45TH & SAXON RESIDENTIAL DEVELOPMENT
NOISE IMPACT STUDY
City of Jurupa Valley

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NOISE IMPACT STUDY
City of Jurupa Valley, California

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1.0 Introduction

1.1 Purpose of Analysis and Study Objectives

The purpose of this report is to evaluate the potential noise impacts from the proposed 45th an Saxon Residential Development (project) and provide recommendations, if necessary, to minimize any project noise impacts.

The assessment was conducted within the context of the California Environmental Quality Act (CEQA, California Public Resources Code Sections 21000, et seq.) and the standards and methodology follow the City of Jurupa Valley Municipal Code requirements.

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 existing noise environment
- Analysis of the project's operational noise impact to adjacent receptors
- Analysis of the project's construction noise and vibration impact to adjacent sensitive receptors
- Summary of recommended mitigation measures and project design features to reduce noise level impacts.

1.2 Site Location

The proposed project site is located near the northwest corner of 45th Street and Saxon Court, in the City of Jurupa Valley. The project site is located approximately 838 feet above sea level and the topography is relatively flat.

The primary sources of ambient noise at the project site include roadway noise from 45th Street as well as typical residential neighborhood noise from the existing residential homes surrounding the project site.

Several noise sensitive receptors are located surrounding the project site, including:

- Existing residential uses located immediately adjacent to the site to the west

- Existing residential uses located approximately 70 feet to the south, south of 45th Street.
- The existing Pacific Avenue Academy of Music Elementary School located approximately 75 feet to the southeast of the site, south of 45th Street.
- The existing Free Church of Tonga located adjacent to the site to the east.

The project site location map is provided in Exhibit A.

1.3 Project Description

The project includes construction and operation of 37 single family residential homes on approximately 3.84 acres site. The site plan used for this analysis, provided by ROBERT BEERS, is illustrated in Exhibit B.

Table 1 summarizes the proposed project land uses.

Table 1
Land Use Summary

Project Land Use	Amount	Metric
Single Family Residential	37	Dwelling Units

This report analyzes the short-term noise impacts associated with construction activities and long-term noise impacts associated with the day-to-day operation of the project. The primary source of operational noise includes residential HVAC mechanical equipment noise.

The project is also proposing to build a six (6) feet high noise barrier wall surrounding the site along the northern, eastern, and western property line and along a portion of the southern property line

1.4 Summary of Analysis Results

Table 2 provides a summary of the noise analysis results, per the CEQA impact criteria checklist. With the implementation of the recommended mitigation measures, the project is not expected to result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

Table 2
CEQA Noise Impact Criteria

Noise Impact Criteria	Potentially Significant	Potentially Significant Unless Mitigated	Less Than Significant Impact	No Impact
Would the project result in?				
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?			X	
b) Generation of excessive groundborne vibration or groundborne noise levels?			X	
c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?			X	

1.5 Recommended Project Design Features (DF)

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 along the property line to the north, east, west, and partially along the south of the project site to shield all abutting properties from the project site. 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 All HVAC units will be located behind the designed noise screening wall and shielded from line of sight of adjacent residential properties. All HVAC equipment should be located at least 10 feet from any adjacent residential property line

DF-3 The project will comply with the California Title 24 building insulation requirements for exterior walls, roofs and common separating assemblies (e.g. floor/ceiling assemblies and demising walls), which shall be reviewed by the City prior to issuance of a building permit.

- 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.

- Party wall and floor-ceiling assembly designs must provide a minimum STC of 50, based on lab tests. Field tested assemblies must provide a minimum noise isolation class (NIC) of 45.

- Penetrations or openings in sound rated assemblies must be treated to maintain required ratings.

Construction Design Features

DF-4 Construction-related noise activities shall comply with the requirements set forth in the City of Jurupa Valley Municipal Code, Chapter 11.05.020.

1. Private construction projects located one-quarter (¼) of a mile or more from an inhabited dwelling;

2. Private construction projects located within one-quarter (¼) of a mile from an inhabited dwelling, provided that:

- Construction does not occur between the hours of six (6:00) p.m. and six (6:00) a.m. during the months of June through September; and

- Construction does not occur between the hours of six (6:00) p.m. and seven (7:00) a.m. during the months of October through May;

DF-5 During construction, the contractor shall ensure all construction equipment is equipped with appropriate noise attenuating devices and equipment shall be maintained so that vehicles and their loads are secured from rattling and banging. Idling equipment shall be turned off when not in use.

DF-6 Locate staging area, generators and stationary construction equipment as far from the nearest residential receptors, as reasonably feasible.

DF-7 No impact pile driving activities are expected to occur on the project site during construction.

DF-8 The project will construct the property line wall during the early phases of construction, prior to grading, to help shield the neighboring properties from construction noise activities.

2.0 Fundamentals of Noise

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

2.1 Sound, Noise, and Acoustics

The sound is a disturbance created by a moving or vibrating source and is capable of being detected by the hearing organs. The 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 its 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 as 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 3dB 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[1]

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 weighing is typically reported in terms of A-weighted decibel (dBA). Typically, the human ear can barely perceive the change in the 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. 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] Technical Noise Supplement to the Traffic Noise Analysis Protocol, September 2013.

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 in 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...".

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. The 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 the hard site (reflective surfaces) and soft site (absorptive surfaces) to help calculate predicted noise levels. Hard site conditions assume no excessive ground

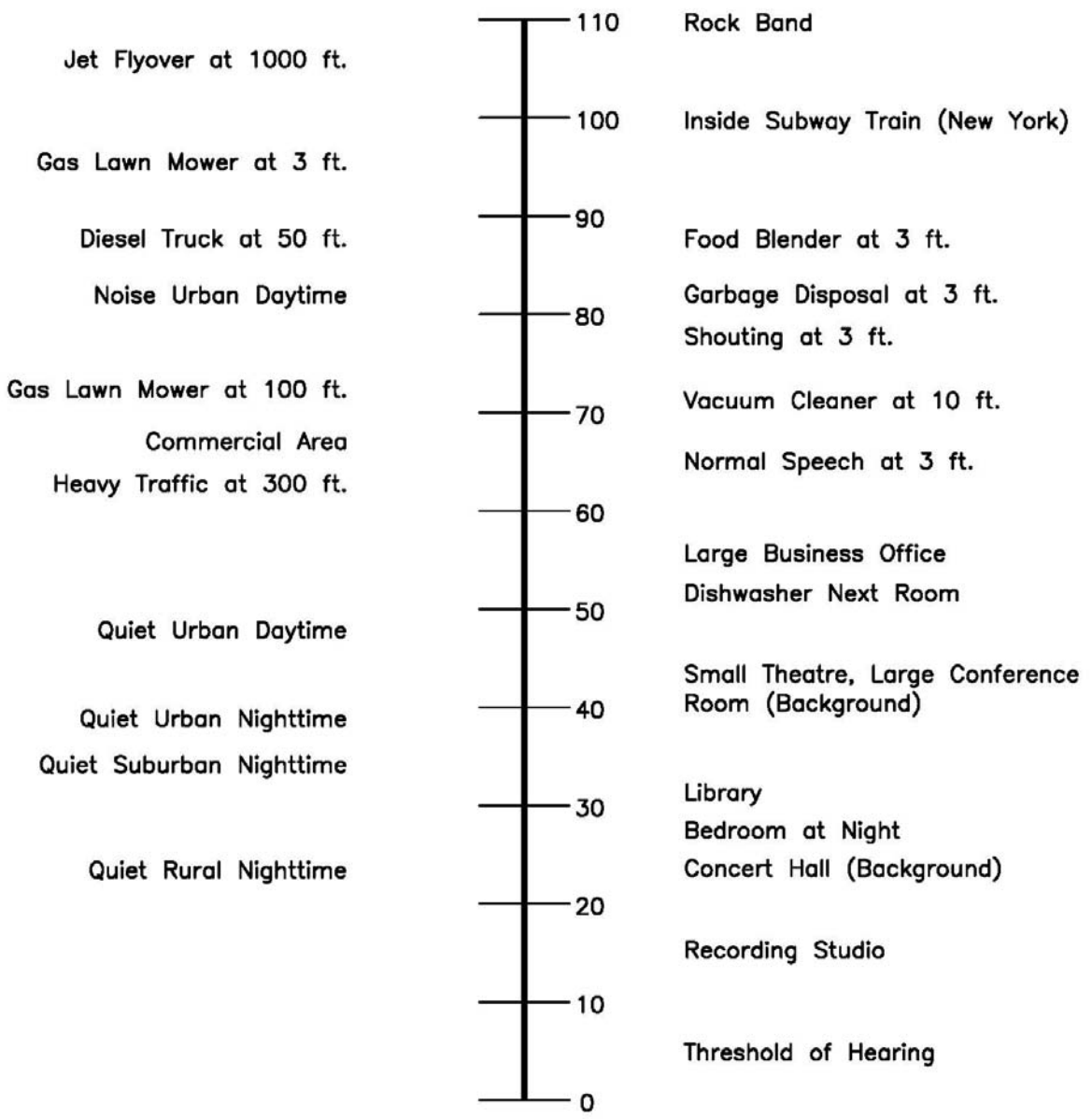
absorption between the noise source and the receiver. Soft site conditions such as grass, soft dirt or landscaping attenuate noise at an additional rate of 1.5 dB per doubling of distance. When added to the geometric spreading, the excess ground attenuation results in an overall noise attenuation of 4.5 dB per doubling of distance for a line source and 6.0 dB per doubling of distance for a point source.

Research has demonstrated that atmospheric conditions can have a significant effect on noise levels when noise receivers are located 200 feet and greater from a noise source. Wind, temperature, air humidity, and turbulence can further impact how far sound can travel.

Figure 1 shows typical sound levels from indoor and outdoor noise sources.

Figure 1[2]

TYPICAL SOUND LEVELS FROM
INDOOR AND OUTDOOR NOISE SOURCES



[2] Technical Noise Supplement to the Traffic Noise Analysis Protocol, September 2013.

2.8 Vibration Descriptors

Ground-borne vibrations consist of rapidly fluctuating motions within the ground that have an average motion of zero. The effects of ground-borne vibrations typically only cause a nuisance to people, but at extreme vibration levels, damage to buildings may occur. Although ground-borne vibration can be felt outdoors, it is typically only an annoyance to people indoors where the associated effects of the shaking of a building can be notable. Ground-borne noise is an effect of ground-borne vibration and only exists indoors since it is produced from noise radiated from the motion of the walls and floors of a room and may also consist of the rattling of windows or dishes on shelves.

Several different methods are used to quantify vibration amplitude.

PPV

Known as the peak particle velocity (PPV) which is the maximum instantaneous peak in vibration velocity, typically given in inches per second.

RMS

Known as the root mean squared (RMS) can be used to denote vibration amplitude.

VdB

A commonly used abbreviation to describe the vibration level (VdB) for a vibration source.

2.9 Vibration Perception

Typically, developed areas are continuously affected by vibration velocities of 50 VdB or lower. These continuous vibrations are not noticeable to humans whose threshold of perception is around 65 VdB. Outdoor sources that may produce perceptible vibrations are usually caused by construction equipment, steel-wheeled trains, and traffic on rough roads, while smooth roads rarely produce perceptible ground-borne noise or vibration. To counter the effects of ground-borne vibration, the Federal Transit Administration (FTA) has published guidance relative to vibration impacts.

2.10 Vibration Propagation

There are three main types of vibration propagation: surface, compression, and shear waves. Surface waves, or Rayleigh waves, travel along the ground's surface. These waves carry most of their energy along an expanding circular wavefront, similar to ripples produced by throwing a rock into a pool of water. P-waves, or compression waves, are body waves that carry their energy along an expanding spherical wavefront. The particle motion in these waves is longitudinal (i.e., in a "push-pull" fashion). P-waves are analogous to airborne sound waves. S-waves, or shear waves, are also body waves that carry energy along an expanding spherical wavefront. However, unlike P-waves, the particle motion is transverse, or side-to-side and perpendicular to the direction of propagation.

As vibration waves propagate from a source, the vibration energy decreases in a logarithmic nature and the vibration levels typically decrease by 6 VdB per doubling of the distance from the vibration source. As stated above, this drop-off rate can vary greatly depending on the soil but has been shown to be effective enough for screening purposes, in order to identify potential vibration impacts that may need to be studied through actual field tests.

2.11 Construction Related Vibration Level Prediction[3]

Operational activities are separated into two different categories. The vibration can be transient or continuous in nature. Each category can result in varying degrees of ground vibration, depending on the equipment used on the site. Operation of equipment causes ground vibrations that spread through the ground and diminish in strength with distance. Buildings in the vicinity of the project area site respond to these vibrations with varying results ranging from no perceptible effects at the low levels to slight damage at the highest levels. The thresholds from Caltrans Transportation and Construction Vibration Guidance Manual, April 2020, in the table below provide general guidelines as to the maximum vibration limits for when vibration becomes potentially annoying.

[3] Caltrans Transportation and Construction Vibration Guidance Manual, April 2020

Table 3
Vibration Annoyance Potential Criteria

Human Response	PPV (in/sec)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Barely perceptible	0.04	0.01
Distinctly perceptible	0.25	0.04
Strongly perceptible	0.90	0.10
Severe	2.00	0.40

Note: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

The Caltrans Transportation and Construction Vibration Guidance Manual, April 2020 provides general thresholds and guidelines as to the vibration damage potential from vibratory impacts. The table below provides general vibration damage potential thresholds:

Table 4
Vibration Damage Potential Threshold Criteria

Structure and Condition	PPV (in/sec)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Extremely fragile historic buildings ruin ancient monuments	0.12	0.08
Fragile buildings	0.20	0.10
Historic and some old buildings	0.50	0.25
Older residential structures	0.50	0.30
New residential structures	1.00	0.50
Modern industrial/commercial buildings	2.00	0.50

Soil conditions have an impact on how vibration propagates through the ground. The Caltrans Transportation and Construction Vibration Guidance Manual, April 2020 provides suggested "n" values based on soil class. The table below outlines the manual's suggested values and description.

Table 5
Suggested "n" Values Based on Soil Classes

Soil Class	Description of Soil Material	Suggested Value of "n"
I	Weak or soft soils: loose soils, dry or partially saturated peat and muck, mud, loose beach sand, and dune sand.	1.4
II	Most sands, sandy clays, silty clays, gravel, silts, weathered rock.	1.3
III	Hard soils: densely compacted sand, dry consolidated clay, consolidated glacial till, some exposed rock.	1.1
IV	Hard, component rock: bedrock, freshly exposed hard rock.	1.0

3.0 Regulatory Setting

The proposed project is located in the City of Jurupa Valley and noise regulations are addressed through the various federal, state, and local government agencies. The agencies responsible for regulating noise are discussed below.

3.1 Federal Regulations

The adverse impact of noise was officially recognized by the federal government in the Noise Control Act of 1972, which serves three (3) purposes:

- Publicize noise emission standards for interstate commerce
- Assist state and local abatement efforts
- Promote noise education and research

The Federal Office of Noise Abatement and Control (ONAC) was originally tasked with implementing the Noise Control Act. However, it was eventually eliminated leaving other federal agencies and committees to develop noise policies and programs. Some examples of these agencies are as follows: The Department of Transportation (DOT) assumed a significant role in noise control through its various agencies. The Federal Aviation Agency (FAA) is responsible to regulate noise from aircraft and airports. The Federal Highway Administration (FHWA) is responsible to regulate noise from the interstate highway system. The Occupational Safety and Health Administration (OSHA) is responsible for the prohibition of excessive noise exposure to workers.

