10.0 NOISE

This chapter includes a description of ambient-noise conditions, a summary of applicable regulations related to noise and vibration, and an analysis of potential noise impacts of the proposed project. Mitigation measures are recommended as necessary to reduce significant noise impacts.

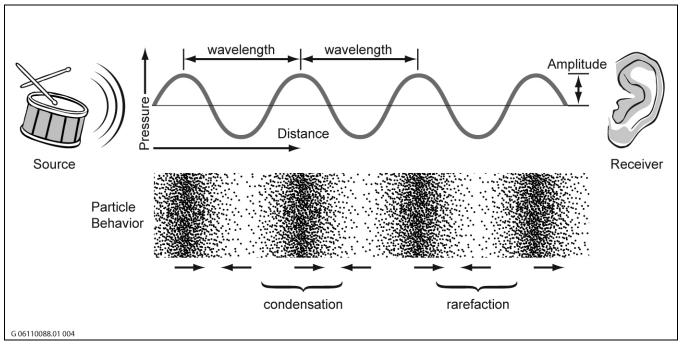
10.1 ENVIRONMENTAL SETTING

10.1.1 SOUND FUNDAMENTALS

Noise is generally defined as sound that is loud, disagreeable, unexpected, or unwanted. Sound, as described in more detail below, is mechanical energy transmitted in the form of a wave by a disturbance or vibration that causes pressure variation in air that the human ear can detect.

Sound Properties

A sound wave is introduced into a medium (air) by a vibrating object. The vibrating object (e.g., vocal cords, the string of a guitar or the diaphragm of a radio speaker) is the source of the disturbance that moves through the medium (Exhibit 10-1). Regardless of the type of source creating the sound wave, the particles of the medium through which the sound moves are vibrating in a back-and-forth motion at a given rate (frequency). The frequency of a wave refers to how often the particles vibrate when a wave passes through the medium. The frequency of a wave is measured as the number of complete back-and-forth vibrations of a particle per unit of time. One complete back-and-forth vibration is called a cycle. If a particle of air undergoes 1,000 cycles in 2 seconds, then the frequency of the wave would be 500 cycles per second. The common unit used for frequency is in cycles per second, called Hertz (Hz).



Source: Data provided by EDAW in 2007

Sound Wave Properties

Exhibit 10-1

Each particle vibrates as a result of the motion of its nearest neighbor. For example, the first particle of the medium begins vibrating at 500 Hz and sets the second particle of the medium into motion at the same frequency (500 Hz). The second particle begins vibrating at 500 Hz and thus sets the third particle into motion at 500 Hz. The process continues throughout the medium; hence each particle vibrates at the same frequency, which is the frequency of the original source. Subsequently, a guitar string vibrating at 500 Hz will set the air particles in the room vibrating at the same frequency (500 Hz), which carries a sound signal to the ear of a listener that is detected as a 500-Hz sound wave.

The back-and-forth vibration motion of the particles of the medium would not be the only observable phenomenon occurring at a given frequency. Because a sound wave is a pressure wave, a detector could be used to detect oscillations in pressure from high to low and back to high pressure. As the compression (high-pressure) and rarefaction (low-pressure) disturbances move through the medium, they would reach the detector at a given frequency. For example, a compression would reach the detector 500 times per second if the frequency of the wave were 500 Hz. Similarly, a rarefaction would reach the detector 500 times per second if the frequency of the wave were 500 Hz. Thus, the frequency of a sound wave refers not only to the number of back-and-forth vibrations of the particles per unit of time, but also to the number of compression or rarefaction disturbances that pass a given point per unit of time. A detector could be used to detect the frequency of these pressure oscillations over a given period of time. The period of the sound wave can be found by measuring the time between successive high-pressure points (corresponding to the compressions) or the time between successive low-pressure points (corresponding to the rarefactions). The frequency is simply the reciprocal of the period; thus an inverse relationship exists so that as frequency increases, the period decreases, and vice versa.

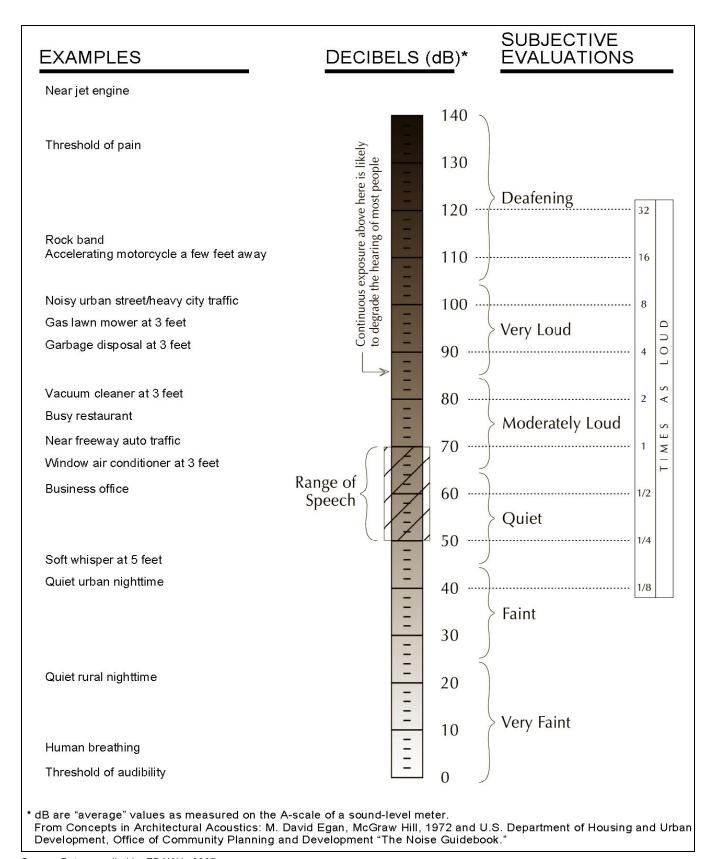
A wave is a phenomenon that transports energy along a medium. The amount of energy carried by a wave is related to the amplitude (loudness) of the wave. A high-energy wave is characterized by large amplitude; a low-energy wave is characterized by small amplitude. The amplitude of a wave refers to the maximum amount of displacement of a particle from its rest position. The energy transported by a wave is directly proportional to the square of the amplitude of the wave. This means that a doubling of the amplitude of a wave indicates a quadrupling of the energy transported by the wave.

Sound and the Human Ear

Because of the ability of the human ear to detect a wide range of sound-pressure fluctuations, sound-pressure levels are expressed in logarithmic units called decibels (dB) to avoid a very large and awkward range in numbers. The sound-pressure level in decibels is calculated by taking the log of the ratio between the actual sound pressure and the reference sound pressure and then multiplying by 20. The reference sound pressure is considered the absolute hearing threshold (Caltrans 1998). Use of this logarithmic scale reveals that the total sound from two individual 65-dB sources is 68 dB, not 130 dB (i.e., doubling the source strength increases the sound pressure by 3 dB).

