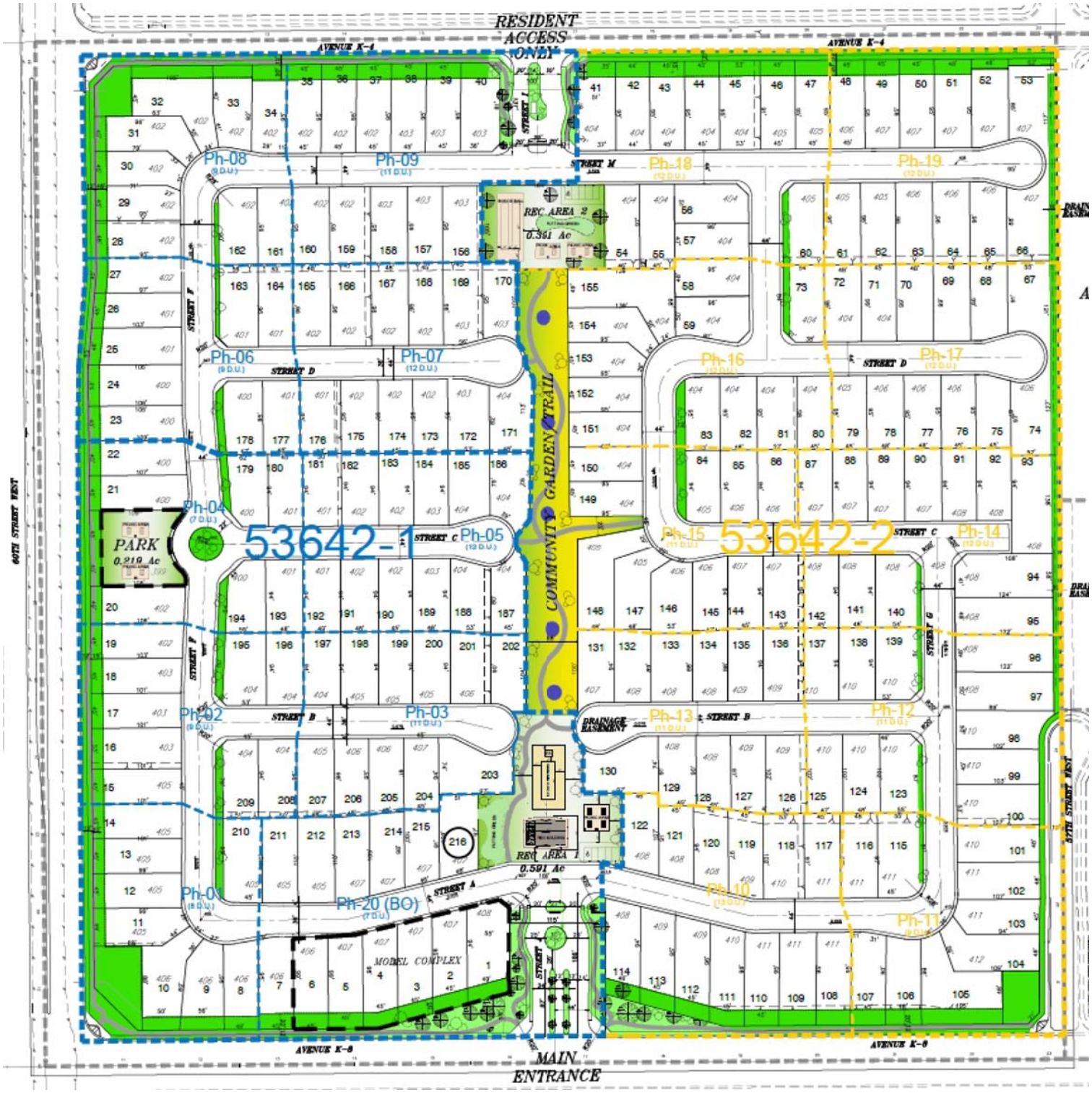
TRACT 53642 PACIFIC TOPAZ
NOISE IMPACT STUDY
City of Lancaster



TRACT 53642 PACIFIC TOPAZ
NOISE IMPACT STUDY
City of Lancaster, California

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1.0 Introduction

1.1 Purpose of Analysis and Study Objectives

The purpose of this report is to review potential noise impacts and noise/land use compatibility for the proposed Tract 53642 Pacific Topaz Project. This report also provides preliminary recommendations for building design and floor/wall/ceiling assemblies to meet the State of California and City of Lancaster interior noise standards.

The following is provided in this report:

- A description of the study area and the proposed project
- Information regarding the fundamentals of noise
- Identification of the regulatory setting and applicable noise standards
- Analysis of the project's operational noise impacts
- Summary of recommended mitigation measures and project design features to reduce noise level impacts.

1.2 Site Location

The proposed Tract 53642 Pacific Topaz project site is located at the northeast corner of 60th Street West and Avenue K-8, in the City of Lancaster, California. The project site is located approximately 2,403 feet above sea level and the topography is flat.

The primary sources of ambient noise at the project site includes roadway noise from 60th Street west as well as typical residential neighborhood noise from the existing residential homes surrounding the project site.

The project site location map is provided in Exhibit A.

1.3 Project Description

The proposed project consists of constructing and operating 216 dwelling units of age restricted (55+) senior adult detached housing on 36.99 acres. As part of the project design, six (6) foot noise barrier walls will be constructed along the property lines of the project site, shielding backyards from Avenue K-4, Avenue K-8 and 60th West Street.

The site plan used for this analysis, provided by PACIFIC COMMUNITY BUILDER, INC., is illustrated in Exhibit B.

1.4 Summary of Findings

The following summary provides a brief overview of the findings of this report. Please refer to Sections 5 for more details.

1. RK utilized future traffic volumes from the City of Lancaster General Plan 2030 Master Environment Assessment to estimate future roadway noise levels near the project site.

2. Future outdoor noise levels at the project site are expected to fall within the "Normally Acceptable to Conditionally Acceptable" range for Residential-Single Family uses, per the City of Lancaster Noise/Land Use Compatibility standards.

3. With adequate building design and insulation, interior noise levels can be reduced to meet the State/City requirement of 45 dBA CNEL.

1.5 Recommended Project Design Features

The following recommended project design features include standard rules and requirements, best practices and recognized design guidelines for reducing noise levels. Design features are assumed to be part of the conditions of the project and integrated into its design.

Operational Design Features

DF-1 A six (6) foot noise barrier wall will be provided to shield all habitable backyard areas facing exterior roadways and adjacent properties. The designed noise screening will only be accomplished if the barrier's weight is at least 3.5 pounds per square foot of face area without decorative cutouts or line-of-site openings between the shielded areas and the project site. All gaps (except for weep holes) should be filled with grout or caulking to avoid flanking.

Noise control barrier may be constructed using one, or any combination of the following materials:

- Masonry block;

- Stucco veneer over wood framing (or foam core), or 1-inch thick tongue and groove wood of sufficient weight per square foot;

- Transparent glass (3/8-inch-thick), acrylic, polycarbonate, or other transparent material with sufficient weight per square foot.

DF-2 The project should incorporate building construction techniques and insulation that is consistent with California Title 24 Building Standards to achieve the minimum interior noise standard of 45 dBA CNEL for all residential units.

DF-3 A "windows closed" condition is expected to be required for all residential units within the project site to meet the interior noise standard. To accommodate a windows closed conditions, all units shall be equipped with adequate fresh air ventilation, per the requirements of the California Uniform Building Code (UBC).

DF-4 Based on the results of this analysis, the project should provide upgraded windows and sliding glass doors per the recommendations described in Table 10 of this report.

DF-5 For proper acoustical performance, all exterior windows, doors, and sliding glass doors should have a positive seal and leaks/cracks must be kept to a minimum.

DF-6 In order to comply with City of Lancaster Municipal Code requirements, all construction activities should take place Monday through Saturday, between the hours of 7 AM to 8 PM. No construction should occur on Sundays or federal holidays.

2.0 Fundamentals of Noise

This section of the report provides basic information about noise and presents some of the terms used within the report.

2.1 Sound, Noise and Acoustics

Sound is a disturbance created by a moving or vibrating source and is capable of being detected by the hearing organs. Sound may be thought of as mechanical energy of a moving object transmitted by pressure waves through a medium to a human ear. For traffic, or stationary noise, the medium of concern is air. *Noise* is defined as sound that is loud, unpleasant, unexpected, or unwanted.

2.2 Frequency and Hertz

A continuous sound is described by its *frequency* (pitch) and its *amplitude* (loudness). Frequency relates to the number of pressure oscillations per second. Low-frequency sounds are low in pitch (bass sounding) and high-frequency sounds are high in pitch (squeak). These oscillations per second (cycles) are commonly referred to as Hertz (Hz). The human ear can hear from the bass pitch starting out at 20 Hz all the way to the high pitch of 20,000 Hz.

2.3 Sound Pressure Levels and Decibels

The *amplitude* of a sound determines it loudness. The loudness of sound increases or decreases, as the amplitude increases or decreases. Sound pressure amplitude is measured in units of micro-Newton per square inch meter (N/m2), also called micro-Pascal (μPa). One μPa is approximately one hundred billionths (0.00000000001) of normal atmospheric pressure. Sound pressure level (SPL or L_p) is used to describe in logarithmic units the ratio of actual sound pressures to a reference pressure squared. These units are called decibels and abbreviated dB.

2.4 Addition of Decibels

Because decibels are on a logarithmic scale, sound pressure levels cannot be added or subtracted by simple plus or minus addition. When two (2) sounds of equal SPL are combined, they will produce an SPL 3 dB greater than the original single SPL. In other words, sound energy must be doubled to produce a 3 dB increase.

If two (2) sounds differ by approximately 10 dB the higher sound level is the predominant sound.

2.5 Human Response to Changes in Noise Levels

In general, the healthy human ear is most sensitive to sounds between 1,000 Hz and 5,000 Hz, (A-weighted scale) and it perceives a sound within that range as being more intense than a sound with a higher or lower frequency with the same magnitude. For purposes of this report as well as with most environmental documents, the A-scale weighting is typically reported in terms of A-weighted decibel (dBA). Typically, the human ear can barely perceive the change in noise level of 3 dB. A change in 5 dB is readily perceptible, and a change in 10 dB is perceived as being twice or half as loud[1]. As previously discussed, a doubling of sound energy results in a 3 dB increase in sound, which means that a doubling of sound energy (e.g. doubling the volume of traffic on a highway), would result in a barely perceptible change in sound level.

2.6 Noise Descriptors

Noise in our daily environment fluctuates over time. Some noise levels occur in regular patterns, others are random. Some noise levels are constant, while others are sporadic. Noise descriptors were created to describe the different time-varying noise levels. Following are the most commonly used noise descriptors along with brief definitions.

A-Weighted Sound Level

The sound pressure level in decibels as measured on a sound level meter using the A-weighted filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the response of the human ear. A numerical method of rating human judgment of loudness.

Ambient Noise Level

The composite of noise from all sources, near and far. In this context, the ambient noise level constitutes the normal or existing level of environmental noise at a given location.

[1] Source: U.S. DOT Federal Highway Administration. Dec. 2011. Highway Traffic Noise: Analysis and Abatement Guidance.

Community Noise Equivalent Level (CNEL)

The average equivalent A-weighted sound level during a 24-hour day, obtained after addition of five (5) decibels to sound levels in the evening from 7:00 to 10:00 PM and after addition of ten (10) decibels to sound levels in the night before 7:00 AM and after 10:00 PM.

Decibel (dB)

A unit for measuring the amplitude of a 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 micro-pascals.

dB(A)

A-weighted sound level (see definition above).

Equivalent Sound Level (LEQ)

The sound level corresponding to a steady noise level over a given sample period with the same amount of acoustic energy as the actual time varying noise level. The energy average noise level during the sample period.

Habitable Room

Any room meeting the requirements of the Uniform Building Code or other applicable regulations which is intended to be used for sleeping, living, cooking or dining purposes, excluding such enclosed spaces as closets, pantries, bath or toilet rooms, service rooms, connecting corridors, laundries, unfinished attics, foyers, storage spaces, cellars, utility rooms, and similar spaces.

L(n)

The A-weighted sound level exceeded during a certain percentage of the sample time. For example, L10 is the sound level exceeded 10 percent of the sample time. Similarly L50, L90 and L99, etc.

Noise

Any unwanted sound or sound which is undesirable because it interferes with speech and hearing, or is intense enough to damage hearing, or is otherwise annoying. The State Noise Control Act defines noise as "...excessive undesirable sound...".

Outdoor Living Area

Outdoor spaces that are associated with residential land uses typically used for passive recreational activities or other noise-sensitive uses. Such spaces include patio areas, barbecue areas, jacuzzi areas, etc. associated with residential uses; outdoor patient recovery or resting areas associated with hospitals, convalescent hospitals, or rest homes; outdoor areas associated with places of worship which have a significant role in services or other noise-sensitive activities; and outdoor school facilities routinely used for educational purposes which may be adversely impacted by noise. Outdoor areas usually not included in this definition are: front yard areas, driveways, greenbelts, maintenance areas and storage areas associated with residential land uses; exterior areas at hospitals that are not used for patient activities; outdoor areas associated with places of worship and principally used for short-term social gatherings; and, outdoor areas associated with school facilities that are not typically associated with educational uses prone to adverse noise impacts (for example, school play yard areas).

Percent Noise Levels

See L(n).

Sound Level (Noise Level)

The weighted sound pressure level obtained by use of a sound level meter having a standard frequency-filter for attenuating part of the sound spectrum.

Sound Level Meter

An instrument, including a microphone, an amplifier, an output meter, and frequency weighting networks for the measurement and determination of noise and sound levels.

Single Event Noise Exposure Level (SENEL)

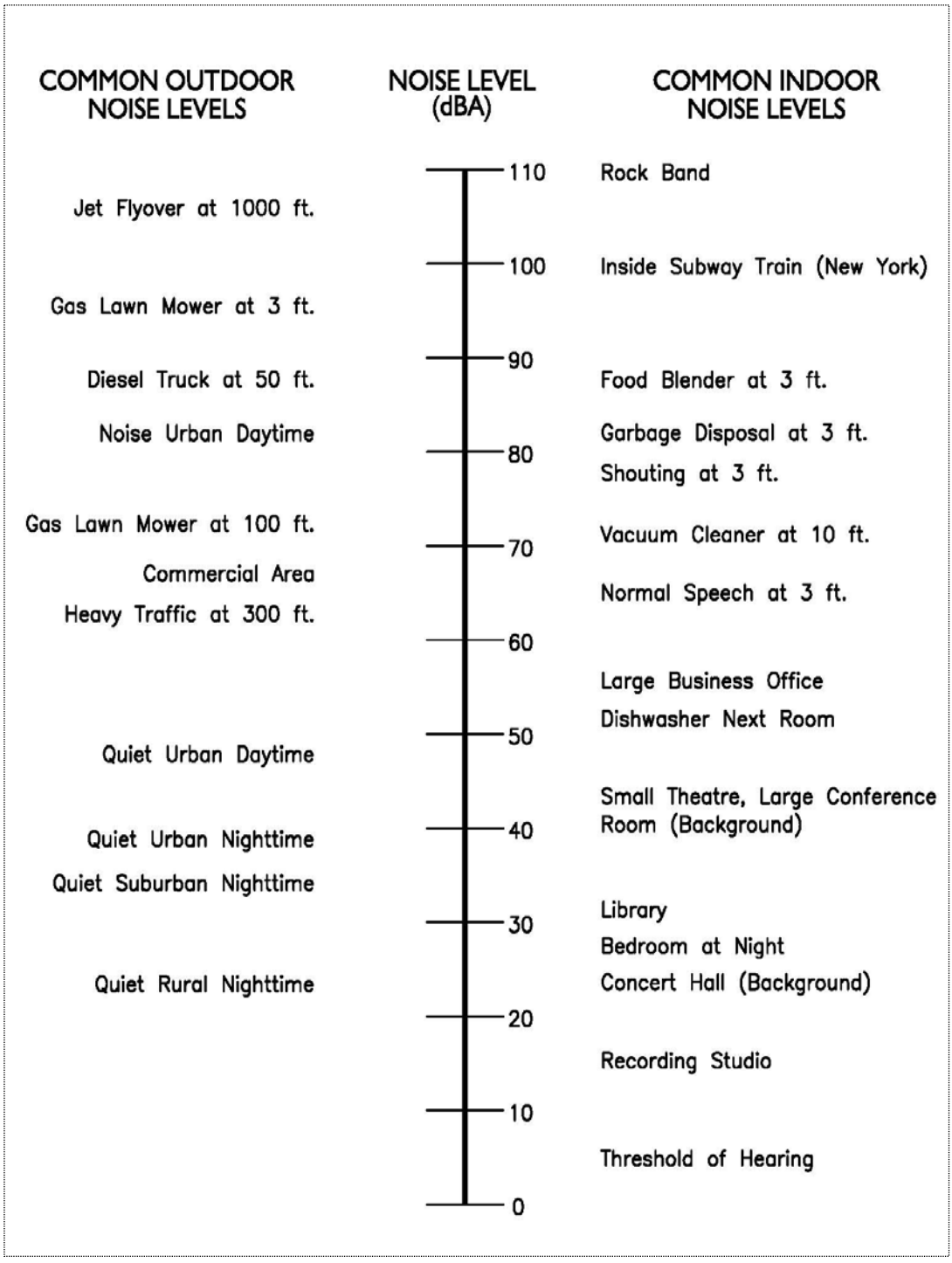
The dBA level which, if it lasted for one (1) second, would produce the same A-weighted sound energy as the actual event.

2.7 Sound Propagation

As sound propagates from a source it spreads geometrically. Sound from a small, localized source (i.e., a point source) radiates uniformly outward as it travels away from the source in a spherical pattern. The sound level attenuates at a rate of 6 dB per doubling of distance. The movement of vehicles down a roadway makes the source of the sound appear to propagate from a line (i.e., line source) rather than a point source. This line source results in the noise propagating from a roadway in a cylindrical spreading versus a spherical spreading that results from a point source. The sound level attenuates for a line source at a rate of 3 dB per doubling of distance.

As noise propagates from the source, it is affected by the ground and atmosphere. Noise models use hard site (reflective surfaces) and soft site (absorptive surfaces) to help calculate predicted noise levels. Hard site conditions assume no excessive ground absorption between the noise source and the receiver. Soft site conditions such as grass, soft dirt or landscaping attenuate noise at an additional rate of 1.5 dB per doubling of distance. When added to the geometric spreading, the excess ground attenuation results in an overall noise attenuation of 3 dB per doubling of distance for a line source and 6.0 dB per doubling of distance for a point source.

