4.10 NOISE

Noise impact in urban settings comes from different sources. Some sources are activities essential for health and safety reasons, such as noise from emergency vehicles, garbage collection and construction and maintenance equipment. Other sources such as traffic, stem from the movement of people and goods, activities that are essential to the viability of a community. Although these and other noise producing activities are necessary, the noise they produce is often undesirable. Simply put noise is defined as any unwanted sound.

The following analysis discusses the potential noise impacts that stem from activities that occur within the project area, and potential noise levels generated from activities that occur outside of the project area (e.g., traffic noise from SR 28) that may impact land uses proposed within the project area. This section also provides information on the existing noise environment and proposes mitigation measures, where necessary, to ensure compliance with state and local noise criteria.

ENVIRONMENTAL SETTING

Regional Setting

The project site is located within Washoe County on the Nevada and California state border. This portion of Washoe County consists of residential, commercial, light industrial, gaming, and other recreational uses including hiking, biking, skiing, and various lake activities. The primary sources of noise in this area are generated from vehicular traffic along State Route 28 (SR 28) and other nearby roads.

Acoustic Terminology[1]

Acoustics is the science of sound, while sound may be thought of as mechanical energy of a vibrating object transmitted by pressure waves through a medium to human (or animal) ears. If variations in pressure waves occur frequently enough (at least 20 times per second), then these waves can be heard as what we call sound. The actual number of pressure variations per second is called the frequency of sound, and is expressed as cycles per second or Hertz (Hz).

Noise is the subjective reaction to different types of sounds. Noise is typically defined as (airborne) sound that is loud, unpleasant, unexpected or undesired, and may therefore be classified as a more specific group of sounds. Perceptions of sound and noise are highly subjective as it is sometimes said: one person's music is another's headache.

Measuring sound directly in terms of pressure requires a very large range of numbers. To avoid the use of such a large range of numbers in evaluating sound, the decibel scale was devised. The decibel scale uses the hearing threshold (20 micropascals), as a point of reference, defined as 0 dB. Other sound pressures are then compared to this reference pressure, and a logarithm is used to keep the numbers in a practical range. The decibel scale allows a million-fold increase in pressure to be expressed as 120 dB, and changes in levels (dB) correspond closely to human perception of relative loudness (see Table 4.10-1).

[1] For an explanation of these terms, see Appendix Y-1: "Acoustical Terminology"

The perceived loudness of sounds is dependent upon many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels (e.g., the decibel scale), perception of loudness is relatively predictable, and can be approximated by A-weighted sound levels. There is a strong correlation between A-weighted sound levels (expressed as dBA) and the way the human ear perceives sound. For this reason, the A-weighted sound level has become the standard tool of environmental noise assessment. All noise levels reported in this section are in terms of A-weighted levels.

The decibel scale is logarithmic, not linear. In other words, two sound levels 10 dB apart differ in acoustic energy by a factor of 10. Using A-weighted sound levels, an increase of 10 dBA is generally perceived as a doubling in loudness. For example, a 70 dBA sound is half as loud as an 80 dBA sound, and twice as loud as a 60 dBA sound. If you doubled the traffic on a highway, you would increase the noise level by approximately 3 dBA.

Community noise is commonly described in terms of the ambient noise level, which is defined as the all-encompassing noise level associated with a given environment. A common statistical tool to measure the ambient noise level is the average, or equivalent, sound level (L_{eq}), which corresponds to a steady-state A weighted sound level containing the same total energy as a time varying signal over a given time period (usually one hour). The L_{eq} is the foundation of the composite noise descriptor, Community Noise Equivalent Level (CNEL), and shows very good correlation with community response to noise. The Tahoe Regional Planning Agency (TRPA) has adopted environmental thresholds for the Lake Tahoe Region. The noise standards, or "Thresholds" as they are commonly referred to, apply maximum numerical CNEL values for various land use categories and transportation corridors. A more detailed discussion of TRPA standards is provided in the “Regulatory Setting” section below.

The CNEL is the 24-hour average noise level of all hourly L_{eq} measurements with a 10 dB penalty added to the levels between 2200 (10:00 p.m.) and 0700 (7:00 a.m.) hours and for the purposes of TRPA calculations, a 5 dB penalty added to the levels between 1900 (7:00 p.m.) and 2200 (10:00 p.m.) hours to reflect people’s sensitivity to noise during the nighttime and evening hours. Because CNEL represents a 24-hour average, it tends to disguise short-term variations in the noise environment.

Table 4.10-1 lists several examples of the noise levels associated with common situations.

Noise sources that produce ambient noise levels in the vicinity of the project area are associated almost exclusively with traffic on SR 28. There are noise sensitive land uses in the project area and immediate vicinity including homes and recreational users (i.e., hiker, cyclist, etc.). Temporary noise associated with construction may be prevalent in the area, but these noises would be limited to the time and duration of construction activities.

Vibration is an oscillatory motion, which can be described in terms of displacement, velocity, or acceleration. The displacement for a vibrating floor is simply the distance that a point on the floor moves away from its static position. The velocity represents the instantaneous speed of the floor movement and acceleration is the rate of change of the speed. The response of humans, buildings, and equipment to vibration is normally described using velocity or acceleration.

Vibration amplitudes are usually expressed as either peak particle velocity (PPV) or the root mean square (RMS) velocity. The PPV is defined as the maximum instantaneous peak of the vibration signal. The RMS of a signal is the average of the squared amplitude of the signal. PPV will be used in this analysis to evaluate the potential of building damage associated with blasting or other high vibration construction activities.

Table 4.10-1

Typical Noise Levels

Common Outdoor Activities and Distance from Noise Source	Noise Level (dBA)	Common Indoor Activities and Distance from Noise Source
	--110--	Rock Band
Jet Flying over at 300 m (1,000 ft)	--100--	
Gas Lawn Mower at 1 m (3 ft)	--90--	
Diesel Truck at 15 m (50 ft), at 80 km/hr (50 mph)	--80--	Food Blender at 1 m (3 ft) Garbage Disposal at 1 m (3 ft)
Noisy Urban Area, Daytime Gas Lawn Mower, 30 m (100 ft)	--70--	Vacuum Cleaner at 3 m (10 ft)
Commercial Area Heavy Traffic at 90 m (300 ft)	--60--	Normal Speech at 1 m (3 ft)
Quiet Urban Daytime	--50--	Large Business Office Dishwasher in Next Room
Quiet Urban Nighttime	--40--	Theater, Large Conference Room (Background)
Quiet Suburban Nighttime	--30--	Library
Quiet Rural Nighttime	--20--	Bedroom at Night, Concert Hall (Background)
	--10--	Broadcast/Recording Studio
Lowest Threshold of Human Hearing	--0--	Lowest Threshold of Human Hearing

Source: Caltrans, Technical Noise Supplement, Traffic Noise Analysis Protocol. October 1998.

Effects of Noise on People

The effects of noise on people can be placed in three categories:

- Subjective effects of annoyance, nuisance, and dissatisfaction;
- Interference with activities such as speech, sleep, and learning; and
- Physiological effects such as hearing loss or sudden startling.

Environmental noise typically produces effects related to the first two categories. Workers in industrial plants can experience noise effects related to the last category. There is no completely satisfactory way to measure the subjective effects of noise or the corresponding reactions of annoyance and dissatisfaction.

A wide variation in individual thresholds of annoyance exists and different tolerances to noise tend to develop based on an individual's past experiences with noise.

Thus, an important way of predicting a human reaction to a new noise environment is the way it compares to the existing environment to which one has adapted: the so-called ambient noise level. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by those hearing it.

With regard to increases in A-weighted noise level, the following relationships occur:

- Except in carefully controlled laboratory experiments, a change of 1 dBA cannot be perceived;
- A change in noise levels of 3 dBA is considered a just-perceivable difference;
- A change in level of at least 5 dBA is required before any noticeable change in human response would be expected; and
- A 10 dBA change is subjectively heard as approximately a doubling in loudness, and can cause an adverse response.

