

11.0 NOISE

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This section includes a description of ambient noise conditions, a summary of applicable regulations, and an analysis of potential noise impacts associated with the proposed project. Mitigation measures are recommended, as necessary, to reduce significant noise impacts to less than significant levels. This section was prepared with technical assistance from the consulting firm Ambient Air Quality & Noise Consulting (2013).

11.1 ENVIRONMENTAL SETTING

11.1.1 CHARACTERISTICS OF ENVIRONMENTAL NOISE

Acoustic Fundamentals

Noise is generally defined as sound that is loud, disagreeable, or unexpected. Sound, as described in more detail below, is mechanical energy transmitted in the form of a wave because of a disturbance or vibration.

Amplitude

Amplitude is the difference between ambient air pressure and the peak pressure of the sound wave. Amplitude is measured in decibels (dB) on a logarithmic scale. For example, a 65 dB source of sound, such as a truck, when joined by another 65 dB source results in a sound amplitude of 68 dB, not 130 dB (i.e., doubling the source strength increases the sound pressure by 3 dB). Amplitude is interpreted by the ear as corresponding to different degrees of loudness. Laboratory measurements correlate a 10 dB increase in amplitude with a perceived doubling of loudness and establish a 3 dB change in amplitude as the minimum audible difference perceptible to the average person.

Frequency

Frequency is the number of fluctuations of the pressure wave per second. The unit of frequency is the Hertz (Hz). One Hz equals one cycle per second. The human ear is not equally sensitive to sound of different frequencies. Sound waves below 16 Hz or above 20,000 Hz cannot be heard at all, and the ear is more sensitive to sound in the higher portion of this range than in the lower. To approximate this sensitivity, environmental sound is usually measured in A-weighted decibels (dBA). On this scale, the normal range of human hearing extends from about 10 dBA to about 140 dBA.

Addition of Decibels

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

Sound Propagation and Attenuation

Geometric Spreading

Sound from a localized source (i.e., a point source) propagates uniformly outward in a spherical pattern. The sound level decreases (attenuates) at a rate of approximately 6 decibels for each doubling of distance from a point source. Highways consist of several localized noise sources on a defined path and hence can be treated as a line source, which approximates the effect of several point sources. Noise from a line source propagates outward in a cylindrical pattern, often referred to as cylindrical spreading. Sound levels attenuate at a rate of approximately 3 decibels for each doubling of distance from a line source, depending on ground surface characteristics. For acoustically hard sites (i.e., sites with a reflective surface between the source and the receiver, such as a parking lot or body of water,) no excess ground attenuation is assumed. For acoustically absorptive or soft sites (i.e., those sites with an absorptive ground surface between the source and the receiver, such as soft dirt, grass, or scattered bushes and trees), an excess ground-attenuation value of 1.5 decibels per doubling of distance is normally assumed. When added to the cylindrical spreading, the excess ground attenuation for soft surfaces results in an overall attenuation rate of 4.5 decibels per doubling of distance from the source.

Atmospheric Effects

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

Shielding by Natural or Human-Made Features

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

Noise reductions afforded by building construction can vary depending on construction materials and techniques. Standard construction practices typically provide approximately 15 dBA exterior-to-interior noise reductions for building facades, with windows open, and approximately 20-25 dBA, with windows closed. With compliance with current Title 24 energy efficiency standards, which require increased building insulation and inclusion of an interior air ventilation system to allow windows on noise-impacted facades to remain closed, exterior-to-interior noise reductions typically average approximately 25 dBA. The absorptive characteristics of interior rooms, such as carpeted floors, draperies, and furniture, can result in further reductions in interior noise.

Noise Descriptors

The intensity of environmental noise fluctuates over time, and several descriptors of time-averaged noise levels are used. The three most commonly used descriptors are L_{eq} , L_{dn} , and

CNEL. The energy-equivalent noise level, L_{eq} , is a measure of the average energy content (intensity) of noise over any given period. The L_{eq} metric is commonly applied to measure of the impact of a series of events during a given time period. Many communities use 24-hour descriptors of noise levels to regulate noise. The day-night average noise level, L_{dn} , is the 24-hour average of the noise intensity, with a 10-dBA “penalty” added for nighttime noise (10:00 PM to 7:00 AM) to account for the greater sensitivity to noise during this period. CNEL, the Community Noise Equivalent Level, is similar to L_{dn} but adds an additional 5-dBA penalty for evening noise (7:00 PM to 10:00 PM) Another descriptor that is commonly used is the sound exposure level (SEL). The SEL is a composite metric that represents both the intensity of a sound and its duration. Individual time-varying noise events (e.g., aircraft overflights) have two main characteristics: a sound level that changes throughout the event, and a period of time during which the event is heard. SEL provides a measure of the net impact of the entire acoustic event, but it does not directly represent the sound level heard at any given time. Noise analyses may also depend on measurements of L_{max} , the maximum instantaneous noise level during a specific period of time, and L_{min} , the minimum instantaneous noise level during a specific period. Common noise level descriptors are summarized in **Table 11-1**.

**TABLE 11-1
COMMON ACOUSTICAL DESCRIPTORS**

Descriptor	Definition
Community Noise Equivalent Level (CNEL)	The CNEL is similar to the L_{dn} described above, but with an additional 5 dBA “penalty” added to noise events that occur between the hours of 7:00 PM and 10:00 PM. The calculated CNEL is typically approximately 0.5 dBA higher than the calculated L_{dn} .
Day-Night Average Noise Level (DNL or L_{dn})	The 24-hour L_{eq} with a 10 dBA “penalty” for noise events that occur during the noise-sensitive hours between 10:00 PM and 7:00 AM. In other words, 10 dBA is “added” to noise events that occur in the nighttime hours to account for increases sensitivity to noise during these hours.
Energy Equivalent Noise Level (L_{eq})	The energy mean (average) noise level. The instantaneous noise levels during a specific period of time in dBA are converted to relative energy values. From the sum of the relative energy values, an average energy value (in dBA) is calculated.
Impulsive Noise	Having a high peak of short duration or a sequence of such peaks. A sequence of impulses in rapid succession is termed repetitive impulsive noise.
Minimum Noise Level (L_{min})	The lowest sound level measured during a single event (e.g., an aircraft overflight) in which the sound level changes value with time.
Maximum Noise Level (L_{max})	The highest sound level measured during a single event in which the sound level changes value with time. Used to describe single events, such as train horn soundings and aircraft flyovers.
Single Event Noise Exposure Level (SENEL)/Sound Exposure Level (SEL)	SENEL/SEL is a logarithmic measure of the total acoustic energy transmitted to the listener during the event. Mathematically, it represents the sound level of a constant sound that would, over the duration of the event (typically one second or less), generate the same acoustic energy as the actual time-varying noise event. Used to describe single events, such as train horn soundings and aircraft flyovers.

Human Response to Noise

The human response to environmental noise is subjective and varies considerably from individual to individual. Noise in the community has often been cited as a health problem, not in terms of actual physiological damage, such as hearing impairment, but in terms of inhibiting general well-being and contributing to undue stress and annoyance. The health effects of noise in the community arise from interference with human activities, including sleep, speech, recreation, and tasks that demand concentration or coordination. Hearing loss can occur at the highest noise intensity levels. When community noise interferes with human activities or contributes to stress,

public annoyance with the noise source increases. The acceptability of noise and the threat to public well-being are the basis for land use planning policies preventing exposure to excessive community noise levels. Typical community noise levels are depicted in **Figure 11-1**.

Unfortunately, there is no completely satisfactory way to measure the subjective effects of noise or of the corresponding reactions of annoyance and dissatisfaction. This is primarily because of the wide variation in individual thresholds of annoyance and habituation to noise over differing individual experiences with noise. Thus, an important way of determining a person's subjective reaction to a new noise is the comparison of it to the existing environment to which one has adapted: the so-called "ambient" environment. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged. Regarding increases in A-weighted noise levels, knowledge of the following relationships will be helpful in understanding this analysis:

- Except in carefully controlled laboratory experiments, a change of 1 dB cannot be perceived by humans.
- Outside of the laboratory, a 3 dB change is considered a just-perceivable difference.
- A change in level of at least 5 dB is required before any noticeable change in community response would be expected.
- A 10 dB change is subjectively heard as an approximate doubling in loudness and would almost certainly cause change in community response.

When evaluating noise impacts, increases in ambient noise levels need to also take into account the existing noise environment. Consequently, increases in cumulative noise exposure (in CNEL/ L_{dn}) of 5 dBA are generally considered significant in areas where the ambient noise environment is less than 60 dBA. In areas where the ambient noise environment is between 60 and 65 dBA, increases of 3.0 dBA, or greater, would be considered significant. In areas where the ambient noise environment exceeds 65 dBA, a predicted increase of 1.5 dBA, or greater, would be considered significant. These thresholds were initially recommended by the Federal Interagency Committee on Noise (FICON) in 1972, based on noise levels at which people typically become increasingly annoyed (FICON 2000). These recommendations have since been recognized by various federal, state, and local agencies for the analysis of transportation noise impacts.

