4.9 NOISE

This chapter summarizes the results of the Noise Analysis prepared for the Community Plan (Appendix D). As part of this assessment, noise levels due to vehicle traffic were calculated and evaluated against County of San Luis Obispo (County) General Plan standards. In addition to compatibility, the potential for noise to impact adjacent receivers from future on-site sources and construction activity was assessed. As concluded in the Noise Analysis, impacts associated with the increase in ambient noise levels and vibration would be less than significant. Impacts associated with the exposure of future development to noise levels in excess land use compatibility standards would be significant but mitigable. Additionally, impacts associated with the exposure of adjacent land uses to construction noise and on-site generated noise would be significant. Implementation of the mitigation outlined in the chapter would reduce all impacts to a level less than significant.

4.9.1 Setting

a. Existing Noise Environment.

Definition of Terms. Sound levels are described in units called the decibel (dB). A change in noise levels is generally perceived as follows: 3 A-weighted dB [dB(A)] barely perceptible, 5 dB(A) readily perceptible, and 10 dB(A) perceived as a doubling or halving of noise (California Department of Transportation [Caltrans] 2013). The noise descriptors used for this study are the one-hour equivalent noise level (L_{eq}) and the community noise equivalent level (CNEL). The CNEL is a 24-hour equivalent sound level. The CNEL calculation applies an additional 5 dB(A) penalty to noise occurring during evening hours, between 7:00 p.m. and 10:00 p.m., and an additional 10 dB(A) penalty is added to noise occurring during the night, between 10:00 p.m. and 7:00 a.m. These increases for certain times are intended to account for the added sensitivity of humans to noise during the evening and night.

Sound from a localized source (approximating a “point” source) radiates uniformly outward as it travels away from the source in a spherical pattern, known as geometric spreading. The sound level decreases or drops off at a rate of 6 dB(A) for each doubling of the distance.

Traffic noise is not a single, stationary point source of sound. The movement of vehicles makes the source of the sound appear to emanate from a line (line source) rather than a point when viewed over some time interval. The drop-off rate for a line source is 3 dB(A) for each doubling of distance. The propagation of noise is also affected by the intervening ground, known as ground absorption. A hard site (such as parking lots or smooth bodies of water) receives no additional ground attenuation, and the changes in noise levels with distance (drop-off rate) are simply the geometric spreading of the source. A soft site (such as soft dirt, grass, or scattered bushes and trees) provides an additional ground attenuation value of 1.5 dB(A) per doubling of distance. Thus, a point source over a soft site would drop off at 7.5 dB(A) per doubling of distance and a line source would drop off at 4.5 dB(A) per doubling of distance.

Groundborne vibration consists of oscillatory waves that propagate from the source through the ground to adjacent structures. The frequency of a vibrating object describes how rapidly it is oscillating. The number of cycles per second of oscillation is the vibration frequency, which is described in terms of hertz (Hz). The normal frequency range of most groundborne vibration that can be felt generally starts from a low frequency of less than 1 Hz to a high of about 200 Hz (Crocker 2007). Vibration levels are usually expressed as a single-number measure of vibration magnitude in terms of velocity or acceleration, which describes the severity of the vibration without the frequency variable. The peak particle velocity (ppv) is defined as the maximum instantaneous positive or negative peak of the vibration signal, usually measured in inches per second.

Noise Measurements. Ambient noise levels were measured in the planning area to provide a characterization of the variability of noise and to assist in determining constraints and opportunities for future development. Eight 15-minute and three 30-minute measurements for a total of eleven daytime noise level measurements were conducted throughout the study area. Noise measurement locations are shown in **Figure 4.9-1** and the results are summarized in **Table 4.9-1**. The main source of noise in the Community Plan area is vehicle traffic on area roadways. Other noise sources included parking lot activities, distant construction, pedestrians, animal vocalizations, and other sources associated with a typical urban environment. As shown, noise levels measured in the Community Plan area ranged from 54.1 to 66.2 dB(A) L_{eq}.

Table 4.9-1. Noise Measurements

ID	Location	Date	Time	L_{eq}
1	Los Osos Valley Road near eastern City boundary	2/16/2016	9:49 a.m. – 10:04 a.m.	66.2
2	Los Osos Valley Road near commercial uses	2/2/2016	2:52 p.m. – 3:07 p.m.	64.3
3	Pecho Valley Road near western City boundary	2/16/2016	2:04 p.m. – 2:19 p.m.	60.5
4	South Bay Boulevard south of school/mixed-use area	2/16/2016	4:36 p.m. – 4:51 p.m.	63.0
5	9th Street, representative of a collector	2/16/2016	10:57 a.m. – 11:27 a.m.	58.0
6	Baywood commercial area	2/2/2016	9:30 a.m. – 10:00 a.m.	61.9
7	Midtown/Morrow Shores mixed-use areas (Los Osos Valley Road)	2/16/16	1:10 p.m. - 1:25 p.m.	64.2
8	Santa Ysabel Avenue	2/16/2016	3:31 p.m. – 4:01 p.m.	57.7
9	Baywood Elementary School (11th St. & Santa Maria Ave.)	2/2/2016	11:23 a.m. – 11:38 a.m.	54.1
10	Monarch Grove Elementary School (Los Osos Valley Rd.)	2/2/2016	12:31 p.m. – 12:46 p.m.	59.6
11	Los Osos Valley Road/South Bay Blvd intersection	2/2/2016	1:59 p.m. – 2:14 p.m.	62.2

Existing Noise Contours. The roads generating the greatest noise level in the Community Plan area are Los Osos Valley Road and South Bay Boulevard. **Figure 4.9-2** shows the existing vehicle traffic noise contours. The noise contour distances represent the predicted noise level for each roadway without the attenuating effects of noise barriers, structures, topography, or dense vegetation. As intervening structures, topography, and dense vegetation would affect noise exposure at a particular location, the noise contours should not be considered site-specific but are rather guides to determine when detailed acoustic analysis should be undertaken. As shown, Los Osos Valley Road and South Bay Boulevard generate the loudest noise levels in the community. Existing noise levels exceed 60 CNEL adjacent to Los Osos Valley Road and South Bay Boulevard. The 70 CNEL contours for Los Osos Valley Road and South Bay Boulevard fall just at the edge of the right-of-way, and existing land uses are not exposed to noise levels 70 CNEL or greater.

b. Regulatory Setting. The study area is exposed to noise from vehicle traffic on area roadways, construction, and from other local noise sources. Federal noise standards include transportation-related noise sources related to interstate commerce (i.e., aircraft, trains, and trucks) for which there are not more stringent state standards. State noise standards are set for automobiles, light trucks, and motorcycles. Local noise standards and guidelines are set for industrial, commercial, and construction activities subject to local noise ordinances and General Plan policies and land use compatibility guidelines. The following is a detailed discussion of the applicable local regulations.

County of San Luis Obispo General Plan. The San Luis Obispo County Noise Element of the General Plan provides a policy framework for addressing potential noise impacts in the planning process. The Noise Element specifies compatibility guidelines for different categories of land use. **Table 4.9-2** shows the ranges of noise exposure from transportation noise sources which are considered to be acceptable, conditionally acceptable, or unacceptable for the development of different land uses. **Table 4.9-2** is used to determine whether mitigation is needed for development of land uses near major transportation noise sources. In areas where the noise environment is acceptable, new development may be permitted without requiring noise mitigation. For areas where the noise environment is conditionally acceptable, new development should be allowed only after noise mitigation has been incorporated into the design of the project to reduce noise exposure to the levels specified by the policies specified in Section 3.3 of the Noise Element. For areas where the noise environment is unacceptable, new development in compliance with the Noise Element policies is usually not feasible.