Stationary point sources of noise (i.e., HVAC systems, idling vehicles, etc.) attenuate (lessen) at a rate of approximately 6 dB each time the distance from the noise source is doubled, depending on environmental conditions (i.e., atmospheric conditions, placement of vegetative or manufactured noise barriers, etc.). Widely distributed noises, such as a large industrial facility spread over many acres, or a street with moving vehicles, would typically attenuate at a lower rate, between 3 dB and 4.5 dB per doubling of distance.

Major Noise Sources in the Project Vicinity

Transportation

Vehicle traffic on SR 28 and other local roadways has been identified as the primary noise source within the project vicinity. To determine existing traffic noise levels at identified noise sensitive land uses within the project vicinity, j.c. brennan & associates, Inc. used the Federal Highway Administration Highway Traffic Noise Prediction Model (FHWA-RD-77-108). The FHWA Model is based upon standard noise factors for automobiles, medium trucks and heavy trucks, and includes inputs to document vehicle volume, speed, roadway configuration, distance to the receiver, and the acoustical characteristics of the site. The FHWA model inputs consisted of existing traffic volumes obtained from Fehr & Peers Transportation Engineers and j.c. brennan & associates, Inc. site observations. A compete listing of the FHWA model inputs is provided in Appendix Y-2.

Table 4.10-2 shows the predicted existing traffic noise levels in terms of the Community Noise Equivalent Level descriptor (CNEL) at a standard distance of 100 feet from the centerlines of the existing immediate project-area roadways for existing conditions, as well as distances to existing traffic noise contours. The modeled CNEL values generated by the FHWA model only represent the noise associated with traffic and do not account for noise associated with other noise sources in the vicinity. Other noise sources are discussed below. The extent by which existing land uses in the project vicinity are affected by existing traffic noise depends on their respective proximity to the roadways and their individual sensitivity to noise.

Table 4.10-2

Modeled Existing Baseline Traffic Noise Levels

Roadway	Segment	Traffic Noise Level @ 100 feet	Traffic Noise Level @ 301 feet	Distance to CNEL Contours (feet)	
				60 dB	55 dB
SR 28	W. of Mount Rose	62 dB CNEL	55 dB CNEL	131	281
SR 28	E. of Mount Rose	61 dB CNEL	54 dB CNEL	125	270
SR 28	W. of Lakeshore	61 dB CNEL	54 dB CNEL	124	266
SR 28	E. of Lakeshore	61 dB CNEL	54 dB CNEL	111	240
SR 28	N. of Reservoir Rd	61 dB CNEL	54 dB CNEL	117	253
SR 28	S. of Reservoir Rd.	61 dB CNEL	54 dB CNEL	115	248
SR 28	W. of Biltmore Drive	61 dB CNEL	54 dB CNEL	116	249
SR 28	E. of Biltmore Drive	61 dB CNEL	54 dB CNEL	116	250
SR 28	W. of Stateline Rd	61 dB CNEL	54 dB CNEL	118	255
SR 28	E. of Stateline Rd	61 dB CNEL	54 dB CNEL	116	250
SR 28	W. of Coon St.	61 dB CNEL	54 dB CNEL	121	260
SR 28	E. of Coon St.	61 dB CNEL	54 dB CNEL	116	250
SR 28	W. of SR 267	61 dB CNEL	54 dB CNEL	125	269
SR 28	E. of SR 267	62 dB CNEL	55 dB CNEL	139	299
SR 267	N. of SR 28	60 dB CNEL	53 dB CNEL	96	207
Lakeshore	S. of SR 28	52 dB CNEL	N/A	29	62
Pinion	N. of SR 28	43 dB CNEL	N/A	8	17
Reservoir Rd	W. of SR 28	46 dB CNEL	N/A	11	24
Reservoir Rd	W. of Wassou Rd.	37 dB CNEL	N/A	3	6
Reservoir Rd	E. of Wassou Rd.	47 dB CNEL	N/A	13	27
Wassou Rd	S. of Reservoir Rd.	47 dB CNEL	N/A	13	29
Wassou Rd	N. of Reservoir Rd.	37 dB CNEL	N/A	3	7
Stateline Rd	N. of SR 28	46 dB CNEL	N/A	12	27
Stateline Rd	S. of SR 28	43 dB CNEL	N/A	7	16
Stateline Rd	N. of Cove St.	46 dB CNEL	N/A	13	27

Source: j.c. brennan & associates, Inc. 2009

[1] Distances are reference distances from centerline of roadway.

N/A Not applicable since it is not a transportation corridor defined by TRPA

FHWA RD77-102 Traffic Noise Prediction Model., Inputs from Fehr & Peers Traffic Consultants

Non-Transportation

Mixed-use developments, hotels and casinos, and other commercial land uses along the SR 28 corridor inherently have noise producing components associated with their operations. Noise sources associated with these types of land uses include, but are not limited to:

- HVAC Systems
- Cooling Towers/Evaporative Condensers
- Loading Docks
- Lift Stations
- Emergency Generators
- Outdoor Public Address Systems

Noise-Sensitive Land Uses in the Project Vicinity

Noise sensitive land uses in the immediate project vicinity consist of single-family and multi-family residential, and to some extent office uses. These land uses are more sensitive to changes in ambient noise levels.

Existing Ambient Noise Levels

To quantify existing ambient noise levels in the vicinity of the project area, j.c. brennan & associates, Inc., conducted continuous 24-hour noise level measurements at three locations within the project area, on Wednesday August 6th – Thursday August 7th, 2008. The intent of the 24-hour continuous noise level measurements was to determine the existing background noise levels on, and within the project vicinity. The results of the noise level measurements are shown in Table 4.10-3. Continuous noise monitoring results are presented graphically in Appendix Y-3. The noise measurement sites are shown on Figure 4.10-1.

Equipment used for the noise measurements included Larson Davis Laboratories (LDL) Model 820 precision integrating sound level meters. The meters were calibrated before and after use with an LDL CAL200 acoustical calibrator to ensure the accuracy of the measurements. The measurement system meets all pertinent specifications of the American National Standards Institute (ANSI) for precision sound level measurement equipment.

A description of each of the noise measurement sites is as follows:

Site A - This site was located on Lake View Avenue. This site represents existing residential uses on Lake View Avenue, adjacent to the west property line of the project area. Traffic on SR 28 was the dominant noise source at this location.

Site B - This site was located west of the project site, and on the northern portion Stateline Road. This site represents existing residential uses along Stateline Road, and is adjacent to the west property line of the project area. Noise sources at this location included HVAC systems at the Tahoe Biltmore and traffic within the existing parking area for the Tahoe Biltmore.

Site C - This site is located on the eastern portion of the project area, and adjacent to SR 28. This site represents the proposed building façade for Building A which is to be located approximately 90 feet from SR 28 centerline. Traffic on SR 28 was the dominant noise source at this location.