The Federal government and the State advocate that local jurisdiction use their land use regulatory authority to arrange new development in such a way that "noise sensitive" uses are either prohibited from being constructed adjacent to a highway or, or alternatively that the developments are planned and constructed in such a manner that potential noise impacts are minimized.

Since the Federal government and the State have preempted the setting of standards for noise levels that can be emitted by the transportation source, the City is restricted to regulating the noise generated by the transportation system through nuisance abatement ordinances and land use planning.

3.2 State Regulations

Established in 1973, the California Department of Health Services Office of Noise Control (ONC) was instrumental in developing regulatory 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.

The State of California has established noise insulation standards as outlined in Title 24 and of the Building Standards Code, 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 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.

The latest sound transmission standards are established in the 2019 California Building Code, Title 24, Part 2, Section 1206. In brief, the Title 24 noise standards require the following design:

- Airborne Sound: Walls, partitions and floor-ceiling assemblies separating dwelling units and sleeping units from each other or from public or service areas shall have a sound transmission class of not less than 50, or not less than 45 if field tested, for airborne noise were tested in accordance with ASTM E90. Alternatively, the sound transmission class of walls, partitions and floor-ceiling assemblies shall be established by engineering analysis based on a comparison of walls, partitions and floor-ceiling assemblies having sound transmission class ratings as determined by the test procedures set forth in ASTM E90. Penetrations or openings in construction assemblies for piping, electrical devices, recessed cabinets, bathtubs, soffits, or heating ventilating or exhaust ducts shall be sealed, lined, insulated or otherwise treated to maintain the required ratings. This requirement shall not apply to entrance doors; however, such doors shall be tight fitting to the frame and sill.

- Structure-Borne Sound. Floor-ceiling assemblies between dwelling units and sleeping units or between a dwelling unit or sleeping unit and a public or service area within the structure shall have an impact insulation rating of not less than 50, or not less than 45 if field tested, where tested in accordance with ASTM E492. Alternatively, the impact insulation class of floor-ceiling assemblies shall be

established by engineering analysis based on a comparison of floor-ceiling assemblies having impact insulation class ratings as determined by the test procedures in ASTM E492. Impact sound insulation is not required for floor-ceiling assemblies over uninhabitable rooms or spaces not designed to be occupied, such as garages, mechanical rooms or storage areas.

- Allowable Interior Noise Levels: Interior noise attributed to exterior sources shall not exceed 45 dB in any habitable room. The noise metric shall be either the day-night average sound level (Ldn) or the community noise equivalent level (CNEL), consistent with the noise element of the local general plan.

3.3 City of Jurupa Valley Noise Regulations

The City of Jurupa Valley outlines their noise regulations and standards within the General Plan, Chapter 7 – Noise Element and the Municipal Code, Chapter 11.05, Noise Regulations.

The Jurupa Valley General Plan Noise Element and Municipal Code Noise Control are provided in Appendix A.

3.3.1 Jurupa Valley General Plan

The City of Jurupa Valley'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 City of Jurupa Valley Noise Element establishes planning criteria for determining a development's noise/land use compatibility based on the community noise equivalent level (CNEL). Table 6 summarizes the City's Noise/Land Use Compatibility guidelines for land uses applicable to this project:

Table 6
Noise/Land Use Compatibility Guidelines

Land Use	Noise Limit (dBA CNEL)			
	Normally Acceptable	Conditionally Acceptable	Normally Unacceptable	Clearly Unacceptable
Residential – Low Density, Single Family, Duplex, Mobile Homes	<60	55-70	70-75	>75

The City of Jurupa Valley defines the noise compatibility categories as follows:

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 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.

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.

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

3.3.2 Municipal Code Noise Standards

Table 7 shows the City of Jurupa Valley's Residential Noise Standards, as established in the Municipal Code, Chapter 11.05, Noise Regulation. The noise standards shown in Table 7 shall apply to residential properties, unless otherwise specifically identified by the Municipal Code.

Table 7
City of Jurupa Valley Exterior Noise Standards

Land Use	Time Period	Noise Standard
Community Development – Estate-, Very Low-, Low-, Medium-, Medium High-, and High-Density Residential	Daytime (7am - 10pm)	55 dBA
	Nighttime (10pm – 7am)	45 dBA

The City of Jurupa Valley does not establish an exterior noise standard for the adjacent church use to the east and school use to the southeast. As a conservative approach, exterior residential noise standards have been used for both church use and school use.

Construction Noise Regulation:

The City of Jurupa Valley Municipal Code Chapter 11.05.020 - Noise Regulations, exempts the noise associated with construction and demolition activity noise, provided.

1. Private construction projects located one-quarter (¼) of a mile or more from an inhabited dwelling.

2. Private construction projects located within one-quarter (¼) of a mile from an inhabited dwelling, provided that:

    - Construction does not occur between the hours of six (6:00) p.m. and six (6:00) a.m. during the months of June through September; and

    - Construction does not occur between the hours of six (6:00) p.m. and seven (7:00) a.m. during the months of October through May.

4.0 Study Method and Procedures

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

4.1 Measurement Procedures and Criteria

Noise measurements are taken to determine the existing noise levels. A noise receiver or receptor is any location in the noise analysis in which noise might produce an impact. The following criteria are used to select measurement locations and receptors:

- Locations expected to receive the highest noise impacts, such as the first row of houses
- Locations that are acoustically representative and equivalent of the area of concern
- Human land usage
- Sites clear of major obstruction and contamination

RK conducted the sound level measurements in accordance with Caltrans technical noise specifications. All measurement equipment meets American National Standards Institute (ANSI) specifications for sound level meters (ANSI S1.4: Specification for Sound Level Meter, 1983).

A Piccolo-II Type 2 integrating-averaging level meter was used to conduct short-term (10-minute) noise measurements at the project site and property boundaries.

The Leq, Lmin, Lmax, L2, L8, L25, and L50 statistical data were recorded over the measurement time period intervals and the information was utilized to define the noise characteristics for the project. The following gives a brief description of the Caltrans Technical Noise Supplement procedures for sound level measurements:

- Microphones for sound level meters were placed five (5) feet above the ground for short-term noise measurements
- Sound level meters were calibrated before and after each measurement
- Following the calibration of equipment, a windscreen was placed over the microphone
- Frequency weighting was set on "A" and slow response
- Temperature and sky conditions were observed and documented

Appendix B includes photos, field sheets, and measured noise data.

4.2 Stationary Noise Modeling

The stationary noise was projected using a computer program that replicates the FHWA Noise Prediction Model (FHWA-RD-77-108). The FHWA model arrives at the predicted noise level through a series of adjustments to the reference energy noise level. For stationary source, the following noise level was applied to the model. The model outputs the projected noise level based on the following key parameters:

- Referenced noise level – (e.g. how loud a source is at a specific distance)
- Vertical and horizontal distances (sensitive receptor distance from noise source)
- Noise barrier vertical and horizontal distances (noise barrier distance from sound source and receptor).
- Typical noise source spectra
- Topography

Table 8 indicates the referenced noise level used in this analysis.

Table 8
HVAC Noise Level

Source	Distance from Source (feet)	Noise Levels (dBA)
		Leq
HVAC Condenser Unit	2.0	77.0

To estimate the future noise levels during typical conditions, RK adjusted the reference noise levels from the nearest HVAC unit to the adjacent sensitive receptor site. Adjusted noise levels are based on the distance of the receptor location relative to the noise source and local topography. The noise levels assume that the stationary sources are operating continuously when in reality not all noise sources will operate continuously throughout the day and night.

4.3 Construction Noise Modeling

The construction noise analysis utilizes the Federal Highway Administration (FHWA) Roadway Construction Noise Model, together with several key construction parameters. Key inputs include distance to the sensitive receiver, equipment usage, and baseline

parameters for the project site. This study evaluates the potential exterior noise impacts during each phase of construction. Noise levels were projected at an average distance of 50 feet for equipment operating over an 8-hour period. While some construction noise activity may occur closer than 50 feet from the property line, noise levels are averaged over an 8-hour period for purposes of assessing impacts. Construction phasing and equipment usage assumptions are based on the standard assumptions.

4.4 Construction Vibration Modeling

The construction vibration assessment is based on the methodology set-forth within the Caltrans Transportation and Construction Induced Vibration Guidance Manual. The vibration impacts from vibratory rollers and compactors, heavy truck loading and bulldozer activity is analyzed. All vibratory activity is analyzed as a continuous and/or frequent event and is required to comply with the applicable guidance thresholds criteria. It is expected that vibration levels will be highest during paving phase. No impact pile driving is expected as part of this project.

Vibratory impacts were calculated from the site area property line to the closest sensitive receptors and structures using the reference vibration levels, soil conditions and the reference equation *PPV= PPV ref (25/D)^n (in/sec)* (from Caltrans Manual) where:

PPV = reference measurement at 25 feet from vibration source
D = distance from equipment to property line
n= vibration attenuation rate through ground (n=1.1 was utilized for this study)

5.0 Existing Noise Environment

The existing noise environment for the project site and surrounding areas has been established based on noise measurement data collected by RK. Noise measurement data indicates that the ambient noise consist of just environmental noise includes noise from leaves rustling and chirping birds, traffic noise propagating from the adjacent roadways.

5.1 Short-Term (10-Minute) Noise Measurement Results

In order to establish the ambient noise environment, RK conducted two (2) 10-minute noise measurements at the project study area.

Noise levels were measured on April 18, 2022 using a Piccolo-II Type 2 integrating-averaging sound level meters. The information was utilized to establish the noise characteristics of the existing ambient environment

The noise monitoring locations were selected based on the proximity and location to adjacent sensitive receptors. Exhibit C graphically illustrates the location of the short-term measurements.

- Short-term noise monitoring location one (ST-1) was taken along the south side of 45th Street, near the residential home located at 6220 45th Street, approximately 18 feet from the centerline of the 45th Street.

- Short-term noise monitoring location two (ST-2) was taken along the western property line of the site, approximately 50 feet from southern property line.

Short term noise monitoring locations represent the existing ambient noise levels near the adjacent noise sensitive land uses and the project site and are summarized in Tables 9. Appendix B includes photographs, field sheets and measured noise data.

Table 9
Short Term Noise Measurement Results

Site No.	Time Started	Leq	Lmin	Lmax	L_2	L_8	L_{25}	L_{50}
ST-1	2:10 PM	65.3	77.2	46.4	73.9	70.9	65.3	57.6
ST-2	2:25 PM	62.5	80.3	42.9	75.8	60.2	54.2	49.0

6.0 Operational Noise Impacts

This assessment analyzes the anticipated noise levels generated by the project and impacts on the nearest sensitive receptors. The main sources of noise generated by the project would include on-site operational activities from HVAC equipment noise. Noise level impacts are compared to the City of Jurupa Valley noise standards.

The project must demonstrate that noise levels generated by the project site would not be in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

6.1 Stationary Source Noise Impacts

The project is not expected to consist of significant sources of stationary noise. The main sources of potential stationary noise impacts from the project would mainly include on-site HVAC units.

The types of on-site noise from the project are typically considered compatible with other adjacent residential uses and would not typically be categorized as loud, unnecessary, or unusual noise that disturbs the peace or quiet of any neighborhood, or that causes discomfort or annoyance to any person of normal sensitiveness. In particular, social activities and vehicular related noise are generally substantially less during the noise sensitive nighttime hours.

The project is proposing to build a six (6) foot noise barrier wall along the northern, eastern, western and partially along the southern property lines and the noise study has taken the proposed wall into account during the analysis as a noise barrier.

Mechanical HVAC equipment has the potential to operate 24-hours a day and will be generally located on the exterior ground floor area of each unit. The closest HVAC units are expected to be located approximately 10 feet from the eastern and western property line, a preliminary evaluation of noise impacts has been provided.

As shown in Table 10, operational noise levels generated by HVAC equipment are not expected to exceed the City's daytime standards of 55 dBA and nighttime noise standards of 45 dBA at the nearest property line to the east and west. Stationary HVAC noise calculation worksheets are shown in Appendix C.

Table 10
Stationary Noise Impact Analysis - Residential

Source	Exterior Noise Level (Leq) dBA[1]	
	Daytime 7:00 a.m. to 10:00 p.m.	**Nighttime 10:00 p.m. to 7:00 a.m.**
HVAC Unit	42.1	42.1
Jurupa Valley Noise Level Criteria	55.0	45.0
Noise Level Exceeds Standard (?)	No	No

[1] Stationary HVAC noise calculation worksheets are shown in Appendix C.

6.2 Flabob Airport Noise Levels

The Riverside County Airport Land Use Commission governs 16 airports in Riverside County, including the Flabob Airport in Riverside. In November 2004, the ALUC adopted the Riverside County Airport Land Use Compatibility Plan (ALUCP) Policy Document, which establishes land use, noise and safety policies in the vicinity of airports throughout Riverside County, including compatibility criteria and maps for the influence areas of individual airports. The ALUCP also establishes procedural requirements for compatibility review of development proposals related to the Flabob Airport Influence Area.

The Flabob Airport is located approximately three quarter of a half mile (0.75 miles) to the east of the project site. A noise/land use compatibility assessment has been performed based on the project's location to the Flabob Airport. The future noise contour maps for the Flabob Airport are provided in Exhibit D.

The project is located outside of the 60 dB Ldn future noise contour limit. The expected noise levels from the Flabob Airport at the project site fall within the normally acceptable limit (less than 60 dBA). 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.

6.3 Operation Project Design Features (DF)

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 along the property line to the north, east, west, and partially along the south of the project site to shield all abutting properties from the project site. 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 All HVAC units will be located behind the designed noise screening wall and shielded from line of sight of adjacent residential properties. All HVAC equipment should be located at least 10 feet from any adjacent residential property line.

DF-3 The project will comply with the California Title 24 building insulation requirements for exterior walls, roofs and common separating assemblies (e.g. floor/ceiling assemblies and demising walls), which shall be reviewed by the City prior to issuance of a building permit.

- 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.
- Party wall and floor-ceiling assembly designs must provide a minimum STC of 50, based on lab tests. Field tested assemblies must provide a minimum noise isolation class (NIC) of 45.
- Penetrations or openings in sound rated assemblies must be treated to maintain required ratings.

7.0 Construction Noise and Vibration Impacts

Temporary construction noise and vibration impacts have been assessed from the project site to the surrounding existing noise sensitive land uses. The degree of construction noise will vary depending on the type of construction activity taking place and the location of the activity relative to the surrounding properties.

Chapter 11.05.020 of the City's municipal code states that the noise from the following activities noises shall be exempted from the provisions of the noise code, provided;

1. Private construction projects located one-quarter (¼) of a mile or more from an inhabited dwelling;

2. Private construction projects located within one-quarter (¼) of a mile from an inhabited dwelling, provided that:

    - Construction does not occur between the hours of six (6:00) p.m. and six (6:00) a.m. during the months of June through September; and

    - Construction does not occur between the hours of six (6:00) p.m. and seven (7:00) a.m. during the months of October through May.

In compliance with the City's Municipal Code, it is assumed construction would not occur during the noise-sensitive nighttime hours.

Construction phasing and equipment usage assumptions are based on the standard assumptions.

7.1 Typical Construction Noise Levels

Table 11 shows typical construction noise levels compiled by the Environmental Protection Agency (EPA) for common type construction equipment. Typical construction noise levels are used to estimate potential project construction noise levels at the adjacent sensitive receptors.

