Noise and Vibration Impact Analysis

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Mapes Residential

Noise and Vibration Impact Analysis

Prepared For

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1 INTRODUCTION

This Noise and Vibration Impact Analysis evaluates the potential noise impacts of the proposed Mapes Residential Project ("Project" or "proposed Project"). The Project is located within unincorporated Riverside County, under the jurisdiction of the County of Riverside.

1.1 Project Description

The Project site is situated in the southwest portion of Riverside County. The site consists of 78 parcels with Assessor's Parcel Numbers (APNs) 327-480-001 through -022, 327-481-001 through -012, 327-490-001 through -016, and 327-491-001 through -018, totaling approximately 39.09 gross acres (36.63 net acres). The Project site is located northeast of Mapes Road and Palomar Road. Regional access to the site is provided via State Route 74 (SR-74), and Interstate 215 (I-215). Local access to the Project site is provided via Mapes Road and Palomar Road. The Project site is vacant, undeveloped, and is heavily disturbed by previous development and grading activities. Vegetation on-site is limited to non-native grass. See Figure 1-1, *Project Vicinity*.

Development of the Project site was previously entitled on July 26, 2005, under Tentative Tract Map (TTM) No. 31684 and Environmental Assessment No. 39303, that approved subdivision of the site into 65 single-family residential lots (minimum lot size of 0.5 acres) along with three open space lots for drainage and flood control purposes. The approved TTM was not developed.

The currently proposed Project would include 157 numbered lots for single-family development and lots for a drainage basin, open space areas, a Riverside County Flood Control District (RCFCD) easement, and various right-of-way dedications for road purposes. See Figure 1-2, *Tentative Tract Map*. The Project would also propose to construct offsite street improvements, including half-width street improvements along the property's frontage of Trade Winds Drive, Palomar Road and Mapes Roads. These improvements will include roadway widening or paving, curb, gutter, and side.

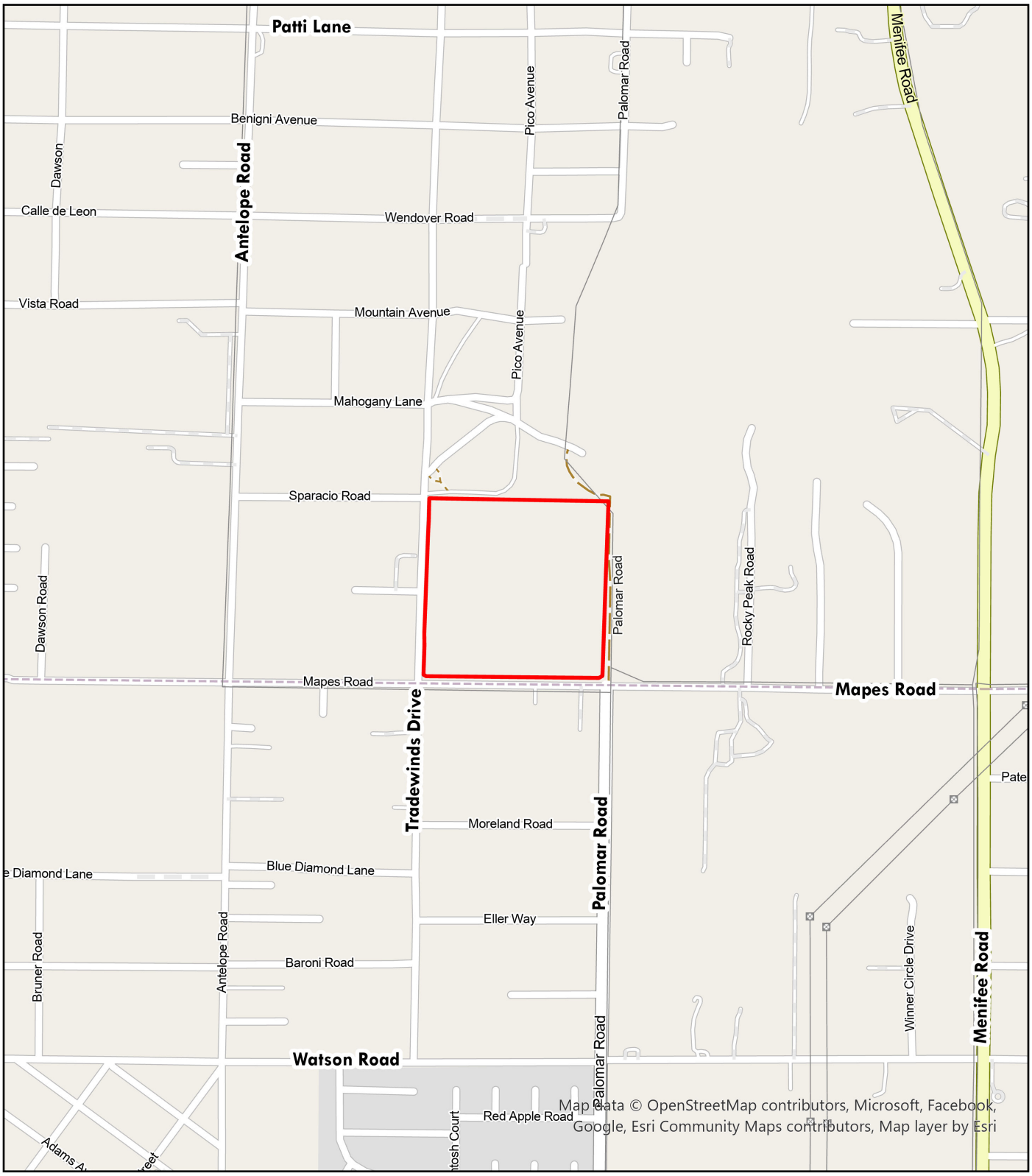
The proposed Project also includes a General Plan Amendment to change the land use designation of the site from Low Density Residential (LDR) to Medium Density Residential (MDR) and zone change from Rural Residential (R-R) to Planned Residential (R-4). Refer to Table 1-1, *Existing Land Use Designations of Project Site and Surrounding Area*, for a description of the land use designations of the Project site and surrounding area.

Table 1-1: Existing Land Use Designations of Project Site and Surrounding Area

Direction	General Plan Land Use	Zoning
Proposed Project Site	Low Density Residential (LDR)	Rural Residential (R-R)
North	Very Low Density Residential (VLDR)	R-R
East	VLDR	R-R
South	City of Menifee	City of Menifee
West	LDR	R-R

Source: County of Riverside, General Plan Land Use Map (2023a)

Figure 1-1: Local Vicinity



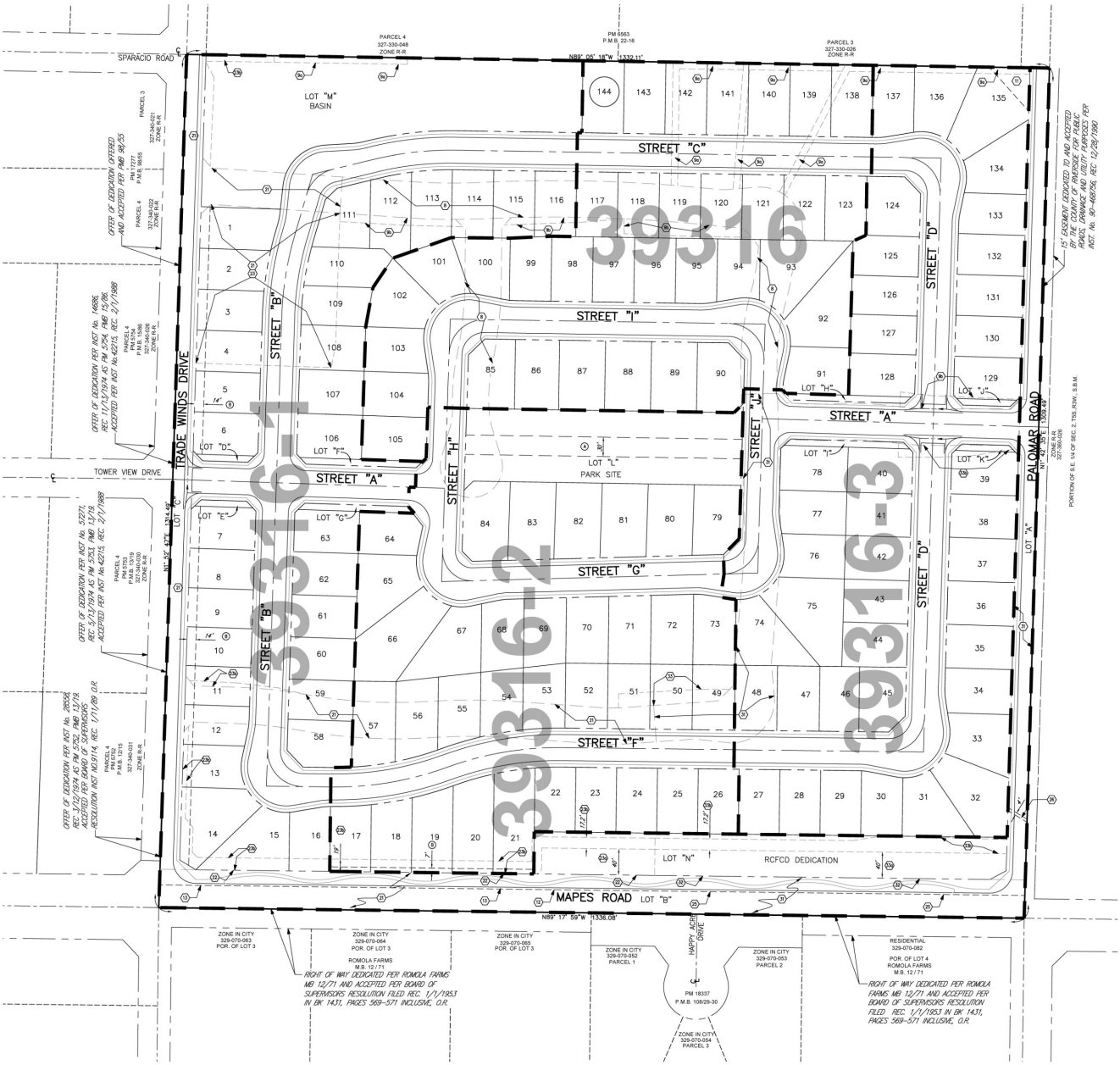
Legend

Project Boundary

0 0.15 0.3 Miles

N

Tentative Tract Map No. 39316



1.2 Purpose of the Report

To support the California Environmental Quality Act (CEQA) document for the proposed Project, this report evaluates potential noise-related impacts to surrounding land uses as a result of implementation of the Project. This report begins with an overview of the study area, the Project site, and the key components of the proposed development. It then provides a foundational explanation of noise and vibration concepts to help frame the analysis.