**FIGURE 11-1
TYPICAL COMMUNITY NOISE LEVELS**

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
Jet Fly-over at 300m (1000 ft)	110	Rock Band
Gas Lawn Mower at 1 m (3 ft)	100	
Diesel Truck at 15 m (50 ft), at 80 km (50 mph)	90	Food Blender at 1 m (3 ft)
Noisy Urban Area, Daytime	80	Garbage Disposal at 1 m (3 ft)
Gas Lawn Mower, 30 m (100 ft)	70	Vacuum Cleaner at 3 m (10 ft)
Commercial Area		Normal Speech at 1 m (3 ft)
Heavy Traffic at 90 m (300 ft)	60	Large Business Office
Quiet Urban Daytime	50	Dishwasher Next Room
Quiet Urban Nighttime	40	Theater, Large Conference Room (Background)
Quiet Suburban Nighttime		Library
Quiet Rural Nighttime	30	Bedroom at Night, Concert Hall (Background)
	20	Broadcast/Recording Studio
	10	
Lowest Threshold of Human Hearing	0	Lowest Threshold of Human Hearing

Source: Caltrans 2013

11.1.2 LOCAL SETTING

Noise-Sensitive Land Uses

Noise-sensitive land uses are generally considered to include those uses which would result in noise exposure that could result in health-related risks to individuals, as well as places where quiet is an essential element of their intended purpose. Residential dwellings, including senior housing, are of primary concern because of the potential for increased and prolonged exposure of individuals to both interior and exterior noise levels. Additional land uses such as parks, historic sites, cemeteries, and recreation areas are also considered sensitive to increases in exterior noise levels. Schools, houses of worship (churches), hotels, libraries, and other places where low interior noise levels are essential are also considered noise-sensitive land uses.

Large portions of the project site consist of open space and/or undeveloped land. The site is currently surrounded by forestlands, existing ski terrain features, and resort development. The nearest noise-sensitive receptors in the project area consist of residential and lodging land uses predominantly located at the base of the mountain (Northstar Village, Aspen Grove Condominiums, Beaver Pond). The Ritz-Carlton Hotel and various residential land uses are also located at mid-mountain (**Figure 11-2**).

Ambient Noise Environment

The ambient noise environment in the project area is generally considered to be fairly quiet. Based on the noise measurement surveys conducted for this project, ambient noise levels are predominantly influenced by vehicle traffic on area roadways and in parking areas. Occasional aircraft overflights also contribute to the ambient noise environment. Depending on location, individuals talking and noise generated by lifts may also be detectable. During the winter months, snowmaking and snow removal activities may also contribute to ambient noise conditions.

Ambient Noise Measurement Surveys

Ambient noise measurement surveys were conducted for the purpose of documenting and measuring the existing noise environment in the project area and near existing noise-sensitive land uses. Noise measurement surveys were conducted on January 10, 2013. Short-term (i.e., 10-minute) noise measurements were conducted during the daytime and nighttime hours. All noise measurements were conducted using a Larson Davis Laboratories, Model 820, Type I sound-level meter placed at a height of approximately 4.5 feet above the ground surface. Ambient noise measurement locations and corresponding measured values are summarized in **Table 11-2**. The noise measurement locations are depicted in **Figure 11-2**.

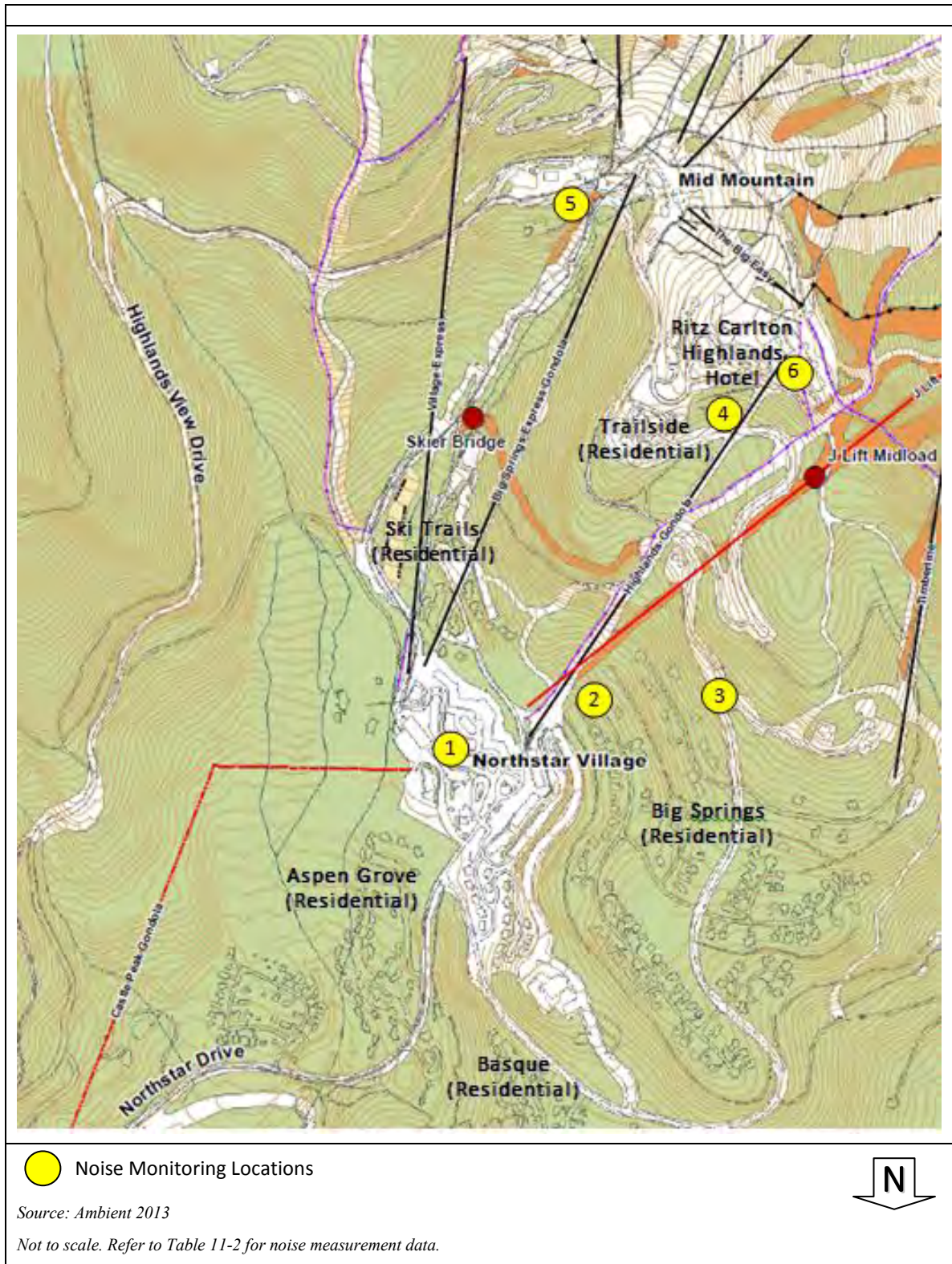
Based on the measurements conducted, daytime noise levels (in dBA L_{eq}) within Northstar Village generally range from the low to upper 50s. Nighttime snow removal activities in the Village walkway areas generated noise levels of 69 dBA L_{eq} and 76 dBA L_{max} , measured at the upper balcony of the Northstar Village rooms and lofts. Noise levels within nearby residential developments generally ranged from the upper 20s during the nighttime hours to the mid 30s during the daytime hours. Noise levels at mid-mountain area generally ranged from the mid 30s during the nighttime hours to the upper 50s during the daytime hours. Nighttime snowmaking operations being conducted along Village Run measured 76 dBA L_{eq} at approximately 190 feet. Ambient noise levels may vary depending on the season and activities conducted.

