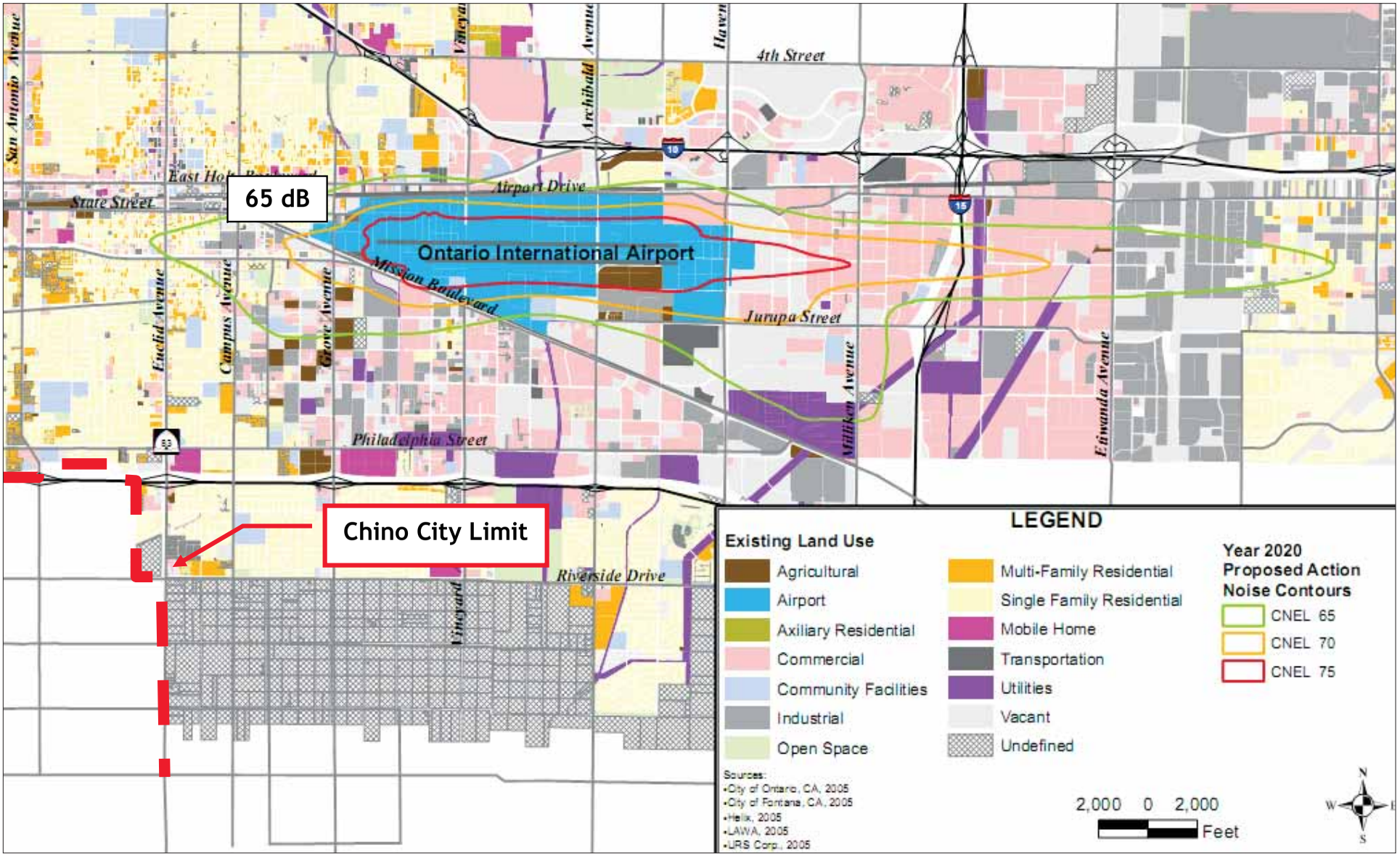
Cumulative noise impacts are considered as part of the project-level analysis since the noise analysis is based on the traffic model where input included planned and approved projects in the City, plus traffic anticipated from buildout of the Proposed General Plan and Focused Growth Plan. The main regional noise sources affecting the noise environment in Chino are the



Source: Airport Master Plan for Chino Airport. December 2003

FIGURE 4.10-8

2025 NOISE CONTOURS FOR CHINO AIRPORT



Source: Noise Technical Report, Pacific Gateway Cargo Center. Proposed Action Alternative. URS. March 2006.

FIGURE 4.10-9

FUTURE (2020) NOISE CONTOURS FOR ONTARIO INTERNATIONAL AIRPORT

freeways, Chino Airport, and Ontario International Airport, the future impacts of which were analyzed in this section. As a result, cumulative impacts would be the same as the project-level impacts discussed above, and are found to be *less than significant*.

F. Impacts and Mitigation Measures

No significant impacts are identified; therefore, no mitigation measures are required.