5.11 NOISE

This section of the Draft Environmental Impact Report (Draft EIR) evaluates the potential for the proposed Section 31 Specific Plan Project ("Section 31 Specific Plan" or "Project") to result in noise impacts within the Project Site and surrounding communities. This evaluation uses procedures and methodologies as specified by the California Department of Transportation (Caltrans), the Federal Transit Administration (FTA), and the Federal Highway Administration (FHWA). Noise monitoring and roadway noise modeling datasheets are included in **Appendix H: Noise Worksheets** of this Draft EIR.

Prior to the preparation of this Draft EIR, an Initial Study (included in **Appendix A** of this Draft EIR) was prepared using the CEQA Guidelines Appendix G Environmental Checklist Form to assess potential environmental impacts associated with noise. The following Initial Study screening criterion related to noise does not require additional analysis in this Draft EIR:

- Potential impacts related to the exposure of people residing or working in the Project area to excessive 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 were evaluated and determined to have "No Impact" in the Initial Study. The Project Site is not within two miles of a public airport. Therefore, this issue is not addressed any further within this section.

Impacts found to be less than significant are further discussed in **Section 8.1: Effects Not Found to be Significant** of this Draft EIR. Please see **Section 9.0** for a glossary of terms, definitions, and acronyms used in this Draft EIR.

A. ENVIRONMENTAL SETTING

1. Fundamentals of Noise

Sound is mechanical energy transmitted by pressure waves in a compressible medium such as air. Noise is generally defined as unwanted sound. Sound is characterized by various parameters that describe the physical properties of sound waves. These properties include the rate of oscillation (frequency); the distance between successive high and low noise levels, the speed of propagation; and the pressure level or energy content of a given sound wave. In particular, the sound pressure level has become the most common descriptor used to characterize the loudness of an ambient sound level.

The unit of sound pressure expressed as a ratio to the faintest sound detectable to a person with normal hearing is called a decibel (dB). Sound or noise can vary in intensity by more than one million times within the range of human hearing. A logarithmic loudness scale, similar to the Richter scale for earthquake magnitude, is used to describe sound-intensity levels. The human ear is not equally sensitive to all sound

frequencies within the entire spectrum. Noise levels at maximum human sensitivity are factored more heavily into sound descriptions in a process called A weighting, written as dBA. Further reference to decibels in this analysis should be understood to be A-weighted.

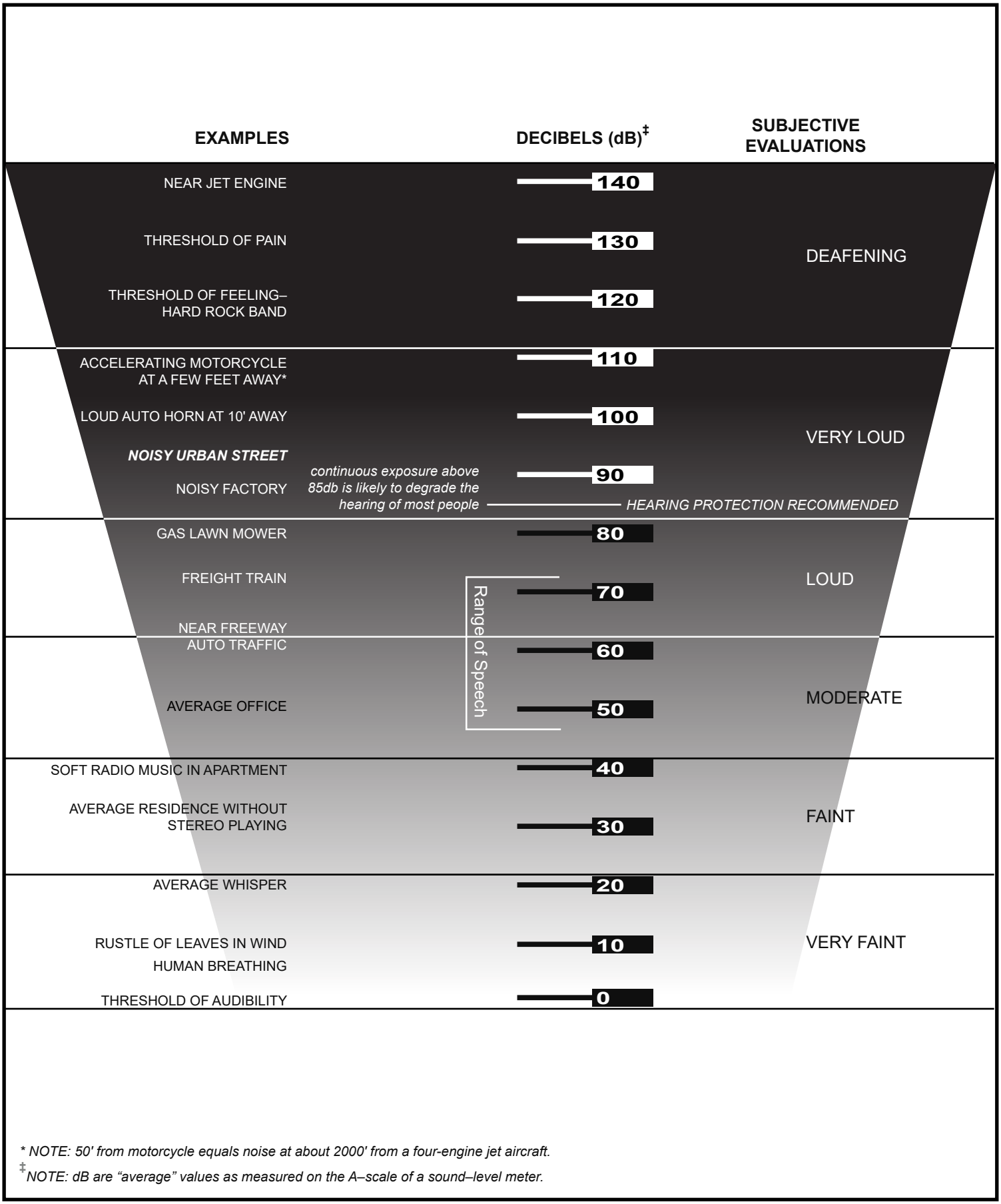
Several noise descriptors have been developed to evaluate the adverse effect of community noise on people. Since noise level fluctuates over time, an equivalent sound level (Leq) descriptor is used to describe typical time-varying instantaneous noise. Finally, because community receptors are more sensitive to unwanted noise intrusion during evening and nighttime hours, State law requires that an artificial decibel increment be added to noise occurring during those time periods. The 24-hour noise descriptor with a specified evening (7:00 to 10:00 PM) and nighttime (10:00 PM to 7:00 AM) penalty is called the Community Noise Equivalent Level (CNEL).

Noise sources can generally be categorized as one of two types: (1) point sources, such as stationary mechanical equipment; and (2) line sources, such as a roadway. Sound generated by a point source typically diminishes (attenuates) at a rate of 6 dBA for each doubling of distance from the source to the receptor at acoustically hard sites, and at a rate of 7.5 dBA at acoustically soft sites.[1] A hard, or reflective site consists of asphalt, concrete, or very hard-packed soil, which does not provide any excess ground-effect attenuation. An acoustically soft or absorptive site is characteristic of normal earth and most ground with vegetation. As an example, a 60-dBA noise level measured at 50 feet from a point source at an acoustically hard site would be 54 dBA at 100 feet from the source and 48 dBA at 200 feet from the source. Noise from the same point source at an acoustically soft site would be 52.5 dBA at 100 feet and 45 dBA at 200 feet from the source. Sound generated by a line source typically attenuates at a rate of 3 dBA and 4.5 dBA per doubling of distance from the source to the receptor for hard and soft sites, respectively.[2] Noise levels generated by a variety of activities are shown in **Figure 5.11-1: Common Noise Levels**. Man-made or natural barriers can also attenuate sound levels, as illustrated in **Figure 5.11-2: Noise Attenuation by Barriers**.

2. Noise Terminology

Different types of scales are used to characterize the time-varying nature of sound. Applicable scales include the maximum noise level (Lmax), equivalent noise level (Leq), and the CNEL. Lmax is the maximum noise level measured during a specified period. Leq is the average A-weighted sound level measured over a given time interval. Leq can be measured over any period, but is typically measured for 1-minute, 15-minute, 1-hour, or 24-hour periods. CNEL is an average A-weighted sound level measured

1 USDOT FHWA, Fundamentals and Abatement, 97.
2 USDOT FHWA, Fundamentals and Abatement, 97.



** NOTE: 50' from motorcycle equals noise at about 2000' from a four-engine jet aircraft.*

‡*NOTE: dB are "average" values as measured on the A–scale of a sound–level meter.*

FIGURE **5.11-1**

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Common Noise Levels

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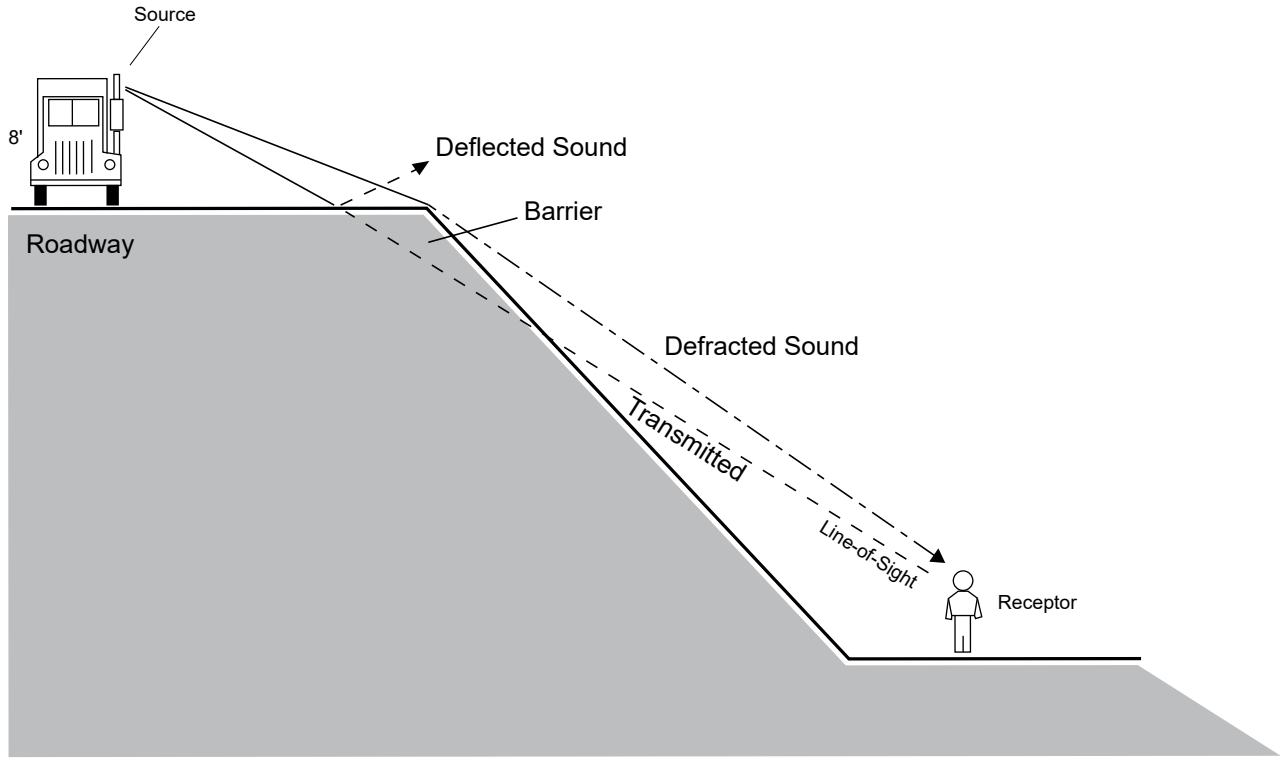
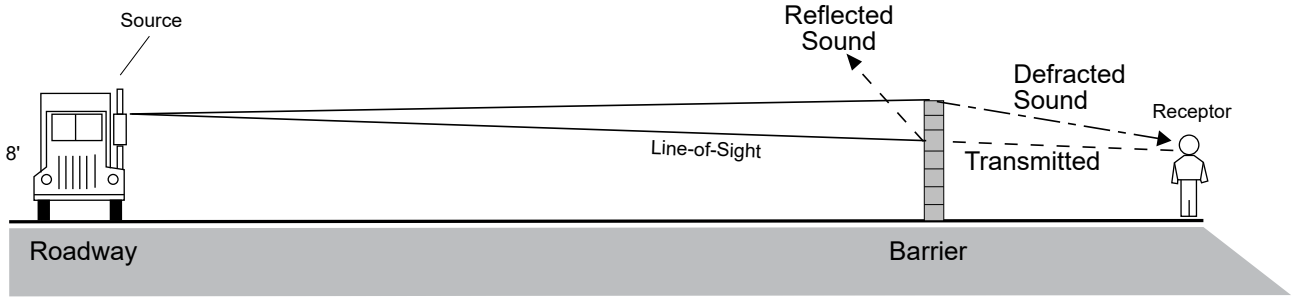


"Barrier Effect" Resulting from Differences in Elevation.



"Barrier Effect" Resulting from Typical Soundwall.

FIGURE **5.11-2**

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Noise Attenuation by Barriers

over a 24-hour period. However, this noise scale is adjusted to account for some individuals' increased sensitivity to noise levels during the evening and nighttime hours. A CNEL noise measurement is obtained by adding 5 dB(A) to sound levels occurring during the evening, from 7:00 PM to 10:00 PM, and 10 dB(A) to sound levels occurring during the nighttime, from 10:00 PM to 7:00 AM. The 5 dB(A) and 10 dB(A) "penalties" are applied to account for increased noise sensitivity during the evening and nighttime hours. Day-night average level (Ldn) is the A-weighted equivalent sound level for a 24-hour period with an additional 10 dB imposed on the equivalent sound levels for nighttime hours of 10:00 PM to 7:00 AM. **Table 5.11-1: Noise Descriptors,** identifies various noise descriptors developed to measure sound levels over different periods of time.

3. Noise Barrier Attenuation

The introduction of a barrier between a noise source and a sensitive receptor redistributes the sound energy into several paths, including a diffracted path over the top of the barrier, a transmitted path through the barrier, and a reflected path directed away from the sensitive receptor. Diffraction is the bending of sound waves over the top of a barrier. The area behind the barrier in which diffraction occurs is known as a "shadow zone," and sensitive receptors located in this area will experience some sound attenuation. The amount of attenuation is related to the magnitude of the diffraction angle. The diffraction angle will increase if the barrier height increases or if the distance from sensitive receptors is decreased to the barrier. In addition to diffraction with the use of barriers, sound can travel through the barrier itself. The level of sound transmission through the barrier depends on factors relating to the composition of the barrier (such as its weight and stiffness), the angle of incidence of the sound, and the frequency spectrum of the sound. The rating of a material's ability to transmit noise is called transmission loss. Transmission loss is related to the ratio of the incident noise energy to the transmitted noise energy, and it is normally expressed in decibels, which represents the amount noise levels will be reduced when the sound waves pass through the material of the barrier.

Table 5.11-1
Noise Descriptors

Term	Definition
Sound	A disturbance created by a vibrating object, which, when transmitted by pressure waves through a medium such as air, is capable of being detected by a receiving mechanism, such as the human ear or a microphone.
Noise	Sound that is loud, unpleasant, unexpected, or otherwise undesirable.
Decibel (dB)	The unit for measuring the volume of sound equal to 10 times the logarithm (base 10) of the ratio of the pressure of a measure sound to a reference pressure.
A-Weighted Decibel (dB[A])	A sound measurement scale that adjusts the pressure of individual frequencies according to human sensitivities. The scale accounts for the fact that the region of highest sensitivity for the human ear is between 2,000 and 4,000 cycles per second (hertz).
Equivalent Continuous Sound Level (Leq)	The sound level containing the same total energy as a time varying signal over a given time period. The Leq is the value that expresses the time averaged total energy of a fluctuating sound level. Leq can be measured over any time period, but is typically measured for 1-minute, 15-minute, 1-hour, or 24-hour periods.
Day-Night Level (Ldn)	The energy average of the A-weighted sound levels occurring during a 24-hour period with 10 dB(A) added sound levels occurring from 10 PM to 7 AM.
Community Noise Equivalent Level (CNEL)	A rating of community noise exposure to all sources of sound that differentiates between daytime, evening, and nighttime noise exposure. These adjustments add 5 dB(A) for the evening, 7:00 PM to 10:00 PM, and add 10 dB(A) for the night, 10:00 PM to 7:00 AM. The 5 and 10 decibel penalties are applied to account for increased noise sensitivity during the evening and nighttime hours. The logarithmic effect of adding these penalties to the 1-hour Leq measurements typically results in a CNEL measurement that is within approximately 3 dB(A) of the peak-hour Leq.1
sound pressure level	The sound pressure is the force of sound on a surface area perpendicular to the direction of the sound. The sound pressure level is expressed in dB.
Ambient Noise	The level of noise that is all encompassing within a given environment, being usually a composite of sounds from many and varied sources near to and far from the observer. No specific source is identified in the ambient environment.

