4.6 NOISE

4.6.1 INTRODUCTION

This section presents existing noise conditions in the project area, including the project site, and analyzes the potential noise impacts, both temporary (i.e., construction) and long term (i.e., operational), from the implementation of the proposed El Dorado Hills Apartments project ("proposed project").

4.6.2 ENVIRONMENTAL SETTING

Fundamentals of Sound and Environmental Noise

Sound is technically described in terms of amplitude (loudness) and frequency (pitch). The standard unit of sound amplitude measurement is the decibel (dB). The decibel scale is a logarithmic scale that describes the physical intensity of the pressure vibrations that make up any sound. The pitch of the sound is related to the frequency of the pressure vibration. Since the human ear is not equally sensitive to a given sound level at all frequencies, a special frequency-dependent rating scale has been devised to relate noise to human sensitivity. The A-weighted decibel scale (dBA) provides this compensation by discriminating against frequencies in a manner approximating the sensitivity of the human ear.

Noise, on the other hand, is typically defined as unwanted sound. A typical noise environment consists of a base of steady ambient noise that is the sum of many distant and indistinguishable noise sources. Superimposed on this background noise is the sound from individual local sources. These can vary from an occasional aircraft or train passing by to virtually continuous noise from, for example, traffic on a major highway. **Table 4.6-1, Representative Environmental Noise Levels**, below, illustrates representative noise levels for the environment.

Table 4.6-1
Representative Environmental Noise Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
Threshold of Pain	—140—	Threshold of Pain
Jet Take-off at 300 feet	—125—	
	—110—	Rock Band
Jet Fly-over at 100 feet		
	—100—	
Jackhammer at 45 feet		
Gas Lawnmower at 3 feet		
	—90—	
		Food Blender at 3 feet
Diesel Truck going 50 mph at 50 feet	—80—	Garbage Disposal at 3 feet
Noisy Urban Area during Daytime		
Gas Lawnmower at 100 feet	—70—	Vacuum Cleaner at 10 feet
Commercial Area		Normal Speech at 3 feet
Heavy Traffic at 300 feet	—60—	
		Large Business Office
Quiet Urban Area during Daytime	—50—	Dishwasher in Next Room
Quiet Urban Area during Nighttime	—40—	Theater, Large Conference Room (background)
Quiet Suburban Area during Nighttime		
	—30—	Library
Quiet Rural Area during Nighttime		Bedroom at Night, Concert Hall (background)
	—20—	
		Broadcast/Recording Studio
	—10—	
Lowest Threshold of Human Hearing	—0—	Lowest Threshold of Human Hearing

Source: United States Occupational Safety & Health Administration, Noise and Hearing Conservation Technical Manual, 1999, California Department of Transportation, 1998.

Several rating scales have been developed to analyze the adverse effect of community noise on people. Since environmental noise fluctuates over time, these scales consider that the effect of noise upon people is largely dependent upon the total acoustical energy content of the noise, as well as the time of day when the noise occurs. Those that are applicable to this analysis are as follows:

- Equivalent Noise Level: L_{eq} represents the average noise level on an energy basis for a specific time period. For example, the L_{eq} for one hour is the energy average noise level during that hour. The

average noise level is based on the energy content (acoustic energy) of sound. L_{eq} can be thought of as a continuous noise level of a certain period equivalent in energy content to a fluctuating noise level of that same period. L_{eq} is expressed in units of dBA.

- L_{max} – The maximum instantaneous noise level experienced during a given period of time.
- L_{min} – The minimum instantaneous noise level experienced during a given period of time.
- Community Noise Equivalent Level: CNEL is an adjusted noise measurement scale of average sound level during a 24-hour period. Due to increased noise sensitivities during evening and night hours, human reaction to sound between 7:00 P.M. and 10:00 P.M. is as if it were actually 5 dBA higher than had it occurred between 7:00 A.M. and 7:00 P.M. From 10:00 P.M. to 7:00 A.M., humans perceive sound as if it were 10 dBA higher. To account for these sensitivities, CNEL is obtained by adding an additional 5 dBA to evening noise levels between 7:00 P.M. and 10:00 P.M. and 10 dBA to nighttime noise levels between 10:00 P.M. and 7:00 A.M. Because of this, 24-hour CNEL figures are always higher than their corresponding actual 24-hour averages.

Effects of Noise

The degree to which noise can impact an environment ranges from levels that interfere with speech and sleep to levels that can cause adverse health effects. However, human response to noise is subjective and can vary from person to person. Factors that influence individual responses include the intensity, frequency, and pattern of noise; the amount of background noise present before any additional noise; and the nature of work or human activity exposed to the source noise.

Noise environments and consequences of human activities are usually well represented by median noise levels during the day, night, or over a 24-hour period. Environmental noise levels are generally considered low when the CNEL is below 45 dBA, moderate in the 45–60 dBA range, and high above 60 dBA. According to the National Institute of Health (NIH), extended or repeated exposure to sounds at or above 85 decibels can cause hearing loss (NIDCD 2017). Examples of low daytime levels are isolated natural settings with noise levels as low as 20 dBA and quiet suburban residential streets with noise levels around 40 dBA. Noise levels above 45 dBA at night can disrupt sleep. Examples of moderate level noise environments are urban residential or semi-commercial areas (typically 55–60 dBA) and commercial locations (typically 60 dBA). People may consider louder environments adverse, but most will accept the higher levels associated with more noisy urban residential or residential-commercial areas (60–75 dBA) or dense urban or industrial areas (65–80 dBA).

