4.7 NOISE

The effects of noise are generally considered in two ways: how a proposed project may increase existing noise levels and affect surrounding noise sensitive land uses, and how a proposed land use may be affected by noise from existing and surrounding land uses. This noise impact analysis is intended to satisfy the requirement for a project specific noise impact analysis by examining and evaluating noise related issues in the project area, the potential short-term and long-term impacts from construction of the project, mitigation measures to lessen impacts associated with the proposed development, and identifying cumulative noise sources affecting future development at the project site. The following section addresses:

- The fundamentals of sound and noise measurements;
- The existing noise environment of the proposed project area;
- Federal, state, and local noise guidelines and policies;
- Potential noise impacts at the project site resulting from existing noise sources;
- Potential impacts on surrounding noise sensitive receptors resulting from development of the proposed project; and,
- Potential noise impacts that would be encountered throughout the area.

4.7.1 Existing Conditions

4.7.1.1 Noise Definition and Terminology

Sound, Noise, and Acoustics

Sound can be described as the mechanical energy of a vibrating object transmitted by pressure waves through a liquid or gaseous medium (e.g., air) to a hearing organ, such as a human ear. Noise is defined as loud, unexpected, or annoying sound.

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

Frequency

Continuous sound can be described by frequency (pitch) and amplitude (loudness). A low-frequency sound is perceived as low in pitch. Frequency is expressed in terms of cycles per second, or Hertz (Hz) (e.g., a frequency of 250 cycles per second is referred to as 250 Hz). High frequencies are sometimes more conveniently expressed in kilohertz (kHz), or thousands of Hertz. The audible frequency range for humans is generally between 20 Hz and 20,000 Hz.

Sound Pressure Levels and Decibels

The amplitude of pressure waves generated by a sound source determines the loudness of that source. Sound pressure amplitude is measured in micro-Pascals (µPa). One µPa is approximately one hundred billionth (0.00000000001) of normal atmospheric pressure. Sound pressure amplitudes for different kinds of noise environments can range from less than 100 to 100,000,000 µPa. Because of this huge range of values, sound is rarely expressed in terms of µPa. Instead, a logarithmic scale is used to describe sound pressure level (SPL) in terms of decibels (dB). The threshold of hearing for young people is about 0 dB, which corresponds to 20 µPa.

Addition of Decibels

Because decibels are logarithmic units, SPL cannot be added or subtracted through ordinary arithmetic. Under the decibel scale, a doubling of sound energy corresponds to a 3-dB increase. In other words, when two identical sources are each producing sound of the same loudness, the resulting sound level at a given distance would be 3 dB higher than one source under the same conditions. For example, if one automobile produces an SPL of 70 dB when it passes an observer, two cars passing simultaneously would not produce 140 dB—rather, they would combine to produce 73 dB. Under the decibel scale, three sources of equal loudness together produce a sound level 5 dB louder than one source.

A-Weighted Decibels

The decibel scale alone does not adequately characterize how humans perceive noise. The dominant frequencies of a sound have a substantial effect on the human response to that sound. Although the intensity (energy per unit area) of the sound is a purely physical quantity, the loudness or human response is determined by the characteristics of the human ear.

Human hearing is limited in the range of audible frequencies as well as in the way it perceives the SPL in that range. In general, people are most sensitive to the frequency range of 1,000–8,000 Hz, and perceive sounds within that range better than sounds of the same amplitude in higher or lower frequencies. To approximate the response of the human ear, sound levels of individual frequency bands are weighted, depending on the human sensitivity to those frequencies. Then, an "A-weighted" sound level (expressed in units of dBA) can be computed based on this information. The A-weighting network approximates the frequency response of the average young ear when listening to most ordinary sounds. When people make judgments of the relative loudness or annoyance of a sound, their judgments correlate well with the A-weighted levels of those sounds. Table 4.7-1 describes typical A-weighted noise levels for various noise sources.

Human Response to Changes in Noise Levels

As discussed above, doubling sound energy results in a 3 dB increase in sound. However, given a sound level change measured with precise instrumentation, the subjective human perception of a doubling of loudness will usually be different than what is measured.

Table 4.7-1. Typical A-Weighted Noise Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	— 110 —	Rock band
Jet fly-over at 1000 feet		
	— 100 —	
Gas lawn mower at 3 feet		
	— 90 —	
Diesel truck at 50 feet at 50 mph		Food blender at 3 feet
	— 80 —	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawn mower, 100 feet	**— 70 —**	Vacuum cleaner at 10 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	**— 60 —**	
		Large business office
Quiet urban daytime	**— 50 —**	Dishwasher next room
Quiet urban nighttime	**— 40 —**	Theater, large conference room (background)
Quiet suburban nighttime		
	— 30 —	Library
Quiet rural nighttime		Bedroom at night, concert
	— 20 —	
		Broadcast/recording studio
	— 10 —	
Lowest threshold of human hearing	**— 0 —**	Lowest threshold of human hearing

Source: Caltrans, Technical Noise Supplement, 2009.