Because the human ear is not equally sensitive to all audible frequencies, a frequency-dependent rating scale was devised to relate noise to human sensitivity. An A-weighted dB (dBA) scale performs this compensation by discriminating against frequencies that are more sensitive to humans. The basis for compensation is the faintest sound audible to the average ear at the frequency of maximum sensitivity. This dBA scale has been chosen by most authorities for regulating environmental noise. Exhibit 10-2 presents typical indoor and outdoor noise levels.

With respect to how humans perceive and react to changes in noise levels, a 1-dBA increase is imperceptible, a 3-dBA increase is barely perceptible, a 6-dBA increase is clearly noticeable, and a 10-dBA increase is subjectively perceived as approximately twice as loud (Egan 1988), as presented in Table 10-1. Table 10-1 was developed on the basis of test subjects' reactions to changes in the levels of steady-state pure tones or broadband noise and to changes in levels of a given noise source. It is probably most applicable to noise levels in the range of 50–70 dBA because this is the usual range of voice and interior noise levels. For these reasons, a noise level increase of 3 dBA or more is typically considered a substantial degradation of the existing noise environment.



Source: Data compiled by EDAW in 2007

Typical Noise Levels Exhibit 10-2

Table 10-1 Subjective Reaction to Changes in Noise Levels of Similar Sources				
Change in Level (dBA)	Subjective Reaction	Factor Change in Acoustical Energy		
1	Imperceptible (Except for Tones)	1.3		
3	Just Barely Perceptible	2.0		
6	Clearly Noticeable	4.0		
10	About Twice (or Half) as Loud	10.0		
Note: dBA = A-weighted decibels Source: Egan 1988				

Sound Propagation and Attenuation

As sound (noise) propagates from the source to the receptor, the attenuation, or manner of noise reduction in relation to distance, depends on surface characteristics, atmospheric conditions, and the presence of physical barriers. The inverse-square law describes the attenuation caused by the pattern in which sound travels from the source to receptor. Sound travels uniformly outward from a point source in a spherical pattern with an attenuation rate of 6 dBA per doubling of distance (dBA/DD). However, from a line source (e.g., a road), sound travels uniformly outward in a cylindrical pattern with an attenuation rate of 3 dBA/DD. The surface characteristics between the source and the receptor may result in additional sound absorption and/or reflection. Soft surfaces such as dirt cover or vegetation can provide an additional 1.5 dBA/DD. Hard surfaces such as parking lots, water, and other roadway surfaces would provide additional attenuation. Atmospheric conditions such as wind speed, temperature, and humidity also affect noise attenuation. Furthermore, the presence of a barrier between the source and the receptor may also attenuate noise levels. The actual amount of attenuation depends on the size of the barrier and the frequency of the noise. A noise barrier may consist of any natural or human-made feature such as a hill, grove of trees, building, wall, or berm (Caltrans 1998).

All buildings provide some exterior-to-interior noise reduction. A building constructed with a wood frame and a stucco or wood sheathing exterior typically provides a minimum exterior-to-interior noise reduction of 25 dBA with its windows closed; by contrast, a building constructed of a steel or concrete frame, a curtain wall or masonry exterior wall, and fixed plate-glass windows one-quarter inch thick typically provides an exterior-to-interior noise reduction of 30–40 dBA with its windows closed (Paul S. Veneklasen & Associates 1973, cited in Caltrans 2002).

Noise Descriptors

The selection of a proper noise descriptor for a specific source depends on the spatial and temporal distribution, duration, and amplitudinal fluctuation of the noise. The noise descriptors most often used when dealing with traffic, community, and environmental noise are defined below (Caltrans 1998, Lipscomb and Taylor 1978):

- ► L_{max} (maximum noise level): The maximum instantaneous noise level during a specific period of time. The L_{max} may also be referred to as the "peak (noise) level."
- \blacktriangleright L_{min} (minimum noise level): The minimum instantaneous noise level during a specific period of time.
- \blacktriangleright L_X (statistical descriptor): The noise level exceeded X% of a specific period of time.
- ▶ L_{eq} (equivalent noise level): 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 is calculated, which is then converted back to dBA to determine the L_{eq} .

In noise environments determined by major noise events, such as aircraft overflights, the L_{eq} value is heavily influenced by the magnitude and number of single events that produce the high noise levels.

- ► *L_{dn}* (*day-night noise level*): The 24-hour L_{eq} with a 10-dBA "penalty" for noise events that occur during the noise-sensitive hours between 10 p.m. and 7 a.m. In other words, 10 dBA is "added" to noise events that occur in the nighttime hours, and this generates a higher reported noise level when determining compliance with noise standards. The L_{dn} attempts to account for the fact that noise during this specific period of time is a potential source of disturbance with respect to normal sleeping hours.
- ► CNEL (community noise equivalent level): A noise level similar to the L_{dn} described above, but with an additional 5-dBA "penalty" added to noise events that occur during the noise-sensitive hours between 7 p.m. and 10 p.m., which are typically reserved for relaxation, conversation, reading, and television. If the same 24-hour noise data are used, the reported CNEL is typically approximately 0.5 dBA higher than the L_{dn}.
- ► SENL (single-event [impulsive] noise level): A receiver's cumulative noise exposure level from a single impulsive noise event, which is an acoustical event of short duration that involves a change in sound pressure above some reference value. SENLs typically represent the noise events used to calculate the L_{eq}, L_{dn}, and CNEL.

Community noise is commonly described in terms of the ambient noise level, the all-encompassing noise level associated with a given noise environment. A common statistical tool to measure the ambient noise level is the average (equivalent) sound level, L_{eq} , which corresponds to a steady-state sound level that contains the same total energy as a time-varying signal over a given time period (usually 1 hour). The L_{eq} is the foundation of the composite noise descriptors such as L_{dn} and CNEL, as defined above, and shows a positive correlation with community response to noise.

Negative Effects of Noise on Humans

Negative effects of noise exposure include physical damage to the human auditory system, interference, and disease. Physical damage to the auditory system can lead to gradual or traumatic hearing loss. Gradual hearing loss is caused by sustained exposure to moderately high noise levels over an extended period of time; traumatic hearing loss is caused by sudden exposure to extremely high noise levels over a brief period. Both gradual and traumatic hearing loss may result in permanent hearing damage. In addition, noise may interfere with or interrupt sleep, relaxation, recreation, and communication. Although most interference may be classified as annoying, the inability to hear a warning signal is considered dangerous. Noise may also contribute to diseases associated with stress, such as hypertension, anxiety, and heart disease. The degree to which noise contributes to such diseases depends on the frequency, bandwidth, noise level, and duration of exposure (Caltrans 1998).

Vibration

Vibration is the periodic oscillation of a medium or object. The rumbling sound caused by the vibration of room surfaces is called structureborne noise. Both natural phenomena (e.g., earthquakes, volcanic eruptions, sea waves, landslides) and human-made causes (e.g., explosions, machinery, traffic, trains, construction equipment) can result in groundborne vibration. Some vibration sources, such as factory machinery, are continuous; others, such as explosions, are transient. As is the case with airborne sound, groundborne vibration may be described by amplitude and frequency.

