14 NOISE ELEMENT

The purpose of the Noise Element is to identify and evaluate noise generation in the City of Chino in order to minimize problems from intrusive sound and to ensure that development does not expose people to unacceptable noise levels. State law requires a Noise Element as part of all city and county General Plans. The Noise Element should provide a systematic approach to the measurement and modeling of noise, the establishment of noise standards, the control of major noise sources, and community planning for the regulation of noise. This Noise Element provides baseline information on the existing noise environment, including noise measurements taken throughout the City; identifies noise-sensitive uses in Chino; provides goals, objectives, policies, and actions for controlling noise in existing and future development; and provides an indicator for monitoring Chino's noise-control efforts.

A. Background

This section provides a brief discussion of noise perception and measurement, acoustical fundamentals, current noise policies regulating development in the area, and existing noise sources in the City of Chino.

1. Understanding Noise

This section explains how noise is measured and gives an overview of the potential effects of excessive noise. An explanation of how noise affects various land uses is provided.

a. Measurement of 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 a sound can be caused by its pitch or its loudness. Pitch is the height or depth of a tone or sound, depending on the relative rapidity of the vibrations (frequency) by which it is produced. Higher-pitched signals sound louder to humans than sounds with a lower pitch. Loudness is the 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 that are used to describe noise in a particular situation. These are listed in Table N-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 ten-fold increase in acoustic energy, while 20 decibels is 100 times more intense, 30 decibels is 1,000 times more intense, etc. 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 perceive a difference between two noises that are less than three 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 N-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

TABLE N-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%, 08%, 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 to 10 p.m.) and 10 decibels to measurements taken between 10 p.m. and 7 a.m.
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 p.m. and 7:00 a.m.
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.

TABLE N-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, disco	
Diesel pile drive (100 feet)	100		Very loud
Power lawn mower (5 feet) Freight cars (50 feet)	90	Boiler room printing press plant	
Pneumatic drill (50 feet) Freeway (100 feet) Vacuum cleaner (10 feet)	80 70	In kitchen with garbage disposal running	Moderately loud
	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

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 weight noise during quiet periods of the night and evening more heavily. 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 p.m. to 10:00 p.m.) and a 10 dB addition to nocturnal (10:00 p.m. to 7:00 a.m.) 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. The Effects of Noise

There are several short- and long-term effects of noise on communities, including hearing loss, sleep and speech interference, and annoyance. These potential effects are described below.

i. General Hearing Loss or Damage

Hearing loss occurs mainly due to chronic exposure to excessive noise, but may be due to a single event such as an explosion. Natural hearing loss associated with aging may also be accelerated by chronic exposure to loud noise.

Sound levels that exceed 85 dBA, when experienced for long durations during each working day, may result in severe temporary or even permanent hearing loss. The Occupational Safety and Health Administration (OSHA) has established a noise exposure standard at the noise threshold where hearing loss may occur from long term exposures. The maximum allowable level is 90 dBA averaged over eight hours. If the noise is above 90 dBA, the allowable exposure time is correspondingly shorter.

ii. Sleep and Speech Interference

Sound levels that exceed 40 to 45 dBA are generally considered excessive for sleeping areas within a residence. Speech intelligibility is impaired when sound levels exceed 60 dBA. The amount of interference increases with sound level, and with distance between speaker and listener.

Typical structural attenuation is 12 to 17 dBA with open windows. With closed windows, the noise attenuation factor is around 20 dBA for an older structure and 25 dBA for newer homes. In order to achieve an acceptable interior noise environment, bedrooms facing secondary roadways must have operable windows; those facing major roadways and freeways typically need specially designed glass installed in window frames.

iii. Annoyance

Attitude surveys are used for measuring the annoyance felt in a community for noises intruding into homes or affecting outdoor activity areas. In these surveys, it was determined that the causes for annoyance include interference with speech, radio and television, house vibrations, and interference with sleep and rest. The L_{dn} as a measure of noise has been found to provide a valid correlation of noise level and the percentage of people annoyed.

People continue to disagree about the relative annoyance of noise from aircrafts and roadways. When measuring the percentage of the population highly annoyed, the threshold for ground vehicle noise is about 55 dBA L_{dn}. At an L_{dn} of about 60 dBA, approximately 2 percent of the population is highly annoyed. When the L_{dn} increases to 70 dBA, the percentage of the population highly annoyed increases to about 12 percent of the population. There is, therefore, an increase of about 1 percent per dBA between an L_{dn} of 60 to 70 dBA. Between an L_{dn} of 70 to 80 dBA, each decibel increase results in about a 2 percent increase in population that is highly annoyed. People appear to respond more adversely to aircraft noise. When the L_{dn} is 60 dBA, approximately 10 percent of the population is believed to be highly annoyed. Each decibel increase to 70 dBA adds about two percentage points to the number of people highly annoyed. Above 70 dBA, each decibel increase re-

sults in about a 3 percent increase in the percentage of the population highly annoyed.

c. Land Use Compatibility

Land uses deemed noise-sensitive by the State of California include schools, hospitals, rest homes, long-term care, and mental care facilities. Many jurisdictions consider residential uses particularly noise-sensitive because families and individuals expect to use time at home for rest and relaxation, and noise can interfere with those activities. Chino also identifies churches, libraries, and health care institutions as noise-sensitive land uses in Section 9.040.070 of the Noise Ordinance.

Land uses that are relatively insensitive to noise include some office and retail developments. Other examples of insensitive uses include industrial and manufacturing uses, utilities, agriculture, vacant land, parking lots, salvage yards, and transit terminals.

2. Regulatory Framework

In addition to policies in this Noise Element, noise within Chino is also governed by standards established by the State Office of Noise Control, the California Department of Housing and Community Development, and the Noise Ordinance of the Chino Municipal Code. A discussion of these guidelines and regulations follows.

a. The State Office of Noise Control

The Government Code and State Office of Noise Control (ONC) Guidelines require that certain major noise sources and areas containing noise-sensitive land uses be identified and quantified. This can be shown on community maps with generalized noise exposure contours for current and projected levels of activity. 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 enforcement of a local noise control ordinance and for ensuring compliance with the State's noise insulation standards.