Table 4.10-3

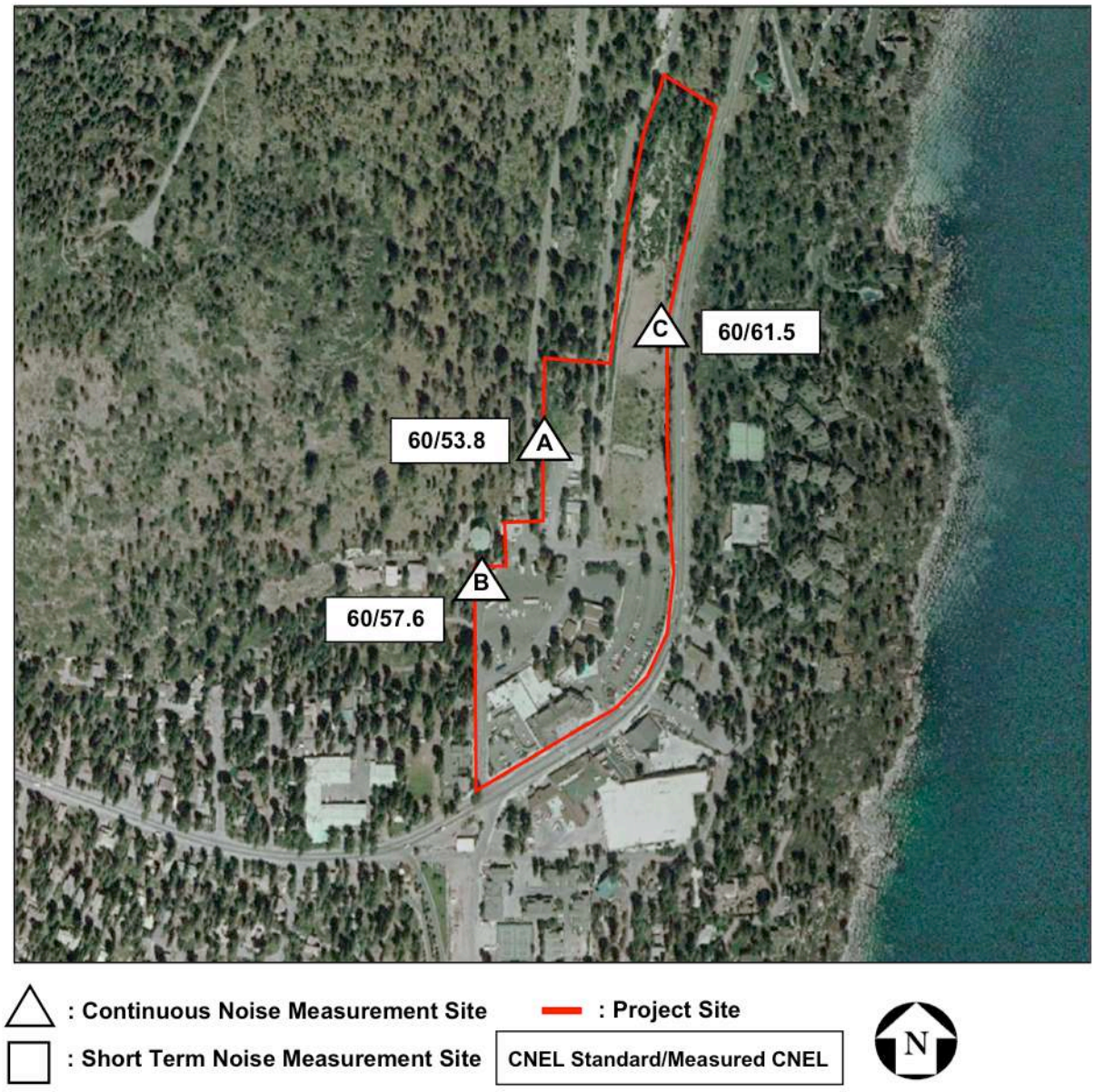
Existing Ambient Noise Monitoring Results for Continuous Noise Measurement Sites, Boulder Bay – Stateline, Nevada

Site	Description	GPS Coordinate	Plan Area #	CNEL Standard	Measurement Date/Day	Measured CNEL	Attainment?	CNEL Delta
A	Lakeview Ave.	39° 13' 46.92" N 120° 00' 19.04" W	032	60 dB	Aug. 6-7, 2008 Wed/Thurs.	53.8 dB	Yes	- 6 dB
B	North end of Stateline Rd.	39° 13' 42.08" N 120° 00' 20.13" W	032	60 dB	Aug. 6-7, 2008 Wed/Thurs.	57.6 dB	Yes	- 2 dB
C	@ 90' from SR 28	39° 13' 47.31" N 120° 00' 13.73" W	032	60 dB	Aug. 6-7, 2008 Wed/Thurs.	61.5 dB	No*	+ 2 dB

Source: j.c. brennan & associates, Inc. 2008-2009

* This noise measurement site was located inside of the SR 28 300 foot corridor.

Figure 4.10-1 Noise Measurement Sites



REGULATORY SETTING

Tahoe Regional Planning Agency Plan Area Criteria

The Tahoe Regional Planning Agency (TRPA) has adopted environmental thresholds for the Lake Tahoe Region. The noise standards, or "Thresholds" as they are commonly referred to, are numerical CNEL values for various land use categories and transportation corridors. TRPA's CNEL standards include noise from all sources within a sample area and are based on not-to-exceed noise levels at any place or time during a 24-hour period within the applicable Plan Area or Transportation Corridor.

The CNEL is the 24-hour average noise level of all hourly L_{eq} measurements with a 10 dB penalty added to the levels between 2200 (10:00 p.m.) and 0700 (7:00 a.m.) hours and for the purposes of TRPA calculations, a 5 dB penalty added to the levels between 1900 (7:00 p.m.) and 2200 (10:00 p.m.) hours to reflect people's sensitivity to noise during the nighttime and evening hours.

As a form of zoning, the TRPA has divided the Lake Tahoe Region into more than 175 separate Plan Areas. Boundaries for each of the Plan Areas have been established based on similar land uses and the unique character of each geographic area. For each Plan Area, a "Statement" is made as to how that particular area should be regulated to achieve regional environmental and land use objectives. As a part of each Statement, an outdoor CNEL standard is established. The project site is located within Plan Area 032 (North Stateline Casino Core) and a small portion of Plan Area 034 (Crystal Bay). The project site is bordered to the east and west by Plan Area 031 (Brockway) and 033 (Stateline Point) and to the north by 034 (Crystal Bay). The Plan Area Statement for Plan Area 032 defers to the North Stateline Community Plan noise level criteria. The adjoining Plan Area noise level criteria are shown in Table 4.10-4.

Table 4.10-4

Project and Adjoining Plan Area Statement Noise Level Criteria

Plan Area #	Plan Area Name	TRPA Noise Level Criteria
031	Brockway	55 dB CNEL for entire Plan Area
032 (Project Site)	North Stateline Community Plan	*See discussion below for the North Stateline Community Plan*
033	Stateline Point	50 dB CNEL for Plan Area, 55 dB CNEL for Highway 28 corridor.
034 (Project Site)	Crystal Bay	50 dB CNEL for Plan Area, 55 dB CNEL for Highway 28 corridor.

Tahoe Regional Planning Agency North Stateline Community Plan Criteria

The North Stateline Community Plan has adopted a CNEL standard of 60 dB for the entire Plan Area, including the State Route 28 corridor. The Community Plan has also established hourly exterior noise level performance standards for stationary or industrial noise sources. These criteria are shown in Table 4.10-5. These criteria are based upon hourly average (Leq) and maximum (Lmax) noise level descriptors. The hourly average (Leq) and the maximum (Lmax) noise level descriptors have been found to provide good correlation to stationary noise sources.

Tahoe Regional Planning Agency Noise Ordinance Criteria:

Chapter 23 of the TRPA Code of Ordinances establishes single event noise level criteria for aircraft, marine craft, motor vehicles, off-road vehicles and over-snow vehicles. The ordinance also establishes community noise level standards. TRPA's Code Section 23.8 provides exemptions to noise limitations for TRPA approved construction projects. The following is contained in Section 23.8:

The standards of this chapter shall not apply to noise from TRPA-approved construction or maintenance projects, or the demolition of structures, provided such activities are limited to the hours between 8 a.m. and 6:30 p.m. The standards of this chapter shall not apply to safety signals, warning devices, or emergency pressure relief valves and other similar devices. Emergency work to protect life or property is exempt from noise standards, as are fireworks used in accordance with a state or local permit.

Table 4.10-5

North Stateline Community Plan Hourly Exterior Noise Performance Standards for Stationary and Industrial Noise Sources

	Acceptable Noise Level, dBA	
Noise Metric	**Daytime (7 a.m. - 10 p.m.)**	**Nighttime (10 p.m. - 7 a.m.)**
Leq	55	45
Lmax	75	65

Washoe County

The recently adopted Washoe County Development Code Section 110, Article 414 outlines exterior noise level standards for properties abutting residential land uses. Exterior noise levels at abutting residential land uses shall not exceed 65 dB Ldn. The Ldn measurement is a day/night average sound level that is similar to CNEL but with no evening weighting (penalty).

