3.11 NOISE

This section includes a summary of applicable regulations related to noise and vibration, a description of ambient noise conditions, and an analysis of potential short-term construction and long-term operational noise impacts associated with the Meeks Bay Restoration Project. Additional data is provided in Appendix C, "Noise Measurement Data and Noise Modeling Calculations."

3.11.1 Regulatory Setting

COMMON TERMS

Commonly used terms in this section are defined below.

- Equivalent Continuous 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 level that occurs during the same period (Caltrans 2013:2-48). For instance, the 1-hour equivalent sound level, also referred to as the hourly L_{eq}, is the energy average of sound levels occurring during a 1-hour period and is the basis for noise abatement criteria used by California Department of Transportation (Caltrans) and Federal Transit Administration (FTA) (Caltrans 2013:2-47; FTA 2018).
- Maximum Sound Level (L_{max}): L_{max} is the highest instantaneous sound level measured during a specified period (Caltrans 2013:2-48; FTA 2018).
- 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-decibel (dB) "penalty" applied to sound levels occurring during nighttime hours between 10 p.m. and 7 a.m. (Caltrans 2013:2-48; FTA 2018).
- Community Noise Equivalent Level (CNEL): CNEL is the energy average of the A-weighted sound levels occurring over a 24-hour period, with a 10-dB penalty applied to sound levels occurring during the nighttime hours between 10 p.m. and 7 a.m. and a 5-dB penalty applied to the sound levels occurring during evening hours between 7 p.m. and 10 p.m. (Caltrans 2013:2-48).

FEDERAL

U.S. Environmental Protection Agency Office of Noise Abatement and Control

The U.S. Environmental Protection Agency (EPA) Office of Noise Abatement and Control was originally established to coordinate Federal noise control activities. In 1981, EPA administrators determined that subjective issues such as noise would be better addressed at more local levels of government. Consequently, in 1982 responsibilities for regulating noise control policies were transferred to state and local governments. However, documents and research completed by the EPA Office of Noise Abatement and Control continue to provide value in the analysis of noise effects.

Federal Transit Administration

To address the human response to ground vibration, FTA has set forth guidelines for maximum-acceptable vibration criteria for different types of land uses. These guidelines are presented in Table 3.11-1.

Table 3.11-1 Ground-Borne Vibration Impact Criteria for General Assessment

Land Use Category	GVB Impact Levels (VdB re 1 micro-inch/second) Frequent Events[1]	GVB Impact Levels (VdB re 1 micro-inch/second) Occasional Events[2]	GVB Impact Levels (VdB re 1 micro-inch/second) Infrequent Events[3]
Category 1: Buildings where vibration would interfere with interior operations.	65 [4]	65 [4]	65 [4]
Category 2: Residences and buildings where people normally sleep.	72	75	80
Category 3: Institutional land uses with primarily daytime uses.	75	78	83

Notes: VdB = vibration decibels referenced to 1 μ inch/second and based on the root mean square (RMS) velocity amplitude. GBV = Ground-Borne Vibration

[1] "Frequent Events" is defined as more than 70 vibration events of the same source per day.

[2] "Occasional Events" is defined as between 30 and 70 vibration events of the same source per day.

[3] "Infrequent Events" is defined as fewer than 30 vibration events of the same source per day.

[4] This criterion is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. Vibration-sensitive manufacturing or research would require detailed evaluation to define acceptable vibration levels.

Source: FTA 2018.

TAHOE REGIONAL PLANNING AGENCY

Tahoe Regional Plan

The elements of the Tahoe Regional Planning Agency (TRPA) Regional Plan related to noise include the following: Noise Subelement of the Goals and Policies of the Regional Plan; the TRPA Code of Ordinances (TRPA Code), Chapter 68, "Noise Limitations"; plan area statements (PASs), community plans, and area plans. These elements are described below, followed by a summary of TRPA's standard conditions of approval that contain best construction practices for construction-generated noise and vibration, region-wide traffic noise mitigation program, and exterior noise policy for mixed-use development.

The Regional Plan Noise Subelement of the Goals and Policies includes a goal to attain and maintain CNEL standards that is relevant to the project (Goal N-2) (TRPA 2012:2-26 through 2-28). The underlying policy intended to help achieve that goal includes establishing specific site design criteria for projects to reduce noise from transportation corridors and which may include using earthen berms, and barriers (Policy N-2.1). The transportation corridor CNEL values override land use-based CNELs within 300 feet of the applicable roadway (TRPA 2012:2-26).

Code of Ordinances

Chapter 68, "Noise Limitations," of the TRPA Code is intended to implement the Noise Subelement of the Goals and Policies document and to attain and maintain the TRPA threshold standards (included below).

TRPA Code Section 68.4, "Community Noise Levels," states that TRPA shall use CNELs to measure community noise levels and that PASs shall set forth CNELs that shall not be exceeded by any one activity or combination of activities (see PASs below) (TRPA 2021). The CNELs set forth in the PASs are based on the land use classification, the presence of transportation corridors, and the applicable threshold standard.

Meeks Bay Plan Area Statement

The maximum community noise equivalent level for this Plan Area is 50 CNEL (TRPA 2002). The maximum community noise equivalent level for the SR 89 corridor is 55 CNEL.

Standard Conditions of Approval

TRPA requires the following standard conditions, among others, for all project construction activity that involves grading and projects in the shoreline (TRPA 2019, 2022):

- Any normal construction activities creating noise in excess of the TRPA noise standards shall be considered exempt from said standards provided all such work is conducted between the hours of 8:00 a.m. and 6:30 p.m.
- Engine doors shall remain closed during periods of operation except during necessary engine maintenance.
- Stationary equipment (e.g., generators or pumps) shall be located as far as feasible from noise-sensitive receptors and residential areas. Stationary equipment near sensitive noise receptors or residential areas shall be equipped with temporary sound barriers.
- All construction equipment, including vibration-inducing impact equipment, on construction sites shall be operated as far away from vibration-sensitive uses as reasonably possible.
- Earthmoving and ground-disturbing operations shall be phased so as not to occur simultaneously in areas close to sensitive uses, to the extent feasible. The total vibration level produced could be significantly less if each vibration source is operated at separate times.
- To prevent structural damage, minimum setback requirements for different types of ground vibration-producing activities (e.g., pile driving) for the purpose of preventing damage to nearby structures shall be established based on the proposed pile driving activities and locations, once determined. Factors to be considered include the specific nature of the vibration activity (e.g., type and duration of pile driving), local soils conditions, and the fragility/resiliency of the nearby structures. Established setback requirements (i.e., 55 feet) can be breached if a project-specific, site-specific analysis is conducted by a qualified geotechnical engineer or ground vibration specialist that indicates that no structural damage would occur at nearby buildings or structures or provides further recommendations (e.g., alternative pile driving methods, site monitoring requirements) to avoid damaging nearby structures.