Figure 1
Typical Sound Levels from Indoor and Outdoor Noise Sources[2]



[2] Source: AASHSTO. 1993. Guide on Evaluation and Abatement of Traffic Noise

3.0 Regulatory Setting

3.1 State of California Noise Regulations

Established in 1973, the California Department of Health Services Office of Noise Control (ONC) was instrumental in developing regularity tools to control and abate noise for use by local agencies. One significant model is the "Land Use Compatibility for Community Noise Environments Matrix." The matrix allows the local jurisdiction to clearly delineate compatibility of sensitive uses with various incremental levels of noise. Table 1 summarizes the Noise/Land Use Compatibility guidelines for land uses applicable to this project:

Table 1
Noise/Land Use Compatibility Guidelines

Land Use	Noise Limit (dBA CNEL)			
	Normally Acceptable[1]	Conditionally Acceptable[2]	Normally Unacceptable[3]	Clearly Unacceptable[4]
Residential - Single Family	50 - 60	55 - 70	70 - 75	75 - 85

[1] 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.

[2] Conditionally Acceptable: New construction or development should be undertaken only after detailed analysis of the noise reduction requirements are made and needed noise insulation features in the design are determined. Conventional construction, with closed windows and fresh air supply systems or air conditioning, will normally suffice.

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

[4] Clearly Unacceptable: New construction or development should generally not be undertaken.

The State of California has also established noise insulation standards as outlined in Title 24 and the Uniform Building Code (UBC) which in some cases requires acoustical analyses to outline exterior noise levels and to ensure interior noise levels do not exceed the interior threshold. The State mandates that the legislative body of each county and city adopt a noise element as a part of its comprehensive general plan. The local noise element must recognize the land use compatibility guidelines published by the State Department of Health Services. The guidelines rank noise land use compatibility in terms of normally acceptable, conditionally acceptable, normally unacceptable, and clearly unacceptable.

Noise insulation design standards for residences have been established by the State of California Uniform Building Code (UBC) Chapter 12, Division II and by the Title 24 noise insulation standards of the California Administrative Code. The City is required by the State Housing Law to adopt these State codes as minimum performance standards. The City may enact stricter noise standards throughout the city or on a case-by-case basis if deemed necessary. In brief, the Title 24 noise standards require the following for allowable interior noise levels:

- Interior noise levels due to exterior sources must not exceed a community noise equivalent level (CNEL) or a day-night level (LDN) of 45 dBA, in any habitable room.

3.2 City of Lancaster Noise Regulations

The City of Lancaster outlines their noise regulations and standards within the General Plan, Section 8 – Noise and the Municipal Code, Chapter 8.24, Noise Regulations. For purposes of this analysis, the City of Lancaster's noise element is used to evaluate the project's noise/land use compatibility and ensure the project is consistent with the established plans, policies and programs for noise control within the City. The Lancaster General Plan Noise Element and Municipal Code Noise Control are provided in Appendix A.

3.2.1 General Plan Noise – Compatible Land Use Objectives

Table 2 shows the City of Lancaster's Residential Noise Standards, as established in table 8-10 of the City of Lancaster General Plan. The noise standards shown in Table 2 shall apply to residential properties, unless otherwise specifically identified by the Municipal Code.

Table 2
City of Lancaster Noise-Compatibility Land Use Objectives

Land Use	Maximum Exterior CNEL	Maximum Interior CNEL
Residential	65 dBA	45 dBA

Mobile noise sources are typically transportation-related and include aircraft, trains, automobiles, trucks, buses, and off-road vehicles. Vehicular traffic noise is subject to the noise standards identified in Table 2. Since mobile noise sources are often associated with traffic volumes, these impacts are many times categorized as long-term noise impacts.

3.2.2 Construction Noise Regulation:

The City of Lancaster Municipal Code Chapter 8.24 - Noise Regulations, Section 8.24.040 – Loud, unnecessary and unusual noises prohibited – Construction and Building, exempts the noise associated with construction and demolition activity noise:

1. Except as otherwise provided in this chapter, a person at any time on Sunday or any day between the hours of eight p.m. and seven a.m. shall not perform any construction or repair work of any kind upon any building or structure or perform any earth excavating, filling or moving where any of the foregoing entails the use of any air compressor, jack hammer, power-driven drill, riveting machine, excavator, diesel-powered truck, tractor or other earth-moving equipment, hard hammers on steel or iron or any other machine tool, device or equipment which makes loud noises within five hundred (500) feet of an occupied dwelling, apartment, hotel, mobile home or other place of residence.

4.0 Study Method and Procedures

The following section describes the noise modeling procedures and assumptions used in the noise analysis.

4.1 Traffic Noise Modeling

Traffic noise from vehicular traffic was projected using a version of the FHWA Traffic Noise Prediction Model (FHWA-RD-77-108). The FHWA model arrives at the predicted noise level through a series of adjustments to the key input parameters. The following outlines the key adjustments made to the computer model for the roadway inputs:

- Roadway classification – (e.g. freeway, major arterial, arterial, secondary, collector, etc.),
- Roadway Active Width – (distance between the center of the outer most travel lanes on each side of the roadway)
- Average Daily Traffic (ADT) Volumes, Travel Speeds, Percentages of automobiles, medium trucks, and heavy trucks
- Roadway grade and angle of view
- Site Conditions (e.g. soft vs. hard)
- Percentage of total ADT which flows each hour throughout a 24-hour period

The following outlines key adjustments to the computer model for the project site parameter inputs:

- Vertical and horizontal distances (Sensitive receptor distance from noise source)
- Noise barrier vertical and horizontal distances (Noise barrier distance from sound source and receptor).
- Traffic noise source spectra
- Topography

Table 3 indicates the roadway parameters utilized for this study.

Table 3
Roadway Parameters[1]

Roadway	Classification	Volume	Capacity	Speed (MPH)	Site Conditions
60th Street West	Regional Arterial	8,000	24,000	55	Hard

[1] Source: City of Lancaster 2030 General Plan Transportation and Circulation.

Table 4 indicates the vehicle distribution and truck mix utilized for all roadways in this study area.

Table 4
Vehicle Distribution (Truck Mix) for Arterial Roadways[1,2]

Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow
Automobiles	69.5	12.9	9.6	92.00
Medium Trucks	1.44	0.06	1.5	3.00
Heavy Trucks	2.4	0.1	2.5	5.00

[1] Vehicle percentages specified are typical with Los Angeles County Traffic data.

4.2 Interior Noise Modeling

The interior noise level is the difference between the projected exterior noise level at the structure's façade and the noise reduction provided by the structure itself. Typical building construction will provide a conservative 12 dBA noise level reduction with a "windows open" condition and a very conservative 20 dBA noise level reduction with "windows closed". RK estimated the interior noise level by subtracting the building shell design from the estimated exterior noise level.

The interior noise analysis is based on industry standards for building noise reduction established by the Federal Highway Administration (FHWA), the 2013 Caltrans Technical Noise Supplement to the Traffic Noise Analysis Protocol (TeNS), the California Office of Noise Control Catalog of STC and IIC Ratings for Wall and Floor/Ceiling Assemblies, and the California Building Standards Code, Title 24.

The TeNS manual shows that the noise reduction due to building exteriors with ordinary sash windows (windows closed) is at least 20 decibels. By providing upgraded STC rated windows, the project design is considered adequate to meet interior noise standards. The building's exterior walls will be constructed per the latest building code insulation requirements and provide occupants with the most protection from exterior noise. Insulated exterior walls, designed per the latest California Building Standards, would provide a minimum of STC 35-40. Windows, on the other hand, are one of the acoustically weakest parts of the structure. Therefore, for a conservative estimate of preliminary interior noise, the building's noise reduction potential is limited to the STC of the windows.

5.0 Operational Noise Impacts

A noise analysis has been performed to determine whether the proposed project would result in a substantial increase in ambient noise levels in the vicinity of the site. Additionally, the noise analysis examines whether the project can meet the City of Lancaster and State of California requirements for residential exterior and interior noise exposure. The State of California and City of Lancaster require that interior noise levels due to exterior sources must not exceed a community noise equivalent level (CNEL) or a day-night level (LDN) of 45 dBA, in any habitable room.

5.1 Project Operational Noise Impacts

The project is consistent with the General Plan Land Use Designation and consists of single-family residential housing. On-site noise would include typical neighborhood noise, such as motor vehicle traffic, HVAC equipment and general human activities. Many project noise sources will be screened behind the proposed six-foot property line walls that will shield backyard areas of the site. Thus, most of the typical on-site outdoor residential activity and HVAC equipment would be screened from the neighboring property's line of sight. As a result, the project is not expected to generate on-site stationary noise that would adversely affect the existing ambient conditions in the vicinity of the site.

The project will also contribute additional traffic to the area which may affect roadway noise levels. Typically, a doubling of traffic volume along a roadway would result in approximately a 3 dBA increase in noise, which is typically considered the threshold of significance for causing a perceptible change. According to the project's Traffic Impact Study, the project will not double the amount of traffic on any of the roadways adjacent to the project, including 60th Street West, either directly or cumulatively, and therefore the project may be presumed to have a less than significant impact to future roadway noise levels.

Table 5
Future Traffic Noise Impacts

Roadway	Segment	ADT Without Project[1]	Project ADT[3]	Future ADT With Project	Significant Impact[2]
60th Street West	Avenue K to Avenue L	9,100	922	10,022	NO

[1] Source: City of Lancaster 2030 General Plan Transportation and Circulation.
[2] A significant increase typically requires a doubling of traffic volume to result in a barely perceptible change of 3 dBA above ambient noise levels.
[3] Pacific Topaz Residential Project Trip Generation & VMT Analysis, City of Lancaster, CA, dated August 19, 2021, by RK Engineering Group, Inc.

5.2 Noise/Land Use Compatibility

Traffic noise impacts from 60th Street West Road are analyzed at the project site and are compared to the City's Noise Standards for determining the project's noise/land use compatibility.

Traffic noise along 60th Street West Road will be the main sources of noise impacting the project site. The first row of residential lots will be set back approximately 72 feet from the centerline of 60th Street West. As previously mentioned, the project is proposing to build a six (6) foot CMU block wall along the property lines facing the external roadways to help reduce noise impacts.

Table 6 indicates the noise level projections to the backyard habitable areas and the facades of the residential units nearest the subject roadways. Future exterior noise levels on the project site range from 63.3 dBA CNEL along the 60th Street West.

Table 6
Future Exterior Roadway Noise Levels (dBA CNEL)[1]

Roadway	Exterior Façade Study Locations	Exterior Noise Level at Facade	Exterior Residential Noise Standard	Noise Level Exceeds Standard
60th Street West	Backyard/Patio	63.3	65	No

[1] Exterior noise levels calculated 5-feet above pad elevation, perpendicular to subject roadway and includes attenuation from 6-foot wall.

Based on the City of Lancaster General Plan Noise-Compatibility Land Use Objectives, the future exterior noise levels at the habitable backyard areas of the project site would not exceed the maximum exterior CNEL noise limits.

The roadway calculation sheets are provided in Appendix B.

5.3 Airport Noise Compatibility

Noise exposure contours around airports are determined from the number and type of aircraft using the airport, the magnitude and duration of each fly over, flight paths, and the time of day when flights occur. The Airport Noise Standards contained in Title 4 of the California Administrative Code specify that airports shall not permit noise exposures of 65 CNEL or greater to extend into residential or school areas.

There are three primary sources of air traffic affecting noise levels within the City of Lancaster including the General William J. Fox Airfield, Edwards Air Force Base, and Air Force Plant 42 (Palmdale Regional Airport).

The airport noise contour sheets are provided in Appendix C.

The project is located outside of the 65 dB Ldn noise contour limit of all three major airports; therefore, the exterior noise impact from the airport would be within the allowable limits for residential land uses and the project is considered compatible with the surrounding land use and noise environment. Noise from airports operations is expected to generate a less than significant on the proposed project.

5.4 Future Interior Noise

A preliminary interior noise analysis has been performed for the first row of habitable dwellings facing adjacent roadways using a typical "windows open" and "windows closed" condition. A "windows open" condition assumes 12 dBA of noise attenuation from the exterior noise level. A "windows closed" condition" assumes 20 dBA of noise attenuation from the exterior noise level.

California standard building shell and residential windows are expected to provide adequate attenuation to meet interior noise standards with a window open and windows closed condition.

Table 7 indicates the future interior noise levels along the adjacent roadways.

Table 7
Future Interior Noise Levels (dBA CNEL)[1]

Roadway	Exterior Façade Study Location	Exterior Noise Level at Façade	Required Interior Noise Reduction	Interior Noise Level w/Standard Windows (STC ~ 25)		STC Rating
				"Windows Open" [1]	"Windows Closed" [2]	
60th Street West	1st Floor (All lots along 60th Street West)	62.9	17.9	50.9	42.9	25
60th Street West	2nd Floor (All lots along 60th Street West)	71.2	26.2	59.2	51.2	29

[1] A minimum of 12 dBA noise reduction is assumed with the "windows open" condition.
[2] A minimum of 20 dBA noise reduction is assumed with the "windows closed" condition.

5.5 Project Design Features

The following recommendations are provided to help ensure the proposed project meets the City of Lancaster and State of California requirements for residential interior noise exposure:

DF-1 A six (6) foot noise barrier wall will be provided to shield all habitable backyard areas facing exterior roadways and adjacent properties. The designed noise screening will only be accomplished if the barrier's weight is at least 3.5 pounds per square foot of face area without decorative cutouts or line-of-site openings between the shielded areas and the project site. All gaps (except for weep holes) should be filled with grout or caulking to avoid flanking.

Noise control barrier may be constructed using one, or any combination of the following materials:

- Masonry block;
- Stucco veneer over wood framing (or foam core), or 1-inch thick tongue and groove wood of sufficient weight per square foot;
- Transparent glass (3/8-inch-thick), acrylic, polycarbonate, or other transparent material with sufficient weight per square foot.

DF-2 The project should incorporate building construction techniques and insulation that is consistent with California Title 24 Building Standards to achieve the minimum interior noise standard of 45 dBA CNEL for all residential units.

DF-3 A "windows closed" condition is expected to be required for all residential units within the project site to meet the interior noise standard. To accommodate a windows closed conditions, all units shall be equipped with adequate fresh air ventilation, per the requirements of the California Uniform Building Code (UBC).

DF-4 Based on the results of this analysis, the project should provide upgraded windows and sliding glass doors per the recommendations described in Table 10 of this report.

DF-5 For proper acoustical performance, all exterior windows, doors, and sliding glass doors should have a positive seal and leaks/cracks must be kept to a minimum.

DF-6 In order to comply with City of Lancaster Municipal Code requirements, all construction activities should take place Monday through Saturday, between the hours of 7 AM to 8 PM. No construction should occur on Sundays or federal holidays.

Exhibits

Exhibit A

Location Map

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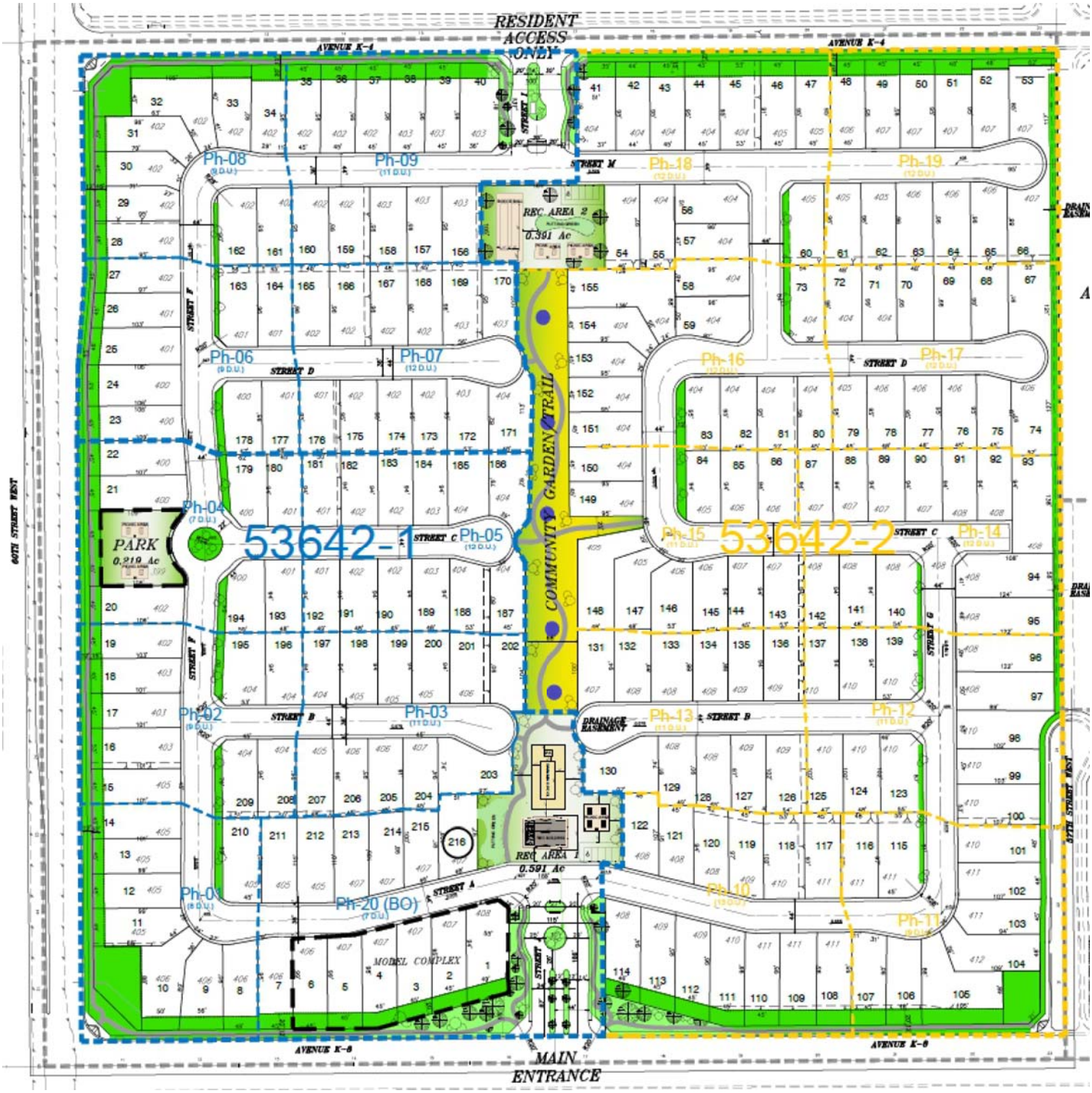
Exhibit B

Site Plan



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RK engineering group, inc.