Vibration amplitude is typically expressed in peak particle velocity (PPV) or root mean square (RMS), as in RMS vibration velocity. The PPV and RMS velocity are normally described in inches per second (in/sec). PPV is defined as the maximum instantaneous positive or negative peak of a vibration signal. PPV is the metric often used to describe blasting vibration and other vibration sources that result in structural stresses in buildings (FTA 2006, Caltrans 2002).

Although PPV is appropriate for evaluating the potential for building damage, it is not always suitable for evaluating human response. It takes some time for the human body to respond to vibration signals. In a sense, the human body responds to average vibration amplitude. The RMS of a signal is the average of the squared amplitude of the signal, typically calculated over a period of 1 second. As with airborne sound, the RMS velocity is often expressed in decibel notation as velocity decibels (VdB), which serves to compress the range of numbers required to describe vibration (FTA 2006). This velocity decibel scale is based on a reference value of 1 microinch per second (μ in/sec).

The background vibration-velocity level typical of residential areas is approximately 50 VdB. Groundborne vibration is normally perceptible to humans at approximately 65 VdB. For most people, a vibration-velocity level of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels (FTA 2006).

Typical outdoor sources of perceptible groundborne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If a roadway is smooth, the groundborne vibration is rarely perceptible. The range of human perception of vibration is from approximately 50 VdB, the typical background vibration-velocity level, to 100 VdB, the general threshold where minor damage can occur in fragile buildings. Construction activities can generate groundborne vibrations, which can pose a risk to nearby structures. Constant or transient vibration can weaken structures, crack facades, and disturb occupants (FTA 2006).

Construction-generated vibration can be transient, random, or continuous. Transient construction vibration is generated by blasting, impact pile driving, and wrecking balls. Random vibration can result from jackhammers, pavement breakers, and heavy construction equipment. Continuous vibration results from vibratory pile drivers, large pumps, horizontal directional drilling, and compressors. Table 10-2 summarizes the general human response to different levels of groundborne vibration.

Table 10-2 Human Response to Different Levels of Groundborne Vibration				
Vibration-Velocity Level	Human Reaction			
65 VdB	Approximate threshold of perception.			
75 VdB	Approximate dividing line between barely perceptible and distinctly perceptible. Many people find that transportation-related vibration at this level is unacceptable.			
85 VdB	Vibration acceptable only if there is an infrequent number of events per day.			
Note: VdB = velocity decibels refe Source: FTA 2006	renced to 1 µinch/sec and based on the root mean square vibration velocity.			

10.1.2 EXISTING NOISE ENVIRONMENT

EXISTING SENSITIVE LAND USES

Land uses that are sensitive to noise and vibration are those uses where exposure would result in adverse effects (i.e., annoyance and/or structural damage) and uses where quiet is an essential element of their intended purpose. Residences are of primary concern because of the potential for increased, prolonged exposure of individuals to both interior and exterior noise or vibration. Other noise-sensitive land uses are hospitals, convalescent facilities, hotels, churches, libraries, and other uses where low interior noise levels are essential.

Noise-sensitive land uses located near the project area are 12 rural homes to the south, off Miller Lane and Godley Road. The closest of these residences is approximately 800 feet from the southern boundary of the Park. The next

closest residential area is located along Garden Bar Road approximately 1,600 feet northwest of the Park's west boundary.

EXISTING NOISE SOURCES

The project area is located in an unincorporated area of Placer County. It was used for cattle grazing in the recent past, and portions of the property continue to be used for this purpose. Adjacent land uses include rural residential home sites and agricultural activities, mostly cattle grazing and raising other livestock and recreational uses on the Didion Ranch portion of the Park. The local noise environment is rural. Agricultural activities, birds, aircraft flyovers, plants rustling, and minor vehicle traffic are the audible noise sources. Natural sounds from meteorological effects (e.g., wind rustling plants, running water) and wildlife are the predominant ambient noise source.

EXISTING-NOISE SURVEY

To quantify the existing noise environment in the project vicinity, three short-term noise measurements were collected on Thursday, June 21, 2007, using a Larson-Davis Model 824 sound meter. The sound meter was calibrated immediately before each measurement, and measurements were conducted in accordance with the acoustical standards of the American National Standards Institute. As presented in Table 10-3, noise levels in the project vicinity range from 35.2 dBA L_{eq} to 42.1 dBA L_{eq} , with L_{max} ranges from 47.7 dBA to 61.4 dBA (readings at the high end of the range were generated by aircraft flyovers). Noise sources noted during the measurements included buzzing insects, singing birds, and wind. Noise associated with agricultural uses—tractors, yelling voices, cows, and horses—was also reflected in the measurements. Exhibit 10-3 shows the measurement locations.

Table 10-3 Existing Ambient Noise Levels					
Sound Level (dBA) ²					
Measurement Number ¹	Location	Monitoring Period —	L_{eq^3}	L _{min} ⁴	L _{max} ⁵
1	Northeast corner	11:00–11:15 a.m.	39.5	31.5	53.4
2	Southern border	10:00–10:15 a.m.	42.1	26.4	61.4
3	Northwest corner	8:40–9:05 a.m.	35.2	28.6	47.7

¹ Measurement locations are shown in Exhibit 10-3.

EXISTING TRAFFIC NOISE LEVELS

Existing traffic noise levels were estimated using the Federal Highway Administration's (FHWA's) traffic noise prediction model (FHWA-RD-77-108) and traffic data obtained from the traffic analysis prepared for this project (Chapter 8.0, "Transportation and Circulation"). Table 10-4 presents the predicted CNEL noise levels at 50 feet from the centerline of the near travel lane and distances from roadway centerline to the 55-, 60-, 65-, and 70-dBA CNEL contours for existing average daily traffic (ADT) volumes. Additional input data included day/night percentages of autos, medium and heavy trucks, vehicle speeds, ground attenuation factors, and roadway widths. Actual noise levels vary from day to day, depending on local traffic volumes, shielding from existing structures, variations in attenuation rates attributable to changes in surface parameters, and meteorological conditions.

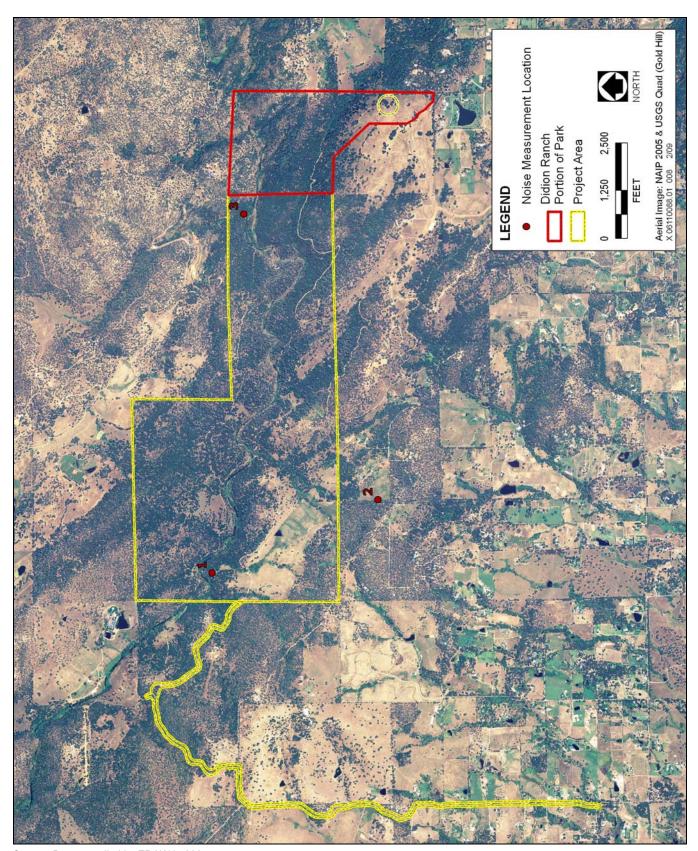
² dBA (A-weighted decibels): The weighted sound level measurement scale specifically adjusted to human hearing.