Audible Noise Changes

People with normal hearing sensitivity can recognize small perceptible changes in sound levels of approximately 3 dBA. Changes of at least 5 dBA can be readily noticeable and may even cause

community reactions. Sound level increases of 10 dBA or greater are perceived as a doubling in loudness and can provoke a community response from those so affected (FTA 2006).

Noise is most audible when traveling by direct line-of-sight, i.e., an unobstructed visual path between noise source and receptor. Barriers that break line-of-sight between sources and receivers, such as walls and buildings, can greatly reduce source noise levels by allowing noise to reach receivers by diffraction only. Other factors such as the weather and reflecting or shielding also intensify or reduce the noise level at any given location.

In addition, noise levels from a particular source generally decline as distance to the receptor increases. Noise from stationary or point sources is reduced by about 6 dBA for every doubling of distance. Noise levels decrease as the distance from noise source to receiver increases. For each doubling of distance, noise from stationary sources ("point sources") can decrease by approximately 6 dBA over hard surfaces (i.e., reflective surfaces such as parking lots) and 7.5 dBA over soft surfaces (i.e., absorptive surfaces such as soft dirt and grass). For example, if a point source produces a noise level of 89 dBA at a reference distance of 50 feet, the noise level would be approximately 83 dBA at a distance of 100 feet, 77 dBA at 200 feet, etc. Noise generated by mobile sources can decrease by approximately 3 dBA over hard surfaces and 4.5 dBA over soft surfaces for each doubling of distance.

Noise levels may also be reduced by intervening structures; generally, a single row of buildings between the receptor and the noise source reduces the noise level by about 5 dBA, while a solid wall or berm reduces noise levels by 5 to 10 dBA. The manner in which older homes in California were constructed generally provides a reduction of exterior-to-interior noise levels of about 20 dBA with closed windows. The exterior-to-interior reduction of newer homes is generally 30 dBA or more.

Fundamentals of Vibration

Characteristics of Vibration

Vibration is an oscillatory motion through a solid medium in which the motion's amplitude can be described in terms of displacement, velocity, and acceleration. Unlike noise, vibration is not a common environmental problem, as it is unusual for vibration from vehicular sources to be perceptible. Common sources of vibration include trains, buses, and construction activities.

Vibration Definitions

Peak particle velocity (PPV) can be used to describe vibration impacts to both buildings and humans. PPV represents the maximum instantaneous peak of a vibration signal, and it is usually measured in inches per second (Caltrans 2013).

Root mean square (RMS) amplitude is most frequently used to describe the effect of vibration on land uses. RMS amplitude is defined as the average of the squared amplitude of the signal. Decibel notation (VdB) is commonly used to measure RMS. The decibel notation acts to compress the range of numbers required to describe vibration (FTA 2006).

Effects of Vibration

High levels of vibration may cause physical personal injury or damage to buildings. However, ground-borne vibration levels rarely affect human health. Instead, most people consider ground-borne vibration to be an annoyance that can affect concentration or disturb sleep. Ground-borne vibration can also interfere with certain types of highly sensitive equipment or machines, especially imaging devices used in medical laboratories.

Perceptible Vibration Changes

Unlike noise, ground-borne vibration is not an environmental issue that most people experience every day. Background vibration levels in residential areas are usually well below the threshold of perception for humans, which is around 0.01 inches per second (FTA 2006). Perceptible indoor vibrations are most often caused by sources within buildings themselves, such as slamming doors. Typical outdoor sources of ground-borne vibration include construction equipment, trains, and traffic on rough roads. Traffic vibration from smooth and well-maintained roads is typically not perceptible.

Noise Sensitive Land Uses

For purposes of this analysis, noise sensitive receptors include residences, places of worship, schools, hospitals, parks, and businesses where there is an expectation of quiet. The nearest noise sensitive receptors within 1,000 feet of the proposed project are:

- Regal Cinemas 14 located approximately 220 feet to the east of the project site
- Holiday Inn Express located approximately 430 feet to the southwest of the project site
- Lakehills Covenant Church located approximately 900 feet to the east of the project site

- El Dorado Hills Kindercare located approximately 900 feet to the northwest of the project site.

Other sensitive receptors in the vicinity of the project site include residential uses (Sunset Mobile Home Park and the Cresleigh Subdivision) and a park (Creekside Greens Park) located approximately 0.25 miles south of the project site across White Rock Road. No hospitals or schools are located within the immediate vicinity of the project site. The closest schools (Oak Meadow Elementary School and William Brooks Elementary School) are both located approximately 0.8 miles to the northwest and northeast of the project site, respectively. The nearest hospital (Mercy Hospital of Folsom) is located approximately 4.5 miles northwest of the project site. Other sensitive receptors, including residences and a school, are located along roadways that would be used by project related vehicular traffic.

