4.9 NOISE

INTRODUCTION

This section addresses the potential noise impacts that could result from the Via Princessa East Extension project ("proposed project" or "project"). Noise prediction modeling conducted in this analysis utilized the Federal Highway Administration (FHWA) Highway Noise Prediction Model (FHWA-RD-77-108). Modeling data referenced in this analysis is provided in **Appendix 4.9.**

The closest sensitive receptors to the proposed project site are the existing single-family residential units along the western terminus of Via Princessa and Golden Valley High School, southeast of the project. Modeling concluded that construction generated noise levels would exceed residential land use noise level thresholds at the existing residential units northeast of the project site. Construction noise levels at Golden Valley High School would be within the threshold for noise levels at institutional land uses. The proposed project would be required to implement **Mitigation Measures MM 4.9-1** and **MM 4.9-2** to reduce the noise levels that the existing residential units would be exposed to during project construction. Specifically, **Mitigation Measure MM 4.9-1** would require a construction sound wall to be developed between the construction boundary and the existing residential units to attenuate such construction noise levels. Construction noise levels can be expected to be as high as 90 A-weighted decibels (dB(A)) without sound walls. Construction generated noise levels with sounds walls can be expected to reach levels of 78.2 dB(A), which exceeds the 70 dB(A) noise level threshold. Therefore, construction impacts would remain temporarily significant and unavoidable. Construction would result in vibration impacts that would be less than the Federal Transit Administration's (FTA) published guidelines for assessing the impacts of ground-borne vibration associated with construction activities.

The proposed project includes the development of a new roadway extension connecting the western terminus of Via Princessa to Golden Valley Road. This roadway would extend through land that is designated as Residential, Industrial under the existing City of Santa Clarita Land Use Map. During operation of the proposed project, noise levels are expected to be approximately 66.9 A-weighted decibels (dB(A)), which is well below the noise level thresholds for Residential and Industrial. Therefore, operational impacts due to implementation of the proposed project would be less than significant.

Cumulative analysis indicated that two roadway segments in the project area would generate noise level increases that exceed 3.0 dB(A). Via Princessa east of Rainbow Glen would generate a cumulative noise level increase of 5.6 dB(A) while Golden Valley south of Via Princessa would generate a cumulative noise level increase of 3.2 dB(A). Project analysis indicates, however, that the proposed project would cumulatively contribute to a noise level increase along Via Princessa east of Rainbow Glen of 0.8 dB(A) and only cumulatively contribute to a 0.1 dB(A) noise increase along Golden Valley south of Via Princessa. Therefore, the proposed project would have a cumulatively less than significant impact.

Introduction to Noise

Terminology

Different types of metrics are used to characterize the time-varying nature of sound. These metrics include the equivalent sound level (Leq), the minimum and maximum sound levels (Lmin and Lmax), the day-night sound level (Ldn), and the community noise equivalent level (CNEL). Below are brief definitions of these metrics and other terminology used in this section:

- **Decibel (dB).** A unitless measure of sound on a logarithmic scale, which indicates the squared ratio of sound pressure amplitude to a reference sound pressure amplitude. The reference pressure is 20 miro-pascals.
- **A-Weighted Decibel (dB(A)).** An overall frequency-weighted sound level in decibels that approximates the frequency response of the human ear.
- **Maximum Sound Level (Lmax).** The maximum sound level measured during the measurement period.
- **Minimum Sound Level (Lmin).** The minimum sound level measured during the measurement period.
- **Equivalent Sound Level (Leq).** The equivalent steady state sound level that in a stated period of time would contain the same acoustical energy.
- **Day-Night Level (Ldn).** The energy average of the A-weighted sound levels occurring during a 24-hour period, with 10.0 dB added to the A-weighted sound levels occurring during the period from 10:00 PM to 7:00 AM.
- **Day Level (Ld – Day).** The energy average of the A-weighted sound levels occurring during a 15-hour period, during the period from 7:00 AM to 10:00 PM.
- **Night Level (Ln – Night).** The energy average of the A-weighted sound levels occurring during an 8-hour period, during the period from 10:00 PM to 7:00 AM. This is not adjusted by adding 10.0 dB to the A-weighted sound levels during this nighttime period.
- **Community Noise Equivalent Level (CNEL).** The energy average of the A-weighted sound levels occurring during a 24-hour period with 5.0 dB added to the A-weighted sound levels occurring during the period from 7:00 PM to 10:00 PM and 10.0 dB added to the A-weighted sound levels occurring during the period from 10:00 PM to 7:00 AM.
- **Line Source of Noise (Line Source).** A source of noise spread out into a line, such as the combined traffic on a roadway.

- **Point Source of Noise (Point Source)**. A source of noise essentially concentrated at a single point, such as noise from a single vehicle observed at some considerable distance, or a Heating Ventilation and Air Conditioning (HVAC) system on the roof of a building.
- **Line of Sight**. A straight line between the observer location and a specific noise source.
- **Barrier**. A solid wall or earth berm located between the roadway and receiver location, which breaks the line-of-sight between the receiver and the roadway noise sources.
- **Berm**. A mound of earth, generally of triangular (or trapezoidal) cross-section, that parallels a roadway and serves as a noise barrier.
- **Barrier Attenuation**. The change in noise level at a receiver location caused by diffraction (or bending) of sound waves over the top or around the sides of a barrier. It represents only a portion of the total barrier performance.

Ldn and CNEL values differ by less than 1.0 decibel (dB). As a matter of practice, Ldn and CNEL values are considered to be equivalent and are treated as such in this assessment.

Fundamentals of Noise

Noise is usually defined as unwanted sound and can be an undesirable byproduct of society's normal day-to-day activities. Sound becomes unwanted when it interferes with normal activities, causes actual physical harm, or has an adverse effect on human health. The definition of "noise" as unwanted sound implies that is has an adverse effect or causes a substantial annoyance to people and their environment.

Sound pressure level alone is not a reliable indicator of loudness because the human ear does not respond uniformly to sounds at all frequencies. For example, it is less sensitive to low and high frequencies than to the medium frequencies that more closely correspond to human speech. In response to the human's sensitivity to different frequencies or lack thereof, the A-weighted noise level, referenced as dB(A), was developed to better correspond with peoples' subjective judgment of sound levels. In general, changes in a community noise level of less than 3.0 dB(A) are not typically noticed by the human ear.[1] Changes from 3.0 dB(A) to 5.0 dB(A) may be noticed by some individuals who are extremely sensitive to changes in noise. An increase greater than 5.0 dB(A) is readily noticeable, while the human ear perceives a 10.0 dB(A) increase in sound level to be a doubling of sound volume. A doubling of sound energy results in a 3.0 dB increase in sound, which means that a doubling of sound wave energy (e.g., doubling the volume of traffic on a roadway) would result in a barely perceivable change in sound level.

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1 U.S. Department of Transportation, Federal Highway Administration, *Highway Noise Fundamentals*, (September 1980), 81.

The minimum attenuation of exterior to interior noise provided by typical structures in California is provided in **Table 4.9-1, Outside to Inside Noise Attenuation (dB(A))**.

Table 4.9-1
Outside to Inside Noise Attenuation (dB(A))

Building Type	Open Windows	Closed Windows[1]
Residences	17.0	25.0
Schools	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

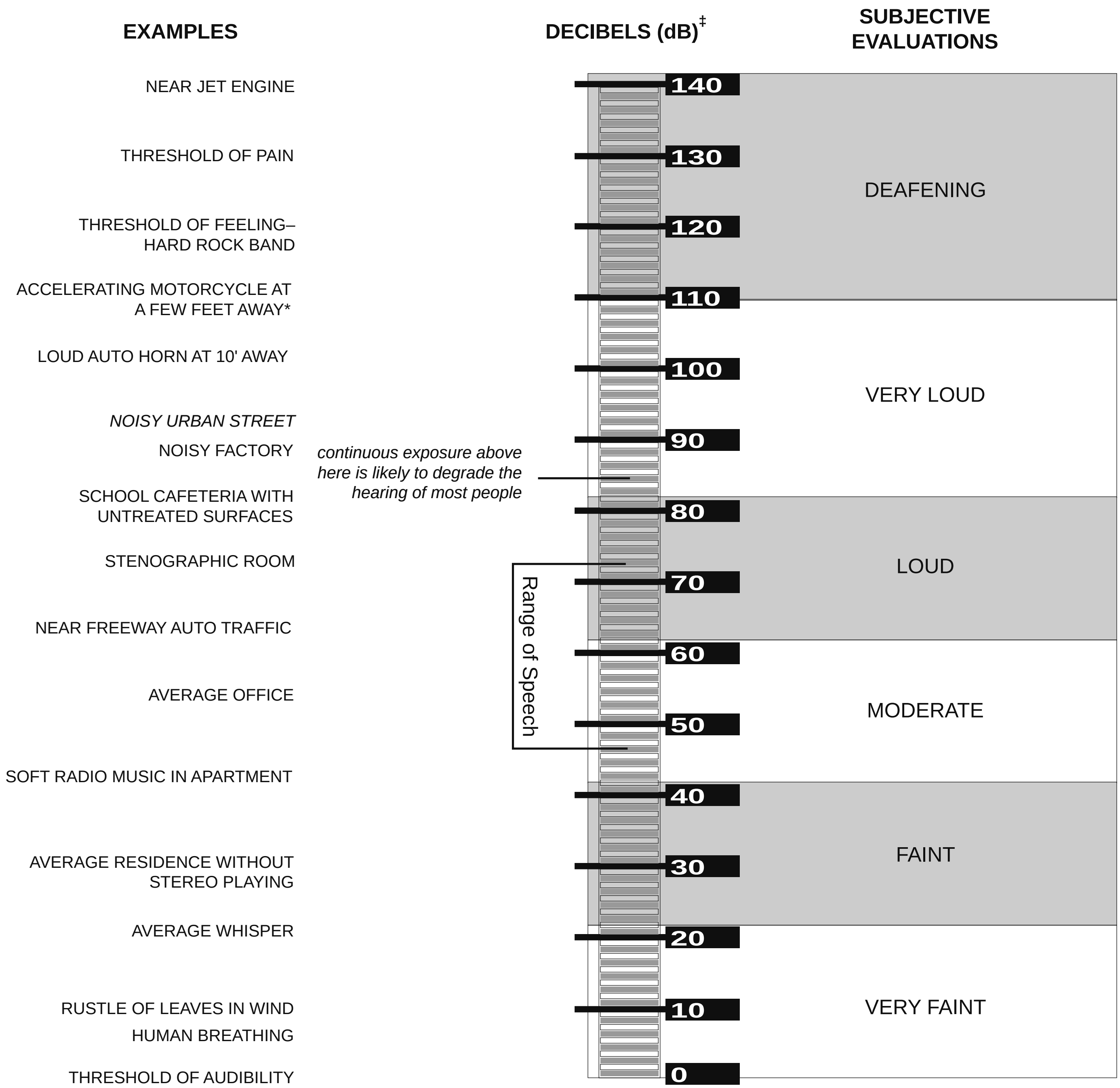
Source: Transportation Research Board, National Research Council, Highway Noise: A Design Guide for Highway Engineers, National Cooperative Highway Research Program Report, p. 117.

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

Common noise levels associated with certain activities are shown on **Figure 4.9-1, Common Noise Levels.**

When assessing community reaction to noise, there is an obvious need for a scale that averages sound pressure levels over time and quantifies the result in terms of a single numerical descriptor. Several scales have been developed that address community noise levels. Those that are applicable to this analysis are the equivalent noise level (Leq) and the community noise equivalent level (CNEL). 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 another average A-weighted sound level measured 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.