According to the Government Code Section 65302(f) and ONC Guidelines, the following major noise sources should be considered in the preparation of a Noise Element:

- Highways and freeways
- Primary arterials and major local streets
- Railroad operations
- Aircraft and airport operations
- Local industrial facilities
- Other stationary sources

b. California Noise Insulation Standards

California's noise insulation standards were officially adopted by the California Department of Housing and Community Development in order to regulate the noise levels allowed in habitable structures. The regulation requires that interior noise levels attributed to exterior noise sources do not exceed 45 dB in any habitable room (noise metric measured in either CNEL or L_{dn}, consistent with the noise element of the local general plan). Additionally, the commission specifies that residential buildings or structures require an acoustical analysis if they are to be located within exterior L_{dn} (or dBA) contours of 60 dB or greater of an existing or adopted freeway, expressway, parkway, major street, thoroughfare, rail line, rapid transit line, or industrial noise source. The analysis must show that the building has been designed to limit intruding noise to an interior L_{dn} of 45 dB.

c. Chino Noise Standards

Chino's interior and exterior noise standards are presented in Table N-3.

d. Chino Municipal Code, Noise Ordinance

Chino's existing Noise Ordinance provides regulations for the control of excessive and annoying noise from stationary sources. Examples of stationary sources include industrial plants, pumps, compressors, and refrigeration units.

TABLE N-3 **INTERIOR AND EXTERIOR NOISE STANDARDS**

Land Use Category	Uses	Energy Average L_{dn} Interior[a]	Energy Average L_{dn} Exterior[b]
Residential	Single-family, duplex, multi-family	45[c]	65
	Mobile home	---	65[d]
Commercial, Industrial, Institutional	Hotel, motel, transient lodging	45	65
	Commercial retail, bank, restaurant	55	---
	Office building, research and development, professional offices, City office building	50	---
	Amphitheatre, concert hall, auditorium, meeting hall	45	---
	Gymnasium (multipurpose)	50	---
	Sports club	55	---
	Manufacturing, warehousing, wholesale, utilities	65	---
	Movie theaters	45	---
Institutional	Hospital, schools, classroom	45	65
	Church, library	45	---
Open Space	Parks	---	65

[a] Indoor environment excluding: bathrooms, toilets, closets, corridors.

[b] Outdoor environment limited to: private yard of single-family or multi-family private patio or balcony which is served by a means of exit from inside, mobile home park, hospital patio, park's picnic area, school's playground, and hotel and motel recreation area.

[c] Noise level requirement with closed windows. Mechanical ventilation system or other means of natural ventilation shall be provided per the California Building Code.

[d] Exterior noise level should be such that interior noise levels will not exceed 45 dB L_{dn}.

The ordinance provides specific standards to be applied for various land uses for both daytime and nighttime hours, prohibits certain noise sources, and describes the manner in which standards are to be enforced. Section 9.40.040 of the Noise Ordinance describes maximum noise levels for noise intrusion into residential properties. These are presented in Table N-4. Each of the noise levels in this table should be reduced by 5 dBA for impulse or simple tone noises, or for noises consisting of speech or music. However, if the ambient noise level exceeds the resulting standard, the ambient shall be the standard.

The Noise Ordinance exempts certain activities from the noise standards in Table N-4.

- Activities conducted on public parks, public playgrounds, and public or private school grounds including school athletic and school entertainment events that are conducted under the sanction of the school or for which a license or permit has been duly issued pursuant to any provision of the City code.
- Occasional outdoor gatherings, public dances, shows, sporting, and entertainment events, provided said events are conducted pursuant to a permit or license issued by the appropriate jurisdiction relative to the staging of said events. Such permits and licenses may restrict noise.

  Any mechanical device, apparatus or equipment used, related to or connected with emergency machinery, vehicle, work or warning alarm or bell, provided the sounding of any bell or alarm on any building or motor vehicle shall terminate its operation within 30 minutes in any hour of its being activated.

Noise sources associated with or vibration created by construction, repair, remodeling or grading of any real property or during authorized seismic surveys, provided said activities do not take place outside the hours for construction as defined in Section 15.44.030 of the Municipal Code, and provided the noise standard of 65 dB(A) plus the limits specified in Section 9.40.040(B) as measured on residential property and any vibration created does not endanger the public health, welfare, and safety.

TABLE N-4 **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

- All mechanical devices, apparatus or equipment associated with agriculture operations provided: (1) operations do not take place between 8 p.m. and 7 a.m. on weekdays, including Saturday, or at any time Sunday or a federal holiday; or (2) such operations and equipment are utilized for the protection or salvage of agricultural crops during periods of potential or actual frost damage or other adverse weather conditions; or (3) such operations and equipment are associated with agricultural pest control through pesticide application, provided the application is made in accordance with permits issued by or regulations enforced by the California Department of Agriculture.
- Noise sources associated with the maintenance of real property, provided said activities take place between the hours of 7 a.m. to 8 p.m. on any day except Sunday, or between the hours of 9 a.m. and 8 p.m. on Sunday.
- Any activity to the extent regulation thereof has been preempted by State or federal law. Note: Preemption may include motor vehicle, aircraft in flight, and railroad noise regulations.

B. Existing Noise Sources

The most significant noise-producing activity within the City of Chino is transportation. This noise source consists of several components: arterial traffic, traffic on the Pomona Freeway (State Route 60) and the Chino Valley Freeway (State Route 71), aircraft operations at Chino Airport, and aircraft overflights from Ontario International Airport. Activities at commercial/industrial properties also contribute to the existing noise environment in Chino. The following sections provide a discussion of the noise measurements obtained throughout the City, and an inventory of these noise sources. From these measurements and corresponding analytical procedures, existing noise exposure contours have been derived, and noise impact areas identified.

An evaluation of the existing noise environment in Chino has been conducted by Wieland Acoustics, Inc., including the following measurements:

- **24-hour Noise Measurements.** 24-hour noise levels were monitored 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 as well.

The 24-hour noise measurement and limited noise measurement data are summarized in Table N-5 and the locations are shown in Figure N-1.

The L_{dn} contours for Chino's major arterials, the freeways, and the railroad under current conditions were developed utilizing SoundPLAN version 6.5 software and the Traffic Noise Model (TNM) lookup tables developed by the Federal Highway Administration (FHWA). Traffic data for the models was obtained from Caltrans and Iteris. The measured noise levels shown in Table N-5 of this report were used to calibrate the SoundPLAN noise model for the City. Noise measurements and contours for each noise source are described below.