Existing Noise Environment

The primary existing noise source throughout the project area is motor vehicle traffic. Localized intermittent sources of noise include sounds from parking lots and curbside parking activities, mechanical equipment, car sirens, and delivery trucks. Other sources of localized periodic noise include a seasonal Farmer's Market which is held within the Town Center and occasional fireworks displays.

Roadway Noise

The existing ambient noise levels were estimated for the segments of roadways near the project site based on average daily traffic volumes provided in the traffic study for this project (Fehr & Peers 2017). The traffic noise was modeled using the Federal Highway Administration Highway (FHWA) Traffic Noise Model Version 2.5 (TNM 2.5). The highest traffic volumes during either the AM or PM peak hour were used as inputs into the model. The results of the noise modeling are presented in **Table 4.6-2, Existing Roadway Modeled Noise Levels.** As shown, the modeled roadway noise levels range from approximately 52.2 dBA Ldn along Town Center Boulevard at the boundary of the project site to about 67.7 dBA Ldn at the property line of the residences adjacent to Latrobe Road, just northeast of the intersection with Golden Foothill Parkway/Monte Verde Drive. It is noted that noise levels along these roadways are likely higher than this level due to the contribution of noise from other sources. However, traffic is the dominant noise source in the area.

Table 4.6-2
Existing Roadway Modeled Noise Levels

Roadway Segment	Sensitive Receptor (Distance to Roadway Centerline)	Estimated dBA, Ldn at Nearest Sensitive Receptor
Town Center Boulevard East of Post Street	Project Site (60 feet)	52.2
Latrobe Road South of White Rock Road	Residence (100 feet)	67.7
White Rock Road from Post Street to Valley View Parkway	Residence (50 feet)	66.6
Valley View Parkway South of White Rock Road	Residence (90 feet)	61.6
Silva Valley Parkway North of U.S. 50	Oak Meadow Elementary School (150 feet)	63.8

Source: Impact Sciences, 2017.

It should be noted that the noise level modeled along Town Center Boulevard is similar to noise long- and short-term measurements taken in 2014 as part of the noise study prepared by J.C. Brennan & Associates (2014). The on-site 24-hour noise measurement for the project site was 55.9 dBA Ldn, and day time short-term measurements ranged from 51.4 to 55.0 dBA Leq.

Stationary and Area Sources

Stationary and area noise sources include parking lots, mechanical equipment, such as air conditioners and ventilation systems, and landscape maintenance. These noise sources result in environmental effects when they are in proximity of land uses where people are likely to be sensitive to noise.

4.6.3 REGULATORY CONSIDERATIONS

4.6.3.1 Federal Laws and Regulations

Currently, no federal noise standards regulate environmental noise associated with short-term construction or the long-term operations of development projects.

4.6.3.2 State Laws and Regulations

The State of California has adopted noise standards in areas of regulation not preempted by the federal government. State standards regulate noise levels of motor vehicles, sound transmission through buildings, occupational noise exposure, and noise insulation.

Though not adopted by law, the *State of California General Plan Guidelines 2003*, published by the Governor's Office of Planning and Research (2003), provide guidance for the compatibility of projects

within areas of specific noise exposure. Acceptable and unacceptable community noise exposure limits for various land use categories have been determined to help guide new land use decisions in California communities (OPR 2003). In many local jurisdictions, these guidelines are used to derive local noise standards and guidance.

4.6.3.3 Local Plans and Policies

County of El Dorado General Plan

The following presents guiding and implementing policies from the current County of El Dorado General Plan (2004) relevant to noise and contained within the Public Health, Safety, and Noise Element.

GOAL 6.5: ACCEPTABLE NOISE LEVELS: Ensure that County residents are not subjected to noise beyond acceptable levels.

OBJECTIVE 6.5.1: PROTECTION OF NOISE-SENSITIVE DEVELOPMENT: Protect existing noise-sensitive developments (e.g., hospitals, schools, churches and residential) from new uses that would generate noise levels incompatible with those uses and, conversely, discourage noise-sensitive uses from locating near sources of high noise levels.

Policy 6.5.1.1 Where noise-sensitive land uses are proposed in areas exposed to existing or projected exterior noise levels exceeding the levels specified in Table 6-1 (presented as **Table 4.6-3** in this Draft EIR**)** or the performance standards of Table 6-2 (presented as **Table 4.6-4** in this Draft EIR**)**, an acoustical analysis shall be required as part of the environmental review process so that noise mitigation may be included in the project design.

Policy 6.5.1.3 Where noise mitigation measures are required to achieve the standards of Table 6-1 (presented as **Table 4.6-3** in this Draft EIR**)** and Table 6-2 (presented as **Table 4.6-4** in this Draft EIR**)**, the emphasis of such measures shall be placed upon site planning and project design. The use of noise barriers shall be considered a means of achieving the noise standards only after all practical design-related noise mitigation measures have been integrated into the project and the noise barriers are not incompatible with the surroundings.

