

3.8 NOISE

This section addresses the noise and vibration impacts associated with construction and development under the East Cherry Avenue Specific Plan (Project). Noise is generally defined as unwanted sound that interferes with normal activities or otherwise diminishes the quality of the environment. Noise is usually measured as sound level on a logarithmic decibel (dB) scale.

3.8.1 Environmental Setting

3.8.1.1 Fundamentals of Sound and Environmental Noise

Noise

Prolonged exposure to high levels of noise is known to have several adverse effects on people, including hearing loss, communication interference, sleep interference, physiological responses, and annoyance. The noise environment typically includes background noise generated from both near and distant noise sources as well as the sound from individual local sources. These can vary from an occasional aircraft or train passing by to continuous noise from sources such as traffic on a major road.

The standard unit of measurement of the loudness of sound is the dB and given that the human ear is not equally sensitive to sound at all frequencies, a special frequency-dependent rating scale has been devised to relate noise to human sensitivity. The A-weighted decibel scale (dBA) performs this compensation by discriminating against frequencies in a manner approximating the sensitivity of the human ear. Decibels are based on the logarithmic scale that compresses the wide range in sound pressure levels to a more useable range of numbers in a manner similar to the way that the Richter scale is used to measure earthquakes. In terms of human response to noise, studies have indicated that a noise level increase of 3 dBA is barely perceptible to most people, a 5 dBA increase is readily noticeable, and a difference of 10 dBA would be perceived as a doubling of loudness. Everyday sounds normally range from 30 dBA to 100. Examples of various sound levels in different environments are shown in Table 3.8-1.

Table 3.8-1. Representative Noise Levels

| Common Outdoor Activities | Noise Level (dBA) | Common Indoor Activities |
|--|-------------------|---|
| Power Saw | —110— | Rock Band |
| Jet Fly-over at 100 feet | | Crying Baby |
| Subway | —100— | |
| Gas Lawnmower at 3 feet | | |
| Rail Transit Horn/ Tractor | —90— | |
| Jack Hammer | | Food Blender at 3 feet |
| Rail Transit At-grade (50 mph) | —80— | Garbage Disposal at 3 feet |
| Noisy Urban Area during Daytime | | |
| Gas Lawnmower at 100 feet | —70— | Vacuum Cleaner at 10 feet |
| Rail Transit in Station/ Commercial Area | | Normal Speech at 3 feet |
| Heavy Traffic at 300 feet | —60— | Sewing Machine |
| Air Conditioner | | Large Business Office |
| Quiet Urban Area during Daytime | —50— | Dishwasher in Next Room |
| | | Refrigerator |
| Quiet Urban Area during Nighttime | —40— | Theater, Large Conference Room (background) |
| Quiet Suburban Area during Nighttime | | |
| | —30— | Library |
| Quiet Rural Area during Nighttime | | Bedroom at Night, Concert Hall (background) |
| | —20— | |
| | | Broadcast/Recording Studio |
| | —10— | |
| | | |
| Lowest Threshold of Human Hearing | —0— | Lowest Threshold of Human Hearing |

Source: California Department of Transportation 1998.

Several rating scales have been developed to analyze the adverse effect of community noise on people. Since environmental noise fluctuates over time, these scales consider the effect of noise upon people largely dependent upon the total acoustical energy content of the noise, as well as the time of day when the noise occurs. Each noise rating scale applicable to this analysis is defined as follows:

- L_{eq} (equivalent energy noise level) is the average acoustic energy content of noise for a stated period of time. Thus, the L_{eq} of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure. For evaluating community impacts, this rating scale does not vary, regardless of whether the noise occurs during the day or the night.
- CNEL (Community Noise Equivalent Level) is a 24-hour average L_{eq} with a 5 dBA “weighting” during the hours of 7:00 PM to 10:00 PM and a 10 dBA “weighting” added to noise during the hours of 10:00 PM to 7:00 AM to account for noise sensitivity in the evening and nighttime, respectively. The logarithmic effect of these additions is that a 60 dBA 24-hour L_{eq} would result in a measurement of 66.7 dBA CNEL.
- L_{dn} (day-night average noise level) is a 24-hour average L_{eq} with a 10 dBA “weighting” added to noise during the hours of 10:00 PM to 7:00 AM to account for noise sensitivity in the nighttime. The logarithmic effect of these additions is that a 60 dBA 24-hour L_{eq} would result in a measurement of 66.4 dBA L_{dn} .
- L_{min} (minimum instantaneous noise level) is the minimum instantaneous noise level experienced during a given period of time.
- L_{max} (maximum instantaneous noise level) is the maximum instantaneous noise level experienced during a given period of time.

Noise levels from a particular source decline (attenuate) as distance to the receptor increases. Other factors, such as the weather and reflecting or shielding by buildings or other structures, intensify or reduce the noise level at a location. A common method for estimating roadway noise is that for every doubling of distance from the source, the noise level is reduced by about 3 dBA at acoustically “hard” locations (i.e., mostly asphalt, concrete, hard-packed soil, or other solid materials) and 4.5 dBA at acoustically “soft” locations (i.e., contains normal earth or vegetation, such as grass).