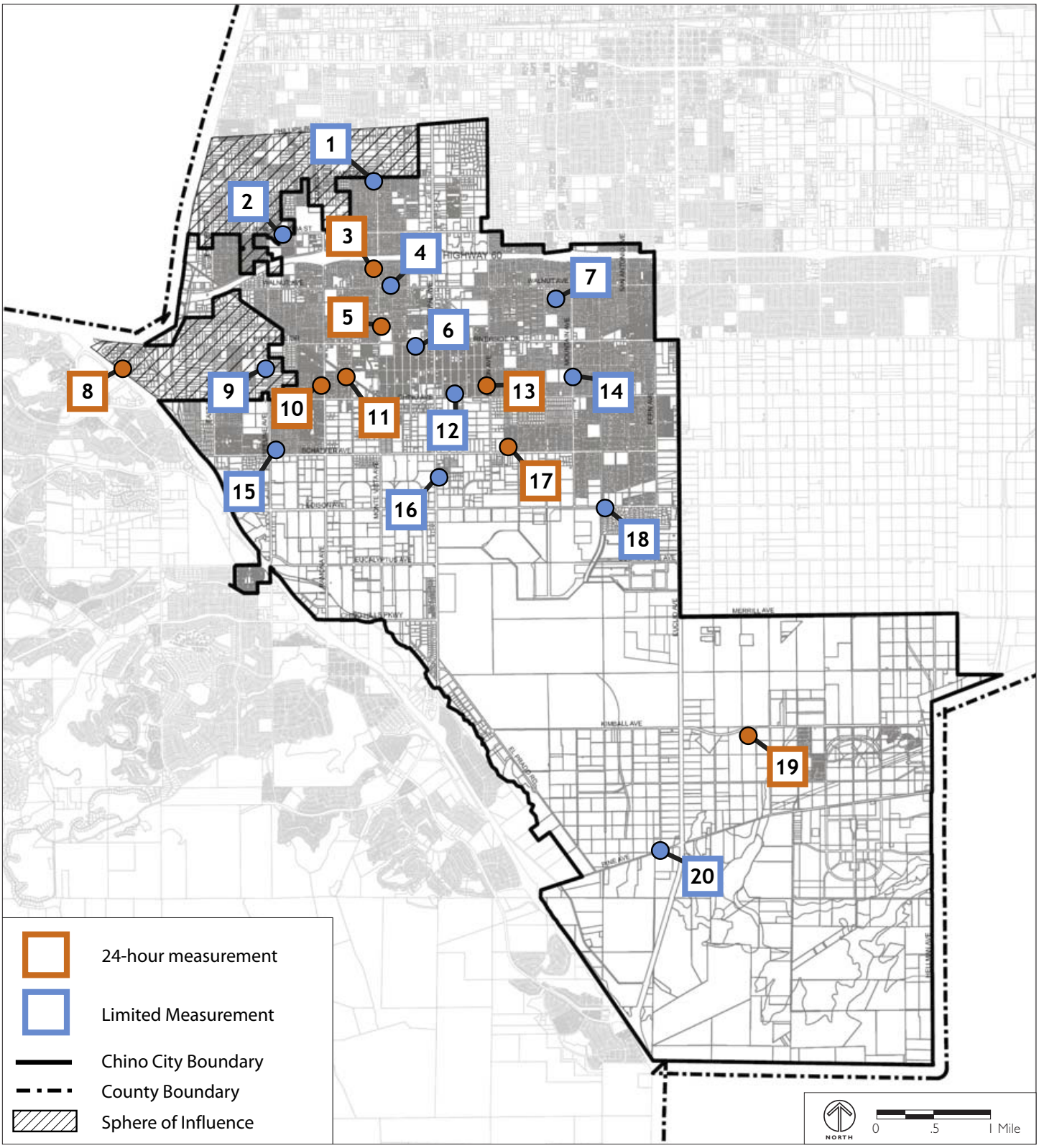
TABLE N-5 **SUMMARY OF NOISE MEASUREMENT LEVELS**

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 – 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**

TABLE N-5 **SUMMARY OF NOISE MEASUREMENT LEVELS** (CONTINUED)

Site	Location	Date	Time	L_{02}	L_{08}	L_{25}	L_{50}	L_{max}	L_{dn}
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**
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 to 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% 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.



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

FIGURE N-1

NOISE MEASUREMENT LOCATIONS

1. Freeway and Arterial Traffic

Freeway traffic is the dominant noise source in Chino. The main contribution of noise is from State Route 60 (Pomona Freeway) which runs through the northern edges of the City of Chino. With 225,000 vehicles per day, State Route 60 generates approximately 85 dB at locations next to the freeway that are noise sensitive. The City's exterior noise standard is 65 dB as defined in the Noise Ordinance. In other areas along the freeway with mitigating conditions such as the existence of topography or existing buildings, the L_{dn} was lower, although these measurements still exceeded the Noise Ordinance standard.

Another 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 about 80 dB at noise-sensitive locations adjacent to the freeway.

Other sources of noise in Chino are the many major and secondary arterials traversing the City that are within or adjacent to noise-sensitive areas. Examples of such areas might be residential communities, hospitals and parks near major and secondary arterials. The following roadway segments may exceed the 65 dB standard:

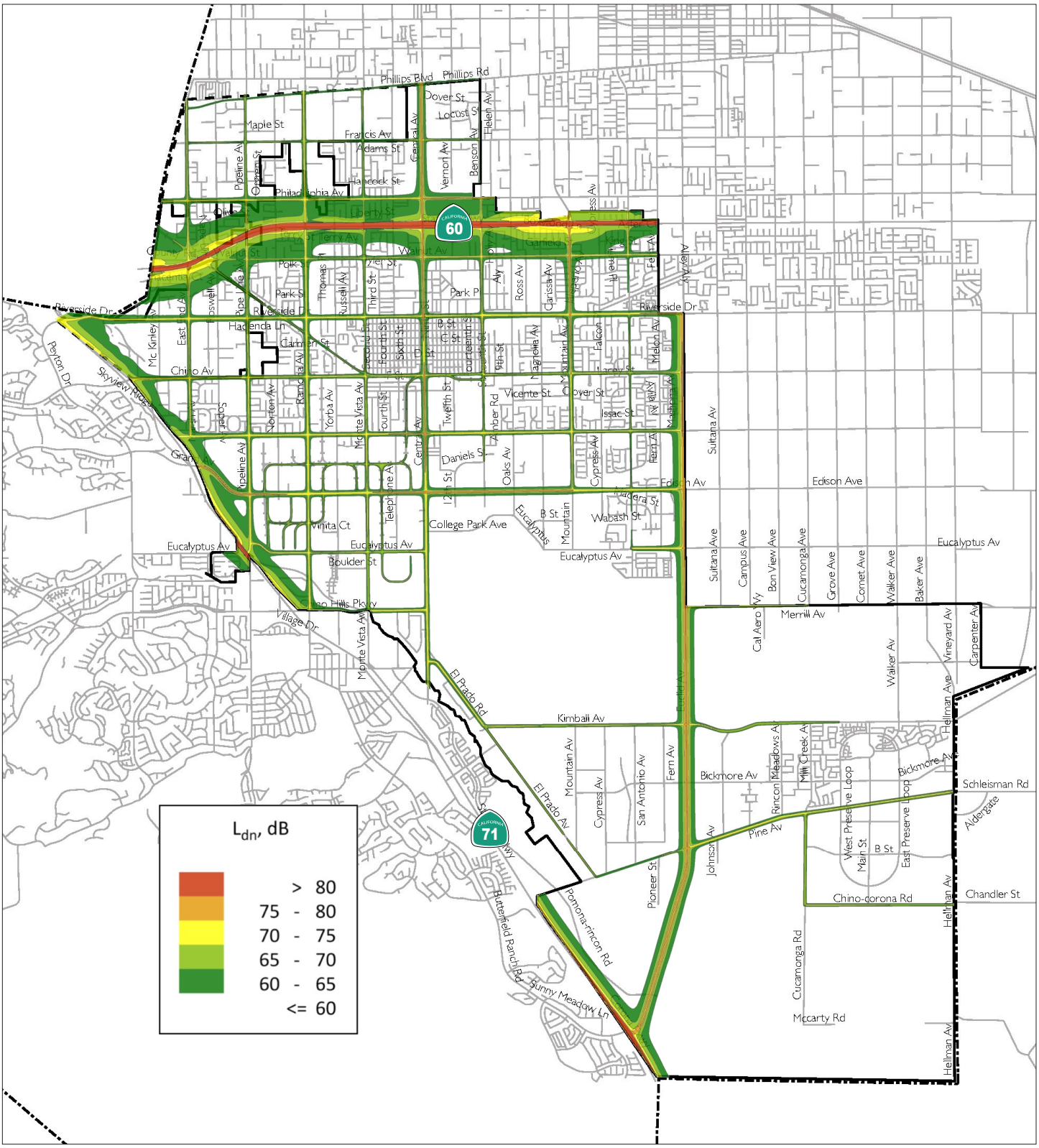
- Benson Avenue, from Phillips Boulevard to Chino Avenue
- Central Avenue, from Phillips Boulevard to State Route 71
- Chino Avenue, from State Route 71 to Central Avenue
- Chino Avenue, from Central Avenue to Benson Avenue
- Chino Avenue, from Benson Avenue to Euclid Avenue
- Chino Corona Road, from Pine Avenue to Hellman Avenue
- Chino Hills Parkway, from State Route 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 State Route 71
- Eucalyptus Avenue, from Pipeline Avenue to Central Avenue

- Eucalyptus Avenue, from College Park Avenue to Euclid Avenue
- Euclid Avenue, from Riverside Drive to State Route 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 State Route 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 State Route 71
- Ramona Avenue, from Phillips Boulevard to Chino Hills Parkway
- Riverside Drive, from State Route 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 N-2 identifies existing noise contours for Chino roadways ranging from 60 to 80 dB in 5 dB increments.

2. Chino Airport

The Chino Airport is located in the southeastern portion of the City, and is a source of noise in its vicinity. The Airport Master Plan for the Chino Airport contains noise contours for the Airport. The 65 dB noise contour in general does not extend beyond the Chino Airport boundaries. More significantly, the noise contour does not cover any residential properties. Near the airport, 24-hour noise measurements were taken which revealed an L_{dn} of 61.6



Source: Wieland Acoustics

FIGURE N-2

L_{dn} CONTOUR LINES FOR EXISTING NOISE ENVIRONMENT

dB, which does not exceed the Noise Ordinance exterior noise standard of 65 dB. Existing noise contours for the Chino Airport are shown in Figure N-3.

3. Ontario International Airport

The Ontario International Airport, a commercial air facility 2 miles northeast of Chino, exposes Chino residents to single-event takeoff noise. However, the Ontario International Airport noise contour map does not cover any part of the City of Chino which implies that in general Chino residents are not adversely affected by airport noise from that airport. Additionally, 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. Existing noise contours for the Ontario Airport are shown in Figure N-4.