Policy 6.5.1.5 Setbacks shall be the preferred method of noise abatement for residential projects located along U.S. Highway 50. Noise walls shall be discouraged within the foreground viewshed of the U.S. Highway 50 and shall be discouraged in favor

of less intrusive noise mitigation (e.g., landscaped berms, setbacks) along other high volume roadways.

Policy 6.5.1.8 New development of noise sensitive land uses will not be permitted in areas exposed to existing or projected levels of noise from transportation noise sources which exceed the levels specified in Table 6-1 (presented as **Table 4.6-3** in this Draft EIR**)** unless the project design includes effective mitigation measures to reduce exterior noise and noise levels in interior spaces to the levels specified in Table 6-1 (presented as **Table 4.6-3** in this Draft EIR**)**.

Policy 6.5.1.9 Noise created by new transportation noise sources, excluding airport expansion but including roadway improvement projects, shall be mitigated so as not to exceed the levels specified in Table 6-1 (presented as **Table 4.6-3** in this Draft EIR**)** at existing noise-sensitive land uses.

Table 4.6-3
Maximum Allowable Noise Exposure for Transportation Noise Sources

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

Source: El Dorado County General Plan, Noise Element, Table 6-1, 2004.

1. In Communities and Rural Centers, where the location of outdoor activity areas is not clearly defined, the exterior noise level standard shall be applied to the property line of the receiving land use. For residential uses with front yards facing the identified noise source, an exterior noise level criterion of 65 dB L_{dn} shall be applied at the building façade, in addition to a 60 dB L_{dn} criterion at the outdoor activity area. In Rural Regions, an exterior noise level criterion of 60 dB L_{dn} shall be applied at a 100-foot radius from the residence unless it is within Platted Lands where the underlying land use designation is consistent with Community Region densities in which case the 65 dB L_{dn} may apply. The 100-foot radius applies to properties which are five acres and larger; the balance will fall under the property line requirement.

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

Table 4.6-4
Noise Level Performance Protection Standards for Noise Sensitive Land Uses Affected by Non-Transportation[1] Sources

Noise Level Descriptor	Daytime 7 a.m. – 7 p.m.		Evening 7 p.m. – 10 p.m.		Night 10 p.m. – 7 a.m.	
	Community	Rural	Community	Rural	Community	Rural
Hourly L_{eq}, dB	55	50	50	45	45	40
Maximum level, dB	70	60	60	55	55	50

Source: El Dorado County General Plan, Noise Element, Table 6-2, 2004.
Each of the noise levels specified above shall be lowered by 5 dB for simple tone noises, noises consisting primarily of speech or music, or for recurring impulsive noises. These noise level standards do not apply to residential units established in conjunction with industrial or commercial uses (e.g., caretaker dwellings).

The County can impose noise level standards which are up to 5 dB less than those specified above based upon determination of existing low ambient noise levels in the vicinity of the project site.

In Community areas the exterior noise level standard shall be applied to the property line of the receiving property. In Rural Areas the exterior noise level standard shall be applied at a point 100' away from the residence. The above standards shall be measured only on property containing a noise sensitive land use as defined in Objective 6.5.1. This measurement standard may be amended to provide for measurement at the boundary of a recorded noise easement between all effected property owners and approved by the County.

1 For the purposes of the Noise Element, transportation noise sources are defined as traffic on public roadways, railroad line operations and aircraft in flight. Control of noise from these sources is preempted by Federal and State regulations. Control of noise from facilities of regulated public facilities is preempted by California Public Utilities Commission (CPUC) regulations. All other noise sources are subject to local regulations. Non-transportation noise sources may include industrial operations, outdoor recreation facilities, HVAC units, schools, hospitals, commercial land uses, other outdoor land use, etc.

Policy 6.5.1.11 The standards outlined in Table 6-3 (presented as **Table 4.6-5** in this Draft EIR**)** shall not apply to those activities associated with actual construction of a project as long as such construction occurs between the hours of 7 a.m. and 7 p.m., Monday through Friday, and 8 a.m. and 5 p.m. on weekends, and on federally-recognized holidays. Further, the standards outlined in Table 6-3 shall not apply to public projects to alleviate traffic congestion and safety hazards.

Table 4.6-5
Maximum Allowable Noise Exposure for Non-transportation Noise Sources in Community Regions and Adopted Plan Areas – Construction Noise

Land Use Designation[1]	Time Period	Noise Level (dB) L_{eq}	Noise Level (dB) L_{max}
Higher-Density Residential (MFR, HDR, MDR)	7 am – 7 pm	55	75
	7 pm – 10 pm	50	65
	10 pm – 7 am	45	60
Commercial and Public Facilities (C, R&D, PF)	7 am – 7 pm	70	90
	7 pm – 7 am	65	75
Industrial (I)	Any Time	80	90

Source: El Dorado County General Plan, Noise Element, Table 6-3, 2004.
1 Adopted Plan areas should refer to those land use designations that most closely correspond to the similar General Plan land use designations for similar development

Policy 6.5.1.12 When determining the significance of impacts and appropriate mitigation for new development projects, the following criteria shall be taken into consideration:

A. Where existing or projected future traffic noise levels are less than 60 dBA Ldn at the outdoor activity areas of residential uses, an increase of more than 5 dBA Ldn caused by a new transportation noise source will be considered significant;

B. Where existing or projected future traffic noise levels range between 60 and 65 dBA Ldn at the outdoor activity areas of residential uses, an increase of more than 3 dBA Ldn caused by a new transportation noise source will be considered significant; and

C. Where existing or projected future traffic noise levels are greater than 65 dBA Ldn at the outdoor activity areas of residential uses, an increase of more than 1.5 dBA Ldn caused by a new transportation noise will be considered significant.