** 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 **4.9-1**

Common Noise Levels

A CNEL noise measurement is obtained by adding 5.0 dB to sound levels occurring during the evening from 7:00 PM to 10:00 PM, and 10.0 dB to sound levels occurring during the nighttime from 10:00 PM to 7:00 AM. The 5.0 dB and 10.0 dB "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 3.0 dB(A) of the per-hour Leq.[2]

Noise Barrier Attenuation

Introduction of a barrier between a noise source and 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 the "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 sensitive receptors are placed closer 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 upon 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. One way of rating a material's ability to transmit noise is by the use of a factor called transmission loss (TL). TL is related to the ratio of the incident noise energy to the transmitted noise energy, and it is normally expressed in decibels, which represent the amount noise levels will be reduced when the sound waves pass through the material of the barrier. Finally, sound energy can 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 4.9-2, Noise Attenuation by Barriers**. Solid walls and berms may reduce noise levels by 5.0 to 10.0 dB(A).[4]

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2 California Department of Transportation, *Technical Noise Supplement; A Technical Supplement to the Traffic Noise Analysis Protocol*, (October 1998), N51–N54.

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

4 U.S. Department of Transportation, Federal Highway Administration, *Highway Noise Mitigation*, (Springfield, Virginia: U.S. Department of Transportation, Federal Highway Administration, September 1980), p. 18.

Construction Noise

Noise levels generated by construction equipment can vary greatly depending on factors such as the type of equipment being used, the specific model, the operation being performed, and the condition of the equipment. The equivalent sound level (Leq) of the construction activity also depends on the fraction of time that the equipment is operated over the period of construction.

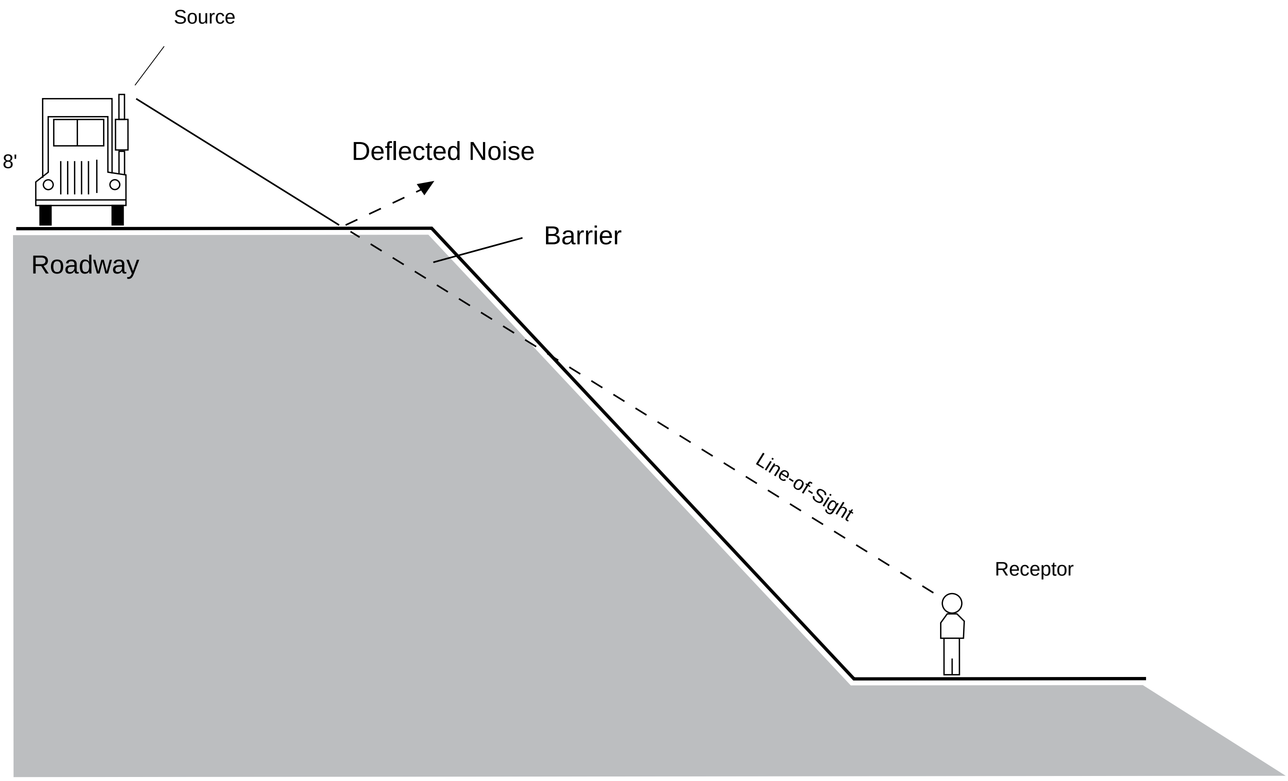
The dominant source of noise from most construction equipment is the engine, usually a diesel, often without sufficient muffling. In a few cases, such as impact pile driving or pavement breaking, noise generated by the process dominates. Construction equipment can be considered to operate in two modes, stationary and mobile. Stationary equipment operates in one location for one or more days at a time, with either a fixed power operation (pumps, generators, compressors) or a variable noise operation (pile drivers, pavement breakers). Mobile equipment moves around the construction site with power applies in cyclic fashion (bulldozers, loaders), or to and from the project site (trucks).

Table 4.9-2, Typical Noise Levels of Construction Equipment, shows the typical noise levels in dB(A) of different types of construction equipment 50 feet from the source.

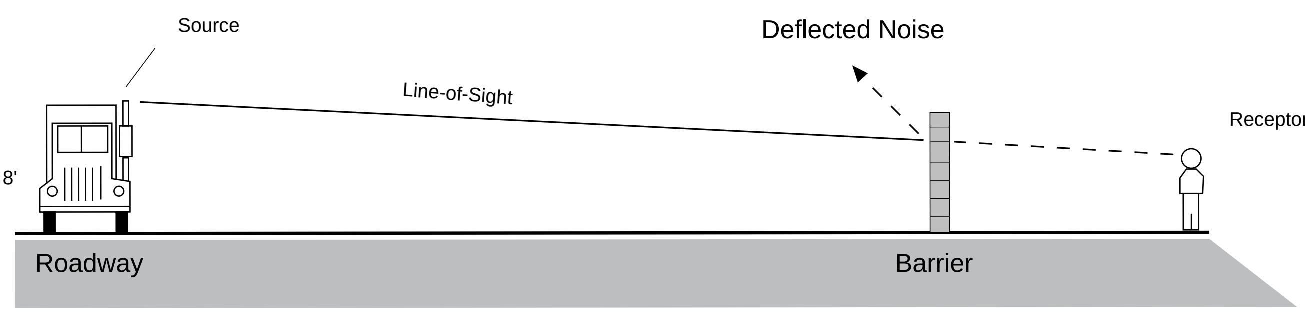
Introduction to Vibration

Vibration is a unique form of noise in that its energy is carried through structures and the earth, whereas noise is carried through the air. Thus, vibration is generally felt as well as heard. Some vibration effects can be caused by noise; for example, the rattling of windows from truck pass-bys. This phenomenon is related to the coupling of the acoustic energy at frequencies that are close to the resonant frequency of the material being vibrated. Typically, ground-borne vibration generated by man-made activities attenuates rapidly with distance from the source of the vibration.

In general, vibration can be described in terms of displacement, velocity, or acceleration. For the purpose of this analysis, vibration will be described in terms of velocity. The peak particle velocity (PPV) or the root mean square (RMS) velocities are usually used to describe vibration amplitudes. PPV is defined as the maximum instantaneous peak of the vibration signal, while RMS is defined as the square root of the average of the squared amplitude of the signal. Units for PPV and RMS are described in inches per second. Vibration in terms of velocity can also be described in a decibel notation—the purpose of which is to compress the range of numbers required to describe vibration. **Figure 4.9-3, Typical Levels of Ground-Borne Vibration**, identifies typical ground-borne vibration levels in decibels, RMS velocity amplitude, and PPV.



"Barrier Effect" Resulting from Differences in Elevation.



"Barrier Effect" Resulting from Typical Soundwall.

SOURCE: Impact Sciences, Inc. – February 2011

FIGURE **4.9-2**

Noise Attenuation by Barriers

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HUMAN/STRUCTURAL RESPONSE	PPV AMPLITUDE IN INCHES PER SECOND [1]	VELOCITY LEVEL IN VdB	RMS VELOCITY AMPLITUDE IN INCHES/SECOND [2]	TYPICAL SOURCES 50 FEET FROM SOURCE
THRESHOLD, MINOR COSMETIC DAMAGE TO FRAGILE BUILDINGS	.4	100	.1	BLASTING FROM CONSTRUCTION PROJECTS
DIFFICULTY WITH TASKS SUCH AS READING A VDT SCREEN	.1264	90	.0316	BULLDOZER AND OTHER HEAVY-TRACKED CONSTRUCTION EQUIPMENT; COMMUTER RAIL, UPPER RANGE
RESIDENTIAL ANNOYANCE, INFREQUENT EVENTS (E.G., COMMUTER RAIL)	.04	80	.01	RAPID TRANSIT, UPPER RANGE
RESIDENTIAL ANNOYANCE, FREQUENT EVENTS (E.G., RAPID TRANSIT)				COMMUTER RAIL, TYPICAL; BUS OR TRUCK OVER BUMP
	.01264	70	.00316	RAPID TRANSIT, TYPICAL; BUS OR TRUCK, TYPICAL
LIMIT FOR VIBRATION-SENSITIVE EQUIPMENT APPROXIMATE THRESHOLD FOR HUMAN PERCEPTION OF VIBRATION	.004	60	.001	
AVERAGE RESIDENCE WITHOUT STEREO PLAYING				TYPICAL GROUND VIBRATION
AVERAGE WHISPER	.00126	50	.000316	

[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 **4.9-3**

Typical Levels of Ground-Borne Vibration

Table 4.9-2
Typical Noise Levels of Construction Equipment

Construction Equipment	Typical Noise Level (dB(A)) 50 feet from Source
Air Compressor	81.0
Backhoe	80.0
Ballast Equalizer	82.0
Ballast Tamper	83.0
Compactor	82.0
Concrete Mixer	85.0
Concrete Pump	82.0
Concrete Vibrator	76.0
Crane, Derrick	88.0
Crane, Mobile	83.0
Dozer	85.0
Generator	81.0
Grader	85.0
Impact Wrench	85.0
Jack Hammer	88.0
Loader	85.0
Paver	89.0
Pile Driver (Impact)	101.0
Pile Driver (Sonic)	96.0
Pneumatic Tool	85.0
Pump	76.0
Rail Saw	90.0
Rock Drill	98.0
Roller	74.0
Saw	76.0
Scarifier	83.0
Scraper	89.0
Shovel	82.0
Spike Driver	77.0
Tie Cutter	84.0
Tie Handler	80.0
Tie Inserter	85.0
Truck	88.0

Source: Department of Transportation, United States of America, Federal Transit Administration, Transit Noise and Vibration Impact Assessment, FTA-VA-90-1003-06, May 2006, Chapter 12 Noises and Vibration During Construction, p. 12-6 and 12-7.