Thresholds Standards

TRPA has established environmental threshold standards (thresholds) for nine resources, including noise. There are two noise threshold indicators: single noise events and cumulative noise events. Prior peer reviews of TRPA's 2011 and 2015 Threshold Evaluations suggested that TRPA's noise program is "too complex and resource intensive," and recommended that TRPA review and evaluate the noise threshold standards, particularly the single noise event evaluation criteria, which were deemed "unrealistic." Based on these reviews, limited noise monitoring resources were prioritized to noise sources that are more responsive to management actions (Lake Tahoe Info 2022). Results of the 2019 update show insufficient data to determine a trend for single-event noise and little or no change for cumulative noise.

Single Noise Events

A noise event can be defined as an unexpected increase in acoustics. Single Noise Event Threshold Standards adopted by TRPA are based on the numerical value associated with the maximum measured level in acoustical energy during an event. This threshold establishes maximum noise levels (Table 3.11-2) for aircraft, watercraft, motor vehicles, motorcycles, off-road vehicles, and snowmobiles.

Cumulative Noise Events

TRPA adopted CNEL standards for different zones within the region to account for expected levels of serenity. The standards, established in the Goals and Policies, apply to the entire Lake Tahoe region. Table 3.11-2 summarizes thresholds for single events (L_{max}) and thresholds for community noise events.

The noise limitations established in Chapter 68 of the TRPA Code, including the noise standards of individual PASs, community plans, and area plans, do not apply to noise from TRPA-approved construction or maintenance projects, or the demolition of structures, provided that such activities are limited to the hours between 8:00 a.m. and 6:30 p.m. Further, the noise limitations of Chapter 68 shall not apply to emergency work to protect life or property.

Table 3.11-2 TRPA Regional Plan Cumulative Noise Levels

Single Noise Events	Noise Measurement
Boats (not to exceed any of 3 tests)	82 dB measured at 50 feet with engine at 3,000 rpm
	SAE test J1970 or SAEJ1970, Shoreline Test, 75 dB (standard adopted 7/03)
	SAE Test J2005, Stationary Test, 88 dB if watercraft manufactured on or after 1/1/93 and 90 dB if watercraft manufactured before 1/1/93 (standard adopted 7/03)
Motor Vehicles (less than 6,000 pounds GVW)	76 dB running at <35/mph (82 dB running at >35/mph) measured at 50 feet
Motor Vehicles (greater than 6,000 pounds GVW)	82 dB running at <35/mph (86 dB running at >35/mph) measured at 50 feet
Motorcycles	77 dB running at <35/mph (86 dB running at >35/mph) measured at 50 feet
Off-road Vehicles	72 dB running at <35/mph (86 dB running at >35/mph) measured at 50 feet
Snowmobiles	82 dB running at <35/mph measured at 50 feet
[Land Use-Based] Community Noise Equivalent Levels: Background levels shall not exceed the following:[1]	
Land Use Category	CNEL, dB
High Density Residential	55
Low Density Residential	50
Hotel/motel facilities	55
Commercial area	65
Industrial	65
Urban Outdoor Recreation	55
Rural Outdoor Recreation	50
Wilderness and Roadless Areas	45
Critical Wildlife Areas	45
Policy Statement: It shall be a policy of the TRPA Governing Board in the development of the Regional Plan to define, locate, and establish CNEL levels for transportation corridors.	
Transportation [Corridor Noise Standards][2]	
U.S. 50	65[(3)] dB CNEL
State Routes 89, 207, 28, 267 and 431	55[(3)] dB CNEL
South Lake Tahoe Airport	60[(4)] dB CNEL

Notes: CNEL = community noise equivalent level measurements are weighted average of sound level gathered throughout a 24–hour period; dB = decibels; dB = A-weighted decibels; mph = miles per hour; rpm = revolutions per minute

1 The title of this table used in the TRPA Code is "TRPA Regional Plan Cumulative Noise Levels."

2 For this analysis, these standards are referred to as "land use-based CNEL thresholds."

3 For this analysis, these CNEL standards are referred to as "transportation corridor noise thresholds."

4 This transportation corridor noise threshold overrides the land use CNEL thresholds and is limited to an area within 300 feet from the edge of the road.

5 This threshold applies to those areas impacted by the approved flight paths.

Source: TRPA 2021.

STATE

California Department of Transportation

In 2020, Caltrans published the Transportation and Construction Vibration Manual (Caltrans 2020). The manual provides general guidance on vibration issues associated with construction and operation of projects in relation to human perception and structural damage. Table 3.11-3 presents recommendations for levels of vibration that could result in damage to structures exposed to continuous vibration.

Table 3.11-3 Caltrans Recommendations Regarding Levels of Vibration Exposure

PPV (in/sec)	Effect on Buildings
0.4-0.6	Architectural damage and possible minor structural damage
0.2	Risk of architectural damage to normal dwelling houses
0.1	Virtually no risk of architectural damage to normal buildings
0.08	Recommended upper limit of vibration to which ruins and ancient monuments should be subjected
0.006-0.019	Vibration unlikely to cause damage of any type

Notes: PPV= peak particle velocity; in/sec = inches per second

Source: Caltrans 2020.

3.11.2 Environmental Setting

ACOUSTIC FUNDAMENTALS

Before discussing the noise setting for the project, background information about sound, noise, vibration, and common noise descriptors is needed to provide context and a better understanding of the technical terms referenced throughout this section.

Addition of Decibels

Because decibels are logarithmic units, SPLs 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 at the same time, the resulting sound level at a given distance would be 3 dB higher than if only one of the sound sources was producing sound under the same conditions. For example, if one idling truck generates an SPL of 70 dB, two trucks idling 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 approximately 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 this range better than sounds of the same amplitude with frequencies outside of this range. 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 A-weighted decibels) 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 judgment correlates well with the A-scale sound levels of those sounds. Thus, noise levels are typically reported in terms of A-weighted decibels. Table 3.11-4 describes typical A-weighted noise levels for various noise sources.

Table 3.11-4 Typical A-Weighted Noise Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	— 110 —	Rock band
Jet fly-over at 1,000 feet	— 100 —	
Gas lawn mower at 3 feet	— 90 —	
Diesel truck at 50 feet at 50 miles per hour	— 80 —	Food blender at 3 feet, Garbage disposal at 3 feet
Noisy urban area, daytime, Gas lawn mower at 100 feet	— 70 —	Vacuum cleaner at 10 feet, Normal speech at 3 feet
Commercial area, Heavy traffic at 300 feet	— 60 —	
Quiet urban daytime	— 50 —	Large business office, Dishwasher next room
Quiet urban nighttime	— 40 —	Theater, large conference room (background)
Quiet suburban nighttime	— 30 —	Library, Bedroom at night
Quiet rural nighttime	— 20 —	
	— 10 —	Broadcast/recording studio
Lowest threshold of human hearing	— 0 —	Lowest threshold of human hearing

Notes: dBA = A-weighted decibels

Source: Caltrans 2013:Table 2-5.

