TTM 39105 Residential Project
Noise Impact Study

City of Jurupa Valley, California
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rkengineer.com

RK ENGINEERING GROUP INC.

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Prepared for:
Mr. Shay Mueller
RC HOBBS COMPANIES
1428 East Chapman Avenue
Orange, CA 92866

Prepared by:
RK Engineering Group, Inc.
1401 Dove Street, Ste. 540
Newport Beach, CA 92660

Bryan Estrada, AICP
Becca Morrison

Table of Contents

Section			Page
1.0	**Introduction**		**1-1**
	1.1	Purpose of Report & Study Objectives	1-1
	1.2	Site Location & Project Description	1-1
	1.3	Sensitive Receptors	1-2
	1.4	Summary of Analysis Results	1-2
	1.5	Recommended Project Design Features (DF)	1-3
2.0	**Fundamentals of Noise**		**2-1**
	2.1	Sound, Noise, and Acoustics	2-1
	2.2	Frequency and Hertz	2-1
	2.3	Sound Pressure Levels and Decibels	2-1
	2.4	Addition of Decibels	2-1
	2.5	Human Response to Changes in Noise Levels	2-1
	2.6	Noise Descriptors	2-2
	2.7	Sound Propagation	2-3
	2.8	Vibration Descriptors	2-5
	2.9	Vibration Perception	2-5
	2.10	Vibration Propagation	2-5
	2.11	Construction-Related Vibration Level Prediction	2-6
3.0	**Regulatory Setting**		**3-1**
	3.1	State Regulations	3-1
	3.2	City of Jurupa Valley Noise Regulations	3-1
		3.2.1 General Plan Noise Standards	3-2
		3.2.2 Municipal Code Noise Standards	3-2
	3.3	Noise Thresholds of Significance	3-3

Table of Contents

Section		Page
4.0	**Study Method and Procedures**	**4-1**
4.1	Noise Measurement Procedures and Criteria	4-1
4.2	Stationary Noise Source Modeling	4-2
4.3	Mobile Noise Source Modeling	4-2
4.3.1	Traffic Noise Modeling	4-2
4.4	Interior Noise Modeling	4-4
4.5	Construction Noise Modeling	4-5
4.6	Construction Vibration Modeling	4-5
5.0	**Existing Noise Environment**	**5-7**
5.1	Existing Ambient Noise Measurement Results (dBA Leq)	5-7
6.0	**Operational Noise Impacts**	**6-1**
6.1	Stationary Noise Source Impacts	6-1
6.2	Mobile Source Noise Impacts	6-2
6.2.1	Roadway Noise	6-2
6.2.2	Airport Noise	6-2
6.3	Noise/Land Use Compatibility	6-3
6.3.1	Exterior Noise/Land Use Compatibility	6-3
6.3.2	Interior Noise/Land Use Compatibility	6-4
6.4	Project Design Features	6-5
6.4.1	Operational Design Features	6-5
7.0	**Construction Noise and Vibration Impacts**	**7-1**
7.1	Typical Construction Noise Levels	7-1
7.2	Construction Noise Impact Analysis	7-3
7.3	Construction Vibration	7-3

List of Exhibits

Exhibit	No.
Location Map	A
Site Plan	B
Noise Monitoring Locations	C
Riverside Municipal Airport Noise Contour Map	D

List of Tables

Table No. Page

Table 1-1 | CEQA Noise Impact Criteria 1-3
Table 2-1 | Vibration Damage Potential Threshold Criteria 2-6
Table 2-2 | Suggested "n" Values Based on Soil Classes 2-7
Table 3-1 | City of Jurupa Valley Land Use Compatibility Guidelines[1] 3-2
Table 3-2 | City of Jurupa Valley Municipal Code Noise Standards[1] 3-3
Table 3-3 | City of Jurupa Valley Noise Thresholds of Significance 3-4
Table 4-1 | Referenced Noise Levels 4-2
Table 4-2 | Roadway Parameters 4-3
Table 4-3 | Traffic Volume Data 4-4
Table 4-4 | Vehicle Distribution (Truck Mix) for Major Roadways[1] 4-4
Table 5-1 | Noise Measurement Results – L-1[1] 5-8
Table 5-2 | Noise Measurement Results – L-2[1] 5-8
Table 5-3 | Noise Measurement Results – L-3[1] 5-8
Table 6-1 | Stationary Noise Impacts – Municipal Code Noise Standards 6-2
Table 6-2 | Exterior Noise/Land Use Compatibility (dBA CNEL) 6-3
Table 6-3 | Future Interior Noise Levels (dBA CNEL) 6-4
Table 7-1 | Typical Construction Noise Levels (dBA Leq)[1] 7-2
Table 7-2 | Project Construction Noise Levels – at 500 Feet 7-3
Table 7-3 | Typical Construction Vibration Levels[1] 7-4
Table 7-4 | Construction Vibration Impact Analysis 7-5

List of Appendices

Appendix	ID
City of Jurupa Valley General Plan Noise Element and Municipal Code Chapter 11.05 – Noise Regulations	A
Field Data and Photos	B
Future Exterior Noise Levels Calculation Worksheets	C
Stationary Noise Calculation Worksheets	D
Construction Noise and Vibration Calculation Worksheets	E

1.0 Introduction

1.1 Purpose of Report & Study Objectives

The purpose of this report is to evaluate the potential noise impacts from the proposed TTM 39105 Residential Project (hereinafter referred to as "project") and provide recommendations, if necessary, to minimize any potential noise impacts.

This 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 and General Plan 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;
- Establishment of the existing ambient noise environment at the project site;
- Analysis of the project's construction and operational noise impacts to adjacent receptors;
- Analysis of the project's noise/land use compatibility and preliminary interior noise levels; and
- Summary of recommended project design features to reduce noise level impacts.

1.2 Site Location & Project Description

The proposed project site is located near the southeast corner of Limonite Avenue and Baldwin Avenue, in the City of Jurupa Valley. **Exhibit A** shows the location map of the proposed project.

The project consists of developing 85 attached residential dwelling units on approximately 4.0 net acres (5.43 gross acres). The site is currently vacant and is located adjacent to the former Albertsons grocery store which is no longer in business.

Construction activities are expected to consist of demolition, site preparation, grading, building construction, paving, and architectural coating. Approximately 2 acres of existing hardscape will be demolished during construction. The project will require the export of approximately 2,000 cubic yards of earthwork material for grading purposes.

Exhibit B shows the proposed site plan used for this analysis.

1.3 Sensitive Receptors

Sensitive receptors are considered land uses or other types of population groups that are more sensitive to noise exposure. There are several sensitive land uses adjacent to the project site, including the following.

A project site location map, including sensitive receptor locations, is provided in **Exhibit A**.

Receptor-1 Existing residential land uses located to the north of the project site. The nearest residential receptor located at Receptor-1 (marked as circle "1" on **Exhibit A**) is located approximately 300 feet north-northwest of the project site's northern boundary.

Receptor-2 Existing residential land uses located to the west of the project site. The nearest residential receptor located at Receptor-2 (marked as circle "2" on **Exhibit A**) is located approximately 175 feet west-southwest of the western boundary of the project site.

Receptor-3 Existing residential land uses located to the east of the project site. The nearest residential receptor located at Receptor-3 (marked as circle "3" on **Exhibit A**) is located approximately 900 feet east of the southeastern corner of the project site.

1.4 Summary of Analysis Results

Table 1-1 provides a summary of the noise analysis results, per the CEQA impact criteria checklist.

Table 1-1 | CEQA Noise Impact Criteria

Air Quality Impact Criteria	Potentially Significant	Potentially Significant Unless Mitigated	Less Than Significant	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. Project design features are typically included as part of the conditions of approval for the project but are not considered mitigation under CEQA.

Construction Design Features

DF-1 The project shall comply with the City of Jurupa Valley Municipal Code requirements. No construction will occur between 6:00 p.m. and 6:00 a.m.

Operational Design Features

DF-2 Any outdoor HVAC/condenser equipment should be shielded from the line of sight of the adjacent sensitive receptors behind noise barrier walls or enclosures.

DF-3 The project should incorporate building construction techniques and insulation that is consistent with California Title 24 Building Standards to achieve the minimum interior noise standard of 45 dBA CNEL for all residential units.

DF-4 A "windows closed" condition is expected to be required for all residential units facing adjacent roadways in order to meet the interior noise standard. See Section 6.3.2, **Table 6-3**, for details regarding window STC requirements.

DF-5 For proper acoustical performance, all exterior windows, doors, and sliding glass doors should have a positive seal, and leaks/cracks must be kept to a minimum. Attic vents and openings should be oriented away from the adjacent roadways.



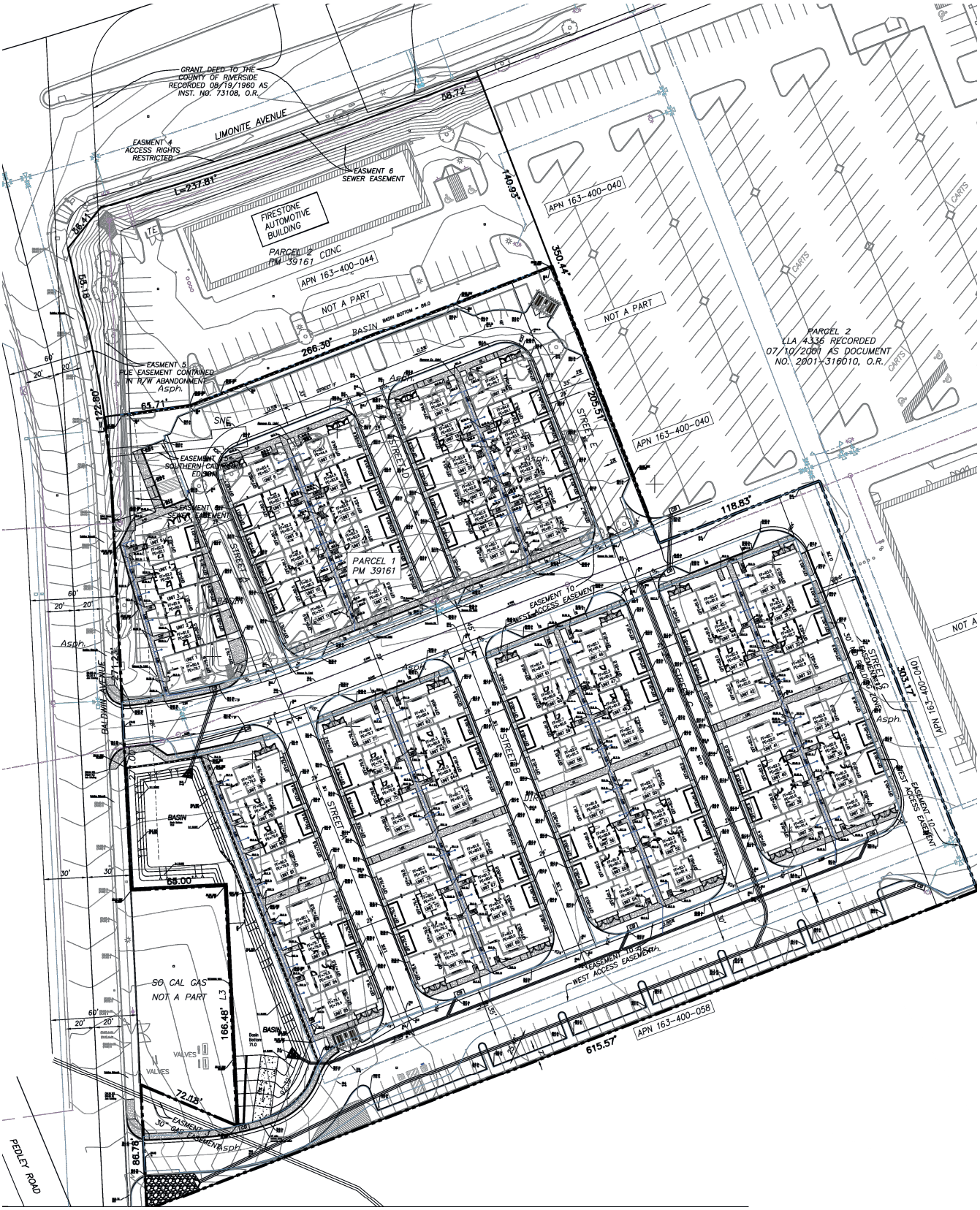
Legend

1 = Sensitive Receptor Location

= Project Site Boundary

Exhibit A

Location Map



N

Exhibit B

Site Plan

2.0 Fundamentals of Noise

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

2.1 Sound, Noise, and Acoustics

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

2.2 Frequency and Hertz

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

2.3 Sound Pressure Levels and Decibels

The amplitude of a sound determines 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 dB.