**TABLE 11-2
SUMMARY OF AMBIENT NOISE MEASUREMENT RESULTS**

Location	Measurement Period	Noise Level (dBA)			Noise Sources
		Minimum (L _{min})	Average (L _{eq})	Maximum (L _{max})	
1 Northstar Village Rooms & Lofts, Village at Northstar	02:30–03:00	60.6	69.2	76.0	Snow removal within the Village and Transit Center (included snow blowers, tractors, trucks at varying distances of approximately 15–100 feet).
	08:20–08:30	53.4	58.3	61.0	People talking. Music. Vehicles in Transit Center.
	19:10–19:20	47.2	54.1	56.8	People talking. Music.
2 Terminus of Grouse Ridge Road	09:45–10:00	29.6	34.0	41.8	J lift at approximately 400 feet.
3 Big Spur Drive & Summit Place	10:20–10:40	29.2	32.2	34.5	J lift at approximately 1,000 feet.
	22:15–22:30	28.2	28.4	29.1	No major noise sources noted.
4 Home Run Trail & Highland Drive	11:05–11:10	35.3	40.2	49.8	Highlands Gondola at approximately 25 feet.
	23:35–23:45	37.5	38.4	39.3	No major noise sources noted.
5 Northstar Fire Department, Station 32, 9100 Highlands View Drive	11:25–11:35	51.0	55.2	57.2	Big Springs Express Gondola at approximately 475 feet.
	13:35–13:50	51.2	56.3	59.7	Big Springs Express Gondola at approximately 475 feet.
	22:50–23:00	76.5	76.4	78.9	Snowmaking at approximately 190 feet, along Village Run.
6 Ritz-Carlton Hotel, Highlands View Drive	13:57–14:10	40.3	48.5	59.2	Highlands Gondola at approximately 120 feet.
	23:10–23:20	34.9	36.2	39.9	No major noise sources noted.

Measurements were conducted on January 10, 2013, using a Larson Davis Type I, Model 820 sound-level meter positioned at a height of approximately 4.5 feet above ground level. Refer to Figure 11-2 for corresponding noise measurement locations.

**FIGURE 11-2
AMBIENT NOISE MONITORING LOCATIONS**



Existing Traffic Noise

Ambient noise levels in many portions of the project area are defined primarily by traffic on area roadways, including State Route 267 (SR 267) and Northstar Drive. The Federal Highway Administration (FHWA) Highway Traffic Noise Prediction model (FHWA-RD-77-108) was used to predict existing traffic noise levels along these major roadways. The FHWA modeling was based on the CALVENO noise emission factors for automobiles and medium- and heavy-duty trucks. Input data used in the model included average-daily traffic volumes, day/night percentages of automobiles and medium and heavy trucks, vehicle speeds, ground attenuation factors, and roadway widths. The model was calibrated based on traffic and noise monitoring data obtained during the site reconnaissance conducted for this project. Predicted traffic noise levels, including general distances to the predicted existing 60, 65, and 70 dBA L_{dn} /CNEL noise contours, are summarized in **Table 11-3**. Predicted noise contours are approximate and do not take into account shielding or reflection of noise due to intervening terrain or structures.

**TABLE 11-3
PREDICTED EXISTING TRAFFIC NOISE LEVELS AND CONTOURS**

Roadway Segment	Existing Average-Daily Volume	CNEL at 50 Feet from Near Travel Lane	Distance to CNEL Contours (Feet)		
			70	65	60
Summer					
SR 267 – Northstar Drive to Airport Road/Schaffer Mill Road	14,630	68.85	69	137	290
SR 267 – Airport Road/Schaffer Mill Road to Nevada County Line	20,160	70.63	81	168	358
SR 267 – Nevada County Line to Brockway Road/Soaring Way	8,460	66.86	WR	96	202
SR 267 – Brockway Road/Soaring Way to Interstate 80	7,660	66.42	WR	90	189
Northstar Drive – SR 267 to Ridgeline Drive/Castle Peak Parking Lot	15,700	61.73	WR	WR	80
Northstar Drive – Ridgeline Drive/Castle Peak Parking Lot to Big Springs Drive	5,090	56.84	WR	WR	WR
Winter					
SR 267 – Northstar Drive to Airport Road/Schaffer Mill Road	17,910	70.11	75	155	331
SR 267 – Airport Road/Schaffer Mill Road to Nevada County Line	18,360	70.22	76	158	337
SR 267 – Nevada County Line to Brockway Road/Soaring Way	13,700	68.95	64	131	277
SR 267 – Brockway Road/Soaring Way to Interstate 80	12,020	68.38	60	120	255
Northstar Drive – SR 267 to Ridgeline Drive/Castle Peak Parking Lot	15,700	61.73	WR	WR	80
Northstar Drive – Ridgeline Drive/Castle Peak Parking Lot to Big Springs Drive	13,200	60.97	WR	WR	72

Note: FHWA Model inputs and results are provided in Appendix 11.0.

WR = within roadway right-of-way

11.2 REGULATORY FRAMEWORK

11.2.1 FEDERAL

There are no federal noise standards or regulations applicable to the project site.

11.2.2 STATE

State of California General Plan Guidelines

The State of California regulates vehicular and freeway noise affecting classrooms, sets standards for sound transmission and occupational noise control, and identifies noise insulation standards and airport noise/land-use compatibility criteria. The *State of California General Plan Guidelines* (State of California 1998), published by the Governor’s Office of Planning and Research (OPR), also provide guidance for the acceptability of projects within specific CNEL/L_{dn} contours. The guidelines also present adjustment factors that may be used in order to arrive at noise acceptability standards that reflect the noise control goals of the community, the particular community’s sensitivity to noise, and the community’s assessment of the relative importance of noise pollution. **Table 11-4** summarizes the guidelines for acceptable and unacceptable community noise exposure limits for various land use categories, as currently defined by the State.

**TABLE 11-4
STATE OF CALIFORNIA
LAND USE COMPATIBILITY FOR COMMUNITY NOISE ENVIRONMENTS**

Land Use	Noise Levels (dBA CNEL/L _{dn})			
	Normally Acceptable	Conditionally Acceptable	Normally Unacceptable	Clearly Unacceptable
Residential Uses – Low-Density Single-Family, Duplex, Mobile Homes	<60	55 to 70	70 to 75	>75
Residential – Multi-Family	<65	60 to 70	70 to 75	>75
Transient Lodging, Hotels, Motels	<65	60 to 70	70 to 80	>80
Schools, Libraries, Churches, Hospitals, Nursing Homes	<70	60 to 70	70 to 80	>80
Auditoriums, Concert Halls, Amphitheaters		< 70		>65
Sports Arena, Outdoor Spectator Sports		< 75		>70
Playgrounds, Neighborhood Parks	<70		67.5 to 75	>72.5
Golf Courses, Riding Stables, Water Recreation, Cemeteries	<75		70 to 80	>80
Office Buildings, Business, Commercial, Professional	<70	67.5 to 77.5	>75	
Industrial, Manufacturing, Utilities, Agricultural	<75	70 to 80	>75	

Source: State of California 2003

Normally Acceptable: Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

Conditionally Acceptable: New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning, will normally suffice.

Normally Unacceptable: New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

Clearly Unacceptable: New construction or development should generally not be undertaken.

11.2.3 LOCAL

Placer County General Plan

The Noise Element of the Placer County General Plan provides goals, objectives, and policies designed to ensure that county residents are not subjected to noise beyond acceptable levels. The General Plan includes noise criteria for the evaluation of proposed land uses subjected to non-transportation noise levels (**Table 11-5**). The Placer County General Plan Noise Element also specifies maximum allowable noise exposure for transportation noise sources (**Table 11-6**).

The Placer County General Plan Policy Document was adopted by the Placer County Board of Supervisors in 1994. **Table 11-7** lists the General Plan policies that relate to noise and the proposed project and provides an analysis of the project's consistency with these policies. While this Draft EIR analyzes the project's consistency with the Placer County General Plan pursuant to State CEQA Guidelines Section 15125(d), the determination of the project's consistency with this General Plan rests with the Placer County Board of Supervisors. Any environmental impacts associated with any inconsistency with General Plan policies are addressed under the impact discussions of this EIR.

TABLE 11-5
ALLOWABLE LDN NOISE LEVELS WITHIN SPECIFIED ZONE DISTRICTS¹
APPLICABLE TO NEW PROJECTS AFFECTED BY OR INCLUDING
NON-TRANSPORTATION NOISE SOURCES

Zone District of Receptor	Property Line of Receiving Use (L _{dn})	Interior Spaces ² (L _{dn})
Residential Adjacent to Industrial ³	60	45
Other Residential ⁴	50	45
Office/Professional	70	45
Transient Lodging	65	45
Neighborhood Commercial	70	45
General Commercial	70	45
Heavy Commercial	75	45
Limited Industrial	75	45
Highway Service	75	45
Shopping Center	70	45
Industrial	–	45
Industrial Park	75	45
Industrial Reserve	–	–
Airport	–	45
Unclassified	–	–

Zone District of Receptor	Property Line of Receiving Use (L _{dn})	Interior Spaces ² (L _{dn})
Farm	(see footnote 6)	–
Agriculture Exclusive	(see footnote 6)	–
Forestry	–	–
Timberland Preserve	–	–
Recreation & Forestry	70	–
Open Space	–	–
Mineral Reserve	–	–