To ensure consistency with local requirements, this report outlines relevant noise guidelines and regulatory standards that apply to the Project. It also describes the existing noise environment in and around the Project site to establish a baseline for comparison. From there, the analysis addresses potential short-term noise and vibration impacts that could occur during construction activities. Finally, the report examines long-term operational impacts once the Project is built and active.

1.3 Summary of Findings

The conclusions of this analysis are shown in Table 1-2, *Summary of Findings*.

Table 1-2: Summary of Findings

Topics	Significance Findings	Mitigation Measures Proposed
Construction Noise	Less than significant	NA
Operation Noise	Less than significant	NA
Construction Vibration	Less than significant	NA
Operation Vibration	Less than significant	NA
Airport Noise	Less than significant	NA

Notes: NA = not applicable

2 NOISE SCALES AND DEFINITIONS

Sound is energy transferred through air that our ears detect as small changes in air pressures. Noise is defined as any sound that is unwanted or excessive. Noise is considered undesirable when it disrupts everyday activities, poses a risk of physical harm, or negatively impacts health. Its effects on people can include irritation, difficulty communicating, sleep disruption, and in severe cases, hearing loss. These impacts can stem from either the pitch or the loudness of the sound. Pitch refers to the frequency of a sound wave, how many vibrations occur per second, which determines whether a sound is high or low in tone. Humans generally perceive higher-pitched sounds as louder. Loudness, on the other hand, relates to the intensity or amplitude of the sound.

Typically, noise is measured or predicted by a sound pressure level, reported in decibels (dB). The dB is a logarithmic unit used to represent the ratio between a measured sound pressure level and a standard reference level. A sound level of 0 dB corresponds to the quietest sound that a healthy, unimpaired human ear can hear. The human ear does not hear all frequencies equally. To better approximate the sensitivity of human hearing, the A-weighted decibel scale (dBA) has been developed. On this scale, the human range of hearing extends from approximately 3 dBA to approximately 140 dBA. Figure 2-1, *Common Noise Levels*, shows typical sound levels and human response for everyday sounds and noises.

Sound and vibration are intimately related. Sound is produced by the vibration of sound pressure waves in the air. Vibrating surfaces and structures can radiate sound, so measures taken to reduce vibration will often lead to a reduction in noise level.

2.1 Terminology

Sound: Sound is a vibratory disturbance produced by a vibrating object that travels through a medium, such as air, in the form of pressure waves. It can be detected by a receiver, such as the human ear or a microphone.

Noise: Sound that is loud, unpleasant, unexpected, or otherwise undesirable.

Ambient noise: The combined noise from all nearby and distant sources present in a specific environment.

Decibel (dB): Unit used to measure the intensity of a sound.

A-weighted decibel (dBA): Unit of sound pressure level in decibels on the "A-weighted" scale.

Sound exposure level (SEL): Represents all the acoustic energy (sound pressure) of an individual noise event as if that event had occurred within a one-second time period.

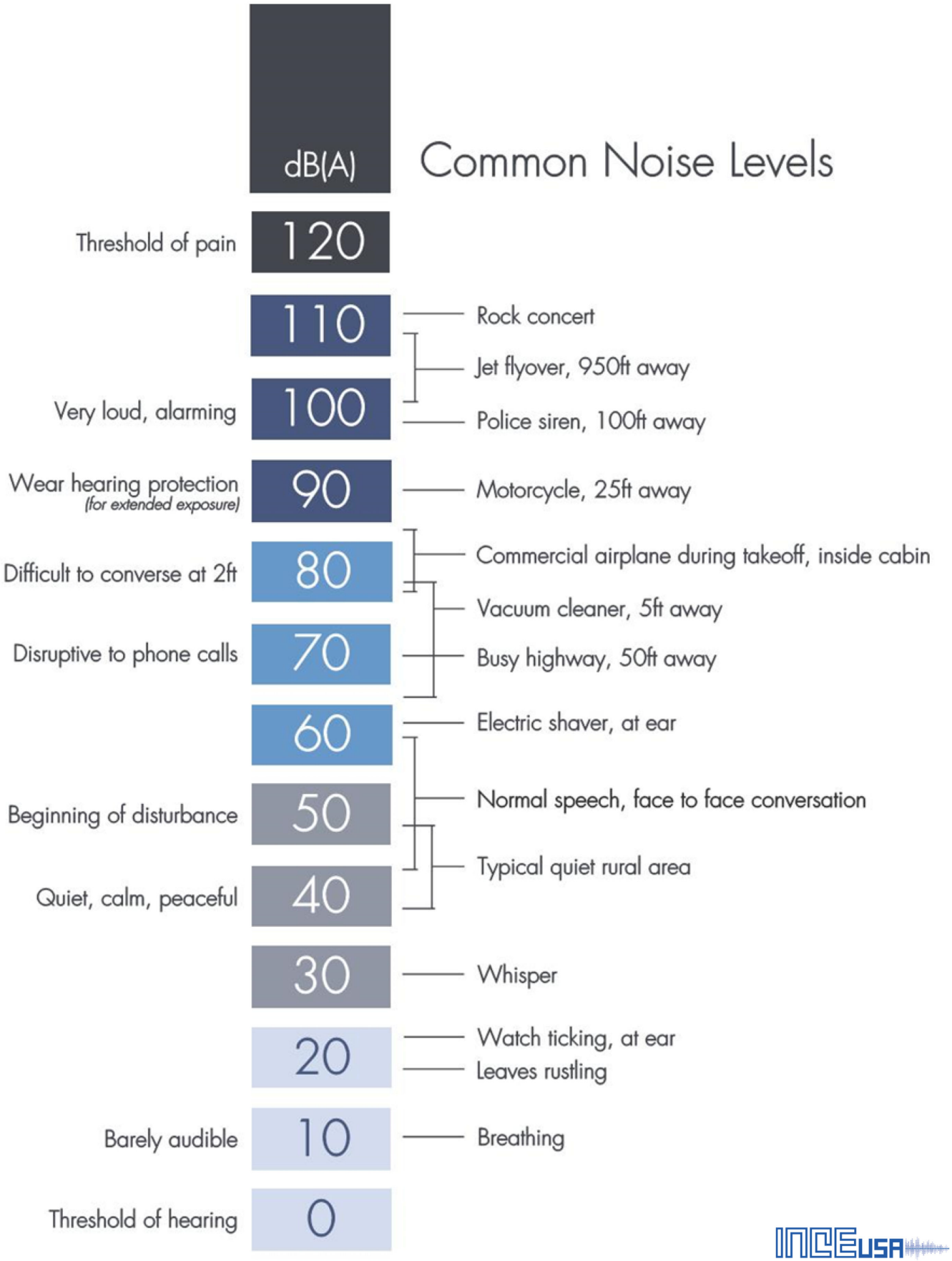
Equivalent sound level (L_{eq}): L_{eq} is the equivalent steady-state level which within a stated period of time contains the same acoustic energy as the time-varying sound level during the same time period.

Maximum sound level (L_{max}): The highest values measured by the sound meter over a given time period.

Minimum sound level (L_{min}): The lowest values measured by the sound meter over a given time period.

Day-night average sound level (L_{dn}): A noise metric used to reflect a person's cumulative exposure to sound over a 24-hour period, expressed as the noise level for the average day of the year on the basis of annual operation.

Figure 2-1: Common Noise Levels



Community noise equivalent level (CNEL): CNEL represents a composite 24-hour noise level. The CNEL is the weighted average of the intensity of a sound, with corrections for time of day, and averaged over 24 hours. The time-of-day corrections require the addition of 5 decibels to dBA L_{eq} sound levels in the evening from 7:00 p.m. to 10:00 p.m., and the addition of 10 decibels to dBA L_{eq} sound levels at night between 10:00 p.m. and 7:00 a.m. These additions are to account for the noise-sensitive time periods during the evening and night hours when quiet is most desirable and sound appears louder. CNEL does not represent the actual sound level heard at any time, but rather represents the total sound exposure.

Root mean square (RMS): RMS is the average vibration amplitude. The RMS amplitude is defined as the average of the squared amplitude of the signal and is most frequently used to describe the effect of vibration on the human body (FTA, 2018).

Peak Particle Velocity (PPV): PPV is the maximum instantaneous peak of the vibration signal (FTA, 2018). The PPV is most frequently used to describe vibration impacts on buildings.

Vibration Decibel (VdB): VdB is a unit used to measure ground motion caused by vibrations, specifically particle velocity in inches per second.

2.2 Sound Propagation

Sound propagates uniformly outward in a spherical pattern. Sound can propagate through air, water, and solids. During propagation, waves can be reflected, refracted, or attenuated by the medium. The reduction of sound (acoustic) waves is known as attenuation. The sound level attenuates (or decreases) at a rate of 6 dB for each doubling of distance in air from a point source. Sound attenuation can occur in numerous ways, including:

- Dissipating through the air when absorbed by another medium.
- Reflected against a barrier.
- Via interference from ambient noise.

2.3 Stationary Noise

A stationary noise source refers to any fixed-location activity or equipment that generates noise. Examples include engines, machinery, energy generation systems, and other powered equipment, as well as activities such as loading and unloading and parking lot activity. Although noise from motor vehicles on public roads is generally exempt from local regulation, these vehicles are considered stationary noise sources when used on private property, such as at construction sites, truck terminals, or warehouse facilities.

The impact of stationary noise depends on several factors, including the type and operation of the equipment, the distance and path between the noise source and the receiver, and environmental conditions such as weather. Regulation of stationary noise can occur at the point of manufacture (for example, limits on engine noise), through restrictions on hours of operation, location of installation, or by requiring noise mitigation features such as barriers, structures, or other project features.

Construction activities are a frequent and often temporary source of stationary noise. Although construction-related noise is typically higher than existing background levels, it is limited to the duration of the work. Construction occurs in phases, each involving different equipment and operations, resulting in varied noise levels and characteristics throughout the project. Despite differences in equipment type and size, the primary

sources and patterns of noise during construction are consistent enough to categorize noise levels by construction phase.

2.4 Mobile Noise

Traffic noise levels are primarily influenced by three factors: the volume of traffic, the speed of vehicles, and the proportion of trucks within the traffic flow. In general, traffic noise becomes louder with increased vehicle volume, higher speeds, and a greater number of heavy trucks. Vehicle noise comes from a combination of sources, including the engine, exhaust system, and tires.

