3.11 NOISE

INTRODUCTION

The purpose of this noise analysis is twofold: (1) to evaluate the Proposed Project in terms of its design to ensure that it is appropriately planned from a noise perspective, and (2) to evaluate the noise impact of the project on the surrounding (off-site) areas. Noise modeling conducted for the project is contained within **Appendix 3.11** *of this environmental impact report (EIR).*

3.11.1 TERMINOLOGY

3.11.1.1 Characteristics of Noise

Noise is usually defined as unwanted sound. Noise becomes unwanted when it interferes with normal activities, causes actual physical harm, or has adverse effects on health. The definition of "noise" as unwanted sound implies that it has an adverse effect on people and their environment.

Noise is measured on a logarithmic scale of sound pressure level known as a decibel (dB). The human ear does not respond uniformly to sounds at all frequencies; it is less sensitive to low and high frequencies than to medium frequencies, which correspond with human speech. In response, the A-weighted noise level (or scale) has been developed. It corresponds better with people's subjective judgment of sound levels. This A-weighted sound level is called the "noise level" and is referenced in units of dB(A). Because noise is measured on a logarithmic scale, a doubling of sound energy results in a 3 dB(A) increase in noise levels. However, changes in a noise level of less than 3 dB(A) are not typically noticed by the human ear.[1] A change from 3 to 5 dB(A) may be noticed by some individuals who are extremely sensitive to changes in noise, and a 5.0 dB(A) increase is readily noticeable. The human ear perceives a 10 dB(A) increase in sound level as a doubling of sound.

Noise sources occur in two forms: (1) point sources, such as stationary equipment, loudspeakers, or individual motor vehicles; and (2) line sources, such as a roadway with a large number of point sources (motor vehicles). Sound generated by a point source typically diminishes (attenuates) at a rate of 6.0 dB(A) for each doubling of distance from the source to the receptor at acoustically "hard" sites and 7.5 dB at acoustically "soft" sites.[2],[3] For example, a 60 dB(A) noise level measured 50 feet from a point source at an acoustically hard site would be 54 dB(A) 100 feet from the source and 48 dB(A) 200 feet from

1 California Department of Transportation, *Technical Supplement to the Traffic Noise Analysis Protocol*. September, 2013.

2 Ibid.

3 California Department of Transportation, *Technical Supplement to the Traffic Noise Analysis Protocol*. October, 1998.

the source. Sound generated by a line source typically attenuates at a rate of 3.0 dB(A) and 4.5 dB(A) per doubling of distance from the source to the receptor for hard and soft sites, respectively.[4] Sound levels can also be attenuated by man-made or natural barriers.

Solid walls and berms typically reduce point and line source noise levels by 3 to 23 dB(A).[5] Sound levels for a source may also be attenuated 3 dB(A) by a first row of houses and 1.5 dB(A) for each additional row of houses.[6] Outside to inside noise attenuation provided by typical structures is provided **in Table 3.11-1, Building Noise Reduction Factors.**

Table 3.11-1
Building Noise Reduction Factors

	Noise Reduction - dB(A)	
Building Type	**Window Condition**	**Noise Reduction Due to Exterior of the Structure**
All	Open	10
Light Frame	Ordinary Sash (Closed)	20
	Storm Windows	25
Masonry	Single Glazed	25
	Double Glazed	35

Source: Federal Highway Administration, Highway Traffic Noise Analysis and Abatement Guidance. December 2011.

When assessing community reaction to noise, there is need for a scale that averages varying noise exposure over time and quantifies the result in terms of a single number descriptor. Several scales have been developed that address community noise levels. Those that are applicable to this analysis are the Equivalent Noise Level (L_{eq}) and the Community Noise Equivalent Level (CNEL). L_{eq} is the average A-weighted sound level measured over a given time interval. L_{eq} can be measured over any period, but is typically measured for 1-minute, 15-minute, 1-hour, or 24-hour periods.

CNEL is another average A-weighted sound level but is measured over a 24-hour period. However, this noise scale is adjusted to account for some individuals' increased sensitivity to noise levels during nighttime hours. A CNEL noise measurement accommodates this sensitivity factor by adding 5 dB to sound levels occurring in the evening from 7:00 PM to 10:00 PM, and 10 dB to sound levels occurring in the nighttime from 10:00 PM to 7:00 AM.

4 California Department of Transportation, *Technical Supplement to the Traffic Noise Analysis Protocol*. September, 2013.