Source: Placer County 2013

- Except where noted otherwise, noise exposures will be those which occur at the property line of the receiving use.
 - Where existing transportation noise levels exceed the standards of this table, the allowable L_{dn} shall be raised to the same level as that of the ambient level.
 - If the noise source generated by, or affecting, the uses shown above consists primarily of speech or music, of if the noise source is impulsive in nature, the noise standards shown above shall be decreased by 5 dB.
 - Where a use permit has established noise level standards for an existing use, those standards shall supersede the levels specified in Table 9-1 and Table 9-3. Similarly, where an existing use which is not subject to a use permit causes noise in excess of the allowable levels in Tables 9-1 and 9-3, said excess noise shall be considered the allowable level. If a new development is proposed which will be affected by noise from such an existing use, it will ordinarily be assumed that the noise levels already existing or those levels allowed by the existing use permit, whichever are greater, are those levels actually produced by the existing use.
 - Existing industry located in industrial zones will be given the benefit of the doubt in being allowed to emit increased noise consistent with the state of the art⁵ at the time of expansion. In no case will expansion of an existing industrial operation because to decrease allowable noise emission limits. Increased emissions above those normally allowable should be limited to a one-time 5 dB increase at the discretion of the decision making body.
 - The noise level standards applicable to land uses containing incidental residential uses, such as caretaker dwellings at industrial facilities and homes on agriculturally zoned land, shall be the standards applicable to the zone district, not those applicable to residential uses.
 - Where no noise level standards have been provided for a specific zone district, it is assumed that the interior and/or exterior spaces of these uses are effectively insensitive to noise.
- 1 Overriding policy on interpretation of allowable noise levels: Industrial-zoned properties are confined to unique areas of the County, and are irreplaceable. Industries which provide primary wage-earner jobs in the County, if forced to relocate, will likely be forced to leave the County. For this reason, industries operating upon industrial zoned properties must be afforded reasonable opportunity to exercise the rights/privileges conferred upon them by their zoning. Whenever the allowable noise levels herein fall subject to interpretation relative to industrial activities, the benefit of the doubt shall be afforded to the industrial use. Where an industrial use is subject to infrequent and unplanned upset or breakdown of operations resulting in increased noise emissions, where such upsets and breakdowns are reasonable considering the type of industry, and where the industrial use exercises due diligence in preventing as well as correcting such upsets and breakdowns, noise generated during such upsets and breakdowns shall not be included in calculations to determine conformance with allowable noise levels.
 - 2 Interior spaces are defined as any locations where some degree of noise-sensitivity exists. Examples include all habitable rooms of residences, and areas where communication and speech intelligibility are essential, such as classrooms and offices.
 - 3 Noise from industrial operations may be difficult to mitigate in a cost-effective manner. In recognition of this fact, the exterior noise standards for residential zone districts immediately adjacent to industrial, limited industrial, industrial park, and industrial reserve zone districts have been increased by 10 dB as compared to residential districts adjacent to other land uses. For purposes of the Noise Element, residential zone districts are defined to include the following zoning classifications: AR, R-1, R-2, R-3, FR, RP, TR-1, TR-2, TR-3, and TR-4.
 - 4 Where a residential zone district is located within an -SP combining district, the exterior noise level standards are applied at the outer boundary of the -SP district. If an existing industrial operation within an -SP district is expanded or modified, the noise level standards at the outer boundary of the -SP district may be increased as described above in these standards. Where a new residential use is proposed in an -SP zone, an Administrative Review Permit is required, which may require mitigation measures at the residence for noise levels existing and/or allowed by use permit as described under "NOTES," above, in these standards.
 - 5 State of the art should include the use of modern equipment with lower noise emissions, site design, and plant orientation to mitigate offsite noise impacts, and similar methodology.
 - 6 Normally, agricultural uses are noise insensitive and will be treated in this way. However, conflicts with agricultural noise emissions can occur where single-family residences exist within agricultural zone districts. Therefore, where effects of agricultural noise upon residences located in these agricultural zones are a concern, an L_{dn} of 70 dBA will be considered acceptable outdoor exposure at a residence.

**TABLE 11-6
PLACER COUNTY MAXIMUM ALLOWABLE NOISE EXPOSURE, TRANSPORTATION
NOISE SOURCES**

Land Use	Outdoor Activity Areas ¹	Interior Spaces	
	L _{dn} /CNEL, dB	L _{dn} /CNEL, dB	L _{eq} , dB ²
Residential	60 ³	45	–
Transient Lodging	60 ³	45	–
Hospitals, Nursing Homes	60 ³	45	–
Theaters, Auditoriums, Music Halls	–	–	35
Churches, Meeting Halls	60 ³	–	40
Office Buildings	–	–	45
Schools, Libraries, Museums	–	–	45
Playgrounds, Neighborhood Parks	70	–	–

Source: Placer County 2013

- 1 Where the location of outdoor activity areas is unknown, the exterior noise level standard shall be applied to the property line of the receiving land use.
- 2 As determined for a typical worst-case hour during periods of use.
- 3 Where it is not possible to reduce noise in outdoor activity areas to 60 dB Ldn/CNEL or less using a practical application of the best-available noise reduction measures, an exterior noise level of up to 65 dB Ldn/CNEL may be allowed provided that available exterior noise level reduction measures have been implemented and interior noise levels are in compliance with this table.

**TABLE 11-7
PLACER COUNTY GENERAL PLAN CONSISTENCY ANALYSIS – NOISE**

Policies	Consistency Determination	Analysis
Policy 9.A.2: Noise created by new proposed non-transportation noise sources shall be mitigated so as not to exceed the noise level standards of Table 9-1 as measured immediately within the property line of lands designated for noise-sensitive uses: provided, however, the noise created by occasional events occurring within a stadium on land zoned for university purposes may temporarily exceed these standards as provided in an approved Specific Plan.	Consistent with Mitigation	As discussed in the impact analysis below, proposed project-level components would result in new snowmaking and grooming activities in the vicinity of the Ritz-Carlton that would exceed County noise standards. Mitigation has been included to reduce project-level non-transportation noise impacts to a less than significant level. Program-level non-transportation noise levels would not exceed County noise standards and would be considered to have a less than significant impact.
Policy 9.A.4: Impulsive noise produced by blasting should not be subject to the criteria listed in Table 9-1. Single event impulsive noise levels produced by gunshots or blasting shall not exceed a peak linear overpressure of 122 dB, or a C-weighted Sound Exposure Level (SEL) of 98 dBC. The cumulative noise level from impulsive sounds such as gunshots and blasting shall not exceed 60 dB LCdn or CNELC on any given day. These standards shall be applied at the property line of a receiving land use.	Consistent with Mitigation	The construction of project- and program-level components may require rock-breaking/blasting activities. A mitigation measure has been included to minimize impacts to nearby noise-sensitive receptors and to require that blast levels at nearby receptors be in compliance with the single-event and cumulative standards identified by the County.

Northstar Mountain Master Plan EIR

Policies	Consistency Determination	Analysis
<p>Policy 9.A.5: Where proposed non-residential land uses are likely to produce noise levels exceeding the performance standards of Table 9-1 at existing or planned noise-sensitive uses, the County shall require submission of an acoustical analysis as part of the environmental review process so that noise mitigation may be included in the project design. The requirements for the content of an acoustical analysis are listed in Table 9-2.</p>	<p>Consistent with Mitigation</p>	<p>The proposed Master Plan would not result in the creation of any new land uses. Noise-related impacts associated with proposed project- and program-level components were analyzed in accordance with Placer County requirements. Mitigation measures, as recommended by the acoustical consultant, have been included in this EIR.</p>
<p>Policy 9.A.6: The feasibility of proposed projects with respect to existing and future transportation noise levels shall be evaluated by comparison to Table 9-3.</p>	<p>Consistent</p>	<p>The noise level standards of the Placer County General Plan were used to evaluate existing and future transportation noise levels in the vicinity of the project site.</p>
<p>Policy 9.A.11: The County shall require one or more of the following mitigation measures where existing noise levels significantly impact existing noise-sensitive land uses, or where the cumulative increase in noise levels resulting from new development significantly impacts noise-sensitive land uses:</p> <ul style="list-style-type: none"> a. Rerouting traffic onto streets that have available traffic capacity and that do not adjoin noise-sensitive land uses; b. Lowering speed limits, if feasible and practical; c. Programs to pay for noise mitigation such as low cost loans to owners of noise-impacted property or establishment of developer fees; d. Acoustical treatment of buildings; or e. Construction of noise barriers. 	<p>Consistent</p>	<p>Implementation of proposed project-level and program-level components would not result in a significant increase in traffic noise levels that would exceed applicable County noise standards at noise-sensitive land uses.</p>
<p>Policy 9.A.12: Where noise mitigation measures are required to achieve the standards of Tables 9-1 and 9-3, the emphasis of such measures shall be placed upon site planning and project design. The use of noise barriers shall be considered as a means of achieving the noise standards only after all other practical design-related noise mitigation measure have been integrated into the project.</p>	<p>Consistent, with Mitigation</p>	<p>As discussed in the impact analysis below, proposed project-level components would result in new snowmaking and grooming activities in the vicinity of the Ritz-Carlton that would exceed County noise standards. Mitigation has been included to reduce project-level non-transportation noise impacts to a less than significant level. Mitigation focuses on site design considerations and use of temporary sound barriers rather than installation of permanent sound barriers.</p>