³L_{eq} (equivalent noise level): The energy mean (average) noise level.

⁴ L_{min} (minimum noise level): The minimum instantaneous noise level during a specific period of time.

⁵ L_{max} (maximum noise level): The maximum instantaneous noise level during a specific period of time.

Source: Measurements collected by EDAW on Thursday, June 21, 2007



Source: Data compiled by EDAW in 2007

Ambient Noise Measurement Locations

Exhibit 10-3

Table 10-4 Summary of Modeled Existing Vehicular Traffic Noise Levels						
Decidence Comment and Localities	Distance (feet) from Roadway Centerline to CNEL				CNEL (dBA) 50 Feet	
Roadway Segment and Location	70 dBA CNEL	65 dBA CNEL	60 dBA CNEL	55 dBA CNEL	from Centerline of Near Travel Lane	
Weekday						
Garden Bar Road, north of Mt. Pleasant Road	2	4	8	17	47.9	
Garden Bar Road, south of Mt. Pleasant Road	5	10	23	49	54.8	
Mt. Pleasant Road, west of Garden Bar Road	4	8	18	39	53.4	
Mt. Pleasant Road, east of Garden Bar Road	7	15	33	70	57.2	
Mears Drive, north of Mt. Vernon Road	2	4	9	20	49.1	
Weekend						
Garden Bar Road, north of Mt. Pleasant Road	2	3	7	16	47.5	
Garden Bar Road, south of Mt. Pleasant Road	4	9	20	42	53.9	
Mt. Pleasant Road, west of Garden Bar Road	3	7	16	34	52.6	
Mt. Pleasant Road, east of Garden Bar Road	6	13	28	60	56.2	
Mears Drive, north of Mt. Vernon Road	2	4	8	18	48.3	

Notes:

CNEL = community noise equivalent level; dBA = A-weighted decibels. Calculated noise levels do not consider any shielding or reflection of noise by existing structures, vegetation, or terrain features; or noise contribution from other sources. See modeling results in Appendix E for further detail.

Source: Modeling performed by EDAW in 2007

10.2 REGULATORY SETTING

10.2.1 FEDERAL PLANS, POLICIES, REGULATIONS, AND LAWS

No federal plans, policies, regulations, or laws related to noise are applicable to the proposed project. However, the Federal Transit Administration (FTA) has set forth guidelines for maximum-acceptable vibration criteria for different types of land uses to address the human response to groundborne vibration (FTA 2006):

- 65 VdB (referenced to 1 μin/sec and based on the RMS velocity amplitude) for land uses where low ambient vibration is essential for interior operations (e.g., hospitals, high-tech manufacturing, laboratory facilities);
- ▶ 80 VdB for residential uses and buildings where people normally sleep; and
- ▶ 83 VdB for institutional land uses with primarily daytime operations (e.g., schools, churches, clinics, offices).

Standards have also been established to address the potential for groundborne vibration to cause structural damage to buildings. These standards were developed by the Committee of Hearing, Bio Acoustics, and Bio Mechanics at the request of the U.S. Environmental Protection Agency (EPA) (FTA 2006). For fragile structures, the committee recommends a maximum limit of 0.25 in/sec PPV (FTA 2006).

10.2.2 STATE PLANS, POLICIES, REGULATIONS, AND LAWS

The *State of California General Plan Guidelines*, published by the Governor's Office of Planning and Research (2003), provides guidance for the acceptability of projects within specific CNEL/L_{dn} contours. Table 10-5 presents acceptable and unacceptable community-noise-exposure limits for various land-use categories. Generally, residential uses are considered to be acceptable in areas where exterior noise levels do not exceed 60 dBA CNEL/L_{dn}. Residential uses are normally unacceptable in areas exceeding 70 dBA CNEL/L_{dn} and conditionally acceptable within 55–70 dBA CNEL/L_{dn}. Schools are normally acceptable in areas up to 70 dBA CNEL/L_{dn}. Recreation uses are normally acceptable in areas up to 75 dBA CNEL/L_{dn}. The guidelines also present adjustment factors that may be used 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 issues.

Table 10-5 State Noise Compatibility Guidelines, by Land Use Category					
	Community Noise Exposure (CNEL/L _{dn} , dBA)				
Land Use Category	Normally Acceptable ¹	Conditionally Acceptable ²	Normally Unacceptable ³	Clearly Unacceptable ⁴	
Residential—Low-Density Single-Family, Duplex, Mobile Home	<60	55–70	70–75	75+	
Residential—Multiple-Family	<65	60–70	70–75	75+	
Transient Lodging, Motel, Hotel	<65	60-70	70–80	80+	
School, Library, Church, Hospital, Nursing Home	< 70	60-70	70–80	80+	
Auditorium, Concert Hall, Amphitheater		< 70	65+		
Sports Arenas, Outdoor Spectator Sports		<75	70+		
Playground, Neighborhood Park	< 70		67.5–75	72.5+	
Golf Courses, Stable, Water Recreation, Cemetery	<75		70–80	80+	
Office Building, Business Commercial and Professional	< 70	67.5–77.5	75+		
Industrial, Manufacturing, Utilities, Agriculture	<75	70-80	75+		

Notes:

CNEL = community noise equivalent level; dBA = A-weighted decibels; L_{dn} = day-night noise level (the 24-hour energy mean [average] noise level with a 10-dBA "penalty" for noise events that occur during the noise-sensitive hours between 10 p.m. and 7 a.m.)

Source: Governor's Office of Planning and Research 2003

With respect to vibration, the California Department of Transportation (Caltrans) recommends a more conservative threshold of 0.2 in/sec PPV for normal residential buildings and 0.08 in/sec PPV for old or historically significant structures (Caltrans 2002) to protect fragile, historic, and residential structures. These standards are more stringent than the federal guidance established by the Committee of Hearing, Bio Acoustics, and Bio Mechanics, presented above.

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

² 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.

³ 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. Outdoor areas must be shielded.

⁴ New construction or development should generally not be undertaken.

10.2.3 Local Plans, Policies, Regulations, and Ordinances

PLACER COUNTY GENERAL PLAN

The following are the relevant policies identified by the *Placer County General Plan* (Placer County 1994) for noise.