Because noise levels are measured on a logarithmic scale, doubling the volume of traffic (while speed and truck percentage remain the same) results in an increase of about 3 dBA. According to the Federal Highway Administration (FHWA, 2026), a change of 3 dBA is considered "barely perceptible" and a change of 5 dBA is considered readily perceptible. A 10 dBA increase is typically required to produce a doubling in perceived loudness. The mix of vehicles also affects noise levels; as the number of heavy trucks rises and makes up a larger share of the traffic, nearby noise levels increase (FTA, 2018).

2.5 Noise From Multiple Sources

Because sound pressure levels in decibels are measured on a logarithmic scale, they cannot be added or subtracted using standard arithmetic. Instead, these levels are combined using energy-based summation. This means that adding a new noise source with the same sound level as an existing one does not result in a doubling of the overall noise level.

When two noise sources differ by 10 dBA or more, the louder source determines the overall level, and the combined noise level will be equal to that louder source. If the difference is between 0 and 1 dBA, the resulting level will be 3 dBA higher than the louder source or both sources if they are equal. A difference of 2 to 3 dBA results in a combined level 2 dBA above the louder source. When the difference is between 4 and 10 dBA, the resulting level will be 1 dBA higher than the louder source (FTA, 2018).

2.6 Vibration

The FTA *Transit Noise and Vibration Impact Assessment Manual* describes that vibration is the periodic oscillation of a medium or object. Sources of ground-borne vibrations include natural phenomena (e.g., earthquakes, volcanic eruptions, sea waves, landslides) or human-made causes (e.g., explosions, machinery, traffic, trains, construction equipment). Unlike airborne noise, ground-borne vibration is generally not perceptible outdoors and is primarily an indoor annoyance. Vibration effects should therefore be evaluated at the structure, considering building characteristics. Light structures such as wood-framed homes are more susceptible to vibration than heavy buildings with deep or spread foundations. In general, heavier buildings respond less to ground vibration due to soil-structure coupling.

There are several different methods that are used to quantify vibration. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal. The PPV is most frequently used to describe vibration impacts on buildings. The root mean square (RMS) vibration is the average of the squared amplitude of the signal and is most frequently used to describe the effect of vibration on the human body. Also, vibration decibel notation (VdB) is another vibration notation used by the FTA to describe vibration levels, provide a background of common vibration levels, and set vibration limits. Typical sources of

perceptible ground-borne vibration are construction equipment, steel-wheeled trains, heavy trucks and traffic on rough roads. If a roadway is smooth, the ground-borne vibration is rarely perceptible. For construction-related activities, PPV-based threshold, such as those established by California Department of Transportation (Caltrans), are generally more appropriate for evaluating potential impacts on both structures and human receptors.

3 REGULATORY SETTING

3.1 Federal

Federal Transit Administration Noise and Vibration Guidance

The noise and vibration assessment in this report is based on criteria from the FTA's 2018 *Transit Noise and Vibration Impact Assessment Manual* (FTA Manual) for a detailed construction noise assessment. Table 3-1, *Construction Noise Thresholds*, lists the FTA's recommended noise thresholds for a detailed construction noise assessment based on adjacent land uses.

Table 3-1: Construction Noise Thresholds

Land Use	$L_{eq.equip(8hr)}$, dBA	
	Day	Night
Residential	80	70
Commercial	85	85
Industrial	90	90

Source: Federal Transit Administration. (2018). *Federal Transit Administration Transit Noise and Vibration Guidance.*

Construction activity can result in varying degrees of ground vibration, depending on the equipment and method employed. Operation of the construction equipment causes ground vibrations that spread through the ground and diminish in strength with distance. Buildings founded on the soil near the construction site respond to these vibrations with varying results, ranging from no perceptible effects at the lowest levels, low rumbling sounds and perceptible vibration at moderate levels, and slight damage at the highest levels. While ground vibrations from construction activities do not often reach levels that can damage structures, fragile buildings must receive special consideration.

Federal Interagency Committee on Noise

The Federal Interagency Committee on Noise (FICON) made the following recommendations when reviewing noise levels for land use planning. If screening analysis shows that noise sensitive areas will be at or above 65 dB and will have an increase of 1.5 dB L_{dn} or more, further analysis should be conducted of noise-sensitive areas between 60-65 dB L_{dn} having an increase of 3 dB L_{dn} or more due to the proposed project noise exposure. If the 65 dB L_{dn} screening test calls for further analysis between 60-65 dB L_{dn}, agency mitigation options may include noise sensitive areas between 60-65 dB L_{dn} that are projected to have an increase of 3 dB or more as a result of the proposed project noise exposure. When the ambient noise level is less than 60 dB L_{dn}, a margin of safety of 5 dB is applied to the identified outdoor level to account for other adverse effects on activity interference and annoyance as well as for the most sensitive fraction of the population.

3.2 State

Noise Element Requirements

California Government Code Section 65302(f) mandates that the legislative body of each county and city adopt a Noise Element within the General Plan. The Element must identify and evaluate noise problems within the community, focusing on noise sources such as transportation, industrial plants, and airports, and presenting noise contours using CNEL or Ldn.

The Governor's Office of Land Use and Climate Innovation (previously known as the Governor's Office of Planning and Research) Noise Element Guidelines include recommended exterior and interior noise level standards for local jurisdictions to identify and prevent creation of incompatible land uses due to noise. The Noise Element Guidelines contain a land use compatibility table that describes the compatibility of various land uses with a range of environmental noise levels in terms of community noise equivalent level (CNEL). A noise environment of 50 CNEL to 60 CNEL is considered to be "normally acceptable" for residential uses.

Title 24 – California Building Standards Code

The California Building Code (CBC) (California Code of Regulations Title 24, Part 2) contains general building design and construction requirements relating to fire and life safety, structural safety, and access compliance. Section 1206.4, *Allowable Interior Noise Levels*, of the CBC requires that interior noise levels attributable to exterior sources shall not exceed 45 dB in any habitable room.

California Department of Transportation

Caltrans published updates to the *Traffic Noise Analysis Protocol* and *Transportation and Construction Vibration Guidance Manual* in April 2020. It contains the recommended thresholds to evaluate vibration impacts during construction. The construction vibration criteria include consideration of building conditions, as shown in Table 3-2, *Construction Vibration Damage Thresholds*.

Table 3-2: Construction Vibration Damage Thresholds

Structure and Condition	Maximum PPV, inches/second	
	Transient Sources	Continuous/Frequent Intermittent Sources
Extremely fragile historic buildings, ruins, ancient monuments	0.12	0.08
Fragile buildings	0.2	0.1
Historic and some old buildings	0.5	0.25
Older residential structures	0.5	0.3
New residential structures	1.0	0.5
Modern industrial/commercial structures	2.0	0.5

PPV=Peak Particle Velocity
Notes: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.
Source: Caltrans. (2020). *Transportation and Construction Vibration Guidance Manual.*

3.3 Local

County of Riverside General Plan

The County of Riverside adopted its most recent General Plan on December 8, 2015. The General Plan Noise Element provides a systematic approach to identifying and appraising noise problems in the community; quantifying existing and projected noise levels; addressing excessive noise exposure; and community planning for the regulation of noise. This element includes policies, standards, criteria, programs, diagrams, a reference to action items, and maps related to protecting public health and welfare from noise. The following are policies from the County's General Plan Noise Element that are applicable to the proposed Project:

Policies

N 1.1 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 noise buffers such as setbacks, landscaping, or block walls shall be used.

N 1.2 Consider the following uses noise-sensitive and discourage these uses in areas in excess of 65 CNEL:

- Schools.
- Hospitals.
- Rest Homes.
- Long Term Care Facilities.
- Mental Care Facilities.
- Residential Uses.
- Libraries.
- Passive Recreation Uses.
- Places of Worship.

According to the State of California Office of Planning and Research General Plan Guidelines, an acoustical study may be required in cases where these noise-sensitive land uses are located in an area of 60 CNEL or greater. Any land use that is exposed to levels higher than 65 CNEL will require noise attenuation measures.

N 1.4 Determine if existing land uses will present noise compatibility issues with proposed projects by undertaking site surveys.

N 1.5 Prevent and mitigate the adverse impacts of excessive noise exposure on the residents, employees, visitors, and noise-sensitive uses of Riverside County.

N 1.7 Require proposed land uses, affected by unacceptably high noise levels, to have an acoustical specialist prepare a study of the noise problems and recommend structural and site design features that will adequately mitigate the noise problem.

N 2.2 Require a qualified acoustical specialist to prepare acoustical studies for proposed noise-sensitive projects within noise impacted areas to mitigate existing noise.

N 2.3 Mitigate exterior and interior noises to the levels listed in Table N-2 below to the extent feasible, for stationary source:

Land Use	Interior Standards	Exterior Standards
Residential		
10:00 p.m. to 7:00 a.m.	40 L_{eq} (10 minute)	45 L_{eq} (10 minute)
7:00 a.m. to 10:00 p.m.	55 L_{eq} (10 minute)	65 L_{eq} (10 minute)

Source: County of Riverside. (2015). *County of Riverside General Plan Noise Element.*

N 4.1 Prohibit facility-related noise received by any sensitive use from exceeding the following worst-case noise levels:

a. 45 dBA-10-minutes Leq between 10:00 p.m. and 7:00 a.m.
b. 65 dBA-10-minutes Leq between 7:00 a.m. and 10:00 p.m.

N 4.2 Develop measures to control non-transportation noise impacts.

N 4.3 Ensure any use determined to be a potential generator of significant stationary noise impacts be properly analyzed and ensure that the recommended mitigation measures are implemented.

N 4.4 Require that detailed and independent acoustical studies be conducted for any new or renovated land uses or structures determined to be potential major stationary noise sources.

N 4.5 Encourage major stationary noise-generating sources throughout the County of Riverside to install additional noise buffering or reduction mechanisms within their facilities to reduce noise generation levels to the lowest extent practicable prior to the renewal of conditional use permits or business licenses or prior to the approval and/or issuance of new conditional use permits for said facilities.

N 4.7 Evaluate noise producers for the possibility of pure-tone producing noises. Mitigate any pure tone that may be emitted from a noise source.

N 7.1 New land use development within Airport Influence Areas shall comply with airport land use noise compatibility criteria contained in the corresponding airport land use compatibility plan for the area. Each Area Plan affected by a public-use airport includes one or more Airport Influence Areas, one for each airport. The applicable noise compatibility criteria are fully set forth in Appendix I-1 and summarized in the Policy Area section of the affected Area Plan.

N 7.2 Adhere to applicable noise compatibility criteria when making decisions regarding land uses adjacent to airports. Refer to the Airports section of the Land Use Element (Page LU-32) and the Airport Influence Area sections of the corresponding Area Plans.