Under controlled conditions in an acoustical laboratory, the trained, healthy human ear is able to discern 1-dB changes in sound levels, when exposed to steady, single-frequency (“pure-tone”) signals in the mid-frequency (1,000 Hz–8,000 Hz) range. In typical noisy environments, changes in noise of 1 to 2 dB are generally not perceptible. However, it is widely accepted that people are able to begin to detect sound level increases of 3 dB in typical noisy environments. Further, a 5 dB increase is generally perceived as a distinctly noticeable increase, and a 10 dB increase is generally perceived as a doubling of loudness. Therefore, a doubling of sound energy (e.g., doubling the volume of traffic on a road or highway) that would result in a 3 dB increase in sound, would generally be perceived as detectable by the average person.

Noise Descriptors

Noise in our daily environment fluctuates over time. Some fluctuations are minor, but some are substantial. Some noise levels occur in regular patterns, but others are random. Some noise levels fluctuate rapidly, but others slowly. Some noise levels vary widely, but others are relatively constant. Various noise descriptors have been developed to describe time-varying noise levels. The following are the noise descriptors most commonly used in noise analysis:

- **Equivalent Sound Level (L_{eq}):** L_{eq} represents an average of the sound energy occurring over a specified period. In effect, L_{eq} is the steady-state sound level containing the same acoustical energy as the time-varying sound that actually occurs during the same period. The 1-hour A-weighted equivalent sound level (L_{eq}[h]) is the energy average of A-weighted sound levels occurring during a one-hour period, and is the basis for noise abatement criteria (NAC) used by Caltrans and FHWA on State Routes such as Highway 1.

- **Percentile-Exceeded Sound Level (L_n):** L_n represents the sound level exceeded for a given percentage of a specified period (e.g., L_{10} is the sound level exceeded 10 percent of the time, and L_{90} is the sound level exceeded 90 percent of the time).

- **Maximum Sound Level (L_{max}):** L_{max} is the highest instantaneous sound level measured during a specified period.

- **Day-Night Level (L_{dn}):** L_{dn} is the energy average of A-weighted sound levels occurring over a 24-hour period, with a 10 dB penalty applied to A-weighted sound levels occurring during nighttime hours between 10 p.m. and 7 a.m.

- **Community Noise Equivalent Level (CNEL):** Similar to L_{dn}, CNEL is the energy average of the A-weighted sound levels occurring over a 24-hour period, with a 10 dB penalty applied to A-weighted sound levels occurring during the nighttime hours between 10 p.m. and 7 a.m., and a 5 dB penalty applied to the A-weighted sound levels occurring during evening hours between 7 p.m. and 10 p.m.

Sound Propagation

When sound propagates over a distance, it changes in level and frequency content. The manner in which noise reduces with distance depends on the following factors.

Geometric Spreading

Sound from a localized source (i.e., a point source) propagates uniformly outward in a spherical pattern. The sound level attenuates (or decreases) at a rate of 6 decibels for each doubling of distance from a point source. Roads and highways consist of several localized noise sources on a defined path, and hence can be treated as a line source, which approximates the effect of several point sources. Noise from a line source propagates outward in a cylindrical pattern, often referred to as cylindrical spreading. Sound levels attenuate at a rate of 3 decibels for each doubling of distance from a line source.

Ground Absorption

The propagation path of noise from a road or railroad track to a receiver is usually very close to the ground. Noise attenuation from ground absorption and reflective-wave canceling adds to the attenuation associated with geometric spreading. Traditionally, the excess attenuation has also been expressed in terms of attenuation per doubling of distance. This approximation is usually sufficiently accurate for distances of less than 200 feet. For acoustically hard sites (i.e., sites with a reflective surface between the source and the receiver, such as a parking lot or body of water,), no excess ground attenuation is assumed. For acoustically absorptive or soft sites (i.e., those sites with an absorptive ground surface between the source and the receiver, such as soft dirt, grass, or scattered bushes and trees), an excess ground-attenuation value of 1.5 decibels per doubling of distance is normally assumed. When added to the cylindrical spreading, the excess ground attenuation results in an overall drop off rate of 4.5 decibels per doubling of distance for a line source.

Atmospheric Effects

Receivers located downwind from a source can be exposed to increased noise levels relative to calm conditions, whereas locations upwind can have lowered noise levels. Sound levels can be increased at large distances (e.g., more than 500 feet) from the source due to atmospheric temperature inversion (i.e., increasing temperature with elevation). Other factors such as air temperature, humidity, and turbulence can also have significant effects.

Shielding by Natural or Human-Made Features

A large object or barrier in the path between a noise source and a receiver can substantially attenuate noise levels at the receiver. The amount of attenuation provided by shielding depends on the size of the object and the frequency content of the noise source. Natural terrain features (e.g., hills and dense woods) and human-made features (e.g., buildings and walls) can substantially reduce noise levels. Walls are often constructed between a source and a receiver specifically to reduce noise. A barrier that breaks the line of sight between a source and a receiver will typically result in at least 5 dB of noise reduction. Taller barriers provide increased noise reduction. Heavy vegetation between the source and receiver could provide additional noise reduction.

4.7.1.2 Identified Sensitive Land Uses

Certain land uses are considered more sensitive to ambient noise levels than others, due to the amount of noise exposure and the types of activities involved. Existing noise-sensitive land uses surrounding the project site include the Pismo State Beach to the west, the Pismo State Beach Golf Course to the north, Le Sage Mobile Home Park and Le Sage Riviera Recreational Vehicle (RV) Park to the north and northeast, residences on Highway 1 and West Grand Avenue, and Pismo State Park to the South.

