4.9 NOISE

This section of the PEIR addresses potential noise and vibration impacts that could result from implementation of the proposed project. The analysis in this section is based, in part, on a Noise Analysis prepared for the project (RECON 2018b), which is included as Appendix K of this EIR.

4.9.1 Existing Conditions

4.9.1.1 Fundamentals of Noise and Sound Level Descriptors

Sound can be described as the mechanical energy of a vibrating object transmitted by pressure waves through a liquid or gaseous medium (e.g., air) to a hearing organ, such as a human ear. Noise is defined as loud, unexpected, or annoying sound, which interferes with normal activities, causes physical harm, or has adverse health effects.

Sound levels are described in units called decibels (dB). Because decibels are logarithmic units, sound levels cannot be added or subtracted through simple addition. Under the decibel scale, a doubling of sound energy corresponds to a three-dBA increase. In other words, when two identical sources are each producing sound of the same loudness, the resulting sound level at a given distance would be three dBA higher than one source under the same conditions.

The human ear is not equally sensitive to all frequencies within the sound spectrum. To account for this phenomenon, the A-scale is used, which approximates the frequency response of the average young ear when listening to most ordinary everyday sounds. When people make relative judgments of the loudness or annoyance of a sound, their judgments correlate well with the A-scale sound levels of those sounds. Therefore, the "A-weighted" noise scale is used for measurements and standards involving the human perception of noise. Noise levels using A-weighted measurements are designated with the notation dBA.

The impact of noise is not a function of loudness alone. The time of day when noise occurs, and the duration of the noise are also important. In addition, most noise that lasts for more than a few seconds is variable in its intensity. Consequently, there are a variety of noise descriptors for time-averaged noise levels. The noise descriptors used herein include the one-hour equivalent noise level (L_{EQ}), the community noise equivalent level (CNEL), and the sound exposure level (SEL). The CNEL is a 24-hour average, where noise levels during the evening hours of 7:00 p.m. to 10:00 p.m. have an added five dBA weighting, and sound levels during the nighttime hours of 10:00 p.m. to 7:00 a.m. have an added 10 dBA weighting. The increases for certain times are intended to account for the added sensitivity of humans to noise during the evening and night. The SEL is a noise level over a stated period of time or event and normalized to one second. These metrics are used to express noise levels for both measurement and municipal regulations, as well as for land use guidelines and enforcement of noise ordinances.

In the science of acoustics, the fundamental model consists of a sound (or noise) source, a receiver, and the propagation path between the two. The loudness of the noise source and obstructions or atmospheric factors affecting the propagation path to the receiver contribute to the sound level and characteristics of the noise perceived by the receiver. The field of acoustics deals primarily with the propagation and control of sound.

Sound from a small, localized source (approximating a "point" source) radiates uniformly outward as it travels away from the source in a spherical pattern, known as geometric spreading. The sound level decreases or drops off at a rate of six dBA for each doubling of the distance.

Traffic noise is not a single, stationary point source of sound. The movement of vehicles makes the source of the sound appear to emanate from a line (line source) rather than a point when viewed over some time interval. The drop-off rate for a line source is three dBA for each doubling of distance.

The propagation of noise is also affected by the intervening ground, known as ground absorption. A hard site (such as parking lots or smooth bodies of water) receives no additional ground attenuation, and the changes in noise levels with distance (drop-off rate) are simply the geometric spreading of the source. A soft site (such as soft dirt, grass, or scattered bushes and trees) receives an additional ground attenuation value of 1.5 dBA per doubling of distance. Thus, a point source over a soft site would attenuate at 7.5 dBA per doubling of distance.

Because of the nature of the human ear, a sound must be about 10 dBA greater than the reference sound to be judged as twice as loud. In general, for most receivers, a three-dBA change in noise levels is clearly noticeable, a three-dBA change is typically the smallest increment that is perceivable, and one to two dBA changes are generally not detectable.

4.9.1.2 Fundamentals of Vibration

Vibration is defined as any oscillatory motion induced in a structure or mechanical device as a direct result of some type of input excitation. Vibration is transmitted through solid material such as the ground by wave motion, which is known as groundborne vibration. Sources of ground-borne vibration include natural phenomena (earthquakes, volcanic eruptions, sea waves, landslides, etc.) or manufactured (explosions, trains, machinery, traffic, construction equipment, etc.). Vibration sources may be transient, steady-state (continuous), or pseudo steady-state. Examples of transient construction vibrations are those that occur from blasting with explosives, impact pile driving, demolition, and wrecking balls.

Groundborne vibration propagates from sources through the ground into nearby structures and buildings. Soil properties affect the propagation of ground-borne vibration. The vibration energy spreads out as it travels through the ground, causing the vibration amplitude to decrease with distance away from the source. 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. Vibration in buildings is typically perceived as the rattling of windows or items on shelves or the motion of building surfaces. Vibration of building surfaces can also be radiated as sound and heard as a low-frequency rumbling noise.

Vibration effects can be described by its peak and root mean square (RMS) amplitudes. Building damage is often discussed in terms of peak velocity, or peak particle velocity (PPV). The PPV is defined as the maximum instantaneous positive or negative peak of the vibration signal. PPV is related to the stresses that are experienced by buildings; it is often used in monitoring of blasting vibration and to discuss construction vibration. Although PPV is appropriate for evaluating the potential for building damage, it is not suitable for evaluating human response. It takes some time for the human body to respond to vibration signals, and as a result, the best metric to assess human response is average (as opposed to peak) vibration amplitude.

The RMS amplitude is useful for assessing human annoyance, while peak vibration is most often used for assessing the potential for damage to buildings and structures. Because the net average of a vibration signal is zero, the RMS amplitude is used to describe the "smoothed" vibration amplitude. The RMS amplitude is always less than the PPV and is always positive. The RMS average is typically calculated over a one-second period.

Decibel notation (VdB) is also commonly used for vibration. The background vibration velocity level in residential areas is usually 50 VdB or lower; this is well below the level perceptible by humans, which is approximately 65 VdB. Most perceptible indoor vibration is caused by sources within buildings, such as the operation of mechanical equipment, movement of people, or slamming of doors. Typical outdoor sources of perceptible groundborne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If the roadway is smooth, the vibration from traffic is rarely perceptible.

4.9.1.3 Existing Noise Environment

Noise Sources

The primary noise source in the project vicinity consists of vehicular traffic noise on I-8 and Alvarado Road. Additional noise is generated by trolleys on the adjacent San Diego MTS Green Line trolley corridor and trolleys and buses at the 70th Street Trolley Station to the west.

Noise and Vibration Sensitive Land Uses

Noise Sensitive Land Uses (NSLUs) are land uses that may be subject to stress and/or interference from excessive noise, such as residential dwellings, schools, transient lodging (hotels), hospitals, educational facilities, and libraries. Industrial and commercial land uses are generally not considered sensitive to noise. NSLUs in the project area include multi-family residences (La Cuesta Apartments, Comanche Hills Apartments, Fleetwood Apartment Homes), a mobile home community, and single-family residences located south of the project site (across Alvarado Creek and the MTS Green Line); a motel approximately 0.13 mile east of the project site, and an educational facility (National University campus) approximately 0.2 mile southeast of the site. Additional residential uses are located north of the project site across I-8; however, construction and operational noise associated with the project would not be anticipated to exceed ambient traffic noise at these residences.