5 Ibid.

6 Ibid.

3.11.1.2 Noise Analysis Methodology

The analysis of the existing and future noise environments presented in this noise impact analysis is based on technical reports, noise prediction modeling, and empirical observations. Noise levels for some stationary activities and equipment were estimated based on available technical reports and literature, which are cited in this report. Noise modeling procedures involved calculating existing and future vehicular noise levels along individual roadway segments in the vicinity of the Proposed Project site. This task was accomplished using the Federal Highway Administration (FHWA) Highway Noise Prediction Model (FHWA-RD-77-108). The model calculates the average noise level at specific locations based on traffic volumes, average speeds, roadway geometry, and site environmental conditions. The average vehicle noise rates (energy rates) utilized in the FHWA Model have been modified to reflect average vehicle noise rates identified for California by the California Department of Transportation (Caltrans).[7] The Caltrans data show that California automobile noise is 0.8 to 1.0 dB(A) higher than national levels, and that medium- and heavy-truck noise is 0.3 to 3.0 dB(A) lower than national levels.[8] Traffic volumes utilized as data inputs in the noise prediction model were provided by the project traffic engineer in **Section 3.14, Transportation/Circulation**, of this EIR.

Analysis in this section addresses the existing and future noise environments on and off the Proposed Project site.

3.11.1.3 Off-Site Methodology

The assessment of off-site noise levels focuses on how on-site activities and increased traffic levels would impact existing land uses adjacent to, or near, the Project site. This section specifically focuses on impacts to existing noise-sensitive uses, or those uses that would be most sensitive to an increase in noise levels. These uses are discussed later in this noise impact analysis. Noise levels were modeled with and without project traffic to determine those locations at which the project (via increased traffic) may have an impact on existing noise-sensitive uses.

3.11.2 EXISTING CONDITIONS

3.11.2.1 On-Site Noise Levels

The Proposed Project site is located north of Poindexter Avenue and the Union Pacific Railroad tracks roughly between Gabbert Road and Walnut Canyon Road. Automobile traffic on nearby roadways and

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7 Rudolf W. Hendriks, *California Vehicle Noise Emission Levels* (Sacramento, California: California Department of Transportation, January 1987), NTIS, FHWA/CA/TL-87/03.

8 Ibid.

railway traffic are the dominant sources of noise on the Project site. Existing noise levels associated with these railway operations are identified below in **Table 3.11-2, Existing On-Site Railroad Noise Levels.** Other sources of noise heard on the site are relatively low and generally composed of human, motor vehicle, and helicopter (Southern California Edison Helipad) activity on adjacent properties.

3.11.2.2 Existing Ambient Noise Levels

Vehicular traffic is the dominant source of noise affecting all noise-sensitive locations that occur in the vicinity of the Project site. Three off-site noise measurements were taken at nearby sensitive receptors to summarize existing ambient noise levels. These monitoring locations are shown in **Figure 3.11-1, Noise Measurement Locations,** below. Results of the noise monitoring are displayed in **Table 3.11-3, Noise Monitoring Results**, below.