Noise from stationary or point sources (including construction noise) is reduced by about 6 to 7.5 dBA for every doubling of distance at acoustically hard and soft locations, respectively. Noise levels may also be reduced by intervening structures. Generally, a single row of buildings between the receptor and the noise source reduces the noise level by about 5 dBA, while a solid wall or berm can reduce noise levels by up to 5 to 10 dBA. The manner in which older homes in California were constructed generally provides a reduction of exterior-to-interior noise levels of about 20 to 25 dBA with closed windows. The exterior-to-interior noise reduction of newer residential units is generally 30 dBA or more.

Groundborne Vibration



Vibration is sound radiated through the ground. The vibration of floors and walls may cause perceptible vibration, rattling of items such as windows or dishes on shelves, or a rumble noise. The rumble is the noise radiated from the motion of the room surfaces. In essence, the room surfaces act like a giant loudspeaker causing what is called groundborne noise. Groundborne vibration is almost never annoying to people who are outdoors. Although the motion of the ground may be perceived, without the effects

associated with the shaking of a building, the motion does not provoke the same adverse human reaction. In addition, the rumble noise that usually accompanies the building vibration is perceptible only inside buildings. The ground motion caused by vibration is measured as particle velocity in inches per second; in the U.S., this is referenced as vibration decibels (VdB) (Harris Miller Miller & Hanson Inc. 2006a). The vibration velocity level threshold of perception for humans is approximately 65 VdB. A vibration velocity level of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels for many people. Most perceptible indoor vibration is caused by sources within buildings, such as operation of mechanical equipment, movement of people, or the slamming of doors. Typical outdoor sources of perceptible groundborne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If a roadway is smooth, the groundborne vibration from traffic is rarely perceptible. The range of interest for groundborne vibration is from approximately 50 VdB, which is the typical background vibration velocity level, to 100 VdB, which is the general threshold where minor damage can occur in fragile buildings (Harris Miller Miller & Hanson Inc. 2006a). General human response to different levels of groundborne vibration velocity levels are described in Table 3.8-2.

Table 3.8-2. Human Response to Different Levels of Groundborne Vibration

| Vibration Velocity Level | Human Response |
|--------------------------|---|
| 65 VdB | Approximate threshold of perception for many humans. |
| 75 VdB | Approximate dividing line between barely perceptible and distinctly perceptible. Many people find transit vibration at this level annoying. |
| 85 VdB | Vibration acceptable only if there are an infrequent number of events per day. |

Source: (Harris Miller Miller & Hanson Inc. 2006a),

3.8.1.2 Existing Noise Environment

The Project site is located adjacent to a low density single family neighborhood, on the semi-rural edge of the City. The predominant source of noise comes from vehicular traffic on adjacent or nearby roads. The Project vicinity generally experiences low noise levels. Noise in this area is characteristic of quiet suburban neighborhoods that typically experience noise between 46 and 52 dB CNEL (EPA 1974). Roadway noise is a function of traffic volume, vehicle fleet mix, and traffic speeds. High traffic volumes generate more noise than low volumes. A vehicle fleet mix with a high percentage of trucks is noisier than a mix composed of mostly passenger automobiles. These variables indicate that roads with high traffic volumes of mixed traffic traveling at high speeds are prime sources of roadway noise.

Specifically, the principal contributors to the ambient noise environment at the Project site are traffic along Traffic Way adjacent to the site, and along the U.S. Highway 101, approximately 300 feet west of the Project site. Traffic along East Cherry Avenue also generates some traffic-related noise. The Project site may generate some minor noise levels associated with agricultural activities that occur within Subareas 1 and 2, such as tilling, planting, irrigation, and harvesting.

3.8.1.3 Sensitive Receptors

Noise sensitive uses, or receptors, generally include single- and multi-family residences, schools, libraries, medical facilities, retirement/assisted living homes, health care facilities, and places of worship. Such uses can be sensitive to increases in both short-term and long-term noise due to a range of issues, such as sleep disturbance and disruption of conversations, lectures or sermons, or decreased attractiveness of exterior use areas, such as patios, backyards, or parks. Of particular concern is exposure of sensitive receptors to long-term elevated interior noise levels and sleep disturbance, which can be associated with health concerns.

No sensitive land uses are currently within the Project site. Sensitive land uses in the Project vicinity include a residential neighborhood with single-family residences along East Cherry Avenue to the north, single family residences adjacent to the northeast and south, Vagabond Mobile Home Park adjacent to the southwest containing approximately 25 units, and the St. Barnabas' Episcopal Church located on the adjacent hillside property 200 feet to the southeast (see Figure 3.8-1).



Noise Sensitive Receptors

FIGURE 3.8-1

3.8.2 Regulatory Setting

3.8.2.1 Federal

Federal Transit Administration Criteria

The Federal Transit Administration (FTA) developed methodology and significance criteria to evaluate noise vibration impacts from surface transportation modes (i.e., passenger cars, trucks, buses, and rail) in the Transit Noise Impact and Vibration Assessment (Harris Miller Miller & Hanson Inc. 2006a). For residential buildings, the

noise and vibration threshold applicable to these projects is 64 dBA CNEL and 80 VdB, respectively.

Federal Noise Control Act (1972)

Public Law 92-574 regulates noise emissions from operation of all construction equipment and facilities; establishes noise emission standards for construction equipment and other categories of equipment; and provides standards for the testing, inspection, and monitoring of such equipment. This Act gives states and municipalities primary responsibility for noise control.

