10.0 NOISE

This chapter summarizes the 2010 Hidden Falls Regional Park (HFRP) Certified Environmental Impact Report (EIR) findings related to noise; describes the HFRP (park) and proposed trail network expansion project area (project area) environmental setting and pertinent regulations; evaluates the potential for project-related impacts to on-site and adjoining land uses and existing plans and policies; and provides mitigation measures as necessary to reduce those impacts.

10.1 SUMMARY OF COUNTY FINDINGS ON THE 2010 CERTIFIED EIR

10.1.1 FINDINGS OF FACT

As discussed in Section 1.2, this SEIR will consider the impacts of the HFRP Trails Expansion and compare it against the analysis contained in the 2010 HFRP certified EIR. The purpose is to ascertain whether the Trail Expansion project would substantially increase the severity of impacts previously identified in the 2010 HFRP Certified EIR, result in a new impact not previously identified, or require application of mitigation measures which were previously found infeasible, and not adopted for the prior project are currently feasible and should be incorporated into project approvals.

The topic of Noise was considered by Placer County in the 2010 HFRP Certified EIR. The following is a summary of the EIR findings made by the Board that pertain to noise.

- The 2010 HFRP Certified EIR determined that the project would result in less than significant impacts associated with short-term project construction noise and vibration for park upgrades to trails, facilities and road improvements along Garden Bar Road.

- Non-transportation noise analyzed in the 2010 HFRP Certified EIR was determined to result in less than significant impacts associated with operation and maintenance activities, recreational day use, reservation-based events, overnight camping and limited hunting.

- Long-term transportation related impacts, however, resulted in significant nighttime impacts along Garden Bar Road North unless mitigation was applied. Mitigation measure 10-1 “Restrict General Public Traffic to 6 a.m. to 30 Minutes after Sunset,” discussed below, restricted park access to only daylight hours in order to mitigate potential nighttime impacts at nearby sensitive receptors.

10.1.2 2010 HFRP MITIGATION MEASURES ADOPTED BY THE COUNTY

- **Mitigation Measure 10-1:** Restrict General Public Traffic to 6 a.m. to 30 Minutes after Sunset *(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 outside of 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 10-1. This would reduce Impact 10-3 to a less-than-significant level.

Table 10-1. 2010 - Comparison of Modeled Existing and Existing Plus Project Plus Mitigation Measure 10-1 Vehicular Traffic Noise Levels

Roadway Segment and Location	Average Daily Traffic		CNEL (dBA) 50 Feet from Centerline of Near Travel Lane		
	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 1978) 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.