4.7.1.3 Existing Noise Environment

Transportation Noise Sources

Existing primary noise sources adjacent to the project site include vehicular traffic, trains, and aircraft.

Vehicle Noise

The project site is immediately adjacent to Highway 1 (SR-1) and Grand Avenue (considered to be primary sources of traffic noise in the city), and would be accessed regionally by U.S. Highway 101 and locally by several City streets as described in the traffic and circulation study prepared by OMNI-MEANS for the proposed project. The City of Grover Beach General Plan Noise Element (Noise Element) indicates that the generalized 65 dBA Ldn noise contour for SR-

1 in the project area lies approximately 150 feet from the centerline of the highway, while the 60 dBA Ldn contour is approximately 400 feet away (Noise Element map Section EE-35 & EE-36). Portions of the project site would be located within these estimated noise contours.

Railroad Noise

The Union Pacific railroad crosses Grand Avenue at grade near the project site. Trains sound their horns at this location to warn motorists and pedestrians. Trains that sound horns at surface grade crossings can be a major noise source. According to the Federal Department of Transportation (DOT), train horn sounding can be between 106 and 113 dBA SEL at 100 feet from the track. The sound exposure level (SEL) is a measurement used for short-term events. Noise of this volume (train horn) can be heard at great distances under normal conditions in suburban areas. Looking at similar at-grade crossings in the project area near the Oceano Airport just to the south of the project site, (as shown in the Noise Element map Section EE-35 & EE-36), the typical 65 dBA Ldn noise contour is located at an approximate distance of 200 feet from the center of the tracks for an at-grade crossing area, while the 60 dBA Ldn contour is located approximately 500 feet from the crossing area. Portions of the project site would be located within these estimated noise contours.

Aircraft Noise

The majority of Grover Beach is within the Airport Review Area for the small county airport at Oceano, which lies just to the south of the project site. As referenced in the Grover Beach Master Land Use Element EIR (February 2010), the Airport Land Use Commission (ALUC) has prepared a map of estimated noise impact contours. According to the noise impact contours provided by the airport, most residents who would be affected by airport noise live in the south-west portion of the city. On the east side of Highway 1 this is the area generally south of Farroll Road and west of 13th Street. On the west side of Highway 1, the area is generally impacted by airport noise (south of Smith Avenue and west of Lakeside Avenue in the community of Oceano). Although the project site is located in close proximity to the airport, it is not located within any of the noise contours shown on the ALUC map (estimated noise levels at the project site based on the ALUC map is approximately 50 dBA), and would not be considered significantly impacted by airport operations.

Stationary Noise Sources

The primary source of existing stationary noise surrounding the project site would result from operations at the Amtrak station to the southeast, the at-grade crossing at Grand Avenue, plus many other existing industrial and commercial activities located on SR-1 and near the project site. The project site itself is currently vacant land.

4.7.2 Regulatory Setting

Noise is regulated at the federal, state, and local levels through regulations, policies, and/or local ordinances. Local policies are commonly adaptations of federal and state guidelines based on prevailing local conditions or special requirements.

4.7.2.1 Federal Policies and Regulations

Congressional: The Federal Noise Control Act of 1972

This law states that controlling noise protects the health and welfare of the Nation's population. It recognizes that transportation vehicles, machinery, and appliances are noise sources.

Responsibility for controlling these noise sources rests with state and local governments. Moreover, the federal government will coordinate and adopt standards for inter-state commerce projects (e.g., airports).

Federal Highway Administration: 23 CFR 772

Federal code provides uniform procedures to evaluate highway noise and implement abatement measures. Interpretation of what constitutes 'substantial noise' is left to the states.

4.7.2.2 State and Local Policies and Regulations

California Government Code

The State General Plan Guidelines requires that local governments identify major noise sources and areas containing noise-sensitive land uses. Noise must be quantified by preparing generalized noise exposure contours for current and projected conditions. Contours may be prepared in terms of either the Community Noise Equivalent Level (CNEL) or the Day-Night Average Level (L_{dn}).