N 7.4 Check each development proposal to determine if it is located within an airport noise impact area as depicted in the applicable Area Plan's Policy Area section regarding Airport Influence Areas. Development proposals within a noise impact area shall comply with applicable airport land use noise compatibility criteria.

N 12.1 Utilize natural barrier such as hills, berms, boulders, and dense vegetation to assist in noise reduction.

N 12.2 Utilize dense landscaping to effectively reduce noise. However, when there is a long initial period where the immaturity of new landscaping makes this approach only marginally effective, utilize a large number of highly dense species planted in a fairly mature state, at close intervals, in conjunction with earthen berms, setbacks, or block walls.

N 13.1 Minimize the impacts of construction noise on adjacent uses within acceptable practices.

N 13.2 Ensure that construction activities are regulated to establish hours of operation in order to prevent and/or mitigate the generation of excessive or adverse noise impacts on surrounding areas.

N 13.3 Condition subdivision approval adjacent to developed/occupied noise-sensitive land uses (see policy N 1.3) by requiring the developer to submit a construction-related noise mitigation plan to the County for review and approval prior to issuance of a grading permit. The plan must depict the location of construction equipment and how the noise from this equipment will be mitigated during construction of this project, through the use of such methods as:

a. Temporary noise attenuation fences;
b. Preferential location of equipment; and
c. Use of current noise suppression technology and equipment.

N 13.4 Require that all construction equipment utilizes noise reduction features (e.g. mufflers and engine shrouds) that are no less effective than those originally installed by the manufacturer.

N 14.1 Enforce the California Building Standards that sets standards for building construction to mitigate interior noise levels to the tolerable 45 CNEL limit. These standards are utilized in conjunction with the Uniform Building Code by the County's Building Department to ensure that noise protection is provide to the public. Some design features may include extra-dense insulation, double-paned windows, and dense construction materials.

N 14.2 Continue to develop effective strategies and mitigation measures for the abatement of noise hazards reflecting effective site design approaches and state-of-the-art building technologies.

N 14.3 Incorporate acoustic site planning into the design of new development, particularly large scale, mixed-use, or master-planned development, through measures which may include:

- Separation of noise-sensitive buildings from noise-generating sources.
- Use of natural topography and intervening structure to shield noise-sensitive land uses.
- Adequate sound proofing within the receiving structure.

N 14.4 Consider and, when necessary, to lower noise to acceptable limits, require noise barriers and landscaped berms.

N 14.9 Mitigate 600 square feet of exterior space to 65 dB CNEL when new development is proposed on residential parcels of 1 acre or greater.

N 16.1 Restrict the placement of sensitive land uses in proximity to vibration-producing land uses.

N 16.2 Consider the following land uses sensitive to vibration:

- Hospitals;
- Residential areas;

- Concert Halls;
- Libraries;
- Sensitive research operations;
- Schools; and
- Offices.

Noise Standards and Land Use Compatibility

The County of Riverside uses the compatibility standards recommended by the California Governor's Office Planning and Research that rate compatibility in terms of normally acceptable, conditionally acceptable, normally unacceptable, and clearly unacceptable, as shown in Table 3-3, *Land Use Noise Compatibility* (from N-3 in the Noise Element).

Table 3-3: Land Use Noise Compatibility

Land Use Category	Community Noise Exposure (dB)			
	Normally Acceptable	Conditionally Acceptable	Normally Unacceptable	Clearly Unacceptable
Residential – Low Density, Single-Family, Duplex, Mobile Homes	50-60	55-70	70-75	75-80
Residential – Multi family	50-65	60-70	70-75	70-85
Transit Lodging, Motels, Hotels	50-70	60-70	70-80	80-85
Schools, Libraries, Churches, Hospitals, Nursing Homes	50-70	60-70	70-80	80-85
Auditoriums, Concert Halls, Amphitheater	--	50-70	--	65-85
Sports Arena Outdoor Spectator Sports	--	50-75	--	70-85
Playgrounds, Neighborhood Parks	50-70	--	57.5-75	72.5-85
Golf Courses, Riding Stables, Water Recreation, Cemeteries	50-75	--	70-80	80-85
Office Buildings, Business, Commercial and Professional	50-70	60-70	75-85	--
Industrial, Manufacturing, Utilities, Agriculture	50-75	55-70	75-85	--

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 Unacceptable: New construction or development should generally not be undertaken.
Source: County of Riverside, *County of Riverside General Plan Noise Element*.

County of Riverside Municipal Code

The County of Riverside Municipal Code has several policies directed at controlling or mitigating environmental noise effects. The County of Riverside Municipal Code Chapter 9.52, *Noise Regulation*,

provides all noise regulations to control and limit unnecessary and excessive noise and vibration in the County. The following sections are applicable to the proposed Project:

Section 9.52.020. Exemptions.

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

1. Construction does not occur between the hours of six p.m. and six a.m. during the months of June through September, and
2. Construction does not occur between the hours of six p.m. and seven a.m. during the months of October through May.

Section 9.52.040. General sound level standards

A. 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 3-4, *Exterior Noise Standards* (Table 1in the Municipal Code Section 9.52.040, General sound level standards):

Table 3-4: Exterior Noise Standards

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 p.m.
Community Development	VLDR	Very Low Density Residential	1 AC	55	45
	LDR	Low Density Residential	½ AC	55	45
	MDR	Medium Density Residential	2-5 AC	55	45
Rural	RM	Rural Mountain	10 AC	45	45

Source: County of Riverside. (2015). *County of Riverside Municipal Code Section. 9.52.040.*

4 EXISTING CONDITIONS

4.1 Existing Noise Levels

To assess existing ambient noise levels in the Project area, EPD conducted short-term noise measurements on December 2, 2025, at four locations in the vicinity of the proposed Project. These measurement locations are shown in Figure 4-1, *Noise Measurement Locations*, and are representative of typical noise exposure levels experienced at the nearest sensitive receptors. Each measurement consisted of a 15-minute recording taken between 10:30 a.m. and 11:30 a.m. These short-term L_{eq} measurements are considered indicative of general noise conditions throughout the day.

The measurements were conducted during "off-peak" traffic hours (9:00 a.m. to 3:00 p.m.) to establish a more conservative baseline. During traditional peak hours, traffic congestion often results in lower vehicle and heavy truck volumes. In contrast, free-flowing traffic conditions immediately before or after peak periods can produce higher noise levels. The recorded noise levels at the measurement sites and at the nearest sensitive receptors are summarized in Table 4-1, *Ambient Noise Measurements*.

Table 4-1: Ambient Noise Measurements

Location	Description	L_{eq} (dBA)	L_{max} (dBA)	L_{min} (dBA)
NM-1	In front of 28309 Mapes Road	65.4	82.2	36.9
NM-2	Along Palomar Road, west of the residential located northeast of the Palomar Road and Mapes Road intersection	53.7	70.7	37.1
NM-3	East of 28243 Tower View Court, along Tradewinds Drive	53.4	72.9	36.8
NM-4	East of 28190 Sparacio Road	56.7	74.0	42.3

Notes: dBA=A-weighted decibels; L_{eq}=Equivalent Sound Level; L_{min}=Minimum Sound Level; L_{max}=Maximum Sound Level
Source: EPD Solutions, Inc. 2025. Refer to Appendix A, *Noise Measurement Data*.

The background ambient noise levels in the Project area are dominated by transportation-related noise associated with surface streets, including the auto and heavy truck activities on study area roadway segments near the noise level measurement locations. Also, noise from regular aircraft flight overhead was captured in the NM-2 through N-4 noise measurement.

The meteorological conditions during the measurement of ambient noise levels included clear conditions and warm temperatures with light windspeeds (5 miles per hour). Noise monitoring equipment used for the ambient noise survey consisted of a PCE-430, which is a Class 1 sound level meter with a half-inch measurement microphone. The monitoring equipment complies with applicable requirements of the American National Standards Institute (ANSI) for sound level meters. The results of the field measurements are included in Appendix A.

Figure 4-1: Noise Measurement Locations



Legend

Project Boundary

Noise Measurement Locations

0 250 500 US Feet

N

4.2 Sensitive Receptors

Noise-sensitive receptors are locations or individuals that may be adversely affected by elevated noise levels due to their nature, function, or occupancy. Land uses considered sensitive by the State of California includes schools, playgrounds, athletic facilities, hospitals, rest homes, rehabilitation centers, long-term care and mental care facilities. Generally, a sensitive receptor is identified as a location where human populations (especially children, senior citizens, and sick people) are present.

The sensitive receptors closest to the Project site boundary are single family residences west, east, and south of the Project site. The nearest sensitive receptor is located 56 feet west and east of the Project site. However, the Project would propose off-site improvements along Mapes Road, Palomar Road, and Tradewinds Drive. The construction activities for the off-site improvements could locate as close as 25 feet to the west and east of the Project site. Other noise sensitive land uses near the Project site are located at greater distances than those listed above and would experience lower noise levels than those detailed in this report due to the additional attenuation from distance and the shielding of intervening structures.

4.3 Aircraft Noise

Aircraft-related noise levels are primarily associated with aircraft engine noise made during takeoff, landing, or idling on the tarmac. The nearest airport is the Perris Valley Airport, which is located 2.8 miles west of the Project site. However, the Project is not located within the Influence Area of the Perris Valley Airport but is within the March Air Reserve Base Influence Area (County of Riverside, 2023b). The March Air Reserve Base is located 7.9 miles northwest of the Project site.

4.4 Stationary Sources

Land uses in the Project area are mostly residential. The primary sources of stationary noise in the Project vicinity are urban-related activities (e.g., mechanical equipment and parking areas). The noise associated with these sources may represent a single-event noise occurrence, short-term noise, or long-term/continuous noise.

4.5 Existing Traffic Noise

The Federal Highway Administration (FHWA) Highway Traffic Prediction Model (FHWA-RD-77-108) was used to evaluate traffic-related noise conditions along local roadway segments in the Project vicinity. The details of traffic noise modeling are included in Appendix B, *Noise Modeling Data*. Table 4-2, *Existing Traffic Noise Levels*, provides the existing traffic noise levels in the Project vicinity. These traffic noise levels are representative of a worst-case scenario that assumes a flat terrain and no shielding between the traffic and the noise contour.

Table 4-2: Existing Traffic Noise Levels

Roadway Segment	ADT[1]	dBA @ curbside feet from Roadway Centerline[2]	Centerline to 65 dBA CNEL (feet)	Centerline to 60 dBA CNEL (feet)	Centerline to 55 dBA CNEL (feet)
Mapes Road (West of Tradewinds Drive)	3,070	60.8	-	56	122
Mapes Road (Between Tradewind Drive and Palomar Road)	2,770	60.3	-	53	114
Mapes Road (East of Palomar Road)	3,125	60.9	-	57	123
Palomar Road (North of Mapes Road)	40	46.6	-	-	-
Tradewind Drive (North of Mapes Road)	100	50.6	-	-	-

Notes: ADT = average daily traffic; CNEL = community noise equivalent level; dBA=A-weighted decibels, - = contour is within the roadway.