Land uses in which ground-borne vibration could potentially interfere with operations or equipment, such as research, manufacturing, hospitals, and university research operations, are considered "vibration-sensitive" (Federal Transit Administration [FTA] 2018). The degree of sensitivity depends on the specific equipment that would be affected by the ground-borne vibration. In addition, excessive levels of ground-borne vibration of either a regular or an intermittent nature can result in annoyance to residential uses or schools. Vibration-sensitive land uses in the project area include the nearby single- and multi-family residences, motel, and educational facility, as well as the existing on-site RV resort.

Existing Ambient Noise Levels

Existing ambient noise levels were measured in the project area to provide a characterization of the existing noise environment. Short-term (15-minute) daytime noise measurements were conducted at three locations within the project area: one on the project site and two at adjacent locales. Measurement location 1 was located in the central portion of the site adjacent to Alvarado Creek. Measurement location 2 was located along Alvarado Road where Alvarado Creek crosses under the

roadway. Measurement location 3 was located at the eastern end of the 70th Street Trolley Station. Noise measurement locations are shown on Figure 4.9-1, *Ambient Noise Measurement Locations*. Table 4.9-1, *Noise Measurements*, summarizes the measured existing noise levels at these selected locations.

Table 4.9-1
NOISE MEASUREMENTS

Measurement Location No.	Location	Time	Noise Sources	Measured Noise Level (dBA L_{EQ})
1	In the central portion of the project site adjacent to Alvarado Creek	11:44 a.m. to 11:59 p.m.	Vehicular traffic on I-8, trolleys	64.1
2	Along Alvarado Road where Alvarado Creek crosses under the roadway	12:16 a.m. to 12:31 p.m.	Vehicular traffic on I-8 and Alvarado Road	72.4
3	East end of the 70th Street Trolley Station	12:50 p.m. to 1:05 p.m.	Vehicular traffic on I-8, trolleys, buses	70.2

Source: RECON 2018b
dBA = A-weighted decibel; L_{EQ} = one-hour average sound level

The measured average noise levels ranged from 64.1 to 72.4 dBA L_{EQ}. The sources of noise varied between sites, but the primary noise generator was vehicular traffic. Secondary sources included trolley pass-bys and trolley horns, trolley crossing bells, and buses.

4.9.2 Regulatory Setting

4.9.2.1 Federal

Federal Transit Administration and Federal Railroad Administration Standards

Although the Federal Transit Administration (FTA) standards are intended for federally funded mass transit projects, the impact assessment procedures and criteria included in the Transit Noise and Vibration Impact Assessment Manual (FTA 2018) are routinely used for projects proposed by local jurisdictions. The FTA and Federal Railroad Administration (FRA) have published guidelines for assessing the impacts of groundborne vibration associated with rail projects, which have been applied by other jurisdictions to other types of projects.

Table 4.9-2, *Groundborne Vibration and Groundborne Noise Impact Criteria*, presents vibration impact criteria that account for variation in receptor types as well as the frequency of events. The project would be considered a Category 2 land use, and the adjacent MTS Green Line trolley corridor involves frequent events, which are defined by the FTA as more than 70 vibration events of the same source per day.

Table 4-9-2
GROUNDBORNE VIBRATION AND GROUNDBORNE NOISE IMPACT CRITERIA

Land Use Category	Groundborne Vibration Impact Levels Frequent Events[1]	Groundborne Vibration Impact Levels Occasional Events[2]	Groundborne Vibration Impact Levels Infrequent Events[3]	Groundborne Noise Impact Levels Frequent Events[1]	Groundborne Noise Impact Levels Occasional Events[2]	Groundborne Noise Impact Levels Infrequent Events[3]
Category 1: Buildings where vibration would interfere with interior operations.	65 VdB[4]	65 VdB[4]	65 VdB[4]	N/A[5]	N/A[5]	N/A[5]
Category 2: Residences and buildings where people normally sleep.	72 VdB	75 VdB	80 VdB	35 dBA	38 dBA	43 dBA
Category 3: Institutional land uses with primarily daytime use.	75 VdB	78 VdB	83 VdB	40 dBA	43 dBA	48 dBA

Source: FTA 2018

1 Frequent Events is defined as more than 70 vibration events of the same source per day. Most rapid transit projects fall into this category.

2 Occasional Events is defined as between 30 and 70 vibration events of the same source per day. Most commuter trunk lines have this many operations.

3 Infrequent Events is defined as fewer than 30 vibration events of the same kind per day. This category includes most commuter rail branch lines.

4 This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. Vibration-sensitive manufacturing or research will require detailed evaluation to define the acceptable vibration levels. Ensuring lower vibration levels in a building often requires special design of the HVAC systems and stiffened floors.

5 Vibration-sensitive equipment is generally not sensitive to groundborne noise.

VdB = decibel notation; N/A = not applicable; dBA = A-weighted decibel

Federal Aviation Administration Standards

Code of Federal Regulations Title 14, Part 150, which is enforced by the Federal Aviation Administration, regulates airport noise compatibility planning. This regulation prescribes the procedures, standards, and methodology governing the development, submission, and review of airport noise exposure maps and airport noise compatibility programs, including the process for evaluating and approving or disapproving those programs. This regulation also identifies those land uses which are normally compatible with various levels of exposure to noise by individuals. The Federal Aviation Administration considers all land uses to be compatible with exterior noise levels less than 65 dBA L_{DN} (or CNEL).

4.9.2.2 State

California Noise Control Act

California Health and Safety Code Sections 46000 through 46080, also known as the California Noise Control Act of 1973, state that excessive noise is a serious hazard to the public health and welfare, and that exposure to certain levels of noise can result in physiological, psychological, and economic damage. The Act also finds that there is a continuous and increasing bombardment of noise in the urban, suburban, and rural areas. The Act declares that the State of California has a responsibility to protect the health and welfare of its citizens by the control, prevention, and abatement of noise. It is the policy of

the State to provide an environment for all Californians free from noise that jeopardizes their health or welfare.

California Code of Regulations

CCR Title 24, California Noise Insulation Standards, requires that residential structures be designed to prevent the intrusion of exterior noise so that the interior noise levels, with windows closed, attributable to exterior sources shall not exceed 45 CNEL in any habitable room. A habitable room is a room used for living, sleeping, eating, or cooking. Bathrooms, closets, hallways, utility spaces, and similar areas are not considered habitable rooms for this regulation. The regulations also specify that acoustical studies must be prepared whenever a multi-family residential building structure may be exposed to exterior noise levels of 60 CNEL or greater. The acoustical analysis must demonstrate that the residences have been designed to limit intruding noise to a maximum interior noise level of 45 CNEL.

Division 2.5, Chapter 6, Section 5012 of Title 21 establishes that 65 CNEL is the acceptable level of aircraft noise for persons living near an airport.