2.4 Addition of Decibels

Because decibels are on a logarithmic scale, sound pressure levels cannot be added or subtracted by simple plus or minus addition. When two (2) sounds of equal SPL are combined, they will produce an SPL 3 dB greater than the original single SPL. In other words, sound energy must be doubled to produce a 3 dB increase. If two (2) sounds differ by approximately 10 dB the higher sound level is the predominant sound.

2.5 Human Response to Changes in Noise Levels

In general, the healthy human ear is most sensitive to sounds between 1,000 Hz and 5,000 Hz, (A-weighted scale) and it perceives a sound within that range as being more intense than a sound with a higher or lower frequency with the same magnitude. For purposes of this report as well as with most environmental documents, the A-scale weighting is typically reported in terms of A-weighted decibel (dBA). Typically, the human ear can barely perceive the change in noise level of 3 dB. A change in 5

dB is readily perceptible, and a change in 10 dB is perceived as being twice or half as loud . 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. The 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.

- **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.

- **dBA.** A-weighted sound level (see definition above).

- **Equivalent Sound Level (Leq).** The sound level corresponding to a steady noise level over a given sample period with the same amount of acoustic energy as the actual time varying noise level. The energy average noise level during the sample period.

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

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

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

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

- **Percent Noise Levels.** See L(n).

- **Sound Level (Noise Level).** The weighted sound pressure level obtained by use of a sound level meter having a standard frequency-filter for attenuating part of the sound spectrum.

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

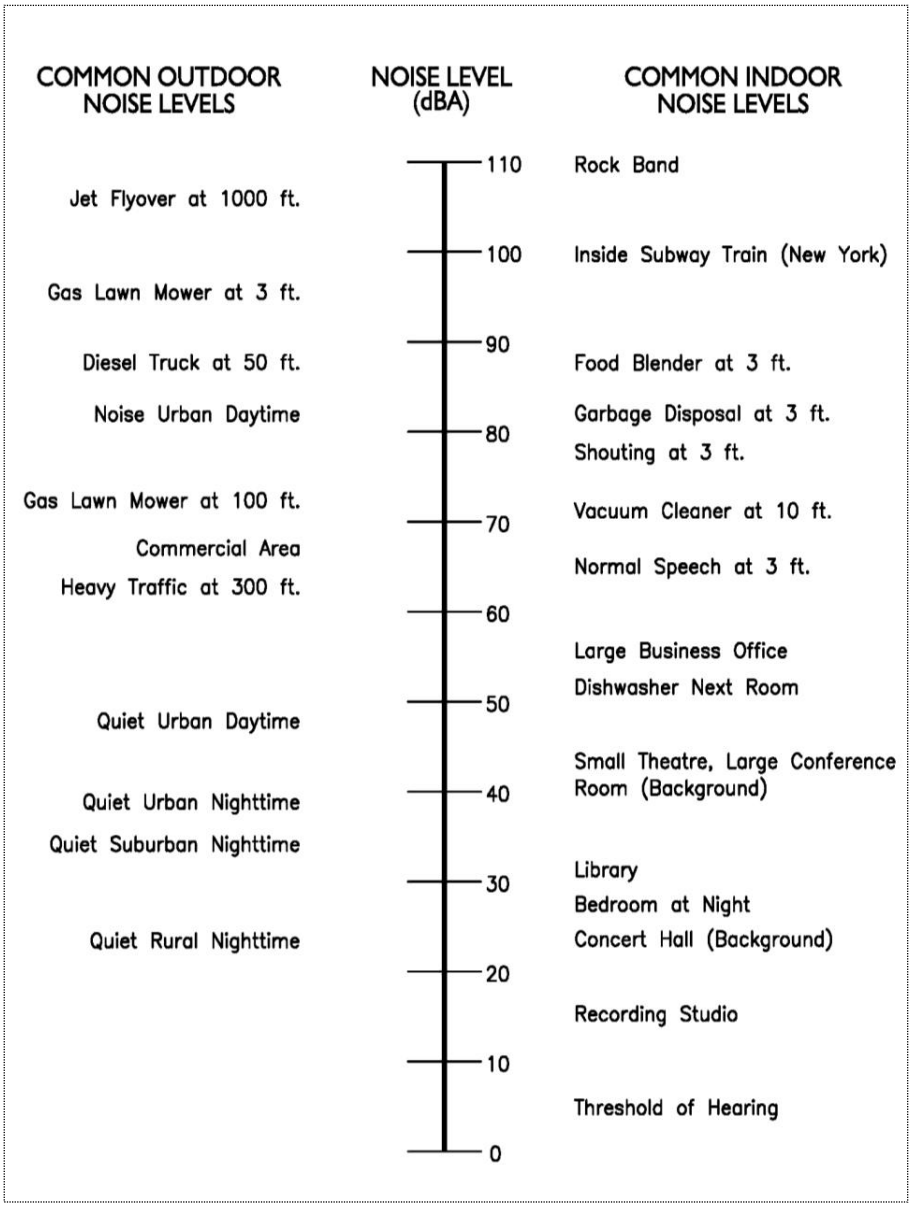
- **Single Event Noise Exposure Level (SENEL).** The dBA level which, if it lasted for one (1) second, would produce the same A-weighted sound energy as the actual event.

2.7 Sound Propagation

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

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

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



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

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 that 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.

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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 to identify potential vibration impacts that may need to be studied through actual field tests.

2.11 Construction-Related Vibration Level Prediction[2]

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 damaging to structures.

The Caltrans Transportation and Construction Vibration Guidance Manual, April 2020 provides general thresholds and guidelines as to the vibration damage potential from vibratory impacts. **Table 2-1** provides general vibration damage potential thresholds.

Table 2-1 | Vibration Damage Potential Threshold Criteria

Structure and Condition	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

[2] Source: Caltrans Transportation and Construction Vibration Guidance Manual, April 2020.

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. **Table 2-2** outlines the manual's suggested values and description.

Table 2-2 | 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, and weathered rock.	1.3
III	Hard soils: densely compacted sand, dry consolidated clay, consolidated glacial till, and 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 the agencies responsible for regulating noise are discussed below.

3.1 State Regulations

The State of California has established noise insulation standards as outlined in Title 24 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.

Noise insulation design standards for residential dwellings are established in the 2022 California Building Code, Title 24, Part 2, Volume 1, Section 1206 Sound Transmission. The City is required by the State Housing Law to adopt these State codes as minimum performance standards. The City may enact stricter noise standards throughout the city or on a case-by-case basis if deemed necessary. In brief, the Title 24 noise standards require the following for allowable interior noise levels:

1. 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.

2. 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.

3. Floor-ceiling assembly designs must provide for a minimum impact insulation class (IIC) of 50, based on lab tests. Field tested assemblies must provide a minimum FIIC of 45.

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

3.2 City of Jurupa Valley Noise Regulations

The proposed project is located in the City of Jurupa Valley and is subject to the standards and regulations established by the City of Jurupa Valley General Plan Noise Element and Municipal Code Chapter 11.05 – Noise Regulations as discussed below.

A copy of the City of Jurupa Valley General Plan and Municipal Code standards are provided in **Appendix A**.

3.2.1 General Plan Noise Standards

3.2.1.1 Noise/Land Use Compatibility

The City of Jurupa Valley General Plan establishes planning criteria for determining a development's noise/land use compatibility based on the day-night noise level (LDN) and community noise equivalent level (CNEL).

Table 3-1 shows the City of Jurupa Valley noise/land use compatibility standards for the land uses on and adjacent to the proposed project site, as prescribed in the General Plan.

Table 3-1 | City of Jurupa Valley Land Use Compatibility Guidelines[1]

Land Use Category	Community Noise Exposure (LDN / CNEL)[2]			
	Normally Acceptable	Conditionally Acceptable	Normally Unacceptable	Clearly Unacceptable
Residential – low density single family, duplex, mobile homes	60 and below	55 – 70	70 – 75	75 and above
Residential – multi family	65 and below	60 – 70	70 – 75	75 and above

[1] Source: City of Jurupa Valley General Plan Noise Element, Figure 7-3: Land Use/Noise Compatibility Matrix.

[2] Notes:

Normally Acceptable:	Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.
Conditionally Acceptable:	New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.
Normally Unacceptable:	New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.
Clearly Incompatible:	New construction or development should generally not be undertaken.

3.2.2 Municipal Code Noise Standards

3.2.2.1 Noise Standards

Table 3-2 shows the exterior noise standards established in Chapter 11.05 of the City of Jurupa Valley Municipal Code for the land uses on and adjacent to the proposed project site.

Table 3-2 | City of Jurupa Valley Municipal Code Noise Standards[1]

Land Use Category	Exterior Noise Level Thresholds (dBA Lmax)	
	Daytime (7 a.m. – 10 p.m.)	Nighttime (10 p.m. – 7 a.m.)
Residential (excluding Rural Residential)	55.0	45.0

[1] Source: City of Jurupa Valley Municipal Code Chapter 11.05, Table 1: Sound Level Standards (dB Lmax).

Per the Municipal Code, it is unlawful to 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 3-2**.

3.2.2.2 Construction Noise Standards

The City of Jurupa Valley Municipal Code Section 11.05.020 exempts the following construction-related noise from the provisions of the Municipal Code:

1. Private construction projects located one-quarter (1/4) of a mile or more from an inhabited dwelling; or

2. Private construction projects located within one-quarter (1/4) 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 during the hours of six (6:00) p.m. and seven (7:00) a.m. during the months of October through May.

3.3 Noise Thresholds of Significance

The thresholds of significance listed in **Table 3-3** are utilized by the City of Jurupa Valley to determine a project's significance under CEQA.