Appendices

Appendix A

City of Lancaster
General Plan Noise Element and
Municipal Code Noise Control

8.0 Noise

8.0 NOISE

8.1 INTRODUCTION

Noise is an unavoidable by-product of modern mechanized civilization, and has long been an accepted part of urban life. Noise, defined as unwanted sound, is principally caused by the operation of machinery for transportation (automobiles, trucks, trains, and aircraft) and machinery for production (industry and construction).

Noise affects the quality of our environment, both at home and work, as well as enjoyment of recreational activity. Excessive amounts of noise may have adverse affects on physical activity and psychological stability. The effect of noise on the individual and the community varies with its duration, its intensity, and the tolerance level of the individual.

The general background level of noise has risen as the Antelope Valley and City of Lancaster have grown. Along with this growth and increased level of noise comes the need for a better understanding of the causes, effects, and mitigation of noise within the manmade environment.

FUNDAMENTALS OF NOISE

Sound is technically described in terms of the loudness (amplitude) of the sound and frequency (pitch) of the sound. Noise is typically described as “unwanted sound,” and is a byproduct of transportation, industrial, and other activities within the community that permeates into the environment and causes disturbance.

Noise Evaluation

The sound we hear is a result of a sound source inducing vibration in the air. The vibration produces alternating bands of relatively dense and sparse particles of air that spread outward from the source. The result of the particle movement is a fluctuation in the normal atmospheric pressure, or sound waves. These waves radiate in all directions from the source and may be reflected and scattered, or possibly turn corners. When the vibration stops, the sound waves disappear instantly, and sound ceases. Sound may be described in terms of three variables: Amplitude (perceived as loudness), frequency (perceived as pitch), and time pattern.

The rate at which a sound source vibrates determines frequency. The units for frequency refer to the number of times that the acoustical pressure (amplitude) peaks for each sound per unit of time. The unit of time is usually one second and the term Hertz (Hz) is used to designate the number of cycles per second. A sound that has more cycles per second is higher pitched. Humans can identify sounds with frequencies from about 20 Hz to 20,000 Hz. Pure tones are relatively rare in real-life situations and most sounds consist instead of a complex mixture of many frequencies.

Major sources of noise within the Lancaster study area include the Antelope Valley Freeway and the arterial roadway system, aircraft operations related to Air Force Plant 42 (Palmdale Regional Airport), Fox Field, Edwards Air Force Base, and the Union Pacific Railroad line.

Noise Measurement

The standard unit of measurement of the loudness of sound is the decibel (dB). This unit expresses an exponential increase, where an increase of 10 decibels represents a tenfold increase in the sound generated. In order to describe "average noise levels," the measurements are then weighted and added over a specified time period to reflect the magnitude of the sound, as well as its duration, frequency, and time of occurrence.

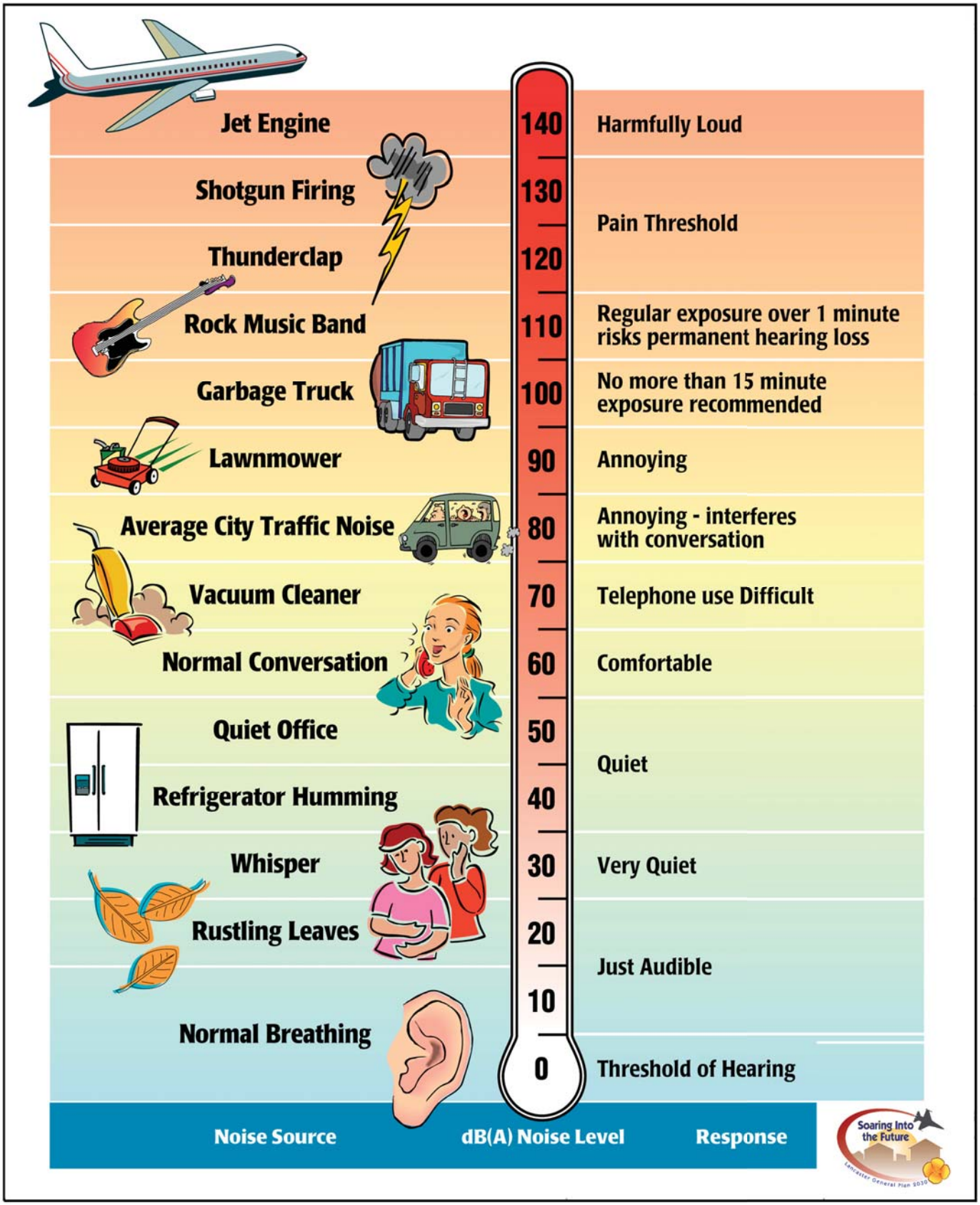
The sound pressure level is measured on a logarithmic scale. The 0 dB level is based on the lowest detectable sound pressure level that people can perceive (an audible sound that is not zero sound pressure level). The decibel scale has a value of 1.0 dB at the threshold of hearing and 140 dB at the threshold of pain. Each interval of 10 decibels indicates a sound energy ten times greater than before, which is perceived by the human ear as being roughly twice as loud. A 1.0-decibel increase is just audible, and a 10-decibel increase means the sound is perceived as being twice as loud as before. In most situations a 3 dB change in sound pressure level is considered a "just-detectable" difference and a 5 dB change (either louder or quieter) is readily noticeable.

Sound from a small localized source (approximating a "point" source) radiates uniformly outward as it travels away from the source in a spherical pattern. The sound level attenuates or drops-off at a rate of 6 dB for each doubling of the distance (6 dB/DD). This decrease, due to the geometric spreading of the energy over an ever-increasing area, is referred to as the *inverse square law*. However, highway traffic noise is not a single, stationary point source of sound. The movement of the vehicles makes the source of the sound appear to emanate from a line (line source) rather than a point when viewed over some time interval. Since the change in surface area of a cylinder only increases by two times for each doubling of the radius instead of four times associated with spheres, the change in sound level is 3 dB per doubling of distance.

Noise levels are expressed as A-weighted decibels (dBA), which adjusts the actual sound level to reflect only those frequencies audible to the human ear. The human ear is most sensitive to frequencies around 4,000 Hz (about the highest note on a piano) and less sensitive to low frequencies below 100 Hz (such as a low rumble). Other examples of the decibel level of various noise sources include: the quiet rustle of leaves (10 dBA), a soft whisper (20 to 30 dBA), the hum of a small electric clock (40 dBA), ambient noise outdoors or in a kitchen (50 dBA), normal conversation at five feet (55 dBA), and a busy street at 50 feet (75 dBA). Examples of various sound levels are shown in Figure 8-1, Sound Levels and Human Response.

Noise Descriptors

Numerous methods have been developed to measure sound over a period of time. These methods include (1) the community noise equivalent level (CNEL); (2) equivalent sound level (Leq); (3) day/night average sound level (Ldn); and (4) single event noise exposure level (SENEL). These methods are described in Table 8-1, Noise Descriptors.



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Sound Levels and Human Response

Figure 8-1

Table 8-1
Noise Descriptors

Term	Definition
Decibel (dB)	The unit for measuring the volume of sound equal to 10 times the logarithm (base 10) of the ratio of the pressure of a measured sound to a reference pressure (20 micropascals).
A-Weighted Decibel (dBA)	A sound measurement scale that adjusts the pressure of individual frequencies according to human sensitivities. The scale accounts for the fact that the region of highest sensitivity for the human ear is between 2,000 and 4,000 cycles per second (hertz).
Equivalent Sound Level (L_{eq})	The sound level containing the same total energy as a time varying signal over a given time period. The L_{eq} is the value that expresses the time averaged total energy of a fluctuating sound level.
Maximum Sound Level (L_{max})	The highest individual sound level (dBA) occurring over a given time period.
Minimum Sound Level (L_{min})	The lowest individual sound level (dBA) occurring over a given time period.
Community Noise Equivalent Level (CNEL)	A rating of community noise exposure to all sources of sound that differentiates between daytime, evening, and nighttime noise exposure. These adjustments are +5 dBA for the evening, 7:00 PM to 10:00 PM, and +10 dBA for the night, 10:00 PM to 7:00 AM.
Day/Night Average (L_{dn})	The L_{dn} is a measure of the 24-hour average noise level at a given location. It was adopted by the U.S. Environmental Protection Agency (EPA) for developing criteria for the evaluation of community noise exposure. It is based on a measure of the average noise level over a given time period called the L_{eq}. The L_{dn} is calculated by averaging the Leq's for each hour of the day at a given location after penalizing the "sleeping hours" (defined as 10:00 PM to 7:00 AM), by 10 dBA to account for the increased sensitivity of people to noises that occur at night.
Single Event Noise Exposure Level (SENEL)	The Single Event Noise Exposure Level (SENEL) is the most appropriate noise level duration rating scale for a single noise occurrence. The SENEL, given in decibels, is the noise exposure level of a single event measured over the time interval between the initial and final times for which it exceeds the threshold noise level.
Exceedance Level (L_n)	The A-weighted noise levels that are exceeded 1%, 10%, 50%, and 90% (L_{01}, L_{10}, L_{50}, L_{90}, respectively) of the time during the measurement period.

Source: Cyril M. Harris, *Handbook of Noise Control*, 1979.

Vibration Characteristics

Vibration is a unique form of noise. It is unique because its energy is carried through structures and the earth, whereas, noise is simply carried through the air. Thus, vibration is generally felt rather than heard. Some vibration effects can be caused by noise (e.g., the rattling of windows from truck pass-bys). This phenomenon is related to the coupling of the acoustic energy at frequencies that are close to the resonant frequency of the material being vibrated. Typically, groundborne vibration generated by manmade activities attenuates rapidly as the distance from the source of the vibration increases. Vibration, which spreads through the ground rapidly, diminishes in amplitude with distance from the source. The ground motion caused by vibration is measured as particle velocity in inches per second and, in the United States is referenced as vibration decibels (VdB).

The vibration velocity level threshold of perception for humans is approximately 65 VdB. A vibration velocity of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels for many people. Sources within buildings such as operation of mechanical equipment, movement of people, or the slamming of doors causes most perceptible indoor vibration. Typical outdoor sources of perceptible groundborne vibration are construction equipment, steel wheeled trains, and traffic on rough roads. If a roadway is smooth, the groundborne vibration from traffic is barely perceptible. The range of interest is from approximately 50 VdB, which is the typical background vibration velocity, to 100 VdB, which is the general threshold where minor damage can occur in fragile buildings.

HUMAN REACTION TO SOUND

An estimated 21 million people in the United States currently have some degree of hearing loss. In approximately 10 million of these cases, exposure to very loud, or sustained noise caused damage to the inner ear, which could be substantial even before a hearing loss was actually noticed. To prevent the spread of hearing loss, a desirable goal would be to minimize the number of noise sources that expose people to sound levels above 70 decibels. Although hearing impairment is one of the harmful effects of noise on people, there are several other effects noise can have on humans.

Physical and Psychological Responses

Noise can also cause a variety of temporary physical and psychological responses in humans. Temporary physical reactions to passing noises range from a startle reflex to constriction in peripheral blood vessels; the secretion of saliva and gastric fluids; and changes in heart rate, breathing patterns, the chemical composition of the blood and urine, dilation of the pupils of the eye, visual acuity, and equilibrium. The chronic recurrence of these physical reactions has been shown to aggravate headaches, fatigue, digestive disorders, heart disease, circulatory and equilibrium disorders. Noise is a contributing factor in stress-related ailments such as ulcers, high blood pressure, and anxiety.

Noise can mask important sounds and disrupt communication. This process can cause anything from a slight irritation to a serious safety hazard. Noise-induced sleep interference is one of the critical components of community annoyance. Sound level, frequency distribution, duration, repetition, and variability can make it difficult to fall asleep and may cause momentary shifts in the natural sleep pattern, or level of sleep. It can produce short-term adverse effects on

mood changes and job performance, with the possibility of more serious effects on health if it continues over long periods.

Noise can cause adverse effects on task performance and behavior at work, and non-occupational and social settings. These effects are the subject of some controversy, since the presence and degree of effects depends on a variety of intervening variables. Most research in this area has focused mainly on occupational settings, where noise levels must be sufficiently high for effects on performance to occur.

Noise has been implicated in the development or exacerbation of a variety of health problems, ranging from hypertension to psychosis. As with other categories, quantifying these effects is difficult due to the amount of variables that need to be considered in each situation. As a biological stressor, noise can influence the entire physiological system. The strongest evidence lies in the cardiovascular effects of noise exposure; research in this area is ongoing. Although evidence for the various effects of noise have differing levels of certainty, it is clear that noise can affect human health. Table 8-2, Noise Levels and Human Responses, summarizes the harmful effects of noise discussed above.

Table 8-2
Noise Levels and Human Responses

Health Effect	Noise Level[1]	Activity Area[2]
Hearing Loss	Leq ≤ 70 dB	All Areas
Outdoor Activity Interference and Annoyance	Ldn ≤ 55 dB	Outdoors in residential areas where people spend time
	Leq ≤ 55 dB	Outdoor areas where people spend a limited amount of time
Indoor Activity Interference and Annoyance	Ldn ≤ 45 dB	Indoor residential
	Leq ≤ 45 dB	Other indoor areas with human activities (e.g. schools)

Source: EPA, *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*, March 1974.

1. Refer to Table 8-1, Noise Descriptors, for a definition of Leq and Ldn.
2. "Area" refers to residential, industrial, commercial, and recreational areas, unless otherwise specified.

Community Response to Noise

Some people have a very low tolerance for noise, and approximately 10 percent of the population object to nearly any noise not of their own making. Even in the quietest manmade environment, some complaints will occur. Another 25 percent of the population will not complain even in very severe noise environments. Thus, a variety of reactions can be anticipated from people exposed to any given noise environment. Despite this, the population as a whole can be expected to exhibit the following responses to changes in noise levels: an increase or decrease of 1.0 dBA cannot be perceived except in carefully controlled laboratory experiments; a 3.0 dBA increase is just noticeable outside of the laboratory; an increase of 5.0 dBA is often necessary before any noticeable change in community response (i.e., complaints) occurs.

Table 8-3, Effects of Noise on People, details the effects of noise on individuals living in various noise environments and predicts the average community reaction to various sound levels in a residential setting. As shown, hearing loss may begin to occur at 75 Ldn, and the noise environment will be highly annoying to 37 percent of the population. Residents who live in noise environments of 70 Ldn are not likely to experience hearing loss; however, 25 percent will be highly annoyed, and noise will be viewed as one of the most important adverse aspects of the community environment. At 65 Ldn, hearing loss will not occur, and 15 percent of the population will be highly annoyed by the noise environment. As shown in Table 8-4, Highly Annoyed Persons and Registered Complaints as a Function of Ldn, at very low noise exposures, up to 13 percent of the population will display a high degree of annoyance, even though complaints might not be registered. At the other end of the spectrum, even in communities exposed to noise levels between 75 and 80 Ldn, only 15 to 20 percent of the population will register a complaint, despite the fact that more than half are highly annoyed by the noise environment.

Table 8-3
Effects of Noise on People[1]

Effects [2]	Hearing Loss	Speech Interference		Annoyance [3]	Average Community Reaction [4]	General Community Attitude Towards Area
Day-Night Average Sound Level in Decibels	Qualitative Description	Indoor: % Sentence Intelligibility	Outdoor: Distance (meters) for 95% Sentence Intelligibility	% of Population Highly Annoyed [5]		
75 and above	May Begin to Occur	98%	0.5	37%	Very Severe	Noise is likely to be the most important of all adverse aspects of the community environment.
70	Will Not Likely Occur	99%	0.9	25%	Severe	Noise is one of the important adverse aspects of the community environment.
65	Will Not Occur	100%	1.5	15%	Significant	Noise is one of the important adverse aspects of the community environment.
60	Will Not Occur	100%	2.0	9%	Moderate to Slight	Noise may be considered an adverse aspect of the community environment.
55 and below	Will Not Occur	100%	3.5	4%		Noise considered no more important than various other environmental factors.

Source: U.S.D.O.T., Guidelines *for Considering Noise in Land Use Planning and Control*, 1980.