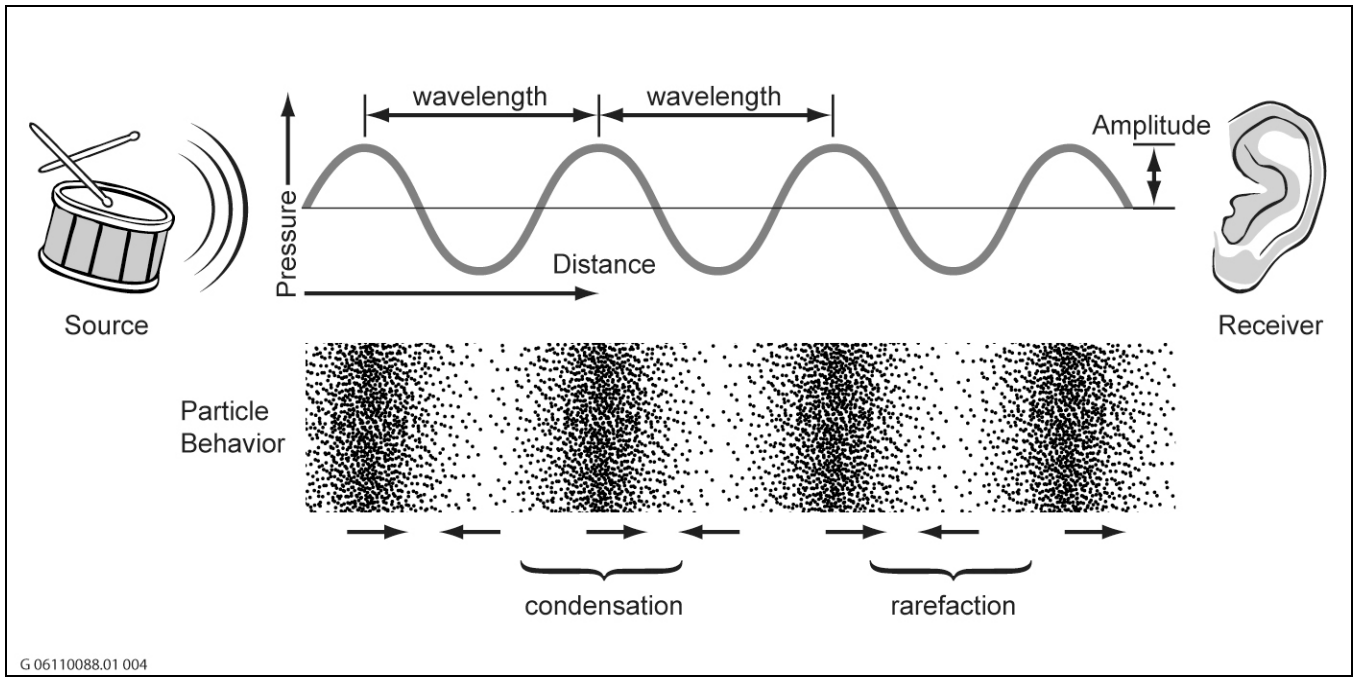
10.2 2019 HFRP TRAILS EXPANSION PROJECT – ENVIRONMENTAL SETTING

10.2.1 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 AECOM in 2019

Exhibit 10-1. Sound Wave Properties

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

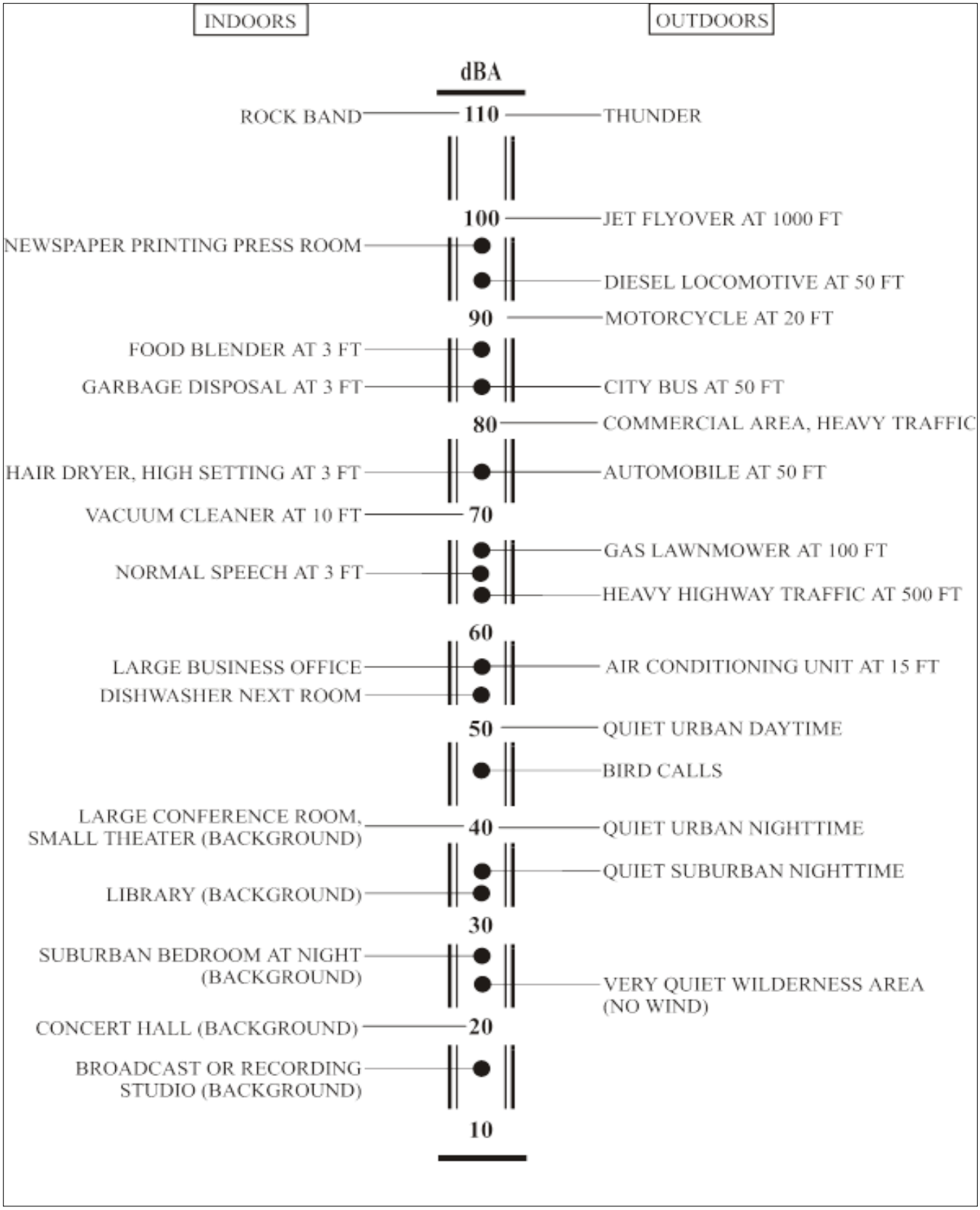
Because of the ability of the human ear to detect a wide range of sound-pressure fluctuations, sound-pressure levels are expressed in logarithmic units called decibels (dB) to avoid a very large and awkward range in numbers. The sound-pressure level in decibels is calculated by taking the log of the 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 2013a). 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, under controlled conditions in a laboratory setting a human is able to discern 1 dB changes in sound levels when exposed to steady, single-frequency ("pure-tone") signals in the mid-frequency range (1,000 Hz-8,000 Hz). In typical noisy environments, changes in noise level of 1-2 dB are generally not perceptible. However, people are able to begin to detect sound level changes of 3 dB in typical environments. A 5-dB change is readily noticeable, and a 10-dB change is generally perceived as a doubling or halving of loudness (Caltrans 2013a).