- Policy 9.A.2. The County shall require that noise created by new nontransportation noise sources be mitigated so as not to exceed the noise level standards of Table 9-1 [Table 10-6 in this document] as measured immediately within the property line of lands designated for noise-sensitive uses.
- ▶ Policy 9.A.9. Noise created by new transportation noise sources, including roadway improvement projects, shall be mitigated so as not to exceed the levels specified in Table 9-3 [Table 10-7 in this document] at outdoor activity areas or interior spaces of existing noise-sensitive land uses.
- Policy 9.A.12. Where noise mitigation measures are required to achieve the standards of Tables 9-1 and 9-3 [Tables 10-6 and 10-7 of this document, respectively], 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.

Table 10-6 Allowable L _{dn} Noise Levels Within Specified Zone Districts ¹ Applicable to New Projects Affected by or Including Nontransportation Noise Sources					
Zone District of Receptor	CNEL/L _{dn} (dBA) at Property Line of Receiving Use	Interior Spaces (dBA) ²			
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	_	-			
Farm	_6	-			
Agriculture Exclusive	_6	-			
Forestry	_	-			
Timberland Preserve					
Recreation & Forestry	70	-			
Open Space	_	-			
Mineral Reserve	_	_			

Table 10-6

Allowable L_{dn} Noise Levels Within Specified Zone Districts¹ Applicable to New Projects Affected by or Including Nontransportation Noise Sources

Notes:

CNEL = community noise equivalent level; dBA = A-weighted decibels; L_{dn} = day-night noise level (the 24-hour energy mean [average] noise level with a 10-dBA "penalty" for noise events that occur during the noise-sensitive hours between 10 p.m. and 7 a.m.)

- Except where noted otherwise, noise exposures will be those that occur at the property line of the receiving use.
- Where existing transportation noise levels exceed the standards of this table, the allowable CNEL/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, or 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 10-6 and Table 10-7. Similarly, where an existing use which is not subject to a use permit causes noise in excess of the allowable levels in Tables 10-6 and 10-7, said excess noise shall be considered the allowable level. If a new development is proposed that 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 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 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.
- Overriding policy on interpretation of allowable noise levels: Industrial-zoned properties are confined to unique areas of the county, and are irreplaceable. Industries that 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.
- 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.
- 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
- 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.
- State of the art should include the use of modern equipment with lower noise emissions, site design, and plant orientation to mitigate off-site noise impacts, and similar methodology.
- 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 on residences located in these agricultural zones are a concern, a CNEL/L_{dn} of 70 dBA will be considered acceptable outdoor exposure at a residence.
 Source: Please Courty 4004

Source: Placer County 1994

Table 10-7 Maximum Allowable Noise Exposure for Transportation Noise Sources					
Land Use	Outdoor Activity Areas ¹	Interior Spa	ces (dBA)		
Land Ose	CNEL/L _{dn} (dBA)	CNEL/L _{dn}	L_{eq^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	_	_		

_ . .

Notes:

CNEL = community noise equivalent level; dBA = A-weighted decibels; L_{dn} = day-night noise level (the L_{eq} with a 10-dBA "penalty" for noise events that occur during the noise-sensitive hours between 10 p.m. and 7 a.m.); L_{eq} = equivalent noise level (the 24-hour energy mean [average] noise level)

Source: Placer County 1994

Construction Noise

The Placer County Planning Commission passed the following resolution (Minute Order 90-08) regarding construction noise associated with land development projects, and the conditions of this resolution shall be applied to address construction noise impacts:

The Planning Commission and Zoning Administrator are hereby directed to consider placement of the following conditions on an individual project basis to control construction noise in areas where existing residences may be adversely impacted.

- 1. All construction vehicles or equipment, fixed or mobile, operated in close proximity of a residential dwelling shall be equipped with properly operating and maintained mufflers; and/or
- 2. Stockpiling and/or vehicle staging areas shall be identified by the applicant on the improvement plans and shall be located as far as is practical from existing dwellings in the area; and/or
- 3. Construction noise emanating from any commercial or residential construction activities for which a building permit is required shall be prohibited on Sundays or federal holidays, and shall only occur:
 - a. Monday through Friday, 6:00 a.m. to 8:00 p.m.; and
 - b. Saturdays, 8:00 a.m. to 8:00 p.m.

Work occurring in an enclosed building, such as a house under construction with the roof and siding on, can occur at other times as well.

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 CNEL/L_{dn} or less using a practical application of the best-available noise reduction measures, an exterior noise level of up to 65 dB CNEL/L_{dn} may be allowed provided that available exterior noise level reduction measures have been implemented and interior noise levels are in compliance with this table.

PLACER COUNTY NOISE ORDINANCE

The Placer County Noise Ordinance (Article 9.36 of the Placer County Code), which was adopted in March 2004, defines sound-level performance standards for sensitive receptors. The ordinance forbids any person to create (or allow the creation of) sound on property he or she owns, leases, occupies, or otherwise controls that causes the exterior sound level—measured at the property line of any affected sensitive receptor—to exceed the ambient sound level by 5 dBA or exceed the standards shown in Table 10-8 below, whichever is greater.

Table 10-8 On-Site Sound Level Standards in the Placer County Noise Ordinance					
Sound Level Descriptor (dBA)	Daytime (7 a.m. to 10 p.m.)	Nighttime (10 p.m. to 7 a.m.)			
Hourly L _{eq}	55	45			
L _{max}	70	65			

Notes: dBA = A-weighted decibels; L_{eq} = equivalent noise level (the 24-hour energy mean [average] noise level); L_{max} = maximum noise level (the maximum instantaneous noise level during a specific period of time) Source: Placer County 2004

Each of the sound-level standards specified in Table 10-8 shall be reduced by 5 dBA 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 dBA.

According to Section 9.36.030, "Exemptions," some noise-generating activities are exempt from the above noise ordinance standards. These activities include construction that is performed between 6 a.m. and 8 p.m., Monday through Friday, and between 8 a.m. and 8 p.m. Saturday and Sunday, provided that all construction equipment is fitted with factory-installed muffler devices and maintained in good working order.

10.3 IMPACTS

10.3.1 ANALYSIS METHODOLOGY

Land use types and major noise sources in the vicinity of the project area were identified based on existing documentation (e.g., the *Placer County General Plan*) and site reconnaissance data. To assess potential short-term impacts from construction noise, noise-sensitive receptors and their relative exposure (considering topographic barriers and distance) were identified. Noise levels of specific construction equipment were determined and resultant noise levels at those receptors were calculated.

FHWA's traffic noise prediction model was used to model traffic noise levels along affected roadways, based on daily volumes and the distribution of traffic, from the traffic analysis prepared for the project (Kd Anderson & Associates 2008). The contribution of the proposed project to the existing traffic noise levels along area roadways was determined by comparing the modeled noise levels at 50 feet from the centerline of the near travel lane under no-project and plus-project conditions.

Groundborne vibration impacts were qualitatively assessed based on existing documentation (e.g., vibration levels produced by specific construction equipment) and the distance of sensitive receptors from the given source.

Predicted noise levels were compared with applicable standards to determine significance. Mitigation measures were developed for significant noise impacts.