3.8.2.2 State

State of California's Guidelines for the Preparation and Content of Noise Element of the General Plan (1987)

These guidelines reference land use compatibility standards for community noise environments as developed by the California Department of Health Services, Office of Noise Control. Sound levels up to 65 L_{dn} or CNEL are determined to be normally acceptable for multi-family residential land uses. Sound levels up to 70 dBA CNEL are normally acceptable for buildings containing professional offices or defined as business commercial. However, a detailed analysis of noise reduction requirements is recommended when new residential development is proposed in areas where existing sound levels approach 70 dBA CNEL.

3.8.2.3 Local

City of Arroyo Grande General Plan

General Plan, Noise Element

According to state law, a Noise Element is required in all City and County general plans. The City slightly modified land use compatibility standards recommended by the California Department of Health Services. The City's maximum noise exposure standards for noise-sensitive land use (specific to transportation noise sources) are shown in Table 3.8-3. Since residential land uses are considered noise-sensitive, there are recommended maximum noise exposure guidelines.

Table 3.8-3. Maximum Allowable Noise Exposure Transportation Noise Sources

| Land Use | Outdoor | Interior Spaces | |
|---|--|---------------------------|-----------------------|
| | Activity Areas ¹ L _{dn} /CNEL, dB | L _{dn} /CNEL, dB | L _{sq1/2} dB |
| Residential | 60 ³ | 45 | -- |
| Transient Lodging | 60 ³ | 45 | -- |
| Hospitals, Nursing Homes | 60 ³ | 45 | -- |
| Theaters, Auditoriums, Music Halls | -- | -- | 35 |
| Churches, Meeting Halls, Office Buildings | 60 ³ | -- | 45 |
| Restaurants⁴ | 60 ³ | 45 | -- |
| Schools, Libraries, Museums, Preschools, Child Care Facilities | -- | -- | 45 |
| Playgrounds (including school playgrounds) | 70 | -- | -- |

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 Where it is not possible to reduce noise in outdoor activity areas to 60 dB L_{dn}/CNEL or less using a practical application of best-available noise reduction measures, an exterior noise level of up to 65 dB L_{dn}/CNEL may be allowed provided that available exterior noise level reduction measures have been implemented and interior noise levels are in compliance with this table.

⁴ Restaurants included with or without outdoor dining or entertainment and/or drive-up windows.

Source: City of Arroyo Grande 2001.

Policy N1-2 – 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}/CNEL for playgrounds and neighborhood parks) 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 given land use in Table 3.8-3.

Policy N2 & 3-3 – 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 3.8-5 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 3.8-4.

The City's *Noise Element* lists mitigation strategies in a descending order of desirability. If preferred strategies are not implemented, it is the responsibility of the applicant to demonstrate through a detailed noise study that the more desirable approaches are either not effective or not practical, before considering other design criteria contained in the General Plan:

Table 3.8-4. Maximum Noise Exposure for Noise-Sensitive Land Use Areas Due to Stationary Noise Sources

| | Daytime (7:00 AM to 10:00 PM) | Nighttime ² (10:00 PM to 7:00 AM) |
|--|----------------------------------|---|
| Hourly L_{eq} , dB ³ | 50 | 45 |
| Maximum level, dB ³ | 70 | 65 |
| Maximum level, dB-Impulsive Noise ⁴ | 65 | 60 |

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 receptor side of noise barriers or other property line noise mitigation measures. Where the noise-sensitive land uses are parks or playgrounds, add ten (10) decibels to the noise level standards in this table.

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

³ Sound level measurements shall be made with slow meter response.

⁴ Sound level measurements shall be made with fast meter response.

Source: (City of Arroyo Grande 2001).

Table 3.8-5. Noise Ranges of Typical Construction Equipment

| Construction Equipment | Noise Levels in dBA Leq at 50 Feet |
|------------------------|------------------------------------|
| Trucks | 82–95 |
| Cranes (moveable) | 75–88 |
| Cranes (derrick) | 86–89 |
| Vibrator | 68–82 |
| Saws | 72–82 |
| Generators | 71–83 |
| Compressors | 75–87 |
| Concrete Mixers | 75–88 |
| Concrete Pumps | 81–85 |
| Back Hoe | 73–95 |
| Tractor | 77–98 |
| Scraper/Grader | 80–93 |
| Paver | 85–88 |

Note: Machinery equipped with noise control devices or other noise-reducing design features does not generate the same level of noise emissions as that shown in this table.

Source: U.S. Department of Transportation 2013.

Policy N5-1 – The City would consider the following mitigation measures appropriate where existing sound levels significantly impact noise-sensitive land uses, or where cumulative increases in sound levels resulting from new development significantly impact existing noise-sensitive land uses:

- a) Rerouting traffic onto streets that have low traffic volumes or onto streets that do not adjoin noise-sensitive land uses.
- b) Rerouting trucks onto streets that do not adjoin noise-sensitive land uses.

- c) Constructing noise barriers.
- d) Lowering speed limits.
- e) Acoustical treatment of buildings.
- f) Programs to pay for noise mitigation such as low cost loans of noise-impacted property or establishment of developer fees.

City of Arroyo Grande Municipal Code, Title 9, Chapter 9.16 - Noise

The City's Municipal Code (§9.16) specifies noise standards for various sources of noise, exceptions to noise standards, noise level measurement standards, and the penalties associated with the violation of any provisions of this chapter.