Noise Level Increase, dB	Human Perception (typical)
0	Reference (no change)
1 to 2	not perceptible
+ 3	barely perceptible increase
+ 5	readily perceptible increase
+ 10	Two times as loud
+ 20	Four times as loud
+ 30	Eight times as loud
+ 40	16 times as loud

Source: Caltrans 2013a



Source: Caltrans, 2013a

Exhibit 10-2. Typical Noise Levels

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 2013a).

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 (Caltrans 2013a).

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 2013a):

- 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."

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

- 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 2013a).

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 2018).

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 2018). This velocity decibel scale is based on a reference value of 1 microinch per second (µin/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 2018).

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 2018).

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 referenced to 1 µinch/sec and based on the root mean square vibration velocity.
Source: FTA 2018

10.2.2 2019 HFRP TRAILS EXPANSION PROJECT – 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, schools, convalescent facilities, hotels, churches, libraries, and other uses where low interior noise levels are essential.

Noise-sensitive land uses located near the proposed trail expansion areas in the northeast include rural homes to the south and north of Curtola Ranch Road and the proposed parking area in the Harvego Bear River Preserve, rural homes adjacent to the Twilight Ride property, rural homes to the south and east of Mears Place parking area and rural homes in the vicinity of the Garden Bar parking area. The closest of these residences is approximately 40 feet north of the proposed access road to the parking lot proposed for the Twilight Ride parcel. The proposed trail expansion parking area located off of Garden Bar Road is completely shielded by existing terrain with no direct line of site to existing noise sensitive receptors.

The existing HFRP as well as the proposed expansion areas are located in an unincorporated area of Placer County. The areas have been used for cattle grazing in the recent past, and portions of the proposed expansion areas continue to be used for this purpose. Adjacent land uses include rural residential homes and agricultural activities, mostly cattle grazing and raising other livestock contribute to the ambient conditions. The local noise environment includes rural sounds associated with agricultural activities, birds, aircraft flyovers, plants rustling, and minor vehicle traffic. Natural sounds from meteorological effects (e.g., wind rustling plants, running water) and wildlife as well as road noise from passing vehicles are the predominant ambient noise source.

2019 NOISE SURVEY

To quantify the existing noise environment in the project vicinity, one long-term 24 hour and two short-term noise measurements were conducted on Wednesday, May 22, 2019, using a Larson-Davis Model 824 and 820 sound meters. The sound meters were 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 expansion project vicinity range from 40.0 dBA L_{eq} to 51.5 dBA L_{eq}, with L_{max} ranges from 53.5 dBA to 74.4 dBA. Noise sources noted during the measurements included buzzing insects, singing birds, wind, and distant traffic noise attributable to local roadways, specificially, Bell Road and Garden Bar Road. 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 2019 EIR - Ambient Noise Levels

Measurement Number[1]	Location	Monitoring Period	Sound Level (dBA)[2]		
			L_{dn}[3]	L_{eq}[4]	L_{max}[5]
LT-01	By Residence at 6525 Curtola Ranch Rd	24 hours	50.2	48.5	73.1
ST-01	Front Yard, 5345 Bell Road, just south of 5355 Bell Road	15 minutes	--	40.0	53.5
ST-02	Garden Bar Road, West of Coon Creek	15 minutes	--	51.5	74.3

[1] Measurement locations are shown in Exhibit 10-3.