4.9.2.3 Local

City of La Mesa General Plan

The Noise Element of the City's General Plan is intended to identify noise-sensitive land uses and noise sources, define areas of noise impacts, establish policies and programs to protect the community from excessive noise, and reduce negative impacts from those noise sources (City 2012a). The Noise Element establishes acceptable noise compatibility noise levels for various land uses. For multi-family residential uses, exterior noise levels up to 65 CNEL are considered "normally acceptable" and noise levels up to 70 CNEL are considered "conditionally acceptable." According to the Noise Element, in conditionally acceptable areas, "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." It further states that "conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice" (City 2012a). The Noise Element similarly states that exterior noise levels between 70 and 75 CNEL are considered "normally unacceptable" and that noise levels above 75 CNEL are considered "clearly unacceptable." Where exterior noise levels are normally unacceptable, "a detailed analysis of noise reduction requirements must be made and needed noise insulation features must be included in the design." The Noise Element also specifies an interior noise standard of 45 CNEL for multi-family uses.

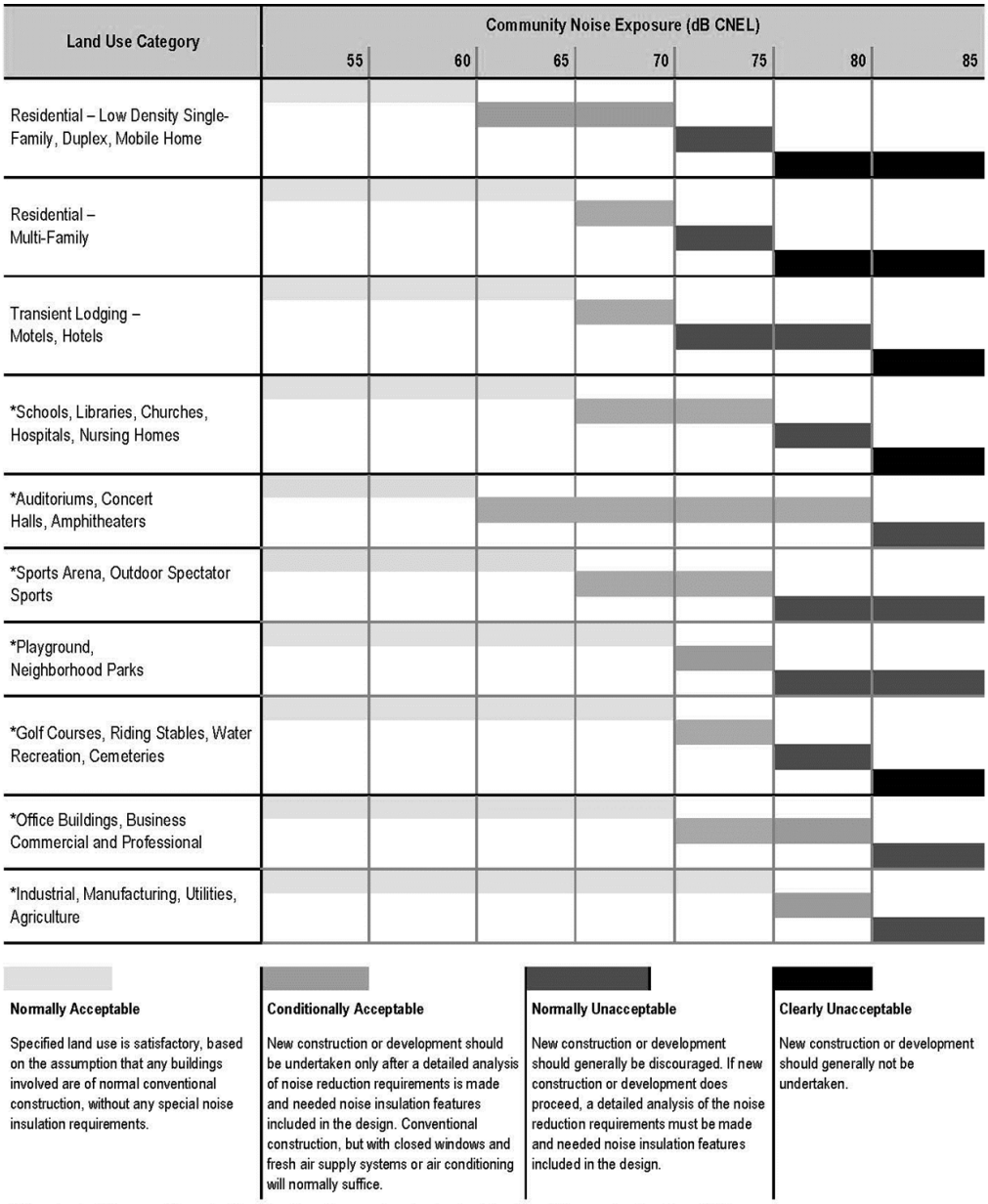
Furthermore, Policy NS-1.1-3 clarifies that the noise compatibility standards also require that new developments minimize the effects of noise by incorporating noise reduction features to reduce exterior noise levels at multi-family outdoor use areas[1] to 65 CNEL or less (i.e., to within the normally acceptable range of the noise compatibility guidelines).

Table 4.9-3, *City of La Mesa Noise – Land Use Compatibility Guidelines*, summarizes the City's noise – land use compatibility guidelines contained in the Noise Element. These guidelines are intended to guide

[1] Outdoor use areas associated with multi-family residential buildings typically include active recreation and public gathering spaces such as community swimming pools, clubhouses, private parks/tot lots, courtyards, and common patio/deck areas.

the design and location of future development and serve as a target for the reduction of noise in existing development.

Table 4.9-3
CITY OF LA MESA NOISE – LAND USE COMPATIBILITY GUIDELINES



* Denotes facilities used for part of the day; therefore, an hourly standard (L_{eq}) would be used rather than CNEL.

Source: City 2012a

La Mesa Municipal Code

Stationary Noise

La Mesa Municipal Code Chapter 10.80, Noise Regulation, prohibits unnecessary, excessive, and annoying noises in the City of La Mesa. Section 10.80.040 establishes noise limits for on-site generated noise at adjacent properties and is based on zone or land use designation. The noise limits for each zone classification are summarized in Table 4.9-4, *La Mesa Municipal Code Noise Limits*. These standards apply when the ambient noise level does not already exceed the noise limit. In cases where the ambient noise level already exceeds the noise limit, the ambient noise level is the applicable noise limit.

Table 4.9-4
LA MESA MUNICIPAL CODE NOISE LIMITS

Zone or Land Use Designation	Noise Level (dBA L_{EQ}) Daytime (7 AM to 10 PM)	Noise Level (dBA L_{EQ}) Nighttime (10 PM to 7 AM)
R1 (Urban Residential) and R2 (Medium Low Density Residential)	55	50
R3 (Multiple Unit Residential) and RB (Residential Business)	60	55
C (General Commercial), CN (Neighborhood Commercial), CD (Downtown Commercial), and CM (Light Industrial and Commercial Service)	65	60
M (Industrial Service and Manufacturing)	70	70

Source: La Mesa Municipal Code Section 10.80.040
dBA = A-weighted decibel; L_{EQ} = one-hour average sound level

The project includes a Specific Plan that outlines a development concept for multi-family housing on the project site. The development intensity of proposed multi-family in-fill development does not fit into the existing land use zoning categories. For the purposes of this analysis, the closest equivalent zoning category was used for the proposed project, which would be Multiple Unit Residential (R3).

The zoning designations for adjoining properties to the south include Urban Residential (R1) and Multiple Unit Residential (R3). The zoning designation for the adjoining properties to the west and east is Light Industrial and Commercial Service (CM). Adjoining property to the south consists of Alvarado Road right-of-way, which is not assigned a zone classification.