Note: California Department of Transportation, Technical Noise Supplement; A Technical Supplement to the Traffic Noise Analysis Protocol, (Sacramento, CA: November 2009), N51-N54.

Noise energy can also be reflected by a barrier wall. The reflected sound energy thus would not affect the sensitive receptor but may affect sensitive receptors to the left and right of the developed barrier.[3] Man-made or natural barriers can also attenuate sound levels, as illustrated in **Figure 5.11-3: Noise Barrier Diffraction**. A solid wall or berm may reduce noise levels by 5 to 10 dB(A).[4]

Contemporary wood frame construction techniques in California typically provide about 25 dB(A) reduction in exterior to interior noise levels. This is due to structural means used to comply with California regulations, such as the Title 24 energy conservation standards. The minimum attenuation of exterior to interior noise provided by typical structures in California is provided in **Table 5.11-2: Attenuation of Typical Structures.**

Table 5.11-2
Noise Attenuation of Typical Structures

Building Type	Open Windows (dB[A])	Closed Windows (dB[A])[a]
Residences	17.0	25.0
Churches	20.0	30.0
Hospitals/convalescent homes	17.0	25.0
Offices	17.0	25.0
Theaters	20.0	30.0
Hotels/motels	17.0	25.0

Source: Bolt Beranek and Newman, Inc., Highway Noise: A Design Guide for Highway Engineers, NCHRP Report No. 117, (1971). Prepared for Highway Research Board, National Academy of Sciences, Washington, D.C.

[a] *As shown, structures with closed windows can attenuate exterior noise by a minimum of 25.0 to 30.0 dB(A).*

3 U.S. Department of Housing and Urban Development, Office of Community Planning and Development, The Noise Guidebook (n.d.), 21–23.

4 Federal Highway Administration, Highway Noise Fundamentals (1980), 18.

4. Vibration

Vibration consists of waves transmitted through a solid medium. Groundborne vibration propagates from the source through the ground to adjacent buildings by surface waves. A vibration may be a single pulse, a series of pulses, or a continuous oscillatory motion. The frequency of a vibrating object describes how rapidly it is oscillating, measured in hertz (Hz). Most environmental vibrations consist of a composite, or "spectrum," of many frequencies, and are generally classified as broadband or random vibrations. **Figure 5.11-4: Typical Levels of Groundborne Vibration**, identifies typical groundborne vibration levels. The normal frequency range of most groundborne vibration that can be felt starts from a low frequency of less than 1 Hz to a high of about 200 Hz. Vibration is often measured in terms of the peak particle velocity (PPV) in inches per second (in/sec), because it is related to the stresses that are experienced by buildings. Vibration is also measured in vibration decibels (VdB). The human threshold of perception is approximately 65 VdB. A vibration velocity of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels for many people. Vibration levels are acceptable at approximately 85 VdB if there are an infrequent number of events per day.[5]

Vibration energy attenuates as it travels through the ground, causing the vibration amplitude to decrease with distance away from the source.[6] High frequency vibrations reduce much more rapidly than low frequencies, so that in the far-field from a source, the low frequencies tend to dominate. Soil properties also affect the propagation of vibration. When groundborne vibration interacts with a building, there is usually a ground-to-foundation coupling loss, but the vibration can also be amplified by the structural resonances of the walls and floors.[7] Vibration in buildings is typically perceived as rattling of windows or of items on shelves, or the motion of building surfaces.

Groundborne vibration is generally limited to areas within a few hundred feet of certain types of construction activities, especially pile driving. Road vehicles rarely create enough groundborne vibration to be perceptible to humans unless the road surface is poorly maintained and there are potholes or bumps.[8] If traffic, typically heavy trucks, induces perceptible vibration in buildings, such as window rattling or shaking of small loose items, then it is most likely an effect of low-frequency airborne noise or ground characteristics. Human annoyance by vibration is related to the vibration energy and the number and duration of events, as well as the setting in which the person experiences the vibration. As discussed previously, vibration can be amplified by the structural resonances of the walls and floors of buildings. The more the events or the greater the duration, the more annoying will it be to humans.

5 Federal Transit Administration Transit Noise and Vibration Impact Assessment Manual, September 2018), 7-8.
6 California Department of Transportation, Earthborne Vibrations (1990), VII-27.
7 Federal Transit Administration Transit Noise and Vibration Impact Assessment Manual, September 2018, 7-1, 7-2.
8 Federal Transit Administration (2018), 7-9.

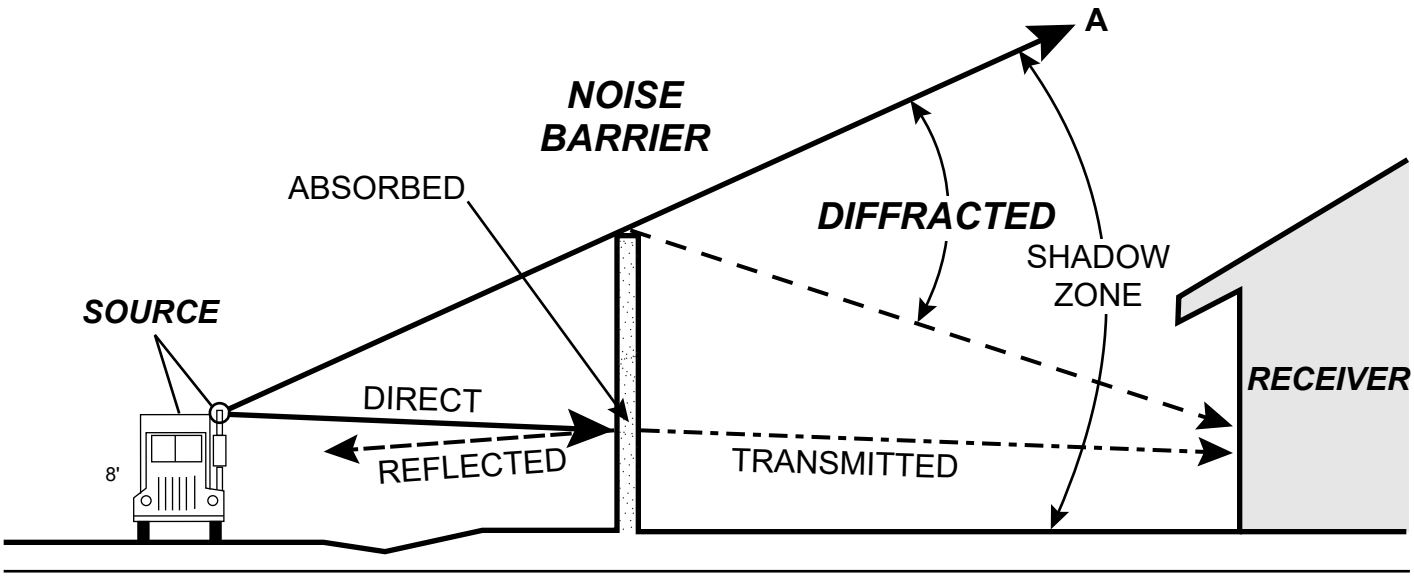

FIGURE **5.11-3**

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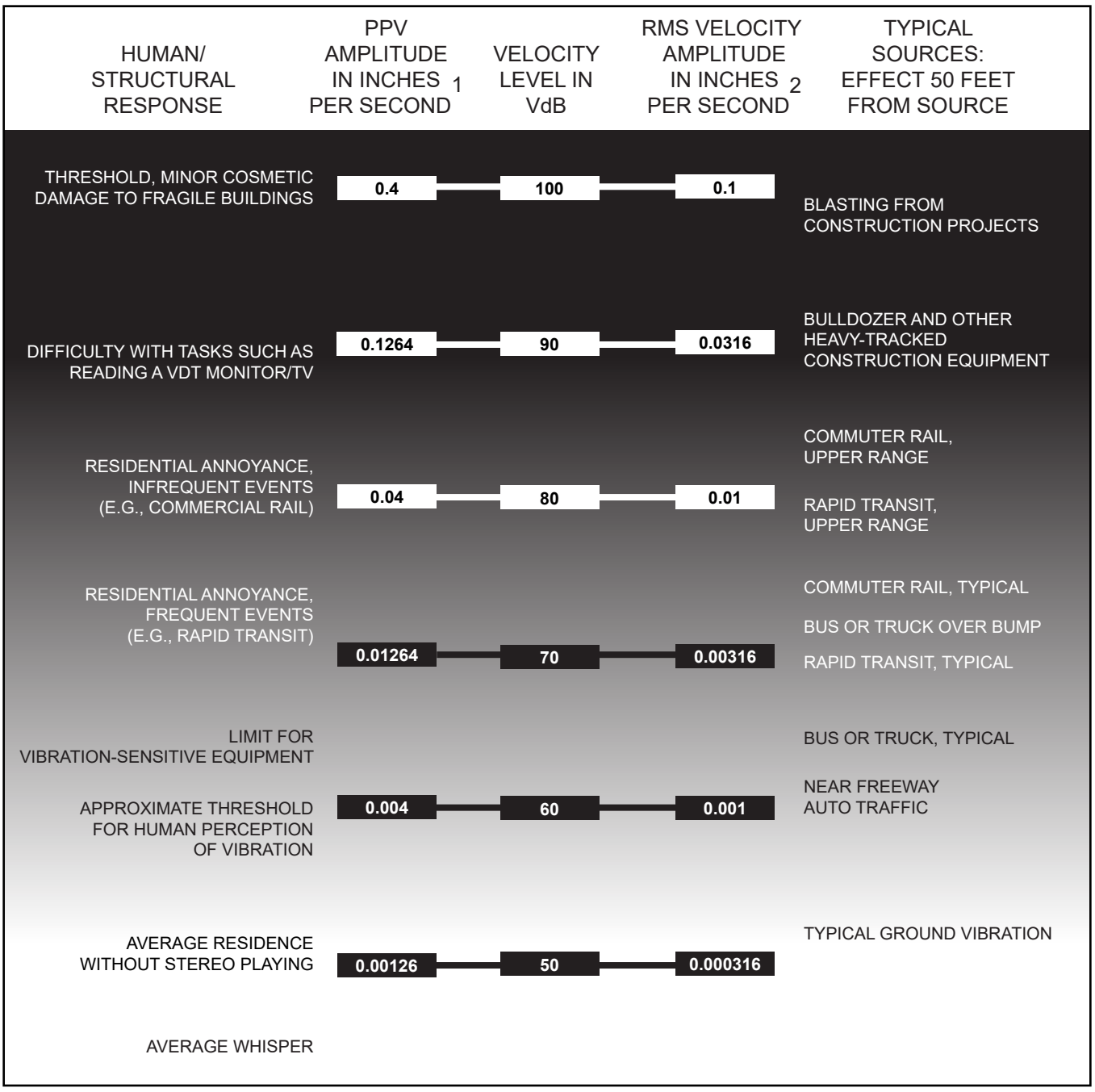
Noise Barrier Diffraction



[1] PPV is typically a factor 1.7 to 6 times greater than RMS vibration velocity. A factor of 4 was used to calculate noise levels.

[2] Vibration levels in terms of velocity levels are defined as: $V=20 \times \log_{10} (a/r)$
V=velocity levels in decibels
a=RMS velocity amplitude
r=reference amplitude (accepted reference quantities for vibration velocity are 1×10^{-6} inches/second in the United States)

FIGURE **5.11-4**

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Typical Levels of Ground-Borne Vibration

5. Existing Conditions

The approximately 618-acre Project Site is located in and surrounded by the City of Rancho Mirage ("City") to the north, south, southeast, and west, and by the City of Palm Desert to the east. The City is considered to be in the heart of the Coachella Valley in Riverside County, nestled at the base of the Santa Rosa and San Jacinto Mountains and conveniently located to utilize the southern California freeway system via Interstate 10 (I-10). The majority of future development in this area of the Coachella Valley is expected to occur near the I-10 corridor.

Existing Noise Levels

The Project Site is currently vacant. While there are no existing stationary- or mobile-sources of noise within the Project Site, the site is surrounded by transportation and stationary sources of noise that contribute to the existing ambient noise environment. The Project Site is bound by Gerald Ford Drive on the north; Monterey Avenue on the east; Frank Sinatra Drive on the south; and Bob Hope Drive on the west. In addition to mobile and stationary sources of noise, the Coachella Valley also experiences high wind gusts that can significantly elevate the ambient noise environment on windy days.

Noise measurements, as discussed below, were conducted at 8 off-site locations adjacent to the Project site area to establish baseline noise conditions. The noise measurements locations are shown in **Figure 5.11-5: Noise Monitoring and Sensitive Receptor Location Map** and described in **Table 5.11-3: Existing Ambient Noise Levels**. Existing noise levels ranged from a low of 69.3 dBA Leq at Site 3 (residences north of the Project site area across Gerald Ford Drive) to a high of 73.7 dBA Leq Site 8 (residences to the east across Monterey Avenue). Based on the land use noise compatibility criteria, forecasted noise levels are classified as conditionally acceptable for Site 3, 6, and 7 and normally unacceptable for Site 1, 2, 4, 5 and 8.[9] As discussed above, the predominant noise source in the Project site vicinity is motor vehicle travel, particularly along the adjacent major streets such as Gerald Ford Drive to the north, Frank Sinatra Drive to the south, Monterey Avenue to the east and Bob Hope Drive to the west.

9 City of Rancho Mirage General Plan Noise Element, Exhibit 20, Noise Level and Land Use Compatibility, accessed May 2019, https://ranchomirageca.gov/content_files/pdf/departments/community_development/gp17/Chapter_7_Noise.

Table 5.11-3
Existing Ambient Noise Levels

Site	Location	Land Use	Leq (15-minute)
Site 1	West of the Project Site, near Sunnylands Center and Gardens	Public	73.6
Site 2	Northwest of Project Site at Bob Hope Dr and Gerald Ford Drive	Residential	70.6
Site 3	North of Project Site at Oasis Way and Gerald Ford Drive	Residential	69.3
Site 4	Northeast of Project Site at Monterey Avenue and Gerald Ford Drive	Residential	71.9
Site 5	Southeast of Project site at Monterey Avenue and Frank Sinatra Drive	Residential	72.2
Site 6	South of Project site near Vista Del Sol and Frank Sinatra Drive	Residential	69.8
Site 7	Southwest of Project Site near Bob Hope Drive and Frank Sinatra Drive	Public/Residential	69.5
Site 8	East of Project Site, near Monterey Avenue and Shadow Ridge Road	Lodging	73.7

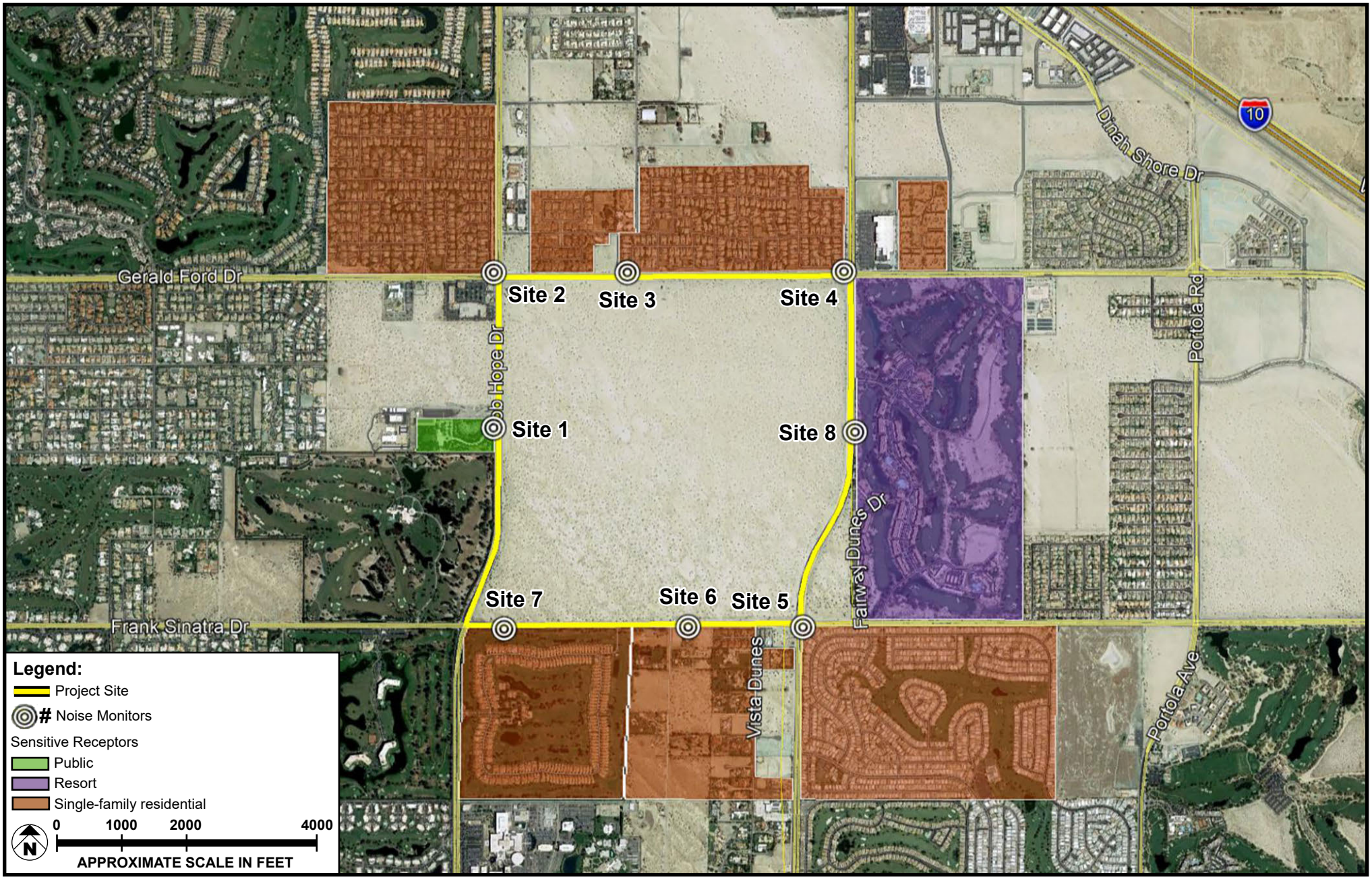
Note: Noise measurements were conducted between 10:00 AM to 2:00 PM on April 19, 2019.
Source: Noise Measurement Datasheets contained in ***Appendix H.1****.*

Existing Off-Site Roadway Noise Levels

In addition to the ambient noise measurements near the Project site, the existing traffic noise on local roadways in the surrounding areas was calculated to quantify the 24-hour CNEL noise levels using information provided in the traffic impact study.[10]

A total of 32 intersections, 5 access intersections, and 2 roadway segments, were selected for the analysis of existing off-site traffic noise and the potential increases in traffic volumes from the Project site. Given that motor vehicle travel is the predominant noise source within the Project vicinity, the analysis focuses on sensitive uses located along the major roadways within the vicinity. Traffic noise levels were calculated using the Federal Highway Administration Traffic Noise Model (FHWA TNM).