For evaluating potential annoyance or interference with vibration-sensitive activities due to construction, vibration is primarily concerned with potential damage to buildings located near the vibration source. The effect of vibration on structures and individuals varies depending on the soil type, ground strata, and receptor location.

Sensitivity to vibration varies from person to person. Peak velocities of 0.01 inch per second RMS are not generally noticeable, while velocities of 0.1 inch per second RMS can be troublesome to persons near the vibration source. Damage to structures can occur above 0.04 inch per second RMS.

Guideline vibration criteria thresholds for different building categories are provided below in **Table 4.9-3, Construction Vibration Damage Criteria.**

Table 4.9-3
Construction Vibration Damage Criteria

Building Category	PPV (in/sec)	Approximate Lv [1]
I. Reinforced-concrete, steel or timber (no plaster)	0.5	102
II. Engineered concrete and masonry (no plaster)	0.3	98
III. Non-engineered timber and masonry buildings	0.2	94
IV. Buildings extremely susceptible to vibration damage	0.12	90

Source: Federal Transit Administration, Traffic Noise and Vibration Assessment, Chapter 12, Noise and Vibration During Construction, 12–13, May 2006.
[1] RMS velocity in decibels (VdB) re 1 micro-inch/second.

METHODOLOGY

The analysis for future noise levels presented in this section is based on noise monitoring, published guidance, noise prediction modeling, empirical observations, and traffic volume data provided in the traffic analysis for the proposed project. The Caltrans *Technical Noise Analysis Protocol* recommends that projects evaluate both construction and operational noise in accordance with the California Environmental Quality Act (CEQA).[5]

Existing ambient noise levels were monitored at selected locations in the project area corresponding to representative land uses that would potentially be impacted by the project. The measurements were taken using a Larson Davis Model 820 sound level meter, which satisfies the American National

5 California Department of Transportation, Division of Environmental Analysis, *Traffic Noise Analysis Protocol*, (2006).

Standards Institute (ANSI) for general environmental noise measurement instrumentation. The sound meter was equipped with an omnidirectional microphone, calibrated before the day's measurements, and set at approximately 5 feet above ground.

Construction noise levels were analyzed using information from the project applicant about the construction period and types of construction equipment that would be used during each phase. The construction period would commence in May 2013 and be completed in June 2016, an approximately 38-month duration. **Table 4.9-4, Construction Phasing and Equipment** shows each construction phase, the general description of each construction phase, the type of equipment that would be used, the commencement date and ending date of each phase, and the duration of each construction phase.

Table 4.9-4
Construction Phasing and Equipment

Construction Phase	Description	Construction Equipment	Dates of Phase	Duration of Each Phase
1	Grubbing/Land Clearing	2 Graders, 2 Rubber Tired Dozers, 2 Scrapers, 1 Paver	May 2013 to August 2013	3.8 months
2	Grading/Excavation/On-Site Cut/Fill	3 Graders, 3 Rubber Tired Dozers, 2 Scrapers, 1 Paver, 1 Tractor/Loader/Backhoe, 1 Water Truck	September 2013 to January 2015	17.1 months
3	Trenching	1 Grader, 1 Compactor, 1 Scraper, 1 Trencher	February 2015 to Early January 2016	11.4 months
4	Paving	2 Pavers	Mid-January 2016 to June 2016	5.7 months

Source: Impact Sciences, Inc. February 2011.

The information regarding the amount and type of construction equipment that would be used during each phase was input into a construction noise model and a construction vibration model. The construction noise model is based on formulas obtained from the Federal Transportation Administration's *Transit Noise and Vibration Impact Assessment* and the US Department of Transportation

Federal Highway Administration *Highway Construction Noise Handbook*. The construction equipment was then modeled to determine their noise levels combined if all pieces of construction equipment were operating simultaneously, as heard from 80 and 720 feet away. The construction vibration model is based on formulas obtained from the Federal Transportation Administration's *Transit Noise and Vibration Impact Assessment.* The construction equipment was then modeled to determine the range of vibrations that sensitive receptors would be exposed to if they are located 80 and 720 feet away from the construction equipment. These distances represent the closest that construction equipment would be to the residential units northeast of the project boundary and the closest building on the Golden Valley High School campus southeast of the project boundary.

Roadway noise levels were modeled using the FHWA *Highway Traffic Noise Prediction Model* (FHWA-RD-77-108). This model calculates the average noise level in dB(A) CNEL along a given roadway segment based on traffic volumes, vehicle mix, average speeds, roadway geometry, and site conditions. The model calculates noise associated with a specific line source and the results characterize noise generated only by motor vehicle traffic along the specific roadway segment and do not reflect other noise sources in the project area. The model incorporates a factor that characterizes the surface conditions of the area. This is called an alpha factor. An acoustically hard site uses an alpha factor of 0 while an acoustically soft site uses an alpha factor of 0.5. The greater the alpha factor, the greater noise attenuates with increasing distance. The site is characterized as an acoustically soft site since the area is predominantly undisturbed. Therefore, the model utilized an alpha factor value of 0.5.

Average vehicle noise rates (energy rates) utilized in the FHWA model have been modified to reflect average vehicle noise rates identified for California by Caltrans.[6] According to data collected by Caltrans, California automobile noise is 0.8 to 1.0 dB(A) louder than national levels while medium and heavy truck noise is 0.3 to 3.0 dB(A) quieter than national levels.[7] Traffic volumes utilized as data inputs to the noise prediction model were based on information provided by the traffic analysis for the proposed project. Noise levels were evaluated with respect to the established significance thresholds discussed later in this section.

Ground-borne vibration impacts were evaluated using the FTA's *Transit Noise and Vibration Impact Assessment* guidance document.[8] Potential vibration sources in the project include construction equipment in operation during project construction. Vibration levels were estimated for these sources

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

7 Rudolf W. Hendriks, *California Vehicle Noise Emission Levels*.

8 Federal Transit Administration, Office of Planning and Environment, *Transit Noise and Vibration Impact Assessment*, (2006).

given reasonably anticipated distances between the vibration sources and nearby vibration sensitive land uses. Vibration levels were estimated in accordance with the FTA guidance and impacts were evaluated with respect to the established significance thresholds discussed later in this section.

REGULATORY SETTING

Noise Criteria

Federal

Federal regulations address highway noise and are defined in the Code of Federal Regulations, Title 23, Part 772 (23 CFR 772), which provides procedures for the preparation of construction and operational noise studies and evaluating noise abatement considered for federal-aid highway projects. All highway projects that are developed in conformance with 23 CFR 772 are deemed to be in conformance with the FHWA noise standards.

Under 23 CFR 772.7, projects are categorized as Type I or Type II federal or federal-aid highway projects. A Type I project is defined as the construction of a highway on a new location, or the physical alteration of an existing highway that significantly changes either the horizontal or vertical alignment, or increases the number of through-traffic lanes. A Type II project is a noise barrier retrofit project that involves no changes to highway capacity or alignment. The proposed project is not a Type I or a Type II federal or federal-aid highway project.

State

California Department of Health Services

In 1972, the US EPA determined that a yearly average day-night sound level of 45 dB(A) would permit adequate speech communication in the home. The US EPA also identified an indoor day/night level of 45 dB(A) as necessary to protect against sleep interference.[9]

Using this information and knowing that residential construction can attenuate noise by at least 25 dB(A) with windows and doors closed, the State of California, Department of Health Services, Environmental Health Division (DHS), developed and published recommended guidelines for noise and land use compatibility, referred to as the *State Land Use Compatibility Guidelines*, as shown below in **Figure 4.9-4, State Land Use Compatibility Guidelines for Noise**.

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9 Dr. Alice H. Suter, "Administrative Conference of the United States: Noise and Its Effects, (November 1991)," http://www.nonoise.org/library/suter/suter.htm. 2004.

The DHS does not mandate application of this compatibility matrix to development projects; however, each jurisdiction is required to consider the *State Land Use Compatibility Guidelines* when developing its general plan noise element and when determining acceptable noise levels within its community.[10]

The *State Land Use Compatibility Guidelines* identify an exterior (outdoor) noise level of 60 dB(A) CNEL to be an acceptable level for single-family, duplex, and mobile homes involving normal, conventional construction, without any special noise insulation requirements (normally acceptable noise levels). Exterior noise levels up to 65 dB(A) CNEL/Ldn are typically considered acceptable for multi-family units and transient lodging without any special noise insulation requirements because interior noise levels will typically be reduced to acceptable levels (to at least 45 dB(A) CNEL/Ldn) through conventional construction, but with closed windows and fresh air supply systems or air conditioning.

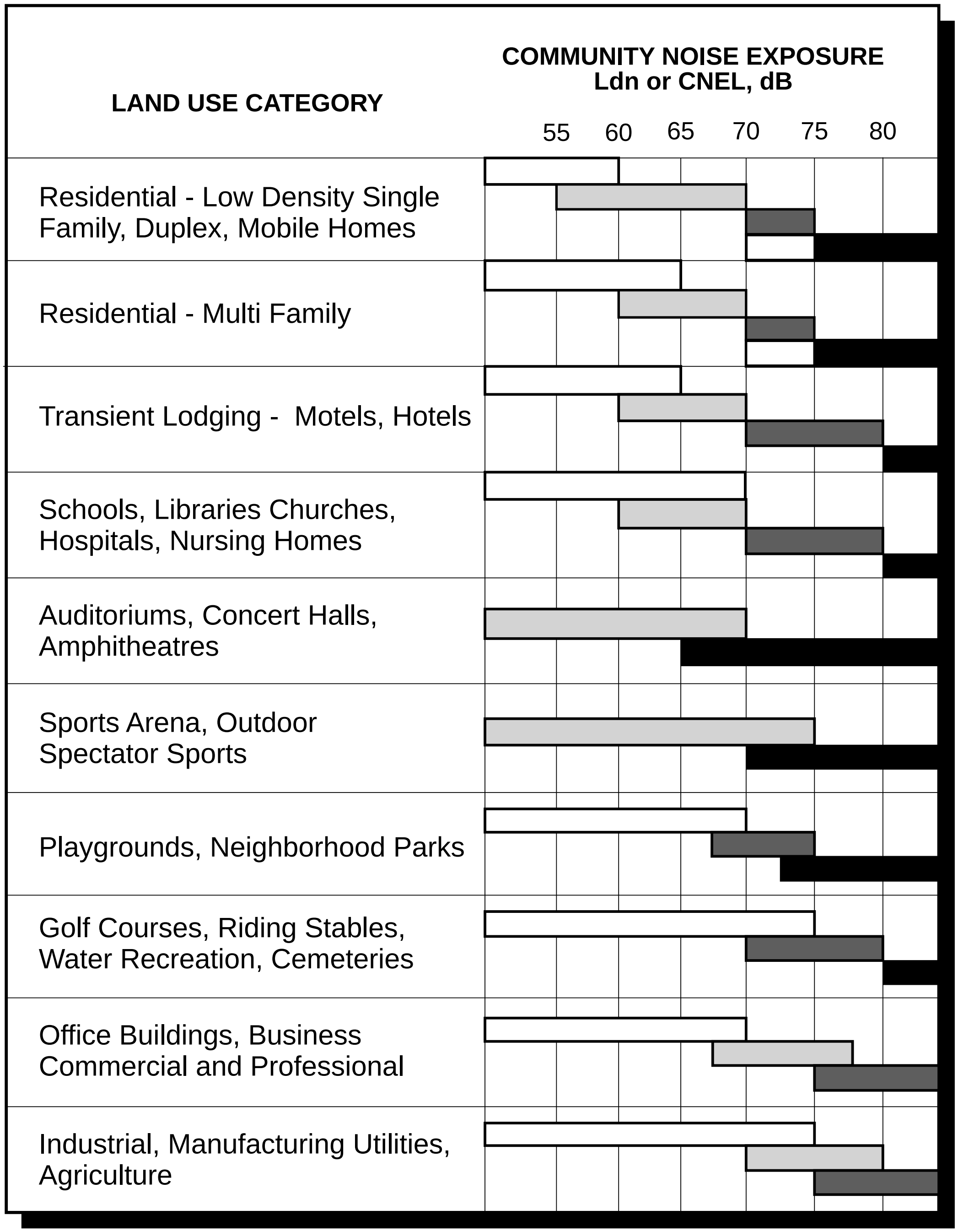
Between these values and 70 dB(A) CNEL/Ldn, exterior noise levels are typically considered acceptable only if the buildings are conditioned to include noise insulation features (conditionally acceptable noise levels) to achieve the 45 dB(A) CNEL/Ldn interior noise level.