Table 3.11-2
Existing On-Site Railroad Noise Levels

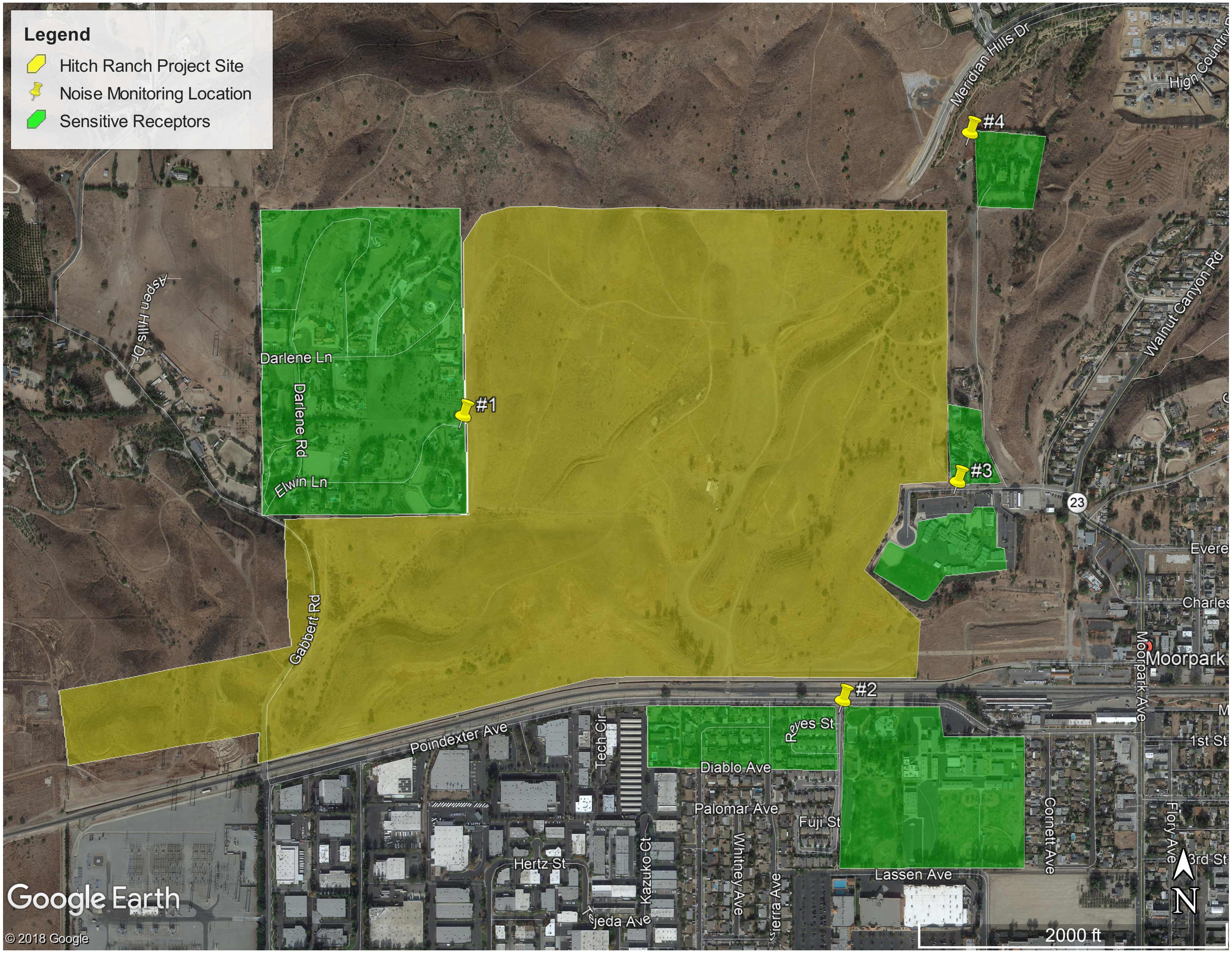
Roadway Segment	Distance from Center of Roadway				
	CNEL at 75 Feet	CNEL Noise Contour 75	70	65	60
Union Pacific Railroad	NA	NA	188 ft	405 ft	872 ft

Source: Moorpark General Plan, Noise Element, (Moorpark, California: City of Moorpark, March 1998), p. A-20.
NA = Data not available.

Table 3.11-3
Noise Monitoring Results

Map Location	Land Use Type	Noise Measurement dB(A) L_{eq}
1	Low Density Residential	50.2
2	Poindexter Park (Adjacent to Chaparral Middle School)	47.9
3	Walnut Canyon Elementary School	52.5

Sound level measurements conducted by Impact Sciences staff, June 6, 2018.



SOURCE: Google Earth, 2018

FIGURE **3.11-1**

IMPACT SCIENCES

Noise Monitoring Locations

1318.003•05/2020

3.11.3 REGULATORY FRAMEWORK

3.11.3.1 Federal Laws and Regulations

Currently, no federal noise standards regulate environmental noise associated with short-term construction or the long-term operations of development projects.

Federal Transit Administration

The Federal Transit Administration (FTA) has published guidance relative to vibration impacts. According to the FTA, non-engineered timber and mason buildings can be exposed to ground-borne vibration levels of 0.2 inches per second without experiencing structural damage, while reinforced concrete, steel, or timber buildings can be exposed to ground-borne vibration levels of 0.5 inches per second.[9]

The FTA has also set standard that address the effect of long-term vibration on human annoyance. Ground-borne vibration levels rarely affect human health. Instead, most people consider ground-borne vibration to be an annoyance that may affect concentration or disturb sleep. The RMS amplitude is most frequently used to describe the effect of vibration on the human body. The RMS amplitude is defined as the average of the squared amplitude of the signal. Decibel notation (VdB) is commonly used to measure RMS. The decibel notation acts to compress the range of numbers required to describe vibration. For residential land uses which experience occasional events of ground-borne vibration or noise, the FTA has established a threshold of 75 VdB. Some commercial buildings, such as auditoriums and theaters have additional vibration and noise annoyance criteria.

3.11.3.2 State Laws and Regulations

The State of California has adopted noise standards in areas of regulation not preempted by the federal government. State standards regulate noise levels of motor vehicles, sound transmission through buildings, occupational noise exposure, and noise insulation.