Human Response to Changes in Noise Levels

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

Under controlled conditions in an acoustical laboratory, the trained, healthy human ear can discern 1-dB changes in sound levels when exposed to steady, single-frequency ("pure-tone") signals in the mid-frequency (1,000–8,000 Hz) range. In general, the healthy human ear is most sensitive to sounds between 1,000 and 5,000 Hz and perceives both higher and lower frequency sounds of the same magnitude with less intensity (Caltrans 2013:2-18). In typical noisy environments, changes in noise of 1–2 dB are generally not perceptible. However, it is widely accepted that people can 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 (Caltrans 2013:2-10). Therefore, a doubling of sound energy (e.g., doubling the volume of traffic on a highway) that would result in a 3-dB increase in sound would generally be perceived as barely detectable.

Vibration

Vibration is the periodic oscillation of a medium or object with respect to a given reference point. Sources of vibration include natural phenomena (e.g., earthquakes, volcanic eruptions, sea waves, landslides) and those introduced by human activity (e.g., explosions, machinery, traffic, trains, construction equipment). Vibration sources may be continuous, (e.g., operating factory machinery) or transient in nature (e.g., explosions). Vibration levels can be depicted in terms of amplitude and frequency, relative to displacement, velocity, or acceleration.

Vibration amplitudes are commonly expressed in peak particle velocity (PPV) or root-mean-square (RMS) vibration velocity. PPV and RMS vibration velocity are normally described in inches per second (in/sec) or in millimeters per second. PPV is defined as the maximum instantaneous positive or negative peak of a vibration signal. PPV is typically used in the monitoring of transient and impact vibration and has been found to correlate well to the stresses experienced by buildings (FTA 2006:7-5, Caltrans 2013:6).

Although PPV is appropriate for evaluating the potential for building damage, it is not always suitable for evaluating human response. It takes some time for the human body to respond to vibration signals. In a sense, the human body responds to average vibration amplitude. The RMS of a signal is the average of the squared amplitude of the signal, typically calculated over a 1-second period. As with airborne sound, the RMS velocity is often expressed in decibel notation as vibration decibels (VdB), which serves to compress the range of numbers required to describe vibration (FTA 2018; Caltrans 2020). This is based on a reference value of 1 micro inch per second.

The typical background vibration-velocity level in residential areas is approximately 50 VdB. Ground vibration is normally perceptible to humans at approximately 65 VdB. For most people, a vibration-velocity level of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels (FTA 2018, Caltrans 2020).

Typical outdoor sources of perceptible ground vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If a roadway is smooth, the ground vibration is rarely perceptible. The range of interest 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 to fragile buildings. Construction activities can generate sufficient ground vibrations to pose a risk to nearby structures. Constant or transient vibrations can weaken structures, crack facades, and disturb occupants (FTA 2018).

Vibrations generated by construction activity can be transient, random, or continuous. Transient construction vibrations are generated by blasting, impact pile driving, and wrecking balls. Continuous vibrations are generated by vibratory pile drivers, large pumps, and compressors. Random vibration can result from jackhammers, pavement breakers, and heavy construction equipment.

Table 3.11-5 summarizes the general human response to different ground vibration-velocity levels.

Table 3.11-5 Human Response to Different Levels of Ground Noise and Vibration

Vibration-Velocity Level	Human Reaction
65 VdB	Approximate threshold of perception.
75 VdB	Approximate dividing line between barely perceptible and distinctly perceptible. Many people find that transportation-related vibration at this level is unacceptable.
85 VdB	Vibration acceptable only if there are an infrequent number of events per day.

Notes: VdB = vibration decibels referenced to 1 μ inch/second and based on the root mean square (RMS) velocity amplitude.

Source: FTA 2018.

EXISTING NOISE ENVIRONMENT

Existing Noise- and Vibration-Sensitive Land Uses

Noise-sensitive land uses are generally considered to include those uses where noise exposure could result in health-related risks to individuals, as well as places where quiet is an essential element of their intended purpose. Residential dwellings are of primary concern because of the potential for increased and prolonged exposure of individuals to both interior and exterior noise levels, and because of the potential for nighttime noise to result in sleep disruption. Additional land uses such as schools, transient lodging, historic sites, cemeteries, and places of worship are also generally considered sensitive to increases in noise levels. These land use types are also considered vibration-sensitive land uses in addition to commercial and industrial buildings where vibration would interfere with operations within the building, including levels that may be well below those associated with human annoyance.

Visitors to the project area and users of the various on-site facilities (e.g., campers, beach goers, people staying at the lodge units, etc.) would be considered noise-sensitive users as their recreational experience could be affected during project construction. The nearest off-site noise-sensitive receptors (SR) are single- and multi-family homes located along State Route 89 approximately 250 feet to the west of the project area boundary (identified as SR1 and SR4, respectively, in Figure 3.11-1) and single and multi-family homes approximately 200 feet to the south and 550 feet to the north of the project area (identified as SR2 and SR3, respectively. Figure 3.11-1 depicts the location of off-site sensitive receptors to the general locations of planned construction activities, categorized as follows:

- Vehicular bridge on State Route 89 (SR 89), including multi-use path for Alternatives 1 and 4 (CS1);
- Campgrounds, north (CS2);

- Campgrounds, south (CS3);
- Parking, multi-use paths, realignment of roads north of marina (CS4);
- Boating/Pedestrian Pier (CS5);
- Parking, multi-use path, realignment of roads south of marina (CS6);
- ADA Parking (CS7);
- Removal of Meeks Bay Marina and restoration of Meeks Creek and lagoon (CS8); and
- Demolition and reconstruction of cabins and stabilization of the shoreline (CS9).

The predominant noise source in the project area is vehicle traffic on SR 89. Existing traffic noise levels on roadway segments in the project area modeled using calculation methods consistent with Federal Highway Administration (FHWA) Traffic Noise Model, Version 2.5 (FHWA 2004) and using available average daily traffic volumes (Caltrans 2017). Table 3.11-6 summarizes the modeled existing traffic noise levels at 100 feet from the centerline of each area roadway segment and lists distances from each roadway centerline to the 70, 65, and 60 L_{dn} traffic noise contours. For further details on traffic-noise modeling inputs and parameters, refer to Appendix C.