City of Grover Beach Noise Element

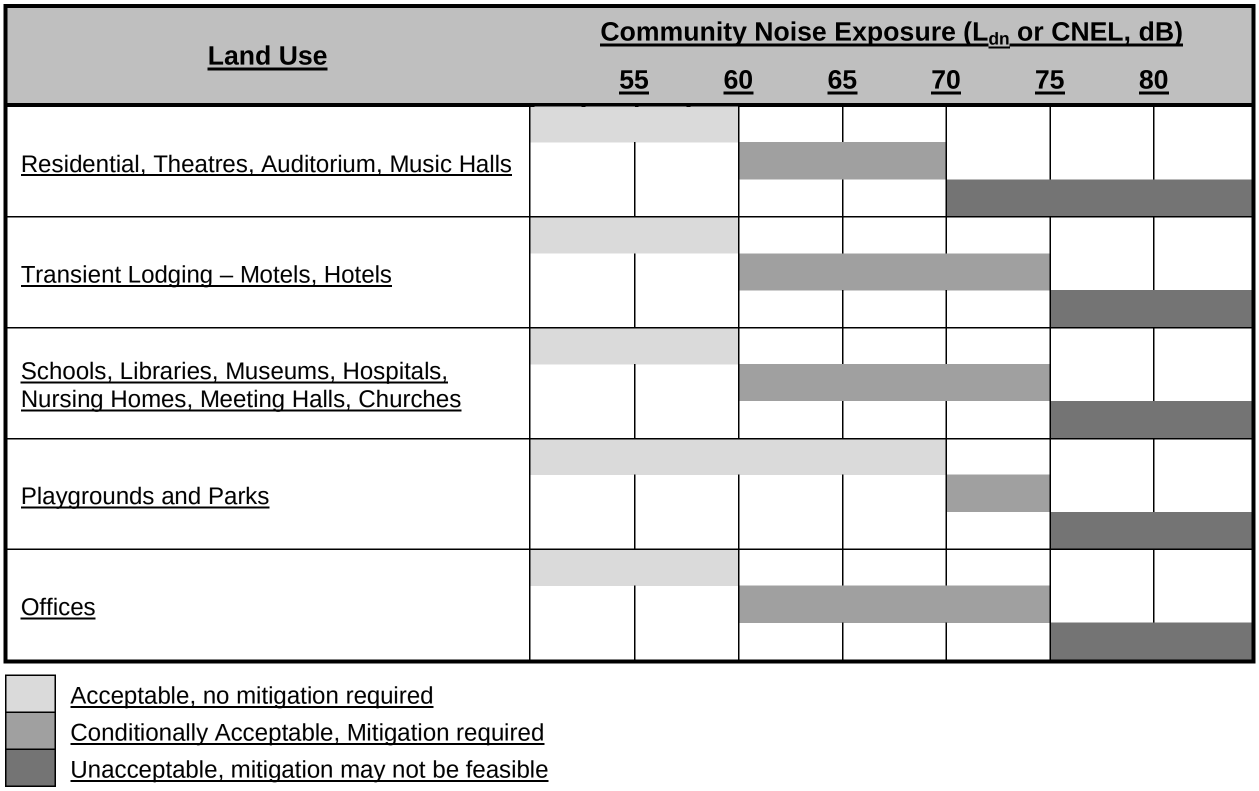
Stationary noise control issues in the City focus upon two objectives: (1) to prevent the introduction of new noise-producing uses in a noise sensitive area; and (2) to prevent encroachment of noise-sensitive land uses upon existing noise-generating facilities. The City attempts to achieve these objectives by applying performance standards and by requiring that new noise-sensitive uses in proximity to existing noise sources include receiver-based mitigation measures.

4.7.3 Thresholds of Significance

4.7.3.1 City of Grover Beach General Plan Noise Element and Standards

In 1993, the City adopted a Noise Element as a required element of the General Plan. State planning guidelines specify that the City must analyze and quantify noise levels and community noise exposure. Local data for various noise generators was collected to develop noise control policies that minimize community exposure to excessive noise. The Noise Element contains maps showing noise contours. These contour maps can help guide land use decisions. The Element also contains implementation measures and possible solutions to existing and future noise problems. Table 4.7-2 (City of Grover Beach, General Plan, 1993) below, shows compatibility of various land uses with transportation noise sources.

Table 4.7-2. Land Use Compatibility for New Development near Transportation Sources



Source: City of Grover Beach Noise Element, Amended 1993

4.7.3.2 CEQA Guidelines

Appendix G of the CEQA Guidelines provides that noise impacts would be considered significant if the proposed project would result in:

a. 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. Exposure of persons to generation of excessive ground borne vibration or ground borne noise levels;

c. A substantial increase in ambient noise levels in the project vicinity above levels existing without the project;

d. For a project located within an airport land use plan area or, where such a plan has not been adopted, within two miles of a public use airport, exposure of people residing or working in the project area to excessive noise levels.

4.7.4 Impact Assessment and Methodology

4.7.4.1 Transportation Noise Assessment

Vehicle Traffic

The project site is located near the corner of Grand Avenue and SR-1, both of which carry substantial traffic volumes during peak periods, typically morning and evening commuter hours and during weekends. A field investigation was conducted in the area to identify frequent outdoor use areas that could be subject to traffic noise impacts and to consider the physical setting of the project site and surrounding area relative to existing noise conditions. Land uses in the immediate project area were noted and sensitive receptor locations were identified for analysis. The following is a brief description of the measurement procedures used for this project:

- The sound level meter was placed approximately 5 feet above the ground and positioned more than 10 feet from any noise source.
- Sound level meter was calibrated before measurements.
- Following the calibration of equipment, a windscreen was placed over the microphone.
- Frequency weighting was set on “A,” and the slow detector response was selected.
- Results of the short-term noise measurements were recorded on data sheets in the field.
- Traffic was counted for model calibration measurements. Vehicle types were separated into three vehicle groups: automobiles, medium trucks (2-axle with 6-wheels but not including dually pick-up trucks), and heavy trucks (3 or more axle vehicles). Average traffic speeds were assumed to be the posted speed limit.
- Wind speed, temperature, humidity, and sky conditions were observed and documented during the short-term noise measurements.