Though not adopted by law, the State of California General Plan Guidelines 2003, published by the Governor's Office of Planning and Research (2003), provide guidance for the compatibility of projects within areas of specific noise exposure. Acceptable and unacceptable community noise exposure limits for various land use categories have been determined to help guide new land use decisions in California

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9 Federal Transit Administration (FTA). 2006. Transit Noise and Vibration Impact Assessment. May.

communities.[10] In many local jurisdictions, these guidelines are used to derive local noise standards and guidance.

California Department of Transportation Vibration Standard

In 2013, the California Department of Transportation (Caltrans) published the Transportation and Construction Vibration Guidance Manual to aid in the estimation and analysis of vibration impacts. Typically, potential building and structural damages are the foremost concern when considering the impacts construction-related vibrations.

Table 3.11-4, Building Damage Vibration Guidelines, summarizes Caltrans' vibration guidelines for building and structural damage.

Table 3.11-4
Building Damage Vibration Guidelines (PPV)

Structure and Condition	Significance Thresholds (in/sec PPV)	
	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 buildings	2.0	0.5

Source: California Department of Transportation, 2013

3.11.3.3 Local Plans and Policies

The following goals and policies of the *City of Moorpark General Plan* are applicable to the proposed Hitch Ranch Specific Plan project.

Circulation Element

Policy 7.1: To reduce energy consumption, noise pollution, and air pollution, employment generating developments shall provide incentives to

10 California Office of Planning and Research (OPR). 2003. General Plan Guidelines, Noise Element Guidelines (Appendix C).

employees to utilize alternatives to the conventional automobile, such as walking, bicycles, carpools, vanpools, buses, and commuter rail.

Noise Element

The City's Noise Element was adopted in 1998.

Goal N-1: Protect the health, safety, and general welfare of the public from adverse noise impacts.

Policy N-1.1: Identify sound attenuation measures that can be applicable to transportation related noise impacts.

Policy N-1.2: Incorporate noise considerations into land use planning decisions to prevent or minimize future noise and land use incompatibilities. The analysis of traffic and other noise sources shall consider future conditions at general plan build out.

Policy N-1.4: Require stationary noise sources to limit noise to levels that do not interfere with adjacent uses.

Policy N-1.5: Require new projects to contribute to the mitigation of off-site traffic noise impacts to the extent that these impacts are generated by the proposed project.

Policy N-1.6: Limit the impact of nuisance noise sources upon residential areas.

3.11.4 THRESHOLDS OF SIGNIFICANCE

The following thresholds for determining the significance of impacts related to noise are contained in the environmental checklist form contained in Appendix G of the most recent update of the *California Environmental Quality Act (CEQA) Guideline*s. The CEQA Guidelines ask whether the project would result in:

- Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.
- Generation of excessive groundborne vibration or groundborne noise levels.

- 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.

The CEQA Guidelines do not provide a definition for “substantial increase” in noise and they do not provide a threshold of significance for potential noise or vibration impacts. Therefore, the following thresholds of significance were developed for this noise analysis based upon the General Plan Noise Element discussed previously in this EIR section. These thresholds apply to both project impacts and cumulative impacts and are as follows:

Off-site impacts from on-site specific plan activities, both temporary and long-term, are assessed based on compliance with the City of Moorpark Noise Ordinance. Any activity on private property must comply with the noise ordinance.

Long-term, off-site impacts from traffic noise generated by the specific plan are assessed using two criteria. Both criteria must be met for a significant impact to be identified. First, project traffic must cause a substantial noise level increase (greater than 3 dB) on a roadway segment adjacent to a noise-sensitive land use. Second, the resulting future with project noise level must exceed the criteria level for the noise-sensitive land use (e.g., residential uses, hospitals). In this case, the exterior criteria level is 65 CNEL and the interior level is 45 CNEL for sensitive land uses.

Neither City’s Noise Element nor Municipal Code contains a numerical threshold to identify the point at which a vibration impact is deemed perceptible. The FTA has published guidelines for assessing the impact of groundborne vibration associated with construction activities, which have been applied by other jurisdictions to other types of projects. The Federal Transit Administration measure of the threshold of architectural damage for conventional sensitive structures (e.g., residential units) is 0.2 in/sec PPV.[11] The vibration threshold of perception is 0.01 in/sec PPV. In the absence of a City standard, this is being been used in this EIR to assess construction vibrations impacts.

The Initial Study for the Hitch Ranch project concluded that impacts related to safety or excessive noise regarding a private helipad located approximately 250 feet south of the project area would be less than significant. This impact is not further discussed in this EIR.

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11 US Department of Transportation, Federal Administration, Office of Planning and Environment, Transit and Vibration Impact Assessment, FTA-VA-90-1003-06, May 2006.