10.3.3 THRESHOLDS OF SIGNIFICANCE

Based on applicable Placer County noise regulations, the Placer County CEQA checklist, and the State CEQA Guidelines, the proposed project would result in a significant noise impact if it would:

- result in short-term noise levels from construction exceeding the applicable County noise standards (Table 10-6 and Table 10-7), or increase substantially (by greater than 3 dBA) ambient noise at nearby existing noise-sensitive receptors during the more sensitive early morning, evening, and nighttime hours of the day (i.e., outside the hours considered exempt by the Placer County Noise Ordinance [6 a.m.-8 p.m., Monday-Friday and 8 a.m.-8 p.m. Saturday and Sunday]);
- result in short-term (construction) or long-term (operational) noise levels from traffic exceeding the applicable County noise standards for transportation noise sources (Table 10-7), or increase substantially (by greater than 3 dBA) ambient noise levels at nearby existing noise-sensitive receptors;
- result in long-term (operational) noise levels from nontransportation stationary or area sources exceeding applicable County noise standards (Table 10-6 and/or Table 10-8), or increase substantially (by greater than 3 dBA) ambient noise at nearby existing noise-sensitive receptors; or
- ▶ expose persons to or generate excessive groundborne vibration or noise levels exceeding Caltrans's recommended standards for preventing structural building damage (0.2 in/sec PPV and 0.08 in/sec PPV, respectively, for normal and historical buildings) or FTA's maximum-acceptable vibration standard with respect to human response (80 VdB for residential structures) at nearby existing or proposed vibration-sensitive land uses (e.g., residences).

10.3.2 IMPACT ANALYSIS

IMPACT

10-1

Noise—Short-Term Construction-Generated Noise Levels Exceeding County Standards. Short-term exterior noise levels at the closest existing noise-sensitive receptor could exceed 68 dBA without

feasible noise controls, which would exceed the applicable County nighttime standard of 45 dBA at existing nearby off-site sensitive land uses. However, construction would be limited to daytime hours.

Significance

Less than Significant

Mitigation

None Warranted

Proposed

Residual Significance

Less than Significant

Regional Park Facility and Infrastructure Construction

Construction activities in the project area would include site preparation (e.g., clearing, excavation, and grading), staging, trenching, paving, equipment installation, finishing, cleanup, and other miscellaneous activities. No pile driving or rock blasting would occur as part of project construction.

The trails would be constructed by hand and/or with a small Sweco trail dozer. Hand construction of the trails would require one or more crews (up to approximately 15 members) using hand tools and chain saws. Other equipment used for trail construction would include a mini excavator, haul trucks, and other types of machinery (e.g., graders) that would fit the size constraints of the 15- to 20-foot-wide trail corridors. Larger equipment such

as graders, excavators, pavers, pneumatic tools, dozers, and haul trucks would be used to construct the proposed roads, parking areas, restrooms, and other facilities.

According to EPA, and as indicated in Table 10-9, noise levels from individual construction equipment ranges from 79 dBA to 91 dBA at 50 feet. The simultaneous operation of on-site construction equipment associated with the project, as identified above, could result in combined intermittent noise levels up to approximately 93 dBA at 50 feet from the construction activity. Based on the equipment noise levels and a typical noise-attenuation rate of 6 dBA/DD, exterior noise levels at the closest existing noise-sensitive receptor (located approximately 800 feet south of the project boundary) could exceed 68 dBA without feasible noise controls. Thus, if construction activities were to occur during the more noise-sensitive hours of the day (i.e., hours not exempt under the Placer County Noise Ordinance) or if construction equipment were not properly equipped with noise control devices, construction-generated noise levels could exceed the applicable County nighttime standard of 45 dBA (Table 10-8) and substantially increase ambient noise at existing nearby sensitive receptors.

Table 10-9 Typical Construction-Equipment Noise Levels					
Time of Facilities	Noise Level (d	BA) at 50 feet			
Type of Equipment	Without Feasible Noise Control	With Feasible Noise Control ¹			
Dozer or Tractor	80	75			
Excavator	88	80			
Scraper	88	80			
Front-End Loader	79	75			
Backhoe	85	75			
Grader	85	75			
Truck	91	75			
Compactor	81	75			
Paver	89	80			
Pavement Scarifier	90	-			
Drill	98	80			
Generator	78	75			

Notes: dBA = A-weighted decibels

Sources: EPA 1971, FTA 2006, FHWA 2006

However, as stated in Chapter 3.0, "Project Description," construction activities for the project would be limited to 6 a.m.—8 p.m., Monday—Friday, during daylight saving time and 7 a.m.—8 p.m. during standard time. Construction activities would be allowed between 8 a.m. and 6 p.m. on Saturdays, and construction activities that are inaudible in areas outside the Park may be permitted on Sundays. Construction equipment would be fitted with factory installed muffling devices. Construction activity that occurs during these hours by equipment fitted with factory installed muffling devices would be exempt from the provisions of the Placer County Noise Ordinance. This impact would be less than significant.

¹ Feasible noise control includes the use of intake mufflers, exhaust mufflers, and engine shrouds in accordance with manufacturers' specifications.

Construction of Garden Bar Road North Improvements

Construction activities along Garden Bar Road North would include road widening, striping, drainage improvements, curve realignment, and intersection improvements at Mt. Pleasant Road and Garden Bar Road North (see Chapter 8.0, "Transportation and Circulation," for a complete description of proposed road improvements).

A complete list of equipment is not currently available; however, roadway improvements typically include a backhoe, compactor, dozer, excavator, pavement scarafier, paver, roller, pickup trucks, and haul trucks.

According to EPA, and as indicated in Table 10-9, noise levels from individual construction equipment range from 79 dBA to 91 dBA at 50 feet. The simultaneous operation of on-site construction equipment associated with the roadway improvements, as identified above, could result in combined intermittent noise levels up to approximately 90 dBA at 50 feet from the construction activity. Based on the equipment noise levels and a typical noise-attenuation rate of 6 dBA/DD, exterior noise levels at the closest existing noise-sensitive receptor (located approximately 50 feet from roadway improvement areas) could exceed 90 dBA without feasible noise controls. Thus, if construction activities were to occur during the more noise-sensitive hours of the day (i.e., hours not exempt under the Placer County Noise Ordinance), or if construction equipment were not properly equipped with noise control devices, construction-generated noise levels could exceed the applicable County nighttime standard of 45 dBA (Table 10-8) and substantially increase ambient noise levels at existing nearby sensitive receptors.

However, as stated in Chapter 3.0, "Project Description," project construction activities would be limited to 6 a.m.–8 p.m., Monday–Friday during daylight saving time and 7 a.m.–8 p.m. during standard time. Construction activities would be allowed between 8 a.m.–6 p.m. on Saturdays. Construction activity that occurs during these hours would be exempt from the provisions of the Placer County Noise Ordinance. Therefore, this impact would be less than significant.

IMPACT Noise—Increases in Long-Term (Operational) Noise Levels from Nontransportation Stationary and Area Sources. *Area-source noise may result from maintenance activities. However, exterior noise levels*

Area Sources. Area-source noise may result from maintenance activities. However, exterior noise levels at the closest existing noise-sensitive receptor (800 feet) would not exceed 41 dBA. Such noise levels would not exceed any of the applicable County standards for daytime or nighttime noise, nor would they result in a substantial increase in ambient noise levels at nearby existing noise-sensitive receptors.