Section 9.16.030(d) – Noise sources associated with construction, provided such activities do not take place before 7:00 AM or after 10:00 PM on any day except Saturday or Sunday, or before 8:00 AM or after 5:00 PM on Saturday or Sunday.

Section 9.16.030(e) – Noise sources associated with the routine maintenance of a residential, commercial, industrial, or public/quasi-public property provided that such maintenance activities take place between the hours of 7:00 AM and 10:00 PM.

Section 9.16.030(g) – Noise sources associated with work performed by the city or private or public utilities in the maintenance or modification of its facilities.

Section 9.16.030(h) – Noise sources associated with the collection of waste or garbage from property devoted to other than residential uses.

Section 9.16.060(a) – Air Conditioning and Refrigeration. Notwithstanding the provisions of Section 9.16.040, when the intruding noise source is an air conditioning or refrigeration system or associated equipment installed prior to the effective date of this chapter, the exterior noise level as measured as provided in Section 9.16.070 shall not exceed fifty-five (55) dB, except where such equipment is exempt from the provisions of this chapter. The exterior noise level shall not exceed fifty (50) dB for such equipment installed or in use after one year after the effective date of this chapter.

Section 9.16.060(b) – Waste and Garbage Collection Equipment. Notwithstanding the provisions of Section 9.16.040, noise sources associated with the collection of waste or garbage from a residential use by persons authorized to engage in such activity, and who are operating truck-mounted loading or compacting equipment, shall not take place before 7:00 AM or after 7:00 PM, and the noise level created by such activities when

measured at a distance of 50 feet in an open area shall not exceed the following standards:

- 85 dB for equipment in use, purchased or leased within six months from the effective date of this chapter;
- 80 dB for the equipment set forth above after five years from the effective date of this chapter;
- 80 dB for new equipment purchased or leased after six months from the effective date of this chapter;
- 75 dB for new equipment purchased or leased after 36 months from the effective date of this chapter.

3.8.3 Environmental Impact Analysis

3.8.3.1 Thresholds of Significance

Sound levels for the Project must comply with relevant noise policies, standards, and ordinances. Appendix G of the 2016 CEQA Guidelines provides a set of screening questions that address impacts related to noise. Specifically, the Guidelines state that a proposed project would have a significant adverse impact related to noise if:

- a) The project would 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;
- b) The project would result in exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels;
- c) The project would result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project;
- d) The project would result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project;
- e) 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, the project would expose people residing or working in the project area to excessive noise levels; or
- f) For a project within the vicinity of a private airstrip, the project would expose people residing or working in the project area to excessive noise levels.

In addition to CEQA Guidelines Appendix G thresholds of significance, the City considers exceedance of a 3dB increase (a perceptible change) along roadways and/or the City's Noise Element defined maximum decibels for both outdoor and indoor residential uses (see preceding Tables 3.8-3 and 3.8-4) as a potential significant noise impact.

3.8.3.2 Impact Assessment Methodology

Construction Noise

Anticipated construction sound levels were estimated and analyzed based on projected construction vehicle requirements, distance between sensitive receptors and construction activities, and proposed daytime operational levels. Standard noise generation levels for typical construction equipment were used to estimate construction sound levels.

Noise levels were estimated using data published by the Federal Highway Administration (FHWA) regarding the noise-generating characteristics of typical construction activities (see Table 3.8-5). These noise levels would diminish rapidly with distance from the construction site, at a rate of approximately 6 dBA per doubling of distance as equipment is generally stationary or confined to specific areas during construction. For example, a noise level of 86 dBA measured at 50 feet from the noise source to the receptor would reduce to 80 dBA at 100 feet from the source to the receptor, and reduce by another 6 dBA to 74 dBA at 200 feet from the source to the receptor. The noise levels from construction at the offsite sensitive uses can be determined with the following equation from the High-Speed Ground Noise and Vibration Impact Assessment, Final Report:

$$L_{eq} \text{ at sensitive use} = L_{eq} \text{ at 50 feet} - 20 \text{ Log}(D/50)$$

L_{eq} = noise level of noise source, D = distance from the noise source to the receiver, and L_{eq} at 50 feet = noise level of source at 50 feet (U.S. Department of Transportation 2012).

Vibration Levels Associated with Construction Equipment

Ground-borne vibration levels resulting from construction activities occurring within the City were estimated using the 2013 Caltrans *Transportation and Construction Vibration Guidance Manual*. Potential vibration levels are identified for on and offsite locations that are sensitive to vibration, including nearby residences. Caltrans provides thresholds of significance for vibration and methodology for calculating vibration levels at distances from generation. Table 3.8-6 indicates vibration levels at which humans would be affected by vibration levels. Table 3.8-7 identifies anticipated vibration velocity levels in inches per second (in/sec) for standard types of construction equipment based on distance from the receptor. Vibration impacts are assessed by estimating the vibration levels of Project construction equipment and the distance of sensitive receptors to the site boundary.

Table 3.8-6. Caltrans Vibration Annoyance Potential Criteria

| Human Response Condition | Maximum Vibration Level (in/sec) for Transient Sources | Maximum Vibration Level (in/sec) for Continuous/Frequent Intermittent Sources |
|--------------------------|--|---|
| Barely perceptible | 0.04 | 0.01 |
| Distinctly perceptible | 0.25 | 0.04 |
| Strongly perceptible | 0.9 | 0.10 |
| Severe | 2.0 | 0.4 |

Source: Caltrans, 2013. Transportation and Construction Vibration Guidance Manual – Table 20.