An exterior noise level of 70 dB(A) CNEL/Ldn is typically the dividing line between an acceptable and unacceptable exterior noise environment for all noise sensitive uses, including schools, libraries, places of worship, hospitals, day care centers, and nursing homes of conventional construction. Noise levels above 75 dB(A) CNEL/Ldn may be considered normally unacceptable for office, commercial, and industrial uses.

California Noise Insulation Standards

The California Noise Insulation Standards of 1988 (*California Code of Regulations* Title 24, Section 3501 et seq.) require that interior noise levels from exterior sources be 45 dB(A) or less in any habitable room of a multi-residential use facility (e.g., hotels, motels, dormitories, long-term care facilities, and apartment houses and other dwellings, except detached single-family dwellings) with doors and windows closed. Measurements are based on CNEL or Ldn, whichever is consistent with the noise element of the local general plan. Where exterior noise levels exceed 60 dB(A) CNEL/Ldn, an acoustical analysis for new development is required to show that the proposed construction will reduce interior noise levels to 45 dB(A) CNEL/Ldn. If the interior 45 dB(A) CNEL/Ldn limit can be achieved only with the windows closed, the residence design must include mechanical ventilation that meets applicable Uniform Building Code (UBC) requirements.

10 These guidelines are also published by the Governor's Office and Planning and Research in the *State of California General Plan Guidelines* (2003).



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 **4.9-4**

State Land Use Compatibility Guidelines for Noise

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In unacceptable interior noise environments, additional noise insulation features, such as extra batting or resilient channels[11] in exterior walls, double paned windows, air conditioners to enable occupants to keep their windows closed, solid wood doors, noise baffles on exterior vents, etc., are typically needed to provide acceptable interior noise levels. The best type of noise insulation for a land use should be based on detailed acoustical analyses that identify all practical noise insulation features and that confirms their effectiveness.

Local

City of Santa Clarita Noise Element

The City has incorporated a slightly modified version of the *State Land Use Compatibility Guidelines* into its Noise Element, as well as noise level control standards that directly affect the proposed project.[12] These are used in this impact analysis as standards (measured in dB(A) CNEL) to measure noise impacts; therefore, application of these guidelines to both on- and off-site project-related noise would meet the City's impact analysis requirements.

The guidelines in the City's Noise Element are referred to as the *City Land Use Compatibility Guidelines* (see **Figure 4.9-5, City Land Use Compatibility Guidelines for Noise**). The Noise Element is herein incorporated by reference and is available for review at the City of Santa Clarita Planning and Community Development Department, located at 23920 Valencia Boulevard, Santa Clarita, California 91355.

The City Land Use Compatibility Guidelines identify an exterior (outdoor) noise level of 60 dB(A) CNEL to be an acceptable level for single-family, duplex, and mobile homes, multi-family units, transient lodging, and schools. Exterior noise levels up to 70 dB(A) CNEL/Ldn are considered conditionally acceptable for these land uses without any special noise insulation requirements because interior noise levels will typically be reduced to acceptable levels (to at least 45 dB(A) CNEL/Ldn) through conventional construction, closed windows, and fresh air supply systems or air conditioning.

Exterior noise levels from 70 dB(A) to 75 dB(A) CNEL are considered acceptable only if the buildings provide noise insulation features, such as sound walls, window upgrades, and other design modifications

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11 A resilient channel is a pre-formed section of sheet metal approximately 0.5 inch deep by 2.5 inches wide by 12 inches long that is installed between wallboard panels and framing to reduce sound transmission through walls. By preventing the wallboard from lying against the studs, the channel inhibits the transmission of sound through the framing.

12 City of Santa Clarita, *General Plan*, "Noise Element Amendment," (2000) N-6 and N-7. The *General Plan* Noise Element may be found at the City of Santa Clarita Planning Department. The Noise Ordinance is found at http://www.santa-clarita.com/cityhall/admin/code/Santa_Clarita_Municipal_Code/Title_11/44/index.html.

to achieve a 45 dB(A) CNEL interior noise level. Noise levels up to 75 dB(A) CNEL may be considered conditionally acceptable for office and commercial uses. Noise levels up to 80 dB(A) CNEL may be considered conditionally acceptable for industrial uses.

General Plan Noise Element

The Noise Element is a comprehensive program for including noise management in the planning process, providing a tool for local planners to use in achieving and maintaining land uses that are compatible with existing and future environmental noise levels in the Santa Clarita Valley.

City of Santa Clarita Noise Ordinance

The City has also adopted an ordinance to control point source noise. This ordinance is also incorporated herein by reference and is available for review at the City's Web site.[13] Three sections of the ordinance are particularly pertinent to the proposed project: Sections 11.44.040, 11.44.070, and 11.44.080, as amended.

Section 11.44.040

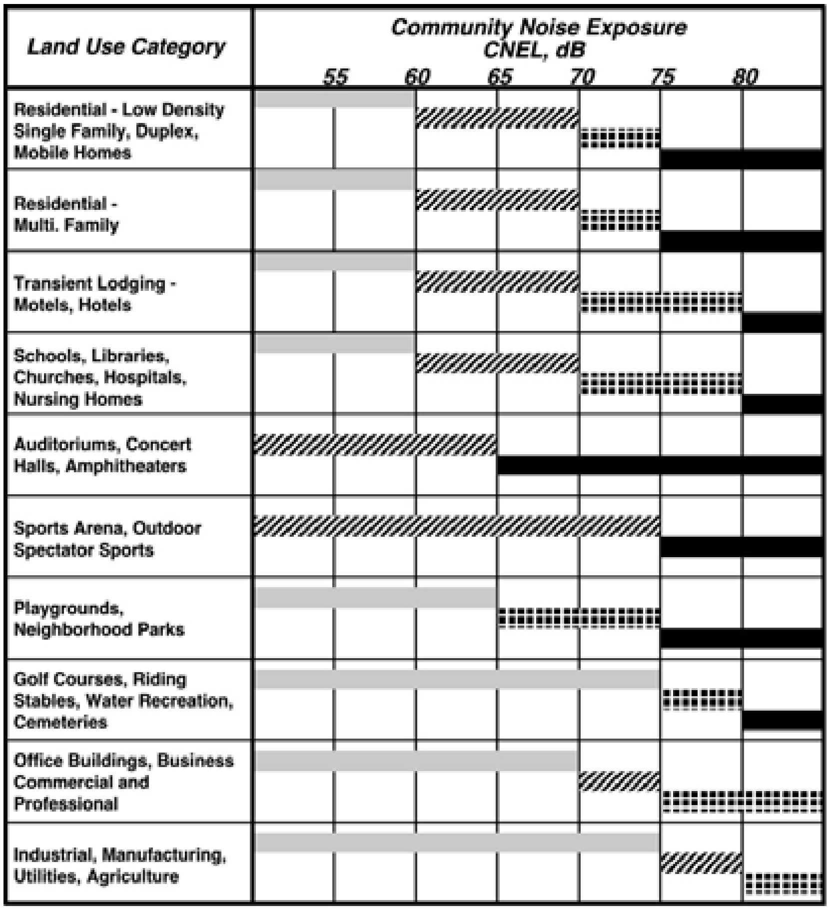
Section 11.40.040 sets the following noise levels for residential, commercial, and manufacturing uses taking place on private property and for construction activities on private property outside of the hourly limits provided in Section 11.40.080. The levels are shown in **Table 4.9-5, City Ordinance Noise Limits**.

Table 4.9-5
City Ordinance Noise Limits

Region	Time	Exterior Sound Level (dB)
Residential Zone	Day	65
Residential Zone	Night	55
Commercial and Manufacturing	Day	80
Commercial and Manufacturing	Night	70

Source: City of Santa Clarita.
Note: Wherever a boundary line occurs between a residential property and a commercial/manufacturing property, the noise level of the quieter zone is to be used.

13 The City of Santa Clarita Noise Ordinance may be viewed at the following Web site: http://www.santa-clarita.com/Index.aspx?page=6.



LEGEND

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 needec noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.

NORMALLY UNACCEPTABLE
New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design. Sound walls, window upgrades, and site design modifications may be needed in order to achieve City standards.

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

CONSIDERATIONS IN DETERMINATION OF NOISE-COMPATIBLE LAND USE

A. NOISE EXPOSURE INFORMATION DESIRED

Where sufficient data exists, evaluate land use suitability with respect to a worst-case value of CNEL. Usually, a future projection of noise levels represents the worst case. Existing and future noise contours for freeway, roadway, airport and railroads are provided in the Noise Element.

B. NOISE SOURCE CHARACTERISTICS

The land use-noise compatibility recommendations should be viewed in relation to the specific source of the noise. For example, aircraft and railroad noise is normally made up of higher single noise events than auto traffic but occurs less frequently. Therefore, different sources yielding the same composite noise exposure do not necessarily create the same noise environment. The State Aeronautics Act uses 65 dB CNEL as the criterion which airports must eventually meet to protect existing residential communities from unacceptable exposure to aircraft noise. In order to facilitate the purposes of the Act, one of which is to encourage land uses compatible with the 65 dB CNEL criterion wherever possible, and in order to facilitate the ability of airports to comply with the Act, residential uses located in areas with an aircraft noise level greater than 65 CNEL should be discouraged and considered located within normally unacceptable areas.

C. SUITABLE INTERIOR ENVIRONMENTS

One objective of locating residential units relative to a known noise source is to maintain a suitable interior noise environment at no greater than 45 dB CNEL. This requirement, coupled with the measured or calculated noise reduction performance of the type of structure under consideration, should govern the minimum acceptable distance to a noise source.

D. ACCEPTABLE OUTDOOR ENVIRONMENTS

Another consideration, which in some communities is an overriding factor, is the desire for an acceptable outdoor noise environment. The acceptable outdoor noise level is 65 CNEL for rear yard areas, neighborhood parks, and pool recreation areas at multi-family developments.