Significance Less than Significant

Mitigation None Warranted

Proposed

Residual Less than Significant

Significance

Use of the proposed Park would not result in the use of any new stationary sources of noise in the project area. However, area-source noise may result from maintenance activities, such as lawn mowing and vegetation clearing (lawn mowers, edgers, trimmers). According to EPA, such activities could result in noise levels reaching approximately 83 dBA at 3 feet from the source (from lawn mowers and trimmers), depending on the exact equipment type and size (EPA 1971). Based on these equipment noise levels and a typical noise-attenuation rate of 6 dBA/DD, exterior noise levels at the closest existing noise-sensitive receptor (800 feet) would not exceed 41 dBA. Noise sources associated with property maintenance (e.g., lawn mowers, edgers, power tools) that occur between 7 a.m. and 9 p.m. are also exempt from the Placer County Noise Ordinance. Use of maintenance equipment would be limited to these hours.

In addition, increased recreation use and associated noise (e.g., people talking, children playing, and visitors riding bicycles) would occur with implementation of the proposed project. Typical noise levels for human speech

are approximately 60 dBA (see Exhibit 10-2). Therefore, based on a typical noise-attenuation rate of 6 dBA/DD, exterior noise levels at the closest existing noise-sensitive receptor (800 feet) would not exceed 35 dBA.

Reservation-based events (e.g. cross country races, family and group outings) would also occur with implementation of the Park. Noise from these reservation-based events would increase the ambient noise level at surrounding areas, however, events would be short in duration (less than 1 day), occur at infrequent intervals, and during the less sensitive (daylight) hours of the day (7 a.m. to 8 p.m.). In addition, amplified sound would be prohibited during all events and activities in the Park. As a result, these reservation-based events would not cause a long-term substantial noise increase to occur.

Some overnight camping is also proposed for the Park. Camping activities would be centralized around the bunkhouses and campfire pits. Noise sources resulting from camping would include people talking. As stated above, human speech would not exceed 35 dBA at the nearest sensitive receptor, and thus would not cause an increase in ambient noise levels or exceed a County threshold (45 dBA). In addition, campers would be restricted by Park quiet hours from 10 p.m. to 7 a.m. to further reduce noise levels during noise-sensitive hours.

Hunting is also being proposed for up to two 2-day seasons per year with 10 hunting permits being issued per season or through depredation permits. Typical noise levels resulting from gunfire are approximately 120-140 dBA at 6 inches (Kardous, et al. 2003). Accounting for intervening topography and vegetation as well as distance, noise resulting from gunshots within the Park would not exceed the Placer County Noise Ordinance maximum noise level standards within 0.5-mile of any sensitive receptor (See Table 10-8). As stated in Chapter 3.0, "Project Description," no hunting would be allowed within 0.5-mile of a residence. Thus, the Placer County maximum noise level standard would not be exceeded.

Use of the Park could also include occasional use of the helistops by helicopters within the project area for emergencies. The use of the helistops would be very infrequent and would be limited to emergency use only. Although there would be an increase in noise in the project area if one or both of the helistops are used by helicopters, this increase in noise would be temporary and very infrequent and would not result in a substantial long-term increase in the ambient noise levels of the project area.

For the reasons stated above, noise associated with Park maintenance or recreational use would not exceed the daytime or nighttime noise standards—50 dBA and 45 dBA, respectively—established by the Placer County Noise Ordinance (Table 10-8), nor would it substantially increase ambient noise at nearby existing noise-sensitive receptors. As a result, this impact would be less than significant.

IMPACT 10-3 Noise—Increases in Transportation-Related Noise Levels. Short-term construction of the proposed Park would not result in a noticeable (i.e., 3 dBA or greater) increase in traffic noise levels along area roadways. Noise increases associated with construction traffic would be temporary and would occur during the less noise-sensitive daytime hours. Long-term traffic associated with project operation would not exceed Placer County standards but would result in a noticeable (i.e., 3 dBA or greater) increase in traffic noise levels along area roadways. Short- and long-term traffic-generated noise levels would not exceed applicable Placer County noise standards; however, long-term traffic would increase ambient noise at nearby existing noise-sensitive receptors.

Significance Significant

Mitigation Mitigation Measure 10-1: Restrict General Public Traffic to 6 a.m. to 30 Minutes after Sunset

Proposed

Residual Less than Significant

Significance

Short-Term Construction-Related Traffic

As described in Chapter 8.0, "Transportation and Circulation," construction of the proposed Park facilities would require approximately four 15-person crews and 10–15 other workers/delivery drivers on-site at any given time and 400 truck haul trips (distributed over several years) over the course of project construction. Assuming the crews would commute in four vans, one per 15-person crew, it is expected that the maximum number of vehicle trips generated in any one day would be four vans and 10–15 other worker/delivery vehicles. In addition, for Phase 1 of construction, truck traffic is expected to be approximately 10–20% of the total number of truck trips (i.e., 40–80 truck trips). Typically, roadway traffic volumes have to double to generate a noticeable increase in traffic noise levels. For this reason, adding these daily trips to the existing average daily traffic volumes (approximately 285 average daily trips on weekdays on Garden Bar Road North, 885 on Garden Bar Road South, 375 on Mt. Pleasant Road west of Garden Bar Road, 377 on Mears Drive north of Mt. Pleasant Road, and 910 on Mt. Pleasant Road east of Garden Bar Road) would not result in a noticeable traffic noise increase along these roadways or an exceedance of Placer County transportation noise source standards (see Table 10-7).

Traffic Increases from Long-Term Use

In the long term, the Park could generate up to 460 one-way daily weekend vehicle trips on local roadways (dispersed over all affected roadways). The majority of trips associated with daily Park operations would occur during the less noise-sensitive daytime hours and on weekends and holidays during the summer months. However, some Park traffic could occur during noise-sensitive evening hours. Adding these daily trips to the existing average daily traffic volume of approximately 285 weekday and 260 weekend average daily trips on Garden Bar Road North would result in a substantial 3.7-dBA increase in noise on Garden Bar Road North (see Table 10-10). Although the overall noise level would not exceed Placer County standards for new interior or exterior transportation noise sources (see Table 10-7), or increase interior noise levels by more 3 dBA, it would increase exterior noise levels by a substantial amount (more than 3 dBA). All other affected roadways would not exceed Placer County standards (see Table 10-7) or increase substantially (more than 3 dBA).