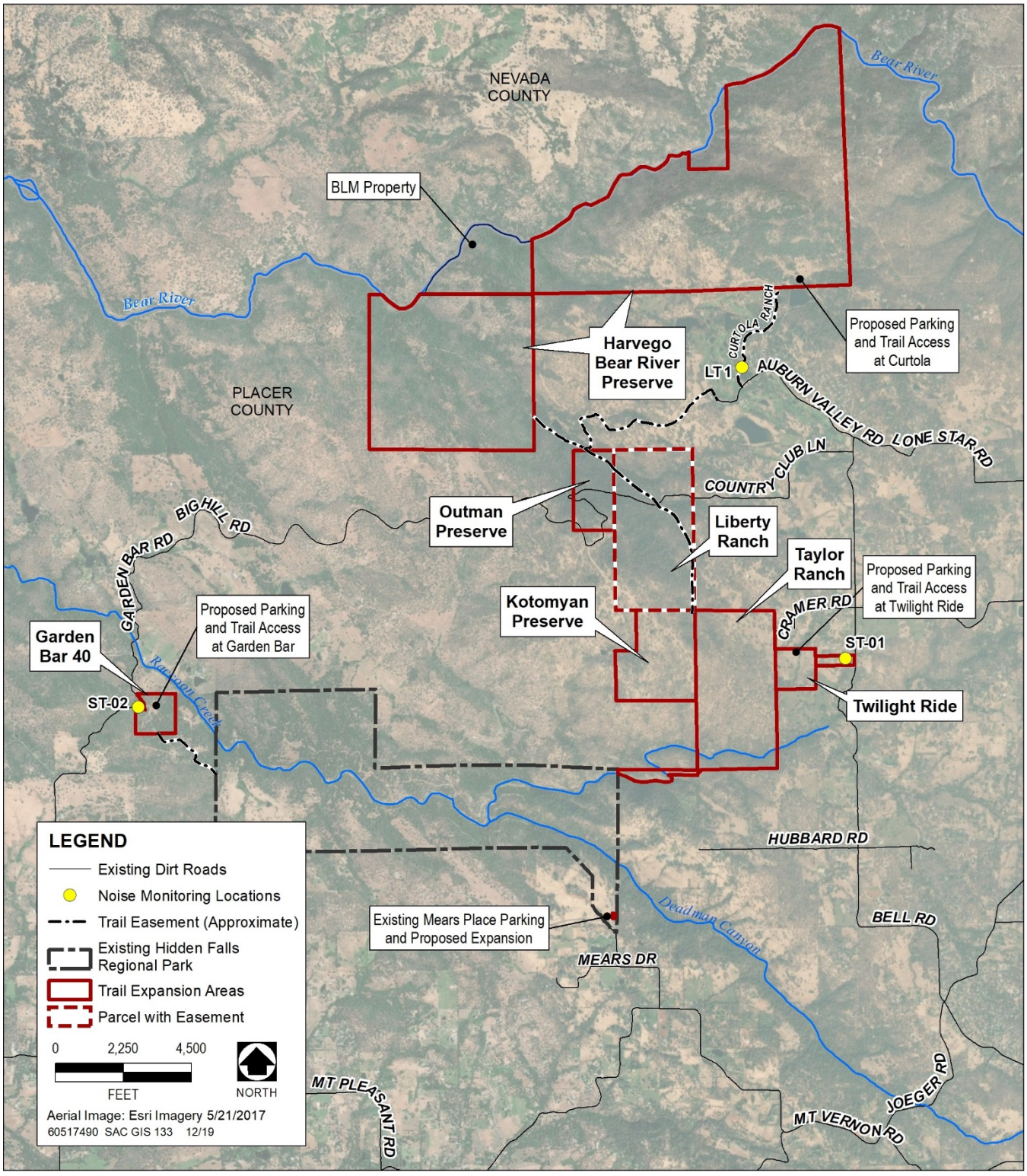
[2] dBA (A-weighted decibels): The weighted sound level measurement scale specifically adjusted to human hearing.

[3] 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.

[4] L_{eq} (equivalent noise level): The energy mean (average) noise level.

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

Source: Measurements collected by AECOM on Wednesday, May 22, 2019



Source: AECOM 2018

Exhibit 10-3. Ambient Noise Measurement Locations

TRAFFIC NOISE LEVELS

Traffic noise levels in the 2010 Certified EIR 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 that project (Chapter 8.0, "Transportation and Circulation"). Table 10-4 below presents a summary of the modeled vehicular traffic noise levels serving the existing HFRP in 2007. 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.

Table 10-4. Summary of Modeled Vehicular Traffic Noise Levels Serving the Existing HFRP

Roadway Segment and Location	Distance (feet) from Roadway Centerline to CNEL				CNEL (dBA) 50 Feet from Centerline of Near Travel Lane
	70 dBA CNEL	65 dBA CNEL	60 dBA CNEL	55 dBA CNEL	
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

Since traffic volumes along studied roadway segments have not changed substantially from those modeled above, predicted noise levels in 2019 remain similar to those depicted in Table 10-4. Ambient conditions along studied roadway segments serving the new trailhead entrys at the HFRP Trail Expansion are provided in Table 10-5.