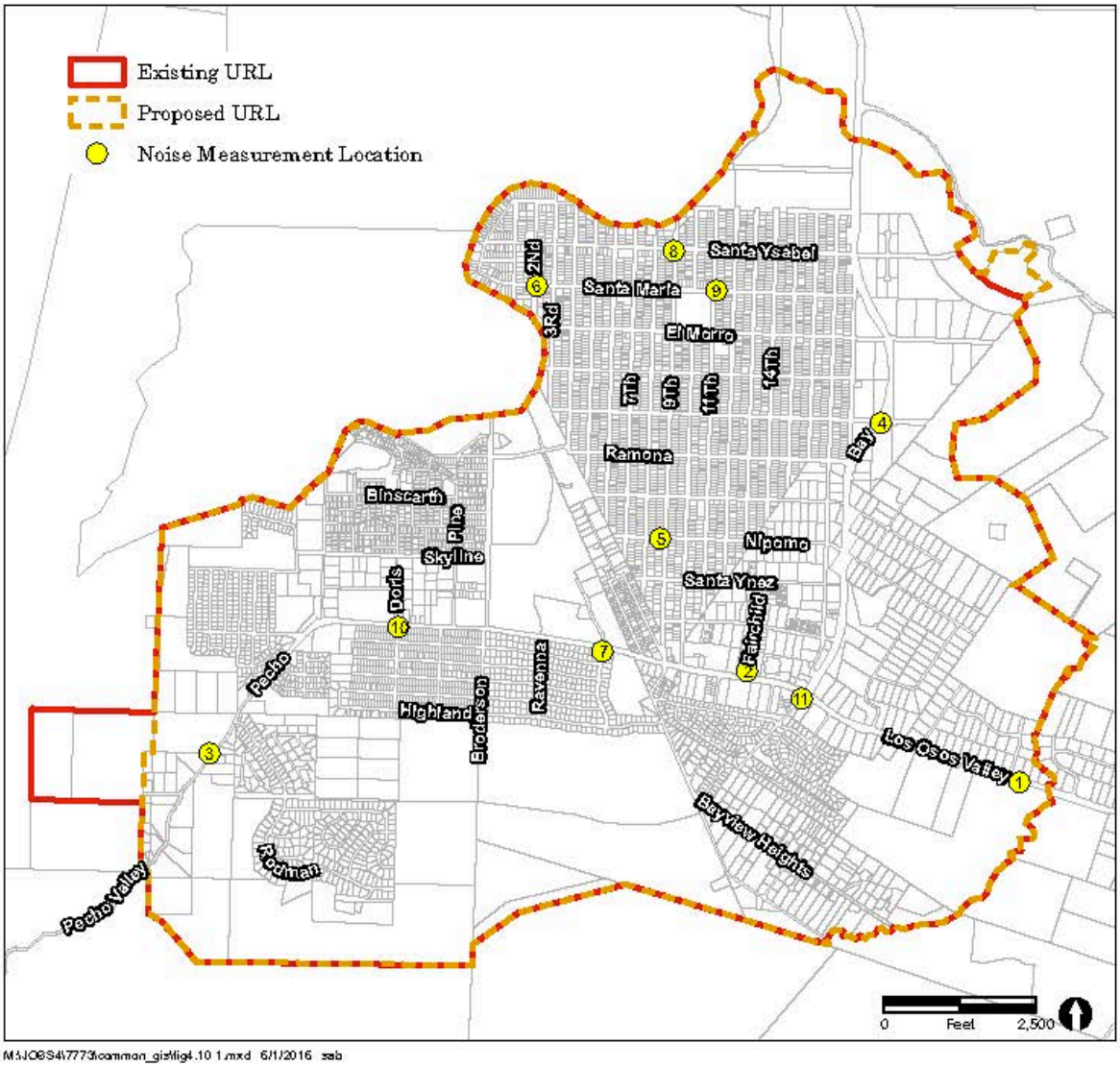

Figure 4.9-1. Noise Measurement Locations

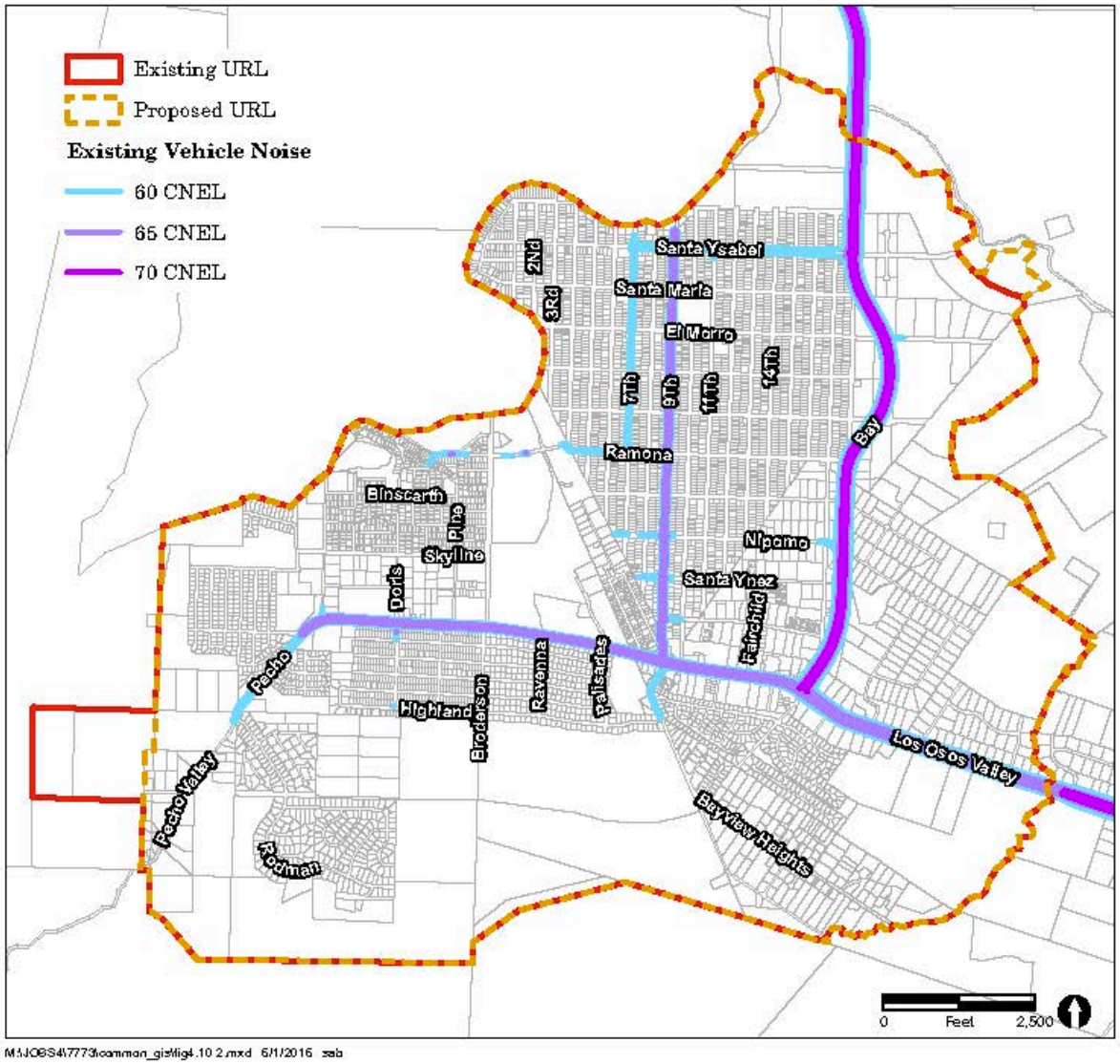

Figure 4.9-2. Existing Vehicle Traffic Noise Contours

Table 4.9-2. County of San Luis Obispo General Plan Land Use Compatibility

Land Use Category	Exterior Noise Exposure Level (CNEL)				
	60	65	70	75	
Residential (except temporary dwellings and residential accessory uses), Public Assembly and Entertainment (except meeting halls)					
Bed and Breakfast Facilities, Hotels and Motels					
Schools – Preschool to Secondary, College and University, Specialized Education and Training, Libraries and Museums, Hospitals, Nursing and Personal Care, Meeting Halls, Churches					
Outdoor Sports and Recreation					
Offices					

	Acceptable (no mitigation required)	Specified land use is satisfactory.
	Conditionally Acceptable (mitigation required)	Use should be permitted only after careful study and inclusion of mitigation measures as needed to satisfy policies of the Noise Element.
	Unacceptable (mitigation may not be feasible)	Development is usually not feasible in accordance with the goals of the Noise Element.

Source: County of San Luis Obispo 1992
Note: This table indicates whether mitigation is required. See Table 4 for noise standard.

The following specific policies are adopted by San Luis Obispo County to accomplish the goals of the Noise Element:

Policy 3.3.1 *The noise standards in this chapter represent maximum acceptable noise levels. New development should minimize noise exposure and noise generation.*

Transportation Noise Sources

Policy 3.3.2 *New development of noise-sensitive land uses [. . .] shall not be permitted in areas exposed to existing or projected future levels of noise from transportation noise sources which exceed 60 dB L_{DN} or CNEL (70 L_{DN} or CNEL for outdoor sports and recreation) unless the project design includes effective mitigation measures to reduce noise in outdoor activity areas and interior spaces to or below the levels specified for the given land use in Table 3-1 [Table 4.9-3 of this chapter].*

Policy 3.3.3 *Noise created by new transportation noise sources, including roadway improvement projects, shall be mitigated so as not to exceed the levels specified in Table 3-1 [Table 4.9-3 of this chapter] within the outdoor activity areas are interior spaces of existing noise sensitive land uses.*

Stationary Noise Sources:

Policy 3.3.4 *New development of noise-sensitive land uses shall not be permitted where the noise level due to existing stationary noise sources will exceed the noise level standards of Table 3-2 [Table 4.9-4 of this chapter], unless effective noise mitigation measures have been incorporated into the design of the development to reduce noise exposure to or below the levels specified in Table 3-2 [Table 4.9-4 of this chapter].*

Policy 3.3.5 *Noise created by new proposed stationary noise sources or existing stationary noise sources which undergo modifications that may increase noise levels shall be mitigated as follows and shall be the responsibility of the developer of the stationary noise source:*

a) Noise from agricultural operations conducted in accordance with accepted standards and practices is not required to be mitigated.

b) Noise levels shall be reduced to or below the noise level standards in Table 3-2 [Table 4.9-4 of this chapter] where the stationary noise source will expose an existing noise-sensitive land use (which is listed in the Land Use element as an allowable use within its existing land use category) to noise levels which exceed the standards in Table 3-2 [Table 4.9-4 of this chapter]. When the affected noise-sensitive land use is Outdoor Sports and Recreation, the noise level standards in Table 3-2 [Table 4.9-4 of this chapter] shall be increased by 10 dB.