Table 10-10 Comparison of Modeled Existing and Existing Plus Project Vehicular Traffic Noise Levels					
Doodynay Cognont and Location	Average Daily Traffic		CNEL (dBA) 50 Feet from Centerline of Near Travel Lane		
Roadway Segment and Location	Existing	Existing Plus Project	Existing	Existing Plus Project	Net Change
Weekday					
Garden Bar Road ¹ , north of Mt. Pleasant Road	285	476	47.9	50.1	2.2
Garden Bar Road, south of Mt. Pleasant Road	885	969	54.8	55.2	0.4
Mt. Pleasant Road, west of Garden Bar Road	375	457	53.4	54.2	0.9
Mt. Pleasant Road, east of Garden Bar Road	910	1,000	57.2	57.6	0.4
Mears Drive ¹ , north of Mt. Vernon Road	377	441	49.1	49.8	0.7
Weekend					
Garden Bar Road ¹ , north of Mt. Pleasant Road	260	605	47.5	51.2	3.7
Garden Bar Road, south of Mt. Pleasant Road	715	867	53.9	54.7	0.8
Mt. Pleasant Road, west of Garden Bar Road	310	458	52.5	54.2	1.7
Mt. Pleasant Road, east of Garden Bar Road	710	872	56.1	57.0	0.9
Mears Drive ¹ , north of Mt. Vernon Road	314	429	48.3	49.7	1.4

Table 10-10 Comparison of Modeled Existing and Existing Plus Project Vehicular Traffic Noise Levels

Notes: CNEL = community noise equivalent level; dBA = A-weighted decibels. Traffic noise levels were modeled using the Federal Highway Administration traffic noise model (FHWA 1988) based on traffic volumes obtained from the traffic report prepared for this project (Chapter 8.0, "Transportation and Circulation"). Calculated noise levels do not consider any shielding or reflection of noise by existing structures, vegetation, or terrain features, nor do they consider noise contribution from other sources. See modeling results in Appendix E further detail.

Assumes that 75% of project-generated traffic would access the project site via North Garden Bar Rd and that 25% of project-generated traffic would access the project site via Mears Drive.

Source: Modeling performed by EDAW in 2008.

Short- and long-term traffic-generated noise levels would not exceed applicable County noise standards, but long-term exterior traffic noise levels would increase at nearby existing noise-sensitive receptors by more than 3 dBA on Garden Bar Road North. As a result, this impact would be significant. Implementation of Mitigation Measure 10-1 would reduce this impact to a less-than-significant level.

IMPACT Noise—Exposure of Persons to or Generation of Excessive Groundborne Vibration or Noise Levels.

10-4

Ground vibration levels generated by on-site construction equipment would not exceed Caltrans's recommended standard of 0.2 in/sec PPV for the prevention of structural damage or FTA's maximum-acceptable vibration standard with respect to human annoyance for residential uses (80 VdB for residential structures). In addition, long-term use and maintenance of the project area would not include the operation of any sources of ground vibration. Thus, the proposed project would not result in the exposure of persons to or generate excessive groundborne vibration or groundborne noise levels.

Significance Less than Significant

Mitigation None Warranted Proposed

Residual Less than Significant

Significance

Construction activities have the potential to result in varying degrees of temporary groundborne vibration, depending on the specific construction equipment used and operations involved. Vibration generated by construction equipment spreads through the ground and diminishes in magnitude with increases in distance. Table 10-11 displays typical vibration levels for construction equipment.

Table 10-11 Typical Vibration Levels of Construction Equipment					
Equipment PPV at 25 feet (in/sec) ¹ Approximate L _v at 25 feet ²					
Large Bulldozer	0.089	87			
Caisson Drilling	0.089	87			
Trucks	0.076	86			
Jackhammer	0.035	79			
Small Bulldozer	0.003	58			

Notes: in/sec = inches per second; L_v = velocity level in decibels referenced to 1 microinch per second and based on the root mean square velocity amplitude; PPV = peak particle velocity

Source: Federal Transit Administration 2006

As discussed above, on-site construction equipment would include a Sweco trail dozer, trucks, excavators, and graders. As shown in Table 10-11, construction haul trucks generate ground vibration levels up to 0.076 in/sec PPV and 86 VdB (referenced to 1 µin/sec and based on the RMS velocity amplitude) at a distance of 25 feet. Using FTA's recommended procedure for applying a propagation adjustment, truck-generated vibration levels would attenuate to approximately 0.0005 in/sec PPV and 41.8 VdB at the closest existing noise-sensitive receptor located 800 feet south of the project area. These vibration levels would not exceed Caltrans's recommended standard of 0.2 in/sec PPV (Caltrans 2002) with respect to the prevention of structural damage for normal buildings or FTA's maximum-acceptable vibration standard of 80 VdB (FTA 2006) with respect to human annoyance. In addition, the long-term operation of the proposed project (i.e., use and maintenance of the proposed Park) would not include any vibration sources. Thus, short-term construction and long-term operation would not result in the exposure of persons to or generate excessive groundborne vibration or groundborne noise levels. As a result, this impact would be less than significant.

10.4 Mitigation Measures

Mitigation Measure 10-1: Restrict General Public Traffic to 6 a.m. to 30 Minutes after Sunset.

Mitigation Measure 10-1 applies to Impact 10-3.

The County shall restrict all long-term general public traffic to 6 a.m. to 30 minutes after sunset by ensuring that the Park gates are closed and locked at these times. With implementation of Mitigation Measure 10-1 traffic noise level increases on Garden Bar Road North would be reduced below a substantial amount (3 dBA or more), as shown in Table 10-12. This would reduce Impact 10-3 to a less-than-significant level.

Table 10-12 Comparison of Modeled Existing and Existing Plus Project Plus Mitigation Measure 10-1 Vehicular Traffic Noise Levels						
	Average Daily Traffic		CNEL (dBA) 50 Feet from Centerline of Near Travel Lane			
Roadway Segment and Location	Existing	Existing plus Project	Existing	Existing plus Project plus Mitigation Measure 10-1	Net Change	
Weekday						
Garden Bar Road ¹ , north of Mt. Pleasant Road	285	476	47.9	49.2	1.3	
Garden Bar Road, south of Mt. Pleasant Road	885	969	54.8	55.2	0.2	
Mt. Pleasant Road, west of Garden Bar Road	375	457	53.4	54.3	0.5	
Mt. Pleasant Road, east of Garden Bar Road	910	1,000	57.2	57.7	0.2	
Mears Drive ¹ , north of Mt. Vernon Road	377	441	49.1	49.8	0.4	
Weekend						
Garden Bar Road ¹ , north of Mt. Pleasant Road	260	605	47.5	50.4	2.3	
Garden Bar Road, south of Mt. Pleasant Road	715	867	53.9	54.8	0.5	
Mt. Pleasant Road, west of Garden Bar Road	310	458	52.5	54.3	1.0	
Mt. Pleasant Road, east of Garden Bar Road	710	872	56.1	57.1	0.5	
Mears Drive ¹ , north of Mt. Vernon Road	314	429	48.3	49.7	0.8	

Notes:

CNEL = community noise equivalent level; dBA = A-weighted decibels. Traffic noise levels were modeled using the Federal Highway Administration traffic noise model (FHWA 1988) based on traffic volumes obtained from the traffic report prepared for this project (Chapter 8.0, "Transportation and Circulation"). Calculated noise levels do not consider any shielding or reflection of noise by existing structures, vegetation, or terrain features, nor do they consider noise contribution from other sources. See modeling results in Appendix E further detail.

1 Assumes that 75% of project-generated traffic would access the project site via North Garden Bar Rd and that 25% of project-generated traffic would access the project site via Mears Drive.

Source: Modeling performed by EDAW in 2008.