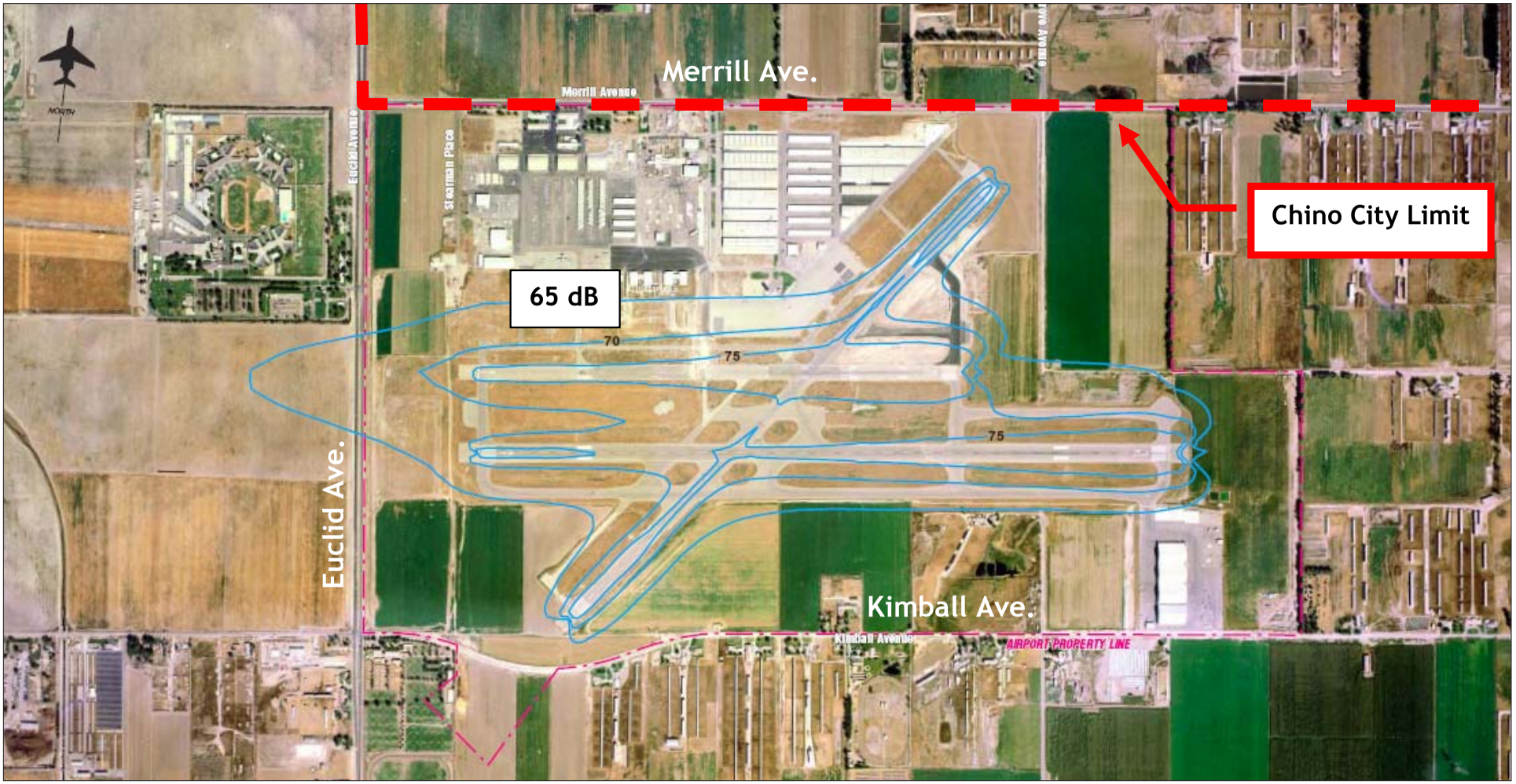
4. Union Pacific Rail Line

The Union Pacific operates a spur line that runs in the City of Chino. While the line is only used to service local industries, 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. Noise measurements in the residential community were taken; the results range from an L_{dn} of 66.3 dB to 98.1 dB. The line runs about two times a day.

5. 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.

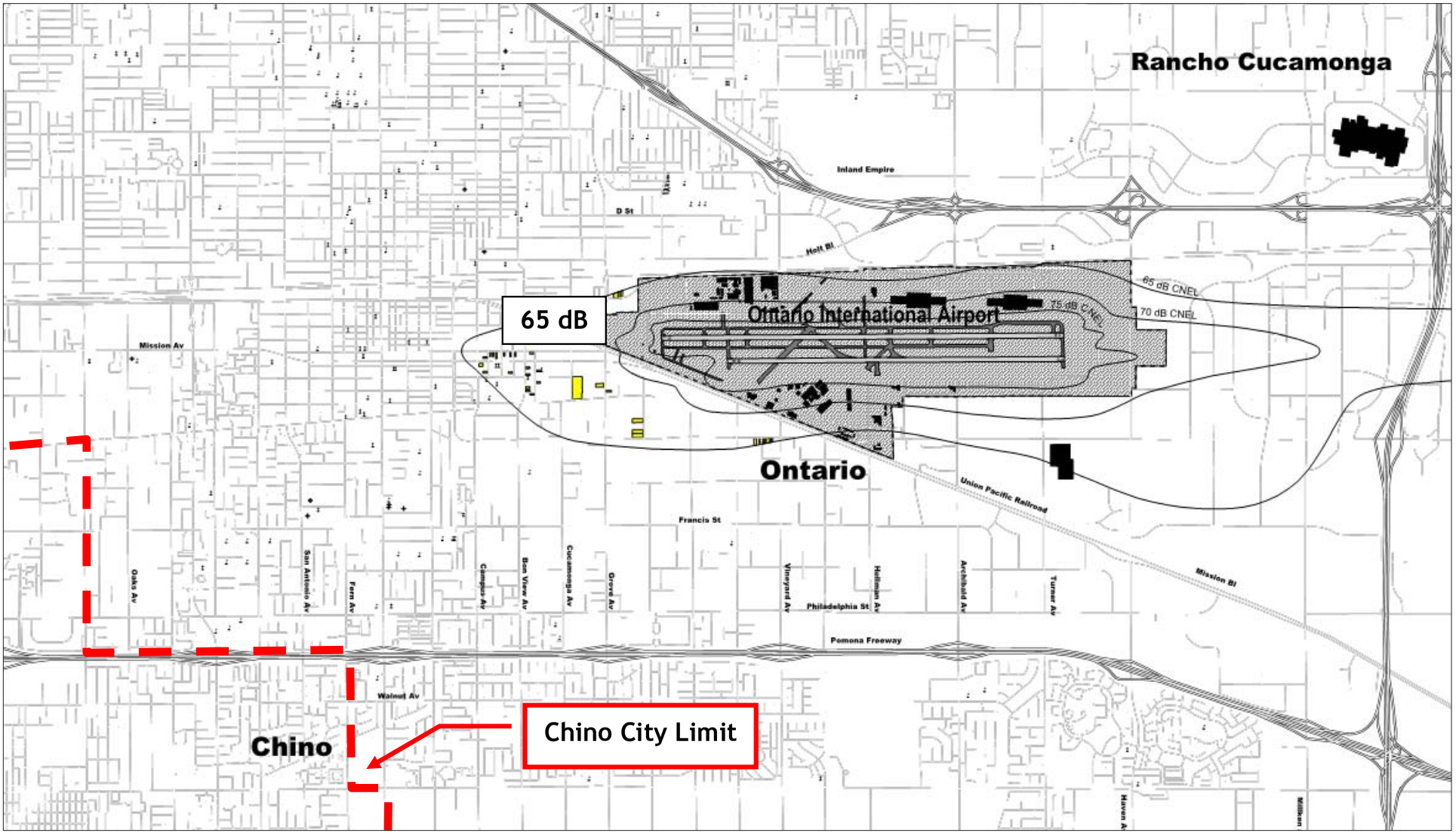
Residential areas and other noise-sensitive activities that are located close to these commercial/industrial operations are generally at risk of noise disturbance. However, in general there are relatively few areas where industrial uses are located immediately adjacent to residential areas in Chino. Noise at



Source: Airport Master Plan for Chino Airport. December 2003

FIGURE N-3

EXISTING (2001) NOISE CONTOURS FOR CHINO AIRPORT



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

FIGURE N-4

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

residential/industrial interfaces has been measured and found to be below the Noise Ordinance standard. Table N-6 shows noise measurements for one area in the City that generates noise complaints, the residential/industrial interface at the rear yard of 13640 Amber Road (location 17 in Table N-5). The table compares the highest noise levels measured at this interface with the maximum allowed noise levels in the Noise Ordinance.