c) Noise levels shall be reduced to or below the noise level standards in Table 3-2 [Table 4.9-4 of this chapter] where the stationary noise source will expose vacant land in the Agriculture, Rural Lands, Residential Rural, Residential Suburban, Residential Single-Family, Residential Multi-Family, Recreation, Office and Professional, and Commercial Retail land use categories to noise levels which exceed the standards in Table 3-2 [Table 4.9-4 of this chapter].
(. . .)
This policy may be waived when the Director of Planning and Building determines that such vacant land is not likely to be developed with a noise sensitive land use.
(. . .)

Existing and Cumulative Noise Impacts:

Policy 3.3.6 *San Luis Obispo County shall consider implementing mitigation measures where existing noise levels produce significant noise impacts to noise-sensitive land uses or where new development may result in cumulative increases of noise upon noise-sensitive land uses.*

Table 4.9-3. Maximum Allowable Noise Exposure – Transportation Noise Sources

Land Use Category	Outdoor Activity Areas[1]	Interior Spaces	
	L_{DN}/CNEL, dB	L_{DN}/CNEL, dB	L_{eq} dB[2]
Residential (except temporary dwellings and residential accessory uses), Public Assembly and Entertainment (except meeting halls)	60[3]	45	--
Bed and Breakfast Facilities, Hotels and Motels	60[3]	45	--
Hospitals, Nursing and Personal Care	60[3]	45	--
Public Assembly and Entertainment (except Meeting Halls)	--	--	35
Offices	60[3]	--	45
Churches, Meeting Halls	--	--	45
Schools – Preschool to Secondary, College and University, Specialized Education and Training, Libraries and Museums	--	--	45
Outdoor Sports and Recreation	70	--	--

Source: County of San Luis Obispo 1992

1 *Where the location of outdoor activity areas is unknown, the exterior noise level standard shall be applied to the property line of the receiving land use.*

2 *As determined for a typical worst-case hour during periods of use.*

3 *For other than residential uses, where an outdoor activity area is not proposed, the standard shall not apply. Where it is not possible to reduce noise in outdoor activity areas to 60 dB LDN/CNEL, [use] may be allowed provided that available exterior noise level reduction measures have been implemented and interior noise levels are in compliance with this table.*

Table 4.9-4. Maximum Allowable Noise Exposure – Stationary Noise Sources[1]

	Daytime (7 a.m. to 10 p.m.)	Nighttime[2] (10 p.m. to 7 a.m.)
Hourly L_{eq}, dB	50	45
Maximum level, dB	70	65
Maximum level, dB-Impulsive Noise	65	60

Source: County of San Luis Obispo 1992

Notes:

1 *As determined at the property line of the receiving land use. When determining the effectiveness of noise mitigation measures, the standards may be applied on the receiver side of noise barriers or other property line noise mitigation measures.*

2 *Applies only where the receiving land use operates or is occupied during nighttime hours.*

County of San Luis Obispo Code. Sections 23.06.044 through 23.06.050 of the County's Code establish standards for acceptable exterior and interior noise levels. These standards are intended to protect persons from excessive noise levels. Exterior and interior noise level standards are summarized in Table 6. The exterior noise levels standards in the County Code are the same as the stationary source noise standards in the General Plan (see **Table 4.9-4**). The noise level limits in **Table 4.9-5** are applicable for noise-sensitive land uses. As stated in Section 23.06.044 and the General Plan, when the receiving noise-sensitive land use is outdoor sports and recreation, the exterior noise level standards shall be increased by 10 dB. Additionally, in the event that the measured ambient noise level exceeds the applicable exterior/interior noise level standards, the applicable exterior/interior standard shall be the ambient noise level plus 1 dB. The standards of Sections 23.06.044 through 23.06.050 do not apply to

noise sources associated with construction, provided such activities do not take place before 7 a.m. or after 9 p.m. any day except Saturday or Sunday, or before 8 a.m. or after 5 p.m. on Saturday or Sunday.