Martis Valley Community Plan

The Martis Valley Community Plan (MVCP) Noise Element establishes specific goals and policies that are intended to provide a means to achieve noise-compatible land uses in the vicinity of existing or planned noise-producing sources. The MVCP also identifies noise standards for transportation and non-transportation noise sources. The transportation noise standards identified in the MVCP are consistent with those identified in the County’s General Plan Noise Element, as reflected in **Table 11-6**. Non-transportation noise standards identified in the MVCP are

summarized in **Table 11-8**. Because snowmaking is an integral part of a modern ski area, multi-family residential structures and transient lodging close to ski trails shall be subject only to interior noise standards. **Table 11-9** lists the Martis Valley Community Plan policies that relate to noise and the proposed project and provides an analysis of the project's consistency with these policies. While this Draft EIR analyzes the project's consistency with the Martis Valley Community Plan pursuant to State CEQA Guidelines Section 15125(d), the determination of the project's consistency with the Community Plan rests with the Placer County Board of Supervisors. Any environmental impacts associated with inconsistency with Community Plan policies are addressed under the impact discussions of this DEIR.

**TABLE 11-8
MARTIS VALLEY COMMUNITY PLAN NOISE STANDARDS FOR
NON-TRANSPORTATION NOISE SOURCES**

Zone District of Receptor	Exterior Hourly L_{eq} , dB		Interior Hourly L_{eq} , dB	
	Daytime (7 AM to 10 PM)	Nighttime (10 PM to 7 AM)	Daytime (7 AM to 10 PM)	Nighttime (10 PM to 7 AM)
Residential Adjacent to Industrial	60	50	–	–
Other Residential ¹	55	45	–	–
Office/Professional	–	–	45	45
Transient Lodging ²	60	60	45	45
Hospitals, Nursing Homes	60	50	–	–
Theaters, Music Halls, Auditoriums	–	–	35	35
Churches, Meeting Halls ²	60	50	45	45
Schools, Libraries, Museums ³	60	50	45	45

Source: Placer County 2004

1. Because snowmaking is an integral part of a modern ski area, multi-family residential structures and transient lodging close to ski trails shall be subject only to interior noise standards.
2. Where no outdoor activity area exists, only the interior noise level criteria will be applied.
3. The exterior noise level criteria only apply at areas which require good speech articulation such as areas designated for learning.
 - Except where otherwise noted, the noise level criteria are applied at the property line of the receiving land use.
 - The noise level criteria are generally applied at the first floor receiver locations.
 - If the noise source generated by, or affecting the uses shown above consists primarily of speech or music, or if the noise source is impulsive in nature, the noise standards shown above shall be decreased by 5 dB.
 - Existing industry located in industrial zones will be given the benefit of the doubt in being allowed to emit increased noise consistent with the state of the art at the time of expansion. In no case will expansion of an existing industrial operation be cause to decrease allowable noise emission limits. Increased emissions above those normally allowable should be limited to a one-time 5 dB increase at the discretion of the decision making body.
 - The standards contained are not applied at incidental residential uses of noise generating uses, such as caretaker dwellings on industrial facilities and homes on agriculturally zoned land.
 - Where no noise level standards have been provided for a specific zone district, it is assumed that the interior and/or exterior spaces of these uses are effectively insensitive to noise.
 - Where an industrial use is subject to infrequent and unplanned upset or breakdown of operations resulting in increased noise emissions, where such upsets and breakdowns are reasonable considering the type of industry, and where the industrial use exercises due diligence in preventing as well as correcting such upsets and breakdowns, noise generated during such upsets and breakdowns shall not be included in calculations to determine conformance with allowable noise levels.
 - New noise-sensitive uses which may be affected by noise sources associated with agricultural operations shall be responsible for mitigating agricultural operations noise levels consistent with this Table. Typical operations associated with agricultural uses shall not be subject to compliance with the criteria contained within this Table at nearby noise-sensitive uses.

**TABLE 11-9
MARTIS VALLEY COMMUNITY PLAN CONSISTENCY ANALYSIS – NOISE**

Policies	Consistency Determination	Analysis
<p>Policy 10.A.2: Noise created by new proposed non-transportation noise sources shall be mitigated so as not to exceed the noise level standards of Table 10-1 as measured immediately within the property line of lands designated for noise-sensitive uses</p>	<p>Consistent with Mitigation</p>	<p>As discussed in the impact analysis below, proposed project-level components would result in new snowmaking and grooming activities in the vicinity of the Ritz-Carlton that would exceed County noise standards. Mitigation has been included to reduce project-level non-transportation noise impacts to a less than significant level. Program-level non-transportation noise levels would not exceed County noise standards and would be considered to have a less than significant impact.</p>
<p>Policy 10.A.4: Where proposed non-residential land uses are likely to produce noise levels exceeding the performance standards of Table 10-1 at existing or planned noise-sensitive uses, an acoustical analysis shall be required as part of the environmental review process so that noise mitigation may be included in the project design. The requirements for the content of an acoustical analysis are given by Table 10-2.</p>	<p>Consistent with Mitigation</p>	<p>The proposed Master Plan would not result in the creation of any new land uses. Noise-related impacts associated with proposed project- and program-level components were analyzed in accordance with Placer County requirements. Mitigation measures, as recommended by the acoustical consultant, have been included in this EIR.</p>
<p>Policy 10.A.10: Where noise mitigation measures are required to achieve the standards of Tables 10-1 and 10-3, the emphasis of such measures shall be placed upon site planning and project design. The use of noise barriers shall be considered as a means of achieving the noise standards only after all other practical design-related noise mitigation measures have been integrated into the project.</p>	<p>Consistent with Mitigation</p>	<p>As discussed in the impact analysis below, proposed project-level components would result in new snowmaking and grooming activities in the vicinity of the Ritz-Carlton that would exceed County noise standards. Mitigation has been included to reduce project-level non-transportation noise impacts to a less than significant level. Mitigation focuses on site design considerations and use of temporary sound barriers rather than installation of permanent sound barriers.</p>

Placer County Noise Ordinance

The Placer County Noise Ordinance also establishes criteria for noise-sensitive receptors, outlined below in **Table 11-10**. According to the Noise Ordinance, each of the sound level standards specified in **Table 11-10** shall be reduced by 5 dB for simple tone noises, consisting of speech and music. However, in no case shall the sound level standard be lower than the ambient sound level plus 5 dB. Construction activities occurring between the hours of 6:00 AM and 8:00 PM, Monday through Friday, and between the hours of 8:00 AM and 8:00 PM on Saturday and Sunday are exempt from these requirements, provided, however, that all construction equipment is fitted with mufflers and maintained in good working order.

**TABLE 11-10
PLACER COUNTY NON-TRANSPORTATION NOISE STANDARDS**

Sound Level Descriptor	Daytime (7 AM–10 PM)	Nighttime (10 PM–7 AM)
Hourly L_{eq}	55 dB	45 dB
Hourly L_{max}	70 dB	65 dB

Source: Placer County 2004

Noise standards are applied at the property line of noise-sensitive receptors.

GROUNDBORNE VIBRATION

Ground vibration spreads through the ground and diminishes in strength with distance. The effects of ground vibration can vary from no perceptible effects at the lowest levels, low rumbling sounds and detectable vibrations at moderate levels, and slight damage to nearby structures at the highest levels. At the highest levels of vibration, damage to structures is primarily architectural (e.g., loosening and cracking of plaster or stucco coatings) and rarely results in structural damage. For most structures, a peak particle velocity (ppv) threshold of 0.5 inches per second (in/sec) is sufficient to avoid structure damage, with the exception of fragile historic structures or ruins. For the protection of fragile, historic, and residential structures, the California Department of Transportation recommends a more conservative threshold of 0.2 inches per second ppv. This same threshold would represent the level at which vibrations would be potentially annoying to people in buildings (FTA 2006; Caltrans 2002).

11.3 IMPACTS

11.3.1 STANDARDS OF SIGNIFICANCE

Following Appendix G of the California Environmental Quality Act (CEQA) Guidelines, noise impacts are considered significant if implementation of the proposed project would result in any of the following:

- 1) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance or of applicable standards of other agencies.
- 2) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.
- 3) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.
- 4) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.
- 5) For a project located within an airport land use plan area or, where such a plan has not been adopted, within 2 miles of a public airport or a public use airport, exposure of people residing or working in the project area to excessive noise levels.
- 6) For a project within the vicinity of a private airstrip, exposure of people residing or working in the project area to excessive noise levels.