The instruments used for the noise measurements included the following:

- Sound Level Meter – Bruel and Kjaer (B & K) Models 2232 precision integrating sound level meter.
- Acoustic Field Calibrator – B & K Model 4230 acoustic calibrator.

In combination, these instruments yield sound level measurements accurate to within 0.1 decibel (dB). All models fulfill standards of relevant sections of IEC (International Electrotechnical Commission) 651 and ANSI (American National Standard) S1.4.1971 for Type 1 (precision) integrating sound level meters.

Peak-hour Leq Data Collection

The procedure for assessing vehicular traffic noise impacts includes measuring the peak-period noise levels at select locations while simultaneously counting vehicles. Typically, multi-axle trucks, cars, and motorcycles are counted separately. Four outdoor peak-hour noise measurements were taken in order to evaluate existing noise levels and to calibrate the computer noise model. Specific measurement sites were chosen to be representative of receptor sites with similar topography, orientation to SR-1 or Grand Avenue, exposure angles, etc. with respect to frequent outdoor use areas adjacent to those routes. Locations that are expected to receive the greatest traffic noise impacts were generally chosen, such as the RVs located along Highway 1. Measurements were taken for a period of 15-minutes at each site. Short-term monitoring was only conducted at residential land uses and the project site. Vehicle speeds varied from 0 mph (idle) to 30 mph as vehicles approached intersections during different phases of the traffic signal light cycle.

Traffic noise is a function of traffic type, volume, and speed. Generally, noise increases with increased speed and with higher volumes of traffic. However, at much higher volumes, travel speed decreases (stop and go conditions), so the worst-case noise levels are experienced when there is an optimum balance between the volume and speed. Under normal free-flow traffic conditions, doubling the traffic volume will produce a 3.0 dB increase in the ambient noise environment. Since the immediate project area has a physical limit to the number of automobiles that can actually occupy the queuing space at the Grand Avenue stoplight and other intersections. Once volume saturation occurs, the noise environment will reach a steady-state level, and sustain that level as long as the vehicle volume stays the same. If more vehicles are added to a saturated traffic condition, the maximum volume noise level could be sustained for longer periods, thereby increasing the L_{eq} (hourly) and L_{dn} (daily) noise levels.

In urban areas, the peak-hour L_{eq} noise level is essentially equivalent to the L_{dn} noise level if there isn't a significant amount of evening or nighttime traffic (generally yielding results within 1.0 dBA of each other). The L_{dn} is the standard measure used for evaluating community noise impacts in the city Noise Element. For most situations involving noise originating from vehicular traffic, the peak-hour L_{eq} can be used as the L_{dn} level, avoiding the need and cost for 24-hour continuous noise measurements. Further analysis is based on the average noise levels (L_{eq}) as discussed in this report.

Noise Model Calibration

The FHWA Traffic Noise Model Version 2.5 (TNM 2.5) was used for the noise computations (FHWA, 2004). TNM 2.5 inputs are based on a three-dimensional grid created for the study area to be modeled. All roadway, barrier, terrain lines, and receiver points are defined by their x, y, and z coordinates. Receivers, defined as single points, are typically located at frequent outdoor use areas such as residences, schools, and recreational areas. In general, receivers are modeled at a height of 5 feet above ground elevation.

In order to determine the noise levels generated by traffic, the TNM 2.5 computer program requires inputs of traffic volumes, speeds, and vehicle types. Three vehicle types were input into the model: cars, medium trucks, and heavy trucks. The propagation path between the source and receiver is modeled in TNM 2.5 by specifying special terrain features, rows of houses or building structures, and existing walls. Selecting ground types such as hard soil, loose soil, pavement, lawn, and field grass can further specify propagation of noise. A mixture of field grass, hard soil, and pavement was chosen as the overall ground type for this study, because the grounds between receptors and SR-1 and the project site are intermittently vegetated. Table 4.7-3 presents the results of the short-term monitoring.

Figure 4.7-1. Noise Measurement Locations

Table 4.7-3. Summary of Short-Term Measurements

Location	Land Uses	Start Time	Duration (minutes)	Measured L_{eq}	Autos	Medium Trucks	Heavy Trucks	Observed Speed (mph)
ST-1	Project Site	2:22 p.m.	15	67.7	1037	10	2	0-30
ST-2	Residential	3:00 p.m.	15	65.0	928	12	6	0-30
ST-3	Residential	3:30 p.m.	15	69.9	1145	8	1	0-30
ST-4	Residential	4:00 p.m.	15	68.0	1091	7	2	0-30

Noise Calibration Results

All four of the short-term measurements were taken to calibrate the Traffic Noise Model (TNM 2.5). Traffic volumes were recorded during the noise measurements. As a general rule, the noise model is considered to be calibrated if the field measured values versus the modeled noise levels (using field collected traffic data) agree within 2 dB of each other. If they don't, refinement of the noise model is performed until there is agreement between the two values. Table 4.7-4 summarizes the calibration results of four short-term measurement locations that were used in the calibration process. After various refinements were made to the model, all the calibration sites were within the 2-decibel standard. The model was then considered calibrated and existing / future noise environments could accurately be predicted.