Table 4.9-5. County of San Luis Obispo Code Exterior/Interior Noise Level Standards

	Daytime (7 a.m. to 10 p.m.) (exterior/interior)	Nighttime (10 p.m. to 7 a.m.) (exterior/interior)
Hourly L_{eq}, dB	50/40	45/35
Maximum level, dB	70/60	65/55

Source: County of San Luis Obispo Code Sections 23.06.044 and 23.06.046

California Code of Regulations – Noise Insulation Standards. Interior noise levels for habitable room are regulated also by Title 24 of the California Code of Regulations (CCR), California Noise Insulation Standards. Title 24, Part 2, Chapter 12, Section 1207 represents the regulatory requirements for interior noise for all new construction in California. Section 1207.1 identifies the applicability of the section. Section 1207.4, which was added as an amendment on July 2015, states that "interior noise levels attributable to exterior sources shall not exceed 45 dB in any habitable room. The noise metric shall be either the day-night average sound level (L_{dn}) or the CNEL, consistent with the noise element of the local general plan." Thus for the County of San Luis Obispo the limit is 45 CNEL. A habitable room in a building is used for living, sleeping, eating or cooking. Bathrooms, closets, hallways, utility spaces, and similar areas are not considered habitable spaces (24 CCR 1207 2016).

California Code of Regulations – Environmental Comfort. Part 11 of Title 24 (California Green Building Standards Code) provides mandatory measures for residential and non-residential buildings. Section 5.507, Environmental Comfort, addresses interior noise control in non-residential buildings. This section provides the minimum Sound Transmission Class (STC) and Outdoor–Indoor Sound Transmission Class (OITC) for wall, roof–ceiling assemblies, and windows for buildings located within the 65 CNEL contour of an airport, freeway, expressway, railroad, industrial source, or fixed guideway source as determined by the Noise Element of the General Plan. Buildings shall be constructed to provide an interior noise environment attributable to exterior sources that does not exceed an hourly average equivalent level of 50 dB(A) L_{eq}. Exterior features such as sound walls or earth berms may be utilized as appropriate to the building, addition, or alteration project to mitigate sound migration to the interior. An acoustical analysis documenting complying interior sound levels is required to be prepared by personnel approved by the architect or engineer of record.

Vibration. Sections 23.06.060 and 23.06.062 of the County's Code address vibration. "Any land use within one-half mile of an urban or village reserve line is to be operated to not produce detrimental earth-borne vibrations perceptible" at or beyond any lot line of a residential, office and professional, recreation, and commercial use, or at or beyond the boundary of any industrial use. These vibration guidelines are not applicable to construction that occurs between 7 a.m. and 9 p.m. The County's Code does not define the level of "detrimental earth-borne vibrations". Numerous public and private organizations and governing bodies have provided guidelines to assist in the analysis of groundborne

noise and vibration. Guidelines from the Federal Transit Authority (FTA) and Caltrans serve as a useful tool to evaluate vibration impacts. Caltrans guidelines recommend that a standard of 0.2 inch per second PPV not be exceeded for the protection of normal residential buildings and that 0.08 inch per second PPV not be exceeded for the protection of old or historically significant structures (Caltrans 2013). With respect to human response within residential uses (i.e., annoyance, sleep disruption), FTA recommends a maximum acceptable vibration standard of 80 vibration decibels (VdB) (FTA 2006).

4.9.2 Impact Analysis

a. Methodology and Significance Thresholds.

Methodology. Traffic noise occurs adjacent to every roadway and is directly related to the distance from the roadway, traffic volume, speed, and vehicle mix. Existing and future traffic volumes and posted speeds were obtained from the traffic study prepared for the Community Plan (Appendix E). Noise generated by existing and future traffic was modeled using SoundPLAN. The SoundPLAN program (Navcon Engineering 2015) uses the Federal Highway Administration's Traffic Noise Model algorithms and reference levels to calculate noise level contours. The model uses various input parameters, such as projected hourly average traffic rates; vehicle mix, distribution, and speed; roadway lengths and gradients; and shielding provided by intervening terrain, barriers, and structures. Roadways were input into the model using three-dimensional coordinates. Flat-site conditions were modeled. Resulting noise contours represent a worst-case scenario, as topography, buildings, and other obstructions along the roadways would shield distant receivers from the traffic noise.

Significance Thresholds. Pursuant to the County's Initial Study Checklist and Appendix G of the CEQA Guidelines, impacts would be significant if development under the Community Plan would result in any of the following:

- *Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;*
- *Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels;*
- *A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project;*
- *A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project;*
- *For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, exposure of people residing or working in the project area to excessive noise levels; and/or*

- *For a project within the vicinity of a private airstrip, exposure of people residing or working in the project area to excessive noise levels.*

The Community Plan area is not located within an Airport Land Use Plan (ALUP), within two miles of a public use airport, or in the vicinity of a private airstrip. As a result, the significance thresholds related to airports were not included in this analysis.

b. Impacts and Mitigation Measures.

Threshold:	***Would actions under the Community Plan result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?***
Threshold:	***Would actions under the Community Plan result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?***

Impact NOS-1 Construction of individual projects that could be facilitated under the proposed Community Plan Update would generate noise and groundborne vibration that could exceed County of San Luis Obispo standards at existing residential uses. Future residential uses and other sensitive receptors may also be exposed to noise and vibration levels that exceed County standards. This is a Class II, *significant but mitigable*, impact.

The Community Plan does not propose the construction of new development; rather it provides capacity for future development. Future buildout could potentially result in temporary ambient noise increase and vibration due to construction activities. Construction activities may include demolition of existing structures, site preparation work, excavation of parking and subfloors, foundation work, and building construction. The exact location of construction activities is not known at this time. Impacts are assessed in this analysis by identifying potential construction noise levels and buffer distances at which construction noise and vibration levels would be less than applicable standards.

Noise

The County limits construction noise impacts by limiting construction to daytime hours. As discussed, the noise limit standards of Sections 23.06.044 through 23.06.050 do not apply to noise sources associated with construction, provided such activities do not take place before 7 a.m. or after 9 p.m. any day except Saturday or Sunday, or before 8 a.m. or after 5 p.m. on Saturday or Sunday. The County has not established noise level limits specific to construction. Many jurisdictions assess construction noise levels with respect to a 75 dB(A) L_{eq} or 75 dB(A) $L_{eq(8h)}$ noise level limit at residential uses. In the absence

of an applicable threshold, this analysis assesses noise levels based on a 75 dB(A) L_{eq} noise level limit as assessed at residential land uses.

Construction noise typically occurs intermittently and varies depending upon the nature or phase of construction (e.g., demolition/land clearing, grading and excavation, building erection). Construction noise in any one particular area would be short-term and would include noise from activities such as site preparation, truck hauling of material, pouring of concrete, and use of power tools. Noise would also be generated by construction equipment, including earthmovers, material handlers, and portable generators, and could reach high levels for brief periods.

Table 4.9-6 summarizes typical construction equipment noise levels.