Table 3-3 | City of Jurupa Valley Noise Thresholds of Significance

Analysis	Receiving Land Use	Condition(s)	Significance Criteria	
			Daytime	Nighttime
Offsite	Noise-Sensitive	If ambient is < 65 dBA CNEL	Project plus ambient > 65 dBA CNEL and a ≥ 3 dBA CNEL Project Increase[2]	
	Non-Noise-Sensitive	If ambient is <70 dBA CNEL	Project plus ambient > 70 dBA CNEL and a ≥ 3 dBA CNEL Project Increase[2]	
Operational	Noise-Sensitive	Exterior Noise Level Standards[2]	65 dBA Leq	45 dBA Leq
		If ambient is > 65 dBA Leq[1]	≥ 3 dBA Leq project increase[2]	
		Vibration Level Threshold[2]	0.2 in/sec PPV	
Construction	Noise-Sensitive	Limit typical construction activities to weekdays between 7:00 a.m. and 6:00 p.m. Limit grading, demolition, pile driving to weekdays between 9:00 a.m. and 3:00 p.m.[3]		
		Noise Level Threshold[4]	80 dBA Leq	70 dBA Leq
		Vibration Threshold[2]	0.2 in/sec PPV	

[1] City of Jurupa Valley General Plan Noise Element Policy NE 1.5 and Figure 7-3 *normally acceptable* noise exposure.
[2] City of Jurupa Valley noise-related CEQA thresholds guidance for noise-sensitive receivers (Appendix 4.1).
[3] City of Jurupa Valley Municipal Code, Section 11.05.020(9).
[4] Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual.
"Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.; "PPV" = Peak Particle Velocity.

4.0 Study Method and Procedures

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

4.1 Noise Measurement Procedures and Criteria

Noise measurements are taken to determine the existing noise levels. A noise receiver or receptor is any location 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 nearest houses to the project site;
- Locations that are acoustically representative and equivalent to the area of concern;
- Human land usage; and
- Sites clear of major obstructions 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).

Piccolo-II Type 2 integrating-averaging level meters were used to conduct 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 intervals and the information was utilized to define the noise characteristics for the project. The following gives a brief description of the procedures for sound level measurements:

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

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

4.2 Stationary Noise Source Modeling

The primary source of potential stationary noise produced by the project would be the operation of onsite HVAC equipment. HVAC noise was modeled using a computer program that replicates the FHWA Noise Prediction Model (FHWA-RD-77-108). The FHWA model arrives at a predicted noise level through a series of adjustments to the reference energy noise level. The model outputs the projected noise level based on the following key parameters:

- Referenced noise level (i.e., how loud a source is at a specific distance);
- Vertical and horizontal distances of sensitive receptor from the noise source;
- Vertical and horizontal distances of noise barriers from the noise source and receptor;
- Typical noise source spectra; and
- Topography.

HVAC equipment is expected to be located on the outdoor patios, shielded from the line of sight of adjacent receptors by noise-attenuating walls. To model HVAC noise, reference noise levels for typical residential HVAC units are used. **Table 4-1** shows the referenced noise levels utilized in this analysis.

Table 4-1 | Referenced Noise Levels

Noise Source	Distance from Source (Feet)	Noise Level (dBA Lmax)
HVAC[1]	1	75

[1] Noise level is representative of a single unit.

4.3 Mobile Noise Source Modeling

4.3.1 Traffic Noise Modeling

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

- Roadway classification (e.g., freeway, major arterial, arterial, secondary, collector, etc.);
- Roadway active width (i.e., distance between the center of the outermost travel lanes on each side of the roadway);

- Average daily traffic (ADT) volumes;
- Travel speeds;
- Percentages of automobiles, medium trucks, and heavy trucks;
- Roadway grade and angle of view;
- Site conditions (e.g., soft site vs. hard site); and
- Percentage of total ADT which flows each hour throughout a 24-hour period.

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

- Vertical and horizontal distances (i.e., sensitive receptor distance from noise source);
- Noise barrier vertical and horizontal distances (i.e., noise barrier distance from sound source and receptor);
- Traffic noise source spectra; and
- Topography.

The primary source of roadway noise impacting the proposed project site would be activity along Limonite Avenue. Roadway noise along Limonite Avenue is modeled using the Existing and Future General Plan Buildout traffic volume data provided in the City of Jurupa Valley 2017 General Plan.

Table 4-2 indicates the roadway parameters used for this study. **Table 4-3** shows the Existing and Future General Plan Buildout traffic volume data used.

Future traffic noise calculation worksheets are provided in **Appendix C**.

Table 4-2 | Roadway Parameters

Roadway	Segment	Speed (MPH)	Site Conditions
1. Limonite Avenue	Pedley Road to Clay Street	45	Hard

Table 4-3 | Traffic Volume Data

Roadway	Segment	Future General Plan Buildout ADT[1]
1. Limonite Avenue	Pedley Road to Clay Street	24,935

[1] Source: City of Jurupa Valley 2017 General Plan, Appendix 3.0 - Technical Reports: Traffic and Noise, Table 3.C: General Plan Build-Out Roadway Segment Levels of Service.

Table 4-4 indicates the vehicle distribution and truck mix utilized for this analysis, based on the County of Riverside Requirements for Determining and Mitigating Traffic Noise Impacts to Residential Structures memo (April 2015). The City of Jurupa Valley General Plan classifies Limonite Avenue as an Arterial Roadway. Therefore, Riverside County's required vehicle mix for roadways designated as Major, Arterial Highways, or Expressways is utilized.

Table 4-4 | Vehicle Distribution (Truck Mix) for Major Roadways[1]

Motor-Vehicle Type	Daytime % (7 a.m. – 7 p.m.)	Evening % (7 p.m. – 10 p.m.)	Night % (10 p.m. – 7 a.m.)	Total % of Traffic Flow
Automobiles	69.50	12.90	9.60	92.00
Medium Trucks	1.44	0.06	1.50	3.00
Heavy Trucks	2.40	0.10	2.50	5.00

[1] Source: County of Riverside Requirements for Determining and Mitigating Traffic Noise Impacts to Residential Structures memo (April 2015).

4.4 Interior Noise Modeling

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

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

The TeNS manual shows that the noise reduction due to building exteriors with ordinary sash windows (windows closed) is at least 20 decibels. The building's exterior walls will be constructed per the latest

building code insulation requirements and provide occupants with the most protection from exterior noise. Insulated exterior walls, designed per the latest California Building Standards, would provide a minimum of STC 35-40. Windows, on the other hand, are one of the acoustically weakest parts of the structure. Therefore, for a conservative estimate of preliminary interior noise, the building's noise reduction potential is limited to the STC of the windows.

4.5 Construction Noise Modeling

The construction noise assessment is based on the General Assessment methodology set forth by the FTA's Transit Noise and Vibration Impact Assessment Manual, Section 7 – Noise and Vibration during Construction. This analysis utilizes the Federal Highway Administration (FHWA) Roadway Construction Noise Model, together with several key construction parameters, to estimate future construction noise levels during each phase of construction. Consistent with the FTA General Assessment methodology, the following assumptions have been utilized in the construction noise model:

- Noise emission level ($L_{emission}$) – Determine the emission level at 50 feet according to noise from typical construction equipment.
- Usage factor (Adj_{Usage}) – Assume a usage factor of one (1). This assumes a period of one-hour with full power operation.
- Distance (D) – Assume that all equipment operates at the center of the project, or centerline for guideway or highway construction projects.
- Ground effect (G) – G equals zero (0) assuming free-field conditions and ignoring ground effects.
- The $L_{eq.equip}$ is determined only for the two noisiest pieces of equipment expected to be used in each phase of construction. The equipment noise levels are summed for each phase of construction using decibel addition.

Noise levels were projected from the center of the project site to the adjacent sensitive receptor property lines. Although some construction activity may occur closer to the adjacent receptors than the center of the project site, noise levels are based on an average distance from the center of the site per FTA General Assessment recommendations.

4.6 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 bulldozers, heavy truck loading, and vibratory roller and compactor activity are analyzed. All vibratory activity is analyzed as a continuous and/or frequent event and is required to comply with the applicable guidance threshold criteria. It is expected that vibration levels will be highest during the paving phase. No impact pile driving is expected as part of this project.

Vibratory impacts were calculated from the nearest expected location of on-site construction to the nearest 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 the vibration source;
- D = distance from equipment to property line; and
- 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. The project setting is residential and commercial, and the primary environmental noise sources impacting the project site are roadway noise from adjacent streets and operational activity at the adjacent Firestone Auto Care facility.

5.1 Existing Ambient Noise Measurement Results (dBA Leq)

To determine the existing noise level environment, RK conducted three (3) one-hour noise measurements at the project site and adjacent receptors.

Noise levels were measured on October 22, 2024, using 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 of adjacent sensitive receptors. **Exhibit C** graphically illustrates the location of the noise measurements.

- Noise Monitoring Location 1 (L-1) was located near the northwest corner of the proposed project site, approximately 260 feet southeast of the centerline of Limonite Avenue and approximately 30 feet east of the centerline of Baldwin Avenue.
- Noise Monitoring Location 2 (L-2) was located near the western boundary of the proposed project site, approximately 480 feet southeast of the centerline of Limonite Avenue and approximately 55 feet east of the centerline of Baldwin Avenue.
- Noise Monitoring Location 3 (L-3) was located near the southeastern corner of the proposed project site, approximately 665 feet southeast of the centerline of Limonite Avenue and approximately 470 feet east of the centerline of Baldwin Avenue.

Noise measurements were conducted at the above-selected locations to determine the existing ambient noise environment at the project site and nearby sensitive receptors. The primary source of ambient noise during the measurement period was roadway noise from adjacent streets and railroad noise.

Results of the ambient noise measurements are shown in **Table 5-1**, **Table 5-2**, and **Table 5-3**. **Appendix B** includes photographs, field sheets, and measured noise data.

Table 5-1 | Noise Measurement Results – L-1[1]

Start Time	Stop Time	Leq	Lmax	Lmin	L2	L8	L25	L50
9:51 a.m.	10:51 a.m.	59.3	83.9	41.9	67.4	61.7	54.7	50.7

[1] L-1 was measured on October 22, 2024.

Table 5-2 | Noise Measurement Results – L-2[1]

Start Time	Stop Time	Leq	Lmax	Lmin	L2	L8	L25	L50
9:53 a.m.	10:53 a.m.	53.3	72.6	43.1	61.9	56.6	51.9	49.0

[1] L-2 was measured on October 22, 2024.

Table 5-3 | Noise Measurement Results – L-3[1]

Start Time	Stop Time	Leq	Lmax	Lmin	L2	L8	L25	L50
9:56 a.m.	10:56 a.m.	48.4	67	40.3	55.1	50.2	47.4	45.5

[1] L-3 was measured on October 22, 2024.

As shown in the tables above, the existing ambient noise levels at the proposed project site range from 48.4 dBA Leq to 59.3 dBA Leq.



Legend

① = Noise Monitoring Location

= Project Site Boundary

Exhibit C

Noise Monitoring Locations

6.0 Operational Noise Impacts

The following noise impact analysis has been performed to determine whether the proposed project would result in a substantial increase in ambient noise levels in the vicinity of the site. Additionally, the noise analysis examines whether the project can meet the City of Jurupa Valley and State of California requirements for residential exterior and interior noise exposure.