SOURCE: City of Santa Clarita General Plan Update Noise Element - 2009

FIGURE **4.9-5**

City Land Use Compatibility Guidelines for Noise

Section 11.44.070

Section 11.44.070 states, "any noise level from the use or operation of any machinery, equipment, pump, fan, air conditioning apparatus, refrigerating equipment, motor vehicle, or other mechanical or electrical device, or in repairing or rebuilding any motor vehicle, which exceeds the noise limits as set forth in Section 11.44.040 at any property line, or, if a condominium or rental units, within any condominium or rental unit within the complex, shall be a violation of this chapter." Construction work performed in conformance with Section 11.44.080 (below) is exempt from Section 11.44.070.[14]

Section 11.44.080, as Amended

Section 11.44.080, as amended by Ordinance No. 93-4 and No. 00-3, prohibits construction work requiring a building permit on sites within 300 feet of a residentially zoned property from operating except between the hours of 7:00 AM and 7:00 PM Monday through Friday, and between 8:00 AM and 6:00 PM on Saturday. Construction work is prohibited on Sundays, New Year's Day, Independence Day, Thanksgiving Day, Christmas Day, Memorial Day, and Labor Day. The Community Development Department of the City of Santa Clarita may issue a permit for work to be done outside of these hours provided that containment of construction noise is provided. Section 11.44.080, as amended, represents an exception for construction work to the noise limits in Section 11.44.040 and 11.44.070 of the City's Noise Ordinance.[15]

Vibration Criteria

Federal Criteria

The FTA has published guidelines for assessing the impacts of ground-borne vibration associated with construction activities, which have been applied by other jurisdictions to other types of projects. The FTA measure of the threshold of architectural damage for non-engineered timber and mason buildings (e.g., residential units) is 0.2 in/sec PPV, which is equal to approximately 94 VdB. [16] The threshold of perception of vibration is 0.01 in/sec PPV.

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14 Telephone conversation with Jeff Hogan, City of Santa Clarita Department of Community Development, Santa Clarita, California, December 2003.

15 Telephone conversation with Jeff Hogan, Santa Clarita, California, December 2003.

16 Federal Transit Administration, Office of Planning and Environment, *Transit Noise and Vibration Impact Assessment*, FTA-VA-90-1003-06, (2006) 12–13.

There are no FHWA standards for traffic-related vibrations. The FHWA position is that highway traffic and construction vibrations pose no threat to buildings and structures.[17]

California Department of Transportation

There are no state standards for traffic-related vibrations. Caltrans position is that highway traffic and construction vibrations generally pose no threat to buildings and structures.[18] For continuous (or steady state) vibrations; however, Caltrans considers the architectural damage risk level to be somewhere between 0.2 and 2.0 in/sec.[19]

EXISTING CONDITIONS

Existing Noise Sources

The City of Santa Clarita is an urbanized area northwest of the City of Los Angeles. The major sources of noise in the City are generated by motor vehicles. The quietest environments within the City are residential areas in the foothills of the City, where noise levels are often below 50.0 dB(A). The loudest noise events are generated by buses and trucks, and these events generate noise levels into the mid 80.0 dB(A) range. In general, aircraft noise, industrial noise, and commercial noise sources are not a significantly contributing noise source in the City of Santa Clarita.

The proposed project site is located between the western terminus of Via Princessa, southwest of the intersection of Via Princessa and Sheldon Way, and Golden Valley Road. The project site is currently vacant and consists of rolling hills covered in undisturbed vegetation. There are currently no features located on the project site that generate noise; however, there are noise sources located near the proposed project.

Adjacent roadways to the project site include the western terminus area of Via Princessa and Golden Valley Road, where vehicle traffic contribute to most of the noise that is currently generated on and off the project site. Other noise sources include typical urban noise such as air conditioning systems, landscaping maintenance, children playing and laughing, dogs barking, and loud music.

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[17] California Department of Transportation, *Transportation Related Earthborne Vibrations (Caltrans Experiences)*, Technical Advisory, Vibration TAV-02-01-R9601, (2002) 10.

[18] California Department of Transportation, *Transportation Related Earthborne Vibrations (Caltrans Experiences)*, Technical Advisory, Vibration TAV-02-01-R9601, (2002) 10.

[19] California Department of Transportation, *Transportation Related Earthborne Vibrations (Caltrans Experiences)*, Technical Advisory, Vibration TAV-02-01-R9601, (2002) 12.

Existing Monitored Noise Levels

Short-term noise monitoring was conducted on September 23, 2010, at four off-site locations in the study area in order to characterize the existing noise environment. It should be noted that monitoring locations 2 and 4 were directly adjacent to the proposed project's boundary line.

Figure 4.9-6, **Noise Monitoring Locations**, depicts the four short-term noise monitoring locations. Weather conditions were fair with average wind speeds between 0 to 5 miles per hour. The resulting short-term noise levels are provided in **Table 4.9-6, Short-Term Monitored Noise Levels**. Monitoring was conducted between the hours of 6:45 AM to 8:35 AM with a sampling duration of approximately 15 minutes at each location.

Table 4.9-6
Short-Term Monitored Noise Levels

Monitoring Location	Location	Noise Level (dB(A) $Leq_{,15}$)
1	Northern end of Robert C. Lee Parkway (Adjacent to Golden Valley High School entrance)	60.0
2	West of Golden Valley High School, adjacent to Golden Valley Road	69.6
3	Northwest corner of Via Princessa/Rainbow Glen Drive	66.1
4	South of Sheldon Avenue on Via Princessa	47.3

Source: Impact Sciences. Inc., (2010). The short-term noise measurements are provided in ***Appendix 4.9*** *of this EIR.*

The first short-term monitoring location was located at the north end of Robert C. Lee Parkway, on the northern sidewalk. The primary sources of noise at this location include traffic traveling to and from Golden Valley High School along Robert C. Lee Parkway.

The second short-term monitoring location was located adjacent to the north of Golden Valley Road west of Golden Valley High School and south of the Los Angeles Department of Water and Power (LADWP) transmission lines. The primary sources of noise at this location include traffic traveling northbound and southbound along Golden Valley Road. This location would be the proposed future intersection of Via Princessa and Golden Valley Road.

The third monitoring location was located near the intersection of Via Princessa and Rainbow Glen Drive. Residential land uses are located on each corner of this intersection. The primary sources of noise at this location include traffic traveling eastbound and westbound along Via Princessa and northbound and southbound along Rainbow Glen Drive. The project site is located approximately 1,700 feet west and south of the Via Princessa/Rainbow Glen Drive intersection.

The fourth short-term monitoring location was located near the intersection of Via Princessa and Sheldon Avenue, approximately 155 feet west of the intersection. The noise monitor was placed in the centerline of Via Princessa adjacent to residential land uses along the northern side of Via Princessa. The primary sources of noise at this location include traffic traveling northbound and southbound along Sheldon Avenue, and eastbound and westbound along Via Princessa. Land uses to the west and south of the location included open space.

Existing Off-Site Roadway Noise Levels

In order to characterize the ambient roadway noise environment in the study area, noise prediction modeling was conducted based on vehicular traffic volumes along nearby roadway segments. Noise levels were modeled using the FHWA *Highway Traffic Noise Prediction Model* (FHWA-RD-77-108). This model calculates the average noise level in dB(A) CNEL along a given roadway segment based on traffic volumes, vehicle mix, average speeds, roadway geometry, and site conditions. The project site is characterized as an acoustically soft site since the area is predominantly undisturbed open space. Only those roadway segments from the traffic study that would be affected in the interim basis were modeled in this analysis.

As shown in **Table 4.9-7, Existing Roadway Noise Levels**, the roadway segments near the proposed project range from a low of 54.7 dB(A) CNEL to a high of 76.4 dB(A) at a distance of 75 feet from the roadway centerline.

SOURCE: Google Earth – March 2006, Impact Sciences, Inc. – February 2011

FIGURE **4.9-6**

Noise Monitoring Locations

112-028•02/11

Table 4.9-7
Existing Roadway Noise Levels

Roadway Segment Number	Roadway Segment	CNEL in dB(A) at 75 Feet from Roadway Centerline
144	Soledad Canyon west of Whites Canyon	76.4
145	Soledad Canyon east of Whites Canyon	76.3
150	Whites Canyon south of Soledad Canyon	74.3
151	Via Princessa east of Golden Valley	N/A
152	Via Princessa east of Rainbow Glen	69.0
153	Via Princessa south of Whites Canyon	75.3
156	Golden Valley south of Via Princessa	73.8
160	Sierra Highway south of Golden Valley	73.2
161	Sierra Highway north of Golden Valley	73.8
162	Sierra Highway south of Soledad Canyon	73.9
199	Golden Valley south of Center Pointe	73.8
229	Rainbow Glen north of Via Princessa	68.4
364	Rainbow Glen south of Via Princessa	57.4
365	Isabella north of Princessa	54.7

Source: Impact Sciences, Inc., June 2011. Modeling results are located in ***Appendix 4.9.***
[1] *This refers to a street segment that does not exist.*

Location of Sensitive Noise Receptors

The proposed project site is currently vacant and consists of rolling hills covered with undisturbed vegetation. There are currently no sensitive receptors on the project site; however, sensitive receptors exist adjacent to the project site boundaries.

The western terminus of Via Princessa is adjacent to existing single-family residential units that could be exposed to increased noise levels during construction and operation of the proposed project. The single-family residential units are approximately 80 feet from the northeast boundary of the proposed project site.

Golden Valley High School, located at 27051 Robert C. Lee Parkway, is the second closest sensitive receptor to the proposed project site. The southeastern boundary of the proposed project site is approximately 720 feet from the nearest building on the Golden Valley High School campus.

PROJECT IMPACTS

Significance Threshold Criteria

In order to assist in determining whether a project will have a significant effect on the environment, *State CEQA Guidelines* Appendix G identifies criteria for conditions that may be deemed to constitute a substantial or potentially substantial adverse change in physical conditions. Potentially significant noise impacts would occur if the proposed project would

- expose persons to or generate noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies; or
- expose persons or generate excessive ground-borne vibration or ground-borne noise levels; or
- result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project; or
- result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project; or
- be located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport and expose people residing or working in the project area to excessive noise levels; or
- be within the vicinity of a private airstrip and expose people residing or working in the project area to excessive noise levels.

The following thresholds of significance are based on the City of Santa Clarita's *City Land Use Compatibility Guidelines*, as well as the noise standards outlined in the City's Noise Ordinance.

Construction Noise

If components of the proposed project and/or off-site noise-sensitive land uses are to be subject to project-related construction noise levels originating on or off the project site that would be in violation of Sections 11.44.040, 11.44.070, and Section 11.44.080 (as amended) of the City's Noise Ordinance, a significant on-site noise impact would occur.

Operational Noise

Stationary Source Noise Thresholds

Should stationary source noise from activities on the project site exceed limits of Sections 11.44.040 and 11.44.070 of the City's Noise Ordinance or in excess of normally acceptable noise levels of the *City Land Use Compatibility Guidelines,* a significant noise impact would occur.

Mobile Source Noise Thresholds

The proposed project would result in a significant on-site mobile source noise impact if traffic on adjacent and nearby roadways would cause on-site exterior use areas to be exposed to continuous noise levels greater than those identified in the *City Land Use Compatibility Guidelines* for the affected land use.

Evaluation of off-site mobile source noise impacts considers the *City Land Use Compatibility Guidelines* and community responses to changes in noise levels. As discussed previously, changes in a noise level of less than 3.0 dB(A) are not typically noticed by the human ear.[20] Changes from 3.0 to 5.0 dB(A) may be noticed by some individuals who are extremely sensitive to changes in noise. A 5.0 dB(A) increase is readily noticeable. Based on this information, significant off-site project operational noise impacts would occur under the following criteria:

- **Criterion 1:** An increase of 5.0 dB(A) or greater in noise level occurs from project-related activities if levels remain within the same land use compatibility classification (e.g., noise levels remain within the normally acceptable range); or
- **Criterion 2:** An increase of 3.0 dB(A) or greater in noise level occurs from project-related activities which results in a change in land use compatibility classification (e.g., noise levels change from normally acceptable to conditionally acceptable); or
- **Criterion 3:** Any increase in noise levels occurs where existing noise levels are already considered unacceptable under the *City Land Use Compatibility Guidelines*.