Policy 6.5.1.13 When determining the significance of impacts and appropriate mitigation to reduce those impacts for new development projects, including ministerial development, the following criteria shall be taken into consideration:

A. In areas in which ambient noise levels are in accordance with the standards in Table 6-2, increases in ambient noise levels caused by new non-transportation noise sources that exceed 5 dBA shall be considered significant; and

B. In areas in which ambient noise levels are not in accordance with the standards in Table 6-2, increases in ambient noise levels caused by new non-transportation noise sources that exceed 3 dBA shall be considered significant.

El Dorado County Ordinance Code

According to Section 130.37, Noise Standards, of the El Dorado County Ordinance Code, construction (e.g., construction, alteration or repair activities) during daylight hours are exempt from County noise standards provided that all construction equipment is fitted with factory installed muffling devices and maintained in good working order.

4.6.4 IMPACTS AND MITIGATION MEASURES

4.6.4.1 Significance Criteria

In accordance with Appendix G of the *California Environmental Quality Act (CEQA) Guidelines*, the impacts of the proposed project related to noise and vibration would be considered significant if the project would:

- Result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- Result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels;
- Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project;
- Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project;
- Result in exposure of people residing or working in the project area to excessive noise levels if the project is located within an area covered by an airport land use plan, or where such a plan has not been adopted, within 2 miles of a public airport or public use airport; or
- Result in exposure of people residing or working in the project area to excessive noise levels if the project is located in the vicinity of a private airstrip.

Operational Noise Thresholds

Operational noise thresholds consider both the County's transportation noise exposure limits identified in **Table 4.6-3** and non-transportation noise exposure limits for sensitive uses identified in **Table 4.6-4**, and community response to changes in noise levels. Off-site noise-sensitive uses in the vicinity of the project site include mobile homes, single-family residences, and parks.

Non-Transportation-related Noise

A significant non-transportation-related noise impact would occur if exterior locations at these sensitive locations were to experience non-transportation noise levels above 55 Leq and 70 Lmax between 7 AM and 7 PM, 55 Leq and 70 Lmax between 7 PM and 10 PM, and 55 Leq and 70 Lmax between 10 PM and 7 AM due to the proposed project.

Transportation-related Noise

Changes in noise levels of less than 3 dBA are typically not noticed by the human ear. Changes from 3 to 5 dBA would be noticed by some individuals who are sensitive to changes in noise. A 5 dBA increase is readily noticeable. Based on this information, and Policy 6.5.1.12 of the General Plan, the following thresholds were used in this EIR to evaluate the significance of the project-related transportation noise increases:

- An increase of 5 dBA or greater in noise level that occurs from project-related traffic would be considered significant where existing or projected future traffic noise levels are less than 60 dBA.
- An increase of 3 dBA or greater in noise level that occurs from project-related traffic would be considered significant where existing or projected future traffic noise levels range between 60 and 65 dBA Ldn.
- An increase of 1.5 dBA or greater in noise level that occurs from project-related traffic would be considered significant where existing or projected future traffic noise levels are greater than 65 dBA Ldn.

Construction Noise Thresholds

Construction thresholds consider the County's maximum construction noise exposure limits identified in **Table 4.6-5**. However, as detailed in General Plan Policy 6.5.1.11 and Section 130.37 of the El Dorado County Ordinance Code, construction occurring between the hours of 7 AM and 7 PM, Monday through Friday, and between 8 AM and 5 PM on weekends and federally recognized holidays is exempt from the standards listed in **Table 4.6-5**. Therefore, a significant impact would occur if construction activities occurred outside of the hours set forth in **Table 4.6-5**, or on federally recognized holidays.

4.6.4.2 Issues adequately addressed in the Initial Study

As noted in the Initial Study, groundborne vibration or noise would primarily be generated during construction of the proposed project as a result of traffic associated with the transport of heavy materials and equipment to and from the construction site, as well as active construction operations at the project site. These temporary increases in groundborne vibration levels would be of short duration, and would occur primarily during daytime hours. Construction activities are limited by grading permit requirements to the hours of 7:00 AM to 7:00 PM, Monday through Friday, and 8:00 AM to 5:00 PM, on weekends, and on federally recognized holidays. As no vibration-sensitive land uses or older structures exist in the immediate vicinity of the project site (the nearest sensitive receptor is located 220 feet from the project site), a temporary increase in groundborne vibration levels would not create any significant impacts, and no further analysis is necessary in this EIR.

As discussed in the Initial Study, the Cameron Airpark Airport is located approximately 4.6 miles northeast of the project site. It is a public use airport with two runways and an average of 99 daily operations. The project site is not within the Airport Influence Area of the Cameron Airpark Airport established in the Land Use Compatibility Plan. There would be no impact. No further analysis is required in this EIR.