6.1 Stationary Noise Source Impacts

The proposed project consists of constructing and operating 85 attached residential dwelling units. The primary source of potential stationary noise produced by the project would be the operation of onsite HVAC/condenser equipment.

To help ensure on-site noise levels do not exceed the City of Jurupa Valley General Plan and Municipal Code noise standards, the following stationary noise impact analysis has been prepared.

Potential HVAC/condenser equipment noise is modeled assuming that equipment would be located at ground level and shielded behind noise barrier walls/enclosures. The nearest potential HVAC location to the adjacent sensitive receptors will be located along the westernmost project buildings, a minimum of approximately 260 feet from Receptor-2.

Table 6-1 shows the project's noise level impacts in terms of dBA Lmax during daytime (7:00 a.m. to 10:00 p.m.) and nighttime (10:00 p.m. to 7:00 a.m.) hours. Daytime and nighttime noise level impacts are compared with the City's Municipal Code noise standards. Stationary noise calculation worksheets are provided in **Appendix D**.

As shown in **Table 6-1**, the project is expected to generate a maximum of 29.2 dBA Lmax during both daytime and nighttime hours. As a result, the proposed project is not expected to exceed the City's daytime and nighttime noise level thresholds of 65.0 dBA Lmax and 45.0 dBA Lmax, respectively.

As a result, the project's stationary noise impact would be less than significant.

Table 6-1 | Stationary Noise Impacts – Municipal Code Noise Standards

Receptor Location	Stationary Noise Source	Project-Generated Noise Level at Receiver Location (dBA Lmax)	
		Daytime (7 a.m. – 10 p.m.)	Nighttime (10 p.m. – 7 a.m.)
Receptor-3	HVAC[1]	29.2	29.2
Total Noise Level		**29.2**	**29.2**
City of Jurupa Valley Municipal Code Noise Level Threshold		65.0	45.0
Noise Level Exceeds Threshold?		**No**	**No**

[1] Noise level is representative of a single unit and includes the noise attenuation effects of the proposed noise barrier walls.

6.2 Mobile Source Noise Impacts

6.2.1 Roadway Noise

The project is not expected to cause a substantial increase in ambient noise levels in the vicinity of the site as a result of increased traffic volumes along adjacent roadways. Typically, it takes a doubling of traffic volume along a roadway to cause a significant increase in ambient noise levels of more than 3 dBA.

The main source of roadway noise affecting the proposed project site and adjacent receptors is activity along Limonite Avenue. Per the City of Jurupa Valley 2017 General Plan Appendix 3.0 – Technical Reports: Traffic and Noise, Limonite Avenue has an existing average daily traffic (ADT) of approximately 19,249 vehicles.

Based on the ITE Trip Generation Manual 12th Edition trip generation rates for Land Use 215 (Single-Family Attached Housing), the proposed project is forecast to generate approximately 558 gross daily trips. Hence, the amount of traffic generated by the project will not double the amount of traffic along Limonite Avenue, either directly or cumulatively, and **therefore the increase in roadway noise levels as a result of the project will be less than significant.**

6.2.2 Airport Noise

The Riverside Municipal Airport, located in Riverside, California, is the nearest airport to the proposed project site, at a distance of approximately 1.5 miles. Per the Riverside County Airport Land Use Compatibility Plan Policy Document (2005), Map R1-3, the project site is located beyond the airport's 55 dBA CNEL noise impacts contour. The City of Jurupa Valley General Plan classifies noise environments of 55 dBA CNEL as Normally Acceptable for all residential land uses based on the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

Furthermore, as described above, the proposed project is not expected to expose people residing or working in the project area to excessive noise levels. Therefore, **the project's noise impact on airport-adjacent land uses will be less than significant.**

A copy of the Riverside County Airport Land Use Compatibility Plan Policy Document (2005), Map R1-3 is provided in **Exhibit D**.

6.3 Noise/Land Use Compatibility

The project proposes to site new residential dwelling units near the southeast corner of Baldwin Avenue and Limonite Avenue. Roadway noise along Limonite Avenue will be the primary source of noise impacting the project site and may expose future residents to noise levels above the City of Jurupa Valley exterior noise thresholds for residential uses.

6.3.1 Exterior Noise/Land Use Compatibility

A noise/land use compatibility assessment has been prepared to help determine whether existing exterior noise levels affecting the project site exceed the City's noise/land use compatibility threshold for residential land uses. Exterior ambient noise levels are assessed at the first-row building façades facing Limonite Avenue.

Table 6-2 shows the anticipated exterior noise levels at the first-row residential lots. Future roadway noise calculation worksheets are provided in **Appendix C**.

Table 6-2 | Exterior Noise/Land Use Compatibility (dBA CNEL)

Noise Source	Estimated Future Exterior Noise Levels
Limonite Avenue	65.0
Exterior Noise Level at First-Row Building Façades	**65.0**
City of Jurupa Valley Noise/Land Use Compatibility Category	Conditionally Acceptable

As shown in **Table 6-2**, future exterior ambient noise levels are expected to be approximately 65.0 dBA CNEL and fall within the Conditionally Acceptable land use compatibility category.

Per the City of Jurupa Valley General Plan, new construction or development of Conditionally Acceptable land uses should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features are included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.

In order to ensure that interior noise levels comply with City and State standards, the following preliminary interior noise analysis is provided.

6.3.2 Interior Noise/Land Use Compatibility

The project must show that interior noise levels at the project site will not exceed the City of Jurupa Valley and State of California noise/land use compatibility threshold for residential land uses. A preliminary interior noise analysis has been performed for the first row of habitable dwellings facing the adjacent roadways using a typical "windows open" and "windows closed" condition. A "windows open" condition assumes 12 dBA of noise attenuation from the exterior noise level. A "windows closed" condition" assumes 20 dBA of noise attenuation from the exterior noise level.

Table 6-3 indicates the future interior noise levels along the adjacent roadways.

Table 6-3 | Future Interior Noise Levels (dBA CNEL)

Exterior Façade Study Location	Projected Exterior Noise Level[1]	Interior Noise Standard	Required Building Shell Noise Reduction	Interior Noise Level with Standard Windows (STC ~ 25)		Required STC Rating
				"Windows Open"[2]	"Windows Closed"[3]	
First-row dwelling units facing Limonite Avenue	65.0	45.0	20.0	53.0	45.0	25

[1] Worst-case future exterior noise levels are based on the projected exterior noise levels shown in **Table 6-2**.
[2] A minimum of 12 dBA noise reduction is assumed with the "windows open" condition.
[3] A minimum of 20 dBA noise reduction is assumed with the "windows closed" condition.

The project is expected to require a "windows closed" condition for all residential units facing Limonite Avenue. To accommodate windows closed conditions, all residential units facing the adjacent roadways shall be equipped with adequate fresh air ventilation.

Exterior walls, designed per the latest California Building Standards are typically rated between STC 35-40. In order to ensure adequate noise attenuation is provided from the building shell, exterior walls should be designed to meet the required sound attenuation targets. Attic vents and other openings should be baffled and oriented away from facing the adjacent roadways.

Prior to issuance of building permits, the project proponent should demonstrate to the City Building Department that the proposed building shell and window assemblies will achieve exterior to interior noise reduction necessary to meet the State of California and City of Jurupa Valley requirements.

6.4 Project Design Features

The following recommendations are provided to help ensure the proposed project meets the City of Jurupa Valley and State of California noise level requirements.

6.4.1 Operational Design Features

DF-2 Any outdoor HVAC/condenser equipment should be shielded from the line of sight of the adjacent sensitive receptors behind noise barrier walls or enclosures.

DF-3 The project should incorporate building construction techniques and insulation that is consistent with California Title 24 Building Standards to achieve the minimum interior noise standard of 45 dBA CNEL for all residential units.

DF-4 A "windows closed" condition is expected to be required for all residential units facing adjacent roadways in order to meet the interior noise standard. See Section 6.3.2, **Table 6-3**, for details regarding window STC requirements.

DF-5 For proper acoustical performance, all exterior windows, doors, and sliding glass doors should have a positive seal, and leaks/cracks must be kept to a minimum. Attic vents and openings should be oriented away from the adjacent roadways.

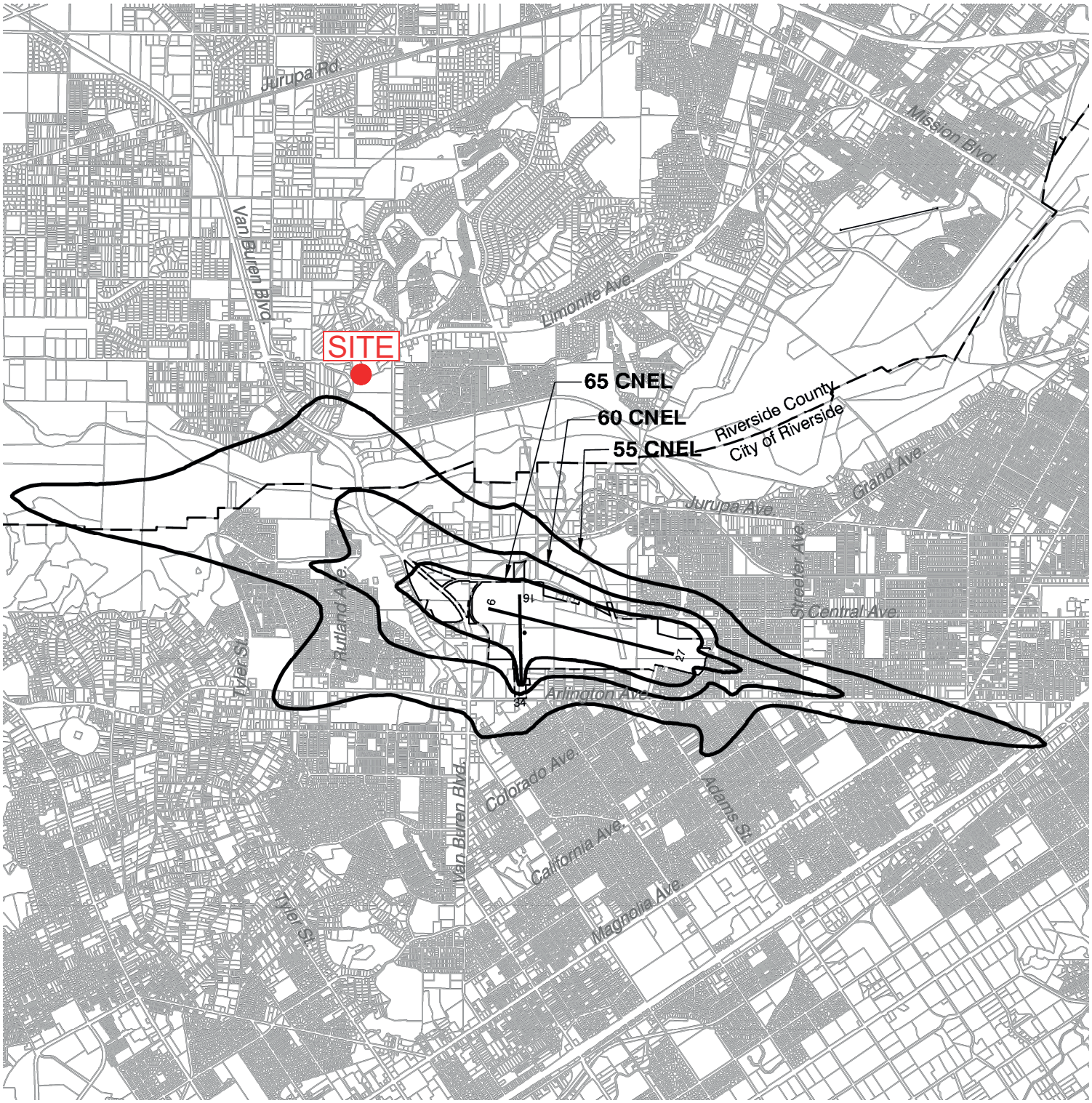


Exhibit D

Riverside Municipal Airport Noise Contour Map

7.0 Construction Noise and Vibration Impacts

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

During the construction period, the contractors would be required to comply the City of Jurupa Valley Municipal Code Section 11.05.020 which indicates that the following construction-related noise is exempt from the provisions of the Municipal Code:

1. Private construction projects located one-quarter (1/4) of a mile or more from an inhabited dwelling; or

2. Private construction projects located within one-quarter (1/4) 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 during the hours of six (6:00) p.m. and seven (7:00) a.m. during the months of October through May.