Noise generated by emergency vehicles is not under the control of the City. The City's noise ordinance exempts emergency operations from noise regulation. The state has preempted local jurisdictions from controlling noise generated by emergency equipment. The use of sirens on police vehicles, ambulances, and fire trucks cannot be controlled by the City. Similarly, emergency flights of helicopters and airplanes cannot be controlled by the City. Therefore, there is no threshold of significance for emergency vehicles.

Interior Noise Thresholds

Should buildout of the proposed project cause interior noise levels from exterior sources be to exceed 45 dB(A) Ldn or CNEL in any habitable room of a multi-residential use facility (e.g., hotels, motels, dormitories, long-term care facilities, and apartment houses and other dwellings, except detached single-family dwellings) with doors and windows closed, a significant noise impact would occur.

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[20] U.S. Department of Transportation, Federal Highway Administration, *Highway Noise Fundamentals*, (1980) 81.

Construction and Operational Vibrations

The Federal Transit Administration (FTA) has published guidelines for assessing the impacts of ground-borne vibration associated with construction activities and operational activities. The FTA threshold for architectural damage for engineered concrete and masonry buildings is 0.3 in/sec PPV, which is equivalent to 98.0 VdB.[21] The FTA does not provide standards for traffic-related vibrations, since they do not consider highway traffic vibrations to pose a threat to buildings and structures.[22] Under this analysis, vibration levels that exceed 98.0 VdB would be considered significant.

PROJECT IMPROVEMENTS AND DESIGN FEATURES

The proposed project would be one of the primary east-west arterials through the City of Santa Clarita. The proposed roadway would be approximately 1.2 miles in length and would be designated as a Major Arterial Highway per the City of Santa Clarita's Master Plan of Arterial Highways. The project involves the construction of a new roadway segment between Golden Valley Road and the existing western terminus of Via Princessa Road near Sheldon Avenue.

The proposed project would include the development of a six-lane roadway segment with a 14-foot-wide raised landscape median, a 10-foot-wide parkway including 5-foot-wide sidewalks on each side, and a 10-foot-wide bike path with a 2-foot-wide parkway along the south side. The vehicle lanes adjacent to the median and the right lanes would be 12-feet wide, and the middle lanes would be 11-feet wide. The typical right-of-way width would be 116 feet.

The following design features are already incorporated into the proposed project:

DM 4.9-1 Pursuant to Section 11.44.080 of the City's Noise Ordinance, construction work shall occur within 300 feet of occupied residences only between the hours of 7:00 AM and 7:00 PM Monday through Friday, and between 8:00 AM and 6:00 PM on Saturday. Construction work shall be prohibited on Sundays, New Year's Day, Independence Day, Thanksgiving Day, Christmas Day, Memorial Day, and Labor Day.

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21 Federal Transit Administration, Office of Planning and Environment, *Transit Noise and Vibration Impact Assessment*, FTA-VA-90-1003-06, (2006) 12–13. The Federal Transit Administration recommends that these limits be viewed as "criteria that should be used during the environmental impact assessment phase to identify problem locations that must be addressed during final design."

22 California Department of Transportation, *Transportation Related Earthborne Vibrations (Caltrans Experiences)*, Technical Advisory, Vibration TAV-02-01-R9601, (2002) 10.

IMPACT ANALYSIS

Impact Threshold 4.9-1 **Expose persons to or generate noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies**

The proposed project includes the development of the Via Princessa Roadway Extension, connecting the western terminus of Via Princessa to Golden Valley Road. The project area consists of open space areas, with single-family residential units located to the northeast of the project boundary and Golden Valley High School located to the project boundary's southeast. In order to determine if development of the proposed project would generate noise levels in excess of local standards, off-site and on-site roadway noise levels were modeled using the Federal Highway Administration Prediction Model (FHWA-RD-88-108). This model considers roadway noise levels from local street segments that would have an increase or decrease in vehicle traffic, due to implementation of the proposed project. The Average Daily Trips (ADTs) for these local roadway segments were obtained in the traffic impact analysis for the proposed project, prepared by Austin-Foust Associates, Inc. The traffic impact analysis is included in **Appendix 4.10** and the roadway modeling results are included in **Appendix 4.9**.

Off-Site Roadway Noise Levels

Roadway noise modeling was conducted on 14 local roadway segments to determine the noise level change between Future Without Project conditions and Future With Project conditions. **Table 4.9-8, Off-Site Roadway Noise levels** shows the studied roadway segments, the noise levels of each segment under Future With Project and Future Without Project conditions, the noise level change between the two conditions, and the determination if the change causes a significant impact. Future noise levels without the project range from a low of 54.7 dB(A) along Isabella north of Via Princessa to a high of 77.2 dB(A) along Soledad Canyon east of Whites Canyon and Via Princessa south of Whites Canyon. Future noise levels within the project range from a low of 54.7 dB(A) along Isabella north of Via Princessa to a high of 77.1 dB(A) along Soledad Canyon east of Whites Canyon.

Table 4.9-8
Off-Site Roadway Noise Levels

Roadway Segment Number	Roadway Segment	Future without Project (dB(A)	Future with Project (dB(A)	Change Due to Project (dB(A)	Significant Impact?
144	Soledad Canyon west of Whites Canyon	77.2	77.1	-0.1	No
145	Soledad Canyon east of Whites Canyon	77.2	77.3	0.1	No
150	Whites Canyon south of Soledad Canyon	76.0	76.2	0.2	No
152	Via Princessa east of Rainbow Glen	69.9	70.7	0.8	No
153	Via Princessa south of Whites Canyon	76.8	76.7	-0.1	No
156	Golden Valley south of Via Princessa	76.6	76.7	0.1	No
160	Sierra Highway south of Golden Valley	76.1	76.2	0.2	No
161	Sierra Highway north of Golden Valley	75.3	75.0	-0.3	No
162	Sierra Highway south of Soledad	75.3	75.1	-0.2	No
199	Golden Valley south of Center Pointe	76.6	76.7	0.1	No
229	Rainbow Glen north of Via Princessa	70.4	69.9	0.5	No
364	Rainbow Glen south of Via Princessa	57.4	57.4	0.0	No
365	Isabella north of Via Princessa	54.7	54.7	0.0	No

In order to determine if implementation of the proposed project would generate significant noise increases along localized roadways, an increase in noise level of 3.0 dB(A) or above was used as a threshold. If the proposed project causes a noise level increase of 3.0 dB(A) or above on the studied roadway segments, impacts would be considered significant. As show above in **Table 4.9-8,** the proposed project would cause a noise level decrease along six of the 14 studied roadway segments. This is primarily due to the re-distribution of roadway traffic along these roadway segments with implementation of the new Via Princessa Roadway extension. The loudest noise level increase would occur along Via Princessa east of Rainbow Glen resulting in a roadway noise level increase of 0.8 dB(A). This 0.2 dB(A) noise level increase is well below the 3.0 dB(A) threshold of significance. Since the proposed project would not result in noise level increase of 3.0 dB(A) or more along the 14 studied roadway segments, impacts under this threshold would be less than significant.

On-Site Roadway Noise Levels

The proposed project site is currently vacant and consists of open space and rolling hills. Implementation of the proposed project would allow for the development of the Via Princessa Roadway extension that would connect the western terminus of Via Princessa with Golden Valley Road. Since no roadways currently exist within the proposed project site, analysis was conducted to determine if development of the roadway extension would result in noise levels that exceed on-site land use noise level thresholds. **Table 4.9-9, On-Site Roadway Noise Levels with Project Development** shows the on-site roadway extension of Via Princessa, the future noise level along this extension, the adjacent land use type, the noise level threshold of the adjacent land uses, and the determination if noise levels would generate a significant impact.

Table 4.9-9
On-Site Roadway Noise Levels with Project Development

Roadway Segment Number	Roadway Segment	Future with Project (dB(A)	Adjacent Land Uses	Threshold Noise Level for Adjacent Land Uses (dB(A))[1]	Significant Impact?
151	Via Princessa east of Golden Valley	66.9	Vacant - Industrial	80.0	No
			Vacant-Residential	70.0	No
			Vacant-Government Land	80.0	No

[1] *The conditionally acceptable noise level threshold for each land use was used under this scenario. Under conditionally acceptable noise conditions 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.*

The proposed project site consists of three different types of land uses, including Industrial and Residential. It should be noted that all of the land uses within the proposed project boundaries are currently vacant, and under the future with project analysis scenario, it is assumed that all of these land uses would remain vacant. As shown in **Table 4.9-9,** future with project noise levels along Via Princessa east of Golden Valley are estimated to be about 66.9 dB(A) at 75 feet from the roadway centerline. Industrial land uses and government land uses can be exposed to a maximum conditionally acceptable noise level of 80.0 dB(A); and, residential land uses can be exposed to a maximum conditionally acceptable noise level of 70.0 dB(A). The proposed project is expected to generate noise levels along these land uses of 66.9 dB(A), which is well below the maximum conditionally acceptable noise level thresholds for Industrial and Residential land uses in the City of Santa Clarita. Therefore, impacts under this threshold would be less than significant.

Off-Site Sensitive Receptors

Off-site sensitive receptors are located to the northeast and southeast of the proposed project boundaries. Single-family residential units are located about 80 feet from the northeast boundary of the proposed project. The closest building on the Golden Valley High School campus is located approximately 720 feet from the southeast project boundary. **Table 4.9-10, Project Generated Noise Levels at Off-Site Sensitive Receptors** shows the estimated noise levels at the residential units to the northeast of the project site and at Golden Valley High School to the southeast.

Table 4.9-10
Project Generated Noise Levels at Off-Site Sensitive Receptors

Roadway Segment	Future Noise Level 75-Feet from Centerline (dB(A))	Future Noise Level at Residential Homes from Via Princessa Centerline (dB(A))	Residential Land Use Noise Level Threshold (dB(A))	Future Noise Level at Golden Valley from Via Princessa Centerline (dB(A))	Institutional Land Use Noise Level Threshold (dB(A))	Significant Impact?
Via Princessa east of Golden Valley	66.9	66.3	70.0	43.8	70.0	No

The maximum conditionally acceptable noise level for residential and institutional land uses in the City of Santa Clarita is 70.0 dB(A). As shown in **Table 4.9-10**, the estimated noise level generated from the proposed project at the adjacent residential units are estimated to be 66.3 dB(A) and the noise level at Golden Valley High School is estimated to be 43.8 dB(A). Both of these noise levels are well below the City of Santa Clarita 70.0 dB(A) noise level threshold for residential and institutional land uses. Implementation of the proposed project would not generate noise levels at these sensitive receptors that exceed the City's land use noise level thresholds. Therefore, impacts would be less than significant.

Mitigation Measures

Impacts would be less than significant and therefore mitigation measures would not be required.

Residual Impacts

Impacts would remain less than significant.

Impact Threshold 5.5-2 Expose persons or generate excessive ground-borne vibration or ground-borne noise levels

Construction Analysis

Ground vibration from construction activities very rarely reach the levels that can damage structures, but they can achieve the audible range and be felt in buildings very close to the proposed project site. The primary and most intensive vibration source associated with the development of the proposed project would be the use of graders, dozers, pavers, scrapers, backhoes, and water trucks during construction Phase 2 of the proposed project. These types of equipment can create intense noise that is disturbing and can result in ground-borne vibrations.