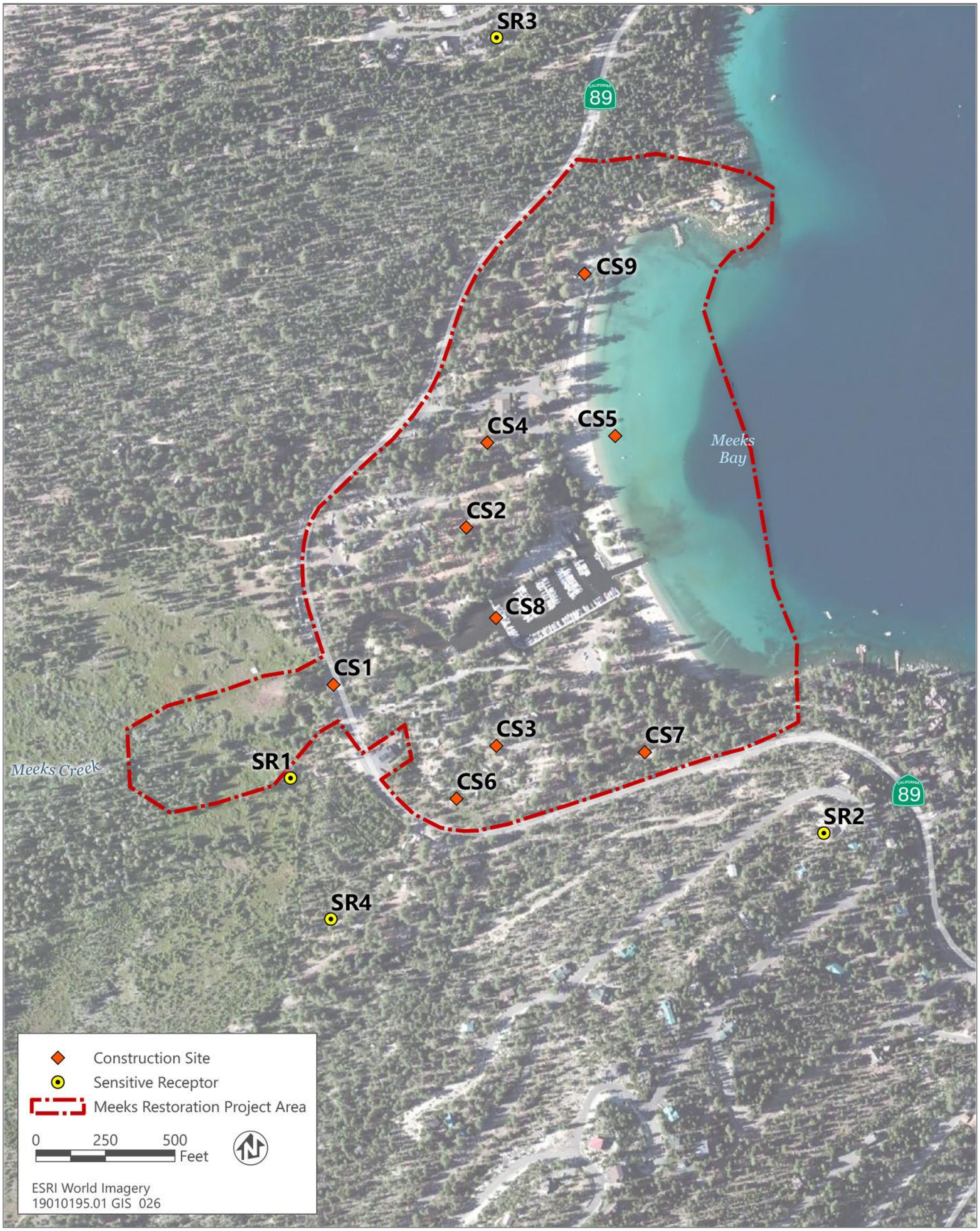
Table 3.11-6 Summary of Modeled Existing Traffic Noise Levels

Roadway Segment/Segment Description	CNEL at 100 feet from Roadway Centerline	Distance (feet) from Roadway Centerline to CNEL Contour 70 dBA	Distance (feet) from Roadway Centerline to CNEL Contour 65 dBA	Distance (feet) from Roadway Centerline to CNEL Contour 60 dBA
SR 89 - Mc Kinney Creek Road to SR 89 – El Dorado/Placer County Line	63.1	23	73	232
SR 89 - El Dorado/Placer County Line to SR 89 - Rubicon Glen Drive	62.0	18	57	180
SR 89 - Rubicon Glen Drive to SR 89 – Bliss Memorial State Park Road	62.3	20	62	197

Notes: CNEL = Community Noise Equivalent Level, dBA = A-weighted decibels

All modeling assumes average pavement, level roadways (less than 1.5 % grade), constant traffic flow, and does not account for shielding of any type or finite roadway adjustments. All noise levels are reported as A-weighted noise levels. For additional details, refer to Appendix B for detailed traffic data, and traffic-noise modeling input data and output results.

Source: Data modeled by Ascent Environmental in 2021.



Source: adapted by Ascent Environmental in 2021.

Figure 3.11-1 Construction Sites and Sensitive Receptor Locations

3.11.3 Environmental Impacts and Mitigation Measures

METHODOLOGY

Construction Noise and Vibration

To assess potential short-term (construction-related) noise and vibration impacts, sensitive receptors and their relative exposure were identified. Project-generated construction source noise and vibration levels were determined based on methodologies, reference emission levels, and usage factors from FTA's *Guide on Transit Noise and Vibration Impact Assessment* methodology (FTA 2018) and FHWA's *Roadway Construction Noise Model User's Guide* (FHWA 2006). Reference levels for noise and vibration emissions for specific equipment or activity types are well documented and the usage thereof common practice in the field of acoustics.

Operational Noise

Operational non-transportation noise sources (e.g., boating activity noise) was evaluated qualitatively based on project-specific details, considering the location of project components, anticipated noise sources and their location, and proximity to sensitive receptors. Long-term increases in traffic noise were assessed quantitatively based on traffic noise modeling conducted in accordance with Caltrans and FHWA guidance, using project-specific trip generation data.

THRESHOLDS OF SIGNIFICANCE

The thresholds of significance were developed in consideration of the State CEQA Guidelines, TRPA Thresholds, TRPA Initial Environmental Checklist, Lake Tahoe Basin Management Unit Forest Plan, and other applicable policies and regulations. Under the National Environmental Policy Act (NEPA) the significance of an effect must consider the context and intensity of the environmental effect. The factors that are considered under NEPA to determine the context and intensity of its effects are encompassed by the thresholds of significance. An alternative would have a significant effect on noise if it would:

- increase existing CNELs beyond those permitted in the applicable Plan Area Statement, Community Plan or Master Plan; or if traffic noise levels would exceed the applicable TRPA noise threshold standards, expressed in CNEL, including the land use-based TRPA Regional Plan Cumulative Noise Level thresholds or the contour-based transportation corridor noise thresholds;
- expose people to severe noise levels (i.e., a long-term noise level increase of 3 A-weighted decibels (dBA) or greater at a noise-sensitive receptor such as a residence, hotel, or tourist accommodation unit);
- expose existing structures to levels of ground vibration that could result in structural damage (i.e., exceedance of Caltrans's recommended level of 0.2 in/sec PPV with respect to the prevention of structural damage for normal buildings or FTA's maximum acceptable level of 72 VdB with respect to negative human response for residential uses and tourist accommodation units or 83 VdB at commercial land uses [i.e., annoyance]);
- place residential or tourist accommodation uses in areas where the existing CNEL exceeds 60 dBA or is otherwise incompatible;
- place uses that would generate an incompatible noise level in close proximity to existing residential or tourist accommodation uses;
- expose persons to or generate noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- expose persons to or generate excessive ground vibration or ground noise levels;
- cause a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project; or
- cause a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

ISSUES NOT DISCUSSED FURTHER

The project is not located within 2 miles of any airport or airstrip, thus would not result in the placement of residents or workers in areas where they could be exposed to airport-related noise. In addition, the project does not propose new residential or tourist accommodation uses; thus, noise compatibility with existing noise levels is not applicable to the project. These issues are not discussed further.

ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Impact 3.11-1: Short-Term Project-Related Construction Noise Levels

Construction activities under Alternatives 1, 2, 3, and 4 would generate short-term noise. These activities would be subject to TRPA's Standard Condition of Approval for the minimization of exposure to construction-generated noise and ground vibration, which are designed to ensure that noise-sensitive receptors are not exposed to excessive construction noise levels during noise-sensitive times of the day. However, some nighttime construction could occur to reduce overall construction duration. Thus, on-site and off-site sensitive receptors could be exposed to construction noise that exceeds applicable standards and results in a substantial temporary increase in noise. This impact would be significant and unavoidable under Alternatives 1, 2, 3, and 4. The No Action Alternative would not include any construction; thus, there would be no impact.

No Action Alternative

No construction activity would occur under the No Action Alternative; therefore, no construction with pile driving or other construction activity would occur. There would be no impact.

Alternative 1: Restoration with Boating Pier

Alternative 1 would involve construction and excavation activities including removal of Meeks Bay Marina and restoration of Meeks Creek (location identified in Figure 3.11-1 as CS8), realignment of parking and roads (CS4, CS6, and CS7), demolition and reconstruction of cabins (CS9), relocation of the utility infrastructure included with other project components, and stabilization of the shoreline. In addition, a new boating pier (CS5) would be constructed and the vehicular bridge on SR 89 (CS1) would be reconstructed.

Construction activities would occur throughout the project area and would generally occur during the daytime hours consistent with TRPA requirements; however, the time-critical construction activities associated with SR 89 bridge reconstruction) could occur for 24-hour periods to reduce overall construction duration. If construction activities for the SR 89 bridge would only occur during daytime hours, the overall length of the construction period for the bridge would be longer than if construction activities would continue over a 24-hour period. The decision to consider the potential for 24-hour construction periods was made to reduce the length of the overall construction period for the SR 89 bridge so that periods of traffic congestion and lane closure are minimized. Construction activities that generate the most noise typically include those associated with earth movement and pile driving because the equipment used for these activities generate the highest noise levels. Construction activities would require the use of various types of equipment, such as a loader, dozer/tractor, scraper, excavator, backhoe, grader, pump, generator, trucks (haul and passenger), and pile drivers. The noise levels of these typical construction equipment are shown in Table 3.11-7.

Construction activities may result in varying degrees of temporary noise levels, depending on the specific construction equipment used and activities involved. Bridge and pier construction typically involve pile driving, while other construction activities would not include pile driving. Based on the types of activities (e.g., restoration, cabin demolition and construction), and bridge/pier construction, worst-case noise modeling was conducted for construction activities that would not include pile driving (depicted as CS2, CS3, CS4, CS6, CS7, CS8, CS9 on Figure 3.11-1) and activities that would require pile driving (depicted as CS1 and CS5 on Figure 3.11-1).

Based on modeling conducted for construction activities without pile driving and for activities with pile driving, construction noise levels could reach, 85 dBA L_{eq} and 92 dBA L_{eq}, respectively, at 50 feet from construction activities. These levels represent maximum potential hourly noise levels during daytime construction, which would occur for the majority of construction activities. Typically, daytime construction noise levels would be exempt from adopted noise standards; however, because construction would occur during the nighttime hours, noise standards for the Meeks Bay PAS (i.e., 50 dBA CNEL) and for the rural outdoor recreational and low-density residential land uses (i.e., 50 dBA CNEL) would apply to nighttime construction activities. Thus, assuming 24 hours of construction activities, construction noise levels could range from 92 dBA CNEL to 99 dBA CNEL at 50 feet from construction activities (i.e., the reference distance used to propagate noise levels to other receptors). The nearest off-site sensitive receptors to activities involving pile driving (i.e., loudest potential noise) would be SR1, approximately 370 feet from CS1 construction activities, and the nearest receptor to activities not involving pile driving would be SR4, approximately 650 feet from construction activities CS6, depicted on Figure 3.11-1. Applying standard attenuation rates, construction activities at these distances would range from 69 dBA CNEL to 76 dBA CNEL at the nearest receptor (SR1) and from 62 dBA CNEL to 69 dBA CNEL at SR4. Modeling inputs and calculations are included in Appendix C. To avoid any additional noise impacts on off-site sensitive receptors, in compliance with TRPA standard conditions of approval (see Section 3.1.1, above), construction equipment and staging areas would be located as far as possible from noise-sensitive land uses, and stationary equipment near sensitive noise receptors or residential areas would be equipped with temporary sound barriers.

It should also be noted that construction noise could affect on-site daytime recreational users of existing campground facilities and the nearby beach, and in some cases, these receptors could be located at similar or even closer distances to construction noise than these off-site receptors, thus, be exposed to higher noise levels. However, as described in Chapter 2, "Description of Proposed Action and Alternatives," daily visitors to the project area during active construction would have received prior notification and would be aware of the potential for construction activities to disrupt daily recreational activities, or could choose not to visit during these times. Regarding noise impacts on sensitive receptors, when people are unaware of increased noise, they are more prone to be surprised, startled, or otherwise disturbed. Therefore, provided that on-site noise-sensitive receptors (i.e., project area visitors) would be fully aware of the ongoing construction activities and the fact that some portions of active construction sites would be closed during construction activities, on-site noise-sensitive receptors would not be more adversely impacted than off-site ones. Nonetheless, considering the lower range of modeled construction noise (69 dBA CNEL) in comparison to existing noise levels in the vicinity (62–63 dBA CNEL), construction noise could increase 24-hour average levels by 7 dBA, which would be noticeable and considered substantial. In addition, considering ambient hourly levels at night are much lower than daytime ambient hourly levels (typically 35–45 dBA), hourly noise levels associated with construction could result in even greater increases in noise during nighttime, which is an important distinction because the greater the increase in noise, the more likely the increase would disrupt a person's sleep. Further, modeled nighttime construction levels would exceed applicable standards of 50 dBA CNEL. For these reasons, this impact would be significant.

Table 3.11-7 Typical Equipment Noise Levels

Type of Equipment	Noise Level (L_{max}) at 50 feet
Pile driver	95
Blasting	94
Crane	85
Excavator	85
Dozer	85
Grader	85
Dump truck	84
Generator	82
Backhoe	80
Compactor	80
Front end loader	80
Chain saw	84
Wood chipper	75[1]

[1] The reference sound level for a wood chipper is based on sound levels provided in Berger, Neitzel, and Kladden 2010.
Source: FHWA 2006:3 unless otherwise noted.