1. Research implicates noise as a factor producing stress-related health effects such as heart disease, high-blood pressure and stroke, ulcers and other digestive disorders. The relationships between noise and these effects, however, have not as yet been quantified.
2. "Speech Interference" data are drawn from the following tables in EPA's "Levels Document"; Table 3, Figure D-1, Figure D-2, Figure D-3. All other data from National Academy of Science, *Guidelines for Preparing Environmental Impact Statements on Noise, Report of Working Group 69 on Evaluation of Environmental Impact of Noise*, 1977.
3. Depends on attitudes and other factors.
4. Attitudes or other non-acoustic factors can modify this. Noise at low levels can still be an important problem, particularly when it intrudes into a quiet environment.
5. The percentages of people reporting annoyance to lesser extents are higher in each case. An unknown small percentage of people will report being "highly annoyed" even in the quietest surroundings. One reason is the difficulty all people have in integrating annoyance over a very long time.

Table 8-4
Highly Annoyed Persons and Registered Complaints as a Function of Ldn

Noise Level (Ldn)	Percentage of Highly Annoyed	Percentage of Complaints
50	13	Less Than 1
55	17	1
60	23	2
65	33	5
70	44	10
75	54	15
80	62	Over 20

Source: U.S. EPA, *Public Health and Welfare Criteria for Noise*, July 27, 1973.

Community responses to noise may range from registering a complaint by telephone or letter initiating court action, depending upon each individual's susceptibility to noise and personal attitudes toward noise. Several factors are related to the level of community annoyance. These include:

- Fear associated with the aircraft activities (fear of a plane crash);
- Socioeconomic status and educational level of the residents;
- Resident's belief that they are being treated unfairly;
- Attitudes regarding the usefulness of the activity creating the noise; and
- Resident's belief that the noise source could be controlled.

Recent studies have shown that changes in long-term noise levels, measured in units of Ldn or CNEL, are noticeable and that people respond. About 10 percent of the people exposed to traffic noise of 60 Ldn will report being highly annoyed with the noise, and each increase of one Ldn is associated with approximately two percent more people being highly annoyed. When traffic noise exceeds 60 Ldn or aircraft noise exceeds 55 Ldn, people begin complaining. Group and legal actions to stop the noise generally occur when traffic noise levels approach 70 Ldn and aircraft noise levels approach 65 Ldn.

General Methods to Reduce Noise Impacts

There are several basic techniques available to minimize the adverse effects of noise on sensitive noise receivers. Classical engineering principles suggest controlling the noise source whenever feasible and protecting the noise receptors when noise source control mechanisms have been pre-empted by State and Federal governments.

Noise producers within local jurisdictions include industrial processes, electrical substations, wastewater treatment facilities, transportation system locations, swimming pool/spa pump motors, air conditioning units, drive-through speakers, siren usage, and local government controlled or sanctioned activities (City vehicles, public works projects). Regulatory mechanisms available to control these noise sources include: City Noise Ordinance, the application of "conditions of approval" on new developments, land use policy and approval practices as outlined in the General Plan, and the provision of noise information in permit applications for swimming pools, spas, and air conditioning systems.

In the event that source control mechanisms have been employed and noise impacts persist or are projected to occur, additional techniques should be considered. Acoustic site planning, architectural design, acoustic construction techniques, and the erection of noise barriers are all effective methods for reducing noise impacts.

Acoustic site planning involves the careful arrangement of land uses, lots, and buildings to minimize intrusive noise levels. The placement of noise compatible land uses between the roadway and more sensitive uses is an effective planning technique. The use of buildings as noise barriers, and their orientation away from the source of noise, can shield sensitive activities, entrances, and common open space areas. Clustered and planned unit developments can maximize the amount of open space available for landscaped buffers next to heavily traveled roadways and thereby allow aesthetic residential lot setbacks in place of continuous noise barriers.

Acoustic architectural design involves the incorporation of noise reduction strategies in the design and layout of individual structures. Building heights, room arrangements, window size and placement, balcony and courtyard design, and the provision of air conditioning all play an important role in shielding noise sensitive activities from intrusive sound levels.

Acoustic construction is the treatment of various parts of a building to reduce interior noise levels. Acoustic wall design, doors, ceilings and floors, as well as dense building materials, the use of acoustic windows (double glazed, double paned, thick, non-opening, or small with air-tight seals), and the inclusion of maximum air spaces in attics and walls are all available options.

Noise barriers are relatively easy to design and inexpensive. Consequently, they are often used indiscriminately in place of the techniques discussed above, resulting in developments where each road is bordered by six foot block walls, behind which residences are “protected” from excessive noise levels. Ideally, noise barriers would incorporate the placement of berms, walls, or a combination of the two in conjunction with appropriate landscaping to create an aesthetically pleasing environment. Where space is available (clustered developments), a meandering earth berm is both effective and pleasing. Where space is restricted, a wall is effective. In either case, thick coniferous landscaping could be specified to reduce the visual impact of the barrier.

8.2 LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

It is difficult to specify noise levels that are generally acceptable to everyone; what is annoying to one person may be unnoticed by another. Standards may be based on studies of the ability of people to sleep, talk, or work under various noise conditions. However, all such studies recognize that individual responses vary considerably. Standards usually address the needs of most of the general population.

This section describes the laws, ordinances, regulations and standards that are applicable to the study area. Regulatory requirements related to environmental noise are typically promulgated at the local level. However, Federal and State agencies provide standards and guidelines to the local jurisdictions.

FEDERAL GUIDELINES AND STANDARDS

The Federal Highway Administration (FHWA) has developed a series of maximum design noise levels for various activity categories that are expressed in terms of equivalent sound levels (Leq) and L_{10} values (refer to Table 8-1 for a definition of Leq and L_{10}). These design noise levels are commonly used on Federally funded road projects or projects for which Federal review or California Department of Transportation (Caltrans) review is anticipated.

The FHWA design noise levels represent maximum values and incorporate tradeoffs between desirable and feasible noise levels (recognizing that in many cases lower noise exposures would result in even greater community benefits). The design levels appear in Table 8-5, Design Noise Level/Activity Relationship, and are to be applied to:

- Undeveloped lands for which development is planned, designed, and programmed on the highway or other Federally funded construction project is publicly noticed;
- Activities and land uses in existence when the project is publicly noticed; and
- Those areas which have regular human use and in which a lowered noise level would be of benefit.

Table 8-5
Design Noise Level/Activity Relationship

Activity Category	Design Noise Leq(h)	Levels L_{10}(h)	Description of Activity Category
A	57 dBA (Exterior)	60 dBA (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 continue to serve its intended purpose.
B	67 dBA (Exterior)	70 dBA (Exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 dBA (Exterior)	75 dBA (exterior)	Developed lands, properties, or activities not included in Categories A or B above.
D	-	-	Undeveloped lands.
E	52 dBA (Interior)	55 dBA (Interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

1. Either L_{10} or Leq (but not both) design noise levels may be used on a project.

Source: U.S. Department of Transportation, *Federal Highway Administration Planning, Environment, & Realty (HEP) Manual FHWA-HEP06-020*, April 2006.

The FHWA noise abatement criteria establish an exterior noise goal for residential areas of 67 Leq and an interior goal of 52 Leq. These criteria apply to private yard areas and assume that typical wood frame homes provide 10 dB (outdoor to indoor) noise reduction with windows open, and a 20 dB reduction with windows closed. Windows are assumed to be open, unless there is firm knowledge that they are, in fact, kept closed almost every day of the year (i.e., non-opening windows).

Table 8-6, Federal Exterior Noise Acceptability Criteria for Housing, and Table 8-7, HUD External Noise Exposure Standards for New Residential Construction, indicate Department of

Housing and Urban Development (HUD) policies used to determine eligibility for financial backing for new or rehabilitative residential construction in noise impacted areas. If the noise environment is determined to be normally unacceptable using Table 8-7, financial assistance from HUD would still be possible if noise insulation provides adequate exterior to interior noise reduction. Measures that reduce the external noise at a site are preferred, when feasible, over measures that only provide attenuation for interior spaces. HUD generally prohibits construction of new noise sensitive land uses in areas with day/night noise levels that exceed 75 dBA.

Table 8-6
Federal Exterior Noise Acceptability Criteria for Housing

Degree of Acceptability	Exterior Noise Exposure Ldn (dB)					
	55	60	65	70	75	80
Acceptable[1]						
Normally Unacceptable[2]						
Unacceptable[3]						

1. The noise exposure may be of some concern, but common building construction will make the indoor environment acceptable and the outdoor environment reasonably pleasant for recreation and play.
2. The noise exposure is significantly more severe; barriers may be necessary between the site and prominent noise sources to make the outdoor environment acceptable; special building constructions may be necessary to ensure that people indoors are sufficiently protected from outdoor noise.
3. The noise exposure at the site is so severe that the construction cost to make the indoor noise environment acceptable may be prohibitive, and the outdoor environment would still be unacceptable.

Source: Federal Register V.44 n.135, Thursday, July 12, 1979.

Table 8-7
HUD External Noise Exposure Standards for New Residential Construction

HUD Approval	Site Noise Exposure	Noise Level (Ldn)	Special Approval/Requirements
Standard	Acceptable	Not Exceeding 65 dB	None
Discouraged	Normally Acceptable	65 dB to 75 dB	Building sound attenuation of 5 dB for 65-70 dB noise level and 10 dB for 70-75 noise level. Special Environmental Clearance Approval of Regional Administration
Prohibited	Unacceptable	75 + dB	Approval of Assistant Secretary of Community Planning EIS required

Source: Federal Register v.44n.135, Thursday, July 12, 1979. Subsequent to original publication, it has been learned that a later Federal Register listing deleted HUD noise exposure standards for residential rehabilitation.

CALIFORNIA ENVIRONMENTAL QUALITY ACT

The California Environmental Quality Act (CEQA) was enacted in 1970 and requires that all known environmental effects of a project be analyzed, including environmental noise impacts. Under CEQA, a project has a potentially significant impact if the project exposes people to noise levels in excess of standards established in the local general plan or noise ordinance. Additionally, under CEQA, a project has a potentially significant impact if the project substantially increases the ambient noise levels in the project vicinity above levels existing

without the project. If a project has a potentially significant impact, mitigation measures must be considered. If mitigation measures to reduce the impact to less than significant are not feasible because of economic, social, environmental, legal, or other conditions, the most feasible mitigation measures must be considered.

CALIFORNIA GOVERNMENT CODE

California Government Code Section 65302(f) mandates that the legislative body of each county and city adopt a noise element as part of its comprehensive general plan. The local noise element must recognize the land use compatibility guidelines established by the State Department of Health Services, as shown in Table 8-8, Land Use Compatibility For Community Noise Environments.

Table 8-8
Land Use Compatibility For Community Noise Environments

Land Use Category	Community Noise Exposure (CNEL)			
	Normally Acceptable	Conditionally Acceptable	Normally Unacceptable	Clearly Unacceptable
Residential-Low Density, Single-Family, Duplex, Mobile Homes	50 - 60	55 - 70	70 – 75	75 – 85
Residential – Multiple Family	50 – 65	60 – 70	70 – 75	70 – 85
Transient Lodging – Motel, Hotels	50 – 65	60 – 70	70 – 80	80 – 85
Schools, Libraries, Churches, Hospitals, Nursing Homes	50 – 70	60 – 70	70 – 80	80 – 85
Auditoriums, Concert Halls, Amphitheaters	NA	50 – 70	NA	65 – 85
Sports Arenas, Outdoor Spectator Sports	NA	50 – 75	NA	70 – 85
Playgrounds, Neighborhood Parks	50 – 70	NA	67.5 – 77.5	72.5 – 85
Golf Courses, Riding Stables, Water Recreation, Cemeteries	50 – 70	NA	70 – 80	80 – 85
Office Buildings, Business Commercial and Professional	50 – 70	67.5 – 77.5	75 – 85	NA
Industrial, Manufacturing, Utilities, Agriculture	50 – 75	70 – 80	75 – 85	NA

CNEL = community noise equivalent level; NA = not applicable

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.
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 have been included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning, will normally suffice.
NORMALLY UNACCEPTABLE: New construction or development should 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 must be included in the design.
CLEARLY UNACCEPTABLE: New construction or development should generally not be undertaken.

Source: Office of Planning and Research, California, *General Plan Guidelines,* October 2003.

The guidelines rank noise land use compatibility in terms of “normally acceptable,” “conditionally acceptable,” “normally unacceptable”, and “clearly unacceptable” noise levels for various land use types. Single-family homes are “normally acceptable” in exterior noise environments up to 60 CNEL and “conditionally acceptable” up to 70 CNEL. Multiple-family residential uses are “normally acceptable” up to 65 CNEL and “conditionally acceptable” up to 70 CNEL. Schools, libraries, and churches are “normally acceptable” up to 70 CNEL, as are office buildings and businesses, commercial, and professional uses.

STATE GUIDELINES AND STANDARDS

Section 1092 of Title 25, Chapter 1, Subchapter 1, Article 4, of the California Administrative Code includes noise insulation standards which detail specific requirements for new multi-family structures (hotels, motels, apartments, condominiums, and other attached dwellings) located within the 60 CNEL contour adjacent to roads, railroads, rapid transit lines, airports or industrial areas. An acoustic analysis is required showing that these multi-family units have been designed to limit interior noise levels, with doors and windows closed, to 45 CNEL in any habitable room. Title 21 of the California Administration Code (Subchapter 6, Article 2, Section 5014) also specifies that noise levels in all habitable rooms shall not exceed 45 CNEL.

Each locality, in developing its Noise Element, must make a determination regarding how much noise is too much. A community's sensitivity to noise may be evaluated by starting with the general guidelines developed by the State of California, and then applying adjustment factors. These allow acceptability standards to be set which reflect the desires of the community and its assessment of the relative importance of noise pollution, and are below the known levels of health impairment.

LOCAL JURISDICTION

City of Lancaster Noise Standards

The City of Lancaster has adopted the California Office of Planning and Research land use compatibility chart for community noise (Table 8-8) as a planning guideline. As stated above, it identifies normally acceptable, conditionally acceptable, normally unacceptable, and clearly unacceptable noise levels for various land use types. Table 8-9, City of Lancaster Normalized CNEL Corrections, contains correction factors that can be used to modify the compatibility assessments.

As shown in Table 8-9, single-family and multi-family homes are "normally acceptable" in exterior noise environments up to 60 CNEL and "conditionally acceptable" up to 70 CNEL. Schools, libraries, hospitals, nursing homes, and churches are "normally acceptable" up to 70 CNEL. Industrial uses are "normally acceptable" up to 75 CNEL, as are office buildings for business, commercial, and professional uses.

A "conditionally acceptable" designation implies that new construction or development should be undertaken only after a detailed analysis of the noise reduction requirements for each land use type is made and needed noise insulation features are incorporated in the design. By comparison, a "normally acceptable" designation indicates that conventional construction can occur with no special noise reduction requirements.

City of Lancaster Noise Environment

As a prerequisite to the formation of an effective noise control program, a community must be aware of the location and extent of local noise problems; namely, major noise source locations and the levels of exposure. An inventory of noise sources can be utilized to focus noise control and abatement efforts to achieve the most good. In some cases, the control of offending noise sources will be beyond the City's jurisdiction; however, by recognizing these limitations, more effective land use strategies can be developed. Table 8-10, Noise-Compatible Land Use

Objectives, identifies noise standards that are to be utilized for design purposes in new development, which promote noise compatible land use relationships.

Table 8-9
City of Lancaster Normalized CNEL Corrections

Type of Correction	Description	Measured CNEL Change (dBA)[1]
Seasonal Correction	Summer (or year-round operation)	0
	Winter only (or windows always closed)	-5
Correction for Outdoor Residual Noise Level	Quiet suburban or rural community (remote from large cities and from industrial activity and trucking).	+5
	Quiet suburban or rural community (not located near industrial activity).	+5
	Urban residential community (not immediately adjacent to heavily traveled roads and industrial areas).	0
	Noisy urban residential community (near relatively busy roads or industrial areas).	-5
	Very noisy urban residential community.	-10
Correction for Previous Exposure and Community Attitudes	No prior experience with the intruding noise.	+5
	Community has had some previous exposure to noise, but little effort is being made to control the noise. This correction may also be applied in a situation where the community has not been exposed to the noise previously, but the people are aware that bona fide efforts are being made to control the noise.	0
	Community has had some considerable previous exposure to the intruding noise and the noisemaker's relations with the community are good.	-5
	Community is aware that the operation causing noise is very necessary and will not continue indefinitely. This correction can be applied for an operation of limited duration and under emergency circumstances.	-10
Pure Tone or Impulse	No pure tone or impulsive in character.	0
	Pure tone or impulsive character present.	-5

Source: California Office of Noise Control, *Guidelines for the Preparation and Content of Noise Elements of the General Plan,* February 1976.
CNEL = community noise equivalent level; dBA = A-weighted decibel.
1. Corrections to be added to the measured CNEL to obtain normalized CNEL.

Table 8-10
Noise-Compatible Land Use Objectives

Land Use	Maximum Exterior CNEL	Maximum Interior CNEL
Rural, Single-, and Multiple-Family Residential Dwellings	65 dBA	45 dBA
Schools: Classrooms Playgrounds	 65 dBA 70 dBA	 45 dBA -
Libraries	-	50 dBA
Hospitals and Convalescent Facilities Living Areas Sleeping Areas	 - -	 50 dBA 40 dBA
Commercial and Industrial Office Areas	70 dBA -	- 50 dBA

CNEL = community noise equivalent level.
Source: *City of Lancaster General Plan EIR,* Noise Compatible Land Use Objectives.

Both stationary and mobile noise sources within Lancaster need to be considered. Stationary sources of noise include airports, industrial and construction activities, air conditioning and refrigeration units, whistles or bells (signaling breaks or shift changes), high level radio, stereo, or television usage, power tools, lawnmowers, appliances used in the home, and barking dogs. Noise associated with these sources may represent a single event noise occurrence, short-term, or long-term/continuous noise. As stated above, the City of Lancaster established maximum exterior and interior noise levels for land uses in the City; refer to Table 8-10.

Mobile noise sources are typically transportation-related and include aircraft, trains, automobiles, trucks, buses, and off-road vehicles. Vehicular traffic noise is subject to the noise standards identified in Table 8-10. Since mobile noise sources are often associated with traffic volumes, these impacts are many times categorized as long-term noise impacts.