Table 10-5. Summary of Modeled Vehicular Traffic Noise Levels Serving the Proposed HFRP Trail Expansion Areas

Roadway Segment and Location	Distance (feet) from Roadway Centerline to CNEL				CNEL (dBA) 50 Feet from Centerline of Near Travel Lane
	70 dBA CNEL	65 dBA CNEL	60 dBA CNEL	55 dBA CNEL	
Weekday					
Bell Road from Lone Star Road to Cramer Road	5	10	21	45	54.4
Bell Road from Joeger Road to Cramer Road	8	17	36	79	57.9
Cramer Road from Bell Road to SR 49	3	7	16	34	52.5
Lone Star Road from Bell Road to SR 49	6	13	28	61	56.3
Auburn Valley Road from Fairway Court to Curtola Ranch Road	2	4	8	18	48.2
Weekend					
Bell Road from Lone Star Road to Cramer Road	4	9	19	42	53.8
Bell Road from Joeger Road to Cramer Road	8	16	35	76	57.7
Cramer Road from Bell Road to SR 49	3	7	16	34	52.4
Lone Star Road from Bell Road to SR 49	6	12	27	57	55.9
Auburn Valley Road from Fairway Court to Curtola Ranch Road	2	5	10	22	49.6

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 AECOM in 2019

10.3 REGULATORY SETTING UPDATE

10.3.1 FEDERAL PLANS, POLICIES, REGULATIONS, AND LAWS

No federal plans, policies, regulations, or laws related to noise are applicable to either the original or trails expansion projects. 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 2018):

- 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. FTA recommends a maximum limit of 0.12 in/sec PPV buildings extremely susceptible to vibration, 0.2 in/sec PPV for non-engineered timber and masonry buildings, 0.3 in/sec PPV for engineered concrete and masonry (no plaster), and 0.5 in/sec PPV for reinforced-concrete, steel or timber (no plaster) (FTA 2018).

10.3.2 STATE PLANS, POLICIES, REGULATIONS, AND LAWS

The following State Plans, Policies, Regulations, and laws are applicable to the 2010 HFRP and the 2019 EIR proposed trail expansion project. The *State of California General Plan Guidelines*, published by the Governor's Office of Planning and Research (OPR 2017), provides guidance for the acceptability of projects within specific CNEL/L_{dn} contours. Table 10-6 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} and normally unacceptable in areas exceeding 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 10-6. State Noise Compatibility Guidelines, by Land Use Category

Land Use Category	Community Noise Exposure (CNEL/L_{dn}, dBA)			
	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.)

[1] Specified and 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.

Source: Governor's Office of Planning and Research 2017

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 2013b) 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.

10.3.3 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 2013) for noise.

- **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 [Table 10-7 in this document] 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.

- **Policy 9.A.5.** Where proposed non-residential land uses are likely to produce noise levels exceeding the performance standards of Table 9-1 [Table 10-7 in this document] 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 of the Placer County General Plan.

- **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 [Table 10-8 in this document].

- **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 10-8 in this document] or the performance standards in Table 9-3 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 10-7 and 10-8 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.

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.

Table 10-7. Allowable L_{dn} Noise Levels Within Specified Zone Districts[1] Applicable to New Projects Affected by or Including Nontransportation Noise Sources – From the Placer County General Plan, 2013, Table 9-1

Zone District of Receptor	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	(see footnote 6)	---
Agriculture Exclusive	(see footnote 6)	---
Forestry	---	---
Timberland Preserve	---	---
Recreation & Forestry	70	---
Open Space	---	---
Mineral Reserve	---	---

Notes:

- Except where noted otherwise, noise exposures will be those which occur at the property line of thereceiving use.
- Where existing transportation noise levels exceed the standards of this table, the allowable Ldn 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 art[5] 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 be 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 is a concern, an L_{dn} of 70 dBA will be considered acceptable outdoor exposure at a residence.

Source: Placer County 2013

Table 10-8. Maximum Allowable Noise Exposure Transportation Noise Sources (From the Placer County General Plan, 2013, Table 9-3)

Land Use	Outdoor Activity Areas[1]	Interior Spaces (dBA)	
	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)

[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.

Source: Placer County 2013

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.

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 10-9 below, whichever is greater.

Table 10-9. 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 Exhibit 10-2 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.