Based on the initial study prepared for this project, the proposed project is located within the Airport Land Use Compatibility Plan for the Truckee Tahoe Airport. However, the project site is not located within the projected 55 dBA CNEL contour of the airport. Therefore, exposure to aircraft noise levels was considered to have a less than significant impact and is not evaluated further in this report. The following thresholds of significance were used for evaluation of project- and program-level impacts:

Short-Term Exposure to Project-Generated Noise

Construction noise impacts would be considered significant if activities would violate Placer County requirements. County noise regulations typically restrict nuisance-related noise-generating construction activities to between the hours of 6:00 AM and 8:00 PM, Monday through Friday, and between the hours of 8:00 AM and 8:00 PM on Saturday and Sunday. In the event that blasting is required, single-event, impulsive noise levels exceeding the County's peak linear overpressure level of 122 dB or 98 dBC at nearby noise-sensitive receptors would be considered to have a potentially significant impact.

Long-Term Exposure to Project-Generated Non-Transportation Noise

Long-term operational noise impacts would be considered significant if the proposed project would result in non-transportation noise levels that would exceed applicable County noise standards at nearby noise-sensitive land uses. Because snowmaking is an integral part of a modern ski area, residential structures and transient lodging close to ski trails are subject only to the County's interior noise standard of 45 dBA L_{dn} . Predicted interior noise levels exceeding 45 dBA L_{dn} within nearby noise-sensitive structures would be considered to have a potentially significant impact.

Long-Term Increases in Transportation Noise

Long-term operational noise impacts would be considered significant if the proposed project would result in a substantial increase in ambient noise levels. For purposes of this analysis, a substantial increase in noise levels is defined as an increase of 5.0, or greater, where the noise levels, without project implementation, are less than 60 dBA CNEL/ L_{dn} ; 3 dBA, or greater, where the noise level, without project implementation, ranges from 60 to 65 dBA CNEL/ L_{dn} ; and 1.5 dB, or greater, where the noise level, without project implementation, exceeds 65 dBA CNEL/ L_{dn} , based on the previously discussed FICON noise criteria.

Exposure to Groundborne Vibration

Groundborne vibration levels would be considered significant if predicted short-term construction or long-term operational groundborne vibration levels attributable to the proposed project would exceed recommended criteria of 0.5 in/sec ppv for structural damage and 0.2 in/sec ppv for human annoyance and at nearby existing structures.

11.3.2 METHODOLOGY

A combination of use of existing literature and general application of accepted noise thresholds was used to determine the impact of ambient noise levels associated with project- and program-level components.

Short-Term Construction Noise

Predicted noise levels at nearby noise-sensitive land uses were calculated utilizing typical noise levels and usage rates associated with construction equipment and blasting activities, based on information derived from the US Department of Transportation, Federal Highway Administration's Roadway Construction Noise Model (version 1.1) and the California Department of Transportation's (Caltrans) *Transportation and Construction-Induced Vibration Guidance Manual* (2004). Construction noise levels were predicted assuming an average noise attenuation rate of 6 dB per doubling of distance from the source.

Non-Transportation Noise

Non-transportation noise levels associated with proposed project- and program-level components would be primarily associated with snowmaking and grooming activities, as well as emergency backup generators for proposed lift operations. Operational noise level associated with these sources was based on representative noise data obtained from equipment manufacturers. Operational noise levels were predicted for activities located nearest existing noise-sensitive receptors assuming an average noise attenuation rate of 6 dB per doubling of distance from the source.

Transportation Noise

Traffic noise levels were calculated using the FHWA roadway noise prediction model (FHWA-RD-77-108) based on California vehicle reference noise levels and traffic data obtained from the traffic analysis prepared for the proposed project. Where average-daily volumes were not provided, traffic volumes were calculated assuming that peak-hour volumes represent 10 percent of the average-daily volumes. Additional input data included day/night percentages of autos, medium and heavy trucks, vehicle speeds, ground attenuation factors, and roadway widths. Predicted noise levels were calculated at a distance of 50 feet from the near-travel-lane centerline, as well as distances to the predicted noise contours. Increases in traffic noise levels attributable to the proposed project were determined based on a comparison of predicted noise levels, with and without project implementation.

Groundborne Vibration

Groundborne vibration levels associated with construction-related activities were evaluated utilizing typical groundborne vibration levels rates associated with construction equipment, obtained from the US Department of Transportation, Federal Transit Administration's *Transit Noise and Vibration Impact Assessment Guidelines* (2006) and Caltrans-recommended screening criteria for blasting activities (2004). Groundborne vibration impacts related to structural damage and human annoyance were evaluated taking into account the distance from construction activities to nearby land uses and typically applied criteria of 0.5 in/sec ppv for structural damage and 0.2 in/sec ppv for human annoyance.

11.3.3 IMPACTS AND MITIGATION MEASURES

IMPACT 11.1: Construction-Generated Noise Impacts

Project- and Program-Level Impacts

Project- and program-level components include the construction of additional ski trails, ski lifts, skier bridges, and various skier service site improvements. The phasing of these improvements is unknown at this time; however, construction is proposed to occur from May 1 to October 15 of each construction year.

Off-Road Equipment

Anticipated off-road equipment to be used for construction of the various improvements and associated noise levels are summarized in **Table 11-11**. As depicted, individual equipment noise levels typically range from approximately 73 to 82 dBA L_{eq} at 50 feet. Intermittent noise levels can range from approximately 80 to 85 dBA L_{max} . Assuming a maximum construction noise level of 82 dBA L_{eq} and an average attenuation rate of 6 dBA per doubling of distance from the source, construction activities located within approximately 667 feet of noise-sensitive receptors could reach levels of approximately 60 dBA L_{eq} . Noise levels could be slightly higher if multiple pieces of equipment are operating simultaneously in a localized area. Activities occurring during the more noise-sensitive evening and nighttime hours may result in increased levels of annoyance and potential sleep disruption to occupants of nearby residential dwellings and lodging facilities.

**TABLE 11-11
TYPICAL CONSTRUCTION EQUIPMENT NOISE LEVELS & CONTOURS**

Equipment	Typical Noise Level (dBA) 50 feet from Source		Distance to Noise Contours (feet, dBA L_{eq})		
	L_{max}	L_{eq}	70 dBA	65 dBA	60 dBA
Air Compressor	80	76	105	187	334
Backhoe/Front End Loader	80	76	105	187	334
Compactor (Ground)	80	73	74	133	236
Concrete Mixer Truck	85	81	187	334	594
Concrete Pump Truck	82	75	94	167	297
Crane	85	77	118	210	374
Dozer/Grader/Excavator/Scraper	85	81	187	334	594
Generator	82	79	149	265	472
Pneumatic Tools	85	82	210	374	667
Truck (Dump/Flat-Bed)	84	80	167	297	529

Source: FHWA 2006

Rock Breaking

In addition to noise from off-road construction equipment, rock breaking or blasting may be required during some construction activities, including construction of the proposed project- and program-level lifts, in the event that underlying rock cannot be removed by off-road equipment. Rock breaking may include the use of chemical expansion agents, explosives, or drill-and-shoot techniques. Specific details related to the methods to be used are not known at this time and vary depending on site conditions. The use of explosives (i.e., blasting) would generate the highest noise levels. Noise generated by blasting of rock depends on various factors, including the location, size, and depth of the blast charge, site and geological conditions, meteorological conditions, and distance. In general, peak linear overpressure levels associated with construction blasting can range from approximately 145 to 160 dB at 50 feet. Depending on blasting requirements, the distance to the 122 dB contour would generally range from approximately 500 to 2,000 feet.

The majority of the proposed project- and program-level improvements are located in excess of 2,000 feet from nearby residences and lodging facilities. However, some project- and program-level components, including proposed ski lifts, gondolas, and trails, are located within 2,000 feet of existing residences and lodging facilities. In the event blasting is required during construction of such facilities, resultant overpressure levels could potentially exceed the County's single-event impulsive noise standard of 122 dB. As a result, construction-generated noise from off-road equipment operation and potential rock busting activities would be considered **potentially significant**.

MITIGATION MEASURE 11-1 Mitigate for Construction-Generated Noise Associated with Off-Road Equipment Operations and Rock-Breaking Activities

The project applicant shall prepare construction specifications that require the construction contractor to limit periods of construction, including the operation of off-road equipment and rock-breaking activities, as follows:

- Noise-generating construction activities shall be limited to between the hours of 6:00 AM and 8:00 PM, Monday through Friday, and between the hours of 8:00 AM and 8:00 PM on Saturdays. Construction activities shall be prohibited on Sundays and holidays. A variance to these hours of construction may be allowed with approval by the Placer County Planning Department.