Table 11
Typical Construction Noise Levels[1]

Type	Noise Levels (dBA) at 50 Feet
Earth Moving	
Compactors (Rollers)	73 - 76
Front Loaders	73 - 84
Backhoes	73 - 92
Tractors	75 - 95
Scrapers, Graders	78 - 92
Pavers	85 - 87
Trucks	81 - 94
Materials Handling	
Concrete Mixers	72 - 87
Concrete Pumps	81 - 83
Cranes (Movable)	72 - 86
Cranes (Derrick)	85 - 87
Stationary	
Pumps	68 - 71
Generators	71 - 83
Compressors	75 - 86
Impact Equipment	
Pneumatic Wrenches	82 - 87
Jack Hammers, Rock Drills	80 - 99
Pile Drivers (Peak)	95-105
Other	
Vibrators	68 - 82
Saws	71 - 82

[1] Referenced Noise Levels from the Environmental Protection Agency (EPA)

7.2 Construction Noise Impact Analysis

This assessment analyzes potential noise impacts during all expected phases of construction, including, site preparation, grading, building construction, paving, and architectural coating. Noise levels are calculated based on an average distance of equipment over an 8-hour period to the nearest adjacent property. The project's estimated construction noise levels have been calculated using the Federal Highway Administration Roadway Construction Noise Model Version 1.1. Tables 12 show the noise level impacts at 50 feet. Construction noise calculation worksheets are provided in Appendix D.

Table 12
Project Construction Noise Levels – at 50 Feet

Phase	Equipment	Quantity	Equipment Noise Level at 50ft (dBA Leq)	Combined Noise Level (dBA Leq)
Site Preparation	Rubber Tired Dozers	3	77.7	87.6
	Tractors/Loaders/Backhoes	4	80.0	
Grading	Excavators	2	76.7	88.2
	Graders	1	81.0	
	Rubber Tired Dozers	1	77.7	
	Scrapers	2	79.6	
	Tractors/Loaders/Backhoes	2	80.0	
Building Construction	Cranes	1	72.6	86.3
	Forklifts	3	71.0	
	Generator Sets	1	77.6	
	Tractors/Loaders/Backhoes	3	80.0	
	Welders	1	70.0	
Paving	Pavers	2	74.2	84.7
	Paving Equipment	2	73.0	
	Tractors/Loaders/Backhoes	2	80.0	
Architectural Coating	Air Compressors	1	73.7	73.7
Worst Case Construction Phase Noise Level - Leq (dBA)				88.2

As shown in Table 12, the project is expected to generate noise levels which range from 73.7 dBA to 88.2 dBA at 50 feet. Construction noise calculation worksheets are provided in Appendix D.

7.3 Construction Vibration

To determine the vibratory impacts during construction, reference construction equipment vibration levels were utilized and then extrapolated to the façade of the nearest adjacent structures. The nearest sensitive receptors are the adjacent residential uses to the east of the project site. All structures surrounding the project site are "new structures". No historical or fragile buildings are known to be located within the vicinity of the site.

The construction of the proposed project is not expected to require the use of substantial vibration inducing equipment or activities, such as pile drivers or blasting. The main sources of vibration impacts during construction of the project would be the operation of equipment such as bulldozer activity during site preparation, loading trucks during grading and excavation and vibratory rollers during paving.

The construction vibration assessment utilizes the referenced vibration levels and methodology set-forth within the Transit Noise and Vibration Impact Assessment Manual, Federal Transit Administration, September 2018.

Table 13 shows the FTA referenced vibration levels.

Table 13
Typical Construction Vibration Levels[1]

Equipment	Peak Particle Velocity (PPV) (inches/second) at 25 feet	Approximate Vibration Level (LV) at 25 feet
Piledriver (impact)	1.518 (upper range)	112
	0.644 (typical)	104
Piledriver (sonic)	0.734 upper range	105
	0.170 typical	93
Clam shovel drop (slurry wall)	0.202	94
Hydromill	0.008 in soil	66
(slurry wall)	0.017 in rock	75
Vibratory Roller	0.210	94
Hoe Ram	0.089	87
Large bulldozer	0.089	87
Caisson drill	0.089	87
Loaded trucks	0.076	86
Jackhammer	0.035	79
Small bulldozer	0.003	58

[1] Transit Noise and Vibration Impact Assessment, Federal Transit Administration, May 2006.

Table 14 shows the project's construction-related vibration analysis at the nearest structures to the project construction area. Construction impacts are assessed at 25 feet from the nearest adjacent structure.

Table 14
Construction Vibration Impact Analysis

Construction Activity	Distance to Nearest Structure (ft)	Duration	Calculated Vibration Level - PPV (in/sec)	Damage Potential Level
Large Bulldozer	25	Continuous/Frequent	0.089	Extremely fragile historic buildings, ruins, ancient monuments
Vibratory Roller	25	Continuous/Frequent	0.210	Historic and old buildings
Loaded Trucks	25	Continuous/Frequent	0.076	No Impact

As shown in Table 14, project related construction activity is not expected to cause any potential damage to the nearest structures.

Construction vibration calculation worksheets are shown in Appendix D.

7.4 Construction 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 the site design and construction management plan.

Construction Design Features

DF-4 Construction-related noise activities shall comply with the requirements set forth in the City of Jurupa Valley Municipal Code, Chapter 11.05.020.

1. Private construction projects located one-quarter (¼) of a mile or more from an inhabited dwelling;

2. Private construction projects located within one-quarter (¼) of a mile from an inhabited dwelling, provided that:

   - Construction does not occur between the hours of six (6:00) p.m. and six (6:00) a.m. during the months of June through September; and

- Construction does not occur between the hours of six (6:00) p.m. and seven (7:00) a.m. during the months of October through May;

DF-5 During construction, the contractor shall ensure all construction equipment is equipped with appropriate noise attenuating devices and equipment shall be maintained so that vehicles and their loads are secured from rattling and banging. Idling equipment shall be turned off when not in use.

DF-6 Locate staging area, generators and stationary construction equipment as far from the nearest residential receptors, as reasonably feasible.

DF-7 No impact pile driving activities are expected to occur on the project site during construction.

DF-8 The project will construct the property line wall during the early phases of construction, prior to grading, to help shield the neighboring properties from construction noise activities.

Exhibits

Exhibit A
Location Map

N

Exhibit B

Site Plan

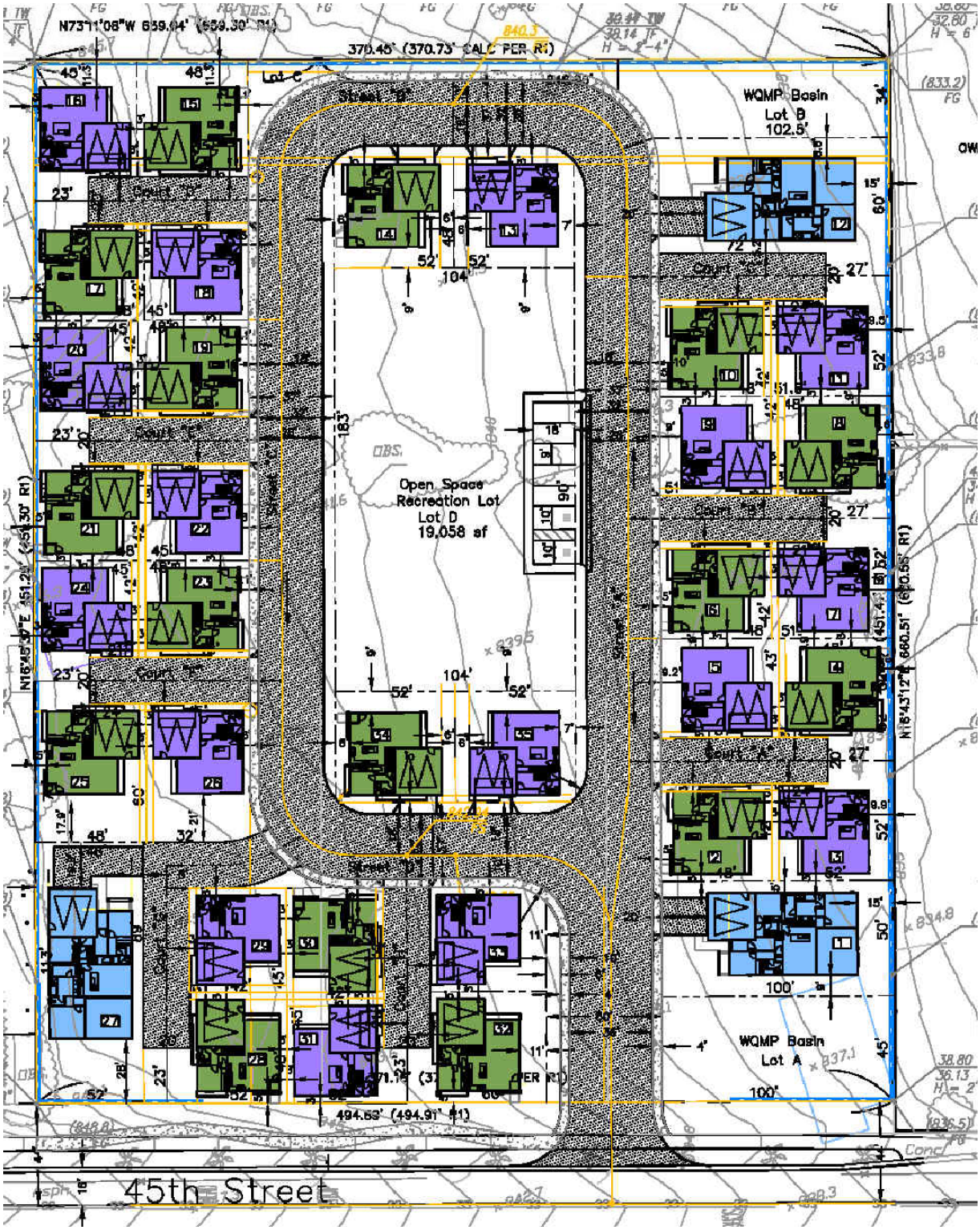


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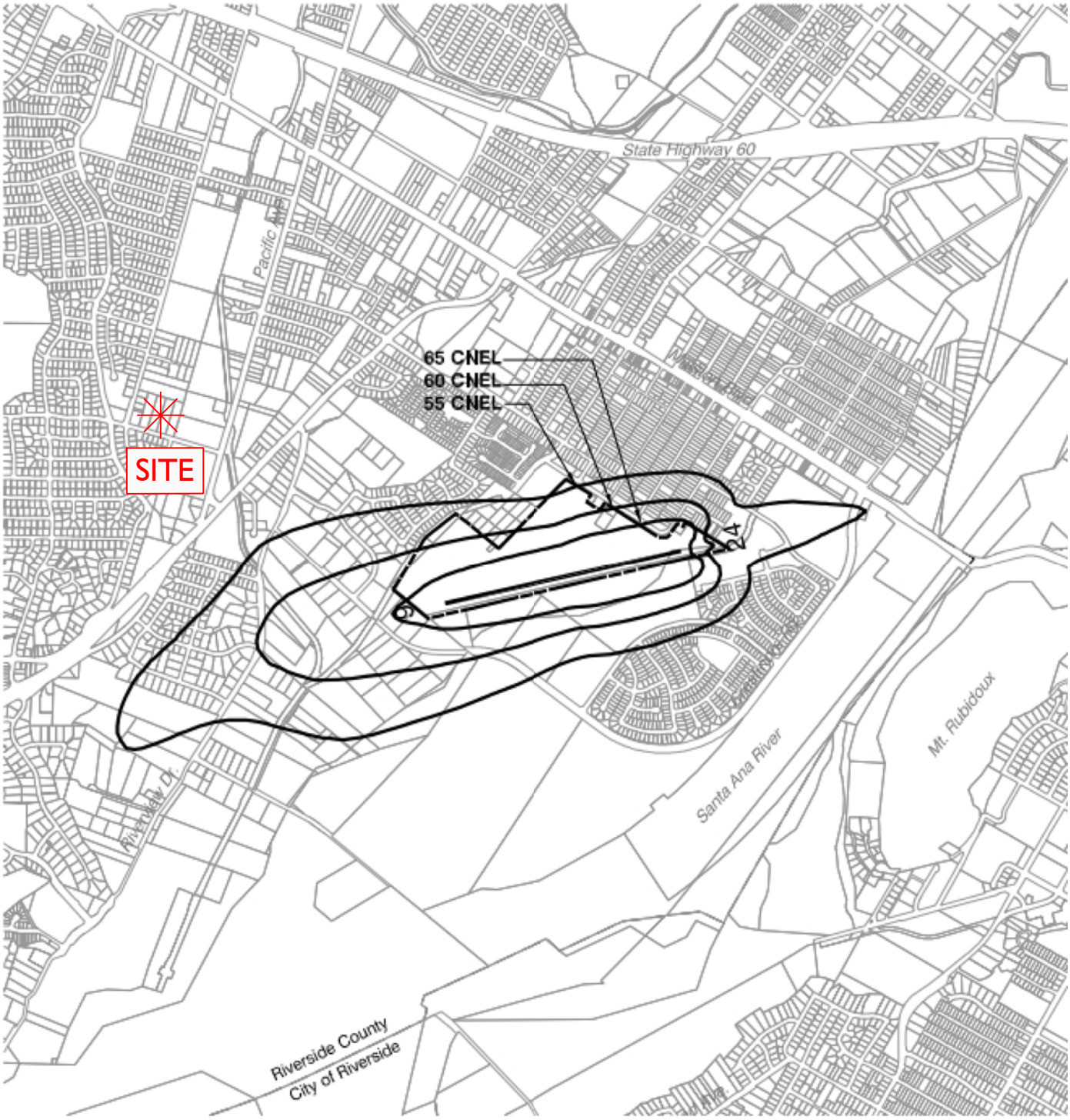
Exhibit C

Noise Monitoring Locations

N

Exhibit D

Flabob Airport Noise Contour Map



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Appendices

Appendix A

City of Jurupa Valley
Noise Element and Noise Ordinance

CHAPTER 11.05. - NOISE REGULATIONS

Sec. 11.05.010. - Intent.

At certain levels, sound becomes noise and may jeopardize the health, safety or general welfare of City of Jurupa Valley residents and degrade their quality of life. Pursuant to its police power, the City Council declares that noise shall be regulated in the manner described in this chapter. This chapter is intended to establish city-wide standards regulating noise. This chapter is not intended to establish thresholds of significance for the purpose of any analysis required by the California Environmental Quality Act (Pub. Resources Code Section 21000 *et seq.*) and no such thresholds are established.

(Ord. No. 2012-01, § 1(11.10.010), 2-16-2012)

Sec. 11.05.020. - Exemptions.