Determination of a Significant Increase in Noise Levels

The TRPA considers the following situations as a significant increase in noise levels:

- a CNEL increase of 3 dB;
- any exceedance of the Plan Area Statement noise standards; or
- any exceedance of other federal, state, or local jurisdiction's noise standards with jurisdiction in the Basin.

Criteria for Acceptable Vibration

The TRPA, Washoe County and Placer County do not have specific policies or criteria pertaining to vibration levels. The effects of construction related vibration are considered in this analysis because the project area is expected to include substantial construction, including excavation.

Human and structural response to different vibration levels is influenced by a number of factors, including ground type, distance between source and receptor, duration, and the number of perceived vibration events. Table 4.10-6, which was developed by Caltrans, shows the vibration levels which would normally be required to result in damage to structures. The vibration levels are presented in terms of peak particle velocity in inches per second.

Table 4.10-6

Effects of Various Vibration Levels on People and Buildings

Peak Particle Velocity inches/second	Peak Particle Velocity mm/second	Human Reaction	Effect on Buildings
0.0-0.006	0.15	Imperceptible by people	Vibrations unlikely to cause damage of any type
0.006-0.02	0.5	Range of Threshold of perception	Vibrations unlikely to cause damage of any type
0.08	2.0	Vibrations clearly perceptible	Recommended upper level of which ruins and ancient monuments should be subjected
0.1	2.54	Level at which continuous vibrations begin to annoy people	Virtually no risk of architectural damage to normal buildings
0.2	5.0	Vibrations annoying to people in buildings	Threshold at which there is a risk of architectural damage to normal dwellings
1.0	25.4		Architectural Damage
2.0	50.4		Structural Damage to Residential Buildings
6.0	151.0		Structural Damage to Commercial Buildings

Source: Survey of Earth-borne Vibrations due to Highway Construction and Highway Traffic, Caltrans 1976

Table 4.10-6 indicates that the threshold for damage to structures ranges from 2 to 6 in/sec. One-half this minimum threshold or 1 in/sec p.p.v. is considered a safe criterion that would protect against architectural or structural damage. The general threshold at which human annoyance could occur is noted as 0.1 in/sec p.p.v.

EVALUATION CRITERIA WITH POINTS OF SIGNIFICANCE

Based on the TRPA Guidelines, a project impact is considered significant if conditions presented in Table 4.10-7 are met.

Table 4.10-7

Evaluation Criteria with Point of Significance - Noise

Evaluation Criteria	As Measured by	Point of Significance	Justification
NOISE-1. Will the project result in a significant increase in noise levels?	Projected CNEL levels measured at any point within the plan area.	An increase in 3 dB CNEL or exceedance of the Plan Area Statement noise standards or an exceedance of any other federal, state, or local jurisdiction's noise standards with jurisdiction in the Basin	TRPA Policy
NOISE-2. Will the project result in an exceedance of any exterior traffic noise level standard?	Projected traffic noise levels measured at 300 feet from centerline of the highway or at outdoor activity areas.	CNEL level of >60 dB at 300 from highway centerline CNEL level of >60 dB at outdoor activity areas	North Stateline Community Plan, TRPA PAS 034, Washoe County Development Code
NOISE-3. Will the project result in excessive noise due to construction activities?	CNEL levels with exemptions from 8am to 6:30pm	CNEL level of >55dB	Chapter 23 of the TRPA Code of Ordinances
NOISE-4. Will the project result in excessive vibration due to construction?	Projected vibration levels at property line or "yard" line of adjacent uses	1 inch per second peak particle velocity.	Survey of Earthborne Vibration due to Highway Construction and Highway Traffic.
NOISE-5. Will the project result in noise levels from on-site mechanical equipment and loading dock activities?	Projected noise levels at noise-sensitive use property lines	CNEL levels of 55 dB or 55 dB Leq (1-hr) during the daytime and 45 dB Leq (1-hr) during the nighttime.	North Stateline Community Plan.
NOISE-6. Will the development of the project result in outdoor activities from people gathering on decks and patios?	Projected noise levels at noise-sensitive use property lines	CNEL levels of 55 dB or 55 dB Leq (1-hr) during the daytime and 45 dB Leq (1-hr) during the nighttime.	North Stateline Community Plan.

Source: Hauge Brueck Associates 2008

ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

IMPACT: NOISE-1: Will the project result in a significant increase in traffic noise levels?

Analysis: *No Impact; Alternative A*

Alternative A will not result in changes to traffic levels or operation of the existing land uses. Therefore, no changes to existing noise levels will occur.

Mitigation: No mitigation is required.

Analysis: *Significant Impact: Alternatives B, C, and D*

As documented in Tables 4.10-8 through 4.10-13, Alternatives B, C & D will result in significant increases in traffic noise levels along Stateline Road between SR 28 and Cove Street of between +3 dB and +4 dB CNEL.

To assess noise impacts due to project-related traffic increases on the existing local roadway network, traffic noise levels were predicted at a representative distance for Existing Plus Project (Alt C), Cumulative Plus Project (Alt C), and for each of the action Alternatives (B, D and E).

The FHWA traffic noise prediction model was used to predict traffic noise levels at a representative distance of 100 feet from the roadway centerline. Table 4.10-8 shows the predicted traffic noise level increases on the local roadway network for Existing and Existing Plus Project (Alt. C) conditions. Table 4.10-9 shows the predicted traffic noise level increases on the local roadway network for Cumulative and the Cumulative Plus Project (Alt. C) conditions.

Tables 4.10-10 through 4.10-13 show the predicted traffic noise level increases for Alternatives B and D under both existing and cumulative conditions.

Mitigation: **NOISE-1: Use of Alternative Pavement**

A 4 dB reduction in noise is possible with the use of alternative pavement treatments. As a part of the project design, Boulder Bay will repave Stateline Road between SR 28 and Cove Street using rubberized asphalt or other noise reducing road surfaces that have shown acceptable noise reductions.

After Mitigation: *Less than Significant: Alternatives B, C and D*

Implementation of mitigation measure Noise-1 will reduce the impact to a less than significant level.

Analysis: *Less than Significant Impact; Alternative E*

As documented in Tables 4.10-14 and 4.10-15, Alternative E will not result in a noticeable change to existing noise levels. Therefore, this impact is considered to be less than significant.

Mitigation: No mitigation is required.

Table 4.10-8

Modeled Existing and Existing + Project (Alternative C) Traffic Noise Levels

				Traffic Noise Levels (CNEL, dBA)			Distance to Existing Contours (feet)		Distance to Existing + Project Contours (feet)	
Roadway	Segment	TRPA CNEL Std	Distance[1]	Existing	Existing + Project	Change	60 CNEL	55 CNEL	60 CNEL	55 CNEL
SR 28	W. of Mount Rose	55 dB	100 feet	62	62	0	131	281	129	279
SR 28	E. of Mount Rose	55 dB	100 feet	61	61	0	125	270	124	268
SR 28	W. of Lakeshore	55 dB	100 feet	61	61	0	124	266	122	263
SR 28	E. of Lakeshore	55 dB	100 feet	61	61	0	111	240	110	238
SR 28	N. of Reservoir	60 dB	100 feet	61	61	0	117	253	118	254
SR 28	S. of Reservoir	60 dB	100 feet	61	61	0	115	248	116	250
SR 28	W. of Stateline Rd	60 dB	100 feet	61	61	0	118	255	117	252
SR 28	E. of Stateline Rd	60 dB	100 feet	61	61	0	116	250	116	251
SR 28	W. of Coon St.	55 dB	100 feet	61	61	0	121	260	120	258
SR 28	E. of Coon St.	55 dB	100 feet	61	61	0	116	250	119	255
SR 28	W. of SR 267	55 dB	100 feet	61	61	0	125	269	124	268
SR 28	E. of SR 267	55 dB	100 feet	62	62	0	139	299	138	297
SR 267	N. of SR 28	55 dB	100 feet	60	60	0	96	207	96	206
Lakeshore	S. of SR 28	55 dB	100 feet	52	52	0	29	62	28	61
Pinion	N. of SR 28	60 dB	100 feet	43	42	-1	8	17	7	14
Stateline Rd	N. of SR 28	60 dB	100 feet	46	49	**+3**	12	27	18	38
Stateline Rd	S. of SR 28	55 dB	100 feet	43	43	0	7	16	7	16
Stateline Rd	N. of Cove St.	60 dB	100 feet	46	43	-3	13	27	7	15

Source – j.c. brennan & associates, Inc. – 2008

[1] Distances are reference distances from centerline of roadway.