The project applicant shall prepare construction specifications that require the construction contractor to implement noise reduction measures during construction when within 700 feet of noise-sensitive receptors. The construction specifications shall include the following measures:

- Fixed construction equipment such as compressors and generators shall be located as far as feasibly possible from sensitive receptors. All intake and exhaust ports on power construction equipment shall be muffled or shielded.
- Before any particularly noisy activities are performed, written notice of such activities shall be provided to all residences within a 200-foot radius of the development site. Notices shall include specific information about the expected timing of these activities and the name and phone number of the applicant's construction representative. The construction contractor shall show reasonable flexibility in accommodating affected

parties if there are specific, relatively brief time periods for which a major affected party would like to avoid noise disturbance (e.g., special events).

- All construction equipment shall be fitted with factory-installed muffling devices and shall be maintained in good working order.

In the event that blasting is required for the removal of rock during the construction process, the project applicant shall implement a blast noise mitigation and notification plan that will include, but is not limited to, the following measures:

- Blasting notification identifying the date and time of blasting shall be provided to nearby sensitive receptors located within 2,000 feet of blasting.
- Best available practices shall be employed to limit airblast from blasting to a single-event peak linear overpressure of 122 dB, or a C-weighted Sound Exposure Level (SEL) of 98 dBC. The cumulative noise level shall not exceed a C-weighted noise level of 60 L_{dn} /CNEL on any given day. These standards shall be applied at the property line of a receiving land use. Groundborne vibration from blasting shall not exceed commonly applied limits, such as those established by the US Bureau of Mines (e.g., 0.5 in/sec ppv) at the nearest noise-sensitive land uses.
- Blasting activities shall be limited to between the hours of 7:00 AM and 7:00 PM, Monday through Friday, and between the hours of 8:00 AM and 7:00 PM on Saturdays. Blasting activities shall be prohibited during the nighttime hours and on Sundays and holidays.
- A blast engineer shall be on-site during all blasting activities.

SIGNIFICANCE AFTER MITIGATION

Implementation of mitigation measure 11-1 would reduce construction-generated noise levels and would limit noise-generating construction activities to the daytime hours. Construction activities would also be prohibited on Sundays and holidays. In the event that rock breaking is required, a mitigation and notification plan shall be implemented to ensure that resultant noise and groundborne vibration levels do not exceed applicable standards. With mitigation, construction noise would not be anticipated to result in substantial increases in sleep disruption and levels of annoyance to occupants of nearby residential dwellings. Since construction activities would be short term, this impact would be considered **less than significant** after mitigation.

IMPACT 11.2: Groundborne Vibration Impacts

Long-term operational activities associated with the proposed project would not involve the use of any equipment or processes that would result in potentially significant levels of ground vibration. Increases in groundborne vibration levels attributable to the proposed project would be primarily associated with short-term construction-related activities. Groundborne vibration levels associated with construction equipment anticipated to be required for construction of the proposed facilities are summarized in **Table 11-12**.

**TABLE 11-12
REPRESENTATIVE CONSTRUCTION EQUIPMENT VIBRATION LEVELS**

Equipment	Peak Particle Velocity at 25 Feet (in/sec ppv)
Large Tractors	0.089
Small Tractors	0.003
Loaded Trucks	0.076

Source: Caltrans 2004; FTA 2006

Project-Level and Program-Level Impacts

Off-Road Equipment

Based on the vibration levels presented in **Table 11-12**, ground vibration generated by most off-road construction equipment would be less than 0.09 inches per second ppv at 25 feet. Existing residential land uses and lodging facilities would be located in excess of 25 feet from proposed improvements. Because groundborne vibration levels decrease with distance, predicted groundborne vibration levels associated with the use of off-road equipment would not be anticipated to exceed even the most conservative threshold of 0.2 in/sec ppm at structures located near proposed project- or program-level facilities.

Rock Breaking

As discussed in Impact 11-1, rock breaking or blasting may be required, depending on the site conditions encountered during construction of some project- or program-level components. The specific ground vibration levels generated will depend on multiple factors, including site conditions, blast techniques, and distance to primarily affected structures. Based on data obtained by Caltrans (2004), a blast radius of 328 feet (100 meters) would typically provide sufficient protection from potential structural damage and human annoyance. The majority of the proposed project- and program-level improvements would not occur within 328 feet of nearby residences or lodging facilities. However, because specific construction information is not yet available, it's possible that some construction activities involving rock breaking may be required in the vicinity of nearby sensitive land uses. As a result, exposure to groundborne vibration levels would be considered to have a **potentially significant** impact.

MITIGATION MEASURE 11-2 Mitigate for Construction-Generated Groundborne Vibration Impacts

Implement mitigation measure 11-1.

SIGNIFICANCE AFTER MITIGATION

Implementation of mitigation measure 11-1 would require implementation of a mitigation and notification plan to ensure that resultant noise and groundborne vibration levels associated with rock-breaking activities would not exceed applicable standards. With mitigation, this impact would be considered **less than significant**.

IMPACT 11.3: Traffic Noise Impacts

Implementation of the proposed project would result in increased traffic volumes on some area roadways. The increase in traffic volumes resulting from implementation of the proposed project would therefore contribute to predicted increases in traffic noise levels. The FHWA roadway noise prediction model was used to predict traffic noise levels along primarily affected roadways for existing and future traffic conditions, with and without implementation of project- and program-level traffic. Project- and program-level traffic noise impacts are evaluated as follows:

Predicted traffic noise levels with and without project-level components for existing and future year 2032 conditions are summarized in **Table 11-13**. In comparison to existing conditions, implementation of the proposed project-level components would result in minimal increases in traffic noise levels along primary affected roadways ranging from approximately 0.01 to 0.39 dBA. Because implementation of the proposed project-level components would not result in a substantial increase in traffic noise levels, this impact would be considered **less than significant**.

**TABLE 11-13
EXISTING TRAFFIC NOISE LEVELS WITH AND WITHOUT PROJECT-LEVEL TRAFFIC**

Roadway Segment	CNEL at 50 Feet from Near Travel Lane		Project-Generated Increase in Noise Levels	Substantial Increase In Noise Levels?	Distance to 60 dBA CNEL/L _{dn} Noise Contour	
	Existing Without Project	Existing With Project-Level Traffic			Existing Without Project	Existing With Project-Level Traffic
Summer						
SR 267 – Northstar Drive to Airport Road/Schaffer Mill Road	68.85	69.24	0.39	No	290	290
SR 267 – Airport Road/Schaffer Mill Road to Nevada County Line	70.63	70.63	0	No	358	358
SR 267 – Nevada County Line to Brockway Road/Soaring Way	66.86	66.87	0.01	No	202	202
SR 267 – Brockway Road/Soaring Way to Interstate 80	66.42	66.44	0.02	No	189	189
Northstar Drive – SR 267 to Ridgeline Drive/Castle Peak Parking Lot	56.85	56.87	0.02	No	WR	WR
Northstar Drive – Ridgeline Drive/Castle Peak Parking Lot to Big Springs Drive	56.84	56.85	0.01	No	WR	WR
Winter						
SR 267 – Northstar Drive to Airport Road/Schaffer Mill Road	70.11	70.13	0.02	No	331	332
SR 267 – Airport Road/Schaffer Mill Road to Nevada County Line	70.22	70.24	0.02	No	337	338
SR 267 – Nevada County Line to Brockway Road/Soaring Way	68.95	69.01	0.06	No	277	280
SR 267 – Brockway Road/Soaring Way to Interstate 80	68.38	68.45	0.07	No	254	257
Northstar Drive – SR 267 to Ridgeline Drive/Castle Peak Parking Lot	61.73	61.76	0.03	No	80	81
Northstar Drive – Ridgeline Drive/Castle Peak Parking Lot to Big Springs Drive	60.97	61.01	0.04	No	72	72

Notes: For purposes of this analysis, a substantial increase in noise levels is defined as an increase of 5.0, or greater, where the noise levels, without project implementation, are less than 60 dBA CNEL/L_{dn}; 3 dBA, or greater, where the noise level, without project implementation, ranges from 60 to 65 dBA CNEL/L_{dn}; and 1.5 dB, or greater, where the noise level, without project implementation, exceeds 65 dBA CNEL/L_{dn}. FHWA Model inputs and results are provided in Appendix 11.0.

WR = Within roadway right-of-way

IMPACT 11.4: Noise from Lift Backup Power Generators

The lift engines would be used for emergency backup and evacuation purposes only. The generators would be operated for maintenance and emergency purposes only. Maintenance operations are typically limited to the daytime hours and are limited to a total of 30 hours per year. The evacuation generator would likely consist of an approximate 535 horsepower (hp) diesel-fueled engine, and the backup generator would consist of a 99 hp diesel-fueled engine. Based on representative manufacturer data, the backup and evacuation engines would generate noise levels of approximately 85 to 95 dBA L_{eq} at 25 feet (FTA 2006; Cummins 2013). The lift engines are typically housed within the lift station structure, which can reduce operational noise levels by approximately 5 to 10 dB. Noise impacts associated with proposed project- and program-level components are discussed in greater detail below.