1. EPD Solutions, Inc. (2025). *Mapes Residential Traffic Impact Analysis*.
2. United States Department of Transportation and Federal Highway Administration. (2018). *Traffic Data Computation Method*. Refer to Appendix B, *Noise Modeling Data*.

5 THRESHOLDS OF SIGNIFICANCE

5.1 CEQA Thresholds

Appendix G, *Environmental Checklist Form*, of the CEQA Guidelines contains the following significance criteria. A project could have potential significant impacts regarding noise and vibration if it were to:

- Generate 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 the other agencies;
- Generate excessive ground vibration or ground borne noise levels; or
- 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 2 miles of a public or public use airport, expose people residing or working in the project area to excessive noise levels.

Based on these standards/criteria, the effects of the Project have been categorized as having "no impact," a "less-than-significant impact," or a "potentially significant impact." Mitigation measures are recommended for potentially significant impacts. If a potentially significant impact cannot be reduced to a less-than-significant level through the application of existing regulations and mitigation, it is categorized as a significant and unavoidable impact.

5.2 Methodology

Construction Noise

Since the County's Municipal Code does not establish quantified thresholds for increases to noise volumes and vibration, the thresholds from the FTA Transit Noise and Vibration Impact Assessment Manual were used in this analysis. Construction noise levels were based on typical noise levels generated by construction equipment as published by the FTA and FHWA and using the FHWA's Roadway Construction Noise Model (RCNM), which includes a national database of construction equipment reference noise levels. The equipment list used in this analysis is based on land use and Project location using the California Emissions Estimator Model (CalEEMod). Since the exact specific equipment to be used on-site is unknown, this evaluation identifies the combined noise levels for all pieces of equipment operating simultaneously for each stage. Construction noise is assessed in dBA L_{eq}. The FTA's Transit Noise and Vibration Impact Assessment Manual sets a threshold of 80 dBA for residential land uses that is used to evaluate noise impacts.

Operational Noise

Operational noise would include noise from off-site mobile sources and on-site noise source such as Heating, Ventilation, Air Conditioning (HVAC) units, parking lot activities, on-site vehicle moving including auto mobiles, garbage and delivery trucks traveling on the internal roads due to implementation of the Project was compared to the exterior thresholds set in the County of Riverside Municipal Code to evaluate the significance of impact. The operational noise on-site is analyzed using the Computer Aided Noise Abatement (CadnaA) program. CadnaA can analyze multiple types of noise sources using the spatially accurate project site plan and OpenStreetMap data in its calculations to predict outdoor noise levels. Using the ISO 9613-2 protocol, CadnaA calculates the distance from each noise source to the noise receptor locations and applies ground

absorption, distance attenuation, and barrier/building attenuation inputs to provide a summary of the noise level at each receptor, as well as the partial noise level contributions from each source.

Consistent with the ISO 9613-2 protocol, the CadnaA noise prediction model relies on reference sound power levels (PWL) to describe individual noise sources. While sound pressure levels (SPL) quantify in decibels the intensity of a given sound at a reference distance, SPLs vary with distance from the source and are influenced by intervening obstacles and barriers, air absorption, wind, and other factors. In contrast, sound power represents the total acoustic energy emitted by a source and is an absolute value that is not affected by the surrounding environment.

The operational noise level calculations presented in this study account for distance attenuation due to geometric spreading, which occurs when sound from a localized stationary source (i.e., a point source) propagates uniformly outward in a spherical pattern. A default ground attenuation factor of 0.5 was used in the analysis to represent mixed ground conditions, reflecting a combination of hard and soft surfaces. This approach provides a reasonable approximation for environments where both surface types are present and aligns with typical real-world conditions.

The FHWA Highway Traffic Prediction Model (FHWA-RD-77-108) was used to evaluate traffic-related noise conditions along local roadway segments in the Project vicinity.

Construction and Operation Vibration

Vibration levels were calculated based on the structure damage assessment method provided in the Caltrans' *Transportation and Construction Vibration Guidance Manual*. As the nearest sensitive receptor structures are residential uses, the construction damage threshold of 0.3 inches-per-second is applied (see Table 5-2, *Significance Criteria Summary*).

Distance to the Surrounding Sensitive Receptors

As discussed above, there are sensitive receptors located in the Project vicinity. The nearest sensitive receptors are the residences located to the west of the Project site. Other noise sensitive land uses near the Project site are located at greater distances than those listed above and would experience lower noise levels than those detailed in this report due to the additional attenuation from distance and the shielding of intervening structures. The construction noise impacts are evaluated from the geographic center of the Project to the nearest sensitive receptors. The construction vibration impacts are evaluated from the construction activities to the nearest residential structures. Please refer to Table 5-1, *Distances Used for Construction Noise Analysis*, for details of distances.

Table 5-1: Distances Used for Construction Noise Analysis

Sensitive Receptor	Distance Between Project Boundary with the Off-site Improvements to Surrounding Land Uses (feet)	Distance From the Geographic Center of Project Site to the Nearest Sensitive Receptor (feet)	Distance from Construction Activities to the Nearest Structure (feet)[1]
Residential to the West	25	720	30
Residential to the East	25	835	90
Residential to the South	55	720	50

1. This distance is in consideration of off-site improvements along Mapes Road, Palomar Road, and Tradewinds Drive.

Airport Noise

The distance between the Project site and the nearest airport was evaluated to determine whether the Project is located within an airport land use plan area or within the vicinity of a public or private airstrip. Aircraft flyovers may occasionally be audible at the project site due to air traffic in the surrounding area. The nearest airport is the Perris Valley Airport, which is located 2.8 miles west of the Project site. However, the Project is not within the Influence Area of the Perris Valley Airport but lies well within the March Air Reserve Base Influence Area (County of Riverside, 2023b). The March Air Reserve Base is located 7.9 miles northwest of the Project site.

5.3 Significance Criteria

The following significance criteria are based on the analysis identified within Appendix G of the CEQA Guidelines. The County's General Plan and Municipal Code establish noise compatibility standards and quantitative thresholds used to evaluate project-related noise impacts. Specifically, operational noise levels generated on-site are compared to the County's exterior noise standards of 55 dBA (daytime) and 45 dBA (nighttime).

The County's regulations do not define thresholds for determining substantial increases in ambient noise levels or establish criteria for construction-related vibration impacts. Therefore, guidance from the FTA's *Transit Noise and Vibration Impact Assessment Manual* and the Caltrans *Transportation and Construction Vibration Guidance Manual* was used to evaluate construction noise and vibration impacts.

Increase in Ambient Noise

FICON guidance provides established criteria to assess the impacts of a substantial permanent increase in baseline ambient noise levels. Based on the FICON criteria, the amount to which a given noise level increase is considered acceptable is reduced when the without Project (baseline) noise levels are already shown to exceed certain land-use specific exterior noise level criteria. The specific levels are based on typical responses to noise level increases of 5 dBA (readily perceptible), 3 dBA (barely perceptible), and 1.5 dBA depending on the underlying "without-Project" noise levels for noise-sensitive uses.

- If ambient noise levels are less than 60 dBA, a project-related increase of 5 dBA or greater (readily perceptible) is considered significant.
- If ambient noise levels range from 60 to 65 dBA, an increase of 3 dBA (barely perceptible) is considered significant.
- If ambient noise levels exceed 65 dBA, an increase of 1.5 dBA or greater is considered significant, as it likely contributes to an existing noise exposure exceedance.

In addition to the FICON criteria, this analysis relies on the Caltrans substantial noise level increase threshold of 12 dBA to account for conditions where an existing unimproved roadway segment experiences an off-site traffic noise level increase due to a lack of existing traffic volumes. According to Caltrans, a traffic noise impact occurs when the future noise level substantially exceeds the existing noise level by 12 dBA or more. The use of 12 dBA was established in California many years ago and is based on the concept that a 10

dBA increase generally is perceived as doubling of loudness (California Department of Transportation, 2020).

Construction

Construction noise impacts are evaluated using a threshold of 80 dBA, consistent with the FTA *Transit Noise and Vibration Impact Assessment Manual*.

Vibration

Construction related vibration impacts are evaluated using the Caltrans *Transportation and Construction Vibrational Manual*. Most buildings near the Project site are modern structures. However, to provide a conservative analysis, the threshold for older residential structures was used, which provides a vibration threshold of 0.3 PPV (in/sec), as listed previously in Table 3-2, *Construction Vibration Damage Thresholds*.

Summary

Table 5-2, *Significance Criteria Summary*, provides a summary of thresholds established by the County of Riverside and used in this report.

Table 5-2: Significance Criteria Summary

Analysis	Conditions	Significance Criteria	
		Daytime	Nighttime
Off-Site Traffic[1,2]	Residential – Low Density, Single-Family, Duplex, Mobile Homes	Normally Compatible: 50-60 dBA Conditionally Compatible: 55-70 dBA	
	Residential – multi-family	Normally Compatible: 50-65 dBA Conditionally Compatible: 60-70 dBA	
	Existing Unimproved Roadways	12 dBA Project Increase	
	Existing Improved Roadways: If ambient is < 60 dBA CNEL	≥ 5 dBA CNEL Project Increase	
	Existing Improved Roadways: If ambient is > 65 dBA CNEL	≥ 1.5 dBA CNEL Project Increase	
Operational	Exterior Noise Level Standards[3]	55 dBA	45 dBA
Construction	Construction does not occur between the hours of six p.m. and six a.m. during the months of June through September, and Construction does not occur between the hours of six p.m. and seven a.m. during the months of October through May.[4]		
	Noise Level at Residential Property[5]	80 dBA	Not Allowed
	Vibration Damage Criteria[6]	0.3 PPV (inches/second)	

1. County of Riverside. (2015). *County of Riverside Noise Element.*
   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.
2. FICON. (1996). *Federal Agency Review of Selected Airport Noise Analysis Issue.*
3. County of Riverside. (2025). *County of Riverside Municipal Code, Section 8.24.040. Exterior Standards.*
4. *County of Riverside. County of Riverside Municipal Code.*
5. FTA. (2018). *Transit Noise and Vibration Impact Assessment Manual.*
6. Caltrans. (2020). *Transportation and Construction Vibration Guidance Manual.* For older residential structures.