Table 4.10-9

Modeled Cumulative and Cumulative + Project (Alternative C) Traffic Noise Levels

				Traffic Noise Levels (CNEL, dBA)			Distance to Cumulative Contours (feet)		Distance to Cumulative + Project Contours (feet)	
Roadway	Segment	TRPA CNEL Std	Distance[1]	Cumulative	Cumulative + Project	Change	60 CNEL	55 CNEL	60 CNEL	55 CNEL
SR 28	W. of Mount Rose	55 dB	100 feet	62	63	0	145	313	149	320
SR 28	E. of Mount Rose	55 dB	100 feet	62	62	0	136	293	138	298
SR 28	W. of Lakeshore	55 dB	100 feet	62	62	0	137	296	140	303
SR 28	E. of Lakeshore	55 dB	100 feet	61	62	+1	124	267	127	273
SR 28	N. of Reservoir Rd/Wellness	60 dB	100 feet	62	62	0	133	287	136	294
SR 28	S. of Reservoir Rd./Wellness	60 dB	100 feet	62	62	0	133	287	135	290
SR 28	W. of Stateline Rd	60 dB	100 feet	62	62	0	134	289	136	292
SR 28	E. of Stateline Rd	60 dB	100 feet	62	62	0	133	288	135	291
SR 28	W. of Coon St.	55 dB	100 feet	62	62	0	137	294	138	297
SR 28	E. of Coon St.	55 dB	100 feet	62	62	0	136	292	137	295
SR 28	W. of SR 267	55 dB	100 feet	62	62	0	144	310	136	293
SR 28	E. of SR 267	55 dB	100 feet	63	63	0	164	354	157	338
SR 267	N. of SR 28	55 dB	100 feet	61	61	0	109	235	108	234
Lakeshore	S. of SR 28	55 dB	100 feet	52	53	+1	31	67	32	68
Pinion	N. of SR 28	60 dB	100 feet	42	42	0	7	14	7	14
Stateline Rd	N. of SR 28	60 dB	100 feet	45	49	**+4**	11	23	18	38
Stateline Rd	S. of SR 28	55 dB	100 feet	43	43	0	7	16	7	16
Stateline Rd	N. of Cove St.	60 dB	100 feet	46	43	-3	11	24	7	15

Source – j.c. brennan & associates, Inc. – 2008

[1] Distances are reference distances from centerline of roadway.

Table 4.10-10

Modeled Existing and Existing + Alternative B Traffic Noise Levels

				Traffic Noise Levels (CNEL, dBA)			Distance to Existing Contours (feet)		Distance to Existing + Alt B Contours (feet)	
Roadway	Segment	TRPA CNEL Std	Distance[1]	Existing	Existing + Alt B	Change	60 CNEL	55 CNEL	60 CNEL	55 CNEL
SR 28	W. of Mount Rose	55 dB	100 feet	62	62	0	131	281	133	287
SR 28	E. of Mount Rose	55 dB	100 feet	61	62	+1	125	270	127	273
SR 28	W. of Lakeshore	55 dB	100 feet	61	62	+1	124	266	126	271
SR 28	E. of Lakeshore	55 dB	100 feet	61	61	0	111	240	111	239
SR 28	N. of Reservoir Rd	60 dB	100 feet	61	61	0	117	253	122	264
SR 28	S. of Reservoir Rd	60 dB	100 feet	61	61	0	115	248	118	255
SR 28	W. of Stateline Rd	60 dB	100 feet	61	61	0	118	255	121	261
SR 28	E. of Stateline Rd	60 dB	100 feet	61	61	0	116	250	118	254
SR 28	W. of Coon St.	55 dB	100 feet	61	61	0	121	260	124	266
SR 28	E. of Coon St.	55 dB	100 feet	61	61	0	116	250	1423	264
SR 28	W. of SR 267	55 dB	100 feet	61	62	+1	125	269	127	273
SR 28	E. of SR 267	55 dB	100 feet	62	62	0	139	299	142	305
SR 267	N. of SR 28	55 dB	100 feet	60	60	0	96	207	98	210
Lakeshore	S. of SR 28	55 dB	100 feet	52	52	0	29	62	29	63
Pinion	N. of SR 28	60 dB	100 feet	43	42	-1	8	17	7	14
Stateline Rd	N. of SR 28	60 dB	100 feet	46	48	.+2	12	27	15	32
Stateline Rd	S. of SR 28	55 dB	100 feet	43	43	0	7	16	7	16
Stateline Rd	N. of Cove St.	60 dB	100 feet	46	48	+2	13	27	15	33

Source – j.c. brennan & associates, Inc. – 2008

[1] Distances are reference distances from centerline of roadway.

Table 4.10-11

Modeled Cumulative and Cumulative + Alternative B Traffic Noise Levels

				Traffic Noise Levels (CNEL, dBA)			Distance to Cumulative Contours (feet)		Distance to Cumulative + Alt B Contours (feet)	
Roadway	Segment	TRPA CNEL Std	Distance[1]	Cumulative	Cumulative + Alt B	Change	60 CNEL	55 CNEL	60 CNEL	55 CNEL
SR 28	W. of Mount Rose	55 dB	100 feet	62	63	+1	145	313	152	328
SR 28	E. of Mount Rose	55 dB	100 feet	62	62	0	136	293	141	303
SR 28	W. of Lakeshore	55 dB	100 feet	62	62	0	137	296	144	311
SR 28	E. of Lakeshore	55 dB	100 feet	61	62	+1	124	267	130	280
SR 28	N. of Reservoir Rd/Wellness	60 dB	100 feet	62	62	0	133	287	141	305
SR 28	S. of Reservoir Rd./Wellness	60 dB	100 feet	62	62	0	133	287	137	294
SR 28	W. of Stateline Rd	60 dB	100 feet	62	62	0	134	289	140	301
SR 28	E. of Stateline Rd	60 dB	100 feet	62	62	0	133	288	137	294
SR 28	W. of Coon St.	55 dB	100 feet	62	62	0	137	294	142	305
SR 28	E. of Coon St.	55 dB	100 feet	62	62	0	136	292	141	303
SR 28	W. of SR 267	55 dB	100 feet	62	63	+1	144	310	147	316
SR 28	E. of SR 267	55 dB	100 feet	63	63	0	164	354	170	366
SR 267	N. of SR 28	55 dB	100 feet	61	61	0	109	235	111	240
Lakeshore	S. of SR 28	55 dB	100 feet	52	53	+1	31	67	33	70
Pinion	N. of SR 28	60 dB	100 feet	42	42	0	7	14	7	14
Stateline Rd	N. of SR 28	60 dB	100 feet	45	48	**+3**	11	23	15	32
Stateline Rd	S. of SR 28	55 dB	100 feet	43	43	0	7	16	7	16
Stateline Rd	N. of Cove St.	60 dB	100 feet	46	48	+2	11	24	15	32

Source – j.c. brennan & associates, Inc. – 2008

[1] Distances are reference distances from centerline of roadway.