Table 4.9-6. Typical Construction Equipment Noise Levels

Equipment	Noise Level at 50 Feet [dB(A) L_{eq}]
Air Compressor	81
Backhoe	80
Compactor	82
Concrete Mixer	85
Crane, Derrick	88
Dozer	85
Grader	85
Jack Hammer	88
Loader	85
Paver	89
Pump	76
Roller	74
Scraper	89
Truck	88

Source: FTA 2006.

During excavating, grading, and paving operations, equipment moves to different locations and goes through varying load cycles, and there are breaks for the operators and for non-equipment tasks, such as measurement. Although maximum noise levels from individual pieces of equipment may be 85 to 90 dB(A) at a distance of 50 feet, during most construction activities, hourly average noise levels from the loudest pieces of equipment working simultaneously would be 82 dB(A) L_{eq} at 50 feet from the center of construction activity. The loudest construction phase is typically grading as it involves the greatest amount of the largest equipment. Construction equipment noise is considered a “point source” and attenuates over distance at a rate of 6 dB(A) for each doubling of distance. Therefore, projects that include construction activities within 200 feet of a noise-sensitive receiver may potentially result in substantial temporary noise increases.

The location of future projects and construction activities that would occur as a result of future development consistent with the Community Plan are not known at this time, thus the Community Plan may result in construction activities in close proximity to residential receivers. Although existing adjacent residences near construction sites would be exposed to construction noise levels that could be heard above ambient conditions, the exposure would be temporary and would cease at the end of construction. Additionally, construction activities would occur during the hours specified in the County's Code. However, temporary noise impacts to residential receivers located within 200 feet of construction activities would be **Class II**, *significant but mitigable*. It should be noted that this is a conceptual construction noise analysis based on standard construction practices. Actual construction noise levels may vary.

Vibration

No operational components of the Community Plan include significant groundborne noise or vibration sources and no significant vibrations sources currently exist, or are planned, in the Community Plan area. Thus, no significant groundborne noise or vibration impacts would occur with the operation of future projects implemented under the Community Plan.

Construction activities may include demolition of existing structures, site preparation work, excavation of parking and subfloors, foundation work, and building construction. Demolition for an individual site may last several weeks to months. Individual construction projects that could be facilitated under the Community Plan could result in vibration that may be felt on properties in the immediate vicinity of the construction site.

Ground vibrations in an outdoor environment are generally not perceptible (FTA 2006). The construction activities that generate excessive vibrations are blasting and impact pile driving. Projects implemented under the Community Plan would be constructed using typical construction techniques; no blasting is contemplated. Heavy construction equipment (e.g., bulldozer and excavator) would generate a limited amount of groundborne vibration during construction activities at short distances away from the source. **Table 4.9-7** identifies vibration levels for standard heavy construction equipment.

Table 4.9-7. Vibration Source Levels for Construction Equipment

Equipment	Approximate VdB			
	40 Feet	100 Feet	200 Feet	300 Feet
Large Bulldozer	79	69	60	55
Loaded Trucks	77	68	59	54
Jackhammer	71	61	52	47
Small Bulldozer	49	40	31	26

Source: FTA 2006.

If individual development projects occurred less than 40 feet from a sensitive receiver, vibration levels could exceed the vibration threshold established by the FTA of 80 VdB for residences and buildings where people normally sleep.

The San Luis Obispo County Code Section 22.10.120 restricts construction activities to between 7:00 a.m. and 9:00 p.m., Monday through Friday and 8:00 a.m. and 5:00 p.m., Saturday and Sunday. Compliance with this requirement would partially limit potential noise and vibration impacts when people normally sleep. Additional mitigation is required to reduce impacts to a less than significant level. Temporary ground-borne vibration impacts would be **Class II**, *significant but mitigable*.

Mitigation Measures. Temporary noise impacts to residential receivers located within 200 feet of construction activities would be potentially significant. The following mitigation would be required.

NOS-1(a) **Planning Area Standards.** The following language shall be added to Section 7.3: Communitywide Standards of the Community Plan:

Noise and Vibration Reduction Plan. *Projects that involve grading, demolition, and/or construction on lots adjacent to occupied residential structures shall implement the following applicable performance standards to ensure that sensitive receptors are not adversely impacted by construction related noise:*

a) Notify existing residences within 1,000 feet of the site boundary concerning the construction schedule;
b) Shield especially loud pieces of stationary construction equipment;
c) Locate portable generators, air compressors, etc. away from sensitive noise receptors;
d) Limit grouping major pieces of equipment operating in one area to the greatest extent feasible; and
e) Use newer equipment that is quieter and ensure that all equipment items have the manufacturers' recommended noise abatement measures, such as mufflers, engine covers, and engine vibration isolators intact and operational. Internal combustion engines used for any purpose on or related to the job shall be equipped with a muffler or baffle of a type recommended by the manufacturer.

Plan Requirements and Timing. The Planning and Building Department shall add the recommended language to the Community Plan prior to Plan adoption.

Monitoring. Planning and Building shall ensure that the above language is included in the Community Plan prior to Plan adoption.

Residual Impacts. Implementation of the above mitigation measure would reduce construction noise and vibration impacts to a less than significant level.

> ***Threshold:*** ***Would actions under the Community Plan result in a substantial temporary of periodic increase in ambient noise levels in the project vicinity above levels existing without the project?***
>
> ***Threshold:*** ***Would actions under the Community Plan result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?***

Impact NOS-2 Traffic generated by the Community Plan is not anticipated to result in a significant ambient noise level increase at existing sensitive receivers. The increase in ambient noise would be a Class III, *less than significant*, impact.

Existing ambient noise levels in the Community Plan area are dominated by vehicle traffic noise, particularly from Los Osos Valley Road and South Bay Boulevard. Vehicular traffic on roadways and the corresponding noise levels would increase due to future development consistent with the Community Plan. Increases in traffic noise would potentially degrade the existing noise environment, especially with respect to noise-sensitive receivers. Policy 3.3.6 of the County's General Plan states that the County shall consider implementing mitigation measures where new development may result in cumulative increases of noise upon noise-sensitive land uses. A significant impact would occur if implementation of the Community Plan resulted in or created a substantial increase in the existing ambient noise levels.

As stated in General Plan Policy 3.3.3, noise created by new transportation noise sources shall be mitigated so as not to exceed the levels specified in **Table 4.9-3**. For residential uses, the exterior noise level limit is 60 CNEL. A significance increase in ambient noise levels would occur if the Community Plan would result in noise levels that exceed the compatibility level. There are locations adjacent to Los Osos Valley Road and South Bay Boulevard where existing noise levels already exceed 60 CNEL. In these location, a significant cumulative increase in ambient noise levels would occur if the Community Plan's contribution to the future noise increase would be greater than 1 dB(A).

Existing and future noise levels with and without implementation of the Community Plan were modeled at 50 feet from each roadway segment centerline using SoundPLAN. **Table 4.9-8** summarizes the existing and future (year 2035) noise levels adjacent to area roadways and the associated increase in noise.