10 Fehr & Peers, *Section 31 Specific Plan Transportation Impact Study*, February 2019.



SOURCE: Google Earth - 2019

FIGURE **5.11-5**

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Noise Monitors and Sensitive Receptor Locations

204-001-18

Table 5.11-4: Existing Roadway Traffic Noise Levels, provides the calculated CNEL for the analyzed local roadway segments based on existing traffic volumes. CNEL levels attributed to roadway traffic only range from 42.1 dBA CNEL for residential receptors at the Sunnylands Centers to 71.6 dBA CNEL for residential receptors along Monterey Avenue. In terms of the City's land use noise compatibility categories based on roadway traffic only, most locations are classified as normally unacceptable, with others classified as normally acceptable. Specifically, the noise exposure compatibility categories based on roadway traffic only are summarized as follows:

- Normally and Conditionally acceptable: Locations along I-10 Ramps, Ramon Road, Varner Road, Dinah Shore Drive, Gerald Ford Drive, Shadow Ridge Road, Sunny Lands Center, Frank Sinatra Drive, Country Club Drive, Hovley Lane, Fred Waring Drive, Dale Palm Drive, SR 111, Da Vall Drive, Rattler Road, Morningside Drive, Bob Hope Drive, Oasis Way, Kavendish Way, Monterey Avenue (except for segment north and south of Hovley Lane which is classified as normally unacceptable), Varner Road, Portola Road/Avenue, and Cook Street.
- Normally unacceptable: Locations along Monterey Avenue north and south of Hovley Lane.
- Clearly unacceptable: None.

Table 5.11-4
Existing Roadway Noise Levels

Intersection No.	Roadway Segment	Adjacent Land Use	Existing Roadway Noise Level (dBA CNEL) AM	Existing Roadway Noise Level (dBA CNEL) PM	Existing Noise Exposure Compatibility Category
I-10 Ramps (WB and EB)					
1	East of Bob Hope Drive	Commercial	67.0	66.1	Normally Acceptable
1	West of Bob Hope Drive	Commercial	62.8	66.6	Normally Acceptable
2	East of Bob Hope Drive	Commercial	56.8	60.7	Normally Acceptable
2	West of Bob Hope Drive	Commercial	67.6	65.4	Normally Acceptable
7	East of Varner Road	Residential	61.5	61.8	Conditionally Acceptable
7	West of Varner Road	Residential	66.0	65.5	Conditionally Acceptable
8	East of Monterey Avenue	Commercial	64.9	67.0	Normally Acceptable
8	West of Monterey Avenue	Commercial	68.1	67.2	Normally Acceptable
10	East of Portola Road	Commercial	N/A	N/A	N/A

Intersection No.	Roadway Segment	Adjacent Land Use	Existing Roadway Noise Level (dBA CNEL) AM	Existing Roadway Noise Level (dBA CNEL) PM	Existing Noise Exposure Compatibility Category
10	West of Portola Road	Commercial	N/A	N/A	N/A
11	East of Portola Road	Commercial	N/A	N/A	N/A
11	West of Portola Road	Commercial	N/A	N/A	N/A
18	East of Cook Street	Commercial	68.9	68.6	Normally Acceptable
18	West of Cook Street	Commercial	54.2	53.4	Normally Acceptable
19	East of Cook Street	Commercial	63.8	66.6	Normally Acceptable
19	West of Cook Street	Commercial	68.1	66.2	Normally Acceptable
Ramon Road					
3	East of Rattler Road	Residential	68.4	68.9	Conditionally Acceptable
3	West of Rattler Road	Residential	68.4	68.9	Conditionally Acceptable
4	East of Bob Hope Drive	Resort/Hotel	67.2	67.3	Conditionally Acceptable
4	West of Bob Hope Drive	Resort/Hotel	69.0	69.0	Conditionally Acceptable
Varner Road					
6	East of I-10 WB Ramps	Residential	66.3	65.8	Conditionally Acceptable
6	West of I-10 WB Ramps	Residential	63.7	64.3	Conditionally Acceptable
Dinah Shore Drive					
5	East of Bob Hope Drive	Residential/Commercial	64.9	67.0	Conditionally Acceptable
5	West of Bob Hope Drive	Residential/Commercial	65.1	66.7	Conditionally Acceptable
9	East of Monterey Avenue	Commercial	65.2	66.5	Normally Acceptable
9	West of Monterey Avenue	Commercial	66.0	68.3	Normally Acceptable
12	East of Portola Road	Residential	58.8	57.8	Conditionally Acceptable
12	West of Portola Road	Residential	63.8	64.0	Conditionally Acceptable
Gerald Ford Drive					
13	East of Date Palm Drive	Residential	63.6	63.7	Conditionally Acceptable

Intersection No.	Roadway Segment	Adjacent Land Use	Existing Roadway Noise Level (dBA CNEL) AM	Existing Roadway Noise Level (dBA CNEL) PM	Existing Noise Exposure Compatibility Category
13	West of Date Palm Drive	Residential	58.5	58.3	Conditionally Acceptable
14	East of Da Vall Drive	Residential	62.0	64.2	Conditionally Acceptable
14	West of Da Vall Drive	Residential	60.8	64.3	Conditionally Acceptable
15	East of Bob Hope Drive	Residential	64.7	64.9	Conditionally Acceptable
15	West of Bob Hope Drive	Residential	65.0	65.7	Conditionally Acceptable
33	East of Oasis Way	Residential	64.5	65.0	Conditionally Acceptable
33	West of Oasis Way	Residential	64.3	64.8	Conditionally Acceptable
16	East of Monterey Avenue	Residential	64.0	64.2	Conditionally Acceptable
16	West of Monterey Avenue	Residential	65.0	65.1	Conditionally Acceptable
17	East of Portola Road	Residential	64.8	64.8	Conditionally Acceptable
17	West of Portola Road	Residential	64.1	64.1	Conditionally Acceptable
20	East of Cook Street	Commercial	63.8	64.1	Conditionally Acceptable
20	West of Cook Street	Commercial	65.5	65.7	Conditionally Acceptable
Shadow Ridge Road					
34	East of Monterey Avenue	Residential	55.6	57.0	Conditionally Acceptable
34	West of Monterey Avenue	Residential	N/A	N/A	N/A
Sunny Lands Center					
35	East of Bob Hope Drive	Residential/Public	N/A	N/A	N/A
35	West of Bob Hope Drive	Residential/Public	46.5	42.1	Normally Acceptable
Project Access					
36	East of Monterey Avenue	Commercial	N/A	N/A	N/A
36	West of Monterey Avenue	Commercial	N/A	N/A	N/A
Frank Sinatra Drive					
21	East of SR-111	Commercial	64.6	64.7	Normally Acceptable
21	West of SR-111	Commercial	57.1	58.4	Normally Acceptable
22	East of Morningside Drive	Residential	64.6	64.9	Conditionally Acceptable

Intersection No.	Roadway Segment	Adjacent Land Use	Existing Roadway Noise Level (dBA CNEL) AM	Existing Roadway Noise Level (dBA CNEL) PM	Existing Noise Exposure Compatibility Category
22	West of Morningside Drive	Residential	65.4	65.6	Conditionally Acceptable
23	East of Bob Hope Drive	Residential	64.7	65.2	Conditionally Acceptable
23	West of Bob Hope Drive	Residential	64.9	65.1	Conditionally Acceptable
37	East of Kavendish Way	Residential	65.7	66.2	Conditionally Acceptable
37	West of Kavendish Way	Residential	65.7	66.1	Conditionally Acceptable
24	East of Monterey Avenue	Commercial	65.7	66.4	Normally Acceptable
24	West of Monterey Avenue	Commercial	65.8	66.4	Normally Acceptable
25	East of Portola Road	Residential	65.7	66.0	Conditionally Acceptable
25	West of Portola Road	Residential	65.6	65.9	Conditionally Acceptable
26	East of Cook Street	Residential	63.0	63.9	Conditionally Acceptable
26	West of Cook Street	Residential	66.0	66.3	Conditionally Acceptable
Country Club Drive					
27	East of Bob Hope Drive	Residential	64.9	65.6	Conditionally Acceptable
27	West of Bob Hope Drive	Residential	63.4	64.0	Conditionally Acceptable
28	East of Monterey Avenue	Commercial	66.5	67.5	Conditionally Acceptable
28	West of Monterey Avenue	Commercial	66.9	67.3	Conditionally Acceptable
29	East of Portola Avenue	Residential	66.2	66.9	Conditionally Acceptable
29	West of Portola Avenue	Residential	66.2	66.7	Conditionally Acceptable
Hovley Lane					
30	East of Monterey Avenue	Residential	60.7	59.1	Conditionally Acceptable
30	West of Monterey Avenue	Residential	50.4	49.4	Normally Acceptable
Fred Waring Drive					
31	East of Monterey Avenue	Commercial	66.3	67.9	Normally Acceptable
31	West of Monterey Avenue	Commercial	64.8	66.9	Normally Acceptable
SR-111					

Intersection No.	Roadway Segment	Adjacent Land Use	Existing Roadway Noise Level (dBA CNEL) AM	Existing Roadway Noise Level (dBA CNEL) PM	Existing Noise Exposure Compatibility Category
32	East of Monterey Avenue	Commercial	68.6	70.5	Conditionally Acceptable
32	West of Monterey Avenue	Commercial	67.8	70.3	Conditionally Acceptable
Date Palm Drive					
13	North of Gerald Ford Drive	Residential	63.7	64.6	Conditionally Acceptable
13	South of Gerald Ford Drive	Residential	64.0	65.2	Conditionally Acceptable
SR 111					
21	North of Frank Sinatra Drive	Commercial	69.9	71.1	Conditionally Acceptable
21	South of Frank Sinatra Drive	Commercial	69.3	70.6	Conditionally Acceptable
Da Vall Drive					
14	North of Gerald Ford Drive	Residential	63.2	63.0	Conditionally Acceptable
14	South of Gerald Ford Drive	Residential	62.6	63.1	Conditionally Acceptable
Rattler Road					
3	North of Ramon Road	Residential	56.2	56.9	Conditionally Acceptable
3	South of Ramon Road	Residential	N/A	N/A	N/A
Morningside Drive					
22	North of Frank Sinatra Drive	Residential	54.6	56.0	Conditionally Acceptable
22	South of Frank Sinatra Drive	Residential	60.5	60.9	Conditionally Acceptable
Bob Hope Drive					
1	North of I-10 WB Ramps	Commercial	64.0	64.1	Normally Acceptable
1	South of I-10 WB Ramps	Commercial	65.4	66.5	Normally Acceptable
2	North of I-10 EB Ramps	Commercial	65.4	66.5	Normally Acceptable
2	South of I-10 EB Ramps	Commercial	66.4	66.7	Normally Acceptable
4	North of Ramon Road	Resort/Hotel	66.9	66.9	Conditionally Acceptable
4	South of Ramon Road	Resort/Hotel	66.4	67.3	Conditionally Acceptable
5	North of Dinah Shore Drive	Residential/Commercial	65.9	66.6	Conditionally Acceptable
5	South of Dinah Shore Drive	Residential/Commercial	66.4	67.3	Conditionally Acceptable

Intersection No.	Roadway Segment	Adjacent Land Use	Existing Roadway Noise Level (dBA CNEL) AM	Existing Roadway Noise Level (dBA CNEL) PM	Existing Noise Exposure Compatibility Category
15	North of Gerald Ford Drive	Residential	66.0	67.0	Conditionally Acceptable
15	South of Gerald Ford Drive	Residential	66.1	66.8	Conditionally Acceptable
35	North of Sunny Lands Center	Residential/Public	65.8	66.8	Normally Acceptable
35	South of Sunny Lands Center	Residential/Public	65.8	66.8	Normally Acceptable
23	North of Frank Sinatra Drive	Residential	66.3	67.4	Conditionally Acceptable
23	South of Frank Sinatra Drive	Residential	66.9	67.5	Conditionally Acceptable
27	North of Country Club Drive	Residential	65.4	66.4	Conditionally Acceptable
27	South of Country Club Drive	Residential	65.6	67.0	Conditionally Acceptable
Oasis Way					
33	North of Gerald Ford Drive	Residential	54.7	55.0	Conditionally Acceptable
33	South of Gerald Ford Drive	Residential	N/A	N/A	N/A
Kavendish Way					
37	North of Frank Sinatra Drive	Residential	N/A	N/A	N/A
37	South of Frank Sinatra Drive	Residential	43.5	45.1	Normally Acceptable
Monterey Avenue					
6	North of Varner Road	Residential	64.7	65.9	Conditionally Acceptable
6	South of Varner Road	Residential	68.0	68.4	Conditionally Acceptable
8	North of I-10 EB Ramps	Commercial	68.6	70.0	Normally Acceptable
8	South of I-10 EB Ramps	Commercial	70.5	71.5	Normally Acceptable
9	North of Dinah Shore Drive	Commercial	70.8	71.6	Normally Acceptable
9	South of Dinah Shore Drive	Commercial	69.1	70.1	Normally Acceptable
16	North of Gerald Ford Drive	Residential	69.1	70.2	Conditionally Acceptable
16	South of Gerald Ford Drive	Residential	69.1	70.2	Conditionally Acceptable
34	North of Shadow Ridge Road	Residential	68.5	69.6	Conditionally Acceptable

Intersection No.	Roadway Segment	Adjacent Land Use	Existing Roadway Noise Level (dBA CNEL) AM	Existing Roadway Noise Level (dBA CNEL) PM	Existing Noise Exposure Compatibility Category
34	South of Shadow Ridge Road	Residential	68.7	69.8	Conditionally Acceptable
36	North of Project Access	Commercial	N/A	N/A	N/A
36	South of Project Access	Commercial	N/A	N/A	N/A
24	North of Frank Sinatra Drive	Commercial	69.3	70.4	Conditionally Acceptable
24	South of Frank Sinatra Drive	Commercial	69.3	70.3	Conditionally Acceptable
28	North of Country Club Drive	Commercial	69.3	70.5	Conditionally Acceptable
28	South of Country Club Drive	Commercial	69.7	70.8	Conditionally Acceptable
30	North of Hovley Lane	Residential	69.0	70.1	Normally Unacceptable
30	South of Hovley Lane	Residential	68.8	70.0	Normally Unacceptable
31	North of Fred Waring Drive	Commercial	68.6	70.1	Conditionally Acceptable
31	South of Fred Waring Drive	Commercial	67.7	69.3	Conditionally Acceptable
32	North of SR 111	Commercial	67.0	68.2	Conditionally Acceptable
32	South of SR 111	Commercial	67.4	68.0	Conditionally Acceptable
Varner Road					
7	North of I-10 WB Ramps	Residential	N/A	N/A	N/A
7	South of I-10 WB Ramps	Residential	67.0	66.0	Conditionally Acceptable
Portola Road/Avenue					
10	North of I-10 WB Ramps	Commercial	N/A	N/A	N/A
10	South of I-10 WB Ramps	Commercial	N/A	N/A	N/A
11	North of I-10 EB Ramps	Commercial	N/A	N/A	N/A
11	South of I-10 EB Ramps	Commercial	N/A	N/A	N/A
12	North of Dinah Shore Drive	Residential	44.2	44.2	Normally Acceptable
12	South of Dinah Shore Drive	Residential	62.7	63.1	Conditionally Acceptable
17	North of Gerald Ford Drive	Residential	63.4	63.8	Conditionally Acceptable
17	South of Gerald Ford Drive	Residential	64.0	64.2	Conditionally Acceptable

Intersection No.	Roadway Segment	Adjacent Land Use	Existing Roadway Noise Level (dBA CNEL) AM	PM	Existing Noise Exposure Compatibility Category
25	North of Frank Sinatra Drive	Residential	63.6	63.5	Conditionally Acceptable
25	South of Frank Sinatra Drive	Residential	65.2	64.9	Conditionally Acceptable
29	North of Country Club Drive	Residential	64.6	64.9	Conditionally Acceptable
29	South of Country Club Drive	Residential	66.2	66.1	Conditionally Acceptable
Cook Street					
18	North of I-10 WB Ramps	Commercial	65.1	63.1	Normally Acceptable
18	South of I-10 WB Ramps	Commercial	68.3	67.5	Conditionally Acceptable
19	North of I-10 EB Ramps	Commercial	68.4	67.6	Conditionally Acceptable
19	South of I-10 EB Ramps	Commercial	70.3	69.9	Conditionally Acceptable
20	North of Gerald Ford Drive	Commercial	70.5	70.2	Conditionally Acceptable
20	South of Gerald Ford Drive	Commercial	69.5	69.4	Conditionally Acceptable
26	North of Frank Sinatra Drive	Residential	69.6	69.4	Conditionally Acceptable
26	South of Frank Sinatra Drive	Residential	68.7	69.0	Conditionally Acceptable

Source: Fehr & Peers Inc., Section 31 Specific Plan Transportation Impact Study (February 2019).
*Note: Refer to **Appendix H.2** for roadway noise model worksheets.*
N/A: No Data.