3.11.5 PROJECT IMPACTS

Impact NOI-1 **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.**

Less than Significant with Mitigation

Construction

Development of the Proposed Project would require site preparation (i.e., land clearing and grading), subsurface excavation, and construction (i.e., infrastructure, buildings, and cleanup) of the proposed new features. These activities typically involve the temporary use of heavy equipment such as tractors, dozers, motor graders, loaders, and concrete mixers. Trucks would be used to deliver equipment and building materials, and to haul away waste materials. Smaller equipment such as pneumatic tools, saws, portable generators, and hammers would also be used throughout the site during the construction phases. This equipment would generate both steady state and episodic noise that would be heard both on and off the site.

The US Environmental Protection Agency has compiled data regarding the noise-generating characteristics of specific types of construction equipment. These data are presented in **Table 3.11-5, Maximum Noise Levels Generated by Typical Construction Equipment**. As shown, noise levels generated by heavy equipment can range from approximately 74 dB(A) to excess of 85 dB(A) when measured at 50 feet. However, these noise levels diminish with distance from the construction site at a rate of approximately 6 dB(A) per doubling of distance. For example, a noise level of 76 dB(A) measured at 50 feet from the noise source to the receptor would reduce to 70 dB(A) at 100 feet from the source to the receptor, and further reduce by another 6 dB(A) to 64 dB(A) at 200 feet from the source to the receptor.

Noise levels generated during the construction phases would affect occupants of off-site residences, and the faculty, staff, and students of Walnut Canyon Elementary School. Existing residences that would be most sensitive to temporary construction noise are located to the south, west, and east, and near the elementary school. Earth-grading equipment can generate some of the loudest noise levels of all standard construction equipment (**Table 3.11-5**). Unattenuated noise levels at these residences could reach 85 dB(A) at edge of the nearest sensitive receptors.

Table 3.11-5
Maximum Noise Levels Generated by Typical Construction Equipment

Type of Equipment	Actual Measured Noise Level (dBA at 50 feet)
Air Compressor	78
Backhoe	78
Concrete Mixer Truck	79
Crane	81
Dozer	82
Generator	81
Grader	85[a]
Paver	77
Pump	81
Roller	80
Tractor	84[a]
Welder	74

Sources: FHWA, Highway Construction Noise Handbook, 2006.
a. FHWA does not have data on actual measured noise levels, therefore FHWA provides a specification limit for maximum noise emitted.

Construction noise levels at adjacent noise-sensitive land uses, including Walnut Canyon School and residential uses would be considered significant. However, construction noise of the individual building areas would be of limited duration (i.e., short term), be restricted to daytime hours in accordance with the *Moorpark Municipal Code*, and with implementation of the **Mitigation Measure NOI-1**, impacts would be reduced to less than significant.

Besides equipment noise associated with the Proposed Project, the construction periods would generate traffic noise along access routes to the proposed development areas from the movement of equipment and workers onto the sites. The major pieces of heavy equipment would be moved onto the development once during each phase and would have an insignificant short-term effect on noise levels. In addition, the daily transportation is expected to cause increases in noise levels along project roadways. However, given that this traffic would not be a substantial percentage of daily volumes in the area and would not increase long-term levels by more than 3 dB(A), potential impacts would be less than significant.

Operational

Noise impacts would also result from completion of the Proposed Project. These long-term impacts would primarily result from project-generated vehicular traffic and increased human activity on the site. Each of these potential noise impacts is discussed separately below.

Traffic Noise

As stated in **Appendix 3.10, General Plan – Circulation Consistency Analysis**, of this EIR, the Proposed Project is projected to generate approximately 6,436 vehicle trips per day when completed. These vehicles accessing the existing roadway network has the potential to increase ambient noise levels in the project vicinity. According to Caltrans, vehicle noise emissions increase with speed, and increased traffic volumes increase traffic noise, however, it takes a doubling of traffic to increase noise levels by only 3 dB(A).[12]

The project's effects on off-site noise levels were based on the difference between the existing traffic volumes and the existing-plus-project traffic volumes. Noise levels that would be generated by these traffic volumes are identified in **Table 3.11-6, Project Traffic Noise Level Increases.** As shown, the increase in noise levels along all study roadways would range from 0.0 to 4.9 dB(A) CNEL. The largest increase of 4.9 dB(A) CNEL would be on Gabbert Road north of Poindexter Avenue but would not result in a noise level that exceeds the City's 65 dB(A) exterior noise level standard, and would not be considered significant. In all cases the increase in noise levels would not exceed the off-site roadway source thresholds of significance for this analysis and the project's off-site traffic noise impacts would not be significant.