Table 3.8-7. Vibration Source Levels for Construction Equipment

| Construction Equipment | Vibration Level (in/sec) at 25 feet | Vibration Level (in/sec) at 50 feet | Vibration Level (in/sec) at 100 feet |
|------------------------|-------------------------------------|-------------------------------------|--------------------------------------|
| Large Bulldozer | 0.089 | 0.031 | 0.011 |
| Loaded Trucks | 0.076 | 0.035 | 0.017 |
| Jackhammer | 0.035 | 0.016 | 0.008 |
| Small Bulldozer | 0.003 | 0.001 | 0.0004 |

Source: Caltrans, 2013. Transportation and Construction Vibration Guidance Manual – Table 18.

Operational & Traffic Noise

Noise generated from proposed Project stationary sources was estimated based on the typical dBA levels generated from urban uses, such as HVAC equipment, delivery trucks, and other common uses. Project-related roadway noise was considered in terms of traffic impacts related to existing conditions by the proposed Project. Daily operational noise levels generated by Project traffic was derived from the Transportation Impact Analysis (TIA) prepared by Omni Means in 2015 (See Appendix K). Noise projections were derived based on calculations and percentage changes in evening peak hour traffic volumes using applications consistent with FHWA traffic noise modeling (FHWA 2014).

3.8.4 Project Impacts and Mitigation Measures

Impacts were analyzed for the existing and future noise environment, and appropriate noise-control mitigation measures are recommended below.

Table 3.8-8. Summary of Project Impacts

| Noise Impacts | Mitigation Measures | Residual Significance |
|---|---------------------------------------|---------------------------------------|
| Impact NOI-1. Short-term construction activities would temporarily generate adverse noise and vibration levels that would exceed thresholds established in the City's General Plan Noise Element. | MM TRANS-1a MM NOI-1a MM NOI-1b | Less than Significant with Mitigation |
| Impact NOI-2. Long-term noise impacts from vehicle traffic associated with the Project would result in increased noise levels to sensitive receptors of up to 1.4 CNEL; however, this increase would be indiscernible to the human ear and not exceed federal, state, or City noise criteria. | None required | Less than Significant |
| Impact NOI-3. Long-term operational noise impacts associated with the Project from the operation of stationary equipment and site maintenance activities could result in the exceedance of thresholds in the City's General Plan Noise Element. | MM NOI-3a MM NOI-3b | Less than Significant with Mitigation |

Impact

NOI-1 Short-term construction activities would temporarily generate adverse noise and vibration levels that would exceed thresholds established in the City's General Plan Noise Element (Less than Significant with Mitigation).

Implementation of the Project would involve construction that could generate noise levels that exceed applicable standards for mobile construction equipment in the City's Noise Standards and result in temporary substantial increases in noise levels primarily from the use of heavy-duty construction equipment. Construction activities would also involve the use of smaller power tools, generators, and other equipment that are sources of noise. Haul trucks using the local roadways would generate noise as they move along the road. Each stage of construction would involve various combinations of operating equipment, and noise levels would vary based on the amount and types of equipment and the location of the activity. Further, not all construction equipment would be operated simultaneously and peak sound levels associated with construction equipment would occur sporadically throughout the workday. Because estimated sound levels associated with construction activities would exceed the City's threshold for noise exposure during construction, onsite and offsite short-term noise impacts would be potentially significant.

Onsite

The grading and site preparation phase of the Project would generate the highest construction sound levels because of the operation of heavy equipment; specifically, work associated with the construction of the proposed hotel and restaurant on Subarea 1, the 58 single-family residences on Subarea 2, and a community center building and 10-unit senior housing building on Subarea 3 would potentially generate the greatest noise levels for the nearby noise-sensitive receptors. Peak sound levels associated with heavy equipment typically range between 75 and 95 dBA at 50 feet from the source (EPA 1971; refer to Table 3.8-5). No construction phasing of the Project has been determined at this time, but at the time of construction, each phase would be subject to permit review to ensure conformity with the approved Project Specific Plan and consistency with applicable regulations.

Given that the noise-sensitive single-family residences adjacent to the north and south of the Project site, the Five Cities Swim School adjacent to the north, and the Vagabond Mobile Home Park adjacent to the southwest are located 50 feet or less from proposed construction activities, sound levels at these locations associated with construction activity have the potential to be slightly greater the estimated sound level ranges of construction equipment shown in Table 3.8-5 (exact noise levels of construction equipment is dependent on year, make, model, condition, and presence or absence of noise mufflers) and would exceed maximum sound level criteria (refer to Table 3.8-4).

Anticipated sound levels at other noise-sensitive receptor locations at 200 feet of the Project site boundary (St. Barnabas' Episcopal Church approximately 200 feet to the southeast, single-family residences approximately 100 feet to the northeast) would also most likely exceed construction-related sound level criteria (refer to Table 3.8-4). These noise-sensitive receptors, at their maximum distance of 200 feet from the Project boundary, would experience construction-related sound levels approximately 6 to 12 dBA less than the estimated noise levels of the construction equipment (e.g., 63-83 dBA for trucks and backhoes instead of 75-95 dBA). Although construction activities could still potentially generate noise that would exceed City noise standards for residential use and cause periodic annoyance to nearby residents (see Table 3.8-9), under City municipal code 9.16.030(d), noise sources associated with construction are exempt from City noise standards, provided construction does not take place before 7:00 AM or after 10:00 PM on any day except Saturday or Sunday, or before 8:00 AM or after 5:00 PM on Saturday or Sunday.