On the day of the measurement, the noise levels at location #17 generated by activities at the commercial use complied with the City's noise ordinance standards. The L_{dn} measured at the residence was 52.1 dB, which is well below the City's Noise Element standard of 65 dB.

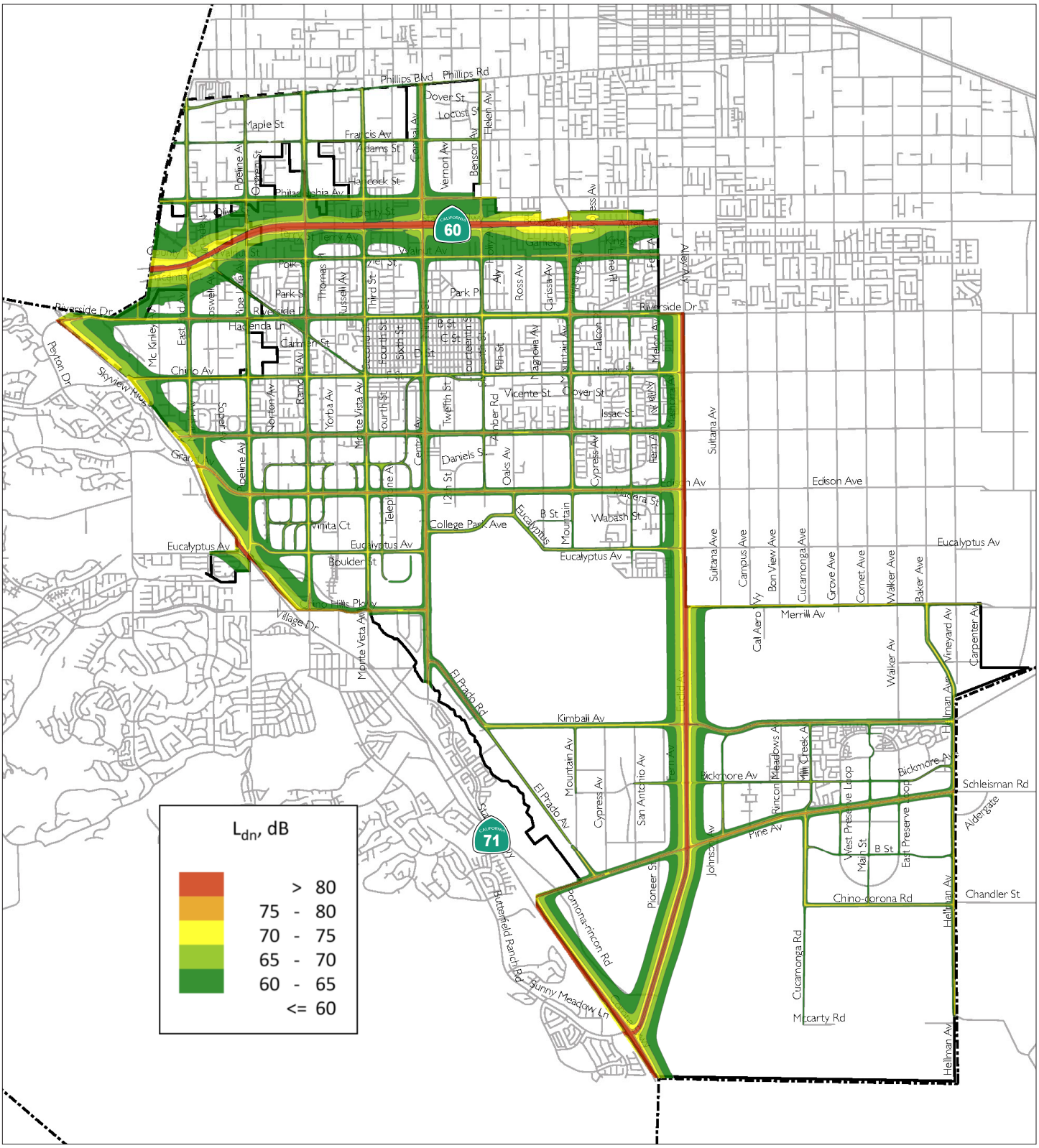
C. Future Noise Sources

1. Freeway and Arterial Traffic

Transportation will continue to be the major source of noise in Chino in future years. Chino is traversed by several major and secondary arterials that are within, or adjacent to, noise-sensitive areas. Noise exposure along many of these roadways 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.

L_{dn} contours were developed for Year 2025 noise conditions for major arterials, the freeways, and the railroad under the proposed General Plan. Figure N-5 shows future noise levels between 60 and 80 dB for roadways under this General Plan

Table N-7 shows the arterial segments where the L_{dn} would exceed the standard of 65 dB under existing conditions and under the General Plan.



Source: Wieland Acoustics

FIGURE N-5

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

TABLE N-6 **SUMMARY OF NOISE LEVELS MEASURED AT A RESIDENTIAL/INDUSTRIAL INTERFACE**

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

Under the General Plan, traffic on State Route 60 would increase to between 235,400 and 246,800 vehicles per day, increasing the L_{dn} at adjoining properties by about 0.2 to 0.3 dB, an indiscernible amount. 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.

2. Chino Airport

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 N-6 shows the 2025 noise contours for Chino Airport. As shown, the 65 dB noise