4.6.4.3 Methodology

Short-term noise-level measurements were taken on the project site on March 24, 2014 (J.C. Brennan & Associates 2014). The lowest ambient sound level reading (51.4 dBA) was applied to nearby noise-sensitive receptors as a baseline ambient sound level for evaluating noise impacts.

Noise levels associated with project-related construction activities were calculated using the FHWA Roadway Construction Noise Model (RCNM) and combined with existing ambient noise level readings to determine new ambient noise levels with construction activities.

Noise from stationary sources includes noise generated by residential activity, such as heating, ventilation, and air conditioning (HVAC), and on-site parking noise. Average noise levels for such activities were added to a worst-case existing ambient sound level reading of 51.4 dBA to provide a worst-case scenario sound level increase to compare to County thresholds.

Traffic noise in the project area was modeled using average daily traffic (ADT) which was derived by averaging peak hour counts from the project's transportation impact assessment (Fehr & Peers 2017) and applying a growth multiplier of 10. These average daily traffic volumes were input into the FHWA

TNM2.5 model (**Appendix 4.6**) to estimate transportation noise levels with and without the project. The estimated noise levels were compared to thresholds provided by General Plan Policy 6.5.1.12.

4.6.4.4 Project Impacts and Mitigation Measures

Impact NOI-1: The proposed project would generate increased traffic in the project vicinity but the increase in traffic would not cause a substantial permanent increase in noise levels at off-site sensitive receptors. (*Less than Significant*)

The proposed project would generate daily vehicle trips that would affect roadways between the project site and the nearest freeway as well as other local roads. As shown in **Table 4.6-2**, sensitive receptors that include residences and a school are located along some of the study area roadways. The impact of this additional traffic on ambient noise levels along the study area roadways was modeled with FHWA TNM 2.5, comparing an existing year no project scenario to an existing year with project scenario. As shown in **Table 4.6-6**, **Operational Roadway Noise Levels – Existing Plus Project Conditions,** the largest ambient noise level increase as a result of project traffic would be 2.7 dBA, occurring on Town Center Boulevard, east of Post Street (i.e., near the project site). The increase along all other study area roadways would be much smaller (on the order of 0 to 0.7 dBA).

Table 4.6-6
Operational Roadway Noise Levels – Existing Plus Project Conditions

	Estimated dBA, Ldn at Adjacent Sensitive Receptors			
Roadway Segment	Existing No Project	Existing Plus Project	Project Change	Significant Impact?
Town Center Boulevard East of Post Street	52.2	54.9	2.7	**No**
Latrobe Road South of White Rock Road	67.7	67.7	0.0	**No**
White Rock Road from Post Street to Valley View Parkway	66.6	67.3	0.7	**No**
Valley View Parkway South of White Rock Road	61.6	62.0	0.4	**No**
Silva Valley Parkway North of U.S. 50	63.8	64.3	0.5	**No**

Source: Impact Sciences, 2017.

This increase in ambient noise levels is below the threshold of audibility and would not cause ambient noise levels measured at the property lines of affected land uses to rise by an audible 3 dBA. Additionally, this increase in ambient noise would not exceed the El Dorado County General Plan threshold of a 5.0 dBA noise level increase where traffic noise is less than 60 dBA Ldn. At all other roadway segments, project-related mobile noise increases would have an even lesser impact. As a result, the project's off-site vehicular noise impacts would be considered less than significant.

Mitigation Measures: No mitigation measures are required.

Impact NOI-2: **The proposed project would add new stationary and area noise sources to the project site but noise from these new noise sources would not cause a substantial permanent increase in ambient noise levels that could affect off-site sensitive receptors. (*Less than Significant)***

HVAC Systems

The HVAC systems that would be installed for the proposed project would typically result in noise levels of approximately 45 dBA L_{eq} at 100 feet from the equipment (MBA 2011). **Table 4.6-7, HVAC Noise Levels,** provides the maximum noise levels that would be experienced by sensitive receptors and other land uses within 1,000 feet of the project site from the operation of HVAC equipment associated with the project.

Table 4.6-7
HVAC Noise Levels

Sensitive Receptor	Distance from Site (feet)	Maximum HVAC Noise Level (dB(A))	Existing Ambient Noise Level (dB(A), Leq)	New Ambient Noise Level (dB(A), Leq)	Increase
Regal Cinemas	220	29.2	51.4	51.4	0.0
Holiday Inn Express	430	26.3	51.4	51.4	0.0
Lakehills Covenant Church	900	7.9	51.4	51.4	0.0
El Dorado Hills Kindercare	900	7.9	51.4	51.4	0.0

Source: Impact Sciences, 2017.

As shown in the table above, HVAC equipment associated with the proposed project would not generate an audible 3 dBA increase in ambient noise levels at the closest sensitive receptors. Other more distant sensitive receptors (e.g., Sunset Mobile Home Park, the Cresleigh Subdivision, Creekside Greens Park) would experience even lower noise level increases, which would not be audible. The resultant noise levels would not exceed the County's exterior noise level standards (**Table 4.6-3**) applicable to these non-residential and residential uses. Therefore, this impact would be less than significant.