Alternative 2: Restoration with Pedestrian Pier

Construction activities associated with Alternative 2 would be similar to Alternative 1, because similar components would be constructed, except that this alternative includes a pedestrian pier instead of a boating pier. Similar to Alternative 1, the loudest construction activities would occur near construction of the new SR 89 bridge (identified as CS1 on Figure 3.11-1) and construction of the pedestrian pier (CS5) where pile driving would occur, and lower construction noise levels would be associated with other construction areas identified in Figure 3.11-1. Alternative 2 would not include demolition and reconstruction of cabins but would construct the shoreline stabilization at CS9. Impacts to noise sensitive receptors within the project area (i.e., visitors) under Alternative 2 would be similar to those described above for Alternative 1; thus, construction noise would result in substantial increases in temporary noise that exceed applicable standards. This impact would be significant.

Alternative 3: Restoration with No Pier

Construction activities associated with Alternative 3 would include activities near the CS1, CS2, CS3, CS4, CS6, CS7, CS8, and CS9 (shoreline stabilization only). Similar to Alternatives 1 and 2, construction activities associated with the SR 89 Bridge replacement (CS1), that could require pile driving would represent the loudest noise levels and could occur at night to reduce overall construction duration for the SR 89 bridge. Other construction activities that do not include pile driving could also occur. Impacts to noise sensitive receptors within the project area (i.e., visitors) under Alternative 3 would be similar to those described above for Alternative 1;thus, construction noise would result in substantial increases in temporary noise that exceeds applicable standards. This impact would be significant.

Alternative 4: Preferred Alternative

Construction activities associated with the Alternative 4 would be similar to Alternative 3, including bridge reconstruction that could involve pile driving (CS1) and other restoration/construction activities (CS2, CS3, CS4, CS6, CS7, CS8, and CS9), including nighttime construction for the SR 89 bridge. Therefore, similar to Alternatives 1, 2, and 3, construction activities associated with the SR 89 bridge, which could require pile driving, would represent the loudest noise levels. Other construction activities that would not include pile driving could also occur. Impacts to noise sensitive receptors within the project area (i.e., visitors) under Alternative 4 would be similar to those described above for Alternative 1; thus, construction noise would result in substantial increases in temporary noise that exceed applicable standards. This impact would be significant.

Mitigation Measures

Mitigation Measure 3.11-1 Construction Noise Reduction

This mitigation measure will apply to Alternatives 1, 2, 3, and 4.

For construction activities related to the SR 89 bridge reconstruction, the USFS and their contractors shall implement or incorporate the following noise reduction measures into construction specifications for contractor(s) implementation during project construction:

- Minimize construction activities outside of daytime hours of 8:00 a.m. to 6:30 p.m. when feasible and consistent with other lead agency goals including minimizing overall construction duration and efficiently completing construction activities.
- Vibration-inducing construction activities (i.e., jackhammering, pile driving, crushing, vibratory compactors) shall not be used outside of the TRPA-established daytime construction hours (8:00 a.m. to 6:30 p.m.) under any circumstance.
- All construction equipment shall be properly equipped with standard manufacturer-installed noise-reduction intake and exhaust mufflers and engine shrouds.
- If TRPA or the USFS receives a noise complaint, then noise monitoring will be implemented by TRPA. If noise monitoring demonstrates that construction activities outside of noise exempt daytime hours of 8:00 a.m. to 6:30 p.m. exceed 70 dBA L_{max} at the receiving land use property line, then the measures listed below shall be implemented such that interior noise levels of 70 dBA L_{max} are not exceeded at any receiving land use. Typical residential structures with windows closed achieve a 25-30 dBA exterior-to-interior noise reduction (Caltrans 2002).

Thus, using the lower end of this range, an exterior noise level of 70 dBA L_{max} would ensure interior noise levels do not exceed 45 dBA L_{max}, which would result in an increased risk for sleep disturbance. To achieve this performance standard, additional feasible noise reduction measures shall be implemented, such as the following:

- Use of noise-reducing enclosures and techniques around stationary noise-generating equipment (e.g., concrete mixers, generators, compressors).
- Individual operations and techniques outside of daytime hours could be replaced with quieter procedures, where feasible, (e.g., using welding instead of riveting, mixing concrete off-site instead of on-site).
- Installation of temporary noise curtains installed as close as possible to the boundary of the construction site within the direct line of sight path of the nearby sensitive receptor(s) and consist of durable, flexible composite material featuring a noise barrier layer bounded to sound-absorptive material on one side. The noise barrier layer should consist of rugged, impervious, material with a surface weight of at least one pound per square foot.

<u>Significance After Mitigation</u>

Implementation of the above mitigation measures would reduce construction noise to the extent feasible by limiting the types of activities that occur during the sensitive times of the day. When nighttime construction would be required and in the event that noise complaints are received and monitoring demonstrates exceedance of TRPA noise standards, the use of noise barriers and use of alternative, quieter construction procedures, or other feasible approaches, would reduce noise exposure to nearby receptors. However, given that TRPA has established a 50 dBA CNEL noise standard for the project area, even considering these measures, nighttime construction activities would exceed the 50 dBA CNEL standard and this impact would remain significant and unavoidable.

Impact 3.11-2: Short-Term Vibration Impact from Project Construction

Construction activities under Alternatives 1, 2, 3 and 4 would generate short-term vibration levels associated with construction. This would include activities such as pile driving, which would be required for bridge construction along SR 89 under all action alternatives and pier construction for alternatives 1 and 2. However, pile driving activities would not exceed recommended maximum levels that could cause structural damage or human annoyance. This impact would be less than significant under all action alternatives. The No Action Alternative would not involve any construction activities, hence there would be no impact.

<u>No Action Alternative</u>

No construction activity would occur under the No Action Alternative; therefore, no vibration associated with pile driving or other construction activity would occur. There would be no impact.

<u>Alternative 1: Full Restoration with Boating Pier</u>

Under Alternative 1, the SR 89 bridge would be replaced and widened to accommodate a multi-use path, a 300-foot boating pier would be installed and removal of Meeks Bay Marina and restoration of Meeks Creek, realignment of the roads, minor improvements to the campgrounds at the Northside, relocation of the utility infrastructure, and stabilization of the shoreline would occur.

Construction activities would require the use of various types of equipment, such as a loader, dozer/tractor, scraper, excavator, backhoe, grader, pump, generator, crane, trucks (haul and passenger), and pile drivers for bridge and pier construction. Table 3.11-8 shows the maximum ground vibration levels generated by the types of equipment (and activities). The construction activities may result in varying degrees of temporary ground vibration, depending on the specific construction equipment used and activities involved, but as seen in Table 3.11-8, pile driving would result in the greatest vibration levels and therefore is the focus of this analysis.