No project construction is expected to occur on weekends or between the hours of 6:00 p.m. and 7:00 a.m. Additionally, per the City's construction noise significance criteria, no grading, demolition, or pile driving activity will occur between the hours of 3:00 p.m. and 9:00 a.m.

In addition, the project will be required to comply with the City of Jurupa Valley's daytime construction noise threshold of 80 dBA Leq.

Construction phasing and equipment usage assumptions are referenced from the *TTM 39105 Residential Project Air Quality and Greenhouse Gas Impact Study*, prepared by RK.

7.1 Typical Construction Noise Levels

Table 7-1 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 7-1 | Typical Construction Noise Levels (dBA Leq)[1]

Equipment Type	Noise Level 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 of the two noisiest pieces of equipment during all expected phases of construction, including demolition, site preparation, grading, building construction, paving, and architectural coating. Noise levels are calculated based on an average distance of equipment over a 1-hour period to each of the adjacent sensitive receptors. The project's estimated construction noise levels have been calculated using the Federal Highway Administration Roadway Construction Noise Model Version 1.1. **Table 7-2** shows the noise level impacts from the center of the project site to each of the sensitive receptor locations.

Construction noise calculation worksheets are provided in **Appendix E**.

Table 7-2 | Project Construction Noise Levels – at 500 Feet

Phase	Equipment	Quantity	Equipment Noise Level at 500 ft. (dBA Leq)	Combined Noise Level (dBA Leq)
Demolition	Concrete/Industrial Saws	1	70.3	71.0
	Rubber Tired Dozers	1	62.4	
Site Preparation	Tractors/Loaders/Backhoes	2	64.7	67.7
Grading	Graders	1	65.7	68.3
	Tractors/Loaders/Backhoes	1	64.7	
Building Construction	Tractors/Loaders/Backhoes	2	64.7	67.7
Paving	Rollers	2	60.7	63.7
Architectural Coating	Air Compressors	1	58.4	58.4
Worst-Case Construction Phase Noise Level (dBA Leq)				**71.0**
City of Jurupa Valley Daytime Construction Noise Threshold (dBA Leq)				80.0
Noise level exceeds criteria?				**No**

As shown in **Table 7-2**, the project is not expected to generate noise levels which exceed the City's construction noise threshold of 80.0 dBA at any of the sensitive receptor locations. **As a result, the project impact is considered less than significant.**

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 structure to the project site is the former Albertsons grocery store which is no longer in business. This structure is considered a "modern industrial/commercial building" and is located approximately 30 feet from the nearest expected area of onsite construction activity.

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 source of vibration impacts during the 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 7-3** shows the FTA-referenced vibration levels.

Table 7-3 | Typical Construction Vibration Levels[1]

Equipment	Peak Particle Velocity (PPV) at 25 Feet (in./sec.)	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] Source: Federal Transit Administration (FTA). *Transit Noise and Vibration Impact Assessment Manual, Section 7: Noise and Vibration During Construction.*

Table 7-4 shows the project's construction-related vibration analysis at the nearest structures to the project construction area. Construction vibration calculation worksheets are provided in **Appendix E**.

Table 7-4 | Construction Vibration Impact Analysis

Construction Activity	Distance to Nearest Structure (Feet)	Duration	Calculated Vibration Level (PPV) (in./sec.)
Large Bulldozer	30	Continuous/Frequent	0.073
Loaded Trucks		Continuous/Frequent	0.062
Vibratory Rollers		Continuous/Frequent	0.172
Worst-Case Construction Vibration Level			**0.172**
Vibration Threshold[1]			0.200
Vibration level exceeds threshold?			**No**

[1] City of Jurupa Valley Construction Vibration Threshold of Significance.

Based on the table above, project-related construction activity will not exceed the City of Jurupa Valley construction vibration threshold and is not expected to cause any potential damage to the nearest structures. **Hence, the impact from construction-related vibration will be less than significant.**

Appendices

Appendix A

City of Jurupa Valley General Plan Noise Element and Municipal Code Chapter 11.05 – Noise Regulations

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.

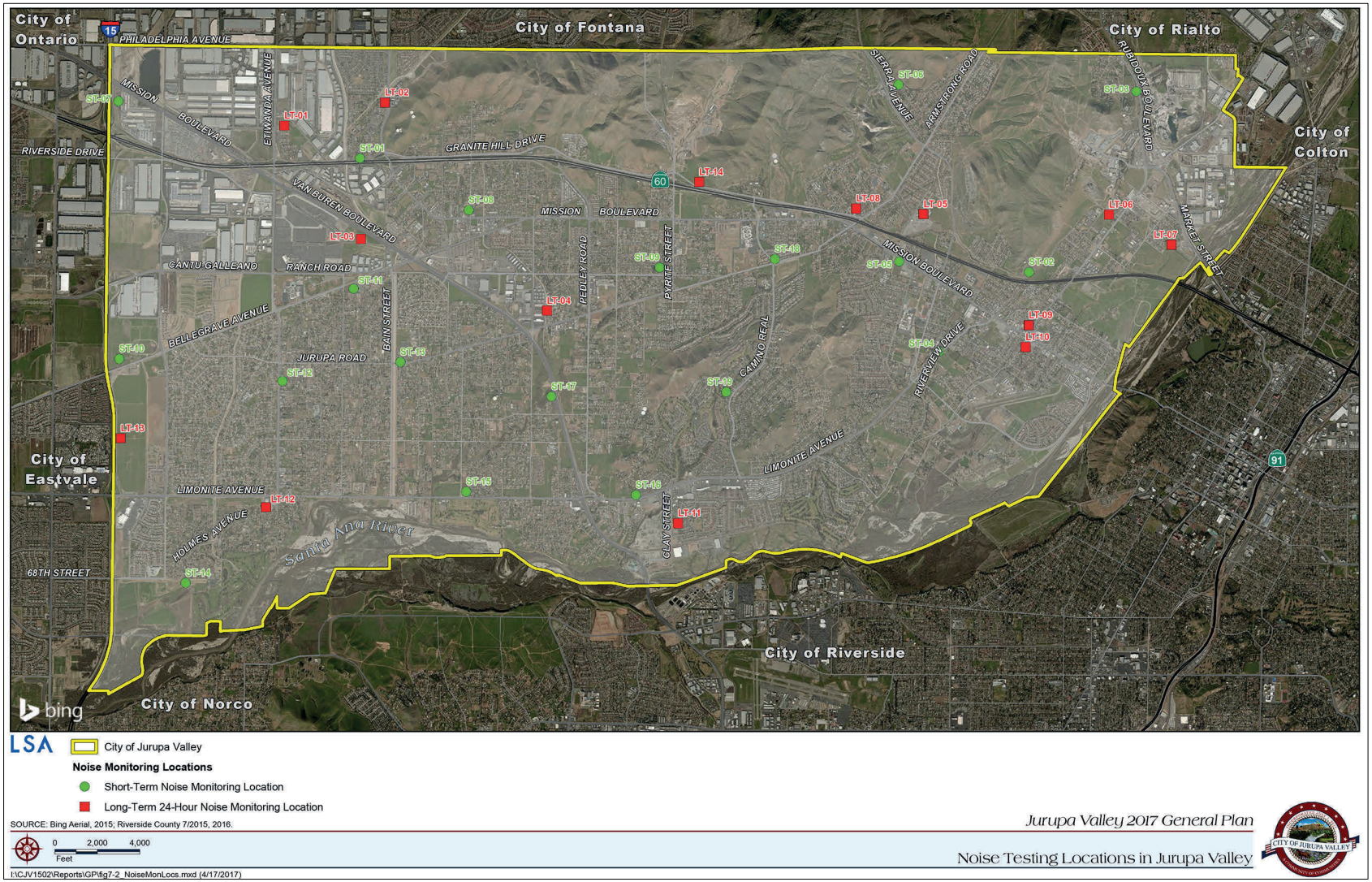


Figure 7-2: Noise testing locations in Jurupa Valley

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.