Existing Vibration Conditions

The primary source of existing groundborne vibration in the vicinity of the Project Site is vehicle traffic on Gerald Ford Drive, Monterey Avenue, Frank Sinatra Drive, and Bob Hope Drive. According to the FTA,[11] typical road traffic-induced vibration levels are unlikely to be perceptible by people. In part, FTA indicates that "it is unusual for vibration from traffic including buses and trucks to be perceptible, even in a location close to major roadways." Therefore, based on FTA published vibration data, the existing ground vibration environment in the Project vicinity would be below the perceptible levels. Trucks and buses typically generate vibration velocity levels of approximately 63 VdB (at 50 feet distance), and these levels could reach 72 VdB when trucks and buses pass over bumps in the road.

11 Federal Transit Administration, Transit Noise and Vibration Impact Assessment (2018).

6. Regulatory Setting

Federal

Department of Housing and Urban Development

The US Department of Housing and Urban Development (HUD) has set a goal of 65 dB(A) CNEL as a desirable maximum exterior standard for residential uses developed under HUD funding. While HUD does not specify acceptable interior noise levels, standard construction of residential uses constructed under Title 24 standards typically provides in excess of 20 dB(A) of attenuation with the windows closed. Based on this premise, the interior CNEL should not exceed 45 dB(A) CNEL.[12]

Federal Transit Administration

The FTA has published a technical manual, *Transit Noise and Vibration Impacts Assessment*, that provides ground-borne vibration impact criteria with respect to building damage during construction activities.[13] According to the FTA guidelines, a vibration criterion of 0.20 PPV should be considered as the significant impact level for nonengineered timber and masonry buildings. Structures or buildings constructed of reinforced concrete, steel, or timber have a vibration damage criterion of 0.50 PPV based on the FTA guidelines. Structures amplify ground-borne vibration, and wood-frame buildings, such as typical residential structures, are more affected by ground vibration than are heavier buildings. The level at which ground-borne vibration is strong enough to cause architectural damage has not been determined conclusively. The most conservative estimates are reflected in the FTA standards, shown in **Table 5.11-5: Construction Vibration Damage Criteria**. The FTA has also adopted standards for ground-borne vibration impacts related to human annoyance, as shown in **Table 5.11-6: Ground-borne Vibration Sensitivity Criteria**. These criteria are based on extensive research that suggests humans are sensitive to vibration velocities in the range of 8 to 80 Hz.[14]

12 Code of Federal Regulations, Title 24, sec. 51, Housing and Urban Development, Environmental Criteria and Standards (revised April 1, 2004).

13 US Department of Transportation, Federal Transit Administration (USDOT, FTA), *Transit Noise and Vibration Impact Assessment,* FTA report no. 0123 (September 2018), accessed December 2018, https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf.

14 USDOT, FTA, *Transit Noise and Vibration Impact Assessment.*

Table 5.11-5
Construction Vibration Damage Criteria

Building Category	PPV (ips)	Lv (VdB)
I. Reinforced concrete, steel, or timber (no plaster)	0.5	102
II. Engineered concrete and masonry (no plaster)	0.3	98
III. Nonengineered timber and masonry buildings	0.2	94
IV. Buildings extremely susceptible to vibration damage	0.12	90

Source: Federal Transit Administration Transit Noise and Vibration Impact Assessment Manual, September 2018).
Note: For Max Lv (VdB), Lv = the velocity level in decibels as measured in 1/3 octave bands of frequency over the frequency ranges of 8 to 80 Hz; VdB = vibration decibels; Hz = hertz; ips = inches per second.

Table 5.11-6
Ground-borne Vibration Sensitivity Criteria

Building Category	Frequent Events	Occasional Events	Infrequent Events
Category 1: High Sensitivity. Buildings where vibration would interfere with interior operations (e.g., vibration-sensitive research and manufacturing facilities, hospitals with vibration-sensitive equipment, and research operations).	65 VdB[1]	65 VdB[1]	65 VdB[1]
Category 2: Residences and buildings where people normally sleep.	72 VdB	75 VdB	80 VdB
Category 3: Institutional land uses, such as schools, churches, other institutions, and quiet offices that do not have vibration-sensitive equipment, but still have the potential for activity interference.	75 VdB	78 VdB	83 VdB

Source: Federal Transit Administration Transit Noise and Vibration Impact Assessment Manual, September 2018.
Note:
1 This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. For equipment that is more sensitive, a Detailed Vibration Analysis must be performed.

State

Noise Standards

The California Department of Health Services (DHS) has established guidelines for evaluating the compatibility of various land uses as a function of community noise exposure; these guidelines have been included in the State of California General Plan Guidelines, which is published and updated by the

Governor's Office of Planning and Research.[15] According to the State, an exterior noise environment up to 60 dBA CNEL and 65 dBA CNEL is "normally acceptable" for single- and multifamily residential uses, respectively, without special noise insulation requirements. In addition, noise levels up to 75 dBA CNEL are "conditionally acceptable" with special noise insulation requirements, while noise levels at 75 dBA CNEL and above are "clearly unacceptable" for residential uses. In addition, Section 65302(f) of the California Government Code requires each county and city in the State to prepare and adopt a comprehensive long-range general plan for its physical development, with Section 65302(g) requiring a noise element to be included in the general plan. The noise element must (1) identify and appraise noise problems in the community, (2) recognize Office of Noise Control guidelines, and (3) analyze and quantify current and projected noise levels.

DHS's Office of Noise Control has established guidelines to provide communities with noise environments that it deems to be generally acceptable based on land-use categories. These guidelines serve as a primary tool for a city to use to assess the compatibility between land uses and outdoor noise. Noise exposure for single-family uses is normally acceptable when the CNEL at exterior residential locations is equal to or below 60 dBA, conditionally acceptable when the CNEL is between 55 to 70 dBA, and normally unacceptable when the CNEL exceeds 70 dBA. Some overlap exists between categories. These guidelines apply to noise sources such as vehicular traffic, aircraft, and rail movements.

Vibration Standards

The California Department of Transportation (Caltrans) published its *Transportation and Construction Vibration Guidance Manual* in September 2018.[16] The manual provides practical guidance to Caltrans engineers, planners, and consultants who must address vibration issues associated with the construction, operation, and maintenance of Caltrans projects. This manual provides guidelines for assessing vibration damage potential to various types of buildings, ranging from 0.08 to 0.12 inches per second for extremely fragile historic buildings, ruins, and ancient monuments, to 0.50 to 2.0 inches per second for modern industrial and commercial buildings.

The guidance and procedures provided in the Caltrans manual should be treated as screening tools for assessing the potential for adverse effects related to human perception and structural damage. General information on the potential effects of vibration on vibration-sensitive research and advanced-technology facilities is also provided, but a discussion of detailed assessment methods in this area is beyond the

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[15] State of California, Governor's Office of Planning and Research, *General Plan Guidelines 2017* (2018), 374, accessed December 2018, http://opr.ca.gov/planning/general-plan/guidelines.html.

[16] California Department of Transportation (Caltrans), *Transportation and Construction Vibration Guidance Manual*, September 2018, accessed May 2019, https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf.

manual's scope. The document is not an official policy, standard, specification, or regulation. Therefore, the vibration analysis in this Draft EIR is based on the FTA's standards and the Caltrans standards are included for informational purposes only.

State of California Building Code

California's noise insulation standards are codified in the California Code of Regulations, Title 24, Building Standards Administrative Code, Part 2, California Building Code. These noise standards are applied to new construction in California for the purpose of interior noise compatibility from exterior noise sources. The regulations specify that acoustical studies must be prepared when noise-sensitive structures, such as residential buildings, schools, or hospitals, are located near major transportation noise sources, and where such noise sources create an exterior noise level of 60 dB(A) CNEL or higher. Acoustical studies that accompany building plans must demonstrate that the structure has been designed to limit interior noise in habitable rooms to acceptable noise levels. For new residential buildings, schools, and hospitals, the acceptable interior noise limit for new construction is 45 dB(A) CNEL.

California Noise Insulation Standards

The California Noise Insulation Standards[17] require that interior noise levels from exterior sources be 45 dB(A) or less in any habitable room of a multiresidential use facility (e.g., hotels, motels, dormitories, long-term care facilities, and apartment houses, except detached single-family dwellings) with doors and windows closed. Measurements are based on CNEL or Ldn (the day–night average), whichever is consistent with the noise element of the local general plan. Where exterior noise levels exceed 60 dB(A) CNEL, an acoustical analysis for new development may be required to show that the proposed construction will reduce interior noise levels to 45 dB(A) CNEL. If the interior 45 dB(A) CNEL limit can be achieved only with the windows closed, the residence must include mechanical ventilation that meets applicable *Uniform Building Code* (UBC) requirements.

California Department of Health Services

The State of California Department of Health Services, Environmental Health Division, has published recommended guidelines for noise and land use compatibility, referred to as the *State Land Use Compatibility Guidelines for Noise* ("*State Noise Guidelines*"). The *State Noise Guidelines*, illustrated in **Figure 5.11-6: Land Use Compatibility to Noise**, indicate that residential land uses and other noise-sensitive receptors generally should locate in areas where outdoor ambient noise levels do not exceed 65 to 70 dB(A) CNEL. According to the *State Noise Guidelines*, an exterior noise level of 60 dB(A) CNEL is

17 California Code of Regulation, Title 24, sec. 3501 et seq.

considered to be "normally acceptable" for single-family, duplex, and mobile homes involving normal, conventional construction, without any special noise insulation requirements. Exterior noise levels up to 65 dB(A) CNEL are typically considered "normally acceptable" for multifamily units and transient lodging without any special noise insulation requirements. Between these values and 70 dB(A) CNEL, exterior noise levels are typically considered "conditionally acceptable," and residential construction should only occur after a detailed analysis of the noise reduction requirements and needed noise attenuation features have been included in the Project design. Exterior noise attenuation features include, but are not limited to, setbacks to place structures outside the conditionally acceptable noise contour, orienting structures so no windows open to the noise source, and/or installing noise barriers such as berms and/or solid walls.

Regional and Local

City of Rancho Mirage Noise Ordinance

The City's Municipal Health and Safety Code set forth standards, guidelines, and procedures concerning the regulation of noise in Rancho Mirage. Section 8.45 of the Municipal Code cites the value and importance given by residents, visitors, and business to the exceptional quality of life and peace and quiet of the community. Pursuant to the City Noise Ordinance, the City restricts noise generated at a property from exceeding certain noise levels for extending periods of time to protect people from objectionable nontransportation noise sources.

According to Section 8.45.050, Special Provisions and Exceptions, of the City's Municipal Code, construction, alternation, repair, grading or improvement of any building, structure, road, or improvement to real property for which a permit has been issued is exempt from the City's noise ordinance so long as construction activities occur within normal business hours (7:00 AM to 7:00 PM, except on Sundays).

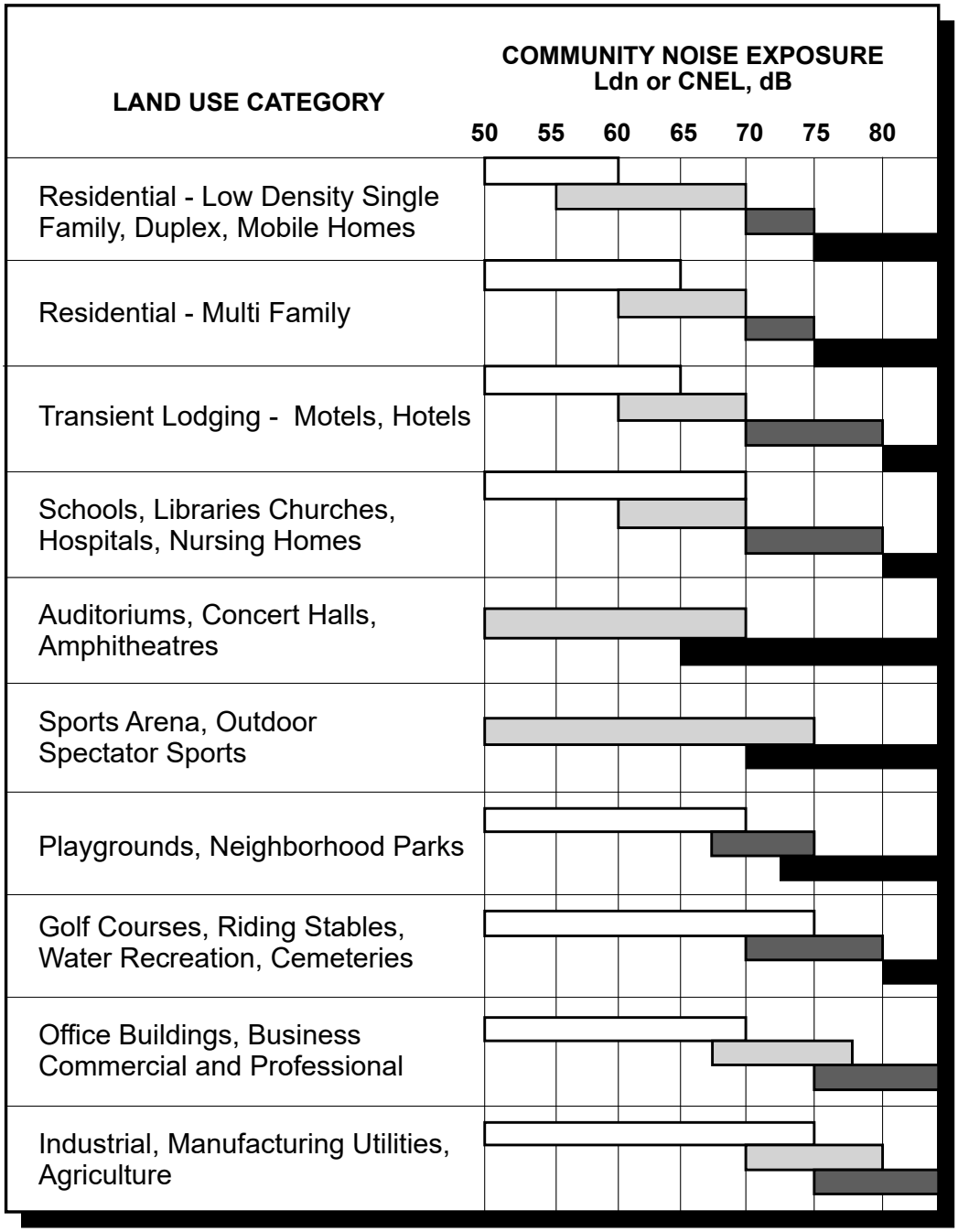
The Rancho Mirage Noise Ordinance provides definition of key terms and defines exterior noise level standards on a time-of-day basis along with adjustments for intensity and duration. The appropriate exterior noise standards are identified in **Table 5.11-7: City of Rancho Mirage Exterior Noise Limits**.[18]

18 City of Rancho Mirage General Plan, Chapter 7 (2006).

Table 5.11-7
City of Rancho Mirage Exterior Noise Limits

Time of Day	Maximum Permissible Noise Levels (dB[A])					
	L_{50}	L_{25}	L_{16}	L_{8}	L_{2}	L_{MAX}
Residential – Low Density						
7:00 AM to 6:00 PM.	55	58	60	65	70	75
6:00 AM to 10:00 PM	50	53	55	60	65	70
10:00 PM. to 7:00 AM	45	48	50	55	60	65
Residential – Medium and High Density, Hospital, Open Space						
7:00 AM to 6:00 PM.	60	63	65	70	75	80
6:00 AM to 10:00 PM	55	58	60	65	70	75
10:00 PM. to 7:00 AM	50	53	55	60	65	70
Commercial Office, Resort Commercial, Mixed Use, Institutional						
7:00 AM to 6:00 PM.	65	68	70	75	80	85
6:00 AM to 10:00 PM	60	63	65	70	75	80
10:00 PM. to 7:00 AM	55	58	60	65	70	75
Commercial Neighborhood, General Commercial, Commercial Recreation, Light Industrial						
7:00 AM to 6:00 PM.	70	73	75	80	85	90
6:00 AM to 10:00 PM	65	68	70	75	80	85
10:00 PM. to 7:00 AM	60	63	65	70	75	80

Source: City of Rancho Mirage, Municipal Code, Chapter 8.45, Noise, Section 8.45.030. Exterior Noise Level Limits.
Note: If the measured ambient noise levels exceed the dB(A) L50 limits, the L50, L25, L16, and the L8 shall be increased by five dB(A) increments as needed to encompass or reflect the existing ambient noise level while the maximum noise level under the L2 and the Lmax shall be increased, if necessary, only to equal the ambient noise level.