6 PROJECT IMPACTS

6.1 Construction Noise

On-Site Construction Noise

Construction is accomplished in different phases with a specific equipment mix, depending on the work to be performed during that phase. As a result of the different equipment mix for each phase, each phase has its own noise characteristics; some phases have higher continuous noise levels, while others have higher impact noise levels. The Project construction activities are expected to occur in the following phases:

1. Site preparation;
2. Grading;
3. Building construction;
4. Paving; and
5. Architectural coating.

Construction activities frequently shift from one location to another. For example, during site preparation and grading, noise-generating activities may concentrate in an area for a short period to remove existing structures, while the majority of the grading involves the equipment moving back and forth in a predictable pattern throughout the site. The building construction and foundation work generally concentrates near the building location, while paving involves a pattern of movement throughout the site over a short term. Therefore, the FTA recommends that construction activities are best evaluated as multiple moving point sources because equipment changes position in terms of its distance and direction relative to the receivers (FTA, 2018). Since this analysis assumed all equipment operating simultaneously, the distance used to evaluate construction noise would be from the geographic center of the Project site and nearest sensitive receptors. The construction noise would be attenuated by distance and existing objects (e.g., walls or buildings) to block line of sight. The noise levels of the potential construction equipment are listed in Table 6-1, *Construction Equipment Noise Levels*.

Table 6-1: Construction Equipment Noise Levels

Activity	Equipment[1]	Maximum Noise Level @ 50 Feet[2,3]	Quantities	Noise Level @ 50 Feet[2,3]	Noise Level from the center of construction activities to nearest sensitive recpetors[2,3]
		dBA L_{max}		dBA L_{eq}	dBA L_{eq}
Site Preparation	Rubber Tired Dozers	81.7	3	87.6	64.5
	Crawler Tractors	84.0	4		
Grading	Excavators	80.7	2	85.0	65.0
	Graders	85.0	1		
	Rubber Tired Dozers	81.7	1		
	Scrapers	83.6	2		
	Crawler Tractors	84.0	2		
Building Construction	Cranes	80.6	1	86.1	62.9
	Forklift	74.7	3		
	Generator Sets	80.6	1		
	Tractors/Loaders/Backhoe	84.0	3		
	Welders	74.0	1		
Paving	Pavers	77.2	2	86.5	63.4
	Paving Equipment	89.5	2		
	Rollers	80.0	2		
Architectural Coating	Air Compressors	77.7	1	73.7	50.5

Source:
1. The equipment list at each construction phase is based on the California Emissions Estimator Model and questionnaire filled by the applicant.
2. Federal Highway Administration. (2006). *Construction Noise Handbook*.
3. The noise levels are based on Table 9.1 of the Construction Noise Handbook. If the exact equipment listed is not available, a default noise level of 85 dBA, representative of typical construction equipment, is used. Specifically, the Forklift is modeled using this default value. Additionally, for the category of Tractors/Loaders/Backhoes, the noise level of a Tractor (84 dBA) is used, as it represents the loudest among the three.

The nearest noise sensitive receptors are multi-family residences 56 feet west and east of the Project site. Since, the Project would propose off-site improvements along nearby roadways. The off-site improvements would be located as close as 25 feet to the nearest sensitive receptors. However, the roadway improvements would only have one piece of equipment at a time due to the width of the road and would move once their completion, which would not impact the nearest sensitive receptors for an extended time. Furthermore, the off-site improvement would be exempt from the County's Municipal Code as it would be categorized as a capital improvement project. The geographic center of the Project site and proposed off-site improvements is approximately 720 feet from the closest residential properties to the west and south. Project construction would be allowed only between the hours of 6:00 a.m. and 6:00 p.m. on any day during the months of June through September, or between the hours of 7:00 a.m. and 6:00 p.m. on any day during months of October

through May in compliance with the County's Municipal Code. Further, the noise levels and quantities of construction equipment are listed in Table 6-1, *Construction Equipment Noise Levels*, above. As discussed above, as a conservative analysis, this analysis assumes all equipment is located at the geographic center of the Project site and operating concurrently. As shown in Table 6-1, the estimated temporary noise levels from the center of Project construction activities when all equipment operating simultaneously at the nearest sensitive receptors would range from 50.5 dBA to 65.0 dBA, which would not exceed the FTA threshold of 80 dBA for residential property. As such, the Project construction would result in a less-than-significant impact.

Off-Site Construction Noise

Project construction would result in additional traffic on adjacent roadways over the period that construction occurs. According to the California Emissions Estimator Model (CalEEMod), which is used to predict the number of construction-related automotive trips, the maximum number of Project construction trips traveling to and from the Project site during a single construction phase would be expected to be 67 daily trips in a single phase. According to the *Caltrans Traffic Noise Analysis Protocol*, a doubling of traffic on a roadway results in an increase of 3 dB (Caltrans, 2020a). A 3 dBA change is considered a just perceptible difference. The Project site would be accessible via Tradewinds Drive and Palomar Road during construction. The existing trips along Tradewinds Drive and Palomar Road are 100 and 2,487 vehicle daily trips, respectively (Streetlight Data, 2025). Therefore, the Project's construction trips (67 trips) would not result in a doubling of traffic on the transportation network (currently as low as 100 trips), which would not be perceptible. Additionally, construction is temporary, and construction trips would cease upon completion of the Project. As such, impacts related to off-site construction noise would be less than significant.

6.2 Operational Noise

Long-term operational noise would be generated from the day-to-day residential operational activities including:

- Off-site mobile sources: automobiles traveling to and from the Project site.
- On-site noise sources:
    - Stationary sources including HVAC units and parking activities.
    - Mobile sources including passenger vehicles, daily delivery trucks, and weekly garbage trucks moving on-site.

Off-Site Mobile Noise

Roadway segment noise levels for the "Existing" and "Existing with Project" scenarios were compared to evaluate Project-related operational noise impacts. According to the *Mapes Residential Transportation Impact Analysis* (TIA Analysis), dated February 2026, prepared by EPD Solutions, Inc., the Project would generate an estimated 1,427 daily trips. As shown in Table 6-2, *Existing Plus Project Traffic Noise Levels*, the noise level under the "Existing" scenario from the roadway centerline to curbside ranges from 46.6 to 60.8 dBA. With the addition of the Project, the noise level would range from 58.1 to 62.1 dBA. The increase due to the Project would range from 0.6 to 11.5 dBA, depending on the roadway segment. As described under Section 5.3, *Significance Criteria,* a project-related increase in off-site traffic noise is considered significant only if both of the following conditions are met: (1) the resulting noise levels exceed applicable land use compatibility standards, and (2) the increase in ambient noise exceeds the applicable significance threshold.

Along Mapes Road (west of Tradewinds Drive, between Tradewinds Drive and Palomar Road, and east of Palomar Road), Project-related noise increases would be less than 1.5 dBA. Based on applicable significance criteria, this increase would not exceed the thresholds for significance. Along Palomar Road (north of Mapes Road) and Tradewind Drive (north of Mapes Road) Project-related noise increases would range from 7.6 to 11.5 dBA. However, since these two segments are considered existing unimproved roadway segments without pavement. Therefore, the Caltrans 12 dBA threshold was used to evaluate the noise level increase. Based on applicable significance criteria, these increases would not exceed the thresholds for significance.

Furthermore, the existing residential receptors along these roadway segments are characterized by typical suburban residential development conditions, including standard building construction, setbacks of approximately 30 feet or greater from the roadway, and the presence of intervening features such as walls and backyard areas that provide additional attenuation. Furthermore, the ambient noise level with project would not exceed the upper limit of conditionally compatible exterior noise exposure for residential land uses. As such, the proposed project would not result in a substantial adverse effect. Impacts would be less than significant

Table 6-2: Existing Plus Project Traffic Noise Levels

Roadway Segment	Existing		Existing Plus Project				Land Use Compatibility Noise Level[3]	Increase over Existing Scenario (dBA)	Thresholds Based on Ambient Noise Measurement (dBA)[4]	Exceed thresholds?[5]
	Existing ADT[1]	dBA @ curbside from Roadway Centerline	Existing Plus Project ADT[2]	dBA @ curbside from Roadway Centerline	Centerline to 60 dBA CNEL (feet)	Centerline to 55 dBA CNEL (feet)				
Mapes Road (West of Tradewinds Drive)	3,070	60.8	4,120	62.1	81	256	70 dBA	1.3	**1.5**	**No**
Mapes Road (Between Tradewind Drive and Palomar Road)	2,770	60.4	3,390	61.2	67	210	70 dBA	0.8	**1.5**	**No**
Mapes Road (East of Palomar Road)	3,125	60.9	3,570	61.5	70	222	70 dBA	0.6	**1.5**	**No**
Palomar Road (North of Mapes Road)	40	46.6	800	58.1	-	51	70 dBA	11.5	**12**	**No**
Tradewind Drive (North of Mapes Road)	100	50.6	830	58.2	-	53	70 dBA	7.6	**12**	**No**

Notes: ADT= average daily traffic; CNEL=Community Noise Equivalent Level; dBA=A-weighted decibels; - = still within the roadway
1. The existing ADT along the roadway is referring to Table 4-2, *Existing Traffic Noise Levels,* above.
2. ADTs were calculated based on the *Mapes Residential Project Traffic Impact Analysis*, dated March 2026, prepared by EPD Solutions.
3. The land use compatibility noise level is based on the land use along the roadway.
4. The thresholds are based on the ambient noise level measured in the correspondent street. Increase thresholds from Table 5-2: If ambient noise level is less than 60 dBA, the increase threshold is 5 dBA. If ambient noise level is between 60-65 dBA, the increase threshold is 3 dBA. If ambient noise level is above 65 dBA, the increase threshold is 1.5 dBA. In addition, 12-dBA threshold was used at existing unimproved roadways, such as Palomar Road (North of Mapes Road) and Tradewind Drive (North of Mapes Road).
5. Exceed both the thresholds?

On-Site Noise

Heating, Ventilation, and Air Conditioning

Typically, mechanical equipment, such as heating, ventilation, and air conditioning (HVAC) units, would be located in the backyard of the proposed unit adjacent to the structure. The Project proposes a 157-unit single-family residential development. For this analysis, it was assumed that the residences would have the most common and currently available HVAC unit with standard sound performance (or similar), which is Air Conditioner Model 26TPA8-C from Carrier. This model would generate 67 dB at the source based on the specification sheet. Based on research online, residential AC could run from 12 to 16 hours per day during an extremely hot day (Craig Air Conditioning, 2025). As a conservative analysis, the HVAC units were analyzed assuming they would be located in the backyard and closer to the proposed buildings, and it was assumed that the HVAC units would operate in steady-state for 24 hours. Also, no walls, which could block more noise, were modelled on-site to be conservative. Based on the modeling results from CadnaA, the noise generated from HVAC would range from 25.9 dBA to 27.5 dBA at the sensitive receptors' property boundaries, which would not exceed the County's exterior thresholds of 55 dBA and 45 dBA at a residential property, respectively.