Table 4.10-12

Modeled Existing and Existing + Alternative D Traffic Noise Levels

				Traffic Noise Levels (CNEL, dBA)			Distance to Existing Contours (feet)		Distance to Existing + Alt D Contours (feet)	
Roadway	Segment	TRPA CNEL Std	Distance[1]	Existing	Existing + Alt D	Change	60 CNEL	55 CNEL	60 CNEL	55 CNEL
SR 28	W. of Mount Rose	55 dB	100 feet	62	62	0	131	281	130	280
SR 28	E. of Mount Rose	55 dB	100 feet	61	61	0	125	270	125	268
SR 28	W. of Lakeshore	55 dB	100 feet	61	61	0	124	266	123	264
SR 28	E. of Lakeshore	55 dB	100 feet	61	61	0	111	240	111	239
SR 28	N. of Reservoir Rd/Wellness	60 dB	100 feet	61	61	0	117	253	118	255
SR 28	S. of Reservoir Rd./Wellness	60 dB	100 feet	61	61	0	115	248	118	255
SR 28	W. of Stateline Rd	60 dB	100 feet	61	61	0	118	255	117	253
SR 28	E. of Stateline Rd	60 dB	100 feet	61	61	0	116	250	116	251
SR 28	W. of Coon St.	55 dB	100 feet	61	61	0	121	260	120	258
SR 28	E. of Coon St.	55 dB	100 feet	61	61	0	116	250	119	255
SR 28	W. of SR 267	55 dB	100 feet	61	61	0	125	269	124	268
SR 28	E. of SR 267	55 dB	100 feet	62	62	0	139	299	138	297
SR 267	N. of SR 28	55 dB	100 feet	60	60	0	96	207	96	206
Lakeshore	S. of SR 28	55 dB	100 feet	52	52	0	29	62	29	62
Pinion	N. of SR 28	60 dB	100 feet	43	42	-1	8	17	7	14
Stateline Rd	N. of SR 28	60 dB	100 feet	46	49	+3	12	27	18	38
Stateline Rd	S. of SR 28	55 dB	100 feet	43	43	0	7	16	7	16
Stateline Rd	N. of Cove St.	60 dB	100 feet	46	41	-5	13	27	5	12

Source – j.c. brennan & associates, Inc. – 2008

[1] Distances are reference distances from centerline of roadway.

Table 4.10-13

Modeled Cumulative and Cumulative + Alternative D Traffic Noise Levels

				Traffic Noise Levels (CNEL, dBA)			Distance to Cumulative Contours (feet)		Distance to Cumulative + Alt D Contours (feet)	
Roadway	Segment	TRPA CNEL Std	Distance[1]	Cumulative	Cumulative + Alt D	Change	60 CNEL	55 CNEL	60 CNEL	55 CNEL
SR 28	W. of Mount Rose	55 dB	100 feet	62	63	+1	145	313	149	321
SR 28	E. of Mount Rose	55 dB	100 feet	62	62	0	136	293	139	298
SR 28	W. of Lakeshore	55 dB	100 feet	62	62	0	137	296	141	304
SR 28	E. of Lakeshore	55 dB	100 feet	61	62	+1	124	267	127	274
SR 28	N. of Reservoir Rd/Wellness	60 dB	100 feet	62	62	0	133	287	137	295
SR 28	S. of Reservoir Rd./Wellness	60 dB	100 feet	62	62	0	133	287	137	294
SR 28	W. of Stateline Rd	60 dB	100 feet	62	62	0	134	289	136	293
SR 28	E. of Stateline Rd	60 dB	100 feet	62	62	0	133	288	135	291
SR 28	W. of Coon St.	55 dB	100 feet	62	62	0	137	294	139	299
SR 28	E. of Coon St.	55 dB	100 feet	62	62	0	136	292	137	295
SR 28	W. of SR 267	55 dB	100 feet	62	62	0	144	310	145	311
SR 28	E. of SR 267	55 dB	100 feet	63	63	0	164	354	166	357
SR 267	N. of SR 28	55 dB	100 feet	61	61	0	109	235	110	236
Lakeshore	S. of SR 28	55 dB	100 feet	52	53	+1	31	67	32	69
Pinion	N. of SR 28	60 dB	100 feet	42	42	0	7	14	7	14
Stateline Rd	N. of SR 28	60 dB	100 feet	45	49	**+4**	11	23	18	38
Stateline Rd	S. of SR 28	55 dB	100 feet	43	43	0	7	16	7	16
Stateline Rd	N. of Cove St.	60 dB	100 feet	46	41	-5	11	24	5	12

Source – j.c. brennan & associates, Inc. – 2008

[1] Distances are reference distances from centerline of roadway.

Table 4.10-14

Modeled Existing and Existing + Alternative E Traffic Noise Levels

				Traffic Noise Levels (CNEL, dBA)			Distance to Existing Contours (feet)		Distance to Existing + Alt E Contours (feet)	
Roadway	Segment	TRPA CNEL Std	Distance[1]	Existing	Existing + Alt E	Change	60 CNEL	55 CNEL	60 CNEL	55 CNEL
SR 28	W. of Mount Rose	55 dB	100 feet	62	62	0	131	281	135	290
SR 28	E. of Mount Rose	55 dB	100 feet	61	62	+1	125	270	128	275
SR 28	W. of Lakeshore	55 dB	100 feet	61	61	0	124	266	118	254
SR 28	E. of Lakeshore	55 dB	100 feet	61	60	-1	111	240	105	226
SR 28	N. of Reservoir Rd/Wellness	60 dB	100 feet	61	61	0	117	253	124	266
SR 28	S. of Reservoir Rd./Wellness	60 dB	100 feet	61	61	0	115	248	118	254
SR 28	W. of Stateline Rd	60 dB	100 feet	61	61	0	118	255	122	263
SR 28	E. of Stateline Rd	60 dB	100 feet	61	61	0	116	250	120	259
SR 28	W. of Coon St.	55 dB	100 feet	61	61	0	121	260	125	269
SR 28	E. of Coon St.	55 dB	100 feet	61	61	0	116	250	124	266
SR 28	W. of SR 267	55 dB	100 feet	61	62	+1	125	269	127	273
SR 28	E. of SR 267	55 dB	100 feet	62	62	0	139	299	142	306
SR 267	N. of SR 28	55 dB	100 feet	60	60	0	96	207	97	209
Lakeshore	S. of SR 28	55 dB	100 feet	52	52	0	29	62	30	64
Pinion	N. of SR 28	60 dB	100 feet	43	42	-1	8	17	7	14
Stateline Rd	N. of SR 28	60 dB	100 feet	46	44	-2	12	27	9	20
Stateline Rd	S. of SR 28	55 dB	100 feet	43	43	0	7	16	7	16
Stateline Rd	N. of Cove St.	60 dB	100 feet	46	41	-5	13	27	5	11

Source – j.c. brennan & associates, Inc. – 2008

[1] Distances are reference distances from centerline of roadway.