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 reduction features included in the design.

CLEARLY UNACCEPTABLE
New construction or development should generally not be undertaken.

SOURCE: California Governor's Office of Planning and Research, State of California General Plan Guidelines, Appendix C: Guidelines for the Preparation and Content of Noise Elements of the General Plan, October 2003.

FIGURE **5.11-6**

CITY OF RANCHO MIRAGE ©

Land Use Compatibility to Noise

B. ENVIRONMENTAL IMPACTS

1. Threshold of Significance

In order to assist in determining whether a project would have a significant effect on the environment, the City finds a project may be deemed to have a significant noise impact, if it would result in the:

Threshold 5.11-1: **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.**

Based on State and local noise criteria, the following would be considered significant:

- **Noise generated by buildout of Section 31 Specific Plan would result in stationary equipment (nontransportation) noise that results in a nuisance at noise sensitive receptors based on stationary noise limits of the Rancho Mirage Municipal Code.**
- **New noise sensitive uses would be located in a noise environment that exceeds the State's noise compatibility guidelines. Similar to State guidelines, it is the policy of the City to require new residential development to achieve an interior noise environment of 45 dB(A) CNEL or exterior noise levels at single family residential noise sensitive areas to 65 dB(A) CNEL.**

Based on local noise criteria established in the City's General Plan, the following would be considered significant:

- **An increase of three dB(A) or greater in traffic noise levels that occur from project-related activities would be significant if the resulting noise levels exceeded the Noise Compatibility Matrix for "acceptable" exterior noise levels.**
- **An increase of five dB(A) or less in traffic noise levels that occur from project-related activities would not be considered significant if the resulting noise levels remain below the "acceptable" thresholds established by the State and City. Increases in traffic noise greater than 5 dB(A) would be considered to be significant.**

Based on local noise criteria established by the City, the following would be considered significant:

- **Construction activities occurring outside the normal business hours of 7:00 AM and 7:00 PM, except Sundays and holidays.**

Threshold 5.11-2: **Generation of excessive groundborne vibration or groundborne noise levels.**

Based on vibration criteria established by the Federal Transit Administration, the following would be considered significant:

- **Construction equipment would produce perceptible levels of vibration (78 VdB) during the daytime at off-site vibration sensitive structures.**

2. Methodology

Ambient Noise Measurements

To establish baseline noise conditions, existing ambient noise levels, as described above, were monitored at the eight representative locations within the vicinity of the Project site. These monitored noise levels serve as the baseline for the analysis of Proposed Project impacts. The baseline noise-monitoring program was conducted on April 19, 2019, using a Larson Davis 831 Type 1 Sound Level Meter, compliant with Section 8.45.040 of the City's Municipal Code. 15-minute measurements were conducted at each of the receptor locations.

Construction

On-Site Construction Activities

Construction activities typically generate noise from the operation of equipment required for construction of various facilities. Noise impacts from on-site construction and staging of construction trucks were evaluated by determining the noise levels generated by different types of construction activity, calculating the construction-related noise level at nearby noise-sensitive receptor locations, and comparing these construction-related noise levels to existing ambient noise levels (i.e., noise levels without Plan-related construction noise). The actual noise level would vary, depending upon the equipment type, model, the type of work activity being performed, and the condition of the equipment.

In order to calculate a construction CNEL, hourly activity or utilization factors (i.e., the percentage of normal construction activity that would occur, or construction equipment that would be active, during each hour of the day) are estimated based on the temporal characteristics of other previous and current construction projects. The hourly activity factors express the percentage of time that construction activities would emit average noise levels. Typical noise levels for each type of construction equipment were obtained from the Federal Highway Administration's (FHWA) Roadway Construction Noise Model. Calculated noise levels associated with construction at noise-sensitive receptor locations were then

compared to estimated existing noise levels and the construction noise significance thresholds identified below.

Construction Traffic Noise

The analysis of construction traffic noise impacts focuses on off-site areas by: (1) identifying major roadways that may be used for construction worker commute routes or truck haul routes; (2) generally identifying the nature and location of noise-sensitive receptors along those routes; and (3) evaluating the traffic characteristics along those routes, specifically as related to existing traffic volumes. Construction traffic volume and road parameter data would be input into the FHWA TNM model to calculate average noise levels for these trips. Construction trucks staging and hauling route noise impacts would be evaluated by determining the noise levels generated by different types of construction activity, calculating the construction-related noise levels to existing ambient noise levels (i.e., noise levels without construction noise).

Construction Equipment Vibration

Construction activity can result in varying degrees of ground vibration, depending on the equipment and methods employed. Operation of construction equipment causes ground vibrations that spread through the ground and diminish in strength with distance. While ground vibrations from construction activities do not often reach the levels that can damage structures, fragile buildings must receive special consideration.

Impacts due to construction activities were evaluated by identifying vibration sources (i.e., construction equipment), measuring the distance between vibration sources and surrounding structure locations, and making a significance determination.

For quantitative construction vibration assessments related to building damage and human annoyance, vibration source levels for construction equipment is taken from the FTA *Transit Noise and Vibration Impact Assessment Manual.* Building damage would be assessed for each piece of equipment individually and assessed in terms of peak particle velocity. Ground-borne vibration related to human annoyance is assessed in terms of rms velocity levels.

The vibration source levels for various types of equipment are based on data provided by the FTA.

Operation

Roadway Noise

Traffic noise levels were modeled using the FHWA TNM. The FHWA TNM calculates noise associated with a specific line source and the results characterize noise generated by motor vehicle travel along a specific roadway segment. The traffic noise impact analysis is based on the 24-hour CNEL noise descriptor and incorporates traffic volumes, vehicle mix, posted speed limits, roadway geometry, and site conditions. Future conditions take into account the 2040 Southern California Association of Governments (SCAG) land use dataset which includes all pending and approved development projects within the City. Noise levels were evaluated with respect to the following traffic scenarios:

- Existing (2018) Conditions;
- Existing (2018) plus Proposed Project Conditions;
- Future (2040) without Proposed Project Conditions; and
- Future (2040) plus Proposed Project Conditions.

Noise impacts due to off-site motor vehicle travel were analyzed by comparing the projected increase in traffic noise levels from Existing without Project conditions to both Existing plus Proposed Project and Future plus Proposed Project to the applicable significance criteria.

Cumulative noise impacts due to off-site motor vehicle travel were analyzed by comparing the projected increase in traffic noise levels from Existing without Project conditions to Future plus Project conditions to the applicable significance criteria. Future plus Project conditions include traffic volumes from future ambient growth, related projects, and the Proposed Project.

Operation Vibration

The majority of the Project's operational-related vibration sources, such as mechanical and electrical equipment, would incorporate vibration attenuation mounts, as required by the particular equipment specifications. Therefore, operation of the Project would not increase the existing vibration levels in the immediate vicinity of the Project and, as such, vibration impacts associated with the Project would be minimal. Therefore, the ground borne vibration analysis is limited to Project-related construction activities.

3. Project Design Features

The following **Project Design Features (PDFs)** are incorporated into the proposed Project and would reduce potential noise impacts:

PDF 5.11-1: Residential Planning Areas 1, 2, and 3 would be gated communities with a perimeter wall to provide privacy and a noise barrier from adjacent arterial roadways. Perimeter walls of the residential communities would be 6 feet in height and the Town Center would include a maximum of 3-feet high perimeter walls.

4. Project Impacts

Threshold 5.11-1: Would the project result in the 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?

Construction

Noise impacts from Project construction activities would result from the noise generated by the amount of construction equipment, the location of the equipment, the timing and duration of the noise-generating construction activities, and the relative distance to noise-sensitive receptors. Construction activities would include: grading, building construction, and building finishing. Each stage of construction would involve the use of various types of construction equipment and would, therefore, have its own distinct noise characteristics. Noise from construction equipment would generate both steady-state and episodic noise that could be heard within and adjacent to the Project site. In addition to these on-site sources, construction would include off-site truck travel associated with the hauling of excavated materials from the Project site, as well as the delivery of construction materials, including concrete. The analysis of noise levels associated with on-site construction activities as well as off-site truck travel is provided below under separate subheadings. In addition, vibration levels associated with on-site construction activities are evaluated in terms of impacts to both off-site buildings and humans.

On-Site Construction Activities

Individual pieces of construction equipment that would most likely be used for construction within the Project site produce maximum noise levels of 74 dBA to 85 dBA at a reference distance of 50 feet from the noise source, as shown in **Table 5.11-8: Typical Maximum Noise Levels for Construction Equipment**. The construction equipment-reference noise levels are based on measured noise data compiled by the FHWA. These maximum noise levels would occur when equipment is operating under full power conditions. However, equipment used on construction sites typically operate at less than full power. The acoustical usage factor is the percentage of time that each type of construction equipment is anticipated

to be in full power operation during a typical construction day. These values are estimates and will vary based on the actual construction process and schedule.

Table 5.11-8
Typical Maximum Noise Levels for Construction Equipment

Type of Equipment	Reference Maximum Noise Levels at 50 Feet,[1] dBA (Lmax)	Acoustical Usage Factor (%)
Air compressor	78	40
Cement and mortar mixer	80	50
Concrete mixer truck	79	40
Concrete pump	81	20
Crane	81	16
Dozer	82	40
Drill Rig	84	20
Excavator	81	40
Forklift	75	20
Generator	81	50
Grader	85	40
Dump/Haul truck	76	40
Paver	77	50
Rollers	80	20
Rubber-tire loader	79	40
Tractor/Loader/Backhoe	84	40
Delivery truck	74	40
Water truck	82	10
Welders	74	40

Source: FHWA Roadway Construction Noise Model User's Guide (2006), Table 1.
[1] Construction equipment noise levels are based on the FHWA Roadway Construction Noise Model.

To characterize construction-period noise levels, the average (hourly Leq) noise level associated with each construction stage was calculated based on the quantity, type, and usage factors for each type of equipment that would be used during each construction stage. These noise levels are typically associated with multiple pieces of equipment operating simultaneously. Site grading typically requires the use of earth moving equipment, such as excavators, graders, dozers, scrapers, and tractors/loaders/backhoes. Building construction typically involves the use of cranes, forklifts, generators, tractors/loaders/backhoes,

and welders. Paving typically involves the use of pavers, paving equipment, and rollers. Architectural coating typically involves air compressors.

Equipment estimates, and noise levels used for the analysis during the construction phases are representative of worst-case conditions because it is unlikely that all construction equipment contained on the Project site would operate simultaneously. Construction equipment operates at its nosiest levels for certain percentages of time during operation. Equipment such as graders, dozers, and scrapers would operate at different percentages over the course of an hour.[19] Forecasts of construction noise levels are shown in **Table 5.11-9: Construction Noise Levels**, which presents construction noise levels generated by on-site construction equipment at each monitored site.

Table 5.11-9
Construction Noise Levels

Location	Ambient Noise Levels (dbA Leq)	Estimated Noise Levels by Construction Phase (dBA Leq)				Maximum Increase Over Ambient (without mitigation)
		Grading	Building Construction	Paving	Architectural Coating	
Site 1	73.6	90.5	84.2	77.0	69.1	+16.9
Site 2	70.6	84.2	78.0	70.7	62.8	+13.6
Site 3	69.3	87.9	81.6	74.4	66.5	+18.6
Site 4	71.9	87.5	81.2	74.0	66.1	+15.6
Site 5	72.2	84.5	78.2	71.0	63.1	+12.3
Site 6	69.8	91.0	84.8	77.5	69.6	+21.2
Site 7	69.5	91.0	84.8	77.5	69.6	+21.5
Site 8	73.7	87.5	81.2	74.0	66.1	+13.8

Source: RCNM Version 1.1
*Refer to **Appendix H.3** for construction noise work sheets.*

Implementation of Mitigation Measure **MM 5.11-1** would provide noise abatement during construction near adjacent receptors. Mitigation Measure **MM 5.11-1** would include the use of optimal muffler systems for all equipment and the break in line of sight to a sensitive receptor would reduce construction noise levels by approximately 10 dB or more.[20] In addition, Mitigation Measure **MM 5.11-1** would limit the number of noise-generating heavy-duty off-road construction equipment (e.g., backhoes, dozers,

19 DOT, Federal Highway Administration (FHWA), *Traffic Noise Model* (2006).
20 FHWA, *Special Report – Measurement, Prediction, and Mitigation*, updated June 2017. https://www.fhwa.dot.gov/Environment/noise/construction_noise/special_report/hcn04.cfm, accessed November 2018.

excavators, loaders, rollers, etc.) simultaneously used on the Project site within 150 feet of off-site noise sensitive receptors surrounding the site and would further reduce construction noise levels by 5 dBA. Furthermore, limiting the number of operating equipment to two within 150 feet of off-site sensitive receptors surrounding site would further reduce construction noise levels by approximately 7 dBA.[21] As shown in **Table 5.11-9**, construction noise levels would increase by a maximum of 21.5 dBA above ambient at Site 7. With implementation of Mitigation Measure **MM 5.11-1**, construction noise would be reduced by, at a minimum, 22 dB, and would not increase the ambient noise levels. As such impacts would be less than significant with mitigation incorporated.

Off-Site Construction Activities

Off-site construction noise, as detailed in the methodology section above, has been forecasted using the FHWA TNM and is based on forecasted haul truck activity as well as the delivery of building materials, including concrete. The FHWA TNM was used to calculate the hourly Leq noise levels generated by construction-related trucks. Noise impacts were determined by comparing the predicted noise level with that of the existing ambient noise levels along the anticipated truck travel routes. At the maximum, construction would include approximately 372 worker trips per day including 121 vendor trips per day (refer to **Appendix C** for Air Quality Output sheets for each Phase of construction). Based on these trips, roadway noise levels would result in approximately 50 dBA CNEL at 75 feet from the receptor. As indicated therein, the estimated noise levels due to off-site construction truck travel would be below existing ambient noise levels. Thus, Proposed Project noise impacts attributable to off-site construction truck travel would be less than significant.

Operation

The Project would generate an estimated 26,408 daily trips, which includes both internal trips (3,644) and external trips (22,764). As mentioned previously, to estimate noise level increase and impacts due to the Project, noise level increases were calculated from the traffic volumes provided in the Traffic Study (refer to **Appendix I**). **Table 5.11-10: Existing plus Project Roadway Noise Levels**, illustrates the change in CNEL from existing traffic volumes and from traffic generated by the Project. The difference in traffic noise between existing conditions and existing plus Project conditions represents the increase in noise attributable to Project-related traffic. As shown in **Table 5.11-10,** Project-related traffic would not cause noise levels along the analyzed roadways to increase by more than 3.0 dB(A). The maximum noise level increase along existing roadways would be 1.4 dBA along the I-10 Ramps, west of Bob Hope Drive

21 Based on the assumption used in the RCNM, 12 scrapers would generate noise levels of up to 85.8 dBA within 85 feet. With optimal exhaust mufflers and limiting to 2 scrapers within 150 feet, noise levels from the scrapers would be 63.1 dBA at the noise sensitive receptor.

(Intersection 1) during the AM peak hour and 1.8 dB(A) along Gerald Ford Drive, west of Monterey Avenue (intersection 16) during the PM peak hour. Consequently, traffic noise levels would not increase by 3 dBA or greater and noise impacts under the Existing plus Project scenario would be less than significant.