Construction Noise

Municipal Code Section 10.80.100 regulates construction noise, and states that it is unlawful for any person within a residential zone or CN (neighborhood commercial) zone, or within 500 feet of these zones, to operate equipment or perform any outside construction or repair work on buildings, structures, or projects or to any pile driver, power shovel, pneumatic hammer, derrick, power hoist, or any other construction-type device between the hours of 10:00 p.m. of one day and 7:00 a.m. of the next day or on Sundays unless a special permit authorizing the activity has been duly obtained from the chief building official.

4.9.3 Methodology and Assumptions

Noise Modeling

Noise level predictions and contour mapping were developed using noise modeling software, SoundPlan Essential (SoundPLAN), version 4.1. SoundPLAN calculates noise propagation based on algorithms and reference levels published by various government agencies, such as the FTA, Federal Highway Administration (FHWA), and the International Standards Organization. The model uses various input parameters, such as distances between sources, barriers, and receivers; and shielding provided by intervening terrain, barriers, and structures. Receivers, sources, and barriers were input into the model using three-dimensional coordinates. The model outputs include noise level contours and noise levels at specific receivers. In all cases, receivers were modeled at five feet above ground or floor elevation, which represents the average height of the human ear.

Construction Noise

Project construction noise would be generated by diesel engine-driven construction equipment used for site preparation and grading, building construction, loading, unloading, and placing materials and paving. Diesel engine-driven trucks also would bring materials to the site and remove the soils from excavation. Construction equipment with a diesel engine typically generates maximum noise levels from 80 to 90 dBA L_{EQ} at a distance of 50 feet (FTA 2018). Table 4.9-5, *Typical Construction Equipment Noise Levels*, summarizes typical construction equipment noise levels.

Table 4.9-5
TYPICAL CONSTRUCTION EQUIPMENT NOISE LEVELS

Equipment	Typical Noise Level [dBA at 50 feet from source]
Air Compressor	81
Backhoe	80
Compactor	82
Concrete Mixer	85
Crane, Derrick	88
Dozer	85
Grader	85
Jack Hammer	88
Loader	85
Paver	89
Pump	76
Roller	74
Scraper	89
Truck	88

Source: RECON 2018b
dBA = A-weighted decibel

During excavation, grading, and paving operations, equipment moves to different locations and goes through varying load cycles, and there are breaks for the operators and for non-equipment tasks. Although maximum noise levels may be 85 to 90 dBA at a distance of 50 feet during most construction activities, hourly average noise levels from the grading phase of construction would be 82 dBA L_{EQ} at

50 feet from the center of construction activity when assessing the loudest pieces of equipment working simultaneously. Noise propagation was modeled based on ISO 9613-2–Acoustics, Attenuation of Sound During Propagation Outdoors.

Vehicle Traffic Noise

Noise generated by future traffic was modeled using FHWA's Traffic Noise Model algorithms and reference levels. The model uses various input parameters, such as projected hourly average traffic rates; vehicle mix, distribution, and speed; roadway lengths and gradients; distances between sources, barriers, and receivers; and shielding provided by intervening terrain, barriers, and structures. Receivers, roadways, and barriers were input into the model using three-dimensional coordinates. The locations of future buildings were obtained from project drawings.

The main source of traffic noise at the project site is vehicle traffic on I-8. For the purpose of the future traffic noise compatibility analysis, the noisiest condition is represented as the maximum level of service (LOS) C/minimum LOS D traffic volume. This condition represents a condition where the maximum number of vehicles are using the roadway at the maximum speed. LOS A and B categories allow full travel speed but do not have as many vehicles, while LOS E and F have a greater number of vehicles, but due to the traffic volume travel at reduced speeds, thus generating less noise. Eastbound I-8 has four mainline lanes and one auxiliary lane, and westbound I-8 has four mainline lanes. Using a capacity of 1,800 vehicles per lane per hour for mainlines and 1,200 vehicles per hour for auxiliary lines, it was calculated that I-8 has a capacity of 15,600 vehicles per hour. The maximum LOS C/minimum LOS D volume is 80 percent of the total capacity, or 12,480 vehicles per hour.

Additional traffic noise would be generated by Alvarado Road. Based on SANDAG Traffic Forecast Information Center data, Alvarado Road has a future year 2035 annual average daily traffic (ADT) volume of 6,300 vehicles and a speed limit of 35 mph (SANDAG 2013a). Peak hour traffic volumes on I-8 were modeled as 10 percent of the total ADT.

The vehicle classification mix for I-8 was obtained from Caltrans truck counts. Based on these truck counts, I-8 carries 96.8 percent automobiles, 2.0 percent medium trucks, and 1.2 percent heavy trucks (Caltrans 2015). Truck counts are not available for local roadways; Alvarado Road was also modeled with the same vehicle classification mix as I-8.

Trolley Noise

The MTS Green Line trolley corridor is located south of the project site, adjacent to the south side of Alvarado Creek. Noise generated by the trolley was modeled using the SoundPLAN program. SoundPLAN calculates trolley noise levels based on trolley speed, length, and the number of pass-bys that occur during the daytime, evening, and nighttime hours. The trolleys were modeled at a speed of 30 mph. This speed is based on the distances between trolley stations and the average timing between stations obtained from published trolley schedules. Adjacent to the project site, there are 96 daytime pass-bys, 18 evening pass-bys, and 23 nighttime pass-bys on weekdays. There are fewer trolley pass-bys on Saturdays and Sundays, therefore, the conservative weekday scenario was modeled.

On-site Generated Noise

The noise sources on the project site after completion of construction are anticipated to be those that would be typical of a multi-family residential development, such as vehicles arriving and leaving,

children at play, and landscape maintenance machinery. None of these noise sources is anticipated result in a substantial permanent increase in existing noise levels and thus were not modeled.

The project would include heating, ventilation, and air conditioning (HVAC) units with a roof-mounted condenser unit for each dwelling unit. It is not known at this time which manufacturer, brand, or model of unit or units would be selected for use in the project. For the purposes of this analysis, to determine what general noise levels the HVAC units would generate, it was assumed that the rooftop units would be similar to a five-ton Carrier 25HHA4 units with a sound power level of 72 dBA. Roof-mounted condenser units would be clustered on the roof; with each condenser unit array having between 6 and 52 units (most commonly 8 units per array). Each condenser unit array was modeled as a point source 0.5 meter above the rooftop height with a composite sound power level between 79.8 and 89.3 dBA, depending on the number of units in the array. Rooftop features such as parapet walls typically provide noise attenuation. As the height and orientation of rooftop features has not been finalized, all rooftops were conservatively modeled as flat, with no features to obstruct noise propagation. For a conservative analysis, it was assumed that the air handling units would be continuously operated at maximum capacity.

Trolley Vibration

Analysis of vibration impacts associated with trolley operations on the adjacent MTS Green Line trolley corridor to future residences follows the guidance provided in the FTA's Transit Noise and Vibration Impact Assessment document (FTA 2018). The analysis follows the general assessment procedure outlined in the document. The general level of assessment uses generalized data to develop a curve of vibration level as a function of distance from the trolley tracks. The vibration levels at specific buildings are estimated and adjustments are applied to account for factors such as track support system, vehicle speed, type of building, and track and wheel condition. The FTA has developed base curves for three standard transportation systems: locomotive-powered passenger or freight trains, rapid transit or light rail vehicles, and rubber-tired vehicles.