10.4 IMPACTS

10.4.1 ANALYSIS METHODOLOGY

This analysis considers how the proposed Trails Expansion project will increase the number of park users and how this would or would not change the conclusions of the prior environmental review. The analysis considers the application of all adopted mitigation measures from the prior environmental review when making the impact determinations presented below in Section 10.4.3, "Impact Analysis."

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 analyses prepared for the project (Kd Anderson & Associates 2008 and 2019). 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.

10.4.2 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 10-7 and Table 10-8), 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]);

- result in short-term (construction) or long-term (operational) noise levels from traffic exceeding the applicable County noise standards for transportation noise sources (Table 10-8), 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 10-7 and/or Table 10-9), 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).

10.4.3 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 70 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 (Consistent with prior analysis in the 2010 HFRP Certified EIR)*
Mitigation Proposed	*None Warranted*
Residual Significance	*Less than significant*

2010 HFRP Certified EIR Impact Summary

The 2010 HFRP Certified EIR considered noise levels from construction activities such as site preparation (e.g., clearing, excavation, and grading), staging, trenching, paving, building construction, equipment installation, finishing, cleanup, and other miscellaneous activities. No pile driving or rock blasting would occur as part of project construction and this method of construction was not evaluated.

Noise levels from individual construction equipment was estimated to range from 78 dBA to 91 dBA at 50 feet. The 2010 HFRP Certified EIR determined that the simultaneous operation of on-site construction equipment associated with the HFRP project could result in combined intermittent noise levels up to approximately 84 dBA L_{eq} at 50 feet from the construction activity (Table 10-10).

Table 10-10. Typical Construction-Equipment Noise Levels

Type of Equipment	Noise Level (dBA) at 50 feet	
	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

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

Sources: EPA 1971, FTA 2018, FHWA 2006

However, the 2010 HFRP Certified EIR found these impacts less than significant because 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 was found to be **less than significant**.

Construction of Road and Access Improvements

Noise levels from individual construction equipment range from 78 dBA to 91 dBA at 50 feet. The 2010 HFRP Certified EIR determined that the simultaneous operation of equipment used to construct roadway improvements could result in intermittent noise levels up to approximately 86 dBA L_{eq} at 50 feet from the construction activity. Thus, if construction activities were to occur within 50 feet of a sensitive receptor 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 10-9) and substantially increase ambient noise levels at existing nearby sensitive receptors. However, construction activity would occur during periods when such activity would be exempt from the provisions of the Placer County Noise Ordinance. Therefore, the 2010 HFRP Certified EIR found this impact would be less than significant.

2019 HFRP Trails Expansion Project Impact Analysis

Construction of Parking and Trailhead Amenities

Construction activities such as site preparation (e.g., clearing, excavation, and grading), staging, trenching, paving, building construction, equipment installation, finishing, cleanup, and other miscellaneous activities would generate temporary noise that is audible to nearby uses.

Trails will be constructed using a small dozer and completed by hand. Other equipment used for trail construction could 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, bridges, parking areas, restrooms, and other facilities.

Based on the equipment noise levels summarized above in Table 10-10 and a typical noise-attenuation rate of 6 dBA/DD, exterior noise levels at the closest existing noise-sensitive receptor (single family residence located approximately 40 feet north of the project boundary at Twilight Ride) could exceed 82 dBA L_{eq} 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 10-9) and substantially increase ambient noise at existing nearby sensitive receptors.

Construction of Road and Access Improvements

Construction activities along Bell Road and Curtola Road would include adding a left turn pocket on Bell Road and road widening along Curtola Road (see Chapter 8.0, “Transportation and Circulation,” for a complete description of proposed road improvements). Although road widening of Garden Bar Road was already approved with the 2010 Certified EIR, construction of the Garden Bar entrance and parking area has not yet been initiated.

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

According to EPA, and as indicated in Table 10-10, noise levels from individual construction equipment range from 78 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 86 dBA L_{eq} 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 40 feet from roadway improvement areas) could exceed 82 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 and would occur during periods when people are less sensitive to noise. Therefore, this impact would be **less than significant**.

IMPACT 10-2	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 at the closest existing noise-sensitive receptor (approximately 40 feet) 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 (Consistent with prior analysis in the 2010 HFRP Certified EIR)*
Mitigation Proposed	*None Warranted*
Residual Significance	*Less than significant*

2010 HFRP Certified EIR Impact Summary

Use of the existing park and proposed trail expansion areas (including parking areas) 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 mowing and vegetation clearing (mowers, edgers, trimmers). According to EPA, such activities could result in noise levels reaching approximately 83 dBA at 3 feet from the source (from 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 (315 feet) would not exceed 43 dBA. Noise sources associated with property maintenance (e.g., 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., parking lot activity, people talking, children playing, and visitors riding bicycles or horses) would occur with implementation of the proposed project. However, since the existing HFRP hours of operation were (and continue to be) limited to being open from dawn to dusk, activities would not occur during the more noise-sensitive hours. For the reasons stated above, noise associated with Park maintenance or recreational use would not exceed the daytime or nighttime noise standards—55 dBA and 45 dBA, respectively—established by the Placer County Noise Ordinance (Table 10-7), nor would it substantially increase ambient noise at nearby existing noise-sensitive receptors. As a result, this impact was found to be **less than significant**.