Sound emanating from the following sources is exempt from the provisions of this chapter:

(1) Facilities owned or operated by or for a governmental agency;

(2) Capital improvement projects of a governmental agency;

(3) The maintenance or repair of public properties;

(4) Public safety personnel in the course of executing their official duties, including, but not limited to, sworn peace officers, emergency personnel and public utility personnel. This exemption includes, without limitation, sound emanating from all equipment used by such personnel, whether stationary or mobile;

(5) Public or private schools and school-sponsored activities;

(6) Agricultural operations on land designated "agriculture" in the Jurupa Valley General Plan, or land zoned A-1 (light agriculture), A-P (light agriculture with poultry), A-2 (heavy agriculture), or A-D (agriculture-dairy), provided such operations are carried out in a manner consistent with accepted industry standards. This exemption includes, without limitation, sound emanating from all equipment used during such operations, whether stationary or mobile;

(7) Wind energy conversion systems (WECS), provided such systems comply with the WECS noise provisions of Jurupa Valley Municipal Code or Title 9;

(8) Private construction projects located one-quarter (¼) of a mile or more from an inhabited dwelling;

(9) Private construction projects located within one-quarter (¼) of a mile from an inhabited dwelling, provided that:

  (a) Construction does not occur between the hours of six (6:00) p.m. and six (6:00) a.m. during the months of June through September; and

  (b) Construction does not occur between the hours of six (6:00) p.m. and seven (7:00) a.m. during the months of October through May;

(10) Property maintenance, including, but not limited to, the operation of lawnmowers, leaf blowers, etc., provided such maintenance occurs between the hours of seven (7:00) a.m. and eight (8:00) p.m.;

(11) Motor vehicles, other than off-highway vehicles. This exemption does not include sound emanating from motor vehicle sound systems;

(12) Heating and air conditioning equipment;

(13) Safety, warning and alarm devices, including, but not limited to, house and car alarms, and other warning

devices that are designed to protect the public health, safety, and welfare; or

(14) The discharge of firearms consistent with all state laws.

(Ord. No. 2012-01, § 1(11.10.020), 2-16-2012)

Sec. 11.05.030. - Definitions.

The following words, terms and phrases, when used in this chapter, shall have the meanings ascribed to them in this section, except where the context clearly indicates a different meaning:

Audio equipment means a television, stereo, radio, tape player, compact disc player, mp3 player, iPod or other similar device.

Decibel (dB) means a unit for measuring the relative amplitude of a sound equal approximately to the smallest difference normally detectable by the human ear, the range of which includes approximately one hundred and thirty (130) decibels on a scale beginning with zero decibels for the faintest detectable sound. Decibels are measured with a sound level meter using different methodologies as defined below:

(1) "A-weighting (dBA)" means the standard A-weighted frequency response of a sound level meter, which de-emphasizes low and high frequencies of sound in a manner similar to the human ear for moderate sounds.

(2) "Maximum sound level (Lmax)" means the maximum sound level measured on a sound level meter.

Governmental agency means the United States, the State of California, Riverside County, City of Jurupa Valley, any city within Riverside County, any special district within Riverside County or any combination of these agencies.

Land use permit means a discretionary permit issued by Jurupa Valley pursuant to Jurupa Valley Municipal Code or Title 9.

Motor vehicle means a vehicle that is self-propelled.

Motor vehicle sound system means a stereo, radio, tape player, compact disc player, mp3 player, iPod or other similar device.

Noise means any loud, discordant or disagreeable sound.

Occupied property means property upon which is located a residence, business or industrial or manufacturing use.

Off-highway vehicle means a motor vehicle designed to travel over any terrain.

Public or private school means an institution conducting academic instruction at the preschool, elementary school, junior high school, high school, or college level.

Public property means property owned by a governmental agency or held open to the public, including, but not limited to, parks, streets, sidewalks, and alleys.

Sensitive receptor means a land use that is identified as sensitive to noise in the noise element of the Jurupa Valley General Plan, as applicable to the City of Jurupa Valley by Chapter 1.35, including, but not limited to, residences, schools, hospitals, churches, rest homes, cemeteries or public libraries.

Sound-amplifying equipment means a loudspeaker, microphone, megaphone or other similar device.

Sound level meter means an instrument meeting the standards of the American National Standards Institute for Type 1 or Type 2 sound level meters or an instrument that provides equivalent data.

(Ord. No. 2012-01, § 1(11.10.040), 2-16-2012)

Sec. 11.05.040. - General sound level standards.

No person shall create any sound, or allow the creation of any sound, on any property that causes the exterior sound level on any other occupied property to exceed the sound level standards set forth in Table 1 of this section or that violates the special sound source standards set forth in Section 11.05.060.

Table 1

Sound Level Standards (Db Lmax)

General Plan Foundation Component	*General Plan Land Use Designation*	*General Plan Land Use Designation Name*	*Density*	*Maximum Decibel Level*	
				7 a.m.— 10 p.m.	*10 p.m.— 7 a.m.*
Community Development	EDR	Estate density residential	2 AC	55	45
	VLDR	Very low density residential	1 AC	55	45
	LDR	Low density residential	1/2 AC	55	45
	MDR	Medium density residential	2—5	55	45
	MHDR	Medium high density residential	5—8	55	45
	HDR	High density residential	8—14	55	45
	VHDR	Very high density residential	14—20	55	45
	HTDR	Highest density residential	20+	55	45

	CR	Retail commercial		65	55
	CO	Office commercial		65	55
	CT	Tourist commercial		65	55
	CC	Community center		65	55
	I	Light industrial		75	55
	HI	Heavy industrial		75	75
	BP	Business park		65	45
	PF	Public facility		65	45
	SP	Specific plan—Residential		55	45
		Specific plan—Commercial		65	55
		Specific plan—Light Industrial		75	55
		Specific plan—Heavy Industrial		75	75
Rural Community	EDR	Estate density residential	2 AC	55	45
	VLDR	Very low density residential	AC	55	45

	LDR	Low density residential	1/2 AC	55	45
Rural	RR	Rural residential	5 AC	45	45
	RM	Rural mountainous	10 AC	45	45
	RD	Rural desert	0 AC	45	45
Agriculture	AG	Agriculture	10 AC	45	45
Open Space	C	Conservation		45	45
	CH	Conservation habitat		45	45
	REC	Recreation		45	45
	RUR	Rural	20 AC	45	45
	W	Watershed		45	45
	MR	Mineral resources		75	45

(Ord. No. 2012-01, § 1(11.10.040), 2-16-2012)

Sec. 11.05.050. - Sound level measurement methodology.

If the sound standard being applied is measured in decibels, then sound level measurements pursuant to this section shall be required to establish a violation of this chapter. If the sound standard being applied is not measured in decibels, then sound level measurements are not required to establish a violation of this chapter. Sound level measurements may be made anywhere within the boundaries of an occupied property. The actual location of a sound level measurement shall be at the discretion of the Enforcement Officials identified in Section 11.05.080. Sound level measurements shall be made with a sound level meter. Immediately before a measurement is made, the sound level meter shall be calibrated utilizing an acoustical calibrator meeting the standards of the American National Standards Institute. Following a sound level measurement, the calibration of the sound level meter shall be re-verified. Sound level meters and calibration equipment shall be certified annually.

(Ord. No. 2012-01, § 1(11.10.050), 2-16-2012)

Sec. 11.05.060. - Special sound sources standards.

The general sound level standards set forth in Section 11.05.040 apply to sound emanating from all sources, including the following special sound sources, and the person creating, or allowing the creation of, the sound is subject to the requirements of that section. The following special sound sources are also subject to the following additional standards, the failure to comply with which constitute separate violations of this chapter:

(1) *Motor vehicles.*

(a) *Off-highway vehicles.*

(i) No person shall operate an off-highway vehicle unless it is equipped with a USDA-qualified spark arrester and a constantly operating and properly maintained muffler. A muffler is not considered constantly operating and properly maintained if it is equipped with a cutout, bypass or similar device.

(ii) No person shall operate an off-highway vehicle unless the noise emitted by the vehicle is not more than ninety-six (96) dBA if the vehicle was manufactured on or after January 1, 1986, or is not more than one hundred and one (101) dBA if the vehicle was manufactured before January 1, 1986. For purposes of this subsection, emitted noise shall be measured a distance of twenty (20) inches from the vehicle tailpipe using test procedures established by the Society of Automotive Engineers under Standard J-1287.

(b) *Sound systems.* No person shall operate a motor vehicle sound system, whether affixed to the vehicle or not, between the hours of ten (10:00) p.m. and eight (8:00) a.m., such that the sound system is audible to the human ear inside any inhabited dwelling. No person shall operate a motor vehicle sound system, whether affixed to the vehicle or not, at any other time such that the sound system is audible to the human ear at a distance greater than one hundred (100) feet from the vehicle. Sound level measurements may be used, but are not required to establish a violation of this subsection.

(2) *Power tools and equipment.* No person shall operate any power tools or equipment between the hours of ten (10:00) p.m. and eight (8:00) a.m. such that the power tools or equipment are audible to the human ear inside an inhabited dwelling other than a dwelling in which the power tools or equipment may be located. No person shall operate any power tools or equipment at any other time such that the power tools or equipment are audible to the human ear at a distance greater than one hundred (100) feet from the power tools or equipment. Sound level measurements may be used, but are not required to establish a violation of this subsection.

(3) *Audio equipment.* No person shall operate any audio equipment, whether portable or not, such that the equipment is audible to the human ear at a distance greater than one hundred (100) feet from the equipment. Sound level measurements may be used, but are not required to establish a violation of this subsection.

(4) *Sound-amplifying equipment and live music.* No person shall install, use or operate sound-amplifying equipment, or perform, or allow to be performed, live music if the sound emanating from sound-amplifying equipment or live music is audible to the human ear at a distance greater than one hundred (100) feet from the equipment or music. To the extent that these requirements conflict with any conditions of approval attached to an underlying land use permit, these requirements shall control. Sound level measurements may be used, but are not required to establish a violation of this subsection.

(Ord. No. 2012-01, § 1(11.10.060), 2-16-2012; Ord. No. 2015-08, § 1, 6-18-2015)

Sec. 11.05.070. - Exceptions.

Exceptions may be requested from the standards set forth in Section 11.10.040 or 11.10.060 of this chapter and may be characterized as construction-related or continuous-events exceptions.

(1) *Application and processing.*

(a) *Construction-related exceptions.* An application for a construction-related exception shall be made to and considered by the Building Official of the city on forms provided by the Building and Safety Division and shall be accompanied by the appropriate filing fee. No public hearing is required.

(b) *Continuous events exceptions.* An application for a continuous events exception shall be made to the Planning Director on forms provided by the Planning Department and shall be accompanied by the appropriate filing fee. Upon receipt of an application for a continuous events exception, the Planning Director shall set the matter for public hearing before the Planning Commission, notice of which shall be given as provided in Section 9.240.250 of this Code. Notwithstanding the above, an application for a continuous events exception that is associated with an application for a land use permit shall be processed concurrently with the land use permit in the same manner that the land use permit is required to be processed.

(2) *Requirements for approval.* The appropriate decision-making body or officer shall not approve an exception application unless the applicant demonstrates that the activities described in the application would not be detrimental to the health, safety or general welfare of the community. In determining whether activities are detrimental to the health, safety or general welfare of the community, the appropriate decision-making body or officer shall consider such factors as the proposed duration of the activities and their location in relation to sensitive receptors. If an exception application is approved, reasonable conditions may be imposed to minimize the public detriment, including, but not limited to, restrictions on sound level, sound duration and operating hours.

(3) *Appeals.* The Building Official's decision on an application for a construction-relation exception is considered final. After making a decision on an application for a continuous-events exception, the appropriate decision-making body or officer shall mail notice of the decision to the applicant. Within ten (10) calendar days after the mailing of such notice, the applicant or interested person may appeal the decision pursuant to and in accordance with the provisions of Chapter 2.40 of this Code.

(Ord. No. 2012-01, § 1(11.10.070), 2-16-2012; Ord. No. 2015-08, § 2, 6-18-2015; Ord. No. 2016-04, § 11(11.10.070), 4-7-2016)

Sec. 11.05.080. - Violations and penalties.

A. Violation of the provisions of this chapter may be enforced pursuant to the enforcement provisions set forth in Title 1 of this Code, including Chapter 1.10, Code Enforcement Generally, Chapter 1.15, Criminal Prosecution, Chapter 1.20, Administrative Penalties, or Chapter 1.25, Public Nuisance Injunctions.

B. The fine schedule for a violation of this chapter enforced pursuant to Chapter 1.20, shall be in the amount of:

(1) Two hundred dollars ($200) for the first violation occurring within a three hundred and sixty-six (366) day period;

(2) Five hundred dollars ($500) for a second violation occurring within three hundred and sixty-six (366) days of the first violation;

(3) Seven hundred and fifty dollars ($750) for a third violation occurring within three hundred and sixty-six (366) days of the first violation; or

(4) One thousand dollars ($1,000) for a fourth violation and each subsequent violation occurring within three hundı sixty-six (366) days of the first violation.

C. The fines set forth in subsection (B) of this section may be modified by a resolution of the City Council establishing an administrative citation schedule not to exceed one thousand dollars ($1,000) per violation and which may include increased fines for repeat violations and penalties.

D. The City Manager or his designee may reduce the fines set forth in subsections (B) or (C) of this section in the event he or she finds that the violation is not likely to reoccur, the violator cooperated with Enforcement Officials in attempting to enforce the provisions of this chapter and resolve the issues giving rise to the violation, the actions of the violator giving rise to the violation were not malicious and were not taken in deliberate disregard of the provisions of this chapter, and the ends of justice would not be served by imposing the full fine.

(Ord. No. 2012-01, § 1(11.10.080), 2-16-2012)

Sec. 11.05.090. - Duty to cooperate.

No person shall refuse to cooperate with, or obstruct, the Enforcement Officials identified in Section 11.05.080 when they are engaged in the process of enforcing the provisions of this chapter. This duty to cooperate may require a person to extinguish a sound source so that it can be determined whether sound emanating from the source violates the provisions of this chapter.

(Ord. No. 2012-01, § 1(11.10.090), 2-16-2012)

7 – Noise Element

A. Introduction

Jurupa Valley values its semi-rural character and diversity of land uses where individual expression is appreciated. However, the mix of land uses also generates a surprising amount of noise, which can adversely affect area residents and other sensitive receptors. Train whistles, aircraft overflights, motor vehicle traffic, barking dogs, and loud parties are a part of daily life that sometimes create a disruptive noise environment. In addition, vibration generated by construction equipment, idling trucks, and other sources can be annoying.

This Noise Element is a mandatory component of the General Plan pursuant to *California Government Code §65302(f).* It is closely related to the Land Use, Mobility, Healthy Communities, and Environmental Justice Elements of the General Plan. The element identifies noise issues within the community, quantifies existing and projected noise levels, addresses excessive noise exposure, and provides goals, policies, and programs to reduce noise to acceptable levels. In the Noise Element, the City describes how it intends to prevent and mitigate the adverse impacts of excessive noise exposure on its residents, employees, visitors, and other persons.

Primary Goal

To be a City that actively works to minimize the effects of noise and vibration on sensitive receptors.

Policy and Program Sections

1. *Land Use Compatibility*
2. *Mobile Noise Sources*
3. *Stationary Noise Sources*
4. *Ground-Borne Vibration*

B. Background

Figure 7-1: Rural setting, Jurupa Valley

Noise can significantly affect community character, quality of life, and human health. Noise is defined as any unwanted sound; however, the determination of what is considered excessive noise can be difficult and subjective. Sources of noise in the City include mobile sources, such as motor vehicles, rail, and aircraft, and stationary sources such as construction activities, truck transfer facilities, and generators. Managing noise involves balancing quality of life issues with the needs of transportation facilities and residential, commercial, and industrial activities. Noise standards should not be so stringent that they discourage business or development, but also not so lenient that the quality of life of the community suffers.

One of the General Plan Advisory Committee's key findings was the need to identify areas and sources of excessive noise, "noise sensitive uses," and measures to reduce noise impacts. Existing noise sources in the City include transportation or traffic-related impacts, rail noise, aircraft noise, and noise impacts associated with operations at commercial and industrial sites. Currently, one of the main issues in the City related to noise is the existence of incompatible land uses. Typically, when commercial or industrial operations are located close to residential or other noise-sensitive uses, complaints from residents are more likely to occur.