Maximum L_{eq} noise levels anticipated to be experienced by these nearby sensitive uses due to Project construction activities are shown in Table 3.8-9. All distances are a conservative estimate and do not account for potential noise barriers due to vegetation or topography.

Table 3.8-9. Estimated Outdoor Construction Peak Noise Levels at Sensitive Receptors (Unmitigated)

| | Residences to the North Along E. Cherry Ave | Residences to the Northeast Along Launa Ln | Residences to the South off of S. Traffic Way | 5 Cities Swim School | Vagabond Mobile Home Park | St. Barnabus' Episcopal Church |
|---|---|--|---|----------------------|---------------------------|--------------------------------|
| Distance from construction | 40 feet | 20 feet | 50 feet | 40 feet | 20 feet | 200 feet |
| Construction Noise (dBA L_{eq}) | 77-97 | 83-103 | 75-95 | 77-97 | 83-103 | 63-83 |

Note: Noise levels at sensitive uses were determined with the following equation from the High-Speed Ground Noise and Vibration Impact Assessment, Final Report: $L_{eq} = L_{eq} \text{ at distance (feet).} - 20 \text{ Log}(D/50)$, where L_{eq} = noise level of noise source, D = distance from the noise source to the receiver, L_{eq} at 50 feet = noise level of source at 50 feet. Noise levels have been rounded up to the nearest whole number. Source: U.S. Department of Transportation 2012.

Project construction could also increase exposure to vibration levels. Based on Caltrans vibration criteria in Table 3.8-6 and Table 3.8-7, sensitive receptors within 100 feet of the Project site would be subject to vibrations from construction equipment. Sensitive receptors within 25 feet of the Project site boundary would include those within the Vagabond Mobile Home Park and residences adjacent to Subarea 3 along Launa Lane. These sensitive receptors could experience periodic vibrations up to 0.089 in/sec. This would be distinctly perceptible. However, vibrations would be temporary and intermittent due to the nature of construction, and would only occur during the hours of construction in accordance with Mitigation Measure NOI-1a. Sensitive receptors located between 25 and 100 feet from the Project site may experience vibrations up to 0.035 in/sec. This would only be barely perceptible.

Offsite

Off-site construction vehicles would exceed maximum noise level criteria for mobile equipment (refer to Table 3.8-3). Sound levels associated with large haul trucks would have an approximate range of 75 to 95 dBA at 50 feet from the noise source. This sound level range would most likely exceed maximum allowable mobile source noise levels associated with sensitive-noise receptors located along construction truck routes in the

vicinity of the Project site including East Cherry Avenue and Traffic Way. Implementation of the Construction Transportation Mitigation Plan would mitigate noise impacts associated with construction traffic.

Due to the temporary nature of construction activities, these exceedances would be adverse in the short term. Overall, onsite and offsite construction noise and vibration impacts would be *less than significant with mitigation*.

Mitigation Measures for All Subareas

MM TRANS-1a would apply.

MM NOI-1a For all construction activity at the Project site, additional noise attenuation techniques shall be employed as needed to ensure that noise levels are maintained within levels allowed by the City's Noise Standards. Such techniques shall include, but are not limited to:

- *Sound blankets on noise-generating equipment.*
- *Stationary construction equipment that generates noise levels above 65 dBA at the project boundaries shall be shielded with a barrier that meets a sound transmission class (a rating of how well noise barriers attenuate sound) of 25.*
- *All diesel equipment shall be operated with closed engine doors and shall be equipped with factory-recommended mufflers.*
- *The movement of construction-related vehicles, with the exception of passenger vehicles, along roadways adjacent to sensitive receptors shall be limited to the hours between 7:00 A.M. and 7:00 P.M., Monday through Saturday. No movement of heavy equipment shall occur on Sundays or official holidays (e.g., Thanksgiving, Labor Day).*
- *Temporary sound barriers shall be constructed between construction sites and affected uses.*

MM NOI-1b The contractor shall inform residents and business operators at properties within 300 feet of the Project site of proposed construction timelines and noise complaint procedures to minimize potential annoyance related to construction noise. Noise-related complaints shall be directed to the City's Community Development Department.

Plan Requirements and Timing. The Applicants shall provide and post signs stating these restrictions at construction site entries. Signs shall be posted prior to commencement of construction and maintained throughout construction. Construction plans shall note construction hours. At the pre-

construction meeting all construction workers shall be briefed on restricted construction hour limitations. A workday schedule will be adhered to for the duration of construction. The Applicants shall designate the equipment area with appropriate acoustic shielding on building and grading plans. Equipment and shielding shall be installed prior to construction and remain in the designated location throughout construction activities. Construction plans shall identify Best Management Practices (BMPs) to be implemented during construction. All construction workers shall be briefed at a pre-construction meeting on how, why, and where BMP measures are to be implemented. BMPs shall be identified and described for submittal to the City for review and approval prior to building or grading permit issuance. BMPs shall be adhered to for the duration of the Project. Construction plans shall include truck routes and shall be submitted to the City prior to permit issuance for each phase of development. Schedule and mailing list shall be submitted 10 days prior to initiation of any earth movement.