2019 HFRP Trails Expansion Project Impact Analysis

Vegetation clearing and similar maintenance activity would occur periodically along the trail alignment, on the entrance and access roads and at the parking areas. 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).

In addition, increased recreation use and associated noise (e.g., parking lot activity, people talking, children playing, and visitors riding bicycles or horses) would occur with implementation of the proposed project. Maintenance and public use of the trail expansion areas would occur during daylight hours, when people are less sensitive to noise. Noise levels associated with operation of the HFRP Trails Expansion project would not exceed the daytime or nighttime noise standards—55 dBA and 45 dBA, respectively—established by the Placer County Noise Ordinance (Table 10-9), nor would it substantially increase ambient noise at nearby existing noise-sensitive receptors. As a result, this impact would be **less than significant**.

Proposed parking areas would be located near existing noise-sensitive rural residential uses. Based on the noise measurements described earlier in this section, the sound event Sound Exposure Level (SEL)[1] associated with a someone parking typically results in a noise level of 71 dBA SEL at 50 feet. When quantifying the associated noise level for parking stalls near rural residential uses, a conservative approach was taken to determine the number of parking events that may occur within a peak hour, the maximum number of spaces and distance to receptor. KD Anderson's traffic analysis indicates that the Harvego Bear River Preserve, Phase 4 generates 115 peak hour trips. Based on this trip generation rate, assuming that each parking space would be filled and emptied two (2) times during the peak hour, the total sound power level from this noise source would be 59.0 dBA at 50 feet. The hourly Leq for daily operations would be 42 dBA L_{eq} at 350 feet from the center of the parking space cluster to the nearest noise-sensitive use (Harvego Bear River Preserve, Phase 4). Parking lot noise for Mears Place, Twilight Ride, and Garden Bar would result in noise levels below 40 L_{eq} dBA at the nearest receptor to each respective parking area. As a result, parking events would not cause a long-term substantial noise increase to occur.

[1] A single event is an individual distinct loud activity, such as a train passage, or any other brief and discrete noise-generating activity such as parking lot noise, which is defined as noise generated by conversation, doors slamming, vehicle passage, and engines starting and stopping. SEL represents the entire sound energy of a given single-event normalized into a one-second period regardless of event duration. As a result, the single-number SEL metric contains information pertaining to both event duration and intensity. Because SEL describes a receiver's total noise exposure from a single impulsive event, SEL is often used to characterize noise from individual brief loud events.

IMPACT 10-3	Noise—Increases in Transportation-Related Noise Levels. *Short-term construction of the proposed project 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 Prior to Mitigation (No new significant impact from those of the 2010 HFRP Certified EIR)*
Mitigation Proposed	*Mitigation Measure 10-1: Restrict General Public Traffic to 6 a.m. to 30 Minutes after Sunset.* *Mitigation Measure S10-2: Mitigation Measure S10-2: Use of pavement or similar hard material is required when laying the final surface on access roads and limit vehicle speeds to 25 mph*
Residual Significance	*Less than significant*

2010 HFRP Certified EIR Impact Summary

Short-Term Construction-Related Traffic

Construction of the HFRP introduced vehicle trips onto the local network. The 2010 HFRP certified EIR assumed that Phase 1 of construction was 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. The 2010 HFRP certified EIR found that adding these daily trips to the existing average daily traffic volumes 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, it was estimated that the HFRP 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 HFRP 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 10-11). 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 10-11. 2010 EIR - Comparison of Modeled Existing and Existing Plus Project Vehicular Traffic Noise Levels

Roadway Segment and Location	Average Daily Traffic		CNEL (dBA) 50 Feet from Centerline of Near Travel Lane		
	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

Notes: CNEL = community noise equivalent level; dBA = A-weighted decibels. Traffic noise levels were modeled using the Federal Highway Administration traffic noise model (FHWA 1978) 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.

2019 HFRP Trails Expansion Project

Short-Term Construction-Related Traffic

As described in Chapter 8.0, "Transportation and Circulation," construction of the proposed trails expansion 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. 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 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).