On-Site Mobile Noise

There are two components of on-site mobile noise: vehicles traveling on internal roads, including regular automobile vehicles, occasional delivery trucks, and weekly garbage trucks, and parking activities. The Project includes two car garages for each residential unit and street curbside parking on-site. There would be 1,427 trips during the day trips on-site, including 110 trips during AM peak hour and 146 trips during PM peak hour based on the TIA Analysis prepared for the Project. As a conservative analysis, it is assumed there would be 146 trips on-site per hour during the day and 28 trips (quarter of the peak PM trips) per hour during the night. It was assumed there would be one percent of truck trips per hour on-site to account for occasional delivery trucks and weekly garbage trucks. Based on *Noise Navigator Sound Level Database with Over 1700 Measurement Values*, light traffic would generate 50.8 dBA at 50 feet, which is within normally acceptable of the single-family's community noise standards (Berger, E. H. and etc, 2015). As such, traffic associated within the residential development is typically not of sufficient volume to exceed community noise standards, which are based on a time-averaged scale such as the CNEL scale.

Cumulative Operational Noise and Its Increases in Ambient Noise

To identify Project operational ambient noise level increases, the Project operational noise levels are combined with the existing ambient noise levels measurements. The difference between the combined Project and ambient noise levels identifies the Project noise level increase. Based on the modeling results from CadnaA, the noise generated from HVAC units and parking activities would be 50.2 dBA during the daytime and 42.7 dBA during the nighttime at the site boundary, which would not exceed the County's exterior thresholds of 45 dBA and 55 dBA at a residential property, respectively. As shown in Table 4-1, *Ambient Noise Measurements*, the ambient noise level in the Project vicinity ranges from 53.4 to 65.4 dBA L_{eq}. The Project's daytime and nighttime noise levels during operation would be less than 53.4 dBA, which would thus not result in an increase in ambient noise level due to auditory masking (in human perception, auditory masking is that the louder sound covers the quieter one so that it is inaudible or less perceptible). Therefore,

the incremental increase in ambient noise from operation of the proposed Project would be less than significant.

6.3 Vibration

Construction Vibration

Construction activities can generate varying levels of ground vibration depending on the equipment used and the methods employed. These vibrations propagate through the ground and decrease in intensity with distance. Table 6-3, *Construction Equipment Vibration Levels*, presents typical vibration levels associated with various types of construction equipment.

Table 6-3: Construction Equipment Vibration Levels

Equipment	Reference Vibration Level at 25 Feet (PPV [inches/second])[1]	Vibration Level at 30 Feet (PPV [inches/second])[2]
Large Bulldozer	0.089	0.068
Loaded Trucks	0.076	0.058
Small Bulldozer	0.003	0.002

Source:
1. FTA. (2018). *Transit Noise and Vibration Impact Assessment Manual.*
2. $PPV_{equip} = PPV_{ref} \times \left(\frac{25}{D}\right)^{1.5}$, D=distance between the equipment to the sensitive receptors.

Based on the equipment list in Table 6-1, *Construction Equipment Noise Levels*, the Project construction would use the following vibration-heavy equipment on-site, that include rubber tired dozers, loaded trucks, and graders (generates similar vibration as large bulldozer). The nearest residential structure would be located as close as 30 feet from the construction activities, which would generate a vibration level of 0.068 from a large bulldozer, which would be the most vibrating piece of equipment used by Project construction. As shown in Table 6-3, *Construction Equipment Vibration Levels*, the vibration level at the nearest residential structure would range from 0.002 to 0.068 PPV (inches per second), which would not exceed the threshold of 0.3 inches per second established by Caltrans. For off-site improvements, the vibration would range from 0.003 to 0.089 PPV at 25 feet, which would not exceed the threshold of 0.3 inches per second established by Caltrans. As such, the vibration impacts during construction would be less than significant.

Operational Vibration

The Project proposes a 157-unit single-family residential development, which would not involve railroads or substantial heavy truck operations that are typically associated with significant operational vibration. Operation of the residences would include heavy trucks for residents moving in and out of the units and garbage trucks for solid waste disposal, which would not be frequent daily activities. Truck vibration levels are dependent on vehicle characteristics, load, speed, and pavement conditions. Garbage trucks and delivery trucks on-site would be travelling at very low speeds and on new pavement installed by the Project, so it is expected that vibration from these trucks at nearby sensitive receptors would not be noticeable. Therefore, operational vibration impacts from the proposed residential project would be less than significant.

6.4 Airport Noise

The Project site is located within the March Air Reserve Base Influence Area (County of Riverside, 2023b). Based on ambient noise measurements performed adjacent to the Project site, which included noise from regular flights overhead, the ambient noise levels range from 53.4 to 56.7 dBA L_{eq}, which is within the *normally acceptable* land use level for single-family residential uses of 60 dBA. Thus, the Project would not expose people residing or working in the Project area to excessive airport noise levels. As such, impacts related to airport noise would therefore be less than significant.

7 CONCLUSION

During construction, the Project would be required to comply with the rules and regulations set in the County's Noise Element and Municipal Code. Construction noise of the Project would not exceed the 80 dBA threshold. In addition, construction vibration would not exceed the threshold of 0.3 inches per second. As such, the Project would not result in a significant impact related to noise and vibration from construction.

During operation, sources of noise would include those from mobile and stationary sources. The operation of future residential uses on the site would not result in an increase in noise levels over the existing ambient noise levels. Also, on-site noise from operation of the residential uses would be 50.2 dBA during the daytime and 42.7 dBA during the nighttime, which would not exceed the County's exterior thresholds of 55 dBA and 45 dBA, respectively. Finally, a residential development would only involve occasional delivery and garbage trucks on-site, which would not cause significant vibrations to the site structures. As such, the Project would not result in a significant impact related to noise and vibration from operation.

Even though the Project would be located within the March Air Reserve Base Influence Area, based on ambient noise measurement performed on-site, the ambient noise level would range from 53.4 to 56.7 dBA L_{eq}, and would not expose people residing or working in the Project area to excessive airport noise levels. Impacts related to airport noise would therefore be less than significant.

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Appendix A – Noise Measurement Data

Noise Measurement Field Data

Project Number:	25-006		
Site Number:	NM-1		
Investigator(s):	Cameron Lukos, Tina Yuan		
Date:	12/3/2025		
Time:	9:00 a.m. – 9:15 a.m.		
Measurement Location:	In front of 28309 Mapes Road		
Peak Noise:	Traffic along Mapes Road, Dog bark, Roaster		
Noise Meter Model:	PCE-430	Microphone Model:	PCE 1/2''
Calibration Date:	3/3/2025		
Weather Conditions:	Sky	Temperature	Wind Speed
	Fog	52 degrees F	1 mph

Measurements Data		
L_{eq} (dB)	L_{max} (dB)	L_{min} (dB)
65.4	82.2	36.9

Site Photo



Project Number:	25-006		
Site Number:	NM-2		
Investigator(s):	Cameron Lukos, Tina Yuan		
Date:	6/3/2025		
Time:	9:25 a.m. – 9:40 a.m.		
Measurement Location:	Along Palomar Road, west of the residential located northeast of the Palomar Road and Mapes Road intersection		
Peak Noise:	Traffic Noise, plane overhead		
Noise Meter Model:	PCE-430	Microphone Model:	PCE 1/2''
Calibration Date:	3/3/2025		
Weather Conditions:	Sky	Temperature	Wind Speed
	Fog	52 degrees F	1 mph

Measurements Data		
L_{eq} (dB)	L_{max} (dB)	L_{min} (dB)
56.7	74.0	42.3

Site Photos



Project Number:	25-006		
Site Number:	NM-3		
Investigator(s):	Cameron Lukos, Tina Yuan		
Date:	12/3/2025		
Time:	9:47 a.m. – 1:02 a.m.		
Measurement Location:	East of 28243 Tower View Court, Romoland, CA 92585, along Tradewinds Drive		
Peak Noise:	Airplane overhead		
Noise Meter Model:	PCE-430	Microphone Model:	PCE 1/2''
Calibration Date:	3/3/2025		
Weather Conditions:	Sky	Temperature	Wind Speed
	Fog	52 degrees F	1 mph

Measurements Data		
L_{eq} (dB)	L_{max} (dB)	L_{min} (dB)
53.4	72.9	36.8

Site Photos



Project Number:	25-006		
Site Number:	NM-4		
Investigator(s):	Cameron Lukos, Tina Yuan		
Date:	6/3/2025		
Time:	9:25 a.m. – 9:40 a.m.		
Measurement Location:	East of 28190 Sparacio Road		
Peak Noise:	Traffic Noise, plane overhead		
Noise Meter Model:	PCE-430	Microphone Model:	PCE 1/2''
Calibration Date:	3/3/2025		
Weather Conditions:	Sky	Temperature	Wind Speed
	Clear	60 degrees F	1 mph

Measurements Data		
L_{eq} (dB)	L_{max} (dB)	L_{min} (dB)
56.7	74.0	42.3

Site Photos



Appendix B – Noise Modeling Data

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 1/28/2026
Case Description: Site Prep

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Reference at 50 feet	Residential	1	1	1

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

Results

		Calculated (dBA)		Noise Limits (dBA) Day		Evening		Night		Noise Limit Exceedance (dBA) Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Dozer		81.7	77.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer		81.7	77.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor		84	80	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor		84	80	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor		84	80	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer		81.7	77.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor		84	80	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	84	87.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Center of the Site	Residential	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Dozer	No	40		81.7	720	0
Dozer	No	40		81.7	720	0
Tractor	No	40	84		720	0
Tractor	No	40	84		720	0
Tractor	No	40	84		720	0
Dozer	No	40		81.7	720	0
Tractor	No	40	84		720	0

Results

		Calculated (dBA)		Noise Limits (dBA) Day		Evening		Night		Noise Limit Exceedance (dBA) Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Dozer		58.5	54.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer		58.5	54.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor		60.8	56.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor		60.8	56.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor		60.8	56.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer		58.5	54.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor		60.8	56.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	60.8	64.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 1/28/2026
Case Description: Grading

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Reference at 50 feet	Residential	1	1	1