Table 4.9-8. Increase in Ambient Noise

Roadway	Segment	Existing Noise Level (CNEL)	Future (Year 2035) without Community Plan Noise Level (CNEL)	Proposed Community Plan Future (Year 2035) Noise Level (CNEL)	Change in CNEL (Future with Plan – Existing)	Plan Contribution to Change in CNEL (Future with Plan – Future without Plan)	Significance Threshold	Significant?
Los Osos Valley Road	east of Los Osos Creek	67	69	69	2	0	+1 CNEL	No
Los Osos Valley Road	east of South Bay Boulevard	65	65	66	1	1	+1 CNEL	No
Los Osos Valley Road	west of South Bay Boulevard	62	63	63	1	0	+1 CNEL	No
Los Osos Valley Road	east of 9th Street	62	63	63	1	-1	+1 CNEL	No
Los Osos Valley Road	west of Bush Drive	61	63	62	1	-1	+1 CNEL	No
Los Osos Valley Road	west of Palisades Avenue	60	62	62	2	0	+1 CNEL	No
Los Osos Valley Road	east of Doris Avenue	61	62	62	1	0	+1 CNEL	No
Los Osos Valley Road	east of Pecho Drive	61	62	62	1	0	+1 CNEL	No
South Bay Boulevard	north of Los Osos Valley Road	66	68	69	3	1	+1 CNEL	No
South Bay Boulevard	south of Santa Ysabel Avenue	65	68	68	2	0	+1 CNEL	No
South Bay Boulevard	north of Santa Ysabel Avenue	67	68	68	1	0	+1 CNEL	No
Pecho Valley Road	south of Monarch Lane	56	58	59	3	1	60 CNEL	No
Pecho Valley Road	south of Rodman Drive	51	55	56	5	1	60 CNEL	No
Los Olivos Avenue	west of 10th Street	54	50	56	2	5	60 CNEL	No
Santa Ynez Avenue	west of 11th Street	54	57	57	3	1	60 CNEL	No
Nipomo Avenue	west of South Bay Boulevard	52	55	57	4	1	60 CNEL	No
Ramona Avenue	west of 9th Street	54	59	58	4	-2	60 CNEL	No
Ramona Avenue	west of 4th Street	51	56	55	3	-2	60 CNEL	No
El Moro Avenue	east of South Bay Boulevard	51	53	52	2	-1	60 CNEL	No
El Moro Avenue	west of 11th Street	52	56	55	4	-1	60 CNEL	No
El Moro Avenue	west of 7th Street	51	56	56	5	-1	60 CNEL	No
Santa Ysabel Avenue	east of South Bay Boulevard	49	52	50	1	-1	60 CNEL	No
Santa Ysabel Avenue	east of 11th Street	59	56	57	-2	1	60 CNEL	No
Santa Ysabel Avenue	west of 11th Street	57	55	56	-1	1	60 CNEL	No
Santa Ysabel Avenue	east of 7th Street	57	56	56	-1	1	60 CNEL	No
Santa Ysabel Avenue	west of 7th Street	54	52	53	-1	1	60 CNEL	No
Pecho Road	north of Los Osos Valley Road	48	53	51	3	-2	60 CNEL	No
Doris Avenue	south of Los Osos Valley Road	51	51	53	2	2	60 CNEL	No
Doris Avenue	north of Los Osos Valley Road	43	44	45	3	1	60 CNEL	No
Ravenna Avenue	south of Los Osos Valley Road	47	50	50	3	0	60 CNEL	No
7th Street	north of Ramona Avenue	54	56	56	2	0	60 CNEL	No
Bayview Heights Drive	south of Los Osos Valley Road	53	57	58	6	2	60 CNEL	No
9th Street	north of Los Osos Valley Road	59	58	59	0	1	60 CNEL	No
11th Street	south of Santa Ysabel Avenue	54	48	52	-1	4	60 CNEL	No

As shown, with the exception of Los Osos Valley Road and South Bay Boulevard, existing and future noise levels with and without implementation of the Community Plan would be less than 60 CNEL. Development resulting from implementation of the Community Plan would not result in the exposure of existing sensitive receivers adjacent to these roadways to noise levels exceeding 60 CNEL. Therefore, the increase in ambient noise levels adjacent to these roadway segments would be a **Class III**, *less than significant*, impact.

Future noise levels with implementation of the Community Plan exceed 60 CNEL adjacent to Los Osos Valley Road and South Bay Boulevard. However, noise levels exceed 60 CNEL at these locations under both the existing condition and the future no-project condition as well. There are existing residential uses located adjacent to these roadway segments. When comparing the future noise levels with and without implementation of the Community Plan, the contribution of new development under the proposed Community Plan's to the change in ambient noise levels would not exceed 1 dB(A). Therefore, the increase in ambient noise levels due to Community Plan-generated traffic would be a **Class III**, *less than significant*, impact.

It should be noted that there are roadway segments where future noise levels under the Community Plan would be less than future noise levels under the adopted Estero Area Plan. This is due to the redistribution of certain land uses and traffic that would occur under the proposed Community Plan.

Mitigation Measures. No mitigation is required.

Residual Impacts. Impacts associated with the increase in ambient noise would be **Class III**, *less than significant*.

Threshold:	***Would actions under the Community Plan result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?***

Impact NOS-3 The Community Plan would place future sensitive receptors in areas that would be exposed to future transportation noise levels that exceed General Plan noise standards. This would be a Class II, *significant but mitigable*, impact.

The maximum allowable noise exposure from transportation sources are summarized in **Table 4.9-3**. As discussed in Policy 3.3.2, new development of noise-sensitive land uses shall not be permitted in areas where transportation noise sources exceed 60 CNEL (70 CNEL for outdoor sports and recreation) unless

the project design includes effective mitigation measures to reduce noise in outdoor activity areas and interior spaces to or below the levels specified in **Table 4.9-3**.

Noise contours for existing and future conditions were modeled using measured and projected traffic volumes on major roadways within the Community Plan area. Noise contours are based on a flat site conditions with no intervening barriers or obstructions (worst-case analysis). This is considered conservative, as the noise levels at any specific location would depend upon not only the source noise level but also the nature of the path from the source to the receiver. Buildings, walls, dense vegetation, and other barriers would block the direct line of sight and reduce noise levels at the receiver. As an example, a first row of buildings would reduce traffic noise levels at receivers by 3 to 5 dB(A) behind those structures depending on the building-to-gap ratio. Large continuous structures can provide substantially greater attenuation of traffic noise.

Figure 4.9-3 shows the future vehicle traffic noise contours for the Community Plan area. As shown, vehicle traffic noise levels throughout most of the Community Plan area are not projected to exceed 60 CNEL. Noise levels have the potential to exceed 60 CNEL adjacent to Los Osos Valley Road and South Bay Boulevard. **Table 4.9-9** summarizes the distances from the centerline to the 60, 65, and 70 CNEL contour lines for Los Osos Valley Road and South Bay Boulevard. The distances are expressed in feet from the roadway centerline. **Table 4.9-9** also summarizes the approximate distance from the centerline to the edge of the roadway right-of-way. Contour distances are based on future year 2035 traffic volumes under the Community Plan as modeled in SoundPLAN.