Aircraft and Airport Noise

Noise exposure contours around airports are determined from the number and type of aircraft using the airport, the magnitude and duration of each fly over, flight paths, and the time of day when flights occur. The Airport Noise Standards contained in Title 4 of the *California Administrative Code* specify that airports shall not permit noise exposures of 65 CNEL or greater to extend into residential or school areas.

The State Aeronautics Act specifies 65 dB CNEL as the criterion which airports must meet to protect existing residential communities from unacceptable exterior exposures to aircraft noise. The exterior maximum of 65 CNEL is given as the level deemed acceptable to a reasonable person residing in urban residential areas where houses are of typical California construction and may have windows partially open. It has been selected with reference to speech interference, sleep interference, and community reaction.

There are three primary sources of air traffic affecting noise levels within the City of Lancaster including the General William J. Fox Airfield, Edwards Air Force Base, and Air Force Plant 42 (Palmdale Regional Airport). Refer to Figure 6-7 of the Transportation Section for the locations of local airports.

GENERAL WILLIAM J. FOX AIRFIELD

General William J. Fox Airfield is a regional general aviation facility serving the cities of Lancaster and Palmdale as well as unincorporated communities in northern Los Angeles County. The airport produces a minor amount of aircraft noise, and is currently the only general aviation facility in the Lancaster area. Despite being inside the city limits, development in the immediate vicinity of the airport is minimal. Additionally, all of the land within a mile of the airport boundary has been rezoned for industrial use.

The *Fox Field Master Plan* developed in 1984 indicated an operational level in excess of 60,000 aircraft movements annually at that time. According to the *2004 General William J. Fox Airfield Land Use Compatibility Plan,* the 2002-2003 annual aircraft movement total was 83,000, with a projected future count of 198,000 in 20 years or more. Approximately 64 percent of these operations are expected to be single engine piston aircraft.

No significant changes to the runway configuration are planned, although the *Airport Master Plan* of 1996 contemplates future establishment of approaches to both ends of the runway.

Since the Master Plan was developed in 1984, there has been an increase in small twin-engine commercial plane activities. An air charter service occasionally operates out of the airfield, but no continual commuter service is available at this time.

Runway use was also addressed in the *Master Plan Update Environmental Assessment/ Environmental Impact Report* (May 1995) for safe use of the field during noise sensitive evening hours. The majority of current operations occur during daylight hours; operations decrease significantly after dusk. During the noise sensitive hours of 7:00 PM to 7:00 AM, less than five percent of the daily operations occur, with only one or two flights after midnight.

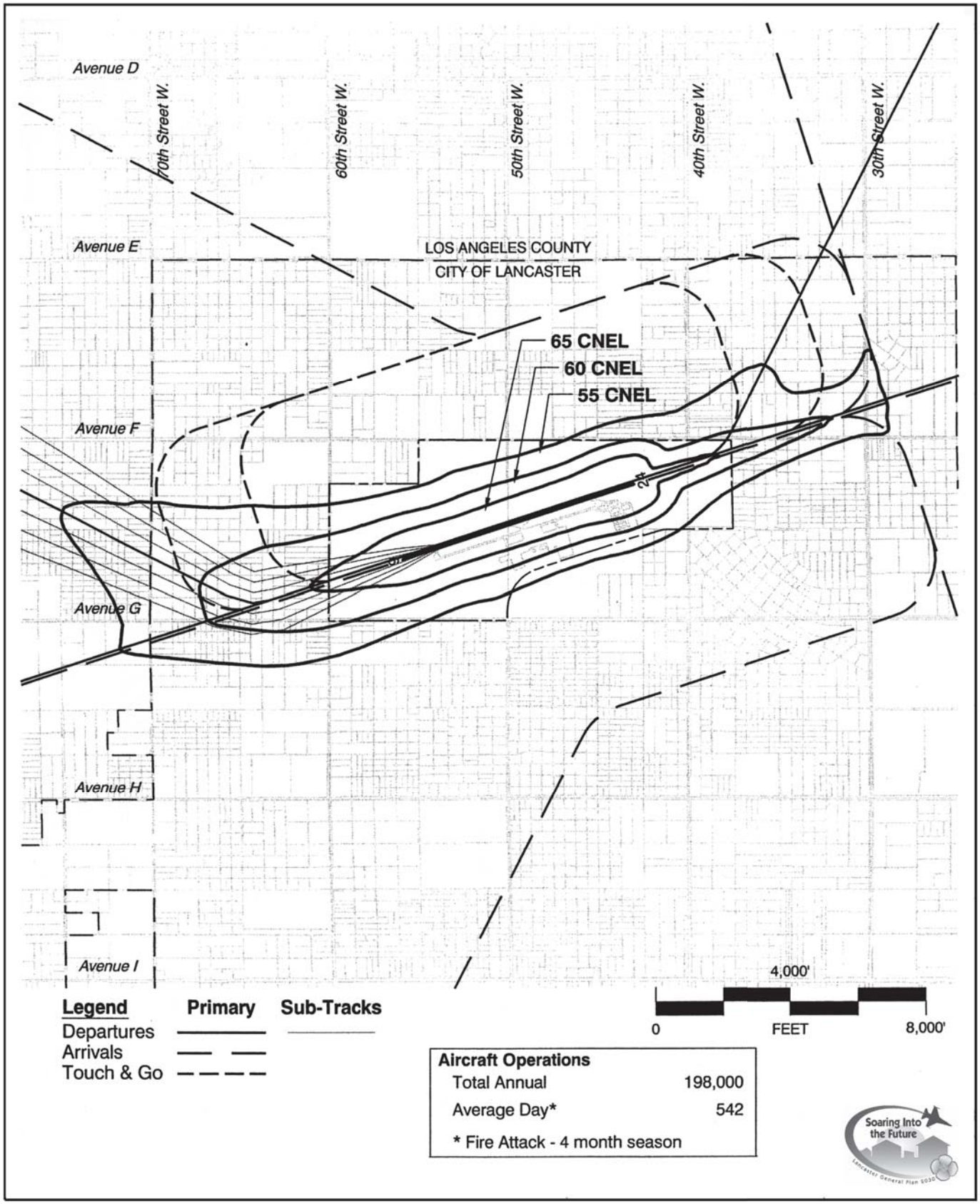
Private single and twin-engine aircrafts are based out of Fox Field. The mix of aircraft includes small jets, turboprops, and reciprocating engine aircraft. Projected noise contours at the airport for future years are depicted in Figure 8-2, Future Fox Field Noise Contours. These noise level contours represent conditions expected should the more extensive runway extension alternative presented in the *Master Plan EA/EIR* be developed. As shown in Figure 8-2, 60 dBA CNEL contours are only expected to extend past the east end and west end of the property line of the airfield facility.

AIR FORCE PLANT 42

Air Force Plant 42 is located within the incorporated boundary of Palmdale, approximately two miles east of State Route 14 (SR-14) and directly south of the City of Lancaster. Aircraft noise contours for Air Force Plant 42 are shown in Figure 8-3, Average Busy-Day CNEL Noise Contours for Air Force Plant 42, and are taken from the Department of the Air Force as part of their *Air Installation Compatible Use Zone (AICUZ) Study* completed in 2002. The contours represent composite noise resulting from aircraft operations.

The contours from the *2002 AICUZ Study* are significantly smaller (closer to Plant 42) than the previous contours presented in the previous *1990 AICUZ study*. The main reasons for these changes seem to be the type of aircraft presently used, modifications in their historical flight patterns, and level and frequency of flights over populated areas. The *2002 AICUZ Study* was reviewed at various stages by representatives from the Air Force (in addition to Plant 42 personnel), the cities of Lancaster and Palmdale, the County of Los Angeles, and the Los Angeles World Airports (formerly the Los Angeles City Department of Airports).

The existing noise contours for the Palmdale Regional Airport are within those of Plant 42. This is because these two facilities already share the same runways, and the Palmdale airport also has significantly fewer flights than Plant 42. However, if at some point the use of this airport were to become significantly increased, it is possible that the 65 CNEL contour would extend some distance off of the airport property itself. Although much of this additional noise would only affect the City of Palmdale, the land uses south of Avenue K within the Lancaster study area could eventually be adversely affected by expansion of the Palmdale Airport. To address these concerns, as well as concerns for the long term viability of Air Force Plant 42, in the early 1990s the City participated in a joint land use study that included the City of Palmdale in an effort to address noise and land use compatibility issues between the jurisdiction and Air Force Plant 42. Recommendations from the study were incorporated into the General Plan. In 1992 the City Council approved a general plan amendment and zone change to reduce allowed densities of development south of Avenue K-8 in order to improve land use compatibility with operations at Air Force Plant 42.



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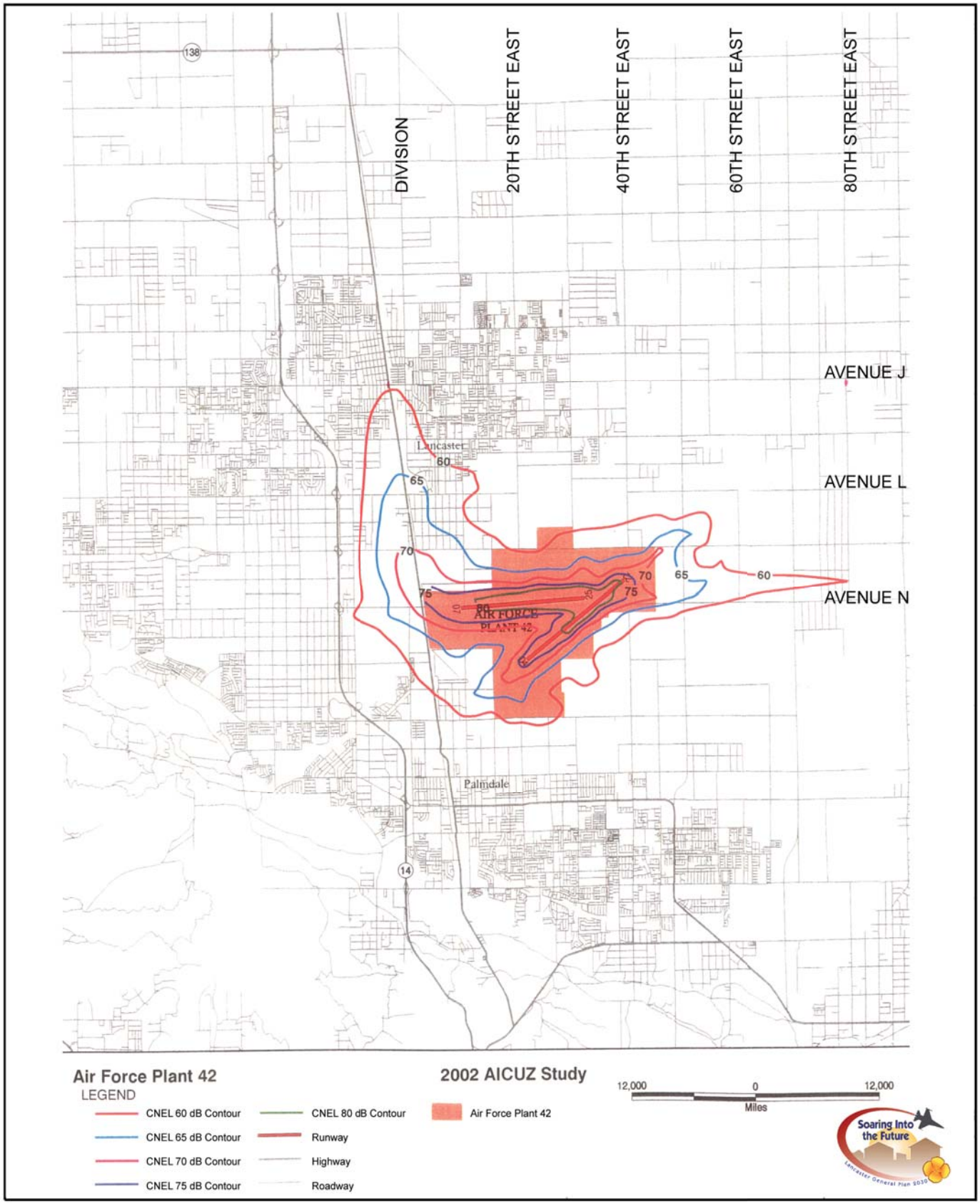
Lancaster General Plan 2030

Future Fox Field Noise Contours

Figure 8-2



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Lancaster General Plan 2030

Average Busy-Day CNEL Noise Contours for Air Force Plant 42

Figure 8-3

EDWARDS AIR FORCE BASE

Because of the arrangement of its Flight Test Range and the flight patterns of aircraft that utilize the facility, the 65 CNEL noise contour for Edwards Air Force Base (EAFB) does not extend off the base property. Therefore, this base is not required to provide an AICUZ Study. However, local and county planning agencies, with technical assistance from EAFB, have designated a Joint Land Use Study (JLUS) safety corridor approximately four miles in width, which extends west of the base's western boundary, along Avenue A. The lower half of this corridor, or the two miles within Avenue A to Avenue C, is within the City of Lancaster's Sphere of Influence. It should be noted that although the width of this zone is intended to encompass all potential flights through this corridor, it is not based on actual measured or predicted noise exposure levels at ground level. In August 1994 the Lancaster City Council adopted the recommendations contained in the Edwards Air Force Base Joint Land Use Study, which was prepared by an inter-agency team representing all local governmental agencies having land use authority adjacent to the base. This document, prepared under the direction of the City of Lancaster, contains land use restrictions/regulations, which are designed to ensure continuations of flight operations at the base.

Other Air Facilities

A helipad is located at the ground level of Antelope Valley Hospital adjacent to the emergency department. This pad is used sparingly for emergency transport of patients. There is also a helipad at the Los Angeles County Sheriffs Station on Lancaster Boulevard at Sierra Highway. This landing site is Federal Aviation Administration (FAA) approved for law enforcement and any public service helicopters that require emergency assistance. According to the Los Angeles County Sheriff's Department, most flights will take place during daytime hours.

Motor Vehicle Noise

Vehicular noise along major roadways was modeled to estimate existing noise levels from mobile traffic. The existing and future roadway noise levels were projected using the Federal Highway Administration (FHWA) Traffic Noise Prediction Model (RD-77-108), together with several roadway and site parameters. The FHWA model is based upon reference energy mean emission levels (REMELS) for automobiles, medium trucks (two axles) and heavy trucks (three or more axles), with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and the acoustical characteristics of the site. To predict CNEL values, it is necessary to determine the hourly distribution of traffic for a typical day and adjust the traffic volume input data to yield an equivalent hourly traffic volume. The Calveno traffic noise emission curves are used as recommended by the California Department of Transportation (Caltrans) to more accurately calculate noise levels generated by California traffic.

Traffic volumes used in the FHWA model were obtained from Meyer Mohaddes Associates (January 3, 2007). These traffic inputs determine the projected impact of vehicular traffic noise and include the roadway cross-section (e.g., number of lanes), roadway width, average daily traffic (ADT), vehicle travel speed, percentages of automobile and truck traffic, roadway grade, angle of view, and site conditions (hard or soft). The model does not account for ambient noise levels (i.e., noise from adjacent land uses) or topographical differences between the roadway and adjacent land uses. Table 8-11, Existing Roadway Noise Levels, indicates the location of the 60-, 65-, and 70-CNEL noise contours associated with vehicular traffic along local roadways as modeled with the FHWA computer model.

Table 8-11
Existing Roadway Noise Levels

Roadway Section	ADT	CNEL at 100 feet from Roadway Centerline	Noise Contour (Distance [feet] From Roadway Centerline)		
			60 dBA	65 dBA	70 dBA
Avenue E					
30th Street West to 25th Street West	50	40.4	6	3	1
Avenue F					
70th Street West to 60th Street West	1,400	54.9	53	25	11
60th Street West to 30th Street West	1,200	54.2	48	22	10
30th Street West to 25th Street West	1,200	54.2	48	22	10
Avenue G					
100th Street West to 90th Street West	100	43.4	9	4	2
70th Street West to 60th Street West	900	53.0	40	18	9
60th Street West to 50th Street West	1,300	54.6	50	23	11
50th Street West to 30th Street West	1,700	55.7	60	28	13
30th Street West to SR-14 Freeway	2,000	59.5	103	33	10
SR-14 Freeway to 10th Street West	1,900	59.3	98	31	10
10th Street West to Sierra Highway	2,000	59.5	103	33	10
Sierra Highway to Division Street	2,600	60.6	134	42	13
Avenue H					
70th Street West to 60th Street West	500	50.4	27	12	6
60th Street West to 50th Street West	1,400	54.9	53	25	11
50th Street West to 30th Street West	1,700	55.7	60	28	13
30th Street West to SR-14 Freeway	2,800	57.9	84	39	18
SR-14 Freeway to 20th Street West	9,700	66.2	499	158	50
20th Street West to 15th Street West	9,600	63.3	192	89	41
15th Street West to 10th Street West	9,300	63.0	187	87	40
10th Street West to Sierra Highway	9,000	62.8	183	85	40
Sierra Highway to Division Street	8,800	65.8	452	143	45
Division Street to 10th Street East	5,800	60.9	137	64	29
Challenger Way (10th Street East) to 20th Street East	3,500	58.7	98	45	21
20th Street East to 30th Street East	2,700	57.6	82	38	18
30th Street East to 40th Street East	2,200	56.7	72	33	15
Avenue I					
70th Street West to 60th Street West	2,000	55.2	57	27	12
60th Street West to 50th Street West	5,900	59.9	118	55	25
50th Street West to 40th Street West	7,500	61.0	138	64	30
40th Street West to 30th Street West	8,700	64.7	351	111	35
30th Street West To 27th Street West	9,300	63.9	289	91	29
27th Street West to SR-14 Freeway	12,000	65.0	373	118	37
SR-14 to 20th Street West	24,100	67.9	748	237	75
20th Street West to 15th Street West	27,200	68.4	846	267	85
15th Street West to 10th Street West	27,700	68.5	861	272	86
10th Street West to Sierra Highway	26,200	68.3	815	258	82
Sierra Highway to Yucca Avenue	26,500	68.3	824	261	82
Yucca Avenue to Division Street	24,000	67.9	747	236	75
Division Street to 5th Street East	21,100	67.4	656	208	66