Parking Facilities

It is anticipated that sources of noise from the parking garage included in the project would include tires squealing, engines accelerating, doors slamming, and car alarms. Noise levels at the parking garage would fluctuate with the amount of automobile and human activity at the site. During times when the largest number of people would enter and exit the project site, the noise levels at the parking facility onsite would range from 60 to 70 dBA L_{eq}. **Table 4.6-8, Parking Noise Levels**, provides the maximum noise levels that would be experienced by sensitive receptors within 1,000 feet of the project site from the operation of the parking facility associated with the project.

Table 4.6-8
Parking Noise Levels

Sensitive Receptor	Distance from Site (feet)	Maximum Parking Noise Level (dB(A))	Existing Ambient Noise Level (dB(A), Leq)	New Ambient Noise Level (dB(A), Leq)	Increase
Regal Cinemas	220	48.1	51.4	53.1	1.7
Holiday Inn Express	430	45.3	51.4	52.4	1.0
Lakehills Covenant Church	900	26.9	51.4	51.4	0.0
El Dorado Hills Kindercare	900	26.9	51.4	51.4	0.0

Source: Impact Sciences, 2017.

As shown in the table above, a noise level of 70 dBA L_{eq} would cause a maximum sound level increase of 1.0 dBA L_{eq} at the nearby Holiday Inn Express and 1.7 dBA L_{eq} at the adjacent Regal Cinemas. These increases are not considered perceptible.

On-site noise generated by parking activities at the parking structure on the project site would be further shielded from nearby sensitive receptors by the project buildings, which would be located on two sides of the parking garage. As discussed above, parking noise would not be anticipated to be perceptible at off-site sensitive receptors without any shielding. Therefore, the parking noise analysis provided above is considered conservative. Thus, impacts associated with noise generated as a result of parking activity at the proposed project would not adversely affect the sensitive receptors near the project site, and this impact would be less than significant.

Combined On-Site Operational Noise

As discussed above, noise emanating from HVAC equipment would not cause a measureable increase in ambient noise levels. When HVAC noise levels are combined with parking noise levels, the maximum increase in noise levels remains at 1.0 dBA L_{eq} and 1.7 dBA L_{eq} at the Holiday Inn Express and Regal Cinemas, respectively (**Appendix 4.6**). As discussed above, this would not increase noise levels by an audible 3 dBA increase, therefore impacts associated with noise generated as a result of the combined parking and HVAC activity at the proposed project would not adversely affect the sensitive receptors near the project site, and this impact would be less than significant.

Mitigation Measures: No mitigation measures are required.

Impact NOI-3: **Implementation of the proposed project would result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity during construction. However, due to compliance with County's Noise Ordinance, the noise increase would not be considered significant. (*Less than Significant*)**

Construction of the proposed project would generate noise from a variety of on- and off-site activities, and would include the use of on-site heavy equipment such as bulldozers, as well as smaller equipment such as saws, hammers, and pneumatic tools. Secondary noise could also be generated by construction worker vehicles and vendor deliveries. Typical sound levels associated with construction equipment are shown in **Table 4.6-9, Maximum Noise Levels Generated by Typical Construction Equipment**. For this analysis, construction noise impacts were modeled using the noise reference level for a grader, which can produce average peak noise levels of 85 dBA at a reference distance of 50 feet.[1] Because graders, tractors, bulldozers and other similar tractor-type vehicles are expected to be the loudest and most extensively used pieces of heavy equipment during construction of the proposed project, this analysis examines a "worst-case-scenario;" the noise impacts of all other construction activities and equipment would not exceed those analyzed here.

1 Federal Highway Administration, Highway Construction Noise Handbook, 2006.

Table 4.6-9
Maximum Noise Levels Generated by Typical Construction Equipment, L_{max}

Type of Equipment	Actual Measured Noise Level (dBA at 50 feet)
Air Compressor	78
Backhoe	78
Concrete Mixer Truck	79
Crane	81
Dozer	82
Generator	81
Grader	85[1]
Paver	77
Pump	81
Roller	80
Tractor	84[1]
Welder	74

Source: FHWA, Highway Construction Noise Handbook, 2006.
1 FHWA does not have data on actual measured noise levels, therefore FHWA provides a specification limit for maximum noise emitted.

Worst-case construction noise levels are anticipated to occur during the site preparation phase of construction. During this phase, it is anticipated that there will be three bulldozers and four tractors operating on-site (De Novo 2017). Estimated construction noise levels are shown in **Table 4.6-10, Construction Noise Levels (Site Preparation).** The maximum new ambient noise levels from construction would be 65.9 dBA L_{eq} occurring at Regal Cinemas. Other sensitive receptors located further away from the project site, including the church and childcare facility, would experience lower ambient noise levels. All of the new ambient noise levels would be below the maximum allowable noise levels presented in Table 6-3 of the General Plan (presented as **Table 4.6-5** in this Draft EIR**).**

With regard to off-site construction-related noise impacts, haul trucks would access and exit the project site via Town Center Boulevard and head north on Latrobe Road to access U.S. 50. The project's hauling activities would temporarily increase ambient noise levels at sensitive receptors along the haul route. However, a 3 dBA increase in roadway noise levels requires an approximate doubling of roadway traffic volume, assuming that travel speed and fleet mix remain constant. Though the addition of haul trucks would alter the fleet mix of the haul route, their addition to local roadways would not double the traffic volumes, or increase traffic to levels capable of producing readily noticeable 5.0 dBA increases.