Table 4.9-9. Contour Distances for Los Osos Valley Road and South Bay Boulevard

Roadway	Segment	Distance to (feet)			
		Edge of Right-of-Way	70 CNEL	65 CNEL	60 CNEL
Los Osos Valley Road	east of Los Osos Creek	25	42	86	175
Los Osos Valley Road	east of South Bay Boulevard	30	--	61	127
Los Osos Valley Road	west of South Bay Boulevard	35	--	40	83
Los Osos Valley Road	east of 9th Street	35	--	37	77
Los Osos Valley Road	west of Bush Drive	25	--	34	69
Los Osos Valley Road	west of Palisades Avenue	15	--	33	66
Los Osos Valley Road	east of Doris Avenue	15	--	31	63
Los Osos Valley Road	east of Pecho Drive	25	--	30	62
South Bay Boulevard	north of Los Osos Valley Road	20	40	84	171
South Bay Boulevard	south of Santa Ysabel Avenue	20	35	73	149
South Bay Boulevard	north of Santa Ysabel Avenue	20	40	78	156

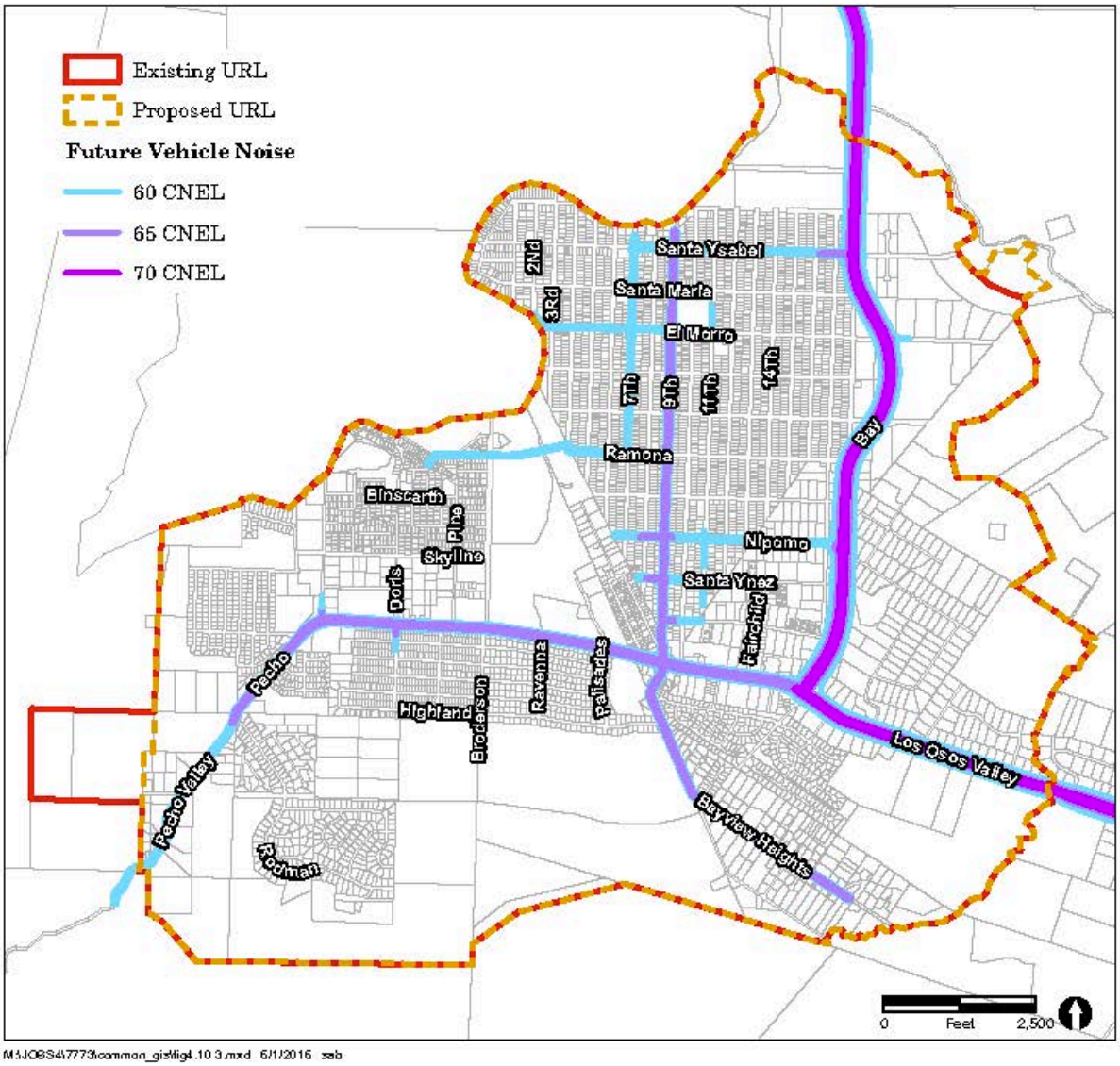

Figure 4.9-3. Future Vehicle Traffic Noise Contours

Policies 3.3.1 and 3.3.2 of the General Plan set standards for the siting of sensitive land uses. New development of noise-sensitive land uses would not be permitted in areas exposed to transportation noise levels which exceed 60 CNEL (70 CNEL for outdoor sports and recreation) unless the project design includes effective mitigation measures to reduce noise in outdoor activity areas and interior spaces to or below the levels specified in **Table 4.9-3**. Noise sensitive land uses located adjacent to Los Osos Valley Road and South Bay Boulevard would have the potential to be exposed to exterior noise levels that exceed County standards (60 CNEL). The contours distances are shown in **Table 4.9-9**. As noted in Section 4.9.1, the drop-off rate for a line source such as vehicle traffic ranges from 3 to 4.5 dB(A) for each doubling of distance. As shown in **Figure 4.9-3**, for all other roadways, the 60 CNEL contour would be entirely within or at the edge of the right-of-way.

Site-specific exterior noise analyses that demonstrate that the project would not place sensitive receivers in locations where the exterior existing or future noise levels would exceed the noise compatibility guidelines of the General Plan would be required. Noise control measures such as site design, sound walls, and other measures could reduce noise to acceptable levels. Such measures cannot practically be designed at this time, because no specific projects have been designed and proposed at this time. Exterior noise impacts adjacent to Los Osos Valley Road and South Bay Boulevard would be **Class II**, *significant but mitigable*.

Interior noise impacts for all future development projects would be **Class III**, *less than significant*, because applicants must demonstrate compliance with the current interior noise standards (45 CNEL) through submission and approval of a Title 24 Compliance Report.

Mitigation Measures. The Community Plan would place future sensitive receptors in areas would be exposed to future transportation noise levels that exceed General Plan noise standards. The following mitigation would be required.

NOS-3(a) **Planning Area Standards.** The following language shall be added to Section 7.3: Communitywide Standards of the Community Plan:

Noise Compatibility: *Where noise sensitive development such as residential uses is proposed within the projected 60 CNEL noise contours distances for Los Osos Valley Road and South Bay Boulevard, a site-specific noise study shall be conducted to demonstrate compliance with the County's noise and land use compatibility standards (60 CNEL). This study shall be completed for noise sensitive uses located within the following distances of the identified segments of Los Osos Valley Road and South Bay Boulevard:*

Roadway	*Segment*	*Distance to (feet) 60 CNEL*
Los Osos Valley Road	*east of Los Osos Creek*	*175*
Los Osos Valley Road	*east of South Bay Boulevard*	*127*
Los Osos Valley Road	*west of South Bay Boulevard*	*83*
Los Osos Valley Road	*east of 9th Street*	*77*
Los Osos Valley Road	*west of Bush Drive*	*69*
Los Osos Valley Road	*west of Palisades Avenue*	*66*
Los Osos Valley Road	*east of Doris Avenue*	*63*
Los Osos Valley Road	*east of Pecho Drive*	*62*
South Bay Boulevard	*north of Los Osos Valley Road*	*171*
South Bay Boulevard	*south of Santa Ysabel Avenue*	*149*
South Bay Boulevard	*north of Santa Ysabel Avenue*	*156*

This study shall contain recommendations to mitigate any noise levels that exceed the County's standard of 60 CNEL. At the program level, the specific attenuation methods cannot be definitively determined. Noise reduction measure could include, but are not limited to, the following:

- *Construction of a berm or wall;*
- *Design of individual homes such that structures block the line-of-sight from useable backyards to the noise source;*
- *For homes with backyards not blocked by intervening structures, backyard fencing of sufficient height to block line-of sight to the noise source; or*
- *Placement of exterior use areas and balconies away from the noise source, as applicable.*

Plan Requirements and Timing. The Planning and Building Department shall add the recommended language to the Community Plan prior to adoption.