Table 3.11-6
Project Traffic Noise Level Increases

	Noise Level at 75 feet From Roadway Centerline					
Roadway Segment	**Existing**	**Existing with Project**	**2026 without Project**	**2026 with Project**	**Increase Over Existing/2026**	**Significant?**
Los Angeles Avenue						
West of Somis Road	65.4	65.4	65.7	65.8	0.0/0.1	No
Between Somis Road and Grimes Canyon Road	67.2	67.2	67.6	67.7	0.0/0.1	No
Between Grimes Canyon Road and Tierra Rejada Road	67.3	67.4	67.8	67.9	0.1/0.1	No
Between Tierra Rejada Road and Moorpark Avenue	67.9	67.9	68.8	68.8	0.0/0.0	No
Between Moorpark Avenue and Spring Road	68.7	69.1	69.7	70.0	0.4/0.3	No
Between Spring Road and Miller Parkway	69.3	69.6	70.2	70.4	0.3/0.2	No
Between Miller Parkway and SR-23 onramps	69.2	69.5	69.4	69.6	0.3/0.2	No
East of SR-23 onramps	66.7	66.9	67.4	67.6	0.2/0.2	No

12 Caltrans, *Technical Noise Supplement to the Traffic Noise Analysis Protocol.* September 2013.

Roadway Segment	Existing	Existing with Project	2026 without Project	2026 with Project	Increase Over Existing/2026	Significant?
	Noise Level at 75 feet From Roadway Centerline					
Grimes Canyon Road						
North of Los Angeles Avenue	60.2	60.2	60.5	60.5	0.0/0.0	No
Tierra Rejada Road						
Between Los Angeles Avenue and Countrywood Drive	66.1	66.3	66.6	66.7	0.2/0.1	No
Between Countrywood Drive and Mountain Trail Street	66.0	66.1	66.3	66.4	0.1/0.1	No
Between Mountain Trail Street and Mountain Meadow Drive	66.1	66.2	66.5	66.5	0.1/0.0	No
Between Mountain Meadow Drive and Walnut Creek Road	66.6	66.6	66.9	66.9	0.0/0.0	No
Between Walnut Creek Road and Peach Hill Road	67.5	67.5	67.8	67.8	0.0/0.0	No
Between Peach Hill Road and Spring Road	67.5	67.5	67.8	67.8	0.0/0.0	No
Between Spring Road and Moorpark Road	68.8	68.9	69.3	69.4	0.1/0.1	No
Between Moorpark Road and SR-23 onramps	69.7	69.8	70.1	70.2	0.1/0.1	No
East of SR-23 onramps	71.0	71.1	71.4	71.4	0.1/0.0	No
Gabbert Road						
North of Poindexter Avenue	50.4	55.3	56.1	58.1	4.9/2.0	No
South of Poindexter Avenue	60.3	61.1	61.3	62.0	0.8/0.7	No
Countrywood Drive						
West of Tierra Rejada Road	57.9	57.9	58.2	58.2	0.0/0.0	No
Mountain Trail Street						
North of Tierra Rejada Road	56.2	56.3	56.6	56.6	0.1/0.0	No
South of Tierra Rejada Road	57.9	57.9	58.2	58.2	0.0/0.0	No
Mountain Meadow Drive						
North of Tierra Rejada Road	56.1	56.2	56.6	56.7	0.1/0.1	No
South of Tierra Rejada Road	54.0	54.0	54.3	54.3	0.0/0.0	No
Walnut Creek Road						
North of Tierra Rejada Road	55.5	55.5	55.8	55.8	0.0/0.0	No
South of Tierra Rejada Road	54.1	54.1	54.4	54.4	0.0/0.0	No
Peach Hill Road						
Between Tierra Rejada Road and Spring Road	59.4	59.4	59.7	59.7	0.0/0.0	No
Walnut Canyon Road/Moorpark Avenue						
Between Broadway Road and Championship Drive	63.7	63.8	64.1	64.2	0.1/0.1	No
Between Championship Drive and Spring Road	64.4	64.5	64.8	64.9	0.1/0.1	No
Between Spring Road and Casey Road	61.2	61.4	62.3	62.4	0.2/0.1	No
Between Casey Road and High Street	60.1	61.1	61.7	62.3	1.0/0.6	No