TABLE N-7 **ARTERIAL SEGMENTS WHERE THE LDN WOULD EXCEED 65 DB**

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

TABLE N-7 **ARTERIAL SEGMENTS WHERE THE LDN WOULD EXCEED 65 DB B(CONTINUED)**

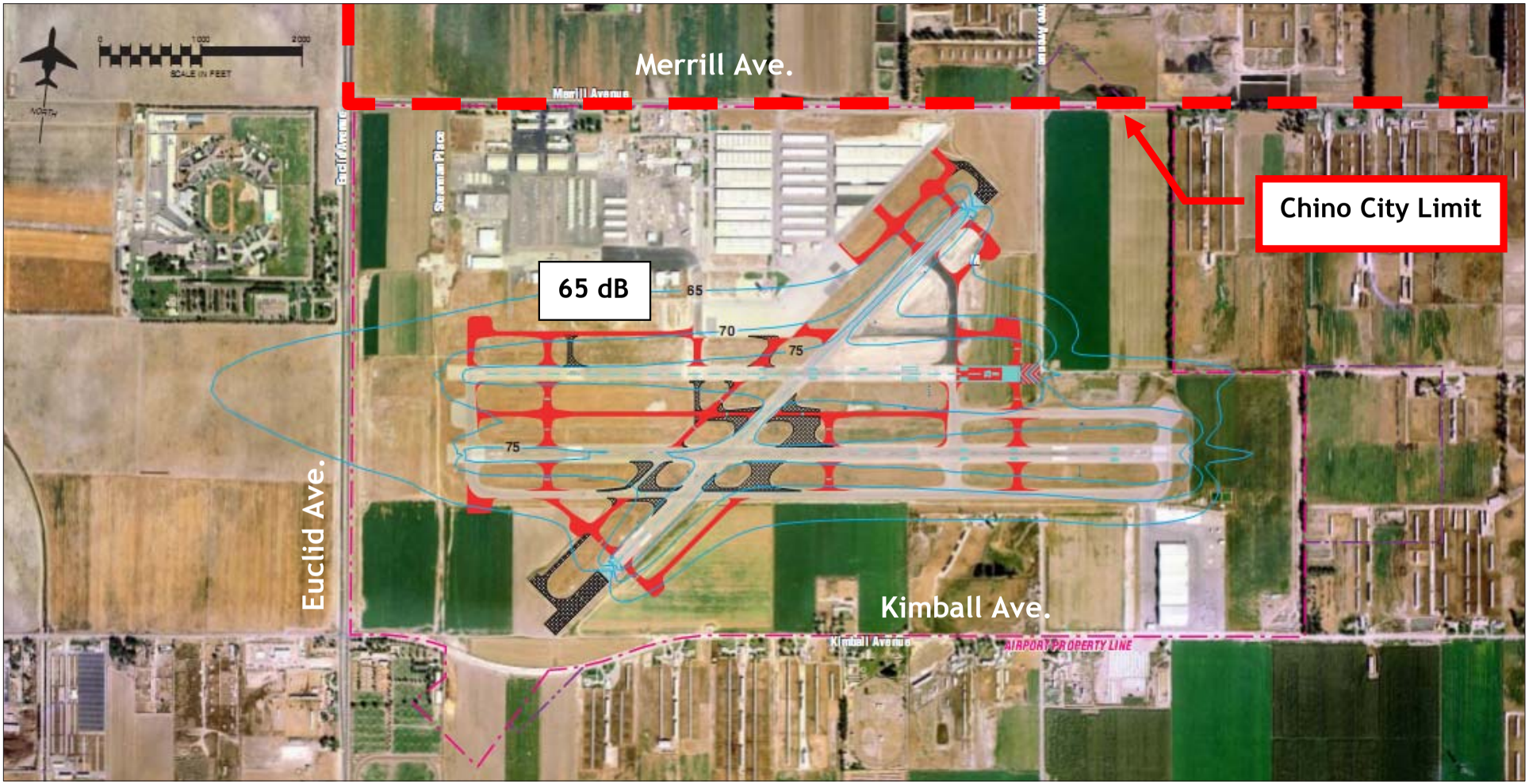
Arterial	Segment	Existing	Year 2025 – General Plan
Oaks Avenue	Edison – College Park	No data	X
Philadelphia Street	Reservoir – Benson E/O Benson	X	X
Phillips Boulevard	East End – Pipeline	X	
Pine Avenue	Highway 71 – Euclid Euclid – East of Grove East of Grove – Hellman	X	X
Pipeline Avenue	Phillips - Philadelphia Philadelphia - Eucalyptus Eucalyptus – Highway 71	X	X
Ramona Avenue	Phillips – Chino Hills	X	X
Riverside Drive	Highway 71 – Euclid	X	X
Roswell Street	Schaefer – Grand	X	X
San Antonio Avenue	Philadelphia – Walnut	X	X
Schaefer Avenue	East End – Euclid	X	X
Walnut Avenue	Pipeline – Ramona Ramona – Euclid	X	X

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

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 the proposed General Plan.

3. Ontario International Airport

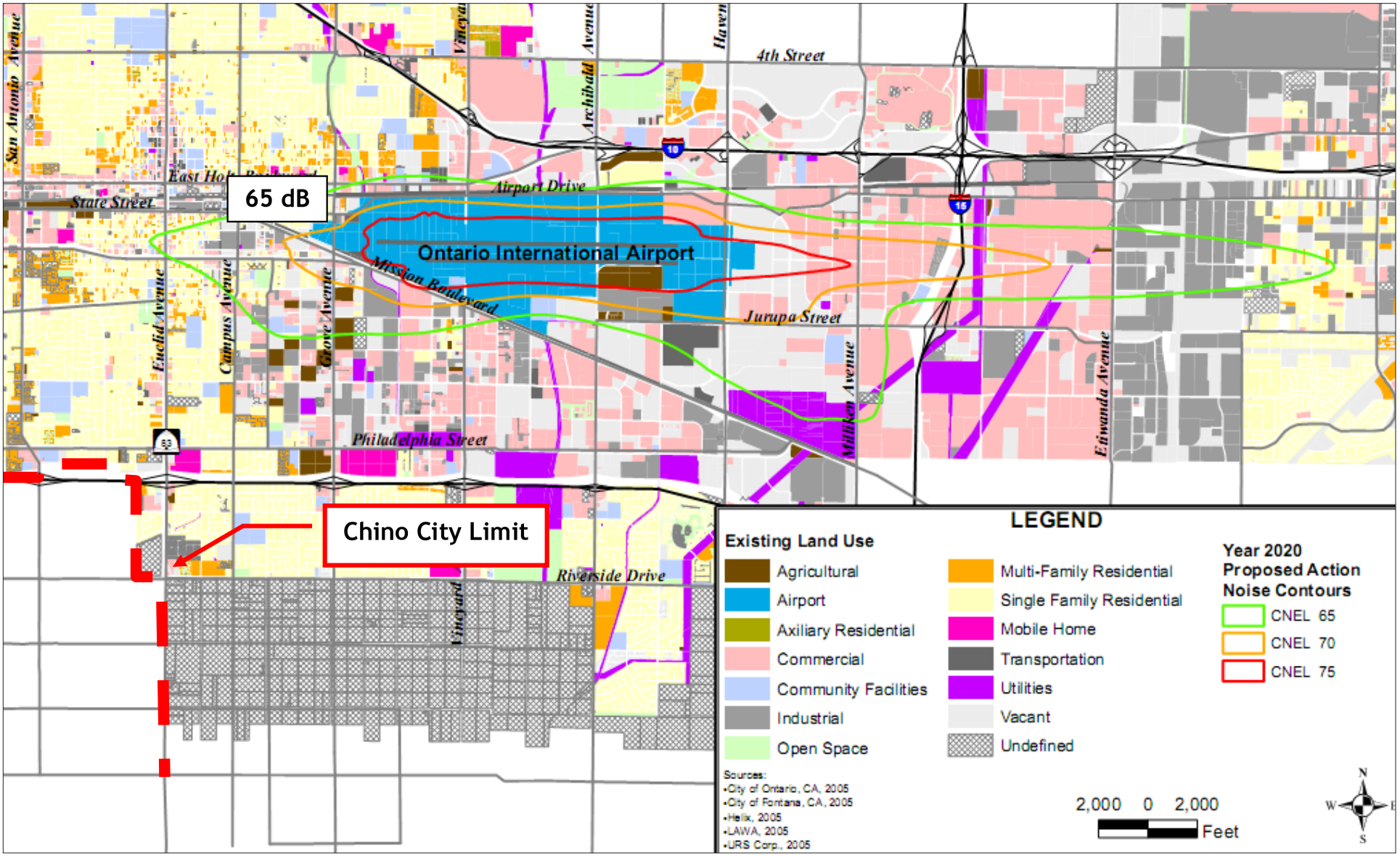
Future noise contours for the Ontario International Airport are shown in Figure N-7. As indicated in this figure, the noise contours do not intrude into