Table 4.7-4. Noise Model Calibration Results

Measurement Location Number	Measured Noise Level, Leq (h), dBA	TNM 2.5 Predicted Noise Level, Leq (h), dBA	Delta Noise Levels Leq (h), dBA
1	67.7	69.6	+1.9
2	65.0	66.6	+1.6
3	69.9	71.5	+1.6
4	68.0	67.2	-0.8

Noise Modeling Results

Traffic volumes were obtained from the Traffic and Circulation Report prepared by OMNI-MEANS (EIR consultants). The composition of medium and heavy trucks was obtained from *Annual Average Daily Truck Traffic on the California Highway System* on the Caltrans web site (Caltrans, 2008b). The relative distribution was applied to differentiate individual medium and heavy truck percentages throughout the corridor. It was assumed that the truck percentages in the future would remain similar to the existing conditions.

Additional Noise Modeling to Analyze Proposed Project Revisions

Additional noise monitoring was conducted to analyze potential changes in noise impacts that would result from the project revisions proposed subsequent to preparation of the Final EIR and July 21, 2011 Planning Commission hearing (in particular, relocation of the conference center to the area adjacent to the Le Sage RV and Mobile Home Parks). Noise monitoring was conducted for a 39-hour period, beginning at 5:00 p.m. on January 10, 2012, to document existing ambient noise levels and sources near the northeast corner of the project site. The monitoring site was located in the riparian setback area at the eastern boundary of the project site, approximately 150 feet south of the center of Le Sage Drive. The additional noise modeling and a revised analysis of potential noise impacts were performed by Brown-Buntin Associates, Inc. and the revised report has been included in Appendix N.

Measured hourly noise levels, as defined by the Equivalent Energy Sound Level (L_{eq}), ranged from 45.5 dBA during the hour beginning at 4:00 p.m. on January 11th to 59.1 dBA of the hour beginning at midnight on January 11th. Maximum hourly noise levels (Lmax) ranged from 54 to 87 dBA. The highest observed intermittent noise levels were caused by train horns and aircraft over-flights. The measured Day Night Average Level (DNL) for the 24-hour period starting at midnight January 11, 2012 was 59.5 dBA. This existing noise level is consistent with the City's 60 dBA standard for residential and meeting hall uses.

4.7.5 Project-Specific Impacts and Mitigation Measures

This noise analysis was conducted to determine future noise impacts of the proposed project on surrounding areas within the study limits, and to determine if the project site would be exposed to existing noise sources from the surrounding area. The future worst-case traffic noise impact at frequent outdoor human use areas along the project corridor was modeled for the No Project Alternative and the Project Alternative. This section discusses the future noise environment with and without the proposed project at select receptor locations and the project site.

4.7.5.1 Traffic Noise Analysis

Tables in Appendix M summarize the TNM 2.5 modeled traffic noise levels for the existing and no project condition as well as for the design year with project condition. Existing peak-hour traffic volumes and existing plus project peak-hour traffic volumes were obtained from the Traffic and Circulation report prepared by OMNI-MEANS for the proposed project (Traffic Report Figures 4 and 7). Predicted traffic noise levels with the project are compared to existing conditions. The comparison to existing conditions is included in the analysis to identify traffic noise impacts under CEQA.

Modeling results indicate that predicted traffic noise levels (Leq [h]) for the project condition are slightly higher than the no-build condition. CEQA requires a strictly baseline vs. build analysis in order to determine project related impacts. As seen in Table 4.7-5, the project build condition only raises noise levels by approximately 1 dBA at the nearest sensitive receptor locations vs. the no build condition during peak-hours.

Table 4.7-5. TNM 2.5 Predicted Existing and Future Plus Project Noise Levels

Receptor Location	Existing Noise Level (dBA) Leq (h)	Predicted Noise Level with Project (dBA) Leq (h)	Project vs. Existing dBA Leq (h)
Grover Beach Lodge Site	51.8	52.6	+0.8
Le Sage Mobile Home Park	61.4	62.3	+0.9
4th and Grand Ave	69.0	69.4	+0.4
Residential on SR-1	62.6	63.5	+0.9

In typical noisy environments, changes in noise levels of 1 to 2 dB are generally not perceptible. Additionally, the project would create little nighttime traffic. Since traffic noise levels are only predicted to increase by approximately 1 dBA at modeled receptor locations resulting from increased traffic volumes created by the project, traffic noise impacts are not expected and mitigation under CEQA would not be required and is not considered appropriate for this project.

4.7.5.2 Combined Noise Levels at Project Site

Existing traffic and rail noise are the dominant noise source at the project site, existing stationary noise sources in the project area would not be considered significant. In terms of how existing traffic conditions and rail noise sources affect the project site, the Grover Beach Lodge traffic noise prediction site indicates a future plus project noise level of approximately 53 dBA from vehicle traffic sources. Noise contours from nearby rail operations indicate that the 60 dBA noise contour lies at approximately 500 feet from the centerline of the at-grade crossing location at Grand Avenue. Although the 60 dBA contour would extend onto the project site, it would fall somewhere on the eastside of the project site, in the parking lot near SR-1, and is not expected to significantly impact any of the Lodge structures or open space areas within the Lodge footprint.