Monitoring. Planning and Building shall ensure that the above language is included in the Community Plan prior to adoption.

Residual Impacts. Implementation of the above mitigation measure would reduce noise impacts to a less than significant level.

Threshold: ***Would actions under the Community Plan result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?***

Impact NOS-4 Future on-site generated noise sources have the potential to exceed to property line noise levels limits established in the County's Code. This would be a Class II, *significant but mitigable*, impact.

A significant impact would occur if implementation of the Community Plan resulted in the exposure of people to noise levels that exceed limits established in the County's General Plan and County Code. These limits apply to existing uses, but will also apply to future uses and are used for evaluating potential impacts of future on-site generated noise levels.

Stationary sources of noise include activities associated with a given land use. The noise sources associated with future residential development proposed under the Community Plan would be those typical of any residential development (vehicles arriving and leaving, children at play and landscape maintenance machinery). None of these noise sources are anticipated to violate the County's Code or result in a substantial permanent increase in existing noise levels. However, HVAC equipment with exterior fans or condensers mounted on the ground or roofs have the potential to produce noise in excess of the County's limits. It is not known at this program level which manufacturer, brand, or model of unit or units would be selected for any project associated with the Community Plan.

The noise sources associated with future commercial, retail, educational, and industrial development proposed under the Community Plan include HVAC, commercial-related mechanical equipment, loading docks, deliveries, trash-hauling activities and customer and employee use of commercial facilities. The type of activities and equipment that would generate noise at commercial uses is not known at this program level.

County policies in the General Plan and regulations in the County Code are in place to control noise and reduce on-site generated noise impacts between various land uses. The property line noise level limits for stationary noise sources are summarized in **Table 4.9-4**. As shown, the daytime property line noise level limit is 50 dB(A) L_{eq} and the nighttime property line noise level limit is 45 dB(A) L_{eq} (Section 22.10.120. Without detailed operational data, it cannot be verified that future projects implemented in accordance with the Community Plan would be capable of reducing noise levels to comply with these County standards. Impacts would be **Class II**, *significant but mitigable*, at the project-level.

Per the Noise Element, when mitigation is required to satisfy the policies contained in Chapter 3.3, the following sequence of mitigation measures shall be considered in the following order of preference:

1. Site layout, including setbacks, open space separation and shielding of noise-sensitive uses with non-noise-sensitive uses;
2. Acoustic treatment and design of buildings; and
3. Structural measures, including construction of earthen berms or noise barriers.

Mitigation Measures. Future on-site generated noise sources have the potential to exceed to property line noise levels limits established in the County's Code. Without detailed operational data, it cannot be verified that future projects implemented in accordance with the Community Plan would be

capable of reducing noise levels to comply with the County's Code property line standards. Impacts may be significant, and the following mitigation would be required.

NOS-4(a) **Community Plan Safety/Health Guidelines and Standards.** The following language shall be added as a subsection to 7.3 Communitywide Standards of the Community Plan.

Noise Study. Where new commercial and industrial development would be located adjacent to residential uses, a site-specific noise study should be conducted to demonstrate compliance with the County noise standards in the Land Use Ordinance (Section 22.10.120).For the purpose of this measure, "adjacent" is assumed to include properties immediately bordering the existing use where the existing structures are within 50 feet of the project site. This study shall determine the area of impact and present appropriate mitigation measures. The mitigation measures required as a result of the noise study may include, but are not limited to the following:

- For new commercial uses, require the placement of loading and unloading areas so that buildings shield nearby residential land uses from noise generated by loading dock and delivery activities or such that there is an open space separation large enough to attenuate noise levels below the threshold.
- Require the placement of all commercial HVAC machinery to be placed within mechanical equipment rooms wherever feasible. If such mechanical equipment is to be outdoors and would expose adjacent residences to equipment noise, provide a noise study to confirm that standards applicable to stationary noise sources in the County Noise Element and Land Use Ordinance will be met.

Plan Requirements and Timing. The Planning and Building Department shall add the recommended language to the Community Plan prior to adoption.

Monitoring. Planning and Building shall ensure that the above language is included in the Community Plan prior to adoption.

Residual Impacts. Implementation of the above mitigation measure would reduce operational noise impacts to a less than significant level.

c. Cumulative Impacts. Cumulative development in the Community Plan area would gradually increase population over the existing conditions and would therefore increase noise. The current residential population of the Community Plan area is 13,906. Buildout of the Community Plan would accommodate an additional 4,094 residents for a total of 18,000 residents. The analysis of the increase in noise levels in the Community Plan area is based on the transportation impact analysis, which accounts for future growth at buildout of the Community Plan. Therefore, cumulative noise impacts associated with buildout of the Community Plan were addressed in the impact analysis above. As discussed, impacts to existing uses due to the increase in vehicle traffic in the Community Plan area would be **Class III**, ***less than significant***, while impacts to future development located within the 60 CNEL contours for Los Osos Valley Road and South Bay Boulevard would be **Class II**, ***significant but mitigable***, with implementation of mitigation measure **NOS-3(a)**.

Due to the temporary nature of construction activities and the implementation of mitigation measure **NOS-1(a)**, cumulative impacts associated with construction noise would be **Class III, *less than significant***. Additionally, County policies in the General Plan and regulations in the County Code are in place to control noise and reduce on-site generated noise impacts between various land uses. With implementation of mitigation measure **NOS-4(a)**, cumulative impacts associated with stationary noise sources would be ***Class III, less than significant***.

d. Subsequent Environmental Review for Future Development Projects in the Community Plan Area. Pursuant to CEQA Guidelines Section 15183, additional CEQA review is not required for projects that are consistent with the development density established by existing zoning, community plan or general plan policies for which an EIR was certified, except as might be necessary to examine whether there are project-specific effects which are peculiar to the project or its site. **Table 4.9-10** describes conditions under which future development in the study area would require additional CEQA review, pursuant to Section 15183.

Table 4.9-10. Conditions Under Which Future Development in the Community Plan Area Would Require Additional CEQA Review

Condition	Impact to Address
The future project is inconsistent with underlying General Plan and zoning designations.	NOI-1 through NOI-4
The future project is inconsistent with Community Plan policies or design guidelines.	NOI-1 through NOI-4
The future project would result in a noise impact peculiar to the project or parcel in any issue area. An effect is not considered peculiar if uniformly applied development policies or standards previously adopted by the County would substantially mitigate the environmental effect.	Impact that is peculiar to the project or parcel
The future project would result in an impact or impacts not analyzed above, including off-site or cumulative effects.	Impact other than NOI-1 through NOI-4
The future project would result in an impact or impacts analyzed above, but at a higher level of severity as a result of substantial new information not known at the time the EIR was certified. This may include the following circumstance: • *If the County Noise Element is updated to include stricter maximum allowable noise exposure levels*	Worsened NOI-1 through NOI-4, as applicable