Typical ground-surface vibration levels calculated by the FTA assume equipment is in good condition and travels at speeds of 50 mph for the rail systems (locomotive freight and rapid transit or light rail vehicles) and 30 mph for buses (rubber-tired vehicles). The levels of groundborne vibration and noise vary approximately as 20 times the logarithm of speed. This means that doubling, or halving, train speed would increase, or decrease, the vibration levels approximately six decibels. As discussed in Section 4.3, trolleys (light rail vehicles) were modeled at 30 mph in the vicinity of the project. Thus, to determine the vibration level at the project site, the FTA generalized ground surface vibration curves were used and then adjusted for speed.

Construction-related Vibration

Analysis of construction-related vibration impacts to existing and future residents was based on the guidance provided in the FTA's Transit Noise and Vibration Impact Assessment document (FTA 2018). Construction equipment vibration levels and reference distances are based on those provided in the FTA guidance. Vibration levels at specific properties were calculated using the annoyance assessment formula contained the FTA guidance.

4.9.4 Significance Thresholds

According to Appendix G of the CEQA Guidelines, a significant noise impact would occur if implementation of the proposed project would result in any of the following:

1. Would the project result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

2. Would the project result in generation of excessive groundborne vibration or groundborne noise levels?

3. For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

4.9.5 Impact Analysis

4.9.5.1 Noise Standards

Threshold 1: Would the project result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Construction Noise

Noise associated with the grading, building, and paving for the project would potentially result in short-term impacts to surrounding properties. Nearby residential developments include the La Cuesta Apartments, Colony Mobile Plaza, Comanche Hills Apartments, Fleetwood Apartment Homes, and single-family residences located south of the project site (across Alvarado Creek and the MTS Green Line trolley corridor). Additionally, a motel (Motel 6) is located approximately 700 feet to the east of the project site.

A car dealership is located directly east of the project site, and the 70th Street Trolley Station is immediately west of the site; however, these uses are not considered noise sensitive. Additional residential uses are located north of the project site across I-8 but construction noise would not be anticipated to exceed ambient traffic noise at these residences due to vehicle traffic noise from I-8.

A variety of noise-generating equipment would be used during construction of the project, such as excavators, backhoes, front-end loaders, and concrete saws, along with others. Although maximum noise levels may be 85 to 90 dBA at a distance of 50 feet during most construction activities, hourly average noise levels would be lower when taking into account the equipment usage factors. The loudest activities of construction would occur during the grading/excavation phase and would include dozers, loaders, and excavators. Construction noise levels were calculated assuming up to nine pieces of heavy equipment being active simultaneously.

Construction noise is considered a point source and would attenuate at approximately 6 dBA for every doubling of distance. To reflect the nature of grading and construction activities, equipment was

modeled as an area source distributed over the project footprint. The total sound energy of the area source was modeled with all pieces of equipment operating simultaneously. Noise levels were modeled at a series of 12 receivers located at the adjacent property lines. The results are summarized in Table 4.9-6, *Modeled Construction Noise Levels*. Modeled receiver locations and construction noise contours are shown in Figure 4.9-2, *Construction Noise Receiver Locations and Contours*.

Table 4.9-6
MODELED CONSTRUCTION NOISE LEVELS

Receiver Number	Receiver Description	Noise Level (dBA L_{EQ})
1	La Cuesta Apartments	64
2	5107 73rd Street Units	64
3	North end of Keeney Street	65
4	5084 Keeney Street	62
5	5061 Keeney Street	66
6	Colony Mobile Plaza	64
7	Colony Mobile Plaza	64
8	Colony Mobile Plaza	64
9	Colony Mobile Plaza	61
10	Comanche Hills Apartments	66
11	Comanche Hills Apartments	68
12	7570 Saranac Avenue	61

Source: RECON 2018b
dBA = A-weighted decibel; L_{EQ} = one-hour average sound level

As shown, construction noise levels at nearby residential properties would range from 61 to 68 dBA L_{EQ}. Additionally, the project could be developed in two phases, with proposed Buildings 1, 2, 3, as well as Alvarado Creek and public improvements occurring in Phase 1 and Building 4 occurring in Phase 2. In this event, the portion of the RV resort east of Alvarado Creek would remain in its existing condition during Phase 1 construction. People staying at the RV resort would be exposed to construction noise levels generated on the adjacent area during Phase 1 construction. If Phase 2 construction occurs after Phase 1 is constructed and buildings are occupied, then on-site residents of Buildings 1, 2, and 3 would potentially be exposed to construction noise levels from Phase 2 construction activities.

Although these receptors would likely be exposed to construction noise levels that could be heard above ambient conditions, the exposure would be temporary and would not be considered adverse. Construction noise levels may be disruptive to nearby and on-site residences (existing and future based on development phases) and motel customers during the allowable daytime construction hours of operation. However, the City's daytime noise limits (as identified in Table 4.9-4) do not apply to construction equipment. Rather, the City restricts the hours of operation of construction equipment to the hours considered least disturbing to residents. Construction activities associated with the proposed project would generally occur on weekdays between the hours of 7:00 a.m. and 5:00 p.m., which is within the limits specified for construction in Section 10.80.100 of the municipal code. Because construction would comply with the applicable regulation for construction noise, temporary increases in noise levels from construction activities would be less than significant.

Transportation Noise

On-site Transportation Noise

The main source of noise at the project site is vehicle traffic on I-8 and Alvarado Road. Additional noise is generated by trolley traffic on the adjacent MTS Green Line trolley corridor.

On-site traffic noise contours were developed using the SoundPLAN program. Noise level contours were modeled at the ground-floor level. These contours account for shielding provided by proposed buildings, topography, and proposed grading. Future vehicle traffic noise contours are shown in Figure 4.9-3, *Future Vehicle Traffic Noise Contours*. As shown, first-floor exterior noise levels are projected to range from approximately 60 to 75 CNEL across the project site.

To refine the noise analysis and determine noise levels at proposed on-site outdoor use areas (patio above café, podium level courtyards, and top-floor sky decks) and building façades, exterior noise levels were calculated at a series of receiver locations throughout the project site. No specific receiver locations were modeled for the concrete parking garage podiums (one story for Building 1 and three stories for Buildings 2, 3, and 4) because they would not include noise-sensitive areas. Modeled receiver locations are shown in Figure 4.9-3.

Daytime noise contours due to trolley operations were developed using the SoundPLAN program. Noise level contours were modeled at the first-floor level and account for shielding provided by proposed buildings, topography, and proposed grading. Future trolley noise contours are shown in Figure 4.9-4, *Future Trolley Noise Contours*. Trolley noise levels were also modeled at the same 41 specific receiver locations as for vehicle traffic. Trolley noise levels are projected to be 60 CNEL or less at all modeled receivers.

Vehicle traffic and trolley noise levels were summed to calculate combined transportation noise levels. Table 4.9-7, *Transportation Noise Levels without Noise Reduction Features*, summarizes the combined vehicle traffic and trolley noise levels at the 41 modeled receivers without incorporation of any noise reduction features.