Monitoring. The Applicants shall demonstrate that required signs are posted prior to grading/building permit issuance and pre-construction meeting. Building inspectors and permit compliance staff shall spot check and respond to complaints. The Applicants shall demonstrate that the acoustic shielding is in place prior to commencement of construction activities. City staff shall ensure compliance throughout construction. Permit compliance monitoring staff shall perform periodic site inspections to verify compliance with activity schedules.

Residual Impact

Some noise from construction activities associated with Impact NOI-1 would occur despite implementation of mitigation measures MM NOI-1a and NOI-1b. These residual noise impacts would be temporary and would occur within limited hours, and construction activities would avoid sensitive receptors to the maximum extent feasible. Therefore residual impacts to Impact NOI-1 would be less than significant with mitigation.

Impact

NOI-2 Long-term noise impacts from vehicle traffic associated with the Project would result in increased noise levels to sensitive receptors of up to 1.4 CNEL; however, this increase would be indiscernible to the human ear and not exceed federal, state, or City noise criteria (Less than Significant).

Implementation of the Project would increase traffic volumes and associated noise levels along major transportation routes. According to the TIA, the Project is anticipated to generate 1,646 average daily trips (ADT), including 132 AM peak hour trips and 157 PM peak hour trips (Omni Means 2015, see Appendix K). These Project-generated trips would be distributed throughout the Project vicinity across a number of intersections (see Section 3.10, *Transportation and Traffic* for further detail). The additional daily trips on streets that are farther away from the Project site, such as Fair Oaks Avenue, East Branch Street, and West Branch would not cause a substantial increase in traffic-related noise to the Project site as these streets would experience less than eight percent increases in ADT.

Traffic counts along Traffic Way would result in a 10 percent or less increase when comparing baseline to proposed scenarios (based on data provided in Appendix K), thus, according to the FHWA transportation noise model, sound levels would only increase by approximately 0.4 dBA (FHWA 2014), at 30 feet from the centerline of the roadway. Traffic counts along East Cherry Avenue would increase by 37 percent and would result in an associated noise level of +1.4 dBA (FHWA 2014). Changes in noise level of 3.0 dBA are considered just noticeably perceptible to the human ear (Harris Miller Miller & Hanson Inc. 2006a). Therefore, the increase of traffic-related noise of +1.4 dBA from nearby sensitive receptors would only be an incremental increase.

Table 3.8-10. Estimated Noise Increases Attributed to Project Traffic

| Roadway | Estimated Increase in PM Peak Hour Traffic | Estimated Increase in Traffic Noise (dBA) ¹ |
|--------------------|--|--|
| Traffic Way | 10% | 0.4 |
| East Cherry Avenue | 37% | 1.4 |

¹ At 30 feet from centerline of roadway.

Source: Harris Miller Miller & Hanson Inc. 2006a.

Given this increase and sensitive receptors along the roadway, traffic sound levels of both existing and proposed Project were calculated. Calculation inputs included PM peak hour traffic along East Cherry Avenue (289), traffic fleet mix (98 percent automobiles and 2

percent buses/large trucks), speed limit (35 miles per hour), distance from center line (30 feet), and vehicle reference constants as depicted in the Federal Transit Administration’s Transit Noise and Vibration Impact Assessment. Given that the PM Peak Hour counts are approximately 10% of the ADT and assuming that 24-hour Leq is equal to Peak PM hour Leq, which would overestimate traffic sound levels in non-peak PM hours, calculated noise levels from traffic along East Cherry Avenue would be 61.0 CNEL under existing conditions and 62.4 CNEL with implementation of the proposed Project, at approximately 30 feet from the roadway. This 1.4 CNEL increase along East Cherry Avenue would be indiscernible to the human ear (see Table 3.8-11).

Table 3.8-11. Existing Noise, Estimated Noise, and Noise Increase Attributed to Project Traffic

| Roadway | Estimated Existing Noise (CNEL) ¹ | Estimated Noise under the Proposed Project ² | Increased Noise under the Proposed Project (CNEL) |
|--------------------|--|---|---|
| East Cherry Avenue | 61.0 | 62.4 | 1.4 |

¹ At 30 feet from centerline of roadway.

² Estimated noise at nearest sensitive receptors.

Estimated existing noise levels associated with transportation along East Cherry Avenue currently exceeds the City’s Maximum Allowable Noise Exposure for Transportation Noise Sources at Outdoor Activity Areas of 60 CNEL for sensitive receptors; however, as stated in Policy N1-2 of the *Noise Element*, where it is not possible to reduce noise in outdoor activity areas to 60 dB CNEL or less using a practical application of best-available noise reduction measures, an exterior noise level of up to 65 dB CNEL may be allowed provided that available exterior noise level reduction measures have been implemented and interior noise levels are below 45 CNEL. Typical reductions in noise levels from exterior to interior conditions for older construction style residences is approximately 22-25 dBA (City of San Luis Obispo 2003), thus the +1.4 dB CNEL increase associated with traffic along East Cherry Avenue would only incrementally increase interior noise levels and is anticipated to below the 45 dB CNEL interior noise threshold and would comply with the City’s *Noise Element*. Given that noise levels would remain below federal, state, and City (with exception) noise criteria, impacts would be *less than significant*.