In coordination with City staff, specific locations at which potentially noise-incompatible uses existed in 2015 were identified. These locations were chosen to represent some of the noise monitoring locations presented in *Figure 7-2*. In addition to the noise-incompatible locations, noise monitoring locations, both long-term (24-hour) and short term (15-minute), were chosen to assess noise impacts from the existing rail operations and traffic noise impacts from major roadways within the City. *Figure 7-2* shows the location of the measurement sites.

Noise monitoring measurements, along with the modeling results of existing traffic noise contours, were used to determine existing noise conditions throughout the City. Future noise conditions were then modeled and compared to 2016 conditions. Future conditions include airport operations, proposed haul routes along the City streets, future rail activities, and expected continued/future incompatible land use noise issues. Noise goals, policies, and programs have been included in this element to address existing and future conditions in conformance with the City's overall goals.

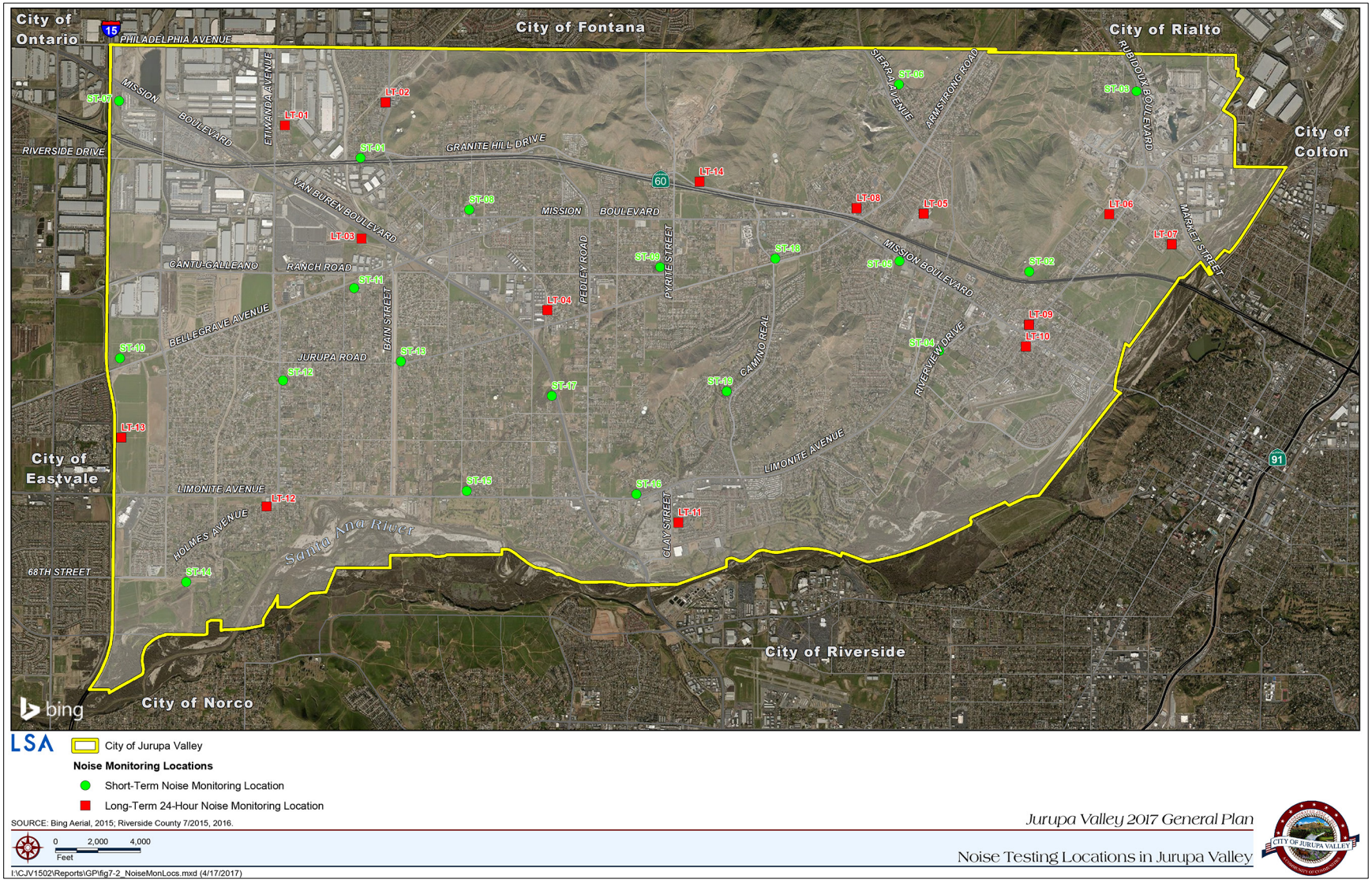


Figure 7-2: Noise testing locations in Jurupa Valley

Land Use Compatibility

The Noise Element of the General Plan directly relates to the Land Use Element in that noise can adversely affect sensitive land uses such as residential uses, schools, hospitals, assisted living facilities, mental care facilities, and places of worship, libraries, and passive recreation areas. Many of these uses depend on low levels of sound to promote the health and well-being of their occupants. Land uses that generate significant mobile or stationary noise must be compatible with adjacent uses in order for the land use plan to be successful. If existing land uses emit noise above a certain level, they may not be compatible with adjacent land uses, and should not be allowed unless attenuation measures are used to reduce indoor and outdoor noise to acceptable levels. In cases of new development, the placement of noise-sensitive land uses is integral to the safety and success of the community. *Table 7.1* lists common sound levels for familiar locations and activities.

Table 7.1: Typical A-Weighted Sound Levels

Noise Source	A-Weighted Sound Level in Decibels	Noise Environments	Subjective Evaluations
Near Jet Engine	140	Deafening	128 times as loud
Civil Defense Siren	130	Threshold of Pain	64 times as loud
Hard Rock Band	120	Threshold of Feeling	32 times as loud
Accelerating Motorcycle at a Few Feet Away	110	Very Loud	16 times as loud
Pile Driver; Noisy Urban Street/Heavy City Traffic	100	Very Loud	8 times as loud
Ambulance Siren; Food Blender	95	Very Loud	—
Garbage Disposal	90	Very Loud	4 times as loud
Freight Cars; Living Room Music	85	Loud	—
Pneumatic Drill; Vacuum Cleaner	80	Loud	2 times as loud
Busy Restaurant	75	Moderately Loud	—
Near Freeway Auto Traffic	70	Moderately Loud	—
Average Office	60	Quiet	One-half as loud
Suburban Street	55	Quiet	—
Light Traffic; Soft Radio Music in Apartment	50	Quiet	One-quarter as loud
Large Transformer	45	Quiet	—
Average Residence without Stereo Playing	40	Faint	One-eighth as loud
Soft Whisper	30	Faint	—
Rustling Leaves	20	Very Faint	—
Human Breathing	10	Very Faint	Threshold of Hearing
—	0	Very Faint	—

Source: Compiled by LSA Associates, Inc. (2015).

Noise Measurement

When discussing noise policy, it is helpful to have a basic understanding of the primary tools used to measure the effect of noise on the community. The decibel is a basic unit of noise that measures the intensity of sound. The A-weighted decibel, also referred to as dB(A), measures the intensity of sound as it relates to

the hearing frequency of the human ear. The Day Night Average Sound Level, or Ldn, is a 24-hour average sound level with a penalty added to nighttime hours to reflect increased hearing sensitivity during that time. The Community Noise Equivalent Level, or CNEL, mirrors Ldn but with an additional penalty added to evening hours.

Noise Attenuation

Noise attenuation refers to measures undertaken to reduce the volume of sound and lessen its harmful or disruptive effects. There are three primary ways to attenuate noise: at the source, along the path, and at the receiver. Examples of attenuation at the source include reducing vehicular speeds, implementing truck restrictions, and enforcing noise ordinance restrictions on amplified music. Attenuation along the path includes increasing the distance between the noise source and the receiver and installing walls, berms, or landscaping to reduce the noise reaching the receiver. Finally, measures undertaken at the receiver to reduce noise include site design to buffer sensitive receptors and the use of construction soundproofing techniques such as double-pane window glazing and roof treatments.

Ground-Borne Vibration

Another community concern related to noise is ground-borne vibration from construction activities, blasting, rail operations, and trucking. Vibration normally falls within the disruptive category, where it can cause such things as window shaking and floor trembling and generally interfere with quality of life. At higher levels, vibration can actually cause structural damage. Vibration can be felt outdoors, but the perceived intensity of vibration impacts is much greater indoors due to structural shaking. *Table 7.2* lists vibration levels common in urban areas and human sensitivity.

Table 7.2: Human Sensitivity to Typical Vibration Levels

Vibration Level Peak Particle Velocity (inches/second)	Human Reaction
0.0059–0.0188	Threshold of perception, possibility of intrusion.
0.0787	Vibrations readily perceptible.
0.0984	Level at which continuous vibrations begin to annoy people.
0.1968	Vibrations annoying to people in buildings.
0.3937–0.5905	Vibrations considered unpleasant by people subjected to continuous vibrations and unacceptable to some people walking on bridges.

Source: Caltrans 1992

C. Noise Element Goals, Policies and Programs

Goals

To be a City that effectively manages noise in order to:

NE 1 Protect individual freedoms while preventing noise and vibration from degrading the safety and well-being of our community.

NE 2 Ensure adjacent land uses are compatible, and protect sensitive receptors from outside sources of noise and vibration.

NE 3 Minimize excessive noise levels and community health risks due to mobile noise sources.

NE 4 Minimize excessive noise levels and community health risks due to stationary noise sources.

NE 5 Minimize excessive noise levels and community health risks due to ground-borne vibration.

Policies and Programs

NE 1 – Land Use Compatibility

As previously identified, noise-producing land uses must be compatible with adjacent land uses in order for the land use plan to be successful. *Figure 7-3*, *Land use/noise compatibility matrix*, outlines the noise acceptability levels of different land uses. Areas around airports may have different or more restrictive noise standards than those cited in *Figure 7-3,* and the Airport Land Use Compatibility Plan for Western Riverside County should be consulted.

The following policies are designed to protect noise-sensitive land uses from noise emitted by outside sources, and prevent new projects from generating adverse noise levels on adjacent properties.

Policies

NE 1.1 **Land Use/Noise Compatibility.** Utilize the Land Use/Noise Compatibility Matrix, *Figure 7-3*, to determine the compatibility of proposed development, including General Plan amendments, specific plan amendments, town center plans, and rezonings, with existing land uses and/or noise exposure due to transportation sources.

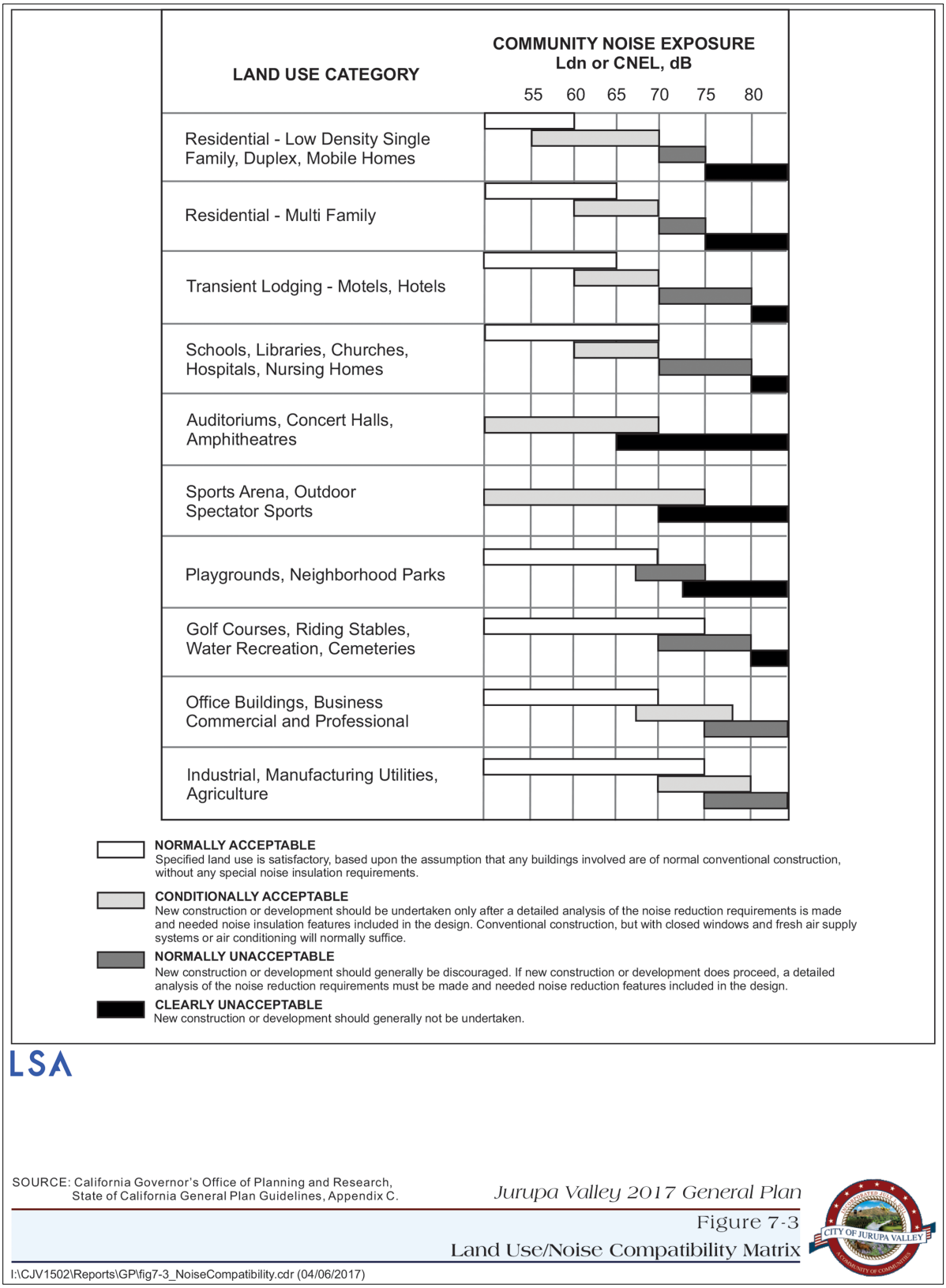


Figure 7-3: Land use/noise compatibility matrix

NE 1.2 **New Development and Stationary Noise Sources.** New development of noise-sensitive land uses near existing stationary noise sources may be permitted only where their location or design allows the development to meet the standards listed in *Figure 7-3*.

NE 1.3 **New or Modified Stationary Noise Sources.** Noise created by new stationary noise sources, or by existing stationary noise sources that undergo modifications that may increase noise levels, shall be mitigated so as not exceed the noise level standards of *Figure 7-3*. This policy does not apply to noise levels associated with agricultural operations existing in 2017.

NE 1.4 **Acoustical Assessment.** Require an acoustical assessment for proposed General Plan amendments and rezones that exceed the "Normally Acceptable" thresholds of the Land Use/Noise Compatibility Matrix.

NE 1.5 **Noise-Sensitive Uses.** Consider the following uses noise-sensitive and discourage these uses in areas in excess of 65 CNEL: schools, hospitals, assisted living facilities, mental care facilities, residential uses, libraries, passive recreational uses, and places of worship.