Table 4.9-7
TRANSPORTATION NOISE LEVELS WITHOUT NOISE REDUCTION FEATURES

Receiver	Description	Exterior Noise Level (CNEL) Second Floor	Exterior Noise Level (CNEL) Third Floor	Exterior Noise Level (CNEL) Fourth Floor	Exterior Noise Level (CNEL) Fifth Floor	Exterior Noise Level (CNEL) Sixth Floor	Exterior Noise Level (CNEL) Seventh Floor	Exterior Noise Level (CNEL) Eighth Floor
1-1	Building 1 Patio Above Café	80	--	--	--	--	--	--
1-2	Building 1 Western Sky Deck	--	--	--	--	70	--	--
1-3	Building 1 Eastern Sky Deck	--	--	--	--	75	--	--
1-4	Building 1 Façade North	78	78	78	78	--	--	--
1-5	Building 1 Façade North	79	80	80	79	79	--	--
1-6	Building 1 Façade North	79	80	80	80	79	--	--
1-7	Building 1 Façade North	78	79	79	79	78	--	--
1-8	Building 1 Façade East	71	73	73	73	73	--	--
1-9	Building 1 Façade South	58	58	58	58	58	--	--
1-10	Building 1 Façade South	58	59	59	59	59	--	--
1-11	Building 1 Façade South	72	72	72	72	72	--	--
1-12	Building 1 Façade West	75	75	75	75	--	--	--
2-1	Building 2 Western Sky Deck	--	--	--	--	--	--	68
2-2	Building 2 Podium Courtyard	--	--	39	--	--	--	--
2-3	Building 2 Podium Periphery	--	--	57	--	--	--	--
2-4	Building 2 Façade North	--	--	79	79	79	78	78
2-5	Building 2 Façade North	--	--	79	79	79	79	78
2-6	Building 2 Façade North	--	--	79	79	79	79	78

Table 4.9-7 (cont.)
TRANSPORTATION NOISE LEVELS WITHOUT NOISE REDUCTION FEATURES

Receiver	Description	Exterior Noise Level (CNEL) Second Floor	Exterior Noise Level (CNEL) Third Floor	Exterior Noise Level (CNEL) Fourth Floor	Exterior Noise Level (CNEL) Fifth Floor	Exterior Noise Level (CNEL) Sixth Floor	Exterior Noise Level (CNEL) Seventh Floor	Exterior Noise Level (CNEL) Eighth Floor
2-7	Building 2 Façade East	--	--	62	67	69	70	70
2-8	Building 2 Façade South	--	--	57	58	58	58	58
2-9	Building 2 Façade South	--	--	58	58	58	58	58
3-1	Building 3 Podium Courtyard	--	--	58	--	--	--	--
3-2	Building 3 Podium Periphery	--	--	67	--	--	--	--
3-3	Building 3 Western Sky Deck	--	--	--	--	--	--	67
3-4	Building 3 Eastern Sky Deck	--	--	--	--	--	--	71
3-5	Building 3 Façade West	--	--	64	68	70	69	70
3-6	Building 3 Façade North	--	--	79	79	79	79	78
3-7	Building 3 Façade North	--	--	79	79	79	78	78
3-8	Building 3 Façade Northeast	--	--	75	75	75	75	75
3-9	Building 3 Façade East	--	--	57	58	57	56	56
3-10	Building 3 Façade South	--	--	57	57	58	58	57
4-1	Building 4 Podium Courtyard	--	--	38	--	--	--	--
4-2	Building 4 Podium Periphery	--	--	68	--	--	--	--
4-3	Building 4 Western Sky Deck	--	--	--	--	--	--	70

Table 4.9-7 (cont.)
TRANSPORTATION NOISE LEVELS WITHOUT NOISE REDUCTION FEATURES

Receiver	Description	Exterior Noise Level (CNEL) Second Floor	Exterior Noise Level (CNEL) Third Floor	Exterior Noise Level (CNEL) Fourth Floor	Exterior Noise Level (CNEL) Fifth Floor	Exterior Noise Level (CNEL) Sixth Floor	Exterior Noise Level (CNEL) Seventh Floor	Exterior Noise Level (CNEL) Eighth Floor
4-4	Building 4 Eastern Sky Deck	--	--	--	--	--	--	70
4-5	Building 4 Façade Northwest	--	--	73	73	73	73	73
4-6	Building 4 Façade North	--	--	76	76	76	76	76
4-7	Building 4 Façade East	--	--	68	68	69	69	69
4-8	Building 4 Façade South	--	--	58	58	58	58	58
4-9	Building 4 Façade South	--	--	60	60	59	59	59
4-10	Building 4 Façade South	--	--	58	59	59	59	58

Source: RECON 2018b
"--" denotes where the receiver does not exist on a floor (e.g., sky decks only exist on the top floor)
CNEL = Community Noise Equivalent Level

Pursuant to the noise – land use compatibility guidelines contained in the General Plan Noise Element, for multi-family residential uses, exterior noise levels up to 65 CNEL are considered normally acceptable. Noise levels up to 70 CNEL are considered conditionally acceptable provided an analysis of noise reduction requirements is conducted and noise insulation features are included in the design, which normally can be achieved with closed windows and air conditioning units. Exterior noise levels between 70 and 75 CNEL are considered normally unacceptable, which means that new development must conduct a detailed analysis of noise reduction requirements and needed noise insulation features must be included in the design. Exterior noise levels in excess of 75 CNEL are considered clearly unacceptable and new development should generally not be undertaken.

Each residential unit within the proposed buildings would include an HVAC system. Additionally, standard wood-frame construction typically achieves an exterior-to-interior noise reduction of 25 dBA (FHWA 2011). Exterior noise levels at the proposed building façades would need to be 70 CNEL or less (with closed windows) to achieve the CCR Title 24 interior noise standard of 45 CNEL in habitable areas of residences. Therefore, the project would be considered consistent with the Nose Element noise – land use compatibility guidelines if noise exposure levels at the building façades would not exceed 70 CNEL.

Furthermore, Noise Element Policy NS-1.1-3 clarifies that the noise compatibility standards also require that new developments minimize the effects of noise by incorporating noise reduction features to

reduce exterior noise levels at multi-family outdoor use areas to 65 CNEL or less (i.e., to within the normally acceptable range of the noise compatibility guidelines).

As shown in Table 4.9-7, exterior noise levels would exceed 65 CNEL at some of the proposed outdoor use areas and 70 CNEL along some proposed building façades without the incorporation of any noise reduction design features, including:

Building 1
- Patio above café (80 CNEL)
- Eastern sky deck (75 CNEL)
- Northern, western, eastern, and western half of southern building façades (71 to 80 CNEL)

Building 2
- Western sky deck (68 CNEL)
- Northern building façade(78 to 79 CNEL)

Building 3
- Podium periphery (67 CNEL)
- Western sky deck (67 CNEL)
- Eastern sky deck (71 CNEL)
- Northern and northeastern building façades (75 to 79 CNEL)

Building 4
- Podium periphery (68 CNEL)
- Western sky deck (70 CNEL)
- Eastern sky deck (70 CNEL)
- Northern and northwestern building façades (73 to 76 CNEL)

As set forth in the Noise Element, where exterior noise levels are in the conditionally acceptable or normally unacceptable ranges, "a detailed analysis of noise reduction requirements must be made and needed noise insulation features must be included in the design" (City 2012a). A project-specific noise analysis was conducted that identified noise reduction design features to achieve consistency with the noise compatibility standards (RECON 2018b). Identified design features include incorporation of sound-attenuating architectural treatments on exterior walls along the northern, western, eastern, and western half of southern façades of Building 1; the northern façade of Building 2; the northern and northeastern façade of Building 3; and the northern and northwestern façade of Building 4. These walls would include components such as windows, doors, finishes (e.g., stucco, wood siding), and/or wall assemblies (i.e., framing) with architectural treatments that would achieve a composite sound transmission class rating of 35.