Long-Term Operational Impacts

In the long term, the trails expansion project could generate up to 852 one-way (1,705 both directions) daily weekend vehicle trips on local roadways (dispersed over all affected roadways). The majority of trips associated with daily operations would occur during the less noise-sensitive daytime hours and on weekends and holidays during the summer months. However, some traffic could occur during noise-sensitive evening hours. Typically, roadway traffic volumes have to double to generate a noticeable increase in traffic noise levels. As shown on

Table 12 of the traffic study (Appendix D), project operation would not result in a doubling of traffic volumes along any studied roadway segment, with the exception of Garden Bar Road, from Mt. Pleasant Road to the Park's entry, and Auburn Valley Road from Fairway to Curtola Ranch Road. These sections of roadway are paved, and would only experience a traffic noise level increase during the less sensitive daytime hours. Even though the increase in ambient noise levels would be 3 dBA or more, the resulting traffic noise level would not exceed 55 dBA at 50 feet and would comply with the County's exterior transportation noise standard. For these reasons and the lack of feasible mitigation, no further mitigation is required.

However, vehicle noise would be greatest where project traffic congregates around the entries. The proposed access road to the Twilight Ride parking area would place a new transportation noise source adjacent to residential uses. Future traffic volumes along this proposed access road could be as high as 599 vehicle trips per day as shown in Table 9 of the traffic study (Appendix D). Under a worst-case scenario, on a Saturday peak hour time, this would mean that approximately 63 vehicles trips could be made on the proposed Twilight Ride access road in one hour. At 25 mph, the resulting exterior noise level would be 47 dBA L_{eq} at 40 feet from the adjacent residential property line.

Use of Curtola Ranch Road for accessing the park entry would also increase traffic volumes near residential uses. At full build-out of the Harvego Bear River Preserve parking area, future traffic volumes along this proposed access road could be as high as 573 vehicle trips per day. Under a worst-case scenario, on a Saturday peak hour time, this would mean that approximately 60 vehicles trips could be made on Curtola Ranch Road in one hour. At 25 mph, the resulting exterior noise level would be 47 dBA L_{eq} at 50 feet from the adjacent residential property line.

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 proposed park entry access roads. As a result, this impact would be significant. Implementation of Mitigation Measure 10-1 and S10-2 would reduce this impact to a **less-than-significant** level.

IMPACT 10-4	Noise—Exposure of Persons to or Generation of Excessive Groundborne Vibration or Noise Levels. *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 (Consistent with prior analysis in the 2010 HFRP Certified EIR)*
Mitigation Proposed	*None Warranted*
Residual Significance	*Less than significant*

2010 HFRP Certified EIR Impact Summary

The 2010 HFRP certified EIR found that construction equipment would generate 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. The vibration analysis considered equipment such as a Sweco trail dozer, trucks, excavators, cranes, bobcats, pavers 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. These vibration levels would not exceed Caltrans's recommended standard of 0.2 in/sec PPV (Caltrans 2013b) with respect to the prevention of structural damage for normal buildings. The 2010 HFRP certified EIR found that construction of park improvements would not result excessive groundborne vibration or groundborne noise levels. As a result, this impact was found to be less than significant.

2019 HFRP Trails Expansion Project Impact Analysis

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 10-12 displays typical vibration levels for construction equipment.

Table 10-12. 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 2018

As discussed above, on-site construction equipment could include equipment such as a Sweco trail dozer, trucks, excavators, cranes, bobcats, pavers and graders. As shown in Table 10-12, 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 0.02 in/sec PPV and 74 VdB at the closest existing noise-sensitive receptor located 60 feet of the nearest project area. These vibration levels would not exceed Caltrans's recommended standard of 0.2 in/sec PPV (Caltrans 2013b) with respect to the prevention of structural damage for normal buildings or FTA's maximum-acceptable vibration standard of 80 VdB (FTA 2018) 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**.

10.5 MITIGATION MEASURES

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

The County shall restrict all long-term general public traffic to 6 a.m. to 30 minutes after sunset by ensuring that the expansion area parking gates are closed and locked outside of 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 10-1. This, in combination with Mitigation Measure S10-2, would reduce Impact 10-3 to a less-than-significant level.

Mitigation Measure S10-2: Use of pavement or similar hard material is required when laying the final surface on access roads and limit vehicle speeds to 25 mph.

The County shall use paving or similar hard surfacing material when constructing new access roads to reduce tire noise generated from interaction with gravel. Vehicle speeds on the newly constructed access roads shall be limited to 25 mph.With implementation of Mitigation Measure S10-2 traffic noise level increases would be reduced below a substantial amount (3 dBA or more), as shown in Table 10-1. This, in combination with Mitigation Measure 10-1, would reduce Impact 10-3 to a less-than-significant level.