Adding the predicted noise level from vehicle traffic to the noise level estimated from rail operations, the closest Lodge building is estimated to be exposed to exterior noise levels of approximately 58 dBA. Referring back to Table 4.7-2, land uses such as motels and hotels are compatible in noise environments of less than 60 dBA and no mitigation is required. Meeting halls are compatible at levels less than 60 dBA and no mitigation is required. Playgrounds and parks are compatible at levels less than 70 dBA and no mitigation is required. Based on the City Noise Element, the Lodge is not expected to be exposed to exterior noise levels above the threshold identified by the City that would require mitigation, and would be considered a compatible land use.

4.7.5.3 Stationary Noise

The Lodge (Buildings 1, 2, and 3)

The Lodge would be considered a new stationary noise source for existing noise sensitive land uses adjacent to the project site to the northeast (mobile home park) and east (RV park). The Lodge would include mechanical HVAC equipment, associated activities at the existing event tent and conference center, food and laundry deliveries, and vehicle traffic in parking lots, all of which would be considered stationary sources of noise.

The ~~proposed project~~main lodge building (Building 1) would have one loading area. During loading and unloading activities, noise would be generated by the trucks' diesel engines, exhaust systems, and brakes during low-speed gear shifting, braking activities, backing up toward the dock, and while maneuvering away from the dock. These peak-event noise sources are measured as a single event from a point source. However, truck traffic resulting from deliveries to the Lodge site is expected to be minimal, and is not considered to represent a significant noise impact.

Noise associated with parking lot activities includes on-site vehicular traffic, car door slamming, car alarms, vehicle engine start-up, tire squealing, and people conversing. Traffic in parking lots would be at very low vehicle speeds (0-10 mph) and is not expected to be noticeable over traffic noise originating from SR-1 or Grand Avenue.

The largest noise-producing component of these Lodge sources would be considered to originate from the mechanical HVAC units for the various Lodge buildings. Detailed information with respect to the number, types, sizes, location, etc; has not yet been determined. A project would normally have a significant noise-related effect on the environment if it would substantially increase the ambient noise levels for adjoining areas or conflict with adopted environmental plans and goals of the community in which it is located. So in order to assess or mitigate stationary noise affects based on these sources, a performance-based standard mitigation measure should be conditioned to ensure that these units do not impact adjacent noise sensitive land uses, or other buildings constructed as part the proposed project. Typical practice includes building measures to shield these types of units such as room enclosures, parapet walls for roof mounted equipment, masonry enclosures, site location, and exhaust orientation to name just a few.

HVAC equipment is typically located on commercial building rooftops. HVAC equipment can generate a sound pressure level of up to 95 dBA at 1 foot. An open enclosure and/or a parapet can create a noise barrier that reduces noise levels from these rooftop HVAC units by 8 dBA or more. A solid enclosure properly oriented and vented can achieve even greater attenuation rates. It is assumed that, as a worst-case scenario, HVAC equipment would operate continuously through the day, evening, and night.

N Impact 1 **The proposed project (Area A) would increase stationary noise levels in the project area by operation of HVAC units and other types of mechanical equipment at the project site.**

N/mm-1 *Prior to issuance of a grading permit for the Lodge buildings in Area A, the applicant shall demonstrate that adequate sounds attenuating enclosures or structures are included for all mechanical and HVAC units associated with the proposed project. Stationary noise controls shall be included on appropriate plan sheets and reviewed and approved by the City of Grover Beach Community Development Director, or designee, prior to issuance of any grading or building permits.*

Residual Impact

This impact is considered less than significant with mitigation.

The Conference Center (Building 4)

Activities associated with the relocated conference center include voices and music associated with event activities, loading and unloading at the northeast corner of the building, use of a prep kitchen for food staging and plating by catering services (although no commercial range hood ventilation fans or trash compactors are proposed), and use of HVAC mechanical equipment. These potential noise sources are not expected to generate noise levels in excess of the City's 60 dB DNL standard at the closest noise sensitive receptor due to the type of facilities proposed, the distance from the building to the receivers of concern and the expected frequency of loading dock use. HVAC units would not be expected to exceed the City's 60 dB DNL standard provided solid roof parapets would be located on the east and north sides of the building (refer to Mitigation Measure N/mm-1, above.

Noise produced at indoor events would be attenuated by the building shell, distance and the overall design of the building, which places restrooms, kitchen facilities and other service areas between the main ballroom and closest noise-sensitive receivers to the north and northeast. It is anticipated that indoor speech or music during conference center events may at times be audible at the closest noise-sensitive receptors; however, such levels would not be expected to exceed the City's 60 dB DNL standard or result in a significant increase in existing ambient noise levels provided windows and doors remain closed during indoor events that include amplified speech or music.

Outdoor events (including amplified speech or music) are not planned for the conference center. Although conference center guests would likely gather informally at the entrance plaza area at the west side of the building and the patio at the southeast corner of the building, a combination of distance (approximately 300 feet) and acoustical shielding provided by the conference center building would significantly reduce noise levels resulting from any outdoor use.