NE 1.6 **Protection of Noise-Sensitive Uses.** Protect noise-sensitive land uses from high levels of noise by restricting noise-producing land uses from these areas. If the noise-producing land uses cannot be relocated, then measures such as building techniques, setbacks, landscaping, and noise walls should be considered.

NE 1.7 **Noise-Tolerant Uses.** Guide new or relocated noise-tolerant land uses into areas irrevocably committed to land uses that are noise producing, such as along major transportation corridors or within the projected noise contours of area airports.

NE 1.8 **Airport Noise Compatibility.** Ensure that new land use development within Airport Influence Areas complies with airport land use noise compatibility criteria contained in the applicable Airport Land Use Compatibility (ALUC) plan for the area.

NE 1.9 **Acoustic Site Planning and Design.** Incorporate acoustic site planning into the design and placement of new development, particularly large scale, mixed-use, or master-planned development, including building orientation, berming, special noise-resistant walls, window and door assemblies, and other appropriate measures.

NE 1.10 **Mixed Uses.** Require that mixed commercial and residential development minimizes the transfer or

transmission of noise from the commercial land use to the residential land use.

Programs

NE 1.1.1 **Municipal Code:** Amend the Municipal Code to require that development entitlements (e.g., tract maps, site development plans, conditional use permits) comply with the Land Use/Noise Compatibility Matrix, *Figure 7-3* above, and with other noise requirements of the General Plan.

NE 1.1.2 **Noise Guide.** The Planning Department shall prepare and maintain a Noise Guide containing "Good Neighbor" guidelines and rules for neighborhood noise reduction and procedures for mitigating noise, and make the Guide available to the public, property owners, and developers.

NE 1.1.3 **Homeowner Assistance.** Assist homeowners living in high noise areas to reduce noise levels in their homes through funding assistance and retrofitting program development, as City resources allow or other agencies provide.

NE 1.1.4 **Noise Compatibility Assessment.** Conduct a noise compatibility assessment of sensitive land uses throughout the City.

NE 2 – Mobile Noise Sources

As previously addressed, mobile noise sources in Jurupa Valley include motor vehicles, rail, and aircraft. Each of these sources presents a unique challenge in minimizing the adverse effects of their noise on sensitive land uses.

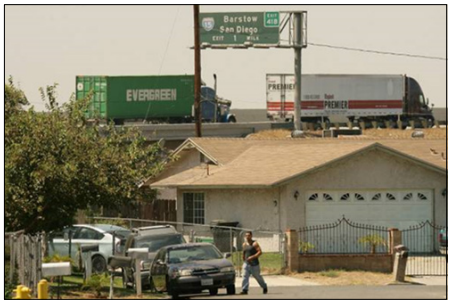


Figure 7-4: Freeway-generated noise

Motor Vehicles. Motor vehicles are one of the most pervasive sources of noise in the City. Motor vehicle noise varies in how it affects land uses depending upon the type of roadway and the distance of the land use from that roadway. Some variables that affect the amount of noise emitted from a road are speed of traffic, flow of traffic, and type of traffic (i.e., automobile versus truck). Another variable affecting the overall measurement of noise is an increased sensitivity to vehicular noise at night. *Figure 7-5* illustrates the existing noise contours from major roads and highways in and near the City. *Figure 7-6* illustrates future noise conditions with anticipated 2017 General Plan buildout.

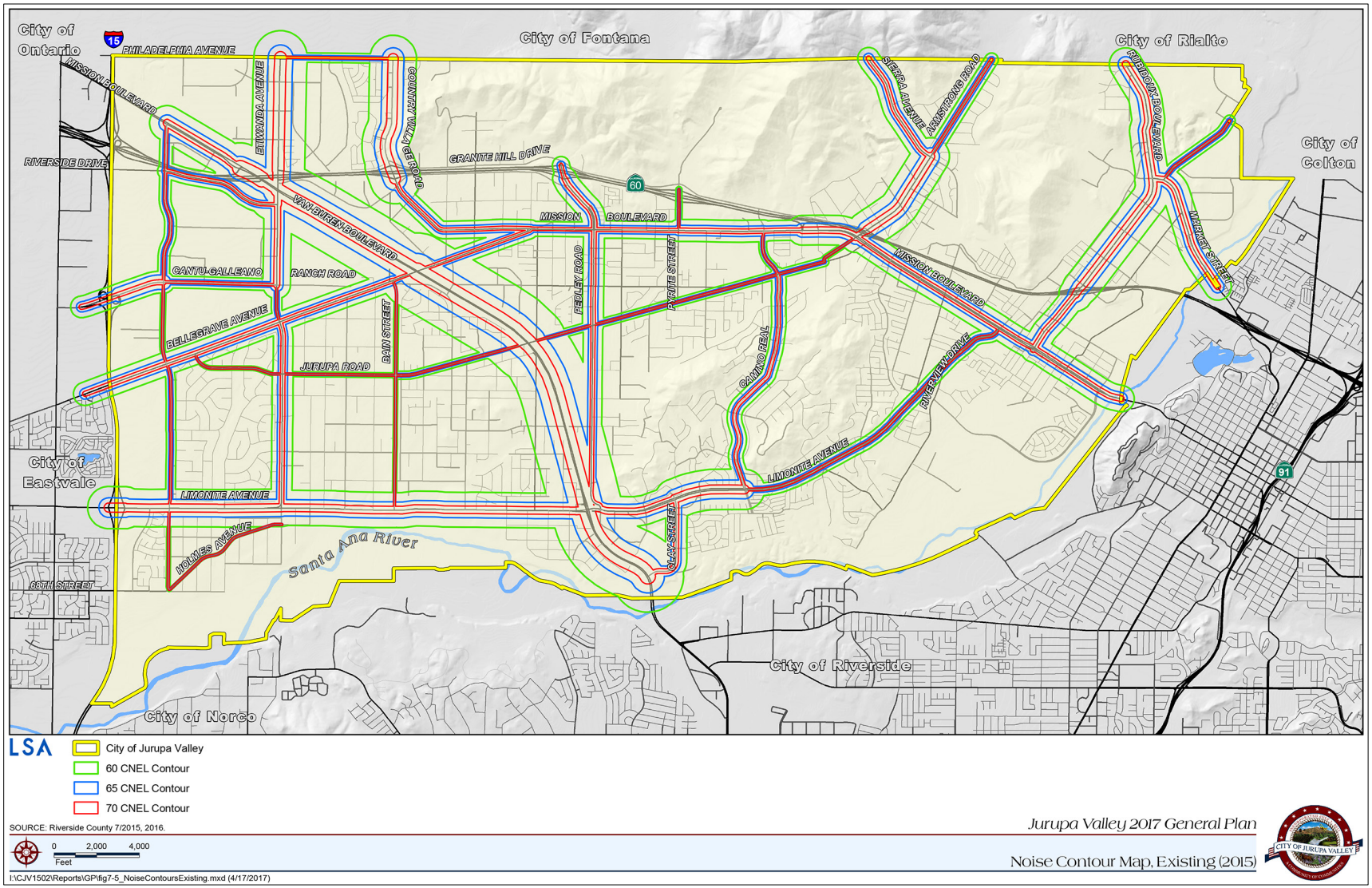


Figure 7-5: Noise contour map, existing (2015)

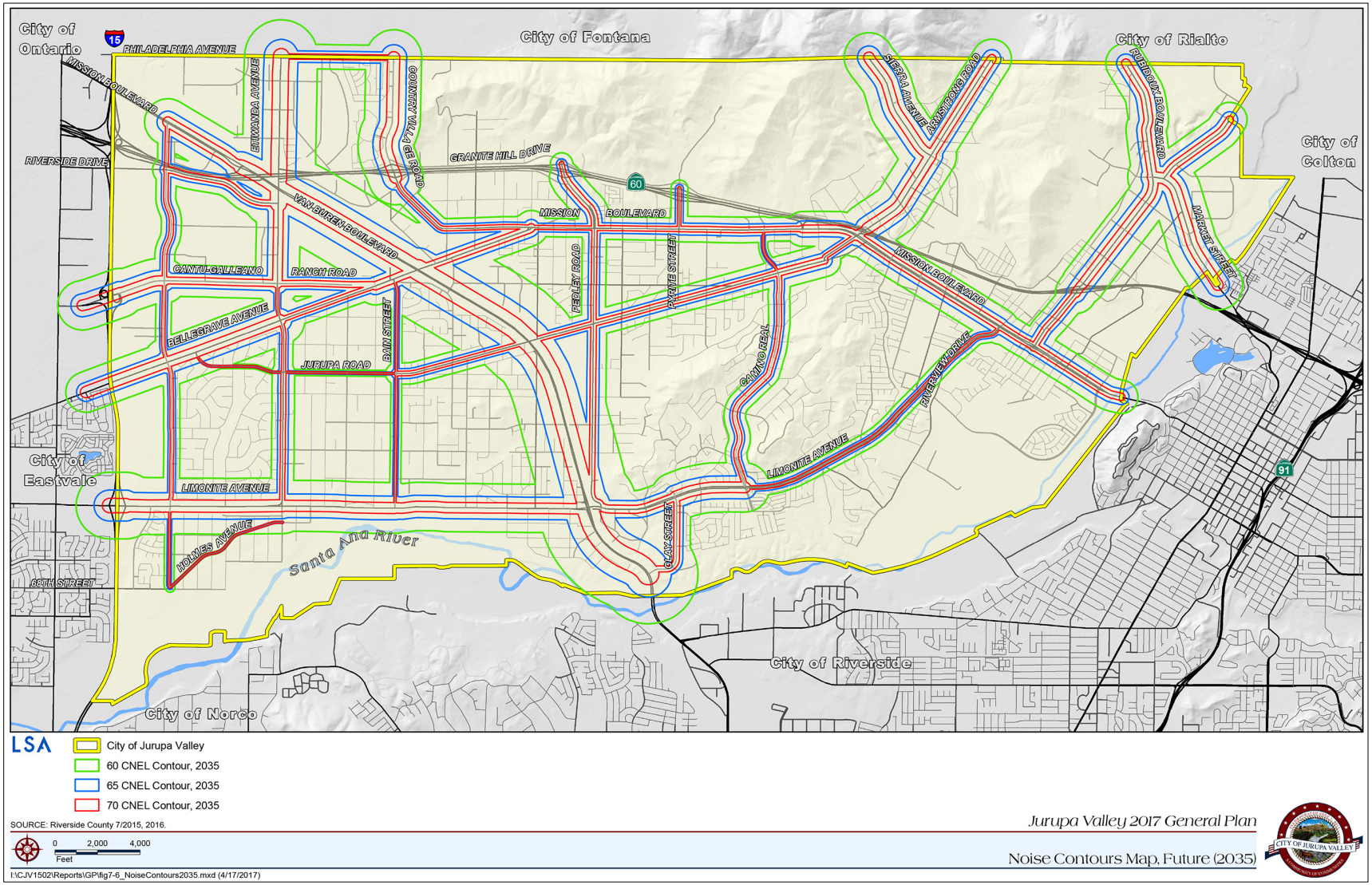


Figure 7-6: Noise contour map, future (2035)

Rail. As outlined in the Mobility Element, the rail system within Jurupa Valley includes the Union Pacific freight railroad and the Metrolink light rail transit that transports commuters to Riverside, Pomona, and Los Angeles. A Burlington Northern Santa Fe (BNSF) freight line also runs through Agua Mansa, Belltown and Glen Avon. Noise from rail operations may disrupt activities in proximity to the railroad tracks. For instance, trains are required to sound their horns at all at-grade crossings, and they may be required to slow their speed through residential areas. These types of noise disturbances can interfere with activities conducted at noise-sensitive land uses. *Figure 7-7* and *Figure 7-8* show existing and future commuter and freight noise contours from rail traffic in the City.

Aircraft. Jurupa Valley is subject to aircraft noise from Flabob Airport and the Riverside Municipal Airport, as shown in *Figure 7-9*. In addition, the community is subject to aircraft noise from the LA/Ontario International Airport, especially when Santa Ana winds force planes to take off in an easterly direction.

Aircraft noise tends to generate the greatest community anti-noise response, although the duration of noise from a single airplane is much less, for example, than that from a freight train. There is great economic benefit to be gained from airports of any size, although living in proximity to an airport can expose residents to aircraft noise. An Airport Land Use Compatibility Plan has been created for each of the airports and includes noise contours and guidelines for compatible land uses, included in the Noise Handbook, Appendix 4.0.

Policies

NE 2.1 **Roadway Projects.** Include noise mitigation measures in the design and construction of new roadway projects in the City. Noise mitigation may include speed reduction, roadway design, noise-reducing materials or surfaces, edge treatments and parkways with berms and landscaping, and other measures.

NE 2.2 **Commercial Truck Deliveries.** Require commercial or industrial truck delivery hours be limited to least-sensitive times of the day when adjacent to noise-sensitive land uses, unless there is no feasible alternative or there are overriding transportation benefits, as determined by the Planning Director.

NE 2.3 **Off-Road Vehicles.** Restrict the use of motorized trail bikes, mini-bikes, and other off-road vehicles except where designated for that purpose. Enforce strict operating hours for these vehicles where they are located to minimize noise impacts on sensitive land uses adjacent to public trails and parks.