Table 4.10-15

Modeled Cumulative and Cumulative + Alternative E Traffic Noise Levels

				Traffic Noise Levels (CNEL, dBA)			Distance to Cumulative Contours (feet)		Distance to Cumulative + Alt E Contours (feet)	
Roadway	Segment	TRPA CNEL Std	Distance[1]	Cumulative	Cumulative + Alt E	Change	60 CNEL	55 CNEL	60 CNEL	55 CNEL
SR 28	W. of Mount Rose	55 dB	100 feet	62	63	+1	145	313	153	331
SR 28	E. of Mount Rose	55 dB	100 feet	62	62	0	136	293	141	305
SR 28	W. of Lakeshore	55 dB	100 feet	62	62	0	137	296	145	313
SR 28	E. of Lakeshore	55 dB	100 feet	61	62	+1	124	267	131	282
SR 28	N. of Reservoir Rd/Wellness	60 dB	100 feet	62	62	0	133	287	142	305
SR 28	S. of Reservoir Rd./Wellness	60 dB	100 feet	62	62	0	133	287	137	294
SR 28	W. of Stateline Rd	60 dB	100 feet	62	62	0	134	289	140	303
SR 28	E. of Stateline Rd	60 dB	100 feet	62	62	0	133	288	138	298
SR 28	W. of Coon St.	55 dB	100 feet	62	62	0	137	294	143	309
SR 28	E. of Coon St.	55 dB	100 feet	62	62	0	136	292	142	305
SR 28	W. of SR 267	55 dB	100 feet	62	63	+1	144	310	147	317
SR 28	E. of SR 267	55 dB	100 feet	63	63	0	164	354	170	366
SR 267	N. of SR 28	55 dB	100 feet	61	61	0	109	235	112	240
Lakeshore	S. of SR 28	55 dB	100 feet	52	53	+1	31	67	33	71
Pinion	N. of SR 28	60 dB	100 feet	42	42	0	7	14	7	14
Stateline Rd	N. of SR 28	60 dB	100 feet	45	44	-1	11	23	9	20
Stateline Rd	S. of SR 28	55 dB	100 feet	43	43	0	7	16	7	16
Stateline Rd	N. of Cove St.	60 dB	100 feet	46	41	-5	11	24	5	11

Source – j.c. brennan & associates, Inc. – 2008

[1] Distances are reference distances from centerline of roadway.

IMPACT: NOISE-2: Will the project result in an exceedance of an exterior traffic noise level standard at on-site residential, condominium, time-share or hotel uses?

Analysis: *No Impact: Alternative A*

This alternative will not result in additional development and therefore, will not result in changes to existing noise levels.

Mitigation: No mitigation is required.

Analysis: *Less than Significant Impact: Alternatives B, C, D and E*

To assess noise impacts from roadway traffic to sensitive receptors located at on-site residential housing facilities, the predicted future traffic noise levels and distances to the 60 dB CNEL contours shown in Tables 4.10-9, 4.10-11, 4.10-13, and 4.10-15 were used.

For each of these alternatives, the primary outdoor activity areas, including the balconies. pool, and pedestrian village areas will be located outside of the 60 dB CNEL contours. Therefore, this impact is considered to be less than significant.

Mitigation: No mitigation is required.

IMPACT: NOISE-3: Will the project result in excessive noise due to construction activities?

Analysis: *No Impact: Alternative A*

Alternative A will not result in additional construction activities.

Mitigation: No mitigation is required.

Analysis: *Less than Significant Impact: Alternative B*

Alternative B will include limited construction activities, including interior remodeling of existing buildings and the construction of three single-family residential units. Therefore, construction will not result in excessive noise due to construction activities.

Mitigation: No mitigation is required.

Analysis: *Significant Impact: Alternatives C, D and E*

Substantial construction activities will occur under Alternatives C, D and E. Construction staging areas for equipment and materials will be located within the project area, but are not defined. The construction noise control program prepared for Boulder Bay by SMC Contracting, Inc. (see Chapter 2.5) proposes construction activities outside of the exempt hours of operation contained within the TRPA noise ordinance. Construction noise levels outside of the exempt hours that exceed Plan Area CNEL standards will result in significant noise impacts.

During the construction phases of the project, noise from construction activities will add to the noise environment in the immediate project vicinity. Activities involved in construction will generate maximum noise levels, as indicated in Table 4.10-16, ranging from 76 to 95 dB at distances of 50 to 100 feet. Construction activities will be temporary in nature and are anticipated to occur during normal daytime working hours.

Noise will also be generated during the construction phase by increased truck traffic on area roadways. A significant project-generated noise source will be truck traffic associated with transport of heavy materials and equipment to and from construction sites. This noise increase will be of short duration, and will likely occur primarily during

daytime hours. Based on predicted construction related noise levels, this impact is considered to be significant.

Table 4.10-16

Construction Equipment Noise

Type of Equipment	Maximum Level
Backhoe	78 dB at 50 feet
Compactor	83 dB at 50 feet
Compressor (air)	78 dB at 50 feet
Concrete Saw	90 dB at 50 feet
Dozer	82 dB at 50 feet
Dump Truck	76 dB at 50 feet
Excavator	81 dB at 50 feet
Generator	81 dB at 50 feet
Jackhammer	89 dB at 50 feet
Pneumatic Tools	85 dB at 50 feet
Pile Driving*	95 dB at 100 feet

Source: *Roadway Construction Noise Model User's Guide*. Federal Highway Administration. FHWA-HEP-05-054. January 2006 and
* j.c. brennan & associates, Inc. Staff noise measurements, 2007

Mitigation:

NOISE-3A: Time of Day Construction Restrictions and Noise Barriers

Restrict construction activities between the hours of 8:00 a.m. and 6:30 p.m. The project applicant shall work with a qualified noise consultant to determine the appropriate heights, lengths and configurations of the temporary noise barriers, as well as the appropriate barrier materials.

NOISE-3B: Equipment Location Guidance

Locate fixed construction equipment such as compressors and generators as far as possible from sensitive receptors (e.g., residential land uses). Shroud or shield all impact tools, and muffle or shield all intake and exhaust ports on power construction equipment.

NOISE-3C: Noise Complaint Coordination and Response

Designate a disturbance coordinator and conspicuously post this person's number around the project site and in adjacent public spaces. The disturbance coordinator will receive all public complaints about construction noise disturbances and will be responsible for determining the cause of the complaint, reporting all complaints to the TRPA, and implement any feasible measures to be taken to alleviate the problem. If temporary noise barriers are required, the project applicant shall work with a qualified noise consultant to determine the appropriate heights, lengths and configurations of the temporary noise barriers, as well as the appropriate barrier materials.

After Mitigation: *Less than Significant Impact: Alternatives C, D and E*

Implementation of mitigation measures 3A, 3B, and 3C will reduce the impact to a less than significant level.

IMPACT: NOISE-4: Will the project result in excessive vibration at buildings in the immediate vicinity of the project site due to construction activities?

Analysis: *No Impact; Alternative A*

This alternative will not result in additional construction activities. Therefore, no vibration impacts will occur.

Mitigation: No mitigation is required.

Analysis: *Less than Significant Impact: Alternatives B, C, D and E*

Construction activities occurring under Alternatives B, C, D and E will produce vibration impacts. These vibration impacts could result in human annoyance and building structural damage. Human annoyance occurs when construction vibration rises significantly above the threshold of perception. Building damage can take the form of cosmetic or structural. Table 4.10-17 shows the typical vibration levels produced by construction equipment that will be used within the Boulder Bay project area. Based upon comparison of Table 4.10-17 (Vibration Levels for Varying Construction Equipment) to Table 4.10-6 (Effects of Vibration Levels on People and Buildings), it is not expected that vibration levels will exceed a peak particle velocity of 0.5 inches per second within the project area. Therefore, this impact is considered to be less than significant

Mitigation: No mitigation is required.

Table 4.10-17

Vibration Levels for Varying Construction Equipment

Type of Equipment	Peak Particle Velocity @ 25 feet	Approx. Velocity Level @ 25 feet
Large Bulldozer	0.089 (inches/second)	87 (VdB)
Loaded Trucks	0.076 (inches/second)	86 (VdB)
Small Bulldozer	0.003 (inches/second)	58 (VdB)
Auger/drill Rigs	0.089 (inches/second)	87 (VdB)
Jackhammer	0.035 (inches/second)	79 (VdB)
Vibratory Hammer	0.070 (inches/second)	85 (VdB)
Vibratory Compactor/roller	0.210 (inches/second)	94 (VdB)

Source: Federal Transit Administration, Transit Noise and Vibration Impact Assessment Guidelines, May 2006

IMPACT: NOISE-5: Will the development of the project result in noise levels from on-site mechanical equipment and loading dock activities that exceed the applicable noise level standards for stationary equipment shown in Table 4.10-5 and contained within the North Stateline Community Plan?

Analysis: *No Impact: Alternatives A and B*

Alternatives A and B will not result in new stationary noise sources on the site.