Table 5.11-10
Existing plus Project Roadway Noise Levels

Intersection No.	Roadway Segment	AM Peak Hour		PM Peak Hour		AM Increase	PM Increase	Significant AM Impact?	Significant PM Impact?
		Existing	Existing plus Project	Existing	Existing plus Project				
		dBA CNEL							
I-10 Ramps (WB and EB)									
1	East of Bob Hope Drive	67.0	67.0	66.1	66.1	0.0	0.0	No	No
1	West of Bob Hope Drive	62.8	64.2	66.6	67.3	1.4	0.7	No	No
2	East of Bob Hope Drive	56.8	56.8	60.7	60.7	0.0	0.0	No	No
2	West of Bob Hope Drive	67.6	68.0	65.4	66.9	0.4	1.5	No	No
7	East of Varner Road	61.4	61.6	61.8	61.8	0.2	0.0	No	No
7	West of Varner Road	66.0	66.2	65.5	65.8	0.2	0.3	No	No
8	East of Monterey Avenue	64.9	65.2	67.0	67.2	0.3	0.2	No	No
8	West of Monterey Avenue	68.1	68.4	67.2	68.0	0.3	0.8	No	No
10	East of Portola Road	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10	West of Portola Road	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11	East of Portola Road	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11	West of Portola Road	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
18	East of Cook Street	68.9	69.0	68.6	69.9	0.1	1.3	No	No
18	West of Cook Street	54.2	54.2	53.4	53.4	0.0	0.0	No	No

Intersection No.	Roadway Segment	AM Peak Hour		PM Peak Hour		AM Increase	PM Increase	Significant AM Impact?	Significant PM Impact?
		Existing	Existing plus Project	Existing	Existing plus Project				
		dBA CNEL							
19	East of Cook Street	63.8	64.6	66.6	67.1	0.8	0.5	No	No
19	West of Cook Street	68.1	68.1	66.2	66.2	0.0	0.0	No	No
Ramon Road									
3	East of Rattler Road	68.4	68.4	68.9	69.1	0.0	0.2	No	No
3	West of Rattler Road	68.4	68.4	68.9	69.0	0.0	0.1	No	No
4	East of Bob Hope Drive	67.2	67.2	67.3	67.3	0.0	0.0	No	No
4	West of Bob Hope Drive	69.0	69.1	69.0	69.1	0.1	0.1	No	No
Varner Road									
6	East of Monterey Avenue	66.3	67.0	65.8	66.7	0.7	0.9	No	No
6	West of Monterey Avenue	63.7	63.7	64.3	64.3	0.0	0.0	No	No
Dinah Shore Drive									
5	East of Bob Hope Drive	64.9	65.2	67.0	67.3	0.3	0.3	No	No
5	West of Bob Hope Drive	65.1	65.1	66.7	66.7	0.0	0.0	No	No
9	East of Monterey Avenue	65.2	65.2	66.5	66.5	0.0	0.0	No	No
9	West of Monterey Avenue	66.0	66.3	68.3	68.6	0.3	0.3	No	No
12	East of Portola Road	58.8	58.8	57.8	57.8	0.0	0.0	No	No
12	West of Portola Road	63.8	63.8	64.0	64.0	0.0	0.0	No	No
Gerald Ford Drive									
13	East of Date Palm Drive	63.6	63.9	63.7	64.1	0.3	0.4	No	No
13	West of Date Palm Drive	58.5	58.5	58.3	58.3	0.0	0.0	No	No
14	East of Da Vall Drive	64.2	64.7	64.2	65.1	0.5	0.9	No	No
14	West of Da Vall Drive	64.5	65.0	64.3	65.1	0.5	0.8	No	No

Intersection No.	Roadway Segment	AM Peak Hour		PM Peak Hour		AM Increase	PM Increase	Significant AM Impact?	Significant PM Impact?
		Existing	Existing plus Project	Existing	Existing plus Project				
		dBA CNEL							
15	East of Bob Hope Drive	64.7	65.9	64.9	66.6	1.2	1.7	No	No
15	West of Bob Hope Drive	65.0	65.5	65.7	66.3	0.5	0.6	No	No
33	East of Oasis Way	64.5	65.7	65.0	66.5	1.2	1.5	No	No
33	West of Oasis Way	64.3	65.4	64.8	66.2	1.1	1.4	No	No
16	East of Monterey Avenue	64.0	64.3	64.2	64.7	0.3	0.5	No	No
16	West of Monterey Avenue	65.0	66.3	65.1	66.9	1.3	1.8	No	No
17	East of Portola Road	64.8	65.1	64.8	65.3	0.3	0.5	No	No
17	West of Portola Road	64.1	64.4	64.1	64.6	0.3	0.5	No	No
20	East of Cook Street	63.8	63.8	64.1	64.1	0.0	0.0	No	No
20	West of Cook Street	65.5	65.7	65.7	66.0	0.2	0.3	No	No
Shadow Ridge Road									
34	East of Monterey Avenue	55.6	55.8	57.0	57.0	0.2	0.0	No	No
34	West of Monterey Avenue	N/A	51.4	N/A	60.0	N/A	N/A	N/A	N/A
Sunny Lands Center									
35	East of Bob Hope Drive	N/A	54.6	N/A	55.2	N/A	N/A	N/A	N/A
35	West of Bob Hope Drive	46.5	46.5	42.1	42.1	0.0	0.0	No	No
Project Access									
36	East of Monterey Avenue	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
36	West of Monterey Avenue	N/A	53.6	N/A	53.6	N/A	N/A	N/A	N/A
Frank Sinatra Drive							***0.0***	***0.0***	***No***
21	East of SR-111	64.6	64.8	64.7	65.1	0.2	0.4	No	No

Intersection No.	Roadway Segment	AM Peak Hour		PM Peak Hour		AM Increase	PM Increase	Significant AM Impact?	Significant PM Impact?
		Existing	Existing plus Project	Existing	Existing plus Project				
		dBA CNEL							
21	West of SR-111	57.1	57.1	58.4	58.4	0.0	0.0	No	No
22	East of Morningside Drive	64.6	65.0	64.9	65.4	0.4	0.5	No	No
22	West of Morningside Drive	65.4	65.7	65.6	66.0	0.3	0.4	No	No
23	East of Bob Hope Drive	64.7	65.4	65.2	66.0	0.7	0.8	No	No
23	West of Bob Hope Drive	64.9	65.3	65.1	65.6	0.4	0.5	No	No
37	East of Kavendish Way	65.7	66.3	66.2	66.8	0.6	0.6	No	No
37	West of Kavendish Way	65.7	66.3	66.1	66.9	0.6	0.8	No	No
24	East of Monterey Avenue	65.7	66.0	66.4	66.8	0.3	0.4	No	No
24	West of Monterey Avenue	65.8	66.4	66.4	67.1	0.6	0.7	No	No
25	East of Portola Road	65.7	66.0	66.0	66.4	0.3	0.4	No	No
25	West of Portola Road	65.6	65.9	65.9	66.4	0.3	0.5	No	No
26	East of Cook Street	63.0	63.2	63.9	64.1	0.2	0.2	No	No
26	West of Cook Street	66.0	66.3	66.3	66.7	0.3	0.4	No	No
Country Club Drive									
27	East of Bob Hope Drive	64.9	65.4	65.6	65.7	0.5	0.1	No	No
27	West of Bob Hope Drive	63.4	63.8	64.0	64.0	0.4	0.0	No	No
28	East of Monterey Avenue	66.5	66.5	67.5	67.6	0.0	0.1	No	No
28	West of Monterey Avenue	66.9	67.0	67.3	67.4	0.1	0.1	No	No

Intersection No.	Roadway Segment	AM Peak Hour		PM Peak Hour		AM Increase	PM Increase	Significant AM Impact?	Significant PM Impact?
		Existing	Existing plus Project	Existing	Existing plus Project				
		dBA CNEL							
29	East of Portola Avenue	66.2	66.2	66.9	67.0	0.0	0.1	No	No
29	West of Portola Avenue	66.2	66.3	66.7	66.8	0.1	0.1	No	No
Hovley Lane									
30	East of Monterey Avenue	60.7	60.8	59.1	59.3	0.1	0.2	No	No
30	West of Monterey Avenue	50.4	50.4	49.4	49.4	0.0	0.0	No	No
Fred Waring Drive									
31	East of Monterey Avenue	66.3	66.4	67.9	67.9	0.1	0.0	No	No
31	West of Monterey Avenue	64.8	64.8	66.9	66.9	0.0	0.0	No	No
SR-111									
32	East of Monterey Avenue	68.6	68.8	70.5	70.7	0.2	0.2	No	No
32	West of Monterey Avenue	67.8	67.9	70.3	70.4	0.1	0.1	No	No
Date Palm Drive									
13	North of Gerald Ford Drive	63.7	63.7	64.6	64.7	0.0	0.1	No	No
13	South of Gerald Ford Drive	64.0	64.2	65.2	65.4	0.2	0.2	No	No
SR 111									
21	North of Frank Sinatra Drive	69.9	69.9	71.1	71.2	0.0	0.1	No	No
21	South of Frank Sinatra Drive	69.3	69.3	70.6	70.6	0.0	0.0	No	No
Da Vall Drive									
14	North of Gerald Ford Drive	63.2	63.5	63.0	63.3	0.3	0.3	No	No

Intersection No.	Roadway Segment	AM Peak Hour		PM Peak Hour		AM Increase	PM Increase	Significant AM Impact?	Significant PM Impact?
		Existing	Existing plus Project	Existing	Existing plus Project				
		dBA CNEL							
14	South of Gerald Ford Drive	63.5	63.6	63.1	63.3	0.1	0.2	No	No
Rattler Road									
3	North of Ramon Road	56.2	57.4	56.9	58.3	1.2	1.4	No	No
3	South of Ramon Road	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Morningside Drive									
22	North of Frank Sinatra Drive	54.6	54.6	56.0	56.0	0.0	0.0	No	No
22	South of Frank Sinatra Drive	60.5	60.5	60.9	60.9	0.0	0.0	No	No
Bob Hope Drive									
1	North of I-10 WB Ramps	64.0	64.0	64.1	64.1	0.0	0.0	No	No
1	South of I-10 WB Ramps	65.4	65.8	66.5	66.8	0.4	0.3	No	No
2	North of I-10 EB Ramps	65.4	65.5	66.5	66.8	0.1	0.3	No	No
2	South of I-10 EB Ramps	66.4	66.9	66.7	67.5	0.5	0.8	No	No
4	North of Ramon Road	66.9	67.4	66.9	67.7	0.5	0.8	No	No
4	South of Ramon Road	66.4	67.1	67.3	68.2	0.7	0.9	No	No
5	North of Dinah Shore Drive	65.9	66.7	66.6	67.7	0.8	1.1	No	No
5	South of Dinah Shore Drive	66.4	67.1	67.3	68.2	0.7	0.9	No	No
15	North of Gerald Ford Drive	66.0	66.7	67.0	67.8	0.7	0.8	No	No

Intersection No.	Roadway Segment	AM Peak Hour		PM Peak Hour		AM Increase	PM Increase	Significant AM Impact?	Significant PM Impact?
		Existing	Existing plus Project	Existing	Existing plus Project				
		dBA CNEL							
15	South of Gerald Ford Drive	66.1	66.6	66.8	67.3	0.5	0.5	No	No
35	North of Sunny Lands Center	65.8	66.3	66.8	67.3	0.5	0.5	No	No
35	South of Sunny Lands Center	65.8	66.0	66.8	67.0	0.2	0.2	No	No
23	North of Frank Sinatra Drive	66.3	66.6	67.4	67.6	0.3	0.2	No	No
23	South of Frank Sinatra Drive	66.9	67.1	67.5	67.7	0.2	0.2	No	No
27	North of Country Club Drive	65.4	65.6	66.4	66.6	0.2	0.2	No	No
27	South of Country Club Drive	65.6	65.8	67.0	67.2	0.2	0.2	No	No
Oasis Way									
33	North of Gerald Ford Drive	54.7	54.7	55.0	55.0	0.0	0.0	No	No
33	South of Gerald Ford Drive	N/A	55.3	N/A	55.2	N/A	N/A	N/A	N/A
Kavendish Way									
37	North of Frank Sinatra Drive	N/A	53.4	N/A	53.3	N/A	N/A	N/A	N/A
37	South of Frank Sinatra Drive	43.5	43.5	45.1	45.1	0.0	0.0	No	No
Monterey Avenue									
6	North of Varner Road	64.7	64.8	65.9	66.1	0.1	0.2	No	No
6	South of Varner Road	68.0	68.5	68.4	69.0	0.5	0.6	No	No
8	North of I-10 EB Ramps	68.6	69.1	70.0	70.0	0.5	0.0	No	No

Intersection No.	Roadway Segment	AM Peak Hour		PM Peak Hour		AM Increase	PM Increase	Significant AM Impact?	Significant PM Impact?
		Existing	Existing plus Project	Existing	Existing plus Project				
		dBA CNEL							
8	South of I-10 EB Ramps	70.5	70.9	71.5	71.8	0.4	0.3	No	No
9	North of Dinah Shore Drive	70.8	71.3	71.6	72.1	0.5	0.5	No	No
9	South of Dinah Shore Drive	69.1	69.7	70.1	70.9	0.6	0.8	No	No
16	North of Gerald Ford Drive	69.1	69.9	70.2	71.1	0.8	0.9	No	No
16	South of Gerald Ford Drive	69.1	70.0	70.2	71.3	0.9	1.1	No	No
34	North of Shadow Ridge Road	68.5	69.0	69.6	70.4	0.5	0.8	No	No
34	South of Shadow Ridge Road	68.7	69.2	69.8	70.6	0.5	0.8	No	No
36	North of Project Access	N/A	60.5	N/A	61.9	N/A	N/A	N/A	N/A
36	South of Project Access	N/A	60.7	N/A	62.5	N/A	N/A	N/A	N/A
24	North of Frank Sinatra Drive	69.3	69.9	70.4	71.1	0.6	0.7	No	No
24	South of Frank Sinatra Drive	69.3	69.6	70.3	70.7	0.3	0.4	No	No
28	North of Country Club Drive	69.3	69.6	70.5	70.8	0.3	0.3	No	No
28	South of Country Club Drive	69.7	69.9	70.8	71.1	0.2	0.3	No	No
30	North of Hovley Lane	69.0	69.3	70.1	70.3	0.3	0.2	No	No
30	South of Hovley Lane	68.8	69.0	70.0	70.2	0.2	0.2	No	No

Intersection No.	Roadway Segment	AM Peak Hour		PM Peak Hour		AM Increase	PM Increase	Significant AM Impact?	Significant PM Impact?
		Existing	Existing plus Project	Existing	Existing plus Project				
		dBA CNEL							
31	North of Fred Waring Drive	68.6	68.9	70.1	70.4	0.3	0.3	No	No
31	South of Fred Waring Drive	67.7	67.9	69.3	69.6	0.2	0.3	No	No
32	North of SR 111	67.0	67.2	68.2	68.5	0.2	0.3	No	No
32	South of SR 111	67.4	67.5	68.0	68.1	0.1	0.1	No	No
Varner Road									
7	North of I-10 WB Ramps	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
7	South of I-10 WB Ramps	67.0	67.1	66.0	66.5	0.1	0.5	No	No
Portola Road/Avenue									
10	North of I-10 WB Ramps	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10	South of I-10 WB Ramps	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11	North of I-10 EB Ramps	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11	South of I-10 EB Ramps	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
12	North of Dinah Shore Drive	44.2	44.2	44.2	44.2	0.0	0.0	No	No
12	South of Dinah Shore Drive	62.7	62.7	63.1	63.1	0.0	0.0	No	No
17	North of Gerald Ford Drive	63.4	63.4	63.8	63.8	0.0	0.0	No	No
17	South of Gerald Ford Drive	64.0	64.0	64.2	64.2	0.0	0.0	No	No
25	North of Frank Sinatra Drive	63.6	63.6	63.5	63.5	0.0	0.0	No	No

Intersection No.	Roadway Segment	AM Peak Hour		PM Peak Hour		AM Increase	PM Increase	Significant AM Impact?	Significant PM Impact?
		Existing	Existing plus Project	Existing	Existing plus Project				
		dBA CNEL							
25	South of Frank Sinatra Drive	65.2	65.2	64.9	64.9	0.0	0.0	No	No
29	North of Country Club Drive	64.6	64.6	64.9	64.9	0.0	0.0	No	No
29	South of Country Club Drive	66.2	66.3	66.1	66.2	0.1	0.1	No	No
Cook Street									
18	North of I-10 WB Ramps	65.1	65.1	63.1	63.1	0.0	0.0	No	No
18	South of I-10 WB Ramps	68.3	68.4	67.5	68.4	0.1	0.9	No	No
19	North of I-10 EB Ramps	68.4	68.5	67.6	67.9	0.1	0.3	No	No
19	South of I-10 EB Ramps	70.3	70.4	69.9	70.2	0.1	0.3	No	No
20	North of Gerald Ford Drive	70.5	70.7	70.2	70.5	0.2	0.3	No	No
20	South of Gerald Ford Drive	69.5	69.6	69.4	69.6	0.1	0.2	No	No
26	North of Frank Sinatra Drive	69.6	69.7	69.4	69.6	0.1	0.2	No	No
26	South of Frank Sinatra Drive	68.7	68.8	69.0	69.0	0.1	0.0	No	No

*Source: Refer to **Appendix H.2** for roadway noise calculations.*
Note: N/A = Data not available.