Project-Level Impacts

The nearest project-level ski lifts in relation to existing noise-sensitive land uses is the proposed J lift, generally located south of the Big Springs residential development (**Figure 11-2**). The base of the lift would be located within the Village at Northstar, approximately 400 feet from the Tahoe Mountain Resorts Luxury Residences and the nearest residential dwellings located in the Big Springs and Ski Trails Condo developments. Noise generated by the proposed lift, as perceived by occupants of nearby residences, would be largely limited to the daytime hours and would not be uncharacteristic of noise generated by existing lifts already in the vicinity of these residences (i.e., Highlands Gondola, Timberline Lift). During routine maintenance and emergency use operations, assuming a minimum structural attenuation of 5 dB, predicted exterior noise levels generated by the lift engines would be approximately 66 dBA L_{eq} at the nearest residences. Based on these predicted exterior noise levels and assuming an average exterior-to-interior noise reduction of 25 dB for the residential structures, predicted interior noise levels at the nearest residential dwelling units would be approximately 41 dBA L_{eq} or less. Because noise from these engines would typically only occur during routine daytime maintenance activities, predicted average-daily interior noise levels would not be projected to exceed the County's noise standard of 45 dBA L_{dn} . As a result, project-level impacts would be considered **less than significant**.

Program-Level Impacts

Program-level improvements would include construction of the proposed Castle Peak Parking Lot Transport Gondola and the Q lift. The proposed Castle Peak Parking Lot Transport Gondola would terminate at the Village at Northstar. The nearest residential land uses to the Castle Peak Parking Lot Transport Gondola include the Northstar Village Rooms and Lofts and residential dwelling units located in the Aspen Grove Condominiums, approximately 400 feet from the proposed gondola station located at the Village at Northstar. No existing residential dwellings are located in the vicinity of the Castle Peak parking area that would be adversely affected. Assuming that the backup power generators would be located within the gondola station located at Northstar Village, predicted operational noise levels at the nearest residences and associated impacts would be similar to those identified for project-level components. No existing residential dwellings are located in the vicinity of the proposed Q lift that would be adversely affected. Because noise from these engines would typically only occur during routine daytime maintenance activities, predicted average-daily interior noise levels would not be projected to exceed the County's noise standard of 45 dBA L_{dn} . As a result, program-level impacts would be considered **less than significant**.

IMPACT 11.5: Noise from Snowmaking and Grooming

Man-made snow is made by spraying atomized water particles under high pressure into the cold dry atmosphere, which freeze into snow particles before falling to the ground. Air and water is delivered through pipelines buried in the ground. The snowmaking heads are attached to hydrants, which are attached to the pipelines at spacing ranging from approximately 120 to 900 feet, depending on the snowmaking heads being used. There are generally two types of snowmaking heads, commonly referred to as either “fan guns” or “nozzles.” Noise levels associated with proposed snowmaking heads are summarized in **Table 11-14**, which also identifies distances to the predicted 70 dBA L_{dn} and 60 dBA L_{eq} noise contours.

TABLE 11-14
PREDICTED SNOWMAKING NOISE LEVELS AND CONTOUR DISTANCES

Snowmaking Head	Type	Noise Level at 50 feet			Distance to 70 dBA L_{dn} Contour (feet) ¹	Distance to 60 dBA L_{eq} Contour (feet) ²
		Front	Side	Rear		
HKD SV10201 Series	Nozzle Gun	84	85	NA	750	1,200
SMI Puma	Fan Gun	64	62	65	75	115
Techno-Alpin T-40	Fan Gun	66	68	72	165	260

Notes: NA = not available

Based on a minimum head spacing of 120 feet and the highest identified directional noise level.

Assumes snowmaking would occur continuously during the nighttime hours (10:00 PM to 7:00 AM). Assuming an average exterior-to-interior noise reduction of 25 dB, an exterior noise level of 70 dBA L_{dn} , or less, would provide an interior noise level of 45 dBA L_{dn} , consistent with the County’s average-daily interior noise standard.

Assuming an average exterior-to-interior noise reduction of 25 dB, an exterior noise level of 60 dBA L_{eq} , or less, would provide an interior noise level of 35 dBA L_{eq} , consistent with commonly applied average-hourly interior noise standards.

As indicated, operational noise levels associated with fan guns are approximately 20 dB lower than noise levels generated by spray nozzles, at equivalent distance. In general, snowmaking typically occurs during the nighttime hours, depending on weather conditions. Assuming an average exterior-to-interior noise reduction of 25 dB, which is typical for standard building construction, an exterior noise level of 70 dBA L_{dn} would provide an interior noise level of 45 dBA L_{dn} , consistent with the County’s average-daily interior noise standard. However, to minimize sleep disruption, a more restrictive interior average-hourly noise threshold of 35 dBA L_{eq} is sometimes recommended. To achieve this more restrictive interior noise standard, nighttime average-hourly noise levels should not exceed 60 dBA L_{eq} at the exterior facade of the nearest occupied rooms.

Noise levels associated with grooming activities are primarily associated with the operation of snowcats, which are used to redistribute and till the man-made snow. Snowcats used for grooming generate noise levels similar to that of large tractors, averaging approximately 81 dBA L_{eq} at 50 feet. In comparison to snowmaking operations, snow-grooming equipment would produce lower noise levels along the proposed ski runs. Noise impacts associated with proposed project-level and program-level components are discussed in greater detail as follows:

Project-Level Impacts

Project-level components would include construction of additional ski trails, which would include snowmaking and grooming activities. The majority of the proposed ski trails would be constructed at higher elevations on the mountain, away from nearby existing residences and the

lodging facilities located at the base of the mountain. New ski trails and snowmaking would, however, be constructed within approximately 400 feet of the Ritz-Carlton Hotel. Based on this distance and the noise levels discussed above, predicted average-hourly noise levels at the exterior of the Ritz-Carlton would be approximately 67 dBA L_{eq} if nozzle guns were used and approximately 54 dBA L_{eq} if fan guns are used. Assuming an average exterior-to-interior noise reduction of 25 dB, predicted hourly interior noise levels would be approximately 42 dBA L_{eq} and 29 dBA L_{eq} , respectively. Noise levels could vary depending on the spacing and placement of the snowmaking heads. Based on these hourly noise levels and assuming that snowmaking and grooming activities could occur continuously throughout the nighttime hours, predicted average-daily noise levels within the nearest rooms would be approximately 48 dBA L_{dn} if nozzle guns were used and approximately 36 dBA L_{dn} if fan guns are used. Predicted noise levels associated with the use of nozzle guns would exceed the County's interior noise standard of 45 dBA L_{dn} . In addition, although predicted noise levels associated with the use of fan guns would not exceed the County's noise standards, noise levels associated with fan guns may still result in disturbance and sleep disruption to occupants of nearby rooms. Project-level impacts would therefore be considered **potentially significant**.

Program-Level Impacts

Ski trail alignments proposed as part of the future program-level components would not be located in the vicinity of nearby existing residences or lodging facilities. Other proposed recreational facilities, such as campsites and skier service centers, would likewise not be located in the vicinity of nearby existing residences or lodging facilities. The nearest residences in relation to the proposed program-level ski trail alignments would be in excess of approximately 2 miles from the nearest noise-sensitive land uses. As a result, program-level impacts would be considered **less than significant**.

Mitigation Measure 11-2 Mitigate for Snowmaking and Grooming Activities

The applicant shall implement the following measures for project-level components:

- Snowmaking activities located within 1,200 feet of the Ritz-Carlton shall utilize quieter fan guns, as opposed to nozzle guns. Fan guns shall be directed to minimize noise levels at the Ritz-Carlton, based on the directional noise aspects of the fan guns used (refer to **Table 11-14**), while still achieving snow-making objectives.
- Fan guns located within 300 feet of the Ritz-Carlton shall be shielded from direct line of sight of the Ritz-Carlton by use of temporary barriers or by locating the fan guns to take advantage of intervening physical features or structures. Temporary barriers shall be constructed of plywood having a minimum thickness of 0.5 inches, or a material of equivalent/increased density. Barriers shall be constructed to minimize air gaps at the base of the structure and between any barrier components. To the extent possible, fan guns located within 300 feet of the Ritz-Carlton shall be placed at ground level to increase the effectiveness of the shielding provided by temporary barriers or intervening physical features.
- Snowmaking equipment shall be located as far as practical from the Ritz-Carlton Hotel.

SIGNIFICANCE AFTER MITIGATION

Implementation of mitigation measure 11-2 would require the use of fan guns in the vicinity of the Ritz-Carlton. In comparison to nozzle guns, the use of fan guns would reduce snowmaking noise levels by approximately 20 dB or more. The use of temporary barriers, such as plywood barriers, would further reduce operational noise levels by up to approximately 5 dB. Locating snowmaking activities at increased distance from the Ritz-Carlton would also help to reduce noise-related impacts. Impacts after mitigation would thus be considered **less than significant**.