Mitigation Measures

No mitigation measures required.

Impact**NOI-3 Long-term operational noise impacts associated with the Project from the operation of stationary equipment and site maintenance activities could result in the exceedance of thresholds in the City's General Plan Noise Element (Less than Significant with Mitigation).**

Implementation of the Project could increase stationary source noise levels from new development, with potential to exceed the land use capability and stationary noise exposure standards in the existing *Noise Element*.

Long-term operational noise impacts associated with the proposed Project would include maintenance and pickup/delivery activities, and noise-generating rooftop equipment such as air conditioners or kitchen ventilation systems. The residences and buildings on Subareas 2 and 3 would contribute some of these noise impacts, due to maintenance activities such as trash pick-up and landscaping, but most of these impacts would come from the proposed hotel and restaurant uses on Subarea 1. Noise levels from commercial heating, ventilation, and air conditioning (HVAC) equipment can reach 100 dBA at a distance of three feet (EPA 1971); however, these units are typically fitted with noise shielding cabinets, placed on the roof or in mechanical equipment rooms to reduce noise levels. Noise from mechanical equipment associated with operation of the proposed Project is required to comply with the California Building Standards Code requirements pertaining to noise attenuation. Therefore, with the application of these noise reduction techniques, noise from these pieces of equipment does not typically exceed 55 dBA at 50 feet, and would not exceed the City's 45 dBA CNEL interior spaces threshold. As such, noise levels from HVAC systems would be below the interior and exterior ambient noise thresholds. Landscaping and maintenance activities may include the use of equipment such as noise-compliant leaf blowers or hedge trimmers, which would reach levels of 65 dBA at 50 feet, potentially exceeding the City's 60 dBA outdoor activity areas threshold at the property line of the receiving land use. Landscaping and maintenance personnel perform maintenance and performance activities within daytime hours between 8:00 a.m. and 5:00 p.m. Sound levels associated with diesel trucks and trash pickup activities generate noise levels of approximately 80 dB at 50 feet and could potentially exceed the City's 60 dBA outdoor activity areas threshold (City of San Luis Obispo 2002).

With the implementation of noise-reducing standard procedures and practices from the City's *Noise Element* and the mitigation measures below, impacts related to the operation

of stationary equipment and site maintenance activities would be *less than significant with mitigation*.

Mitigation Measure for All Subareas

MM NOI-3a All noise-generating rooftop building equipment, such as air conditioners and kitchen ventilation systems, shall be installed away from existing and proposed noise-sensitive receptors (i.e., residences) or be placed behind adequate noise barriers.

Mitigation Measure for Subarea 1

MM NOI-3b The Applicant (SRK Hotels) shall submit a truck traffic plan to the City Public Works Department which will address timing, noise, location, and number of deliveries for each project component. The Applicant shall cooperate with the City to ensure that impacts to noise-sensitive receptors are mitigated to the maximum extent feasible.

Plan Requirements and Timing. The Applicant (SRK Hotels) shall ensure that all noise-generating mechanical equipment associated with operation of the proposed development complies with the California Building Standards Code requirements pertaining to noise attenuation. The Applicant shall prepare a maintenance and truck plan to the City that addresses timing, noise, location, and number of deliveries for each project component, as well as ensuring that noise impacts are mitigated to the maximum extent feasible.

Monitoring. The Applicant (SRK Hotels) shall ensure that all noise-generating mechanical equipment is compliant prior to installation. The Applicant shall receive approval from the City before maintenance and truck activities begin. Building inspectors and permit compliance staff shall check before implementation.

Residual Impact

Residual impacts to Impact NOI-3 would be less than significant.

3.8.5 Cumulative Impacts

Implementation of the proposed Project would continue the existing development pattern in the southern portion of the City, which includes commercial uses along Traffic Way,

and residential uses away from major arterials. Development under the Project would temporarily generate significant adverse noise levels due to construction activities and would result in long-term operational noise impacts due to stationary equipment and site maintenance activities. Further, as shown in Table 3.8-10 and 3.8-11, the long-term increase in traffic related noise exposure near the Project site would be negligible along all areas roadways (up to 0.4 dBA) with the exception of East Cherry Avenue when comparing the Cumulative-No Project to the Cumulative-Project. East Cherry Avenue would experience a 1.2 CNEL increase when comparing the Cumulative-No Project (61.6 CNEL) to the Cumulative-Project (62.8 CNEL) at 30-feet from the roadway centerline (see Table 3.8-12). This increase would be indiscernible to the human ear and would remain below federal, state, county, and City (with exception) land use and noise criteria. Therefore, if the recommended project-specific mitigation measures are implemented, and all other projects are consistent with Noise Element requirements and conditions, the Project's contribution to cumulative noise impacts is *less than significant*.

Table 3.8-12. Existing Noise, Estimated Cumulative Noise, and Noise Increase Attributed to Project Traffic

| Roadway | Estimated Existing Noise (CNEL) ¹ | Estimated Noise under the Cumulative No Project (CNEL) | Estimated Noise under the Cumulative Project ² | Increased Noise under the Cumulative Project (CNEL) |
|---------------------------|--|--|---|---|
| East Cherry Avenue | 61.0 | 61.6 | 62.8 | 1.8 |

¹ At 30 feet from centerline of roadway.

² Estimated noise at nearest sensitive receptors.