As shown in Figure 3.11-1, bridge reconstruction would occur at location CS1 and pier construction at location CS5, both locations where pile driving could occur. The nearest sensitive receptor to bridge construction activities is located at SR1, approximately 370 feet away. Construction vibration could also affect on-site daytime recreational users of existing campground facilities and the nearby beach, and in some cases, these receptors could be located at similar or even closer distances to construction noise than off-site receptors. However, as described in Appendix A, "Resource Protection Measures," daily visitors to the project area during active construction would have received prior notification and would be aware of the potential for construction activities to disrupt daily recreational activities or could choose not to visit during these times. Regarding vibration impacts on sensitive receptors, when people are unaware of increased vibration, they are more prone to be surprised, startled, or otherwise disturbed. Therefore, provided that on-site noise-sensitive receptors (i.e., project area visitors) would be fully aware of the ongoing construction activities and the fact that some portions of active construction sites would be closed during construction activities, on-site noise-sensitive receptors would not be more adversely impacted than off-site ones.

Table 3.11-8 Representative Ground Vibration and Noise Levels for Construction Equipment

Equipment	PPV at 25 feet (in/sec)	Approximate L_v (VdB) at 25 feet[2]
Pile driver (impact) upper range	1.518	112
Typical	0.644	104
Pile driver (sonic) upper range	0.734	105
Typical	0.170	93
Blasting	1.13	109
Large dozer	0.089	87
Caisson drilling	0.089	87
Loaded trucks	0.076	86
Rock breaker	0.059	83
Jackhammer	0.035	79
Small dozer	0.003	58

Notes: PPV = peak particle velocity; L_V = the root mean square velocity expressed in vibration decibels (VdB), assuming a crest factor of 4; VdB = vibration decibels.

Source: FTA 2018.

According to FTA, vibration levels associated with typical pile drivers are 0.644 in/sec PPV and 104 VdB at 25 feet. Based on FTA's recommended procedure for applying a propagation adjustment to these reference levels, vibration levels from pile driving could exceed Caltrans-recommended level of 0.2 in/sec PPV with respect to structural damage within 55 feet of pile-driving activities and could exceed FTA's maximum acceptable level of 72 VdB (for frequent events like pile driving) with respect to human response within 292 feet of pile-driving activities. Refer to Appendix C for attenuation calculations. As discussed above and shown in Figure 3.11-1, no off-site structures or sensitive land uses (e.g., residences, tourist accommodation units) are located within 292 feet distance of the SR 89 bridge (CS1) or the pier location (CS5), where pile driving could occur. This impact would be less than significant.

<u>Alternative 2: Full Restoration with Pedestrian Pier</u>

Alternative 2, like Alternative 1, would also include reconstruction of the vehicular bridge on SR 89 and new pier, although the pier would be for pedestrians rather than for boating. Other construction activities, as discussed above for Alternative 1, would also occur under this alternative. Because this alternative would include bridge and pier construction in the same locations as for Alternative 1 (i.e., CS1 and CS5), pile driving would also be of greatest concern affecting the same receptors (SR1 located 370 feet from CS1). Vibration impacts to sensitive receptors within the project area under Alternative 2 would be similar to those described above for Alternative 1. This impact would be less than significant.

<u>Alternative 3: Full Restoration with No Pier</u>

Construction activities associated with Alternative 3 would be similar to Alternative 1 and 2, but no pier would be constructed. Similar to Alternatives 1 and 2, bridge construction that would occur for Alternative 3 would include pile driving, which would generate the highest levels of ground vibration. Thus, pile driving is the focus of this analysis, which would occur for the SR 89 bridge replacement at CS1, affecting the same receptor as described above (SR1 located 370 feet from CS1). Vibration impacts to sensitive receptors within the project area under Alternative 3 would be similar to those described above for Alternative 1. This impact would be less than significant.

Alternative 4: Preferred Alternative

Construction activities associated with Alternative 4 would be similar to Alternative 1 and 2, but no pier would be constructed. Similar to Alternatives 1 and 2, bridge construction that would occur for Alternative 4 would include pile driving, which would generate the highest levels of ground vibration. Thus, pile driving is the focus of this analysis, which would occur for the SR 89 bridge replacement at CS1, affecting the same receptor as described above (SR1 located 370 feet from CS1). Vibration impacts to sensitive receptors within the project area under Alternative 4 would be similar to those described above for Alternative 1. This impact would be less than significant.

Mitigation Measures

No mitigation measures are required.

Impact 3.11-3: Long-Term Changes in Boat Noise

Long-term stationary sources associated with the proposed alternatives could result from new or expanded boating operations at the new boating pier associated with Alternative 1; however, this noise would be offset by a reduction in boat noise associated with removing the existing boat ramp at the Meeks Bay Marina resulting in a less-than-significant impact for Alternative 1. Alternative 2 would include a pedestrian pier instead of a boating pier and Alternatives 3 and 4 would not include a pier. Under Alternatives 2, 3, and 4, no boating pier would be installed so boating activity/noise would not increase in the project area. Long-term boating noise levels in Meeks Bay would decrease under Alternatives 2, 3, and 4 resulting in a beneficial effect. The No Action Alternative would not result in any new piers or other facilities that could increase boating activity; boating noise would be continue at existing levels. This would be a less-than-significant impact.

No Action Alternative

No stationary source of noise would be constructed under the No Action Alternative and the marina would continue to operate generating noise levels that are similar to existing conditions. Because there would be no increase in existing levels of boat noise, this would be a less-than-significant impact.

Alternative 1: Restoration with Boating Pier

Under Alternative 1, a new approximately 300-foot boating pier would be installed, which could increase localized noise levels in the vicinity of the pier (i.e., boating parking/loading/unloading). In addition, if a substantial increase in boating activity and therefore noise levels were to occur, ambient noise levels could also increase. Boat noise is regulated by TRPA's single-event noise levels (Table 3.11-2) and by the applicable PAS noise policies (i.e., 50 dBA CNEL for the Meeks Bay PAS).

Noise sources from motorized watercraft include the engine revving, exhaust noise, and the boat slapping the water. Currently, TRPA enforces a 600-foot no-wake zone, which requires boaters to limit their speed to 5 miles per hour (mph) within 600 feet of the shore, with the exception of up to 7 mph for tour boats. Limiting boat speed reduces engine noise, exhaust noise, and wake-slapping noise, thus substantially reducing boat noise levels at the shore. TRPA enforcement of the no-wake zone and noise limit tests for individual boats, would ensure compliance with single-event noise levels.