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

Equipment	Results Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Leq	Evening Lmax	Leq	Night Lmax	Leq	Noise Limit Exceedance (dBA) Day Lmax	Leq	Evening Lmax	Leq	Night Lmax	Leq
Excavator	80.7	76.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	80.7	76.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grader	85	81	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	81.7	77.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper	83.6	79.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper	83.6	79.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	84	80	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	84	80	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	85	88.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Center of the Site	Residential	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	720	0
Excavator	No	40		80.7	720	0
Grader	No	40	85		720	0
Dozer	No	40		81.7	720	0
Scraper	No	40		83.6	720	0
Scraper	No	40		83.6	720	0
Tractor	No	40	84		720	0
Tractor	No	40	84		720	0

Equipment	Results Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Leq	Evening Lmax	Leq	Night Lmax	Leq	Noise Limit Exceedance (dBA) Day Lmax	Leq	Evening Lmax	Leq	Night Lmax	Leq
Excavator	57.5	53.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	57.5	53.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grader	61.8	57.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	58.5	54.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper	60.4	56.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper	60.4	56.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	60.8	56.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	60.8	56.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	61.8	65	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 1/28/2026
Case Description: Building Construction

---- Receptor #1 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Reference at 50 feet	Residential	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	50	0
Man Lift	No	20		74.7	50	0
Man Lift	No	20		74.7	50	0
Man Lift	No	20		74.7	50	0
Generator	No	50		80.6	50	0
Tractor	No	40	84		50	0
Tractor	No	40	84		50	0
Tractor	No	40	84		50	0
Welder / Torch	No	40		74	50	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Crane	80.6	72.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Man Lift	74.7	67.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Man Lift	74.7	67.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Man Lift	74.7	67.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Generator	80.6	77.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	84	80	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	84	80	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	84	80	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch	74	70	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	84	86.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Center of the Site	Residential	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	720	0
Man Lift	No	20		74.7	720	0
Man Lift	No	20		74.7	720	0
Man Lift	No	20		74.7	720	0
Generator	No	50		80.6	720	0
Tractor	No	40	84		720	0
Tractor	No	40	84		720	0
Tractor	No	40	84		720	0
Welder / Torch	No	40		74	720	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Crane	57.4	49.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Man Lift	51.5	44.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Man Lift	51.5	44.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Man Lift	51.5	44.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Generator	57.5	54.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	60.8	56.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	60.8	56.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	60.8	56.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch	50.8	46.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	60.8	62.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 1/28/2026
Case Description: Paving

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Reference at 50 feet	Residential	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Pavement Scarafier	No	20		89.5	50	0
Pavement Scarafier	No	20		89.5	50	0
Paver	No	50		77.2	50	0
Paver	No	50		77.2	50	0
Roller	No	20		80	50	0
Roller	No	20		80	50	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Pavement Scarafier	89.5	82.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pavement Scarafier	89.5	82.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver	77.2	74.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver	77.2	74.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	80	73	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	80	73	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	89.5	86.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Center of the Site	Residential	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Pavement Scarafier	No	20		89.5	720	0
Pavement Scarafier	No	20		89.5	720	0
Paver	No	50		77.2	720	0
Paver	No	50		77.2	720	0
Roller	No	20		80	720	0
Roller	No	20		80	720	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Pavement Scarafier	66.3	59.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pavement Scarafier	66.3	59.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver	54.1	51	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver	54.1	51	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	56.8	49.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	56.8	49.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	66.3	63.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 1/28/2026
Case Description: Architectual Coating

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Reference at 50 feet	Residential	1	1	1

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

		Results Calculated (dBA)		Noise Limits (dBA) Day		Evening		Night		Noise Limit Exceedance (dBA) Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Compressor (air)		77.7	73.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	77.7	73.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Center of the Site	Residential	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	720	0

		Results Calculated (dBA)		Noise Limits (dBA) Day		Evening		Night		Noise Limit Exceedance (dBA) Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Compressor (air)		54.5	50.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	54.5	50.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Traffic Noise levels and Noise Contours

Project Number 25-006
Project Name Mapes Residential
Scenario Exsiting

Background Information

Model Description: FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise Emission Levels.
Source of Traffic Volumns: Streetlight Data
Coomunity Noise Descriptors: Ldn ____ CNEL x

Assumed 24-Hour Traffic Distribution:	Day	Evening	Night	Total
Total ADT Volumns	77.50%	12.90%	9.60%	100.00%
Medium-Duty Trucks	84.80%	4.90%	10.30%	100.00%
Heavy-Duty Trucks	86.50%	2.70%	10.80%	100.00%

Analysis						Vehicle Mix			Distance from Centerline of Roadway to Contour			
Roadway Segment	Lanes	Median Width	ADT Volume	sign Speed (mp	Alpha Factor	Medium Trucks (MT)	Heavy Trucks (HT)	CNEL at Curbside	70 CNEL	65 CNEL	60 CNEL	55 CNEL
Mapes Road (West of Tradewinds Drive)	2	0	3,070	45	0	1.8%	0.7%	60.8	-	-	60	191
Mapes Road (Between Tradewind Drive and Palomar Road)	2	0	2,770	45	0	1.8%	0.7%	60.4	-	-	54	172
Mapes Road (East of Palomar Road)	2	0	3,125	45	0	1.8%	0.7%	60.9	-	-	61	194
Palomar Road (North of Mapes Road)	2	0	40	45	0.5	1.8%	0.7%	46.6	-	-	-	-
Tradewinds Drive (North of Mapes Road)	2	0	100	45	0.5	1.8%	0.7%	50.6	-	-	-	-

Alpha Factor: Coefficent of absoprtion relating to the effects of the ground surface. An alpha factor 0 indicate that the site is an accoustically "hard" site such as asphalt. An alpha factor of 0.5 indicates that the site is an accoustically "soft" site such as vegetation ground cover.

Traffic Noise levels and Noise Contours

Project Number 25-006
Project Name Mapes Residential
Scenario Exsiting + Project

Background Information

Model Description: FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise Emission Levels.
Source of Traffic Volumns: Streetlight Data
Coomunity Noise Descriptors: Ldn ____ CNEL x

Assumed 24-Hour Traffic Distribution:	Day	Evening	Night	Total
Total ADT Volumns	77.50%	12.90%	9.60%	100.00%
Medium-Duty Trucks	84.80%	4.90%	10.30%	100.00%
Heavy-Duty Trucks	86.50%	2.70%	10.80%	100.00%

Analysis						Vehicle Mix			Distance from Centerline of Roadway to Contour			
Roadway Segment	Lanes	Median Width	ADT Volume	sign Speed (mp	Alpha Factor	Medium Trucks (MT)	Heavy Trucks (HT)	CNEL at Curbside	70 CNEL	65 CNEL	60 CNEL	55 CNEL
Mapes Road (West of Tradewinds Drive)	2	0	4,120	45	0	1.8%	0.7%	62.1	-	-	81	256
Mapes Road (Between Tradewind Drive and Palomar Road)	2	0	3,390	45	0	1.8%	0.7%	61.2	-	-	67	210
Mapes Road (East of Palomar Road)	2	0	3,570	45	0	1.8%	0.7%	61.5	-	-	70	222
Palomar Road (North of Mapes Road)	2	0	800	45	0	1.8%	0.7%	58.1	-	-	-	51
Tradewinds Drive (North of Mapes Road)	2	0	830	45	0	1.8%	0.7%	58.2	-	-	-	53

Alpha Factor: Coefficent of absoprtion relating to the effects of the ground surface. An alpha factor 0 indicate that the site is an accoustically "hard" site such as asphalt. An alpha factor of 0.5 indicates that the site is an accoustically "soft" site such as vegetation ground cover.

Coeffient 10

Intersection			Going North	Going East	Going South	Going West
1	Antelope Road	Mapes Road	114	106	134	240
2	Tradewinds Drive	Mapes Road	2	101	7	188
3	Palomar Road	Mapes Road	1	123	33	177
4	Menifee Road	Mapes Road	385	182	361	190
5	Tradewinds Drive	Driveway 1	2	0	8	0
6	Palomar Road	Driveway 2	1	0	1	0

1	Antelope Road	Mapes Road	151	119	69	215
2	Tradewinds Drive	Mapes Road	2	101	7	188
3	Palomar Road	Mapes Road	4	154	31	142
4	Menifee Road	Mapes Road	421	181	310	158
5	Tradewinds Drive	Driveway 1	5	0	5	7
6	Palomar Road	Driveway 2	0	0	0	0

1	Antelope Road	Mapes Road	130	146	200	287
2	Tradewinds Drive	Mapes Road	29	117	12	241
3	Palomar Road	Mapes Road	18	130	63	204
4	Menifee Road	Mapes Road	425	196	333	190
5	Tradewinds Drive	Driveway 1	5	18	53	0
6	Palomar Road	Driveway 2	2	0	39	15

1	Antelope Road	Mapes Road	161	216	91	240
2	Tradewinds Drive	Mapes Road	55	164	14	196
3	Palomar Road	Mapes Road	52	194	41	175
4	Menifee Road	Mapes Road	383	251	291	163
5	Tradewinds Drive	Driveway 1	4	51	32	7
6	Palomar Road	Driveway 2	4	0	28	42

	AM		PM		Existing	Existing + Project
	Existing	Existing plus Project	Existing	Existing plus Project	Max	
Mapes Road						
West of Tradewinds Drive	2940	3870	3070	4120	3,070	4,120
Between Tradewind Drive and Palomar Road	2770	3210	2425	3390	2,770	3,390
East of Palomar Road	3125	3200	3115	3570	3,125	3,570
Palomar Road (North of Mapes Road)	20	570	40	800	40	800
West of Tradewind Drive	100	820	85	830	100	830

Receiver		Land Use	Limiting Value		rel. Axis			Lr w/o Noise Control		dL req.		Lr w/ Noise Control		Exceeding		passive NC
Name	ID		Day	Night	Station	Distance	Height	Day	Night	Day	Night	Day	Night	Day	Night	
			dB(A)	dB(A)	m	m	m	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
SR-2			0	0	64	6.10	1.60	47.1	39.8	47.1	39.8	0.0	0.0	-	-	-
SR-1			0	0	20	5.61	1.60	50.2	42.7	50.2	42.7	0.0	0.0	-	-	-

Receiver		Land Use	Limiting Value		rel. Axis			Lr w/o Noise Control		dL req.		Lr w/ Noise Control		Exceeding		passive NC
Name	ID		Day	Night	Station	Distance	Height	Day	Night	Day	Night	Day	Night	Day	Night	
			dB(A)	dB(A)	m	m	m	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
SR-2			0	0	59	14.82	1.60	25.9	25.9	25.9	25.9	0.0	0.0	-	-	-
SR-1			0	0	19	9.42	1.60	27.5	27.5	27.5	27.5	0.0	0.0	-	-	-