Additionally, the project would incorporate sound walls into the design at various locations to reduce exterior noise levels at outdoor use areas. The sound walls would consist of solid masonry, acrylic glass, or a combination thereof and would include 10- to 12-foot-high walls around the patio above the café in Building 1, 6-foot-high walls along the eastern sky deck in Building 1, and 5-foot-high walls along the other sky decks and podium periphery identified above.

With these noise reduction design features that have been incorporated into the project design, interior noise levels at all habitable rooms would be reduced to levels that comply with the City interior noise

compatibility standards of 45 CNEL or less. The incorporation of the identified noise walls would reduce noise levels at all outdoor use areas that would comply with the City's exterior noise compatibility standards of 65 CNEL or less. Therefore, impacts related to on-site transportation noise would be less than significant.

Off-site Transportation Noise

The project site is accessed exclusively via Alvarado Road and thus project-generated traffic would contribute to increased traffic noise levels along Alvarado Road. Nearby NSLUs in the project area include multi-family residences (La Cuesta Apartments, Comanche Hills Apartments, Fleetwood Apartment Homes), a mobile home community, and single-family residences located between 0.03 and 0.07 mile south of the project site (across Alvarado Creek and the MTS Green Line); a motel approximately 0.13 mile east of the project site, and an educational facility (National University campus) approximately 0.2 mile southeast of the site. Traffic volumes along Alvarado Road would essentially double with implementation of the project based on existing and forecasted daily traffic volumes (Kimley Horn 2020). A doubling of traffic volumes on a given roadway typically results in a three dBA increase in ambient noise levels. However, ambient noise levels along Alvarado Road are primarily attributable to vehicle traffic on I-8 rather than vehicle traffic on Alvarado Road itself. Vehicle traffic on I-8 would be anticipated to remain the dominant traffic noise source due to the relative volume and speed of vehicle traffic (vehicles on I-8 typically travel at 65 mph and the speed limit for Alvarado Road is 35 mph). Although the project would contribute to an increase in traffic volumes along Alvarado Road, ambient noise increases would be anticipated to be less than three dBA. Therefore, the project would not result in a substantial increase in ambient noise levels in the vicinity of the project such that noise levels at nearby NSLUs would exceed applicable noise standards. Impacts associated with off-site transportation noise would be less than significant.

On-site Generated Noise

Noise sources on the project site following construction are anticipated to be typical of any residential complex, such as vehicles arriving and leaving, children at play, and landscape maintenance machinery. None of these on-site noise sources is anticipated to exceed the La Mesa Municipal Code noise limits at adjacent properties or result in a substantial permanent increase in existing noise levels. However, HVAC equipment with a roof-mounted condenser unit for each residence would be placed on each proposed building. These on-site generated noise sources were modeled to calculate noise levels at 12 receivers located adjacent to the southern property line.

The location of each condenser unit array was obtained from the project roof plans. Noise generated by HVAC equipment would occur on an intermittent basis, primarily during the day and evening hours and less frequently during the nighttime hours. For a conservative analysis, it was assumed that the HVAC units would operate continuously. The location of the modeled receivers and HVAC units are shown in Figure 4.9-5, *On-site Generated Future Noise Contours*. Future projected HVAC noise levels at adjacent residential properties are presented in Table 4.9-8, *HVAC Noise Levels at Adjacent Residential Properties*.

Table 4.9-8
HVAC NOISE LEVELS AT ADJACENT RESIDENTIAL PROPERTIES

Receiver	Receiver Description	Noise Level [dBA L_{EQ}]	Noise Level Limit (dBA L_{EQ}) Daytime	Noise Level Limit (dBA L_{EQ}) Nighttime
1	La Cuesta Apartments	39	60	55
2	5107 73rd Street Units	40	60	55
3	North end of Keeney Street	41	55	50
4	5084 Keeney Street	44	55	50
5	5061 Keeney Street	42	60	55
6	Colony Mobile Plaza	45	55	50
7	Colony Mobile Plaza	45	55	50
8	Colony Mobile Plaza	45	55	50
9	Colony Mobile Plaza	44	55	50
10	Comanche Hills Apartments	41	60	55
11	Comanche Hills Apartments	39	60	55
12	7570 Saranac Avenue	41	55	50

Source: RECON 2018b

As shown, on-site generated noise levels from HVAC equipment would range from 39 to 45 dBA L_{EQ} and would not exceed the noise limits set forth in LA Mesa Municipal Code Section 10.80.040 at adjacent properties.

Additionally, the project could be developed in two phases: Phase 1 would include proposed Buildings 1, 2, 3, as well as the Alvarado Creek and public improvements; Buildings 1, and Phase 2 would include Building 4. If Phase 2 occurs after Phase 1 is constructed and buildings are occupied, there could be an interim period where Phase 1 and the remaining portion of the RV resort are both in operation. In this case, people staying at the RV resort could potentially be exposed to noise levels from HVAC equipment on Buildings 1, 2, and 3. The project site currently has a commercial zone classification (CM) and thus, applicable municipal code noise limits are 65 dBA L_{EQ} during the daytime and 60 dBA L_{EQ} during the nighttime. It is anticipated that noise levels generated from on-site HVAC equipment at the RV resort would be similar to, but slightly higher than the calculated levels at adjacent residences above (in Table 4.9-8) because some of the RV spaces are closer to the HVAC equipment than the model receivers. Given that the upper range above is 45 dBA L_{EQ}, on-site generated noise levels at the RV resort would not be expected to exceed 60 dBA L_{EQ}. Therefore, impacts related to on-site generated noise would be less than significant.

4.9.5.2 Vibration

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

The main concern associated with groundborne vibration from typical development projects is annoyance; however, vibration-sensitive operations and equipment, such as those in hospitals and laboratories, can be disrupted at much lower levels than would typically affect other uses. In extreme cases, groundborne vibration can cause damage to buildings, particularly those that are old or otherwise fragile. In addition, excessive levels of groundborne vibration of either a regular or an intermittent nature can result in annoyance to residential uses or schools.

Common sources of groundborne vibration are trains and construction activities such as blasting, pile-driving, and heavy earth-moving equipment. Impacts related to the potential exposure of vibration-sensitive land uses to excessive groundborne vibration levels from these sources are assessed based on screening distances determined by the FTA and Caltrans:

- Vibration-sensitive land uses within 600 feet of a railroad may be exposed to disruptive vibration (FTA 2018)

- Major construction activity within 200 feet and pile driving within 600 feet may be potentially disruptive to vibration-sensitive operations (Caltrans 2002)

Trolley Vibration

The project site is located adjacent to the MTS Green Line trolley corridor, and the proposed buildings would be as close as approximately 65 feet from the tracks. Because the proposed residential uses are within the 600-foot screening distance for railroads, vibration levels were calculated to determine if the proposed on-site buildings would be subject to excessive vibration due to trolley pass-bys. Vibration levels at the project site were determined by the FTA generalized ground surface vibration curves (based on a reference speed of 50 mph) and then adjusted for speed based on project area trolley characteristics.