The proposed 300-foot boating pier would result in new boating activity associated with the pier; however, this noise would be offset by a reduction in boat noise associated with removing the boat ramp at the Meeks Bay Marina, which results in localized boat noise when the marina is open. As described in Table 3.1-3 in Section 3.1, "Recreation," approximately 1,970 boats are launched from the Meeks Bay Marina per year, which equates to approximately 3,940 boat trips through Meeks Bay per year, assuming two trips per launch (i.e., one trip leaving the marina and one returning). Under this alternative, a boat pier would be constructed. Even though it is not possible to know how many boats would access the new boating pier, based on anecdotal observations at other public piers around Lake Tahoe, it is assumed that an average of five to 10 boats would access the pier per day during the approximately 100-day boating season that generally lasts from Memorial Day weekend through Labor Day weekend. This would result in an estimated total of 1,000–2,000 boat trips (assuming one trip to the pier and one trip from the pier for each boat accessing the pier). To be conservative, this analysis assumes that implementing Alternative 1 would result in approximately 2,000 boat trips per year, which is fewer trips than under baseline conditions with the operation of the marina. Other incidental boat trips, such as boats beaching outside of swim areas or boat anchoring in Meeks Bay, would be unchanged under all the alternatives. Because the overall ambient noise levels experienced at any one time are determined by averaging noise levels or noise events over a 24-hour period of time, the number and duration of each noise-generating event throughout a day influence the ultimate 24-hour CNEL. Thus, provided that under Alternative 1 a reduction in boating activity in the project vicinity is anticipated, overall ambient noise levels are also not anticipated to increase. This impact would be less than significant.

<u>Alternative 2: Restoration with Pedestrian Pier</u>

Alternative 2 would be similar to Alternative 1; however, instead of a boating pier, the new pier would be for pedestrian use only. Therefore, no new boating activity or boat-related noise would occur at the new pier. Further, and similar to the discussion above for Alternative 1, there would be a reduction in boat traffic associated with the removal of the Meeks Bay Marina that would result in a reduction in overall motorized boating noise levels. TRPA would continue to enforce the no-wake zone and overall ambient noise levels would not increase. Since there would be no other new stationary noise sources under this alternative and noise levels would be reduced with the removal of the Meeks Bay Marina, Alternative 2 would have a beneficial effect.

<u>Alternative 3: Restoration with No Pier</u>

Unlike Alternatives 1 and 2, this alternative would not include the construction of a new pier. Instead, this alternative would construct a small, universally accessible nonmotorized paddle craft launch structure at the south end of the bay. The introduction of nonmotorized paddle boats would not affect the ambient noise levels near the sensitive receptors. Also, similar to Alternatives 1 and 2, there would be a reduction in boat traffic associated with the removal of the Meeks Bay Marina that would result in a reduction in motorized boating noise levels. Since there would be no other new stationary noise sources under this alternative and noise levels would be reduced with the removal of the Meeks Bay Marina, Alternative 3 would have a beneficial effect.

<u>Alternative 4: Preferred Alternative</u>

This Alternative would be similar to Alternative 3, and no pier would be constructed but a small, universally accessible nonmotorized paddle craft launch structure would be constructed at the south end of the bay. The introduction of nonmotorized paddle boats would also not affect the ambient noise levels near the sensitive receptors. Also, there would be a reduction in boat traffic associated with the removal of the Meeks Bay Marina that would result in a reduction in motorized boating noise levels. Since there would be no other new stationary noise sources under this alternative and noise levels would be reduced with the removal of the Meeks Bay Marina, Alternative 4 would have a beneficial effect.

Mitigation Measures

No mitigation measures are required.

Impact 3.11-4: Long-Term Traffic Noise Levels

Alternatives 1 through 4 would result in a decrease in average daily trips associated with removal of the marina and taking into consideration changes proposed in the project area (e.g., change in number of campsites and parking spaces). Thus, there would be a less-than-significant impact related to long-term traffic noise levels for Alternatives 1 through 4. No changes related to traffic would occur with the No Action Alternative and, thus, there would be no impact on long-term traffic noise levels.

<u>No Action Alternative</u>

No increase in traffic would occur under the No Action Alternative; therefore, no traffic noise impact would occur. Hence, there would be no impact.

<u>Alternative 1: Restoration with Boating Pier</u>

As detailed in Chapter 3.12, "Transportation and Circulation," the changes proposed under Alternative 1, including removal of the marina and development of up to two additional campsites, would likely result in a net decrease in average daily trips. Therefore, Alternative 1 would not generate an increase in traffic or associated traffic noise. There would be a less-than-significant impact associated with long-term traffic noise.

<u>Alternative 2: Restoration with Pedestrian Pier</u>

As detailed in Chapter 3.12, "Transportation and Circulation," the changes proposed under Alternative 2, including removal of the marina and development of up to two additional campsites, would likely result in a net decrease in average daily trips. Therefore, Alternative 2 would not generate an increase in traffic or associated traffic noise. There would be a less-than-significant impact associated with long-term traffic noise.

<u>Alternative 3: Restoration with No Pier</u>

As detailed in Chapter 3.12, "Transportation and Circulation," the changes proposed under Alternative 3, including removal of the marina and development of up to 22 additional campsites, would likely result in a net decrease in average daily trips. Therefore, Alternative 3 would not generate an increase in traffic or associated traffic noise. There would be a less-than-significant impact associated with long-term traffic noise.

<u>Alternative 4: Preferred Alternative</u>

As detailed in Chapter 3.12, "Transportation and Circulation," the changes proposed under Alternative 4, including removal of the marina and development of up to two additional campsites, would likely result in a net decrease in average daily trips. Therefore, Alternative 4 would not generate an increase in traffic or associated traffic noise. There would be a less-than-significant impact associated with long-term traffic noise.

Mitigation Measures

No mitigation measures are required.

3.11.4 Cumulative Impacts

For the Tahoe Basin as a whole, all CNEL threshold standards are in attainment of the TRPA threshold standard except for the standard for critical wildlife habitat areas (TRPA 2021). The predominant noise source in the project area is vehicle traffic on SR 89. Existing traffic noise levels on roadway segments in the project area are summarized in Table 3.11-6.

Noise and vibration levels associated with construction of all the action alternatives would be temporary, intermittent, and relatively minor. Construction-related noise is typically considered a localized affect, affecting the land uses closest to construction activities and TRPA requirements limit construction activities to the less-sensitive times of the day. Given that proposed construction activities would be relatively minor, localized, and would occur during the less-sensitive times of the day, construction activities associated with Alternatives 1, 2, 3, and 4 would not combine with noise from other construction activities in the area to result in a cumulative noise impact from construction.

Alternatives 1 through 4 would result in an overall decrease in average daily trips, which considers the removal of the marina with changes proposed in the project area (e.g., change in number of campsites and parking spaces). Thus, there would be no traffic noise impact for Alternatives 1 through 4. Therefore, even if traffic in the project vicinity increased under cumulative conditions, the project's contribution would not be considered substantial.

Alternative 1 would include construction of a new boating pier that would result in boating noise near the pier. However, removal of the boat ramp and marina would result in an overall net decrease in motorized boating activity and boat noise in the project vicinity. All other action alternatives would not include a boating pier, therefore, none of the action alternatives would result in a substantial increase in boating activity and associated ambient noise levels. In fact, overall boating activity and associated noise in the project vicinity would decrease compared to existing conditions, as a result of less motorized boating activity in Meeks Bay. Thus, long-term boat-related noise would not be substantial and would not combine with other noise sources in the area to result in a substantial increase in cumulative noise levels.

For these reasons, the alternatives would a have a less than cumulatively considerable impact related to noise.

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