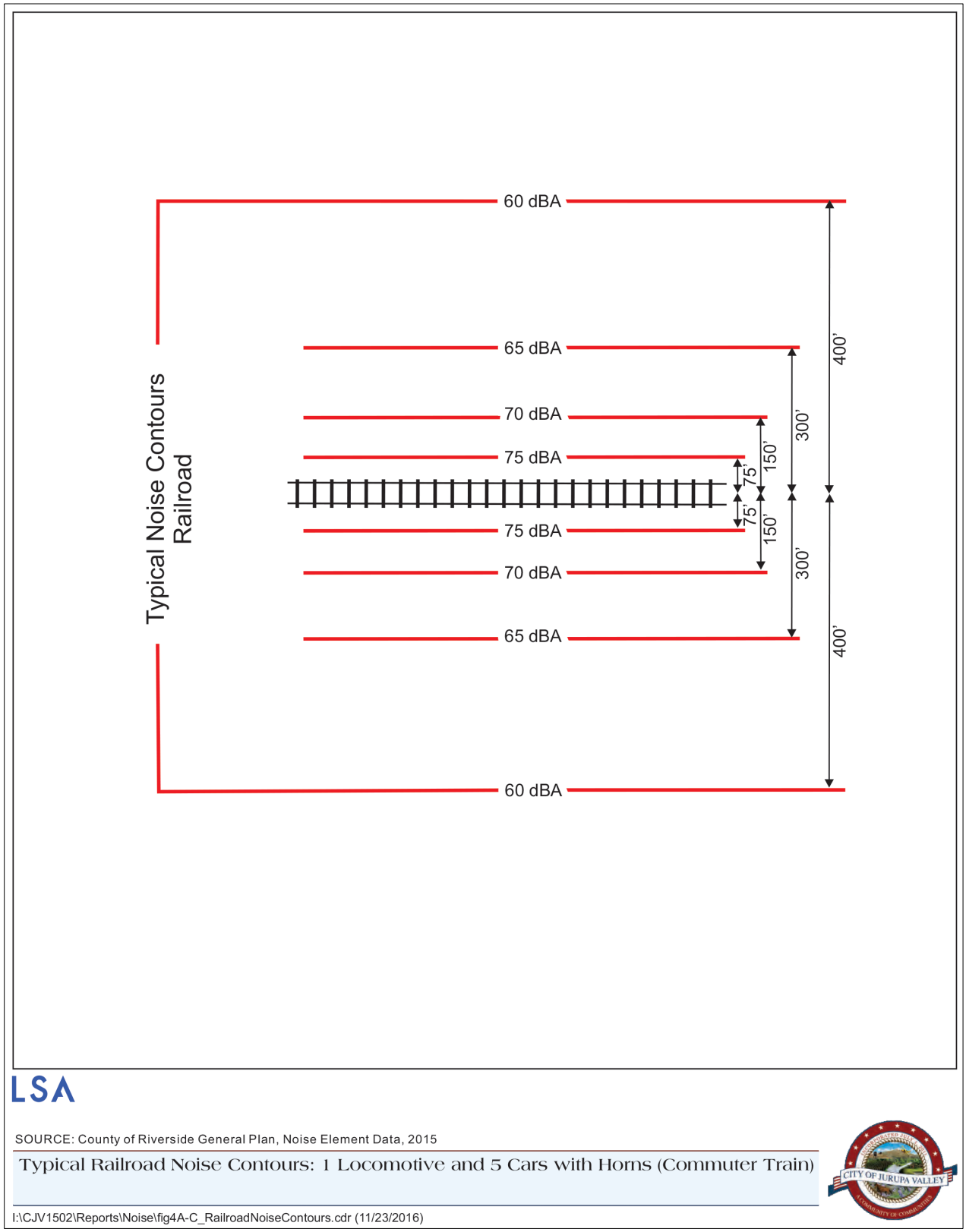
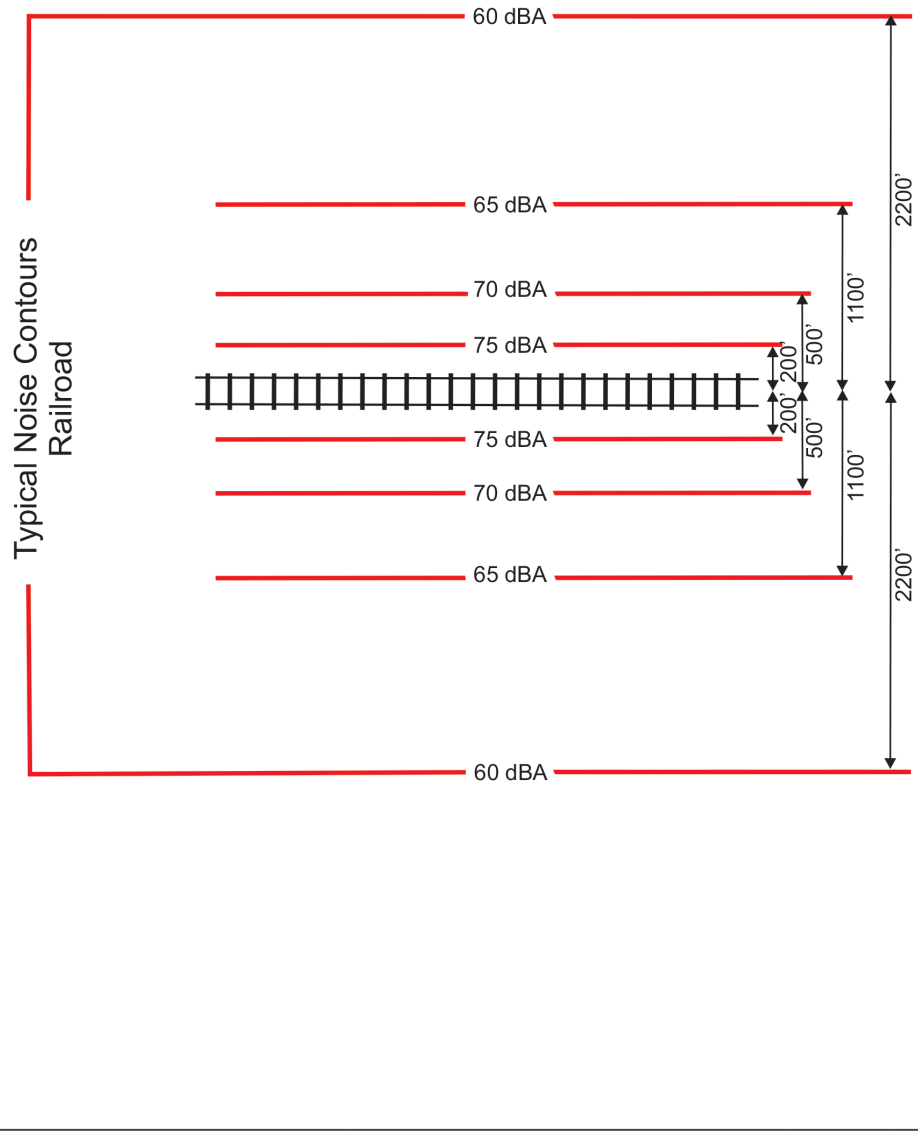


Figure 7-7: Typical railroad noise contours, commuter train



LSA

SOURCE: County of Riverside General Plan, Noise Element Data, 2015

Typical Railroad Noise Contours: 2 Locomotives and 50 Cars with Horns (Freight Train)

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Figure 7-8: Typical railroad noise contours, freight train

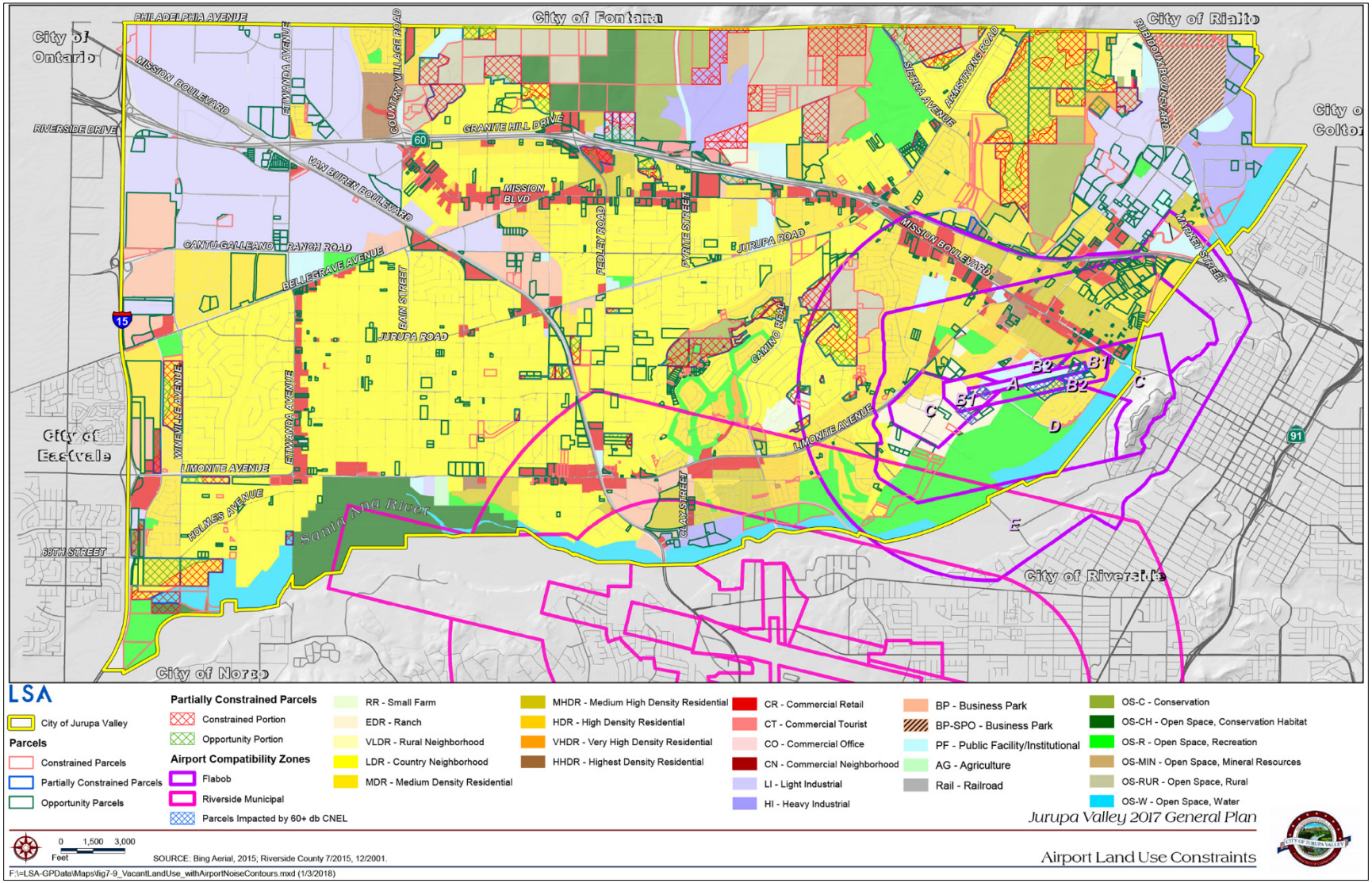

Figure 7-9: Airport land use constraints

NE 2.4 **Rail Noise.** Minimize the noise effect of rail transit (freight and passenger) on residential uses and other sensitive land uses through the land use planning and discretionary approval process.

NE 2.5 **Rail Noise Mitigation.** Encourage and, where possible, require the rail service provider to install noise mitigation features where rail operations impact existing adjacent residential or other noise-sensitive uses.

NE 2.6 **Noise Contours.** Check all proposed development projects for possible location within roadway, railroad, and airport noise contours.

NE 2.7 **Airport Compatibility.** Comply with applicable noise mitigation policies contained in the Airport Land Use Compatibility (ALUC) Plans for Flabob Airport, Riverside Municipal Airport, and the LA/Ontario International Airport.

NE 2.8 **Preferred Noise Mitigation Methods.** When approving new development of noise-sensitive uses or noise-generating uses, the City will require noise mitigation in the order of preference, as listed below, with "1" being most preferred. For example, when mitigating outdoor noise exposure, providing distance between source and recipient is preferred to providing berms and walls. Before approving a less desirable approach, the City approval body must make a finding that more desirable approaches are not effective or that it is not practical to use the preferred approaches consistent with other design criteria based on the General Plan.

1. Mitigating Noise Generation
    a. Design the site of the noise-producing project so that buildings or other solid structures shield neighboring noise-sensitive uses;
    b. Limit the operating times of noise-producing activities;
    c. Provide features, such as walls, with a primary purpose of blocking noise.
2. Mitigating Outdoor Noise Exposure
    a. Provide distance between noise source and recipient;
    b. Provide distance plus planted earthen berms;
    c. Provide distance and planted earthen berms, combined with sound walls;
    d. Provide earthen berms combined with sound walls;
    e. Provide sound walls only;

f. Integrate buildings and sound walls to create a continuous noise barrier.

NE 2.9 **Noise Mitigation in Town Centers.** In the City's town center areas, building orientation and acoustical construction techniques may be utilized as a first order of preference to mitigate noise levels.

NE 2.10 **Noise Walls.** Noise mitigation walls (sound walls) should be used only when it is shown that preferred approaches are not effective or that it is not practical to use the preferred approaches consistent with other design criteria in the General Plan. Where noise walls are used, they should be designed to enhance community character, protect significant views, discourage graffiti, and help create an attractive pedestrian-friendly residential setting through features such as setbacks, changes in vertical and horizontal alignment, detail and texture, public art, walkways or trails, and landscaping. The height of such walls should be minimized, and where sound attenuation requires that a buffer that exceeds 10 feet in height, the sound buffer should consist of a combination of berms and a wall, or two or more retaining walls stepped back to allow intervening landscaping.

Programs

NE 2.1.1 **Truck Routes.** Prepare and adopt truck routes to direct commercial trucks away from sensitive noise receptors.

NE 2.1.2 **City Actions.** The City will consider implementing one or more of the following measures where existing or cumulative increases in noise levels from new development significantly affect noise-sensitive land uses or residential neighborhoods:

1. Rerouting traffic onto streets that can maintain desired levels of service, consistent with the Mobility Element, and that do not adjoin noise-sensitive land uses.
2. Rerouting commercial trucks onto streets that do not adjoin noise-sensitive land uses.
3. Constructing noise barriers.
4. Reducing traffic speeds through street or inter-section design methods (also refer to the Mobility Element).
5. Retrofitting buildings with noise-reducing features.
6. Establishing financial programs, such as low cost loans to owners of noise-impacted property, or requiring noise mitigation or trip reduction programs as a condition of development approval.

7. Encourage and support stepped up enforcement of traffic laws and the *California Vehicle Code*.

NE 2.1.3 **City Operations and Purchasing**. The City will pursue alternatives to the use of noisy equipment and vehicles, and will purchase equipment and vehicles only if they incorporate the best available noise reduction technology.

NE 3 – Stationary Noise Sources

Figure 7-10: Leaf blower use in residential neighborhood

A stationary noise source is a land use, building, or activity in a relatively fixed location that emits noise. The noise may be temporary, intermittent, or continuous. Stationary noise sources are common in many noise-sensitive areas. Motors, appliances, air conditioners, lawn and garden equipment, power tools, generators, and amplified sounds are often found in residential neighborhoods, as well as on or near the properties of schools, hospitals, and parks. Industrial, commercial, and manufacturing facilities can also generate stationary noise that may affect sensitive land uses.

The emitted noise can usually be reduced to acceptable levels either at the source or on the adjacent property through the use of proper planning, setbacks, block walls, acoustic-rated windows, dense landscaping, or by changing the location of the noise producer. In Jurupa Valley, some of the stationary noise producers include truck transfer stations, construction activities, idling trucks, and a go-kart racetrack. Maximum noise exposure levels from stationary sources for noise-sensitive uses are regulated by the Municipal Code.

Nuisance noise, such as amplified music from bars and private parties, dog barking, and illegal firework use, is another type of stationary source noise that has been identified by area residents as creating a problem within the City. The effects or significance of nuisance noise can be compounded by the time of day, volume, and proximity to sensitive receptors. For instance, a loud party might be tolerated by neighbors in the early evening hours but be considered a nuisance after 10:00 p.m. The City's Noise Ordinance contains regulations limiting the allowable noise generated by private parties and other events.

Policies

NE 3.1 **Noise Analysis.** Require that a noise analysis be conducted by an acoustical specialist for all proposed development projects that have the potential to generate significant noise near a noise-sensitive land use, or on or near land designated for noise-sensitive land uses, and ensure that recommended mitigation measures are implemented.

NE 3.2 **Truck Loading, Shipping, and Parking.** Require that the loading, shipping or parking facilities of commercial and industrial land uses that abut or are within 200 feet of residential parcels, be located and designed to minimize potential noise impacts upon residents. Overnight commercial truck parking areas shall be regulated in the Zoning Ordinance as a commercial use.

NE 3.3 **Noise Buffers.** Require major stationary noise-generating sources to install noise buffering or reduction mechanisms within their facilities to reduce noise generation levels to the lowest level practical as a condition of the approval or renewal of project entitlements.

NE 3.4 **Construction Equipment.** Require that all construction equipment utilize noise reduction features (i.e., mufflers and engine shrouds) that are at least as effective as those originally installed by the equipment's manufacturer.

NE 3.5 **Construction Noise.** Limit commercial construction activities adjacent to or within 200 feet of residential uses to weekdays, between 7:00 a.m. and 6:00 p.m., and limit high-noise-generating construction activities (e.g., grading, demolition, pile driving) near sensitive receptors to weekdays between 9:00 a.m. and 3:00 p.m.