The result from vibration can range from no perceptible effects at the lowest vibration levels to low rumbling sounds and perceptible vibration at moderate levels, and to slight structural damage at the highest levels. Ground vibrations from construction activities and excavation activities rarely reach the levels that can damage structures, but they can achieve the audible and perceptible ranges in buildings close to the construction site. **Table 4.9-11, Construction Vibration Levels**, shows the four construction phases of the project, the type and amount of equipment that would be used during each phase, and the range of vibration levels as measured from the construction equipment to the nearest residential units to the northeast and to Golden Valley High School to the southeast.

Table 4.9-11 indicates that during Phase 1 construction, the residential units northeast of the project site could be exposed to vibration levels between 68.8 to 77.8 VdB and Golden Valley High School could be exposed to vibration levels between 40.2 to 49.2 VdB. During Phase 2 construction, the residential units could be exposed to vibration levels between 64.8 to 81.3 VdB and Golden Valley High School could be exposed to vibration levels between 36.2 to 52.7 VdB. During Phase 3 construction, the residential units could be exposed to vibration levels between 64.8 to 67.8 VdB and Golden Valley High School could be exposed to vibration levels between 36.2 to 39.2 VdB. Finally, during Phase 4 construction the residential units could be exposed to vibration levels up to 74.9 VdB and Golden Valley High School could be exposed to vibration levels of up to 46.2 VdB. These measurements are based on the closest that construction equipment would be located to the residential units, which is approximately 80 feet and the closest that equipment would be located to buildings on the school campus, which is approximately 720 feet away.

Table 4.9-11
Construction Vibration Levels

Construction Phase	Construction Equipment	Vibration Level at Residential Units(VdB)	Vibration Level at Golden Valley High School (VdB)
1	2 Graders, 2 Rubber Tired Dozers, 2 Scrapers, 1 Paver	68.8 to 77.8	40.2 to 49.2
2	3 Graders, 3 Rubber Tired Dozers, 2 Scrapers, 1 Paver, 1 Tractor/Loader/Backhoe, 1 Water Truck	64.8 to 81.3	36.2 to 52.7
3	1 Grader, 1 Compactor, 1 Scraper, 1 Trencher	64.8 to 67.8	36.2 to 39.2
4	2 Pavers	74.9	46.2

Based on standards developed by the FTA, a significant impact would occur should construction activity expose a Category II Building to vibration levels in excess of 98.0 VdB. As construction activities would not occur any closer than 80 feet from the residential units and 720 feet from buildings on the school campus, these structures would not be exposed to vibration levels that exceed 98.0 VdB. Therefore, impacts would be less than significant under this threshold.

Operational Analysis

Implementation of the proposed project would result in an increase in vehicular traffic traveling between the western terminus of Via Princessa and Golden Valley Road. Ground-borne vibration from vehicles is typical produced on roadways that have rough or pitted surfaces. Vibration levels are typically sensed close to the roadway and reduce quickly further away from a roadway. Material would be used in the development of the roadway that reduces vehicle vibration and the new surface of the roadway would be smooth. It is expected that vibration emanating from the proposed project would be confined to the right-of-way area of the roadway segment and would diminish rapidly the further one is away from the roadway. Therefore, vibration levels produced by vehicles traveling along the proposed project are not expected to exceed 98.0 VdB at the residential units northeast of the site or Golden Valley High School southeast of the project site. Operational impacts would be less than significant under this threshold.

Mitigation Measures

No mitigation is required.

Residual Impacts

Construction and operational impacts would remain less than significant.

Impact Threshold 5.5-3 Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project

As discussed under significance **Impact Threshold 4.9-1** above, increases in off-site and on-site roadway noises would be less than significant. Additionally, noise level increase at adjacent off-site sensitive receptors would not be increased above identified threshold levels with implementation of the project. These impacts would also be less than significant.

Mitigation Measures

Impacts would be less than significant and therefore mitigation measures would not be required.

Residual Impacts

Impacts would remain less than significant.

Impact Threshold 5.5-4 Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project

Construction Analysis

Construction of the proposed project is anticipated to commence in May 2013 (or as soon as funding becomes available) and be completed by June 2016. The construction process would involve four distinct phases including grubbing/land clearing (Phase 1); grading/excavation and on-site cut/fill activities (Phase 2); trenching (Phase 3); and, paving activities (Phase 4). These phases, the anticipated duration of each phase, and the equipment that will be used during each phase is listed above in **Table 4.9-4**.

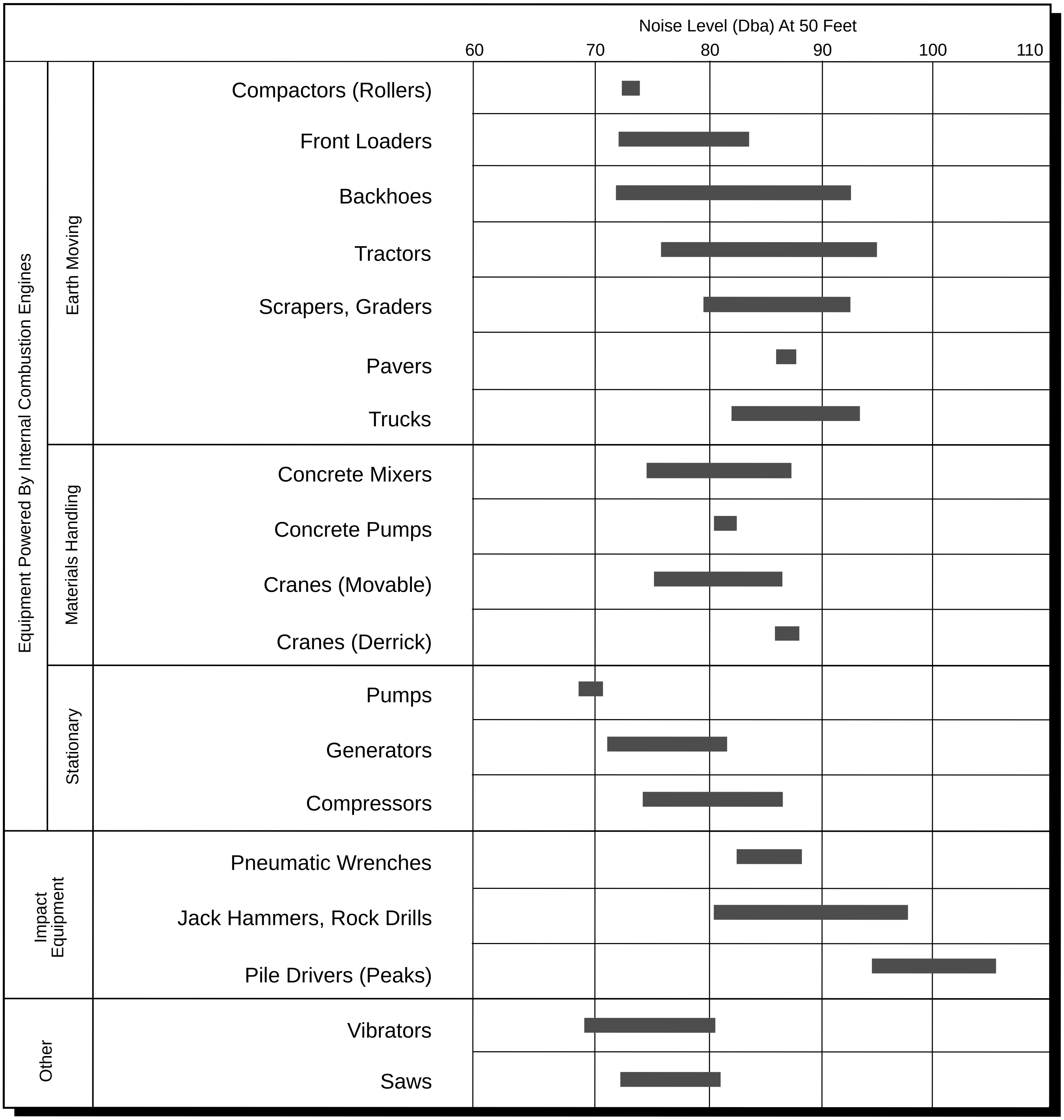
These activities typically involve the use of heavy equipment such as graders, dozers, scrapers, pavers, water trucks, trenchers, and backhoes. This equipment would generate both steady state and episodic noise that would be heard both on and off the project site. Specifically, the off-site residential uses that are located to the northeast of the project site will be most susceptible to the noise from the development of the project. This is due to the proximity to the project site, approximately 80 feet, and the outdoor backyard areas that face the project site. Since the proposed project site is 25.2 acres in size it can be assumed that all pieces of construction equipment listed under each phase could be operating simultaneously and at the same distance from these residential units.

The US Environmental Protection Agency (US EPA) has compiled data regarding the noise generating characteristics of specific types of construction equipment. This data is presented in **Figure 4.9-7, Noise Levels of Typical Construction Equipment**. As shown, noise levels generated by heavy equipment can range from approximately 68.0 dB(A) to in excess of 95.0 dB(A), when measured at 50 feet from the source. The following describes the pieces of equipment expected to be used during the development of the proposed project, and the expected noise levels that the closest adjacent sensitive receptors would be exposed to.

Table 4.9-12, Estimated Construction Noise Levels during Construction Phases shows each construction phase, the amount and type of equipment that would be used during each phase, and the estimated noise level at the residential units and at Golden Valley High School when all construction equipment is operating simultaneously, at the closest point to each sensitive receptor.

Phase 1, grubbing and land clearing, would commence in May 2013 and be completed in August 2013, lasting approximately 3.8 months. It is expected that during this phase, two graders, two rubber tired dozers, two scrapers, and one paver will be used. As shown, the peak noise level due to the simultaneous operation of all equipment during Phase 1 at the residential units and Golden Valley High School would be 88.0 dB(A) and 69.0 dB(A), respectively.

Phase 2, grading/excavation and on-site cut/fill activities, would commence in September 2013 and be completed in January 2013, lasting approximately 17.1 months. It is expected that during this phase, three graders, three rubber tired dozers, two scrapers, one pave, one tractor/loader/backhoe, and one water truck will be used. As shown, the peak noise level due to the simultaneous operation of all equipment during Phase 2 at the residential units and Golden Valley High School would be 90.0 dB(A) and 70.0 dB(A), respectively.



Note: Based On Limited Available Data Samples.

SOURCE: United States Environmental Protection Agency, 1971, "Noise From Construction Equipment And Operations, Building Equipment, And Home Appliances," Ntid 300-1.

FIGURE **4.9-7**

Noise Levels of Typical Construction Equipment

112-028•02/11

Table 4.9-12
Estimated Construction Noise Levels during Construction Phases

Construction Phase	Construction Equipment	Construction Generated Noise Level at Residential Units (dB(A))	Residential Land Use Noise Level Threshold	Potentially Significant Temporary Impact?	Construction Generated Noise Level at Golden Valley High School (dB(A))	Institutional Land Use Noise Level Threshold	Potentially Significant Temporary Impact?
1	2 Graders 2 Rubber Tired Dozers 2 Scrapers 1 Paver	88.0	70.0	Yes	69.0	70.0	No
2	3 Graders 3 Rubber Tired Dozers 2 Scrapers 1 Paver 1 Tractor 1 Water Truck	90.0	70.0	Yes	70.0	70.0	No
3	1 Grader 1 Compactor 1 Scraper 1 Trencher	82.0	70.0	Yes	63.0	70.0	No
4	2 Pavers	84.0	70.0	Yes	65.0	70.0	No

Phase 3, trenching activities would commence February 2015 and be completed in early January 2016, lasting approximately 11.4 months. It is expected that during this phase, one grader, one plate compactor, one scraper, and one trencher will be used. As shown, the peak noise level due to the simultaneous operation of all equipment during Phase 3 at the residential units and Golden Valley High School would be 82.0 dB(A) and 63.0 dB(A), respectively.