The closest proposed building façade, the southern façade of Building 4, would be approximately 65 feet from the railroad centerline. Based on the FTA vibration curves, trolleys traveling at 50 mph would generate a vibration level of 71 VdB at a distance of 65 feet. Adjusting these levels for speed results in an estimated vibration level of 67 VdB. As shown in Table 4.9-2, the applicable groundborne vibration impact criterion for Category 2 land uses (residential uses) is 72 VdB for frequent events, which is defined as more than 70 vibration events of the same source per day. Trolley vibration levels of 67 VdB would not exceed the impact criteria of 72 VdB and thus, project residents would not be exposed to excessive groundborne vibration or noise levels. Vibration impacts to on-site residents associated with trolley pass-bys would be less than significant.

Construction-related Vibration

The project consists of a residential development with some limited resident-serving commercial uses. This type of development does not include uses or equipment that generate excessive groundborne vibration. Construction activities however would involve equipment that creates groundborne vibration. Thus, the following analysis evaluates potential annoyance due to construction-related vibration at nearby vibration-sensitive land uses.

Vibration-sensitive land uses in the project area include nearby single- and multi-family residences, a motel, and an educational facility. No hospitals, laboratories, or research facilities that could use vibration-sensitive equipment occur in the project vicinity. The closest residences range from approximately 150 to 400 feet away from the project site to the south. The motel is approximately 700 feet to the east, and the educational facility is approximately 1,000 feet to the northeast. Some of the residences to the south are within the screening distances for major construction activities and thus could be subject to intermittent groundborne vibration during project construction, particularly during demolition, site clearing, and grading.

Construction equipment utilized during the construction phases of the project that would generate the highest levels of construction-related vibration would be a bulldozer, which creates a vibration level of 87 VdB at a reference distance of 25 feet (FTA 2018). At a distance of 150 feet, which is the approximate distance to the closest residential use, this level would be expected to reduce to 63.7 VdB (applying the FTA annoyance assessment equation). Based on the vibration impact criteria in Table 4.9-2, the applicable vibration impact level for construction activities at the nearby residential land uses is 80 VdB for infrequent events. Normal construction activities are considered infrequent events with the exception of vibratory pile driving which are frequent events (due to the potential duration of the activity); however, no vibratory pile driving would be required for project construction. As construction vibration levels at the closest residential use would not exceed impact criteria of 80 VdB, project construction would not generate excessive groundborne vibration or noise levels.

Additionally, the project could be developed in two phases, with proposed Buildings 1, 2, 3, as well as Alvarado Creek and public improvements occurring in Phase 1, and Building 4 occurring in Phase 2. In this event, the portion of the RV resort east of Alvarado Creek would remain in its existing condition during Phase 1 construction. People staying at the RV resort would be exposed to construction-related groundborne vibration levels generated on the adjacent area during Phase 1 construction, particularly during site preparation and grading (when the heaviest construction equipment operates). If Phase 2 construction occurs after Phase 1 is constructed and buildings are occupied, then on-site residents of Buildings 1, 2, and 3 would potentially be exposed to construction-related vibration levels from Phase 2 construction activities.

During Phase 1 construction, the closest RV spaces from the construction area would range from 30 to 45 feet. At a distance of 30 feet, groundborne vibration levels would be between approximately 79 and 85 VdB, which would exceed the vibration impact criteria of 80 VdB for infrequent events. This calculation is based on a conservation assumption of a bulldozer operating near the eastern end of the construction area. However, it should be noted that vibration from construction equipment is a source that continually moves across the site, so the exposure would not be a constant source at any one location. Vibration levels at RV spaces at distances of 43 feet or greater from the source (i.e., specific construction equipment), which would be most of the spaces in the RV resort, would not exceed 80 VdB. Furthermore, vibration events would be short-term and infrequent during initial site clearing and grading activities and would occur during allowable day time hours (per Municipal Code Section 10.80.100). Thus, while some people staying at the RV resort would potentially be exposed to construction-related vibration during Phase 1 construction that could be considered an annoyance, Phase 1 construction activities would not generate excessive groundborne vibration or noise levels.

During Phase 2 construction, the closest on-site building, Building 3, would be approximately 50 feet from the construction area. At a distance of 50 feet, groundborne vibration levels would be approximately 78 VdB, which would not exceed the vibration impact criteria of 80 VdB for infrequent events. As a result, Phase 2 construction activities would not generate excessive groundborne vibration or noise levels.

Based on the analysis above, the project would not generate excessive groundborne vibration or groundborne noise levels during construction. Therefore, construction-related vibration impacts would be less than significant.

4.9.5.3 Airport Noise

Threshold 3: For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

No private airstrips or public airports are located in the project vicinity. The closest public airport to the project site is Gillespie Field, which is approximately five miles to the northeast in the City of El Cajon. The next closest airports include Montgomery-Gibbs Executive Airport (approximately seven miles to the northwest in the City of San Diego) and MCAS Miramar (approximately eight miles to the northwest in the City of San Diego). The project site is not located within the 60 dBA CNEL noise contour of Gillespie Field, Montgomery-Gibbs Executive Airport, or MCAS Miramar (SDCRAA 2010a, 2010b, and 2008). The Grossmont Hospital heliport is located approximately 1.8 miles northeast of the project site in the City of La Mesa. The heliport is privately owned and operated by the Grossmont Hospital District. Five to ten flights are normally flown to the hospital every month, typically during standard business hours (City 2012a). This relatively low number of flights is not enough to generate noise levels above 60 CNEL at the project site. Therefore, implementation of the proposed project would not expose people residing or working in the project area to excessive noise levels generated by airports. Impacts would be less than significant.

4.9.6 Mitigation Measures

4.9.6.1 Noise Standards

No significant noise impacts related to substantial temporary or permanent increases in ambient noise levels in excess of applicable noise standards would result from the implementation of the proposed project. Therefore, no mitigation measures are required.

4.9.6.2 Vibration

No significant impacts related to the generation of excessive groundborne vibration or groundborne noise levels would result from the implementation of the proposed project. Therefore, no mitigation measures are required.

4.9.6.3 Airport Noise

No significant impacts related to airport noise would result from the implementation of the proposed project. Therefore, no mitigation measures are required.

4.9.7 Significance Determination

The significance of noise impacts before and after mitigation is summarized in Table 4.9-9, *Significance Determination Summary of Noise Impacts*. Implementation of the proposed project would not result in any significant noise impacts. Impacts related to noise standards, vibration, and airport noise would be less than significant, and no mitigation is required.

Table 4.9-9
SIGNIFICANCE DETERMINATION SUMMARY OF NOISE IMPACTS

Issue	Significance Before Mitigation	Mitigation Measure	Significance After Mitigation
Noise Standards	Less than significant	None required	Less than significant
Vibration	Less than significant	None required	Less than significant
Airport Noise	Less than significant	None required	Less than significant