Table 8-11 [continued]
Existing Roadway Noise Levels

Roadway Section	ADT	CNEL at 100 feet from Roadway Centerline	Noise Contour (Distance [feet] From Roadway Centerline)		
			60 dBA	65 dBA	70 dBA
Avenue I [continued]					
5th Street East to 15th Street East	14,500	65.8	451	143	45
15th Street East to 20th Street East	12,600	66.3	508	161	51
20th Street East to 30th Street East	11,100	65.8	448	142	45
30th Street East to 40th Street East	7,300	61.9	160	74	34
Lancaster Boulevard					
35th Street West to 30th Street West	4,800	62.0	194	61	19
30th Street West to 25th Street West	7,400	63.9	299	94	30
25th Street West to Valley Central Way	9,500	65.0	384	121	38
Valley Central Way to 20th Street West	14,500	66.8	585	185	59
20th Street West to 15th Street West	19,700	67.0	613	194	61
15th Street West to 10th Street West	17,300	66.5	538	170	54
10th Street West to Sierra Highway	17,900	66.6	556	176	56
Sierra Highway to Yucca Avenue	12,500	64.1	308	98	31
Yucca Avenue to Division Street	2,500	58.1	78	25	8
Division Street to 5th Street East	8,100	63.3	252	80	25
5th Street East to Challenger Way (10th Street East)	8,900	63.7	277	88	28
Challenger Way (10th Street E) to 15th Street East	5,200	62.5	210	66	21
15th Street East to 20th Street East	6,000	63.1	242	77	24
20th Street East to 30th Street East	8,200	61.4	147	68	32
30th Street East to 40th Street East	6,600	60.4	127	59	27
40th Street East to 50th Street East	4,400	58.7	97	45	21
Avenue J					
70th Street West to 60th Street West	5,700	60.8	135	63	29
60th Street West to 50th Street West	6,400	61.3	146	68	31
50th Street West to 40th Street West	9,800	63.2	194	90	42
40th Street West to 35th Street West	11,700	63.8	218	101	47
35th Street West to 30th Street West	8,800	62.4	181	84	39
30th Street West to 25th Street West	14,500	66.7	586	185	59
25th Street West to Valley Central Way	19,900	67.0	619	196	62
Valley Central Way to SR-14 Freeway	29,100	67.3	682	216	68
SR-14 Freeway to 20th Street West	32,300	67.7	756	239	76
20th Street West to 15th Street West	25,900	66.8	606	192	61
15th Street West to 10th Street West	25,900	66.8	606	192	61
10th Street West to Sierra Highway	21,200	65.9	496	157	50
Sierra Highway to Division Street	31,600	67.7	741	234	74
Division Street to 5th Street East	30,300	68.7	941	298	94
5th Street East to Challenger Way (10th Street E)	25,600	69.1	1032	326	103
Challenger Way (10th Street E) to 15th Street East	23,200	68.7	937	296	94
15th Street East to 20th Street East	15,800	67.0	638	202	64
20th Street East to 30th Street East	9,700	64.9	392	124	39
30th Street East to 40th Street East	8,400	61.2	149	69	32
40th Street East to 50th Street East	7,100	60.4	133	62	29

Table 8-11 [continued]
Existing Roadway Noise Levels

Roadway Section	ADT	CNEL at 100 feet from Roadway Centerline	Noise Contour (Distance [feet] From Roadway Centerline)		
			60 dBA	65 dBA	70 dBA
Avenue J-8					
35th Street West to 30th Street West	8,800	62.2	206	65	21
30th Street West to 25th Street West	8,500	63.3	264	83	26
25th Street West to 15th Street West	13,200	65.2	411	130	41
15th Street West to 10th Street West	11,600	64.6	360	114	36
5th Street East to Challenger Way (10th Street E)	2,100	57.2	65	21	7
Challenger Way (10th Street E) to 15th Street East	3,700	59.6	115	36	11
15th Street East to 20th Street East	2,700	58.3	84	27	8
20th Street East to 25th Street East	2,400	57.8	75	24	7
Avenue K					
70th Street West to 60th Street West	1,500	53.7	47	22	10
60th Street West to 50th Street West	5,700	59.5	115	53	25
50th Street West to 45th Street West	7,100	60.4	133	62	29
42nd Street West to 40th Street West	9,900	65.0	400	126	40
40th Street West to 35th Street West	14,300	66.0	578	183	58
35th Street West to 30th Street West	21,000	68.2	847	268	85
30th Street West to 25th Street West	23,300	68.7	941	298	94
25th Street West to 20th Street West	26,000	68.0	809	256	81
20th Street West to 15th Street West	27,600	68.3	859	272	86
15th Street West to 10th Street West	28,800	68.5	895	283	90
10th Street West to Sierra Highway	28,300	67.2	663	210	66
Sierra Highway to Division Street	30,100	67.4	706	223	71
Division Street to 5th Street East	22,900	66.3	537	170	54
5th Street East to Challenger Way (10th Street E)	23,100	68.7	933	295	93
Challenger Way (10th Street E) to 15th Street East	22,200	65.3	285	132	61
15th Street East to 20th Street East	13,400	63.1	204	94	44
20th Street East to 25th Street East	10,600	62.0	174	81	38
25th Street East to 30th Street East	9,400	61.6	161	75	35
30th Street East to 35th Street East	7,700	60.8	141	65	30
35th Street East to 40th Street East	7,300	60.5	136	63	29
40th Street East to 50th Street East	5,100	59.0	107	50	23
Avenue K-8					
35th Street West to 30th Street West	3,500	59.4	109	34	11
30th Street West to 25th Street West	7,200	62.5	224	71	22
25th Street West to 20th Street West	7,900	62.9	246	78	25
20th Street West to 15th Street West	9,800	63.9	305	96	30
15th Street West to 10th Street West	9,500	63.7	296	93	30
Division Street to 5th Street East	1,700	56.3	53	17	5
5th Street East to Challenger Way (10th Street E)	900	53.5	28	9	3
30th Street East to 35th Street East	1,000	54.0	31	10	3
Avenue L					
70th Street West to 60th Street West	4,400	58.4	97	45	21
60th Street West to 50th Street West	11,500	62.5	184	85	40
42nd Street West to 35th Street West	22,700	67.4	706	223	71

Table 8-11 [continued]
Existing Roadway Noise Levels

Roadway Section	ADT	CNEL at 100 feet from Roadway Centerline	Noise Contour (Distance [feet] From Roadway Centerline)		
			60 dBA	65 dBA	70 dBA
Avenue L [continued]					
35th Street West to 30th Street West	24,800	67.8	771	244	77
30th Street West to 25th Street West	30,500	68.7	948	300	95
25th Street West to 20th Street West	29,100	68.5	905	286	91
20th Street West to 15th Street West	29,600	68.6	920	291	92
15th Street West to 10th Street West	33,200	70.1	1339	423	134
10th Street West to Sierra Highway	29,600	69.7	1196	378	120
Sierra Highway to Business Center Parkway	26,500	69.2	1071	339	107
Business Center Parkway to Challenger Way (10th Street E)	15,400	66.8	622	197	62
Challenger Way (10th Street E) to 20th Street East	6,800	63.3	275	87	27
20th Street East to 30th Street East	3,700	60.6	149	47	15
Avenue L-8					
70th Street West to 60th Street West	3,600	60.5	145	46	15
60th Street West to 55th Street West	4,800	61.8	194	61	19
40th Street West to 35th Street West	3,900	60.8	157	50	16
35th Street West to 30th Street West	3,300	60.1	133	42	13
Columbia Way (Avenue M)					
70th Street West to 60th Street West	5,500	59.3	112	52	24
57th Street West to 55th Street West	5,700	59.5	115	53	25
45th Street West to 40th Street West	9,600	61.7	163	76	35
40th Street West to 35th Street West	9,500	61.7	162	75	35
35th Street West to 30th Street West	10,000	65.0	403	128	40
30th Street to 20th Street West	11,200	65.5	452	143	45
20th Street West to SR-14 Freeway	8,500	64.3	343	109	34
SR-14 Freeway to 10th Street West	19,200	67.8	774	245	79
10th Street West to Sierra Highway	21,100	68.2	852	270	85
Sierra Highway to Business Center Parkway	23,400	68.6	946	299	95
Business Center Parkway to Challenger Way (10th Street E)	17,900	67.5	722	228	72
Avenue N					
45th Street West to 40th Street West	7,300	63.6	295	93	29
40th Street West to 30th Street West	9,100	64.5	367	116	37
70th Street West					
Avenue E to Avenue G	200	44.9	12	6	3
Avenue G to Avenue H	400	47.9	20	9	4
Avenue H to Avenue I	1,200	52.7	41	19	9
Avenue I to Avenue J	1,000	51.9	36	17	8
Avenue J to Avenue K	1,700	54.2	51	24	11
Avenue K to Avenue L	2,900	56.5	73	34	16
Avenue L to Avenue L-8	4,200	58.1	94	44	20
Avenue L-8 to Columbia Way (Avenue M)	2,100	55.1	59	27	13

Table 8-11 [continued]
Existing Roadway Noise Levels

Roadway Section	ADT	CNEL at 100 feet from Roadway Centerline	Noise Contour (Distance [feet] From Roadway Centerline)		
			60 dBA	65 dBA	70 dBA
60th Street West					
Avenue E to Avenue F	1,600	54.0	49	23	11
Avenue F to Avenue G	1,900	54.7	55	26	12
Avenue G to Avenue H	1,600	54.0	49	23	11
Avenue H to Avenue I	2,600	56.1	68	32	15
Avenue I to Avenue J	5,500	59.3	112	52	24
Avenue J to Avenue K	5,900	59.6	118	55	25
Avenue K to Avenue L	8,000	60.9	144	67	31
Avenue L to Avenue L-8	11,400	62.5	183	85	39
Avenue L-8 to Columbia Way (Avenue M)	8,900	61.4	155	72	33
50th Street West					
Avenue G to Avenue H	500	48.9	23	11	5
Avenue H to Avenue I	1,100	52.3	38	18	8
Avenue I to Avenue J	2,400	55.7	65	30	14
Avenue J to Avenue K	5,700	59.5	115	53	25
Avenue K to Avenue K-8	8,700	61.3	153	71	33
40th Street West					
Avenue I to Avenue J	1,700	54.2	51	24	11
Avenue J to Avenue K	6,700	60.2	128	60	28
Avenue K to Avenue L	11,800	62.6	187	87	40
Avenue L to Avenue L-8	2,500	55.9	66	31	14
Avenue L-8 to L-12	400	47.9	20	9	4
35th Street West					
Lancaster Boulevard to Avenue J	1,500	53.2	26	8	3
Avenue J to Avenue J-8	1,900	54.2	33	10	3
Avenue K-8 to Avenue L	1,900	56.8	59	19	6
Avenue L to Avenue L-8	1,800	56.5	56	18	6
Avenue L-8 to Columbia Way (Avenue M)	1,900	57.9	77	24	8
30th Street West					
Avenue E to Avenue F	100	45.1	4	1	0
Avenue F to Avenue G	300	49.9	12	4	1
Avenue G to Avenue H	500	52.1	20	6	2
Avenue H to Avenue I	2,700	59.4	109	34	11
Avenue I to Lancaster Boulevard	5,500	62.5	222	70	22
Lancaster Boulevard to Avenue J	9,600	64.8	387	122	39
Avenue J to Avenue J-8	9,400	64.7	379	120	38
Avenue J-8 to Avenue K	16,900	67.3	682	216	68
Avenue K to Avenue K-8	18,800	67.8	758	240	76
Avenue K-8 to Avenue L	13,100	66.2	528	167	53
Avenue L to Avenue L-8	15,000	66.8	605	191	61
Avenue L-8 to Columbia Way (Avenue M)	13,900	66.4	561	177	56
Columbia Way (Avenue M) to Avenue N	10,000	63.9	311	98	31

Table 8-11 [continued]
Existing Roadway Noise Levels

Roadway Section	ADT	CNEL at 100 feet from Roadway Centerline	Noise Contour (Distance [feet] From Roadway Centerline)		
			60 dBA	65 dBA	70 dBA
27th Street West					
Avenue I to Lancaster Boulevard	700	52.4	22	7	2
25th Street West					
Lancaster Boulevard to Avenue J	5,500	61.4	171	54	17
Avenue J to Avenue J-8	8,500	63.3	264	83	26
Avenue J-8 to Avenue K	6,000	61.7	186	59	19
Avenue K to Avenue K-8	4,500	60.5	140	44	14
Avenue K-8 to Avenue L	3,000	58.7	93	29	9
Valley Central Way					
Avenue I to Lancaster Boulevard	6,800	62.3	212	67	21
Lancaster Boulevard to Avenue J	11,500	64.6	358	113	36
SR-14 On Ramp					
Avenue J-6 to Avenue J-8	9,400	61.1	162	51	16
20th Street West					
Avenue H to Avenue I	6,200	62.9	250	79	25
Avenue I to Lancaster Boulevard	9,600	64.8	387	122	39
Lancaster Boulevard to Avenue J	19,600	66.8	609	193	61
Avenue J to Avenue J-8	32,700	68.9	1016	321	102
Avenue J-8 to Avenue J-12	20,800	67.0	647	205	65
Avenue J-12 to Avenue K	18,100	67.5	731	231	73
Avenue K to Avenue K-8	15,500	66.8	626	198	63
Avenue K-8 to Avenue L	14,200	66.5	574	181	57
Avenue L to Columbia Way (Avenue M)	8,000	64.0	323	102	37
17th Street West					
Avenue J-12 to Avenue K	5,400	58.6	93	29	9
Avenue K to Avenue K-8	5,600	58.7	97	31	10
15th Street West					
Avenue H to Avenue I	2,900	58.4	90	28	9
Avenue I to Lancaster Boulevard	6,300	61.9	196	62	20
Lancaster Boulevard to Avenue J	11,700	64.6	364	115	36
Avenue J to Avenue K	20,100	66.9	625	198	62
Avenue K-2 to Avenue K-8	1,200	54.7	37	12	4
Avenue K-8 to Avenue L	6,300	61.9	196	62	20
10th Street West					
Avenue G to Avenue H	500	52.0	20	6	2
Avenue H to Avenue I	8,200	64.2	331	105	33
Avenue I to Lancaster Boulevard	18,800	67.7	758	240	76
Lancaster Boulevard to Avenue J	23,900	68.7	965	305	97
Avenue J to Avenue J-8	28,900	67.2	677	214	68
Avenue J-8 to Avenue K	26,900	66.9	631	199	63
Avenue K to Commerce Center Dr	30,900	67.5	724	229	72
Commerce Center Dr to Avenue K-8	30,100	67.4	706	223	71

Table 8-11 [continued]
Existing Roadway Noise Levels

Roadway Section	ADT	CNEL at 100 feet from Roadway Centerline	Noise Contour (Distance [feet] From Roadway Centerline)		
			60 dBA	65 dBA	70 dBA
10th Street West [continued]					
Avenue K-8 to Avenue L	28,600	69.5	1155	365	116
Avenue L to Columbia Way (Avenue M)	25,800	69.1	1042	329	104
Gadsden Avenue					
Avenue K to Avenue K-8	2,900	55.9	50	16	5
Sierra Highway					
Avenue G to Avenue H	4,300	61.4	174	55	17
Avenue H to Avenue I	4,600	61.6	186	59	19
Avenue I to Lancaster Boulevard	6,000	62.8	242	77	24
Lancaster Boulevard to Avenue J	13,200	65.1	410	130	41
Avenue J to Avenue J-8	23,900	68.7	965	305	97
Avenue K to Avenue L	22,100	68.4	893	282	89
Avenue L to Columbia Way (Avenue M)	23,800	68.7	961	304	96
Yucca Avenue					
Avenue I to Lancaster Boulevard	1,900	54.1	33	10	3
Lancaster Boulevard to Milling Street	6,400	59.4	110	35	11
Division Street					
Avenue G to Avenue H	2,900	59.6	117	37	12
Avenue H to Avenue H-8	5,000	62.0	202	64	20
Avenue H-8 to Avenue I	5,200	62.2	210	66	21
Avenue I to Lancaster Boulevard	8,300	63.1	258	82	26
Lancaster Boulevard to Avenue J	13,700	65.3	426	135	43
Avenue J to Avenue K	16,40	66.0	510	161	51
Avenue K to Avenue K-8	14,100	65.4	438	139	44
Business Center Parkway					
Avenue K-8 to Avenue L	14,300	64.2	335	106	33
4th Street East					
Avenue L to Columbia Way (Avenue M)	6,600	59.5	114	36	11
5th Street East					
Avenue H-8 to Avenue I	3,500	58.1	82	26	8
Avenue I to Avenue J	4,300	59.0	101	32	10
Avenue J to Avenue J-8	1,800	55.2	42	13	4
Avenue J-8 to Avenue K	2,600	56.8	61	19	6
Avenue K to Avenue K-8	4,000	58.7	94	30	9
Challenger Way (10th Street E)					
Avenue H to Avenue I	3,800	60.8	153	48	15
Avenue I to Lancaster Boulevard	10,100	65.1	408	129	41
Lancaster Boulevard to Avenue J	8,400	64.3	339	107	34
Avenue J to Avenue J-8	18,400	67.7	743	235	74
Avenue J-8 to Avenue K	19,600	67.9	790	250	79
Avenue K to Avenue K-8	12,800	66.1	516	163	52
Avenue K-8 to Avenue L	14,400	66.6	582	184	58
Avenue L to Columbia Way (Avenue M)	5,700	62.6	230	73	23

Table 8-11 [continued]
Existing Roadway Noise Levels

Roadway Section	ADT	CNEL at 100 feet from Roadway Centerline	Noise Contour (Distance [feet] From Roadway Centerline)		
			60 dBA	65 dBA	70 dBA
15th Street East					
Avenue H-8 to Avenue I	2,100	57.1	65	21	7
Avenue I to Lancaster Boulevard	4,500	60.4	140	44	14
Lancaster Boulevard to Avenue J	5,800	61.5	180	57	18
Avenue J to Avenue J-8	6,200	61.8	193	61	19
Avenue J-8 to Avenue K	4,900	60.8	152	48	15
Avenue K to Avenue K-8	400	49.9	12	4	1
20th Street East					
Avenue H to Avenue I	800	54.0	32	10	3
Avenue I to Lancaster Boulevard	900	54.6	36	11	4
Lancaster Boulevard to Avenue J	8,200	64.2	331	105	33
Avenue J to Avenue J-8	13,300	66.3	537	170	54
Avenue J-8 to Avenue K	10,300	65.1	416	131	42
Avenue K to Avenue L	6,100	62.9	246	78	25
30th Street East					
Avenue H to Avenue I	3,300	60.2	133	42	13
Avenue I to Lancaster Boulevard	4,300	61.4	174	55	17
Lancaster Boulevard to Avenue J	5,100	62.1	206	65	21
Avenue J to Avenue K	3,200	60.1	129	41	13
Avenue K to Avenue L	4,000	61.0	161	51	16
35th Street East					
Avenue K to Avenue K-8	1,400	52.8	24	8	2
40th Street East					
Avenue H to Avenue I	300	49.8	12	4	1
Avenue I to Lancaster Boulevard	1,200	55.8	48	15	5
Lancaster Boulevard to Avenue J	3,000	59.8	121	38	12
Avenue J to Avenue K	3,500	60.5	141	45	14
Avenue K to Avenue L	900	54.6	36	11	14
50th Street East					
Lancaster Boulevard to Avenue J	3,700	60.7	149	47	15
Avenue J to Avenue K	3,800	60.8	153	48	15
Avenue K to Avenue L	6,100	62.9	246	78	25

ADT = average daily trips; dBA = A-weighted decibels; CNEL = community noise equivalent level

Noise modeling is based upon traffic data provided by Meyer Mohaddes Associates, January 3, 2007.