Phase 4, paving activities, would commence mid-January 2016 and be completed in June 2016, lasting approximately 5.7 months. It is expected that during this phase, two pavers would be used. As shown, the peak noise level due to the simultaneous operation of all equipment during Phase 4 at the residential units and Golden Valley High School would be 84.0 dB(A) and 65.0 dB(A), respectively.

The residential units to the northeast of the project site would be temporarily exposed to noise levels that exceed the maximum conditionally acceptable exterior noise level threshold of 70.0 dB(A) during construction Phases 1, 2, 3, and 4. Therefore, impacts during each of these construction phases could potentially be temporarily significant.

Operational Analysis

As discussed under **Impact Threshold 4.9-2**, the proposed project consists of the development of the Via Princessa extension, connecting the western terminus of Via Princessa with Golden Valley Road. During operation, the only noise that would be generated by the proposed project would consist of vehicles traveling along the new roadway extension. The proposed project would be located in an area with Residential, Government Land, and Industrial Land Uses, which are permitted to be exposed to noise levels up to 70.0 dB(A), 80.0 dB(A), and 80.0 dB(A), respectively. Noise levels generated by the proposed project are expected to be 66.9 dB(A), which is well below the land use noise thresholds for the Residential, Government Land and Industrial Land Uses. Therefore, operational noise impacts associated with implementation of the proposed project would be less than significant.

Mitigation Measures

Construction Mitigation

Design Measure **DM 4.9-1**, above, shall be implemented during construction of the proposed project. Additionally, during construction, the following mitigation measure shall be implemented to reduce temporary noise levels at the residential units to the northeast of the project site:

MM 4.9-1 The construction contractor shall construct a 10-foot-tall temporary noise barrier on the northeastern perimeter of the proposed project site, separating the existing single-family residential units from the existing western terminus of Via Princessa. The installation of the noise barrier shall occur prior to commencement of Phase 1 construction and left in place through the end of Phase 4 to reduce the noise levels at the effected residential homes. The noise barrier shall be constructed in a manner such that the line-of-sight is blocked between construction activities on the proposed project site and the adjacent single-family residential units to the northeast of the project site. The noise barrier shall be made out of any outdoor weather-resistant solid material that meets a minimum sound transmission loss including: 16-gauge steel, 1-inch thick plywood, and any reasonable thickness of concrete. The use of the noise barrier between construction equipment and the sensitive uses to northeast of the proposed project site would attenuate construction equipment noise levels as much as 11.8 dB(A) CNEL during each construction phase.

MM 4.9-2 The following specifications shall be included in the project plans approved by the City of Santa Clarita building permits:

Best Management Practices (BMPs) shall be implemented by the contractor and sub-contractors to reduce construction noise as much as practicable. Two weeks prior to the commencement of construction, notification shall be provided to the residential land uses and institutional land uses near the project site disclosing an approximate construction schedule and describing the various activities that would be occurring during the construction period until completion. Such notification may be made by delivering the construction notice to each residential unit, or by posting it in a conspicuous place at the corner of Via Princessa and Sheldon Avenue and at the driveway entrance to Golden Valley High School. During the entire construction period, the contractor and sub-contractors shall comply with the following:

- Ensure that construction equipment using gasoline or diesel engines shall be properly muffled according to industry standards and in good working condition.
- Locate noise-generating construction equipment and staging areas away from sensitive uses when and where feasible.
- Use electric air compressors and similar power tools rather than gasoline or diesel powered equipment when and where feasible.
- Construction-related gasoline or diesel-powered equipment, including heavy-duty equipment, motor vehicles, and portable equipment shall be turned off when not in use for more than 30 minutes.

- Construction hours, allowable workdays, and the phone number of the project superintendent shall be clearly posted at all construction entrances to allow surrounding property owners and residents to contact the project superintendent.
- If the project superintendent receives a complaint from a surrounding owner or resident, the superintendent shall investigate the complaint, and if required or practical take appropriate corrective action, and report the action to the reporting party.

Operational Mitigation

As there would be no operational impacts, no operational mitigation measures would be required.

Residual Impacts

Table 4.9-13, Construction Noise Levels with Implementation of Mitigation Measure MM 4.9-1 shows the estimated noise levels at the residential units during each construction phase with implementation of **Mitigation Measure MM 4.9-1**.

Table 4.9-13
Construction Noise Levels with Implementation of Mitigation Measure MM 4.9-1

Construction Phase	Construction Equipment	Construction Generated Noise Level at Residential Units (dB(A))	Construction Generated Noise Level at Residential Units with Mitigation Measure (dB(A))	Residential Land Use Noise Level Threshold	Potentially Significant Temporary Impact?
1	2 Graders 2 Rubber Tired Dozers 2 Scrapers 1 Paver	88.0	76.2	70.0	Yes
2	3 Graders 3 Rubber Tired Dozers 2 Scrapers 1 Paver 1 Tractor 1 Water Truck	90.0	78.2	70.0	Yes
3	1 Grader 1 Compactor 1 Scraper 1 Trencher	82.0	70.2	70.0	Yes
4	2 Pavers	84.0	72.2	70.0	Yes

As shown above, even with implementation of **Mitigation Measure MM 4.9-1**, construction impacts would remain temporarily significant and unavoidable since the residential units would be exposed to noise levels that exceed 70.0 dB(A).

Operational impacts would remain less than significant.

Impact Threshold 5.5-5 **Be located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport and expose people residing or working in the project area to excessive noise levels**

Analysis

The proposed project is not located within an airport land use plan and is not located within 2 miles of a public airport or public use airport. Therefore, the project has no impact with respect this threshold.

Mitigation Measures

No mitigation measures are required.

Residual Impacts

No impacts.

Impact Threshold 5.5-6 **Be within the vicinity of a private airstrip and expose people residing or working in the project area to excessive noise levels**

Analysis

The proposed project is not located within the vicinity of a private airstrip. Therefore, the project has no impact with respect to this threshold.

Mitigation Measures

No mitigation measures are required.

Residual Impacts

No impacts.

CUMULATIVE IMPACTS

Construction Analysis

Other projects located within the vicinity of the proposed project have the potential to generate noise during their construction. Given that timing of construction activities for the related projects cannot be fully defined, any quantitative analysis that assumes multiple, concurrent construction projects would be speculative. In addition, each of the related projects would have to comply with the local noise ordinance, as well as mitigation measures that may be incorporated pursuant to CEQA required environmental review that would reduce construction noise for each project. As such, individual construction noise impacts would only contribute to cumulative impacts when projects are in proximity to each other. No projects are proposed within close proximity to the proposed project site. These related projects are located far enough from the project site or are anticipated to undergo construction at a different time. Therefore, it is reasonably anticipated that the proposed project would not contribute to cumulatively considerable noise impacts during construction.

Operational Analysis

Cumulative noise impacts would primarily occur as the result of increased traffic on local roadways due to ambient growth and other development in the vicinity of the project site. Future (2030) roadway noise levels were compared to existing roadway noise levels previously under **Impact Threshold 5.5-1**. As previously described, future roadway noise levels are based on traffic generated by the proposed project as well as related projects in the study area, in addition to ambient traffic growth. As described in **Section 5.0, Environmental Impact Analysis**, the Santa Clarita Valley Cumulative Buildout Scenario and the One Valley One Vision buildout scenario which included cumulative development within the City's Planning Area through the horizon year of 2030 was used to analyze cumulative impacts. As indicated in **Table 4.9-14, Cumulative Roadway Noise**, Via Princessa east of Rainbow Glen would be exposed to a noise level increase of 5.6 dB(A) and Golden Valley south of Via Princessa would be exposed to a noise level increase of 3.2 dB(A) under cumulative buildout.

Table 4.9-14
Cumulative Roadway Noise

Roadway Segment Number	Roadway Segment	Existing 2010 (dB(A))	Long Range Buildout (dB(A))	Cumulative Change in Noise Levels (dB(A))	Significant Cumulative Impact?
144	Soledad Canyon west of Whites Canyon	76.4	75.7	-0.7	No
145	Soledad Canyon east of Whites Canyon	76.3	76.4	0.1	No
150	Whites Canyon south of Soledad Canyon	74.3	76.8	2.5	No
151	Via Princessa east of Golden Valley	N/A	74.3	N/A	N/A
152	Via Princessa east of Rainbow Glen	69.0	74.6	5.6	Yes
153	Via Princessa south of Whites Canyon	75.3	77.1	1.8	No
156	Golden Valley south of Via Princessa	73.8	77.0	3.2	Yes
161	Sierra Highway north of Golden Valley	73.8	74.7	0.9	No
162	Sierra Highway south of Soledad Canyon	73.9	75.5	1.6	No
199	Golden Valley south of Center Pointe	73.8	75.9	2.1	No
229	Rainbow Glen north of Via Princessa	68.4	70.4	2.0	No
364	Rainbow Glen south of Via Princessa	57.4	57.4	0.0	No
365	Isabella north of Princessa	54.7	54.7	0.0	No

When roadways generate a noise level increase that exceeds 3.0 dB(A) with cumulative buildout, such an increase is considered to be cumulatively significant. However, as indicated above in **Table 4.9-8,** the proposed project would generate a cumulative contributable increase Via Princessa east of Rainbow Glen of 0.8 dB(A) and would only cumulatively contribute to a noise level increase of 0.1 dB(A) along Golden Valley south of Via Princessa. Therefore, the proposed project would not cumulatively contribute to the increase in noise levels along these roadway segments under cumulative conditions.

The General Plan would ensure implementation of compatible land uses so that noise sensitive receptors are not adversely affected by noise, and that business centers, rather than noise sensitive uses, are placed along major transportation corridors. The policies of the General Plan would reduce traffic noise by supporting alternative forms of transportation, promoting walkable neighborhoods and business districts, reducing the number of cars on roadways, and constructing sound barriers. With implementation of such measures, the related projects would reduce cumulative impacts to less than significant.

Cumulative Mitigation

As the proposed project would not cumulatively contribute to off-site roadway noise level increase, the project's cumulative contribution would be less than significant. The related projects could potentially increase noise levels along the studied roadways that exceed the 3.0 dB(A) increase threshold. However, implementation of policies of the General Plan would ensure that such cumulative noise level increase would be reduced to a cumulatively less than significant level.

UNAVOIDABLE SIGNIFICANT IMPACTS

As described above, the proposed project would generate a temporary increase of noise levels at the existing single-family residential units to the northeast that would exceed noise threshold levels for residential land uses. The proposed project would be required to implement **Mitigation Measure MM 4.9-1** which would include the development of a temporary construction sound wall between the single-family residential units and the area of the proposed project just to their south. This temporary sound wall would reduce construction noise levels at the existing residential units by up to 11.8 dB(A). However, even with implementation of this mitigation measure, noise levels at the existing residential units would exceed threshold levels for residential land uses during each construction phase of the project. Therefore, construction impacts would remain temporarily significant and unavoidable.