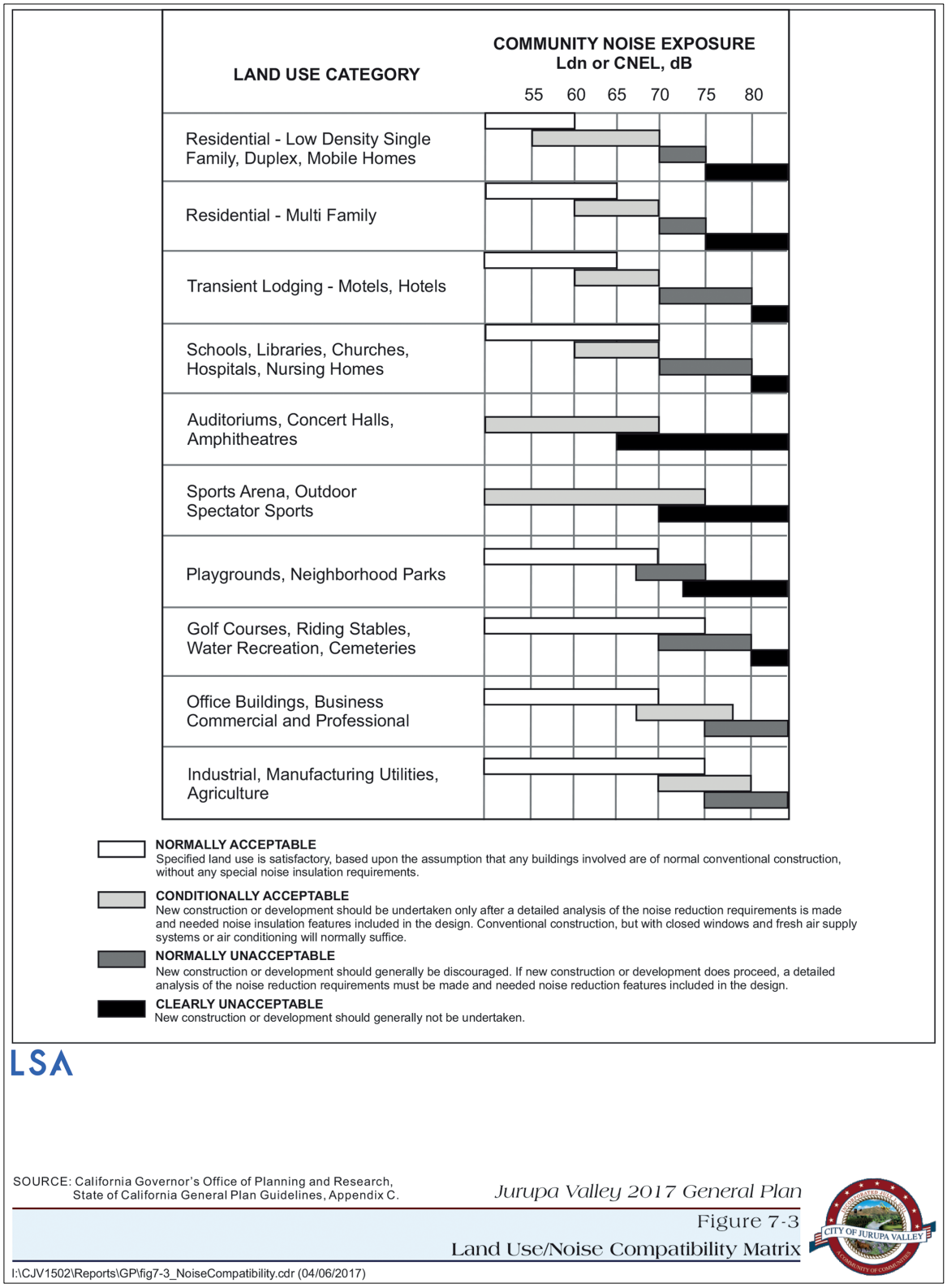


Figure 7-3: Land use/noise compatibility matrix

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.

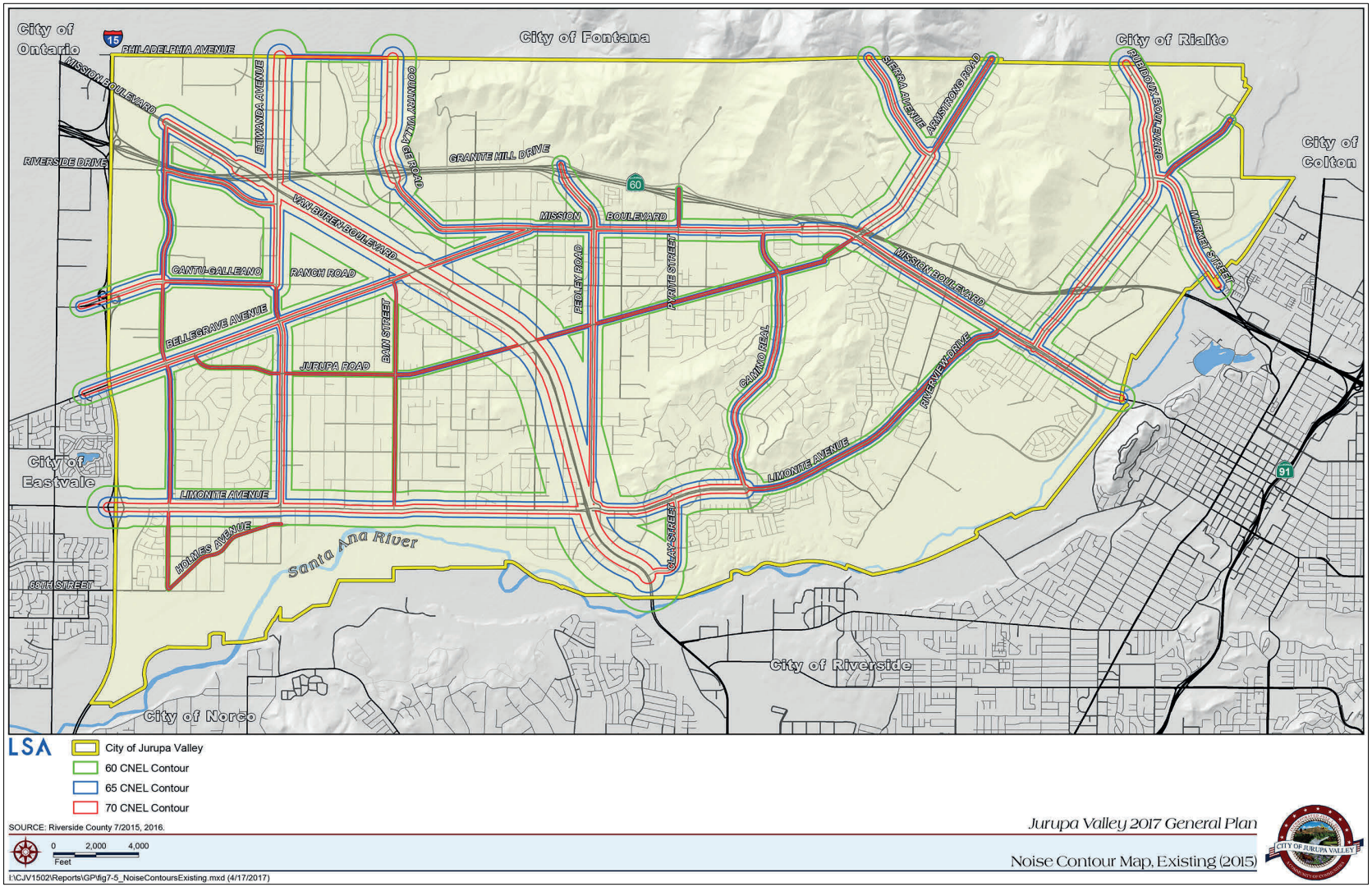


Figure 7-5: Noise contour map, existing (2015)

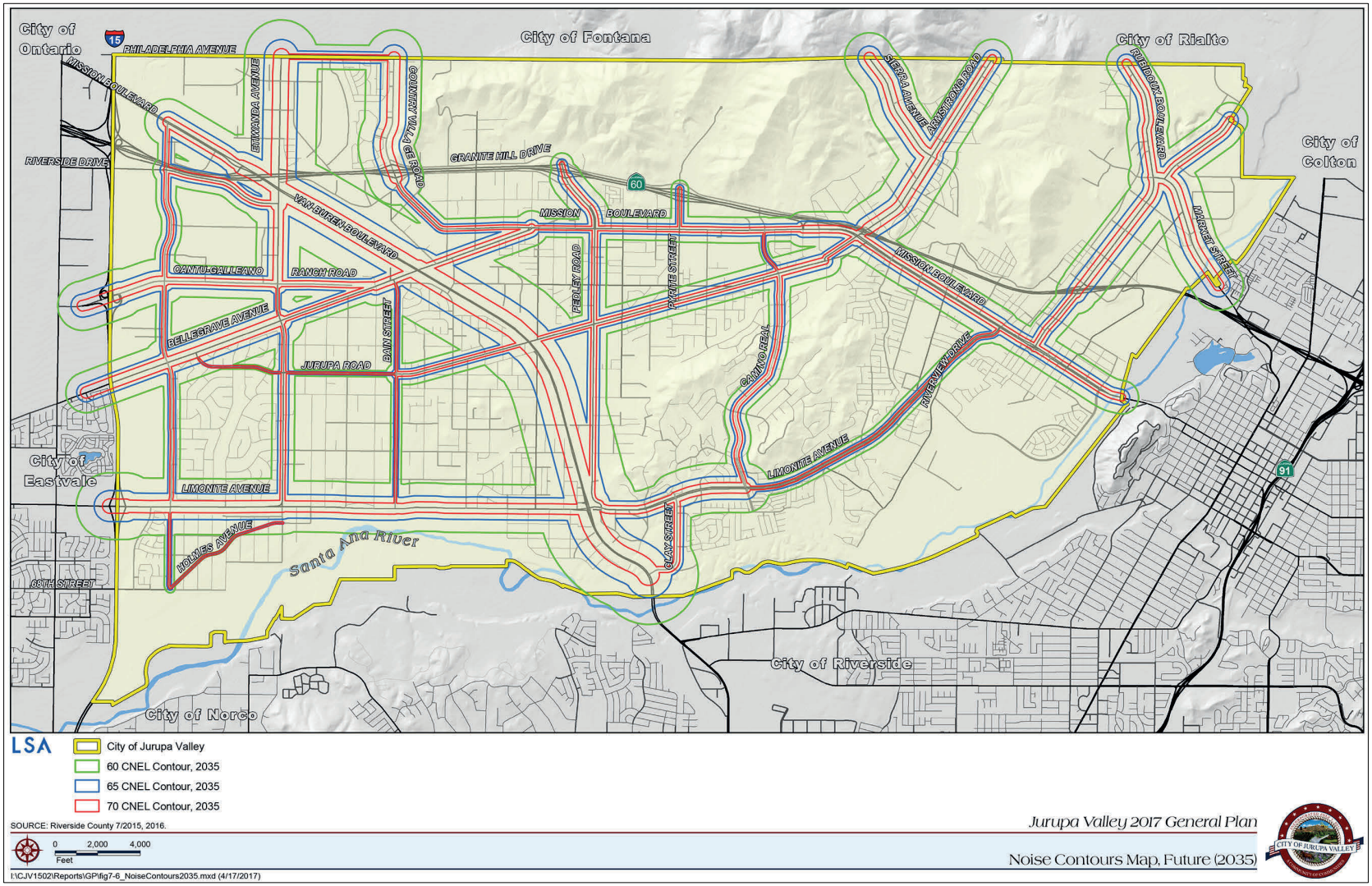


Figure 7-6: Noise contour map, future (2035)

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.