As shown in Table 8-11, the existing noise levels adjacent to City roadways range from a low of 40.4 CNEL from 30th Street West to 25th Street West along Avenue E to a high of 70.1 CNEL from 15th Street West to 10th Street West along Avenue L. Existing noise levels may be considered higher than those predicted under future conditions, mainly because of higher average vehicle speeds along rural roadways. As existing roadways approach their capacity under future conditions, more congestion will naturally occur and the average vehicle speeds would decrease.

Sensitive receptors including schools, libraries, hospitals, and nursing homes are unacceptable in exterior environments, which exceed 70 CNEL, while residential uses are unacceptable in exterior environments in excess of 65 CNEL. The 70 CNEL maximum criteria developed by State Office of Noise Control serves as a general guideline for identifying community noise problems.

Under existing conditions, very few areas within the City experience ambient noise levels in excess of 70 CNEL. From the noise levels provided in Table 8-11, it can be seen that the 70 dBA CNEL level is only exceeded at one of the 284 roadway links analyzed. The 70-dBA contour along these three roadway links, located along Avenue L from 5th Street West to 10th Street West, extends to a maximum of 134 feet from the roadway centerline. Many of the City's downtown areas do, however, experience noise levels in excess of 65 CNEL adjacent to master planned roadway and freeway rights-of-way. Residences located within this area may experience unacceptable noise levels. It should be noted that these are modeled traffic noise levels, and are not based upon actual site measurements.

Office buildings, retail commercial areas, and industrial facilities are considered normally unacceptable in exterior noise environments that exceed 75 CNEL. As indicated by the noise contours provided in Table 8-11, it is unlikely that any areas of the City of Lancaster experience noise levels in excess of 75 CNEL as a result of motor vehicle noise.

Future Roadway Noise Levels

Ultimate noise contours can be used for general planning purposes and refined on a site-specific basis when detailed acoustic reports are prepared for new developments. Until that time, the setbacks required to insure an acceptable noise environment for various land uses can be determined using general planning guidelines to determine potential "worst case" noise levels.

Railroad Noise

The Mojave Mainline of the Union Pacific Transportation Company bisects the City of Lancaster from north to south, and runs parallel to Sierra Highway and the Antelope Valley Freeway. This line runs between Mojave and Palmdale, where it divides for destinations in San Bernardino and Los Angeles.

According to the *Goods Movement Truck and Rail Study* performed by the Southern California Association of Governments (SCAG) (performed in January 2003), Class I rail mileage has declined between 1970 and 1999 by approximately 10,000 miles. However, SCAG's *Goods Movement Program White Paper: A Survey of Regional Initiatives and a Discussion of Program Objectives* (January 2002), estimates that rail freight volume would increase from 91 million tons

in 1995 to 309 million tons in 2020. These growth projections reflect expected trends throughout the entire SCAG region.

Spur lines currently serve businesses between Avenues H and J. The number of spur lines is expected to increase in the near future. This increase would result from expansion of the City's industrial base; however, the number of new rail spurs and their location cannot be predicted at this time. Only freight trains utilize the Mojave Mainline, running at any time of the day or night as necessitated by market demand. These freight trains travel at a speed of up to 60 miles per hour, as the Lancaster area is relatively flat.

Metrolink was extended to downtown Lancaster to serve the Antelope Valley in January 1994. A new station was completed on Sierra Highway just south of Lancaster Boulevard and dedicated in March 1996. The trains operated by Metrolink are significantly quieter than Mojave Mainline trains and operate on a restricted time frame, from 4:30 AM to 10:00 PM.

Noise exposure contours along railway tracks are determined from the number and type of trains using the line, the magnitude and duration of each train pass, and the time of day when the train passes. Using the procedures developed by Wyle Laboratories, an analysis of the train operations was performed to determine existing noise levels. As the Lancaster area develops, train traffic is expected to increase, and, at the same time, average train speeds will decrease. Increases in the number of local rail spurs is not expected to significantly increase noise problems due to the slow speed used on the spurs.

Noise contours generated by the rail traffic are depicted in Table 8-12, Railroad Noise Contours. The 75 dBA CNEL contour extends approximately 225 feet from the railway centerline. The 70 dBA CNEL contour extends approximately 425 feet from the railway centerline, while 65 dBA CNEL and 60 dBA CNEL contour extends approximately 750 and 850 feet from the centerline, respectively.

Table 8-12
Railroad Noise Contours

Distance to Receptor (feet)	Noise Level (Ldn)
50	75
100	70
150	68
200	66
Source: Federal Railroad Administration, *Initial Noise Evaluation Model*, 1998.	

Industrial Noise

Industrial noise sources are located in industrial zoned properties throughout the City. In general, industrial noise sources are not creating large-scale problems, but some localized noise problems related to industrial sources do exist. Several residential uses can be found within the industrial areas located east of the downtown area, east of the Union Pacific rail line, and are subject to high single event noise levels from nearby industrial sources.

AMBIENT NOISE MEASUREMENTS

Sensitive Noise Receptors

Sensitive populations are more susceptible to the effects of noise and air pollution than are the general population. Land uses considered sensitive by the State of California include schools, playgrounds, athletic facilities, hospitals, rest homes, rehabilitation centers, long-term care and mental care facilities. Some jurisdictions also consider day care centers, single-family dwellings, mobile home parks, churches, and libraries to be sensitive to noise and air pollutants. Generally, a sensitive receptor is identified as a location where human populations (especially children, senior citizens, and sick persons) are present, and where there is a reasonable expectation of continuous human exposure to air pollutants or noise. As a result, the sensitive receptors identified within the City of Lancaster would be the same for air quality as well as noise.

According to the City of Lancaster, there are very few noise complaints that are reported within the City. The majority of the calls include complaints about after hours construction activities, loud music, and motorcycles.

Land uses less sensitive to noise are business, commercial, and professional developments. Noise receptors categorized as being least sensitive to noise include industrial, manufacturing, utilities, agriculture, natural open space, undeveloped land, parking lots, motorcycle parks, rifle ranges, warehousing, liquid and solid waste facilities, salvage yards, and transit terminals. These types of land uses often generate high noise levels. Moderately sensitive land uses typically include: multi-family dwellings, hotels, motels, dormitories, and outpatient clinics.

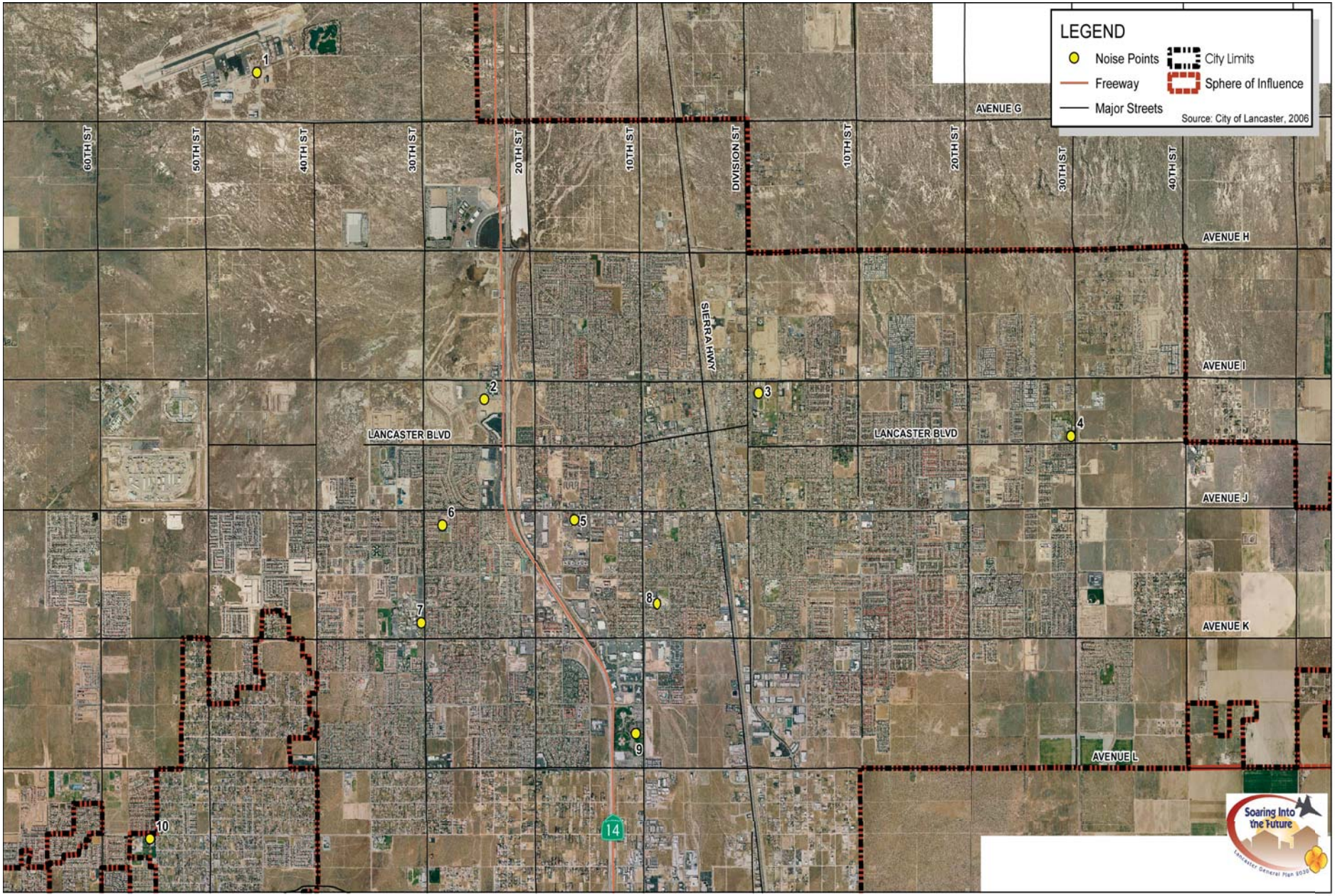
Current land uses located within the City of Lancaster that are sensitive to intrusive noise include residential uses, schools, hospitals, churches, and parks.

SENSITIVE NOISE RECEPTOR MEASUREMENT SITES

Noise levels were throughout the City of Lancaster at ten locations throughout the City of Lancaster as illustrated in Figure 8-4, Noise Measurement Locations. These locations were selected as a representative sample of the more urbanized portions of the City in order to identify ambient baseline levels. The noise measurements described in Table 8-13, Ambient Noise Measurements/Existing Noise Exposure Levels, were taken adjacent to major roadways in the City to determine peak noise levels at worst-case sensitive receptor locations.

Noise levels at the selected sensitive receptor sites were measured by RBF Consulting on August 31, 2006, using a Brüel & Kjær model 2250 sound level meter (SLM) equipped with Brüel & Kjær pre-polarized freefield microphone, which meets standards of the American National Standards Institute (ANSI) for general environmental noise measurement instrumentation. Each measurement was for 10 minutes, and the sound meter was calibrated before each measurement was taken.

- Measurement Site 1 was located at the General William J. Fox Airfield. The measurement was taken from the terminus of 45th Street West off of West Avenue G, a few hundred yards from the runway. Sources of peak noise included vehicles, trucks, and a helicopter. The noise level monitored at Site 1 was 54.9 dBA.



RBF CONSULTING

0 0.5 1 2 Miles

Lancaster General Plan 2030

Noise Measurement Locations

Figure 8-4

Table 8-13
Ambient Noise Measurements/Existing Noise Exposure Levels

Site No.	Location	Leq (dBA)	Time and Conditions
1	General William J. Fox Airfield	54.9	7:06 AM – 7:16 AM clear, sunny, and slight winds
2	Lancaster Municipal Stadium	57.3	7:29 AM – 7:39 AM clear, sunny, and slight winds
3	Antelope Valley High School	58.4	8:06 AM – 8:16 AM clear, sunny, and slight winds
4	Tierra Bonita Park	52.2	8:40 AM – 8:50 AM clear, sunny, and slight winds
5	Antelope Valley Hospital	53.2	9:14 AM – 9:24 AM clear, sunny, and slight winds
6	Amargosa Middle School	50.3	9:56 AM –10:06 AM clear, sunny, and slight winds
7	Antelope Valley College	56.5	10:15 AM – 10:25 AM clear, sunny, and slight winds
8	Lancaster Community Hospital	55.9	10:40 AM – 10:50 AM clear, sunny, and slight winds
9	Lancaster City Park	59.6	11:00 AM – 11:10 AM clear, sunny, and slight winds
10	George Lane County Park	50.5	11:27 AM – 11:37 AM clear, sunny, and slight winds
Leq = equivalent sound level; dBA = A-weighted decibel.			
Source: RBF Consulting, *Noise Monitoring Survey,* August 31, 2006.			

- Measurement Site 2 was located at the Lancaster Municipal Stadium, on Avenue I, between Valley Central Way and the Antelope Valley Freeway. The measurement was taken from a vacant lot on Mall Loop Road just behind the facility, approximately 100 feet from the parking lot and the stadium. The noise level at this site was 57.3 dBA, with most noise coming from traffic on nearby roadways.

- Measurement Site 3 was located at the Antelope Valley High School, on Division Street near Lancaster Boulevard. The measurement at Site 3 was taken in a parking lot behind the stadium, about 100 feet from Division Street centerline. Noise emanating from Lancaster Boulevard was minimal since the school is located at its eastern terminus and a drainage dip exists just west of the intersection, resulting in low vehicle speeds. The majority of the noise was generated by through traffic along Division Street. The noise level monitored at Site 3 during after-school hours was 58.4 dBA.

- Measurement Site 4 was at Tierra Bonita Park, located on the corner of 30th Street East and Lancaster Boulevard near a school. Site 4 was more specifically located approximately 200 yards off of the street, on a sidewalk within the park, near a parking lot and open grassy area. Most noise was generated by an air conditioner at the adjacent school, dog barking, and cars passing through the parking lot. The noise level monitored at Site 4 was 47.3 dBA.

- Measurement Site 5 was located at the Antelope Valley Hospital near the helipad, approximately 125 feet from the main hospital facility, and about 25 feet from a parking lot. The hospital was on the corner of Avenue J and 15th Street West. The noise level monitored at Site 5 was 53.2 dBA, with the majority of the noise coming from cars and distant sirens.

- Measurement Site 6 was taken from Amargosa Middle School on the corner of 27th Street West and Avenue J. The measurement was taken from the sidewalk directly across the street from the school. Most noise came from traffic on 27th Street West and bells sounding from the school. The noise level monitored at Site 6 was 50.3 dBA.

- Measurement Site 7 was located at Antelope Valley College, on Avenue K and 30th Street West. The measurement was taken from a grassy area, approximately 30 feet from a parking lot. The noise level monitored at Site 7 was 56.5 dBA, with most noise coming from traffic and people talking.

- Measurement Site 8 was taken from the Lancaster Community Hospital, which is located on 10th Street West and Avenue J-12. The measurement was taken near the backside of the facility, adjacent to Heaton Avenue and an elementary school. Vehicles, trucks, and ventilation equipment were the main sources of peak noise. The noise level monitored at Site 8 was 55.9 dBA.

- Measurement Site 9 was located at the Lancaster City Park, on 10th Street West near Avenue L and the Antelope Valley Freeway to the west. The measurement was taken from an open grassy area near a park and ride, with most noise emanating from the nearby freeway. The noise level monitored at Site 9 was 59.6 dBA.

- Measurement Site 10 was taken from the George Lane County Park, on Avenue L-8 and 55th Street West. The site was adjacent to a school, and the measurement was taken approximately 100 yards from the street. The noise level monitored at Site 10 was 50.5 dBA, with most noise coming from minor construction at the adjacent school, and children on the playground.

8.3 REFERENCES

Air Installation Compatible Use Zone Study, Air Force Plant 42, Palmdale, California, 2002.

California Office of Noise Control, *Guidelines for the Preparation and Content of Noise Elements of the General Plan*, February 1976.

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Harris, Cyril M., *Handbook of Noise Control*, 1979.

Los Angeles County Airport Land Use Commission, *General William J. Fox Airfield Land Use Compatibility Plan*, December 1, 2004.

Southern California Association of Governments, *Goods Movement Program White Paper: A Survey of Regional Initiatives and a Discussion of Program Objectives*, January 2002.

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State of California, Office of Planning and Research, *General Plan Guidelines*, October 2003.

United States Department of Transportation, *Guidelines for Considering Noise in Land Use Planning and Control*, 1980.

United States Department of Transportation, *Federal Highway Administration Planning, Environment, & Realty (HEP) Manual FHWA-HEP06-020*, April 2006.

United States Environmental Protection Agency, *Public Health and Welfare Criteria for Noise*, July 27, 1973.

Chapter 8.24 - NOISE REGULATIONS

8.24.010 - Declaration of policy.

It is declared to be the policy of the city to prohibit unnecessary, excessive and annoying noises from all sources subject to its police power. At certain levels noises are detrimental to the health and welfare of the citizenry, and, in the public interests, such noise levels shall be systematically proscribed.

(Prior code § 4-1.1)

8.24.020 - Definitions.