Source: Airport Master Plan for Chino Airport. December 2003

FIGURE N-6

LONG-TERM NOISE CONTOURS FOR CHINO AIRPORT



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

FIGURE N-7

FUTURE (2020) NOISE CONTOURS FOR ONTARIO INTERNATIONAL AIRPORT

the City of Chino. Although 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, future development under the General Plan would not expose residents to excessive noise associated with the Ontario Airport.

4. Union Pacific Rail Line

Future rail operations are expected to be generally similar to current operations, although data on such operations is not available. If that is the case, noise measurements would continue to be similar to current measurements of L_{dn} of 66.3 dB to 98.1 dB.

5. Commercial/Industrial Properties

There are few areas in Chino where industrial uses are located immediately adjacent to residential areas, and development under the General Plan would not increase the incidence of major noise-generating uses locating immediately adjacent to residential areas.

D. Goals, Objectives, Policies, and Actions

Goal N-1 Protect Chino residents from excessive noise.

Objective N-1.1 Ensure appropriate exterior and interior noise levels for existing and new land uses.

Policies

P1. The City shall not locate noise-sensitive land uses (schools, medical centers and hospitals, senior centers, and residences) in areas with noise levels that exceed those considered normally acceptable for each land use unless measures can be implemented to reduce noise to acceptable levels.

P2. The City shall require measures to ensure noise-sensitive uses have appropriate interior noise environments when located in areas adjacent to major noise generators.

P3. The City shall require measures that attenuate exterior and/or interior noise levels to acceptable levels to be incorporated into all development projects where current and/or future noise levels may be unacceptable.

P4. The City shall require a noise impact study to evaluate impacts of projects that may exceed 65 L_{dn} as part of the design review process.

P5. The City shall require an acoustical study for all new residential developments that lie within the 65 L_{dn} noise contour on the Future Noise Contour Map, to ensure indoor levels will not exceed City standards. In addition, the City shall continue to enforce the California Building Code for indoor noise levels.

P6. The City shall only approve projects which comply with adopted noise standards, or meet the provisions of the California Environmental Quality Act.

P7. The City shall require noise reduction features to be used in the site planning process for new projects where current and/or future noise levels may be unacceptable. The focus of these efforts shall be site design techniques, so long as they do not conflict with the goals of the Community Character Element. Techniques include:

1. Designing landscaped building setbacks to serve as a buffer between the noise source and receptor.
2. Placing noise-tolerant land uses such as parking lots, maintenance facilities, and utility areas between the noise source and receptor.

3. Orienting buildings to shield noise-sensitive outdoor spaces from a noise source.
4. Locating bedrooms or balconies on the sides of buildings facing away from noise sources.
5. Utilizing noise barriers (e.g. fences, walls, or landscaped berms) to reduce adverse noise levels in noise-sensitive outdoor activity areas.

Objective N-1.2 Reduce noise impacts from transportation.

Policies

P1. The City shall minimize transportation noise through street and right-of-way design or route coordination including reducing speed limits or planting street trees along high-volume arterials.

P2. The City shall require mitigation of noise impacts for new roadway projects, including roadway alignment and noise barriers.

P3. The City shall use pavement surfaces that reduce noise from roadways when paving or repaving whenever feasible.

P4. The City shall seek to reduce impacts from groundborne vibration associated with rail operations by requiring that vibration-sensitive buildings (e.g. residences) are sited at least 100 feet from the centerline of the railroad tracks whenever feasible. The development of vibration-sensitive buildings within 100 feet from the centerline of the rail-road tracks would require a study demonstrating that groundborne vibration issues associated with rail operations have been adequately addressed (i.e. through building siting, foundation design, and construction techniques).

Objective N-1.3 Control sources of construction noise.

Policies

P1. The City shall require a noise monitoring plan to be prepared and submitted prior to starting all construction projects. The noise monitoring plan shall identify monitoring locations and frequency, instrumentation to be used, and appropriate noise control measures that will be incorporated.

P2. The City shall limit all construction in the vicinity of noise-sensitive land uses, such as residences, hospitals, or senior centers, to daylight hours or 7:00 a.m. to 7:00 p.m. In addition, the following construction noise control measures shall be included as requirements at construction sites to minimize construction noise impacts:

- Equip all internal combustion engine-driven equipment with intake and exhaust mufflers that are in good condition and appropriate for the equipment.
- Ensure that during construction, trucks and equipment are running only when necessary.
- Shield all construction equipment with temporary noise barriers to reduce construction-related noise impacts.
- Locate stationary noise-generating equipment as far as possible from sensitive receptors when sensitive receptors adjoin or are near a construction area.
- Utilize "quiet" air compressors and similar equipment, where available.

P3. The City shall evaluate new development projects for potential construction related noise impacts.

E. Indicators

The following trends are indicative of progress made in regards to the above policies. Each indicator is followed by the ideal direction of the trend.

- Number of noise complaints reported annually:
  - Direction: *Decrease*