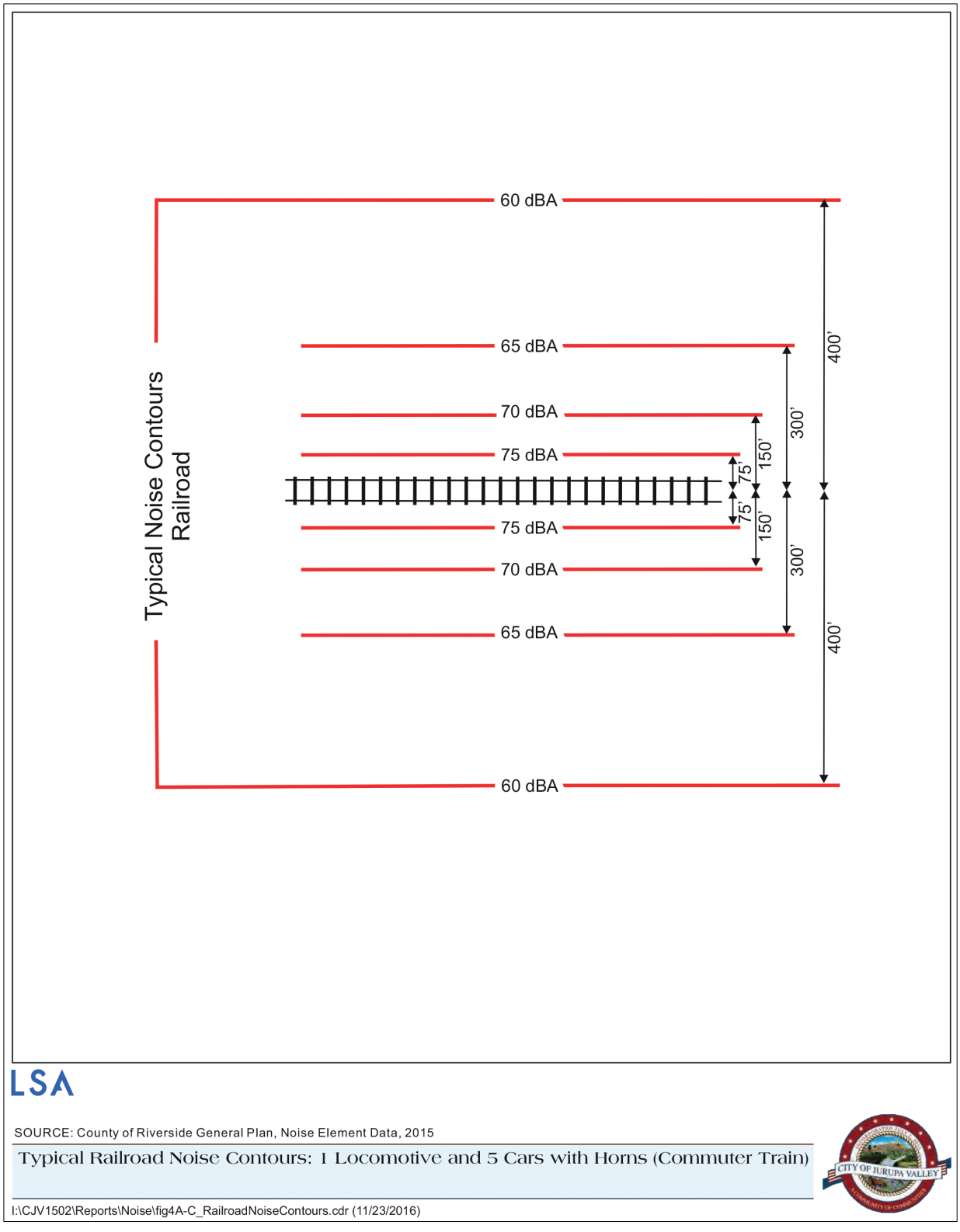


Figure 7-7: Typical railroad noise contours, commuter train

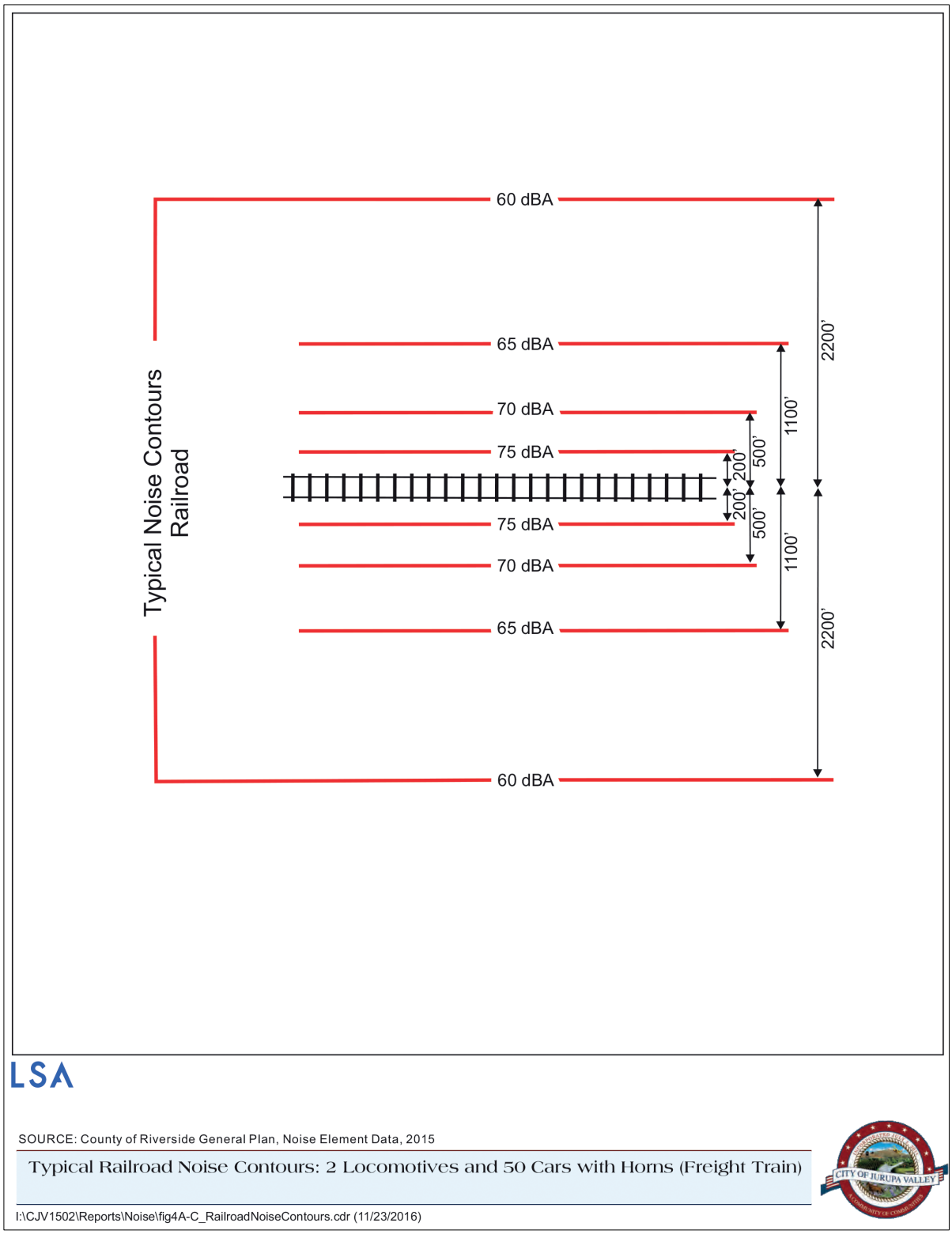


Figure 7-8: Typical railroad noise contours, freight train

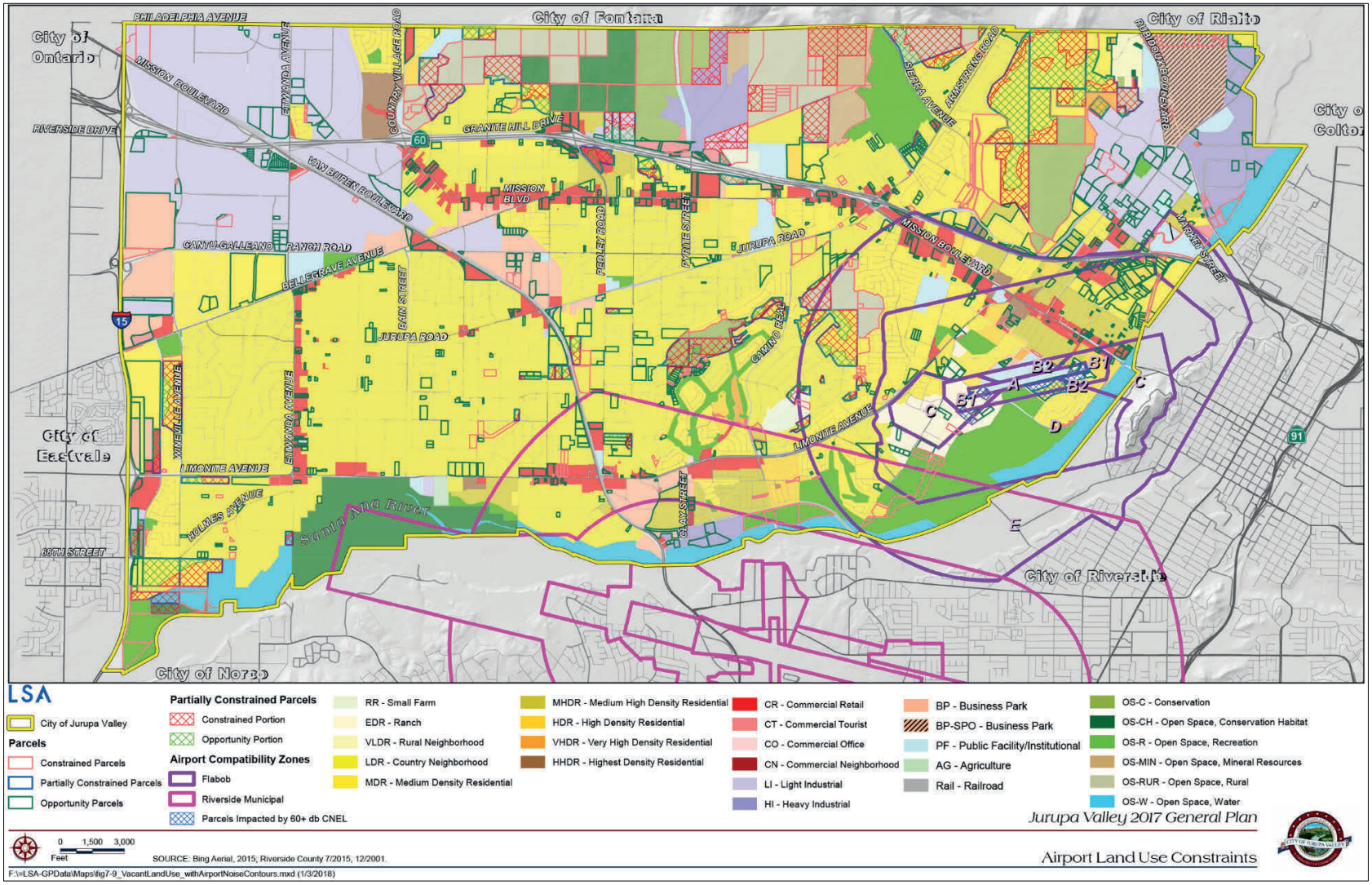


Figure 7-9: Airport land use constraints

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.

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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 Community Development 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 Community Development 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; Ord. No. 2021-09, § 4, 4-15-2021)

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 hundred and 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)

Appendix B
Field Data and Photos

RK ENGINEERING GROUP INC.

Field Sheet

Project:	TTM 39105 Residential Project			**Engineer:**	B. Morrison
Date:	10/22/2024				
JN:	1742-2024-09				
Measurement Address:	Southeast corner of Limonite Ave. and Baldwin Ave.			**City:**	Jurupa Valley, CA

Sound Level Meter:
Piccolo II
Serial #: P0222082204
P0222082205
P0221010801

Calibrator:
BSWA
Serial #: 500732

Calibration Record:

Meter	Input (dB)	Time
1	94	9:49 a.m.
2	94	9:49 a.m.
3	94	9:48 a.m.
4	--	--

Conditions:

Temperature (°F):	72
Windspeed (m.p.h.):	1
Wind Direction:	Northwest
Skies:	Clear

Meter Settings:

☑ A-Weighted	☐ Linear	☑ Slow	☐ 1/1 Octave	☑ _60_ Minute Intervals
☐ C-Weighted	☐ Impulse	☐ Fast	☐ 1/3 Octave	☑ L(n) Percentile Values

Notes:
Noise measurements were collected at each location for a duration of one (1) hour. The primary sources of ambient noise during the measurement period were roadway noise from adjacent streets and operational activity at the adjacent Firestone Auto Care facility.