The revised noise impact analysis prepared to analyze potential noise impacts that would potentially result from the proposed project revisions and relocation of the conference center concluded that the re-designed project would not result in any impacts not already addressed in the Final EIR. Existing ambient noise levels at the proposed location for the conference center were found to not exceed the City's 60 dB DNL standard for residential and meeting hall uses. Additionally, existing noise-sensitive uses to the east and northeast of the proposed conference center building are already exposed to intermittent nose levels from traffic, railroad operations and aircraft over-flights that are higher than would be expected from the re-designed project. Therefore, no new impacts would result and no additional mitigation measures are necessary (refer to Appendix N for additional information).

4.7.5.4 Short-Term Construction-Related Impacts

Construction noise represents a short-term impact on ambient noise levels. Short-term noise impacts would be associated with excavation, grading, and construction of buildings on site during development of the proposed project. Construction-related short-term noise levels would be higher than existing ambient noise levels currently in the project area but would obviously no longer occur once construction of the project is completed. During the construction phases of the project, noise from construction activities may intermittently dominate the noise environment in the immediate area of construction.

Construction is performed in discrete steps, or phases, each of which has its own mix of equipment and, consequently, its own noise characteristics. As a result, noise levels vary as construction progresses. Despite the variety in the type and size of construction equipment, similarities in the dominant noise sources and patterns of operation allow construction-related noise ranges to be categorized by work phase. The site preparation phase, which includes excavation and grading of the site, tends to generate the highest noise levels because earthmoving machinery is the noisiest construction equipment. Earthmoving equipment includes excavating machinery such as bulldozers, and front loaders. Earthmoving and compacting equipment includes compactors, scrapers, and graders. Typical operating cycles for these types of construction equipment may involve one or two minutes of full-power operation followed by three or four minutes at lower power settings.

Table 4.7-6 summarizes noise levels produced by construction equipment commonly used on construction projects. As indicated, equipment involved in construction is expected to generate noise levels ranging from 80 to 89 dBA at a distance of 50 feet. Noise produced by construction equipment would be reduced over distance at a rate of about 6 dB per doubling of distance. There are no intervening structures between the existing residences and the project site. Therefore, the closest residences may be subject to short-term construction noise reaching 85 dBA Lmax, generated by construction activities near the project boundary.

Table 4.7-6. Construction Equipment Noise Levels

Equipment	Maximum Noise Level (dBA at 50 feet)
Scrapers	89
Bulldozers	85
Heavy Trucks	88
Backhoe	80
Pneumatic Tools	85
Concrete Pump	82

Source: Federal Transit Administration, 2006

N Impact 2 **Adjacent residential land uses may be subject to short-term construction noise reaching 85 dBA Lmax, generated by construction activities from Area A near the project boundary.**

N/mm-2 *Prior to issuance of grading permits for Areas A and B, a comprehensive Construction Noise Management Plan shall be developed. The plan shall be reviewed and approved by the City of Grover Beach Community Development Director, or designee. The construction noise mitigation measures applicable to the noise management plan include but are not limited to:*

- *Each internal combustion engine, used for any purpose on the job, or related to the job, shall be equipped with a muffler of a type recommended by the manufacturer. No internal combustion engine shall be operated on the job site without an appropriate muffler. All* *equipment shall have sound-control devices no less effective than those provided on the original equipment. No equipment shall have an un-muffled exhaust.*

- *Minimize construction activities at residential areas during evening, nighttime, weekend, and holiday periods. Noise impacts are typically minimized when construction activities are performed during daytime hours.*

- *If possible, avoid using impact pile driving (if piles are required for this project). Utilize less noise intrusive pile installation techniques such as vibratory pile driving or CIDH (cast in drill hole) piling.*

- *In case of construction noise complaints by the public received by the City, the construction manager shall be notified and the specific noise producing activity may be changed, altered, or temporarily suspended if necessary. If more than three complaints are received by the City, the applicant shall retain an acoustical engineer or qualified noise specialist to review construction plans and operations, and recommend additional noise reduction measures.*

- *When feasible, the use of loud sound signals (e.g. back-up warning buzzers or alarms) shall be avoided in favor of light warnings except those required by safety laws for the protection of personnel.*

- *Truck loading, unloading, and hauling operations shall be directed to use West Grand Avenue whenever possible.*

- *Temporary barriers shall be used and relocated as needed and if needed, to protect sensitive receptors from excessive construction noise generated by small items such as compressors, generators, pneumatic tools, and jackhammers. Noise barriers can be made of heavy plywood, moveable insulated sound blankets, or other best available control techniques.*

- *The contractor shall implement appropriate additional noise abatement measures including, but not limited to, changing the location of stationary construction equipment, turning off idling equipment, rescheduling construction activity, notifying adjacent residents in advance of construction work, or installing acoustic barriers around stationary construction noise sources, or any other method to reduce noise as recommended by the City.*

Residual Impact

This impact is considered less than significant with mitigation.

4.7.6 Cumulative Impacts

As the City develops, noise will incrementally increase. Noise will fluctuate and increase depending on the time of year and construction in the local area, especially when combined with increase in tourist use at the State Park and train travel increase. The City has land use plan and noise policies in place to address cumulative noise. General Plan Goal LU-20, Policies LU-20.1(g), LU-20.4, and LU-20.8(h), LUE Update Table 8, Program 43, and the Noise Element in the Grover Beach General Plan all relate to cumulative noise levels from land use buildout. Cumulative impact from Noise is considered less than significant if existing plans and policies are followed.

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