	Noise Level at 75 feet From Roadway Centerline					
Roadway Segment	**Existing**	**Existing with Project**	**2026 without Project**	**2026 with Project**	**Increase Over Existing/2026**	**Significant?**
Between High Street and Poindexter Avenue	61.2	61.7	62.3	62.8	0.5/0.5	No
Between Poindexter Avenue and Los Angeles Avenue	59.1	59.9	60.5	61.1	0.8/0.6	No
Poindexter Avenue						
Between Gabbert Road and Moorpark Avenue	57.9	57.9	58.5	58.6	0.0/0.1	No
East of Moorpark Avenue	53.9	53.9	54.6	54.6	0.0/0.0	No
Spring Road						
Between Walnut Canyon Road and High Street	64.8	64.8	66.0	66.0	0.0/0.0	No
Between High Street and Los Angeles Avenue	64.8	65.1	65.7	65.9	0.3/0.2	No
Between Los Angeles Avenue and Peach Hill Road	63.5	64.0	64.2	64.5	0.5/0.3	No
Between Peach Hill Road and Tierra Rejada Road	62.9	63.2	63.7	63.9	0.3/0.2	No
High Street						
Between Moorpark Avenue and Spring Road	59.7	60.8	61.1	61.8	1.1/0.7	No
East of Spring Road	62.4	62.7	63.9	64.1	0.3/0.2	No
Miller Parkway/Moorpark Road						
North of Los Angeles Avenue	56.9	56.9	59.4	59.4	0.0/0.0	No
Between Los Angeles Avenue and Tierra Rejada Road	59.7	59.8	61.1	61.3	0.1/0.2	No
Between Tierra Rejada Road and Santa Rosa Road	66.3	66.3	66.6	66.7	0.0/0.1	No
Santa Rosa Road						
West of Moorpark Road	67.9	67.9	68.2	68.2	0.0/0.0	No
East of Moorpark Road	64.7	64.7	65.0	65.0	0.0/0.0	No

Source: Impact Sciences, Inc. Calculations are provided in ***Appendix 3.11***
Bold numbers indicate that a City of Moorpark exterior noise standard is exceeded

Residential Noise

Future residents of the Project site would generate noise that would include people talking, doors slamming, use of the parks and recreational areas, landscape maintenance equipment operations, stereos, domestic animals, etc. Noise levels generated by these sources typically do not exceed City standards for residential uses nor the standards previously identified. These noise levels also contribute to the ambient noise levels that are experienced in all quiet residential areas. Suburban residential areas typically have ambient noise environments of between 52 to 61 dB(A) L_{eq}, which are composites of traffic and other noise sources. These impacts would be less than significant.

Impact NOI-2 Generation of excessive groundborne vibration or groundborne noise levels.

Less than Significant with Mitigation

Ground vibrations from construction activities very rarely reach levels that can damage structures, but they can achieve the audible range and be felt in buildings very close to the Proposed Project site. The primary and most intensive vibration source associated with the development of the Proposed Project, under all three buildout scenarios, would be the use of bulldozers, leveling equipment, and pile drivers during construction. These types of equipment can create intense noise that is disturbing and can result in ground vibrations.

The results from vibration can range from no perceptible effects at the lowest vibration levels to low rumbling sounds and perceptible vibrations at moderate levels, and to slight structural damage at the highest levels. Ground vibrations from construction activities rarely reach the levels that can damage structures, but they can achieve the audible and perceptible ranges in buildings close to the construction site. **Table 3.11-7, Vibration Source Levels for Construction Equipment**, lists vibration source levels for construction equipment.

Table 3.11-7
Vibration Source Levels for Construction Equipment

Equipment		PPV[1] at 25 ft (in/sec)
Hydromill (slurry wall)	In soil	0.008
	In rock	0.017
Large Bulldozer		0.089
Caisson drilling		0.089
Loaded trucks		0.076
Jackhammer		0.035
Small bulldozer		0.003

Source: Office of Planning and Environment, Federal Transit Administration, Transit Noise and Vibration Impact Assessment (May 2006) FTA-VA-90-1003-06, 12-9.
Note:[1] PPV is Peak Particle Velocity

As indicated above in **Table 3.11-5**, large bulldozers are capable of producing approximately 0.09 PPV (peak particle velocity) at 25 feet. Land uses adjacent to the Project site that could be affected by groundborne vibration include the existing Walnut Canyon School and residential use surrounding the Project site. Depending on the location of construction equipment operations near these areas, the project could result in vibration levels near sensitive receptors above 0.01 in/sec or between 0.003 and 0.09 in/sec at nearby structures containing sensitive receptors. In addition, these levels could exceed the threshold of architectural damage for conventional sensitive structures (e.g., residential units) of 0.2 in/sec PPV.[13] However, grading, and construction activities would be limited to operation during the hours of 7:00 AM to 7:00 PM Monday through Saturday, and not at any time on Sundays or any public holiday as described in the City of Moorpark Municipal Code. With these restrictions and implementation of the **Mitigation Measures NOI-1** through **NOI-4**, impacts will be less than significant.