Measurement Type:
☐ Long-term (24-hour)
☑ Short-term

		Start Time	Stop Time	Leq	Lmax	Lmin	L2	L8	L25	L50
Location	1	9:51 a.m.	10:51 a.m.	59.3	83.9	41.9	67.4	61.7	54.7	50.7
		Comments: Noise Monitoring Location 1 (L-1) was located near the northwest corner of the proposed project site, approximately 260 feet southeast of the centerline of Limonite Avenue and approximately 30 feet east of the centerline of Baldwin Avenue.								
	2	9:53 a.m.	10:53 a.m.	53.3	72.6	43.1	61.9	56.6	51.9	49.0
		Comments: Noise Monitoring Location 2 (L-2) was located near the western boundary of the proposed project site, approximately 480 feet southeast of the centerline of Limonite Avenue and approximately 55 feet east of the centerline of Baldwin Avenue.								
	3	9:56 a.m.	10:56 a.m.	48.4	67	40.3	55.1	50.2	47.4	45.5
		Comments: Noise Monitoring Location 3 (L-3) was located near the southeastern corner of the proposed project site, approximately 665 feet southeast of the centerline of Limonite Avenue and approximately 470 feet east of the centerline of Baldwin Avenue.								



(1) = Noise Monitoring Location

RK ENGINEERING GROUP INC.

Field Photos - L-1

Project:	TTM 39105 Residential Project		**Engineer:**	B. Morrison	**Date:** 10/22/2024
Measurement Address:	Southeast corner of Limonite Ave. and Baldwin Ave.		**City:**	Jurupa Valley, CA	**JN:** 1742-2024-09



RK ENGINEERING GROUP INC.

Field Photos - L-2

Project:	TTM 39105 Residential Project		**Engineer:**	B. Morrison	**Date:** 10/22/2024
Measurement Address:	Southeast corner of Limonite Ave. and Baldwin Ave.		**City:**	Jurupa Valley, CA	**JN:** 1742-2024-09



RK ENGINEERING GROUP INC.

Field Photos - L-3

Project:	TTM 39105 Residential Project		**Engineer:**	B. Morrison	**Date:** 10/22/2024
					JN: 1742-2024-09
Measurement Address:	Southeast corner of Limonite Ave. and Baldwin Ave.		**City:**	Jurupa Valley, CA	



Appendix C
Future Exterior Noise Levels Calculation Worksheets

RK ENGINEERING GROUP INC.

Roadway Noise Calculations - Based on FHWA-RD-77-108

Project:	TTM 39105 Residential Project	**Date:**	1/28/2026
Roadway:	Limonite Avenue (Pedley Road to Clay Street)	**JN:**	1742-2024-09
Location:	First row building facades facing Limonite Avenue	**Engineer:**	B. Morrison

Noise Input Data

Roadway Conditions

ADT	24,935
SPEED	45
PK HR %	10
NEAR LANE/FAR LANE DIST	90
ROAD ELEVATION	0.0
GRADE	0.0 %
PK HR VOL	2,494

Receiver Input Data

RECEIVER DISTANCE	260
DIST C/L TO WALL	0
RECEIVER HEIGHT	5.0
WALL DISTANCE FROM RECEIVER	260
PAD ELEVATION	0.0
ROADWAY VIEW:	
LF ANGLE	-90
RT ANGLE	90
DF ANGLE	180

Site Conditions

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

Wall Information

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

Vehicle Mix Data

Vehicle Type	Day	Evening	Night	Daily
AUTOMOBILES	0.756	0.140	0.104	0.9200
MEDIUM TRUCKS	0.480	0.020	0.500	0.0300
HEAVY TRUCKS	0.480	0.020	0.500	0.0500

Misc. Vehicle Info

Vehicle Type	Height	SLE Distance	Grade Adjustment
AUTOMOBILES	2.0	256.09	- -
MEDIUM TRUCKS	4.0	256.08	- -
HEAVY TRUCKS	8.0	256.09	0.00

Noise Output Data

Noise Impacts (Without Topo or Barrier Shielding, dBA)

Vehicle Type	Peak Hour Leq	Day Leq	Evening Leq	Night Leq	LDN	CNEL
AUTOMOBILES	59.2	57.2	55.9	49.8	58.2	58.9
MEDIUM TRUCKS	52.6	48.6	40.8	50.0	56.2	56.2
HEAVY TRUCKS	59.3	55.3	47.6	56.8	62.9	63.0
COMBINED NOISE LEVEL	***62.7***	***59.7***	***56.6***	***58.3***	***64.8***	***65.0***

Noise Impacts (With Topo and Barrier Shielding, dBA)

Vehicle Type	Peak Hour Leq	Day Leq	Evening Leq	Night Leq	LDN	CNEL
AUTOMOBILES	59.2	57.2	55.9	49.8	58.2	58.9
MEDIUM TRUCKS	52.6	48.6	40.8	50.0	56.2	56.2
HEAVY TRUCKS	59.3	55.3	47.6	56.8	62.9	63.0
COMBINED NOISE LEVEL	***62.7***	***59.7***	***56.6***	***58.3***	***64.8***	***65.0***

Noise Contour (Feet)

Noise Levels	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	121	260	560	1207
LDN	118	253	546	1175

Appendix D
Stationary Noise Calculation Worksheets

RK ENGINEERING GROUP INC.

Stationary Noise Calculations - Based on FHWA-RD-77-108

Project:	TTM 39105 Residential Project	**Date:**	1/28/2026
		JN:	1742-2024-09
Noise Source:	HVAC	**Engineer:**	B. Morrison
Location:	Nearest adjacent receptor (Receptor-2)		

Noise Input Data				
OBS DIST=	260.0			
DT WALL=	2.0			
DT W/OB=	258.0			
HTH WALL=	5.0	********		
BARRIER =	0.0	(0=WALL,1=BERM)		
OBS HTH=	5.0			
NOISE HTH=	3.0		BARRIER+	
OBS EL =	0.0		TOPO SHIELDING =	-9.60
NOISE EL =	0.0		NOISE HTH EL=	3.0
DROP-OFF=	15.0	(20 = 6 dBA PER DOUBLING OF DISTANCE)		

Noise Output Data (dBA)							
	Distance (ft.)	**Leq**	**Lmax**	**L2**	**L8**	**L25**	**L50**
REF LEVEL	1	75.0	75.0	75.0	75.0	75.0	75.0
PROJ LEVEL	260	38.8	38.8	38.8	38.8	38.8	38.8
SHIELDING	260	-9.6	-9.6	-9.6	-9.6	-9.6	-9.6
ADJ LEVEL	**260**	***29.2***	***29.2***	***29.2***	***29.2***	***29.2***	***29.2***
NOISE LEVEL REDUCTION DUE TO DISTANCE =							-36.22460022

Appendix E
Construction Noise and Vibration Calculation Worksheets

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 10/31/2024
Case Description: TTM 39105 Single-Family Residential Project

---- Receptor #1 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Demolition	Residential	48.4	48.4	48.4

Equipment

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Saw	No	100		89.6	460	0
Dozer	No	100		81.7	460	0

Results

		Calculated (dBA)		
Equipment		*Lmax	Leq	Day Lmax
Concrete Saw		70.3	70.3	N/A
Dozer		62.4	62.4	N/A
	Total	70.3	71	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 10/31/2024
Case Description: TTM 39105 Single-Family Residential Project

---- Receptor #1 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Site Preparation	Residential	48.4	48.4	48.4

Equipment

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Tractor	No	100	84		460	0
Tractor	No	100	84		460	0

Results

Calculated (dBA)

Equipment		*Lmax	Leq
Tractor		64.7	64.7
Tractor		64.7	64.7
	Total	64.7	67.7

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 10/31/2024
Case Description: TTM 39105 Single-Family Residential Project

---- Receptor #1 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Grading	Residential	48.4	48.4	48.4

Equipment

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Grader	No	100	85		460	0
Tractor	No	100	84		460	0

Results

Calculated (dBA)

Equipment		*Lmax	Leq
Grader		65.7	65.7
Tractor		64.7	64.7
	Total	65.7	68.3

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 10/31/2024
Case Description: TTM 39105 Single-Family Residential Project

---- Receptor #1 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Building Construction	Residential	48.4	48.4	48.4

Equipment

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Tractor	No	100	84		460	0
Tractor	No	100	84		460	0

Results

Calculated (dBA)

Equipment		*Lmax	Leq
Tractor		64.7	64.7
Tractor		64.7	64.7
	Total	64.7	67.7

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 10/31/2024
Case Description: TTM 39105 Single-Family Residential Project

---- Receptor #1 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Paving	Residential	48.4	48.4	48.4

Equipment

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Roller	No	100		80	460	0
Roller	No	100		80	460	0

Results

Calculated (dBA)

Equipment		*Lmax	Leq
Roller		60.7	60.7
Roller		60.7	60.7
	Total	60.7	63.7

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 10/31/2024
Case Description: TTM 39105 Single-Family Residential Project

---- Receptor #1 ----

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
Paving	Residential	48.4	48.4	48.4

Equipment

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	100		77.7	460	0

Results

Calculated (dBA)

Equipment		*Lmax	Leq
Compressor (air)		58.4	58.4
	Total	58.4	58.4

*Calculated Lmax is the Loudest value.

RK ENGINEERING GROUP INC.

Vibration Impact Analysis

Project:	TTM 39105 Residential Project	**Date:**	1/28/2026
Activity:	Construction Vibration	**JN:**	1742-2024-09
Location:	Nearest adjacent structures	**Engineer:**	B. Morrison

Vibration Input/Output Data

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

PPV =	**0.073 in/sec**

Equipment Type =	2	Large Bulldozer
PPV_{ref} =	0.089	Reference PPV at 25 ft.
D =	30.00	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

RK ENGINEERING GROUP INC.

Vibration Impact Analysis

Project:	TTM 39105 Residential Project	**Date:**	1/28/2026
Activity:	Construction Vibration	**JN:**	1742-2024-09
Location:	Nearest adjacent structures	**Engineer:**	B. Morrison

Vibration Input/Output Data

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

PPV =	**0.062 in/sec**

Equipment Type =	4	Loaded Trucks
PPV_{ref} =	0.076	Reference PPV at 25 ft.
D =	30.00	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

RK ENGINEERING GROUP INC.

Vibration Impact Analysis

Project:	TTM 39105 Residential Project	**Date:**	1/28/2026
Activity:	Construction Vibration	**JN:**	1742-2024-09
Location:	Nearest adjacent structures	**Engineer:**	B. Morrison

Vibration Input/Output Data

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

PPV =	**0.172 in/sec**

Equipment Type =	1	Vibratory Roller
PPV_{ref} =	0.210	Reference PPV at 25 ft.
D =	30.00	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