Stationary Noise

Parking Lots

Development of the Project would introduce parking lots associated with retail-commercial, resort flex, mixed core uses on the Project Site. Generally, noise associated with parking lots is not of sufficient volume to exceed community noise standards based on the time-weighted CNEL scale. Parking lots can be a source of annoyance due to automobile engine start-ups and acceleration, and the activation of car alarms. Parking lots can generate L_{eq} noise levels of between 49 dB(A) L_{eq} (tire squeals) to 74 dB(A) L_{eq} (car alarms) at 50 feet. Existing off-site residential land uses along Gerald Ford Drive and Frank Sinatra Drive, and proposed on-site multifamily uses along internal roadways would be the closest sensitive receptors and would thus represent the worst-case impact associated with parking lot noise from the Project. Due to the existing level of traffic noise along area roadways, noise would not likely be audible due to the masking of noise by traffic. However, single noise events could be an annoyance to on-site and surrounding residents during certain time periods such as evening and morning hours and may exceed local standards at receptor locations. Implementation of Mitigation Measure **MM 5.11-2** would require sound attenuation measures be incorporated into the design to minimize noise levels generated from the parking lots. In addition, acoustical analysis would be prepared to ensure noise levels on sensitive uses would be within the City exterior noise level L50 standard of 60 dB(A) between 7:00 AM and 6:00 PM, 55 dB(A) between 6:00 PM and 10:00 PM, and 50 dB(A) between 10:00 PM and 7:00 AM. Impacts would be reduced to less than significant with mitigation incorporated.

Loading Docks

External truck loading and unloading docks associated with the Project would introduce potential stationary noise sources. These sources would primarily be associated with the retail and commercial, resort flex, and mixed-use core uses. The specific location of potential loading docks has not been determined. The operations at loading docks typically result in noise levels of 64 to 66 dB(A) at 75 feet. The noise from loading docks would not cause an increase in long-term average noise of more than 5 dB(A) on the time-weighted CNEL scale, and would not be significant from that perspective. However, single noise events could be an annoyance during certain time periods such as evening and morning hours to existing on-site and off-site residential land uses and internal roadways. Noise levels may exceed local standards. Implementation of Mitigation Measure **MM 5.11-3** would require sound attenuation measures be incorporated into the design to minimize noise levels generated from loading docks. In addition, acoustical analysis would be prepared to ensure noise levels on sensitive uses would be within the City exterior noise level L50 standard of 60 dB(A) between 7:00 AM and 6:00 PM, 55 dB(A) between 6:00 PM and 10:00 PM, and 50 dB(A) between 10:00 PM and 7:00 AM. Impacts would be reduced to less than significant with mitigation incorporated.

HVAC Systems

The Project would introduce various stationary noise sources, including HVAC systems, which would be located either on the roof, the side of a structure or on the ground. Off-site and on-site sensitive receptors could be potentially affected by the introduction of such equipment. Typically, this type of equipment produces noise levels of approximately 56.0 dB(A) at 50 feet from the source. This equipment would be screened and integrated in architectural design of the building, and would further attenuate sound emanating from the HVAC systems. As the sound distance doubles to 100 feet from the equipment, sound levels would be 50 dB(A), which would be below the local exterior noise limits (50 dB(A) between 10:00 PM and 7:00 AM for the City of Rancho Mirage). The use of such equipment would not generate noise levels that would substantially elevate the ambient noise environment and would not generate substantial noise and impacts to nearby noise-sensitive receptors. Impacts would be less than significant.

Human Activity Related Noise

Future residents located on the Project site, as well as nearby sensitive receptors, may experience increases in noise due to an increase in human activity within the area either from people living on the premises, utilizing the on-site amenities including common areas, and the outdoor commercial and mixed-use areas. Potential residential and commercial types of noise include people talking, doors slamming, stereos, and other noise associated with human activity. These noise sources are not unique and generally contribute to ambient noise levels experiences in all land use areas. Maximum permissible noise levels for mixed use areas are typically 55 to 65 dB(A) between 7:00 AM and 6:00 PM. Overall, the noise generated by the Project's land uses would be consistent with the ambient noise levels in the Project Site, which range from 66 to 76 dB(A). Accordingly, impacts would be less than significant.

Threshold 5.11-2: Would the project result in the generation of excessive groundborne vibration or groundborne noise levels?

Construction

On-Site Construction Vibration

Table 5.11-11: On-Site Construction Vibration Impacts–Building Damage and **Table 5.11-12: On-Site Construction Vibration–Human Annoyance** presents the construction vibration impacts associated with on-site construction in terms of building damage and human annoyance, respectively. As shown in **Table 5.11-11**, the forecasted vibration levels due to on-site construction activities would not exceed the building damage significance threshold for all sites surrounding the Project area during construction. Therefore, on-site construction vibration would not result in a significant vibration impact with regard to building damage.

Table 5.11-11
On-Site Construction Vibration Impacts–Building Damage

Nearest Off-Site Building Structures[a]	Estimated Vibration Velocity Levels at the Nearest Off-Site Structures from the Project Construction Equipment[b] (PPV ips)						Significance Threshold (PPV ips)[c]	Significant Impacts without Mitigation?
	Vibratory Roller	Large Bulldozer	Caisson Drilling	Loaded Trucks	Jack-hammer	Small Bulldozer		
FTA Reference Vibration Levels at 25 feet								
	0.210	*0.089*	*0.089*	*0.076*	*0.035*	*0.003*	—	—
Site 1	0.033	0.085	0.014	0.109	0.006	0.006	0.3	No
Site 2	0.011	0.029	0.005	0.011	0.002	0.002	0.3	No
Site 3	0.021	0.054	0.009	0.069	0.004	0.004	0.3	No
Site 4	0.020	0.051	0.008	0.065	0.003	0.003	0.3	No
Site 5	0.003	0.030	0.005	0.039	0.002	0.002	0.3	No
Site 6	0.009	0.023	0.016	0.119	0.006	0.006	0.3	No
Site 7	0.009	0.023	0.016	0.119	0.006	0.006	0.3	No
Site 8	0.020	0.051	0.008	0.065	0.003	0.003	0.3	No

Source: US Department of Transportation, Federal Transportation Authority, Transit Noise and Vibration Impact Assessment *(September 2018), https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf;*

Refer to ***Appendix H.3*** *for construction vibration worksheets.*

a Represents off-site building structures located nearest to the Project Site to the north, south, east, and west.

b Vibration level calculated based on FTA reference vibration level at a 25-foot distance.

c *FTA criteria for engineered concrete and masonry buildings.*

As shown in **Table 5.11-12**, the forecasted vibration levels due to on-site construction activities would exceed the human annoyance significance thresholds for all site surrounding the Project. With implementation of Mitigation Measure **MM 5.11-1**, limiting the number of noise-generating heavy-duty off-road construction equipment operating simultaneously within 150 feet of off-site noise sensitive receptors surrounding the site would reduce vibration levels by approximately 22 VdB. As shown in **Table 5.11-12**, vibration levels for a vibratory roller would be reduced to 94 VdB at 25 feet. With implementation of Mitigation Measure **MM 5.11-1**, would reduce vibration levels to 72 VdB, below the 78 VdB perceptible levels of vibration. Therefore, on-site construction vibration would not result in a significant vibration impact with regard to human annoyance.

Table 5.11-12
Construction Vibration Impacts–Human Annoyance

Off-Site Receptor Location	Estimated Vibration Velocity Levels at the Nearest Off-Site Structures from the Project Construction Equipment[b] (PPV ips)						Significance Threshold (VdB)	Significant Impacts without Mitigation?	Significant Impacts with Mitigation
	Vibratory Roller	Large Bulldozer	Caisson Drilling	Loaded Trucks	Jack-hammer	Small Bulldozer			
FTA Reference Vibration Levels at 25 feet									
	94	*87*	*87*	*86*	*79*	*58*	—	—	
Site 1	78	87	71	89	63	63	78	**Yes**	**No**
Site 2	69	77	62	79	53	54	78	**Yes**	**No**
Site 3	75	83	67	85	59	59	78	**Yes**	**No**
Site 4	74	82	67	84	58	59	78	**Yes**	**No**
Site 5	69	78	62	80	54	54	78	**Yes**	**No**
Site 6	79	87	72	90	64	64	78	**Yes**	**No**
Site 7	79	87	72	90	64	64	78	**Yes**	**No**
Site 8	74	82	67	84	58	59	78	**Yes**	**No**

Source: US Department of Transportation, Federal Transportation Authority, Transit Noise and Vibration Impact Assessment *(September 2018), https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf;*

Refer to ***Appendix H.3*** *for construction vibration worksheets.*

Notes: ***Boldface type*** *indicates vibration levels in exceedance of the significance threshold. Ips = inches per second; PPV = peak particle velocity.*

Off-Site Construction Vibration

In addition to on-site construction activities, construction delivery/haul trucks would generate ground-borne vibration as they travel along the Projects anticipated off-site truck travel routes. Based on the FTA data, the vibration generated by a typical heavy-duty truck would be approximately 71 VdB (0.015 PPV) at a distance of 75 feet from the truck.[22] This forecasted vibration level would be well below the most stringent building damage criteria of 0.12 PPV. Therefore, vibration impacts with respect to building damage from off-site construction truck travel on public roadways would be less than significant.

In addition, vibration sensitive uses (e.g., residential, hotel) are located along Gerald Ford Drive to the north, Frank Sinatra Drive to the south, and Monterey Avenue to the east. Ground-borne vibration levels generated by off-site construction truck travel would be below the 78 VdB significance threshold, as these uses are located more than 75 feet from the truck travel pathway. Thus, vibration impacts with respect to

22 FTA, "Transit Noise and Vibration Impact Assessment," May 2006, Figure 7-3.

human annoyance from off-site construction truck travel would be less than significant for the vibration sensitive land uses located along these roadways.

Operation

Similar to existing conditions, the primary sources of vibration associated with operation would include passenger-vehicle circulation within the Project area and on-site truck activity. Ground-borne vibration typically attenuates rapidly as a function of distance from the vibration source. Furthermore, the majority of the Project's operation-related vibration sources, such as mechanical equipment, would incorporate vibration attenuation mounts as required by the particular equipment specifications. Therefore, operation would not substantially increase existing vibration levels in the immediate vicinity of the Project site. Therefore, vibration impacts associated with operation would be less than significant.

5. Cumulative Impacts

Construction

Noise

Noise impacts are localized in nature and decrease with distance. Cumulative construction noise impacts have the potential to occur when multiple construction projects in the local area generate noise within the same time frame and contribute to the local ambient noise environment. Based on noise levels generated by construction activities associated with the Project and the proximity of both on- and off-site receptors, construction noise from the Project would contribute to the cumulative noise environment. It is expected that, as with the Project, the related projects would implement Best Management Practices (BMPs), which would minimize any noise-related nuisances during construction. Therefore, combined construction noise impact of the related projects and the Project's contribution would not cause a significant cumulative impact. Consequently, impacts would be less than significant with mitigation incorporated.

Vibration

As discussed above, vibration impacts are generally less than significant when the receptor is more than 25 feet from the vibration source. There are no identified project anticipating construction concurrently with the Project and within 25 feet of the sensitive receptors that could be affected by construction. As such, there would be no cumulative sources of construction vibration and no cumulative impact. Impacts would be less than significant.

Operational

Traffic volumes for the future scenario consists of existing counts plus the addition of growth derived from the Rancho Mirage General Pan Model (RMGPM). The RMGPM was updated to be consistent with the

2016 Southern California Association of Governments (SCAG) Regional Transportation Plan (RTP) and Sustainable Communities Strategy (SCS) growth projections. In addition, the pending and approved development projects not included in the City of Rancho Mirage General Plan Model were also included in future projections including: Section 24 Specific Plan, Rancho Mirage Country Club, Agua Caliente Resort and Casino Expansion, the General Plan Zoning Map Amendment, and other changes in zoning designations within the City.

Table 5.11-13: Future (Year 2040) Plus Project Roadway Noise Levels, illustrates the change in CNEL from Year 2040 ambient conditions and from buildout. The Year 2040 ambient conditions represent traffic growth or cumulative development within the Project Site. As shown in **Table 5.11-13,** Project-related traffic would not cause noise levels along the analyzed roadways to increase by more than 3.0 dB(A). The maximum noise level increase along future roadways would be 0.9 dBA along Gerald Ford Drive, West of Monterey Avenue (Intersection 16) during the AM peak hour and 1.3 dB(A) along I-10 Ramps, west of Portola Road (Intersection 11) during the PM peak hour. As such, impacts related to cumulative roadway noise levels would be less than significant.

Table 5.11-13
Future (2040) plus Project Roadway Noise Levels

Intersection No.	Roadway Segment	AM Peak Hour		PM Peak Hour		AM Increase	PM Increase	Significant AM Impact?	Significant PM Impact?
		Future	Future plus Project	Future	Future plus Project				
		dBA CNEL							
I-10 Ramps (WB and EB)									
1	East of Bob Hope Drive	69.2	69.2	69.0	69.0	0.0	0.0	No	No
1	West of Bob Hope Drive	67.3	67.9	69.2	69.6	0.6	0.4	No	No
2	East of Bob Hope Drive	61.1	61.1	63.1	63.1	0.0	0.0	No	No
2	West of Bob Hope Drive	69.8	70.0	68.5	69.0	0.2	0.5	No	No
7	East of Varner Road	65.0	65.0	65.6	65.6	0.0	0.0	No	No
7	West of Varner Road	68.3	68.4	68.3	68.4	0.1	0.1	No	No
8	East of Monterey Avenue	67.7	67.8	69.2	69.3	0.1	0.1	No	No
8	West of Monterey Avenue	69.0	69.1	68.5	68.9	0.1	0.4	No	No
10	East of Portola Road	61.7	62.2	64.7	65.3	0.5	0.6	No	No

Intersection No.	Roadway Segment	AM Peak Hour		PM Peak Hour		AM Increase	PM Increase	Significant AM Impact?	Significant PM Impact?
		Future	Future plus Project	Future	Future plus Project				
		dBA CNEL							
10	West of Portola Road	57.9	57.9	59.1	59.1	0.0	0.0	No	No
11	East of Portola Road	66.1	66.5	66.1	66.5	0.4	0.4	No	No
11	West of Portola Road	63.3	64.0	64.4	65.7	0.7	1.3	No	No
18	East of Cook Street	69.3	69.4	69.1	69.2	0.1	0.1	No	No
18	West of Cook Street	54.9	54.9	54.9	54.9	0.0	0.0	No	No
19	East of Cook Street	64.4	64.8	67.7	67.9	0.4	0.2	No	No
19	West of Cook Street	69.4	69.4	68.2	68.2	0.0	0.0	No	No
Ramon Road									
3	East of Rattler Road	70.4	70.4	70.7	70.8	0.0	0.1	No	No
3	West of Rattler Road	70.4	70.5	70.7	70.8	0.1	0.1	No	No
4	East of Bob Hope Drive	69.0	69.0	69.4	69.4	0.0	0.0	No	No
4	West of Bob Hope Drive	70.6	70.7	70.9	71.0	0.1	0.1	No	No
Varner Road									
6	East of I-10 WB Ramps	68.6	69.0	68.7	69.1	0.4	0.4	No	No
6	West of I-10 WB Ramps	67.2	67.2	68.1	68.1	0.0	0.0	No	No
Dinah Shore Drive									
5	East of Bob Hope Drive	67.4	67.4	69.6	69.8	0.0	0.2	No	No
5	West of Bob Hope Drive	66.7	66.8	69.1	69.1	0.1	0.0	No	No
9	East of Monterey Avenue	67.1	67.1	68.6	68.6	0.0	0.0	No	No
9	West of Monterey Avenue	68.0	68.1	70.1	70.2	0.1	0.1	No	No
12	East of Portola Road	59.9	59.9	62.3	62.3	0.0	0.0	No	No

Intersection No.	Roadway Segment	AM Peak Hour		PM Peak Hour		AM Increase	PM Increase	Significant AM Impact?	Significant PM Impact?
		Future	Future plus Project	Future	Future plus Project				
		dBA CNEL							
12	West of Portola Road	66.9	66.9	68.8	68.8	0.0	0.0	No	No
Gerald Ford Drive									
13	East of Date Palm Drive	66.5	66.6	67.0	67.2	0.1	0.2	No	No
13	West of Date Palm Drive	62.2	62.2	60.8	60.8	0.0	0.0	No	No
14	East of Da Vall Drive	66.6	66.9	67.3	67.7	0.3	0.4	No	No
14	West of Da Vall Drive	66.5	66.8	67.4	67.8	0.3	0.4	No	No
15	East of Bob Hope Drive	66.5	67.3	67.6	68.6	0.8	1.0	No	No
15	West of Bob Hope Drive	66.9	67.2	67.6	68.0	0.3	0.4	No	No
33	East of Oasis Way	66.3	67.1	67.4	68.4	0.8	1.0	No	No
33	West of Oasis Way	66.2	66.9	67.3	68.2	0.7	0.9	No	No
16	East of Monterey Avenue	67.3	67.6	67.5	68.1	0.3	0.6	No	No
16	West of Monterey Avenue	66.5	67.4	67.6	68.7	0.9	1.1	No	No
17	East of Portola Road	67.7	67.8	68.1	68.2	0.1	0.1	No	No
17	West of Portola Road	67.0	67.4	67.5	68.0	0.4	0.5	No	No
20	East of Cook Street	64.3	64.3	65.1	65.1	0.0	0.0	No	No
20	West of Cook Street	67.5	67.6	67.9	68.0	0.1	0.1	No	No
Shadow Ridge Road									
34	East of Monterey Avenue	56.1	56.1	57.3	57.3	0.0	0.0	No	No
34	West of Monterey Avenue	N/A	51.3	N/A	60.0	N/A	N/A	N/A	N/A
Sunny Lands Center									
35	East of Bob Hope Drive	N/A	54.6	N/A	55.2	N/A	N/A	N/A	N/A