Mitigation: No mitigation is required.

Analysis: *Potentially Significant Impact: Alternatives C, D and E*

Under Alternatives C, D and E, new structures (e.g., casino, hotel, multi-family residential and/or commercial uses) will be constructed. Each of these uses will require climate control and fresh air exchange mechanical equipment. In addition, deliveries will be required for products and services. Therefore, new noise sources associated with mechanical equipment and loading docks may result in significant impacts.

Mechanical Equipment. Emergency backup power, heating, air conditioning and ventilation equipment can be a primary noise source associated with commercial or retail uses. These types of equipment are often mounted on roof tops, located on the ground or located within mechanical rooms. Common mechanical equipment noise sources include fans, pumps, air compressors, chillers and cooling towers.

Noise levels from these types of equipment can vary significantly and generally range between 45 dB to 85 dB at a distance of 50 feet. However, numerous noise control strategies, including barriers, acoustical enclosures, and acoustical treatment to ventilation openings, will be utilized to mitigate noise levels to less than significant levels.

Loading Docks. Loading docks and their associated activities have a potential to produce noise levels which exceed the noise level criteria at adjacent noise sensitive land uses. Noise sources associated with loading docks include trucks idling, truck circulation on the sites, refrigeration units on trucks, and unloading operations.

Noise monitoring conducted at loading docks indicate that typical hourly average noise levels at a distance of 50 feet can range between 55 dB Leq and 60 dB Leq, and maximum noise levels range between 75 dB and 80 dB at a distance of 50 feet.

Sound walls and setbacks will be used to mitigate loading dock and truck circulation noise impacts. These strategies can be utilized individually or in combination with one another to reduce noise levels from mechanical equipment and loading docks.

Mitigation: **NOISE-5A: Mechanical Equipment Noise Level Specifications and Sound Control**

All mechanical air handling equipment shall comply with an exterior hourly noise level criterion of 45 dB Leq at the nearest residential, or tourist accommodation unit building facades. As a means of achieving these standards, the HVAC equipment shall either be located at ground level or when located on roof-tops, the building facades shall include parapets or barriers for shielding. In addition, large heating, cooling and ventilation equipment shall be located within mechanical rooms, where it is possible.

NOISE-5B: Loading Dock and Truck Circulation Design

Loading docks and truck circulation routes shall include the following mitigation measures in the project design:

- Loading docks shall maintain a minimum distance of 100 feet from residential property lines and include shielding by building facades.
- Circulation routes for large trucks shall be located a minimum of 50-feet from the residential property lines.

After Mitigation: *Less than Significant Impact: Alternatives C, D and E*

Implementation of mitigation measures Noise 5A and 5B will reduce the impact to a less than significant level.

IMPACT: NOISE-6: Will the development of the project result in outdoor activities from people gathering on decks and patios that exceed the applicable noise level standards for stationary noise sources shown in Table 4.10-5 and contained within the North Stateline Community Plan?

Analysis: *No Impact; Alternatives A and B*

Alternatives A and B will not result in additional balconies or decks for people to gather on the site.

Mitigation: No mitigation is required.

Analysis: *Less than Significant Impact: Alternatives C, D and E*

Based upon the following analysis, it is not expected that Boulder Bay guests gathering outside on decks and patios will exceed the noise level standards of the North Stateline Community Plan.

As a means of addressing balcony occupancies and associated noise levels, j.c. brennan & associates, Inc. utilized observations and noise measurements conducted by j.c. brennan & associates at the Hyatt Regency in Incline Village. The observations were conducted hourly between 3:00 pm and 10:00 pm on Saturday, September, 01, 2007 (Labor Day Weekend). The room configurations at the Hyatt Regency in Incline Village include a tower which does not contain balconies, timeshare units which have balconies/decks, and cottages which also have balconies/decks. Observations were conducted throughout the Timeshare and Cottage units located on the Hyatt Regency Resort. Observations were conducted twice per hour for the 3:00 p.m., 6:00 p.m., 7:00 p.m., 8:00 p.m., 9:00 p.m. and 10:00 p.m. hours. The deck occupancies were observed for 77 timeshare units and 46 cottage units. During the observation period approximately 80 to 90 percent of the timeshare units and cottages units were either occupied or had lights on, which indicated that they were occupied for that evening.

During the observations, j.c. brennan & associates, Inc. conducted noise level measurements of the occupied decks. During the noise measurements the background noise environment from parking areas and distant traffic were the primary contributors to the noise levels. However, occasional maximum noise levels from normal conversations were captured, and were approximately 55 dB at 15 feet. However, the average or median noise levels were generally less than 45 dB Leq. Therefore, the anticipated noise levels from outdoor activities at the Boulder Bay hotel and residential uses is considered to be less than significant.

Mitigation: No mitigation is required.

CUMULATIVE IMPACTS AND MITIGATION MEASURES

IMPACT: NOISE-C1: Will the project have significant cumulative short-term construction noise impacts to the noise environment?

Analysis: *No Impact: Alternative A*

This alternative will not include any additional development that will result in increased traffic or on-site noise levels.

Mitigation: No mitigation is required.

Analysis: Less than *Significant Impact: Alternatives B, C, D and E*

Alternatives B, C, D and E include outdoor construction activities. Construction of other nearby projects could also result in exceedances of local noise standards. However, construction noise occurring during the daytime hours is exempt from the applicable standards, provided that construction equipment is properly fitted with feasible noise control devices. In addition, mitigation measures have been provided for construction noise associated with this project, and based on TRPA regulations, other projects in the area will also be required to include construction noise mitigation measures. Since the project must adhere to the requirements of the exemption for construction noise and will implement construction noise mitigation measures, the project will not contribute to a substantial increase in noise levels and would not have a cumulatively considerable impact.

Mitigation: No mitigation is required.

IMPACT: NOISE-C2: Will the project have significant cumulative increase in noise levels due to on-site stationary noise sources?

Analysis: *No Impact: Alternative A*

This alternative will not include any additional development that will result in increased traffic or on-site noise levels.

Mitigation: No mitigation is required.

Analysis: Less than *Significant Impact: Alternatives B, C, D and E*

Each of these alternatives result in on-site noise sources such as heating and ventilation equipment, emergency power supplies and on-site human activities. There are no other known projects in the vicinity of the project site that would add new stationary noise sources. The project will implement mitigation measures for Impacts NOISE-5 and NOISE-6 related to on-site stationary noise sources. These mitigation measures are expected to reduce the impacts to a less than significant level. Also, noise levels associated with the existing uses on the site include the same types of noise sources associated with the project. The newer technology of HVAC equipment, emergency generators and mechanical equipment are considerably quieter than equipment which is currently in use on the site. Therefore, it is expected that the overall noise levels

associated with these types of new noise sources will be less than those currently in use on the project site.

Mitigation: No mitigation is required.

IMPACT: NOISE-C3: Will the project have significant cumulative increase in noise levels due to traffic on the local street network?

Analysis: *No Impact: Alternative A*

This alternative will not include any additional development that will result in increased traffic or on-site noise levels.

Mitigation: No mitigation is required.

Analysis: Less than Significant Impact*: Alternatives B, C, D and E*

Each of these alternatives will result in increased traffic noise on portions of the local street network. Other known projects in the north shore of the Lake Tahoe Basin will also contribute to the overall increase in traffic and associated traffic noise levels. The project shows a significant increase in traffic noise levels along Stateline Road. The project proposes mitigation for that roadway segment where a significant increase in traffic noise levels will occur. Tables 4.10-9, 4.10-11, 4.10-13, and 4.10-15 document cumulative traffic noise levels. A comparison of cumulative traffic noise levels without the project (that includes other foreseeable projects within the basin) to the cumulative traffic noise levels with the project demonstrates that there is not a significant increase in noise levels identified along any other roadways due to the project. Therefore, this impact is considered to be less than significant.

Mitigation: No mitigation is required.

REFERENCES

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