NE 3.6 **Commercial Truck Idling**. Restrict truck idling near noise sensitive receptors.

NE 3.7 **Automobile-Oriented Uses**. Require that parking structures, terminals, drive-through restaurants, automobile sales and repair, fueling stations, mini-marts, car washes, and similar automobile-oriented uses be sited and designed to minimize potential noise impacts on adjacent land uses.

NE 3.8 **Entertainment Uses.** Minimize the generation of excessive noise from entertainment and restaurant/bar establishments into adjacent residential or noise-sensitive uses.

NE 3.9 **Neighborhood Noise.** Support efforts of the Sheriff's Department, Animal Control, and Code Enforcement to curb nuisance noise from private parties, barking dogs, and illegal firework use.

Program

NE 3.1.1 **Ensuring Compliance.** Ensure that required noise mitigation measures are enforced as a project is built, and in place and/or fully implemented prior to release of occupancy, including enforcement of the State Building Codes regarding Chapter 35, "Sound Transmission

Control," as amended, and "Noise Insulation Standards" (*California Code of Regulations*, Title 24).

NE 3.1.2 **Stationary Noise Regulations.** Review and revise the City's Noise Ordinance to ensure there are adequate stationary noise regulations in effect to protect the quality of life of Jurupa Valley.

NE 4 – Ground-Borne Vibration

Figure 7-11: Construction graders, Inland Empire

In Jurupa Valley, the primary sources of vibration are construction activities, such as demolition, excavation, and pile driving; rail transport, including light and heavy rail, truck idling, and truck transport. In addition, because most hillside areas are solid granite, grading for new construction often includes blasting. All of these sources can be disruptive to vibration-sensitive receptors such as residential uses, concert halls, hospitals, libraries, research operations, schools, and offices. The following policies and programs seek to minimize the adverse effects of vibration on sensitive uses in Jurupa Valley.

Policies

NE 4.1 **Sensitive Land Uses.** Avoid the placement of sensitive land uses adjacent to or within one-quarter mile of vibration-producing land uses.

NE 4.2 **Vibration Producing Land Uses.** Avoid the placement of vibration-producing land uses adjacent to or within one-quarter mile of sensitive receptors.

NE 4.3 **Truck Idling.** Restrict truck idling near sensitive vibration receptors.

NE 4.4 **Passing Trains.** Prohibit exposure of residential dwellings to perceptible ground vibration from passing trains as perceived at the ground or the second floor. Perceptible motion shall be presumed to be a motion velocity of 0.01 inches per second over a range of 1 to 100 Hz.

NE 4.5 **Mining Operations.** Require measures to protect properties adjacent to mining or construction sites that will entail blasting as part of the operation when considering land use entitlement applications.

Programs

NE 4.1.1 **Rail-Related Noise.** Minimize the noise impact of passenger (Metrolink) and freight rail service on sensitive land uses by coordinating with rail authorities to effectively manage train noise and by establishing and enforcing noise mitigation measures that apply to rail uses.

NE 4.1.2 **Quiet Zone Crossings.** Require new development in the vicinity of railroad crossings that are within 1,000 feet of existing residential neighborhoods to design and construct Quiet Zone railroad crossing improvements and seek to qualify for a Quiet Zone designation.

###

Appendix B

Field Data and Photos

Field Sheet

Project: 45th and Saxon Residential Development **Engineer:** D. Shivaiah **Date:** 4/18/2022 **JN:** 1742-2022-02

Measurement Address: Northwest corner of 45th Street and Saxon Court **City:** Jurupa Valley **Site No.:** 1

Sound Level Meter:
LD-712
Serial # A0520

Calibrator:
LD-250 250
Serial # 1322

Calibration Record:

	Input, dB/	Reading, dB/	Offset, dB/	Time
Before				
After				
Before	94.0	94.0	0.0	2:18 PM
After	94.0	94.0	0.0	2:18 PM

Notes:
Temp: 79
Windspeed: 5 MPH
Direction: ENE
Skies: Clear
Camera:
Photo Nos.

Meter Settings:
☒ A-WTD ☐ LINEAR ☒ SLOW ☐ 1/1 OCT ☒ INTERVALS ___10____- MINUTE
☐ C-WTD ☐ IMPULSE ☐ FAST ☐ 1/3 OCT ☒ L_N PERCENTILE VALUES

Notes:

Measurement Type:
Long-term
Short-term X

		Start Time	Stop Time	Leq	Lmax	Lmin	L2	L8	L25	L50
Locations	1	2:20 PM	2:30 PM	65.3	77.2	46.4	73.9	70.9	65.3	57.6
		Measurement was taken at the southern residential home (at 6220, 45th Street), approximately 18 feet from the centerline of the 45th Street.								
	2	2:33 PM	2:43 PM	62.5	80.3	42.9	75.8	60.2	54.2	49.0
		Measurement was taken along the western property line of the site, approximately 50 feet from southern property line.								
	3									
	4									

RK engineering group, inc.

Field Sheet - ST1 Location Photos

Project: 45th and Saxon Residential Development	**Engineer:** D. Shivaiah	**Date:**	4/18/2022
		JN:	1742-2022-02
Measurement Address:		**Site No.:**	1

Measurement was taken at the southern residential home (at 6220, 45th Street), approximately 18 feet from the centerline of the 45th Street.

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Field Sheet - ST2 Location Photos

Project: 45th and Saxon Residential Development

Engineer: D. Shivaiah

Date: 4/18/2022

JN: 1742-2022-02

Measurement Address:

Site No.: 2

Measurement was taken along the western property line of the site, approximately 50 feet from southern property line.

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Appendix C

Stationary Noise Impact Results

NOISE BARRIER CALCULATIONS - BASED UPON FHWA - RD-77-108

PROJECT:	45th and Saxon Residential Project	JOB #:	1742-2022-2
SOURCE:	Nearest HVAC Unit	DATE:	21-Apr-22
LOCATION:	Nearest Sensitive Receptor Property Line	BY:	D. Shivaiah

NOISE INPUT DATA

OBS DIST=	20.0			
DT WALL=	10.0			
DT W/OB=	10.0			
HTH WALL=	6.0	********		
BARRIER =	0.0	(0=WALL,1=BERM)		
OBS HTH=	5.0			
NOISE HTH=	3.0		BARRIER+	
OBS EL =	0.0		TOPO SHIELDING =	-7.90
NOISE EL =	0.0		NOISE HTH EL=	3.0
DROP-OFF=	20.0	(20 = 6 dBA PER DOUBLING OF DISTANCE)		
COFF				

NOISE OUTPUT DATA (dBA)

	DIST (FT)	Leq	Lmax	L2	L8	L25	L50
REF LEVEL	1	76.0					
PROJ LEVEL	20	50.0					
SHIELDING	20	-7.9					
ADJ LEVEL	20	***42.1***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***

NOISE LEVEL REDUCTION DUE TO DISTANCE = -26.0205999

Appendix D

Construction and Vibration Analysis Results

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 4/19/2022
Case Description: 45th and Saxon Residential Development

				---- Receptor #1 ----			
		Baselines (dBA)					
Description	Land Use	Daytime	Evening	Night			
Site Preparation	Residential	80	80	45			

			Equipment Spec	Actual	Receptor	Estimated
	Impact		Lmax	Lmax	Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Dozer	No	40		81.7	50	0
Tractor	No	40	84		50	0
Dozer	No	40		81.7	50	0
Dozer	No	40		81.7	50	0
Tractor	No	40	84		50	0
Tractor	No	40	84		50	0
Tractor	No	40	84		50	0

		Results	
		Calculated (dBA)	
Equipment		*Lmax	Leq
Dozer		81.7	77.7
Tractor		84	80
Dozer		81.7	77.7
Dozer		81.7	77.7
Tractor		84	80
Tractor		84	80
Tractor		84	80
	Total	84	87.6

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 4/19/2022
Case Description: 45th and Saxon Residential Development

				---- Receptor #1 ----			
		Baselines (dBA)					
Description	Land Use	Daytime	Evening	Night			
Grading	Residential	80	80	45			

			Equipment			
	Impact		Spec Lmax	Actual Lmax	Receptor Distance	Estimated Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Excavator	No	40		80.7	50	0
Grader	No	40	85		50	0
Excavator	No	40		80.7	50	0
Dozer	No	40		81.7	50	0
Scraper	No	40		83.6	50	0
Scraper	No	40		83.6	50	0
Tractor	No	40	84		50	0
Tractor	No	40	84		50	0

Results

Calculated (dBA)

Equipment		*Lmax	Leq
Excavator		80.7	76.7
Grader		85	81
Excavator		80.7	76.7
Dozer		81.7	77.7
Scraper		83.6	79.6
Scraper		83.6	79.6
Tractor		84	80
Tractor		84	80
	Total	85	88.2

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 4/19/2022
Case Description: 45th and Saxon Residential Development

		Baselines (dBA)		---- Receptor #1 ----
Description	Land Use	Daytime	Evening	Night
Building Construction	Residential	80	80	45

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	50	0
Pickup Truck	No	40		75	50	0
Generator	No	50		80.6	50	0
Tractor	No	40	84		50	0
Welder / Torch	No	40		74	50	0
Pickup Truck	No	40		75	50	0
Tractor	No	40	84		50	0
Tractor	No	40	84		50	0
Pickup Truck	No	40		75	50	0

Results

		Calculated (dBA)	
Equipment		*Lmax	Leq
Crane		80.6	72.6
Pickup Truck		75	71
Generator		80.6	77.6
Tractor		84	80
Welder / Torch		74	70
Pickup Truck		75	71
Tractor		84	80
Tractor		84	80
Pickup Truck		75	71
	Total	84	86.3

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 4/19/2022
Case Description: 45th and Saxon Residential Development

		Baselines (dBA)		---- Receptor #1 ----
Description	Land Use	Daytime	Evening	Night
Paving	Residential	80	80	45

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	50	0
Paver	No	50		77.2	50	0
Roller	No	20		80	50	0
Roller	No	20		80	50	0
Tractor	No	40	84		50	0
Tractor	No	40	84		50	0

Results

		Calculated (dBA)	
Equipment		*Lmax	Leq
Paver		77.2	74.2
Paver		77.2	74.2
Roller		80	73
Roller		80	73
Tractor		84	80
Tractor		84	80
	Total	84	84.7

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 4/19/2022
Case Description: 45th and Saxon Residential Development

		Baselines (dBA)		---- Receptor #1 ----
Description	Land Use	Daytime	Evening	Night
Architectural Coating	Residential	80	80	45

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	50	0

Results

Calculated (dBA)

Equipment		*Lmax	Leq
Compressor (air)		77.7	73.7
	Total	77.7	73.7

*Calculated Lmax is the Loudest value.

VIBRATION IMPACTS FROM CONSTRUCTION AND OPERATIONS

PROJECT:	45th and Saxon Residential Development	JOB #:	1742-2022-02
ACTIVITY:	Large Bulldozer	DATE:	19-Apr-22
LOCATION:	Nearest Structure	ENGINEER:	D. Shivaiah

VIBRATION INPUT/OUTPUT DATA

OTHER CONSTRUCTION EQUIPMENT

$$PPV = PPV_{ref}(25/D)^{n} \text{ (in/sec)}$$

PPV =	**0.089 in/sec**

Equipment Type =	2	Large Bulldozer
PPV_{ref} =	0.089	Reference PPV at 25 ft.
D =	25.00	Distance from Equipment to receiver in ft.
n =	1.10	Vibration attenuation rate through the ground

EQUIPMENT PPV REFERENCE LEVELS

Type	Equipment	Reference PPV
1	Vibratory Roller	0.210
2	Large Bulldozer	0.089
3	Caisson Drilling	0.089
4	Loaded Trucks	0.076
5	Jackhammer	0.035
6	Small Bulldozer	0.003
7	Crack and Seat	2.400

VIBRATION IMPACTS FROM CONSTRUCTION AND OPERATIONS

PROJECT:	45th and Saxon Residential Development	JOB #:	1742-2022-02
ACTIVITY:	Vibratory Roller	DATE:	19-Apr-22
LOCATION:	Nearest Structure	ENGINEER:	D. Shivaiah

VIBRATION INPUT/OUTPUT DATA

OTHER CONSTRUCTION EQUIPMENT

$$PPV = PPV_{ref}(25/D)^{n} \text{ (in/sec)}$$

PPV =	**0.210 in/sec**

Equipment Type =	1	Vibratory Roller
PPV_{ref} =	0.210	Reference PPV at 25 ft.
D =	25.00	Distance from Equipment to receiver in ft.
n =	1.10	Vibration attenuation rate through the ground

EQUIPMENT PPV REFERENCE LEVELS

Type	Equipment	Reference PPV
1	Vibratory Roller	0.210
2	Large Bulldozer	0.089
3	Caisson Drilling	0.089
4	Loaded Trucks	0.076
5	Jackhammer	0.035
6	Small Bulldozer	0.003
7	Crack and Seat	2.400

VIBRATION IMPACTS FROM CONSTRUCTION AND OPERATIONS

PROJECT:	45th and Saxon Residential Development	JOB #:	1742-2022-02
ACTIVITY:	Loaded Trucks	DATE:	19-Apr-22
LOCATION:	Nearest Structure	ENGINEER:	D. Shivaiah

VIBRATION INPUT/OUTPUT DATA

OTHER CONSTRUCTION EQUIPMENT

$$PPV = PPV_{ref}(25/D)^{n} \text{ (in/sec)}$$

PPV =	**0.076 in/sec**

Equipment Type =	4	Loaded Trucks
PPV_{ref} =	0.076	Reference PPV at 25 ft.
D =	25.00	Distance from Equipment to receiver in ft.
n =	1.10	Vibration attenuation rate through the ground

EQUIPMENT PPV REFERENCE LEVELS

Type	Equipment	Reference PPV
1	Vibratory Roller	0.210
2	Large Bulldozer	0.089
3	Caisson Drilling	0.089
4	Loaded Trucks	0.076
5	Jackhammer	0.035
6	Small Bulldozer	0.003
7	Crack and Seat	2.400

Suggested "n" Values Based on Soil Classes		
Soil Class	**Description of Soil Material**	**Suggested Value of "n"**
I	Weak or soft soils: loose soils, dry or partially saturated peat and muck, mud, loose beach sand, and dune sand.	1.4
II	Most sands, sandy clays, silty clays, gravel, silts, weathered rock.	1.3
III	Hard soils: dense compacted sand, dry consolidated clay, consolidated glacial till, some exposed rock.	1.1
IV	Hard, component rock: bedrock, freshly exposed hard rock.	1.0

Guideline Vibration Damage Potential Threshold Criteria		
Structure and Condition	**Maximum PPV (in/sec)**	
	Transient Sources	**Continuous/Frequent Intermittent Sources**
Extremely fragile historic buildings, ruins ancient monuments	0.12	0.08
Fragile buildings	0.20	0.10
Historic and some old buildings	0.50	0.25
Older residential structures	0.50	0.30
New residential structures	1.00	0.50
Modern industrial/commercial buildings	2.00	0.50

Guideline Vibration Annoyance Potential Criteria		
Human Response	**Maximum PPV (in/sec)**	
	Transient Sources	**Continuous/Frequent Intermittent Sources**
Barely perceptible	0.04	0.01
Distinctly perceptible	0.25	0.04
Strongly perceptible	0.90	0.10
Severe	2.00	0.40

Note: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

Source: Caltrans Transportation and Construction-Induced Vibration Guidance Manual, June 2004