Unless the context otherwise clearly indicates, the words and phrases used in this chapter are defined as follows:

"Commercial purpose" means and includes the use, operation or maintenance of any sound-amplifying equipment for the purpose of advertising any business, or any goods, or any services, or for the purpose of attracting the attention of the public to, or advertising for, or soliciting patronage or customers to or for any performance, show, entertainment, exhibition or event, for the purpose of demonstrating any such sound equipment.

"Day" means the time period from seven a.m. to eight p.m.

"Impulsive sound" means a short-duration sound (such as might be produced by the impact of a drop hammer or a pile driver) with one second or less duration.

"Motor vehicles" means and includes, but is not limited to, automobiles, trucks, motorcycles, mini-bikes and go-carts.

"Night" means the time period from eight p.m. to seven a.m.

"Noncommercial purpose" means the use, operation or maintenance of any sound equipment for other than a commercial purpose. "Noncommercial purpose" means and includes, but shall not be limited to, philanthropic, political, patriotic and charitable purposes.

"Person" means a person, firm, association, co-partnership, joint venture, corporation, or any entity, public or private, in nature.

"Sound" means the sensation perceived by the sense of hearing. For the purpose of this chapter, the terms "sound" and "noise" shall be used synonymously.

"Sound-amplifying equipment" means any machine or device for the amplification of the human voice, music or any other sound, but shall not include:

1. Warning devices on emergency vehicles;

2. Horns, burglar and fire alarms, or other warning devices expressly authorized by law.

"Sound truck" means any motor vehicle, or any other vehicle, regardless of motive power, whether in motion or stationary, which carries, is equipped with, or which has mounted thereon or attached thereto any sound-amplifying equipment for commercial, political and charitable purposes.

(Prior code § 4-1.2)

(Ord. No. 916, § 1, 2-10-09)

8.24.030 - Loud, unnecessary and unusual noises prohibited.

Notwithstanding any other provision of this chapter, and in addition thereto, no person shall make, cause or suffer, or permit to be made upon any premises owned, occupied or controlled by him/her any unnecessary noises or sounds which are physically annoying to persons of ordinary sensitiveness which are so harsh or so prolonged or unnatural or unusual in their use, time, or place as to occasion physical discomfort to the inhabitants of any neighborhood. All animals shall be so maintained.

(Ord. 791 § 1, 2001: Ord. 693 § 1 (part), 1995: prior code § 4-1.3)

8.24.040 - Loud, unnecessary and unusual noises prohibited—Construction and building.

Except as otherwise provided in this chapter, a person at any time on Sunday or any day between the hours of eight p.m. and seven a.m. shall not perform any construction or repair work of any kind upon any building or structure or perform any earth excavating, filling or moving where any of the foregoing entails the use of any air compressor, jack hammer, power-driven drill, riveting machine, excavator, diesel-powered truck, tractor or other earth-moving equipment, hard hammers on steel or iron or any other machine tool, device or equipment which makes loud noises within five hundred (500) feet of an occupied dwelling, apartment, hotel, mobile home or other place of residence.

(Ord. 693 § 1 (part), 1995: prior code § 4-1.4)

(Ord. No. 916, § 2, 2-10-09)

8.24.050 - Exceptions.

A. The provisions of Section 8.24.040 do not apply to any person who performs the construction, repair, excavation or moving work pursuant to the express written permission of the city engineer to perform such work at times prohibited in Section 8.24.040. Upon receipt of an application stating the reasons for the request, the city engineer may grant such permission if he finds that:
    1. The work proposed to be done is effected with the public interest; or
    2. Hardship or injustice or unreasonable delay would result with the interruption thereof with

the hours and days specified in Section 8.24.040; or

3. The building or structure involved is devoted or intended to be devoted to a use immediately incident to public interest.

B. The provisions of Section 8.24.040 do not apply to the construction, repair or excavation during prohibited hours as may be necessary to restore property to a safe condition following a public calamity or work required to protect persons or property from imminent exposure to danger or work by private or public utility companies when restoring utility service.

(Prior code § 4-1.5)

8.24.060 - Violation—Penalty.

Any person violating any of the provisions of this chapter shall be deemed guilty of a misdemeanor, and upon conviction thereof, shall be fined in the amount not exceeding one thousand dollars ($1,000.00) or be imprisoned in the county jail for a period not exceeding six months, or by both such fine and imprisonment. Each day such violation is committed or permitted to continue shall constitute a separate offense and shall be punishable as such.

(Prior code § 4-1.6)

8.24.070 - Injunctions.

As an additional remedy, the operation or maintenance of any device, instrument, vehicle or machinery in violation of any provision of this chapter shall be deemed and is declared to be a public nuisance, and may be subject to abatement summarily by a restraining order or injunction issued by a court of competent jurisdiction.

(Prior code § 4-1.7)

Appendix B

Roadway Noise Calculation Results

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT: Pacific Topaz Tract 53642 SFR
ROADWAY: 60th Street West
LOCATION: Nearest Residential Building Property Line.

JOB #: 0888-2021-04
DATE: 1-Oct-21
ENGINEER: D. Shivaiah

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	24,000
SPEED =	55
PK HR % =	10
NEAR LANE/FAR LANE DIST	100
ROAD ELEVATION =	0.0
GRADE =	0.0 %
PK HR VOL =	2,400

RECEIVER INPUT DATA

RECEIVER DISTANCE =	82
DIST C/L TO WALL =	72
RECEIVER HEIGHT =	5.0
WALL DISTANCE FROM RECEIVER =	10
PAD ELEVATION =	0.0
ROADWAY VIEW: LF ANGLE=	-90
RT ANGLE=	90
DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	10	
MEDIUM TRUCKS =	10	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	10	

WALL INFORMATION

HTH WALL=	6.0	
AMBIENT=	0.0	
BARRIER =	1	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.695	0.129	0.096	0.9200
MEDIUM TRUCKS	0.014	0.001	0.015	0.0300
HEAVY TRUCKS	0.024	0.001	0.025	0.0500

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	62.01	- -
MEDIUM TRUCKS	4.0	61.90	- -
HEAVY TRUCKS	8.0	61.90	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	72.5	70.1	68.8	62.7	71.2	71.8
MEDIUM TRUCKS	64.7	45.5	37.7	46.9	53.1	53.1
HEAVY TRUCKS	70.9	53.9	46.1	55.3	61.5	61.5
NOISE LEVELS (dBA)	75.2	70.2	68.8	63.6	71.7	72.2

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	63.5	61.1	59.8	53.7	62.2	62.8
MEDIUM TRUCKS	56.0	36.8	29.0	38.2	44.4	44.4
HEAVY TRUCKS	62.7	45.7	37.9	47.1	53.3	53.3
NOISE LEVELS (dBA)	66.2	61.3	59.9	54.6	62.7	63.3

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	137	434	1373	4343
LDN	120	381	1205	3809

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT: Pacific Topaz Tract 53642 SFR
ROADWAY: 60th Street West
LOCATION: Nearest Residential Building 1st Floor Façade.

JOB #: 0888-2021-04
DATE: 1-Oct-21
ENGINEER: D. Shivaiah

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	24,000
SPEED =	55
PK HR % =	10
NEAR LANE/FAR LANE DIST	100
ROAD ELEVATION =	0.0
GRADE =	0.0 %
PK HR VOL =	2,400

RECEIVER INPUT DATA

RECEIVER DISTANCE =		92
DIST C/L TO WALL =		72
RECEIVER HEIGHT =		5.0
WALL DISTANCE FROM RECEIVER =		20
PAD ELEVATION =		0.0
ROADWAY VIEW:	LF ANGLE=	-90
	RT ANGLE=	90
	DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	10	(10 = HARD SITE, 15 = SOFT SITE)
MEDIUM TRUCKS =	10	
HEAVY TRUCKS =	10	

WALL INFORMATION

HTH WALL=	6.0	
AMBIENT=	0.0	
BARRIER =	1	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.695	0.129	0.096	0.9200
MEDIUM TRUCKS	0.014	0.001	0.015	0.0300
HEAVY TRUCKS	0.024	0.001	0.025	0.0500

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	71.99	- -
MEDIUM TRUCKS	4.0	71.87	- -
HEAVY TRUCKS	8.0	71.87	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	71.8	69.4	68.1	62.1	70.5	71.1
MEDIUM TRUCKS	64.1	44.9	37.1	46.3	52.4	52.5
HEAVY TRUCKS	70.3	53.3	45.5	54.7	60.8	60.9
NOISE LEVELS (dBA)	74.5	69.6	68.2	62.9	71.0	71.6

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	63.0	60.6	59.3	53.3	61.7	62.3
MEDIUM TRUCKS	55.7	36.5	28.7	37.9	44.0	44.1
HEAVY TRUCKS	62.3	45.3	37.5	46.7	52.9	52.9
NOISE LEVELS (dBA)	65.8	60.8	59.4	54.2	62.3	62.9

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	133	420	1327	4197
LDN	116	368	1164	3682

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO)

PROJECT: Pacific Topaz Tract 53642 SFR
ROADWAY: 60th Street West
LOCATION: Nearest Residential Building 2nd Floor Façade.

JOB #: 0888-2021-04
DATE: 1-Oct-21
ENGINEER: D. Shivaiah

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	24,000
SPEED =	55
PK HR % =	10
NEAR LANE/FAR LANE DIST	100
ROAD ELEVATION =	0.0
GRADE =	0.0 %
PK HR VOL =	2,400

RECEIVER INPUT DATA

RECEIVER DISTANCE =		92
DIST C/L TO WALL =		72
RECEIVER HEIGHT =		15.0
WALL DISTANCE FROM RECEIVER =		20
PAD ELEVATION =		0.0
ROADWAY VIEW:	LF ANGLE=	-90
	RT ANGLE=	90
	DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	10	
MEDIUM TRUCKS =	10	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	10	

WALL INFORMATION

HTH WALL=	6.0	
AMBIENT=	0.0	
BARRIER =	1	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.695	0.129	0.096	0.9200
MEDIUM TRUCKS	0.014	0.001	0.015	0.0300
HEAVY TRUCKS	0.024	0.001	0.025	0.0500

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	78.31	- -
MEDIUM TRUCKS	4.0	78.01	- -
HEAVY TRUCKS	8.0	77.54	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	71.4	69.1	67.8	61.7	70.2	70.8
MEDIUM TRUCKS	63.7	44.5	36.7	45.9	52.1	52.1
HEAVY TRUCKS	69.9	52.9	45.2	54.4	60.5	60.5
NOISE LEVELS (dBA)	74.2	69.2	67.8	62.5	70.7	71.2

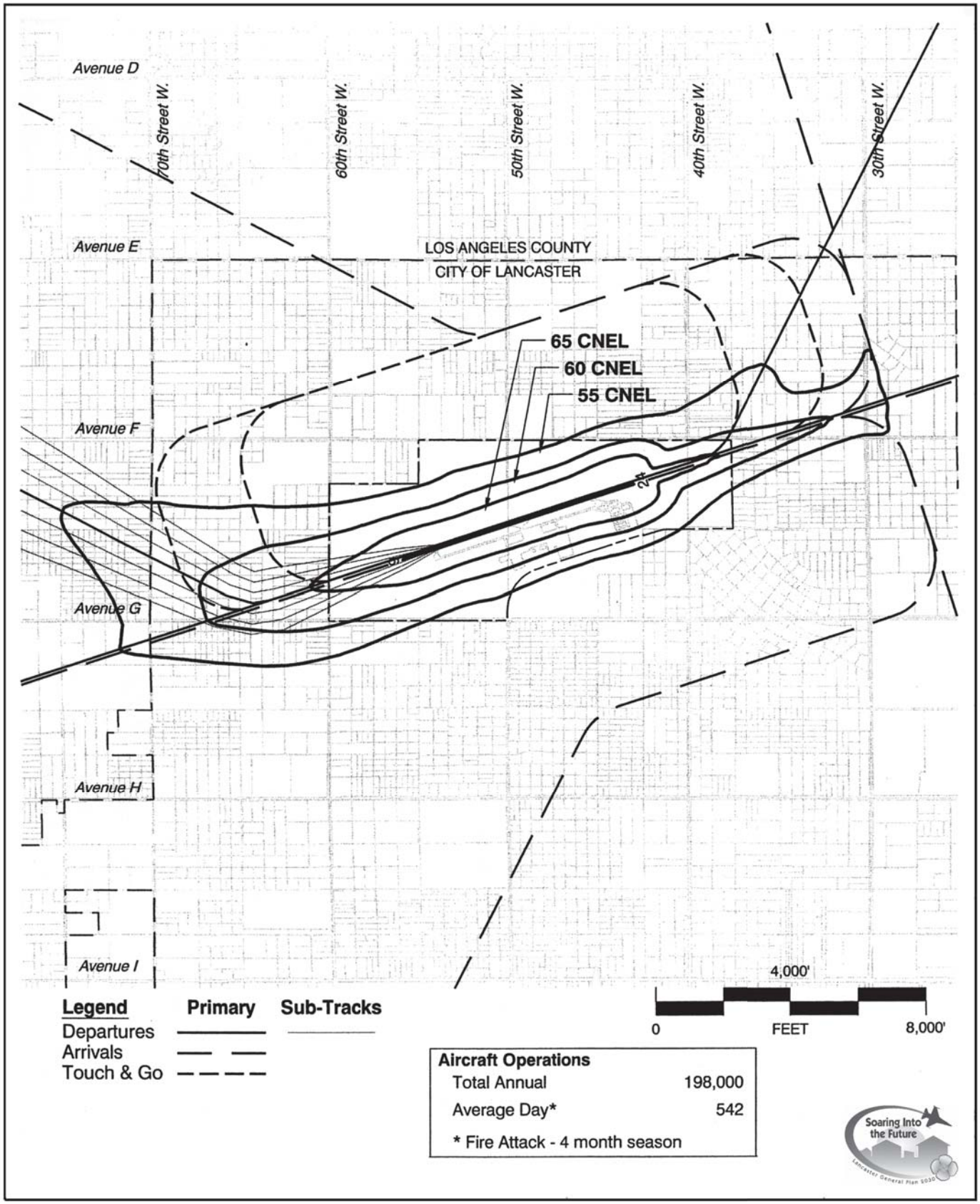
NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	71.4	69.1	67.8	61.7	70.2	70.8
MEDIUM TRUCKS	63.7	44.5	36.7	45.9	52.1	52.1
HEAVY TRUCKS	69.9	52.9	45.2	54.4	60.5	60.5
NOISE LEVELS (dBA)	74.2	69.2	67.8	62.5	70.7	71.2

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	122	386	1221	3861
LDN	107	339	1071	3387

Appendix C

Airport Noise Contours



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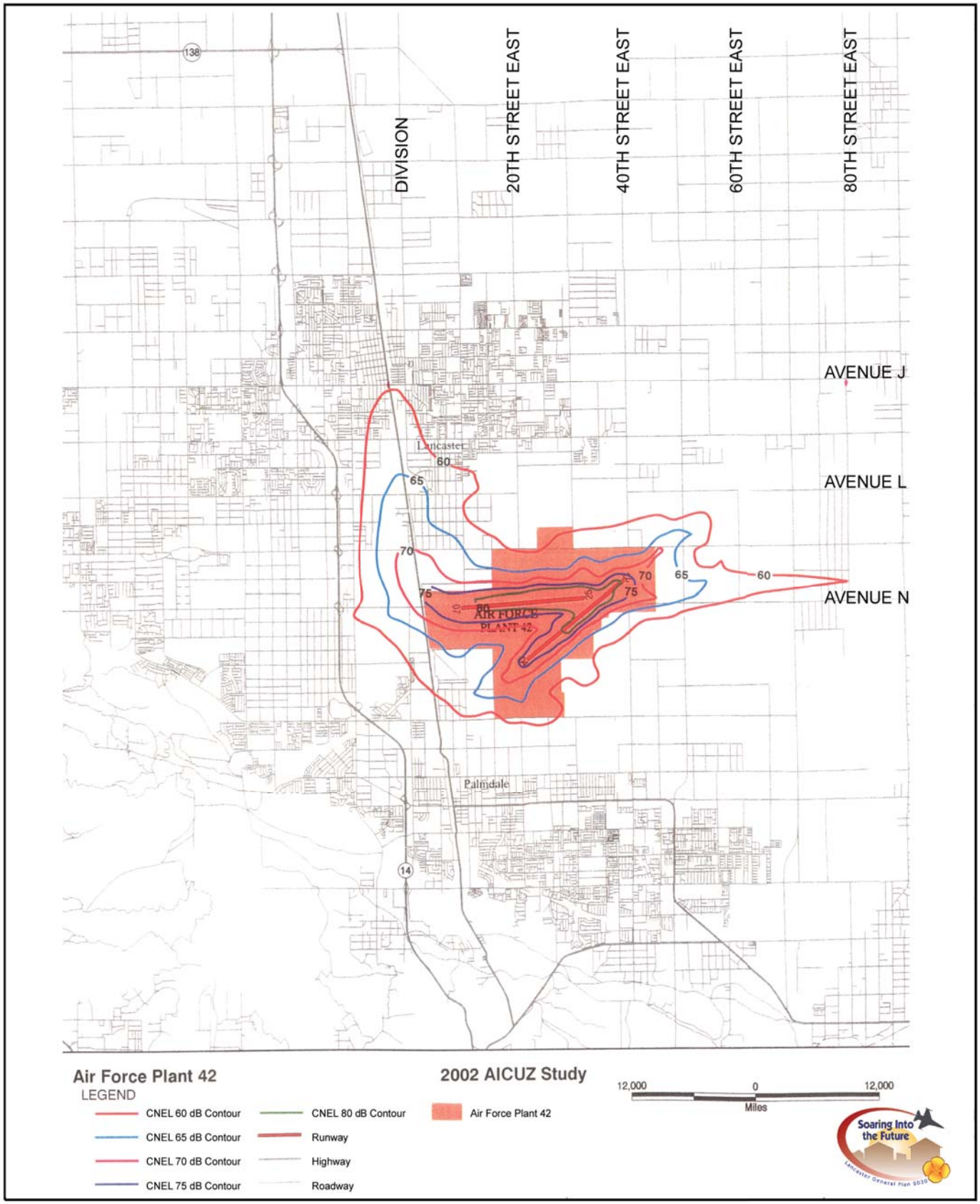
Lancaster General Plan 2030

Future Fox Field Noise Contours

Figure 8-2



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Lancaster General Plan 2030

Average Busy-Day CNEL Noise Contours for Air Force Plant 42

Figure 8-3