Intersection No.	Roadway Segment	AM Peak Hour		PM Peak Hour		AM Increase	PM Increase	Significant AM Impact?	Significant PM Impact?
		Future	Future plus Project	Future	Future plus Project				
		dBA CNEL							
35	West of Bob Hope Drive	47.8	47.8	47.8	47.8	0.0	0.0	No	No
Project Access									
36	East of Monterey Avenue	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
36	West of Monterey Avenue	N/A	54.3	N/A	55.4	N/A	N/A	N/A	N/A
Frank Sinatra Drive									
21	East of SR-111	67.0	67.2	67.3	67.5	0.2	0.2	No	No
21	West of SR-111	58.2	58.2	62.4	62.4	0.0	0.0	No	No
22	East of Morningside Drive	66.2	66.4	66.6	66.9	0.2	0.3	No	No
22	West of Morningside Drive	67.1	67.3	67.3	67.6	0.2	0.3	No	No
23	East of Bob Hope Drive	66.7	67.1	67.2	67.7	0.4	0.5	No	No
23	West of Bob Hope Drive	66.4	66.7	66.9	67.2	0.3	0.3	No	No
37	East of Kavendish Way	67.4	67.8	68.1	68.5	0.4	0.4	No	No
37	West of Kavendish Way	67.4	67.8	68.1	68.5	0.4	0.4	No	No
24	East of Monterey Avenue	67.9	68.8	69.4	69.7	0.9	0.3	No	No
24	West of Monterey Avenue	67.7	69.0	68.3	68.9	1.3	0.6	No	No
25	East of Portola Road	67.9	68.0	68.8	69.0	0.1	0.2	No	No
25	West of Portola Road	67.5	67.8	68.6	68.9	0.3	0.3	No	No
26	East of Cook Street	67.3	67.3	67.9	68.0	0.0	0.1	No	No
26	West of Cook Street	68.3	68.5	69.4	69.5	0.2	0.1	No	No
Country Club Drive									

Intersection No.	Roadway Segment	AM Peak Hour		PM Peak Hour		AM Increase	PM Increase	Significant AM Impact?	Significant PM Impact?
		Future	Future plus Project	Future	Future plus Project				
		dBA CNEL							
27	East of Bob Hope Drive	68.3	68.4	68.3	68.4	0.1	0.1	No	No
27	West of Bob Hope Drive	67.1	67.1	67.3	67.3	0.0	0.0	No	No
28	East of Monterey Avenue	69.1	69.1	69.1	69.2	0.0	0.1	No	No
28	West of Monterey Avenue	69.4	69.4	68.7	68.8	0.0	0.1	No	No
29	East of Portola Avenue	68.0	68.1	68.0	68.1	0.1	0.1	No	No
29	West of Portola Avenue	68.2	68.3	68.1	68.2	0.1	0.1	No	No
Hovley Lane									
30	East of Monterey Avenue	62.9	62.9	64.2	64.2	0.0	0.0	No	No
30	West of Monterey Avenue	53.3	53.3	58.0	58.0	0.0	0.0	No	No
Fred Waring Drive									
31	East of Monterey Avenue	67.7	67.7	69.2	69.3	0.0	0.1	No	No
31	West of Monterey Avenue	66.0	66.0	67.8	67.8	0.0	0.0	No	No
SR-111									
32	East of Monterey Avenue	70.2	70.4	71.5	71.6	0.2	0.1	No	No
32	West of Monterey Avenue	69.9	69.9	71.2	71.3	0.0	0.1	No	No
Date Palm Drive									
13	North of Gerald Ford Drive	66.4	66.4	66.5	66.6	0.0	0.1	No	No
13	South of Gerald Ford Drive	66.6	66.7	66.7	66.9	0.1	0.2	No	No
SR 111									
21	North of Frank	71.3	71.3	72.2	72.3	0.0	0.1	No	No

Intersection No.	Roadway Segment	AM Peak Hour		PM Peak Hour		AM Increase	PM Increase	Significant AM Impact?	Significant PM Impact?
		Future	Future plus Project	Future	Future plus Project	dBA CNEL			
	Sinatra Drive								
21	South of Frank Sinatra Drive	70.9	70.9	71.6	71.6	0.0	0.0	No	No
Da Vall Drive									
14	North of Gerald Ford Drive	65.3	65.4	65.1	65.3	0.1	0.2	No	No
14	South of Gerald Ford Drive	65.5	65.6	65.3	65.4	0.1	0.1	No	No
Rattler Road									
3	North of Ramon Road	59.4	60.0	60.6	61.3	0.6	0.7	No	No
3	South of Ramon Road	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Morningside Drive									
22	North of Frank Sinatra Drive	56.9	56.9	56.9	56.9	0.0	0.0	No	No
22	South of Frank Sinatra Drive	62.1	62.1	63.6	63.6	0.0	0.0	No	No
Bob Hope Drive									
1	North of I-10 WB Ramps	66.1	66.1	66.3	66.3	0.0	0.0	No	No
1	South of I-10 WB Ramps	68.3	68.5	69.2	69.4	0.2	0.2	No	No
2	North of I-10 EB Ramps	68.3	68.5	69.2	69.4	0.2	0.2	No	No
2	South of I-10 EB Ramps	69.1	69.4	69.7	70.0	0.3	0.3	No	No
4	North of Ramon Road	69.5	69.7	70.0	70.3	0.2	0.3	No	No
4	South of Ramon Road	69.3	69.6	70.7	71.0	0.3	0.3	No	No

Intersection No.	Roadway Segment	AM Peak Hour		PM Peak Hour		AM Increase	PM Increase	Significant AM Impact?	Significant PM Impact?
		Future	Future plus Project	Future	Future plus Project				
		dBA CNEL							
5	North of Dinah Shore Drive	69.0	69.4	69.3	69.8	0.4	0.5	No	No
5	South of Dinah Shore Drive	68.7	69.1	68.7	69.3	0.4	0.6	No	No
15	North of Gerald Ford Drive	68.3	68.7	68.5	69.0	0.4	0.5	No	No
15	South of Gerald Ford Drive	68.4	68.7	68.5	68.8	0.3	0.3	No	No
35	North of Sunny Lands Center	68.1	68.4	68.1	68.2	0.3	0.1	No	No
35	South of Sunny Lands Center	68.1	68.3	68.1	68.2	0.2	0.1	No	No
23	North of Frank Sinatra Drive	68.5	68.7	68.5	68.6	0.2	0.1	No	No
23	South of Frank Sinatra Drive	69.1	69.2	68.3	68.5	0.1	0.2	No	No
27	North of Country Club Drive	68.9	69.0	68.2	68.3	0.1	0.1	No	No
27	South of Country Club Drive	68.3	68.3	68.1	68.2	0.0	0.1	No	No
Oasis Way									
33	North of Gerald Ford Drive	55.2	55.2	55.7	55.7	0.0	0.0	No	No
33	South of Gerald Ford Drive	N/A	55.4	N/A	55.5	N/A	N/A	N/A	N/A
Kavendish Way									
37	North of Frank Sinatra Drive	N/A	53.3	N/A	52.9	N/A	N/A	N/A	N/A
37	South of Frank Sinatra Drive	47.8	47.8	47.8	47.8	0.0	0.0	No	No

Intersection No.	Roadway Segment	AM Peak Hour		PM Peak Hour		AM Increase	PM Increase	Significant AM Impact?	Significant PM Impact?
		Future	Future plus Project	Future	Future plus Project				
		dBA CNEL							
Monterey Avenue									
6	North of Varner Road	67.2	67.3	68.5	68.6	0.1	0.1	No	No
6	South of Varner Road	70.2	70.5	70.7	71.1	0.3	0.4	No	No
8	North of I-10 EB Ramps	70.0	70.3	70.6	70.9	0.3	0.3	No	No
8	South of I-10 EB Ramps	71.5	71.8	72.6	72.9	0.3	0.3	No	No
9	North of Dinah Shore Drive	71.9	72.2	73.0	73.3	0.3	0.3	No	No
9	South of Dinah Shore Drive	70.2	70.6	71.1	71.7	0.4	0.6	No	No
16	North of Gerald Ford Drive	70.4	70.9	71.3	71.9	0.5	0.6	No	No
16	South of Gerald Ford Drive	69.9	70.6	71.1	72.0	0.7	0.9	No	No
34	North of Shadow Ridge Road	70.0	70.3	71.0	71.6	0.3	0.6	No	No
34	South of Shadow Ridge Road	70.2	70.6	71.2	71.7	0.4	0.5	No	No
36	North of Project Access	N/A	70.5	N/A	71.5	N/A	N/A	N/A	N/A
36	South of Project Access	N/A	70.6	N/A	71.6	N/A	N/A	N/A	N/A
24	North of Frank Sinatra Drive	70.1	70.8	71.7	72.2	0.7	0.5	No	No
24	South of Frank Sinatra Drive	70.2	70.5	71.3	71.6	0.3	0.3	No	No
28	North of Country Club Drive	70.2	70.5	71.5	71.7	0.3	0.2	No	No

Intersection No.	Roadway Segment	AM Peak Hour		PM Peak Hour		AM Increase	PM Increase	Significant AM Impact?	Significant PM Impact?
		Future	Future plus Project	Future	Future plus Project				
		dBA CNEL							
28	South of Country Club Drive	70.6	70.8	72.1	72.3	0.2	0.2	No	No
30	North of Hovley Lane	70.1	70.3	71.6	71.8	0.2	0.2	No	No
30	South of Hovley Lane	69.8	70.0	71.1	71.3	0.2	0.2	No	No
31	North of Fred Waring Drive	69.9	70.1	71.3	71.5	0.2	0.2	No	No
31	South of Fred Waring Drive	69.2	69.4	70.5	70.7	0.2	0.2	No	No
32	North of SR 111	69.1	69.3	70.1	70.3	0.2	0.2	No	No
32	South of SR 111	69.4	69.5	69.8	69.9	0.1	0.1	No	No
Varner Road									
7	North of I-10 WB Ramps	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
7	South of I-10 WB Ramps	68.8	68.9	68.4	68.6	0.1	0.2	No	No
Portola Road/Avenue									
10	North of I-10 WB Ramps	64.5	64.5	64.6	64.6	0.0	0.0	No	No
10	South of I-10 WB Ramps	64.9	65.0	67.4	67.5	0.1	0.1	No	No
11	North of I-10 EB Ramps	64.8	64.9	67.2	67.4	0.1	0.2	No	No
11	South of I-10 EB Ramps	66.3	66.7	68.5	68.9	0.4	0.4	No	No
12	North of Dinah Shore Drive	66.0	66.4	68.2	68.7	0.4	0.5	No	No
12	South of Dinah Shore Drive	67.7	67.9	68.4	68.8	0.2	0.4	No	No
17	North of Gerald Ford Drive	68.1	68.3	68.9	69.4	0.2	0.5	No	No

Intersection No.	Roadway Segment	AM Peak Hour		PM Peak Hour		AM Increase	PM Increase	Significant AM Impact?	Significant PM Impact?
		Future	Future plus Project	Future	Future plus Project				
		dBA CNEL							
17	South of Gerald Ford Drive	68.3	68.4	68.4	68.5	0.1	0.1	No	No
25	North of Frank Sinatra Drive	66.5	66.6	67.0	67.1	0.1	0.1	No	No
25	South of Frank Sinatra Drive	67.4	67.4	67.5	67.5	0.0	0.0	No	No
29	North of Country Club Drive	67.3	67.3	67.7	67.8	0.0	0.1	No	No
29	South of Country Club Drive	68.5	68.5	68.7	68.8	0.0	0.1	No	No
Cook Street									
18	North of I-10 WB Ramps	66.8	66.8	65.2	65.2	0.0	0.0	No	No
18	South of I-10 WB Ramps	69.3	69.3	68.6	68.7	0.0	0.1	No	No
19	North of I-10 EB Ramps	69.4	69.4	68.7	68.8	0.0	0.1	No	No
19	South of I-10 EB Ramps	71.0	71.1	70.3	70.4	0.1	0.1	No	No
20	North of Gerald Ford Drive	71.5	71.6	70.8	70.9	0.1	0.1	No	No
20	South of Gerald Ford Drive	70.6	70.7	70.2	70.2	0.1	0.0	No	No
26	North of Frank Sinatra Drive	71.4	71.4	70.2	70.3	0.0	0.1	No	No
26	South of Frank Sinatra Drive	69.9	69.9	70.2	70.3	0.0	0.1	No	No

Source: Refer to Appendix H.2. for roadway noise calculations
Note: N/A = Data not available.

C. MITIGATION MEASURES

The following mitigation measures have been identified to mitigate noise impacts:

MM 5.11-1: The project applicant shall require that the following construction best management practices (BMPs) be implemented by contractors to reduce construction noise levels below the City's established thresholds:

- Ensure that construction equipment is properly equipped with optimal muffler systems according to industry standards and in good working condition.
- Place noise-generating construction equipment and locate construction staging areas away from sensitive uses, where feasible.
- Limit the number of noise-generating heavy-duty off-road construction equipment (e.g., backhoes, dozers, excavators, loaders, rollers, etc.) to two (2) pieces of equipment operating simultaneously within 150 of off-site noise sensitive receptors surrounding the site.
- Stationary construction equipment, such as pumps, generators, or compressors, must be placed as far from noise sensitive uses as feasible during all phases of project construction.
- Implement noise attenuation measures to the extent feasible, which may include, but are not limited to, temporary noise barriers, such as solid walls and berms, 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, must be turned off when not in use for more than 30 minutes.
- Construction hours, allowable workdays, and the phone number of the job superintendent must be clearly posted at all construction entrances to allow for surrounding owners and residents to contact the job superintendent. If the City or the job superintendent receives a complaint, the superintendent must investigate, take appropriate corrective action, and report the action taken to the reporting party. Contract specifications must be included in the proposed Project construction documents, which must be reviewed by the City prior to issuance of grading permits.

MM 5.11-2: Sound attenuation measures shall be incorporated into the design of individual projects to minimize noise from parking lots. These measures could include, but are not limited to, a noise barrier of sufficient size to break the line of sight, an open-space buffer, a setback, or a combination of methods shall be developed along locations between parking lot noise and exterior usable areas within on-site and adjacent residential uses where these uses interface. Acoustical analysis shall be performed to demonstrate that the parking lot does not result in noise levels on sensitive uses within the City that exceed the City Municipal Code L50 standard of 60 dB(A) between 7:00 AM and 6:00 PM, 55 dB(A) between 6:00 PM and 10:00 PM, and 50 dB(A) between 10:00 PM and 7:00 AM. These components shall be incorporated into the plans submitted by the applicant to the City, prior to the issuance of building permits.

MM 5.11-3: Sound attenuation measures must be incorporated into the design of individual projects to minimize noise from loading docks so that noise levels stay remain below the City's established thresholds. These measures may include, but are not limited to, designing loading docks to have either a depressed (i.e., below grade) loading area, an internal bay, or a wall to break the line of sight between on-site and adjacent residential land uses and loading operations. Acoustical analysis shall be performed to demonstrate that the loading dock does not result in noise levels on sensitive uses within the City that exceed the City's L50 standard of 60 dB(A) between 7:00 AM and 6:00 PM, 55 dB(A) between 6:00 PM and 10:00 PM, and 50 dB(A) between 10:00 PM and 7:00 AM. These components must be incorporated into the plans submitted by the applicant to the City for review and approval, prior to issuance of building permits.

D. LEVEL OF SIGNIFICANCE AFTER MITIGATION

Construction Noise

Implementation of Mitigation Measure **MM 5.11-1**, would provide noise abatement during construction near adjacent receptors including: the use of optimal muffler systems for all equipment and the break in line of sight to a sensitive receptor reducing construction noise levels by approximately 10 dB or more; and limiting the number of noise-generating heavy-duty off-road construction equipment (e.g., backhoes, dozers, excavators, loaders, rollers, etc.) to two (2) pieces of equipment operating simultaneously within 150 feet of off-site noise sensitive receptors surrounding the site. With implementation of Mitigation Measure **MM 5.11-1**, construction noise would be reduced by, at a minimum, 22 dB, and would not increase the ambient noise levels. As such impacts related to construction noise would be less than significant with mitigation incorporated.

Construction Vibration

Implementation of Mitigation Measure **MM 5.11-1** would limit the number of noise-generating heavy-duty off-road construction equipment to two (2) pieces of equipment operating simultaneously within 150 feet of off-site noise sensitive receptors surrounding the site would reduce vibration levels by approximately 22 VdB. Construction vibration would be reduced to below the perceptible levels of vibration of 78 VdB at off-site vibration sensitive structures. As such, impacts related to construction vibration would be less than significant with mitigation incorporated.

Operation

Mitigation Measures **MM 5.11-2** and **MM 5.11-3** would require acoustical analysis of the design of the individual projects to reduce stationary noise sources from parking lots and loading docks to a less than significant level.