3.11.6 CUMULATIVE IMPACTS

Cumulative noise impacts would primarily occur as a result of increased traffic on local roadways due to the proposed project and other developments in the area. Therefore, cumulative traffic-generated noise impacts have been assessed based on the difference between the existing traffic volumes and future traffic scenarios with the addition of project traffic volumes.

As shown, the project-related increase in noise levels along all study roadways would range from 0.0 to 4.9 dB(A) CNEL. The largest increase of 4.9 dB(A) CNEL would be on Gabbert Road north of Poindexter Avenue but would not result in a noise level that exceeds the City's 65 dB(A) exterior noise level standard, and would not be considered significant. In all cases the increase in noise levels would not exceed the off-site roadway source thresholds of significance for this analysis and the cumulative traffic noise impacts would not be significant.

3.11.7 MITIGATION PROGRAM

3.11.7.1 Standard Conditions and Requirements

Temporary Construction Activity Impacts

The applicant shall comply with Chapters 9.28, 10.04, 12.24, and 17.53 of the Moorpark Municipal Code and any provision amendatory or supplementary thereto, as a standard requirement for construction noise reduction.

3.11.7.2 Mitigation Measures

Construction

The following measures are recommended to reduce the adverse noise and vibration impacts associated with grading and construction activities to the greatest extent possible.

[13] US Department of Transportation, Federal Administration, Office of Planning and Environment, Transit and Vibration Impact Assessment, FTA-VA-90-1003-06, May 2006.

NOI-1 When construction operations occur within 100 feet of occupied residential areas and the Walnut Canyon Elementary School, the construction contractor(s) shall implement appropriate noise reduction measures. The following construction best management practices (BMPs) be implemented by contractors to reduce construction noise levels:

- Two weeks prior to the commencement of construction, notification must be provided to surrounding land uses within 1,000 feet of a Project site disclosing the construction schedule, including the various types of activities that would be occurring throughout the duration of the construction period.
- Ensure that construction equipment is properly muffled according to industry standards and in good working condition.
- Place noise-generating construction equipment and locate construction staging areas away from sensitive uses, i.e., nearby off-site residences, and the faculty, staff, and students of Walnut Canyon Elementary School, where feasible.
- Schedule high noise-producing activities, such as large earth-grading equipment that would generate over 85 dB(a), between the hours of 8:00 AM and 5:00 PM to minimize disruption to sensitive uses.
- Schedule grading when school is not in session, to the extent feasible.
- Implement noise attenuation measures to the extent feasible, which may include, but are not limited to, temporary noise barriers or noise blankets around stationary construction noise sources.
- Use electric air compressors and similar power tools rather than diesel equipment, where feasible.
- Construction-related equipment, including heavy-duty equipment, motor vehicles, and portable equipment, shall be turned off when not in use for more than 30 minutes.
- Construction hours, allowable workdays, and the phone number of the job superintendent shall be clearly posted at all construction entrances to allow for surrounding owners and residents to contact the job superintendent. If the Moorpark School District or the job superintendent receives a complaint, the superintendent

shall investigate, take appropriate corrective action, and report the action taken to the reporting party.

Timing/Implementation: During grading and construction activities

Enforcement/Monitoring: City of Moorpark Public Works and Community Development Departments

NOI-2 The construction contractors during grading and earthmoving activities shall adjust vibration amplitudes of the construction equipment used on site, such as by limiting the number of pieces operating in one location at the same time in areas where conditions would affect structures, sensitivity of vibration sensitive equipment, and/or human tolerance.

Timing/Implementation: During grading and earthmoving activities

Enforcement/Monitoring: City of Moorpark Public Works and Community Development Departments

NOI-3 Prior to commencing grading and earthmoving activities, provide notification to Walnut Canyon School, and the residential land uses within 1,000 feet of the project at least 10 days in advance of construction activities that are anticipated to result in vibration levels above the 0.09 in/sec PPV threshold, i.e., days when large bulldozers would be in use.

Timing/Implementation: Prior to grading and earthmoving activities

Enforcement/Monitoring: City of Moorpark Public Works and Community Development Department

NOI-4 Storage, maintenance, and operation of earthmoving equipment on the construction site shall be as far from vibration-sensitive sites (i.e., Walnut Canyon School and residential use surrounding the Project site) as possible or practical; use wheeled or rubber-tracked equipment; and small pieces of equipment such as smaller bulldozers when possible.

Timing/Implementation: During grading and earthmoving activities

Enforcement/Monitoring: City of Moorpark Public Works and Community Development Departments

3.11.8 LEVEL OF SIGNIFICANCE AFTER MITIGATION

Project specific and cumulative residual impacts would be less than significant.