Table 4.6-10
Construction Noise Levels (Site Preparation)

Sensitive Receptor	Distance from Site (feet)	Maximum Construction Noise Level (dB(A))	Existing Ambient Noise Level (dB(A), Leq)	New Ambient Noise Level (dB(A), Leq)	Maximum Allowable Noise Exposure – Construction (dB(A), Leq)
Regal Cinemas	220	65.7	51.4	65.9	70
Holiday Inn Express	430	62.9	51.4	63.2	70
Lakehills Covenant Church	900	44.5	51.4	52.2	55
El Dorado Hills Kindercare	900	44.5	51.4	52.2	55

Source: Impact Sciences, 2017.

El Dorado County General Plan Policy 6.5.1.11 and Ordinance Code Section 130.37 exempt construction noise from quantitative County thresholds. The project would comply with the County noise ordinance, and the construction of the proposed project would occur between the hours of 7 AM and 7 PM, Monday through Friday, and between 8 AM and 5 PM on weekends and federally recognized holidays. Furthermore, as the analysis above shows, even with the addition of the project's construction noise, the ambient noise levels at the nearest receptors would remain below the maximum ambient noise levels allowed for those uses under the General Plan. As a result, construction-related noise impacts would be less than significant.

Mitigation Measures: No mitigation measures are required.

Impact NOI-4: **The proposed project would not expose on-site sensitive receptors to noise levels in excess of standards established in the County General Plan. (*Less than Significant*)**

The proposed project would locate new noise-sensitive receptors (project residents) at the project site. Motor vehicle traffic noise would account for the majority of noise levels experienced at the project site. A 24-hour ambient noise measurement was conducted on April 24th, 2014 at the project site, which indicated that the ambient noise level at the project site is about 55.9 dBA Ldn (J.C. Brennan & Associates 2014). This is consistent with and within 0.5 dBA Ldn of the noise level calculated based on traffic volumes in the project areas; the modeled noise level is shown in **Table 4.6-11** and is estimated to be 55 dBA Ldn.

Table 4.6-11 also presents the increase in ambient noise levels at the project site under cumulative conditions. As the table shows, both the existing ambient noise level and the projected ambient noise level at the project site under cumulative conditions are below the maximum allowable noise exposure from transportation sources (60 dBA Ldn) for residential land use under the County General Plan (see **Table 4.6-3** above).

Although there are no airports within 2 miles of the project site, there are several airports in the greater area which have the potential to generate air traffic noise. As discussed above and in the Initial Study, the Cameron Airpark Airport is located approximately 4.6 miles northeast of the project site. The project site is not within the Airport Influence Area of the Cameron Park Airport established in the Land Use Compatibility Plan. The project site is approximately 4.4 miles southwest from the 55-60 dBA CNEL noise contour for Cameron Park Airport (El Dorado County ALUC 2012). Additionally, the project site is approximately 14 miles northeast of Mather Airport. According to the Mather Airport Comprehensive Land Use Plan, the proposed project is well outside of the 60 dBA CNEL noise contour, which extends approximately 5 miles to the northeast of the airport (Sacramento County Department of Airports 2013). The project site is not within the 60 dBA CNEL of any of the area airports, and the project receptors would not be exposed to excessive aircraft noise.

There are no stationary sources of noise near the project site that would contribute additional noise to the noise resulting from transportation sources described above. As a result, the project is considered to be located in a compatible noise environment and would not expose project site receptors to excessive noise. This impact would be considered less than significant.

Mitigation Measures: No mitigation measures are required.

4.6.4.5 Cumulative Impacts and Mitigation Measures

Cumulative Impact C-NOI-1: The proposed project along with other future development in El Dorado County would generate increased traffic, but the increase in traffic would not cause a substantial permanent increase in noise levels at off-site locations. (*Less than Significant)*

Table 4.6-11, Cumulative Mobile Source Noise Levels, shows cumulative plus project noise level increases from increased traffic on roadways that would be affected by project traffic and compares the estimated noise levels to a cumulative without project scenario. As shown in **Table 4.6-11**, the largest ambient noise level increase as a result of project traffic would be 0.4 dBA, occurring on Town Center

Boulevard, east of Post Street. This increase in ambient noise would not exceed the General Plan threshold of 5.0 dBA where traffic noise is less than 60 dBA. This increase in ambient noise would also be below the threshold of audibility and would not cause ambient noise levels measured at the property lines of affected land uses to increase by an audible 3 dBA. Along all other roadway segments, project-related mobile noise increases would have an even lesser impact. As a result, the project's off-site vehicular traffic would not contribute considerably to a significant cumulative noise impact. The impact would be less than significant.

Table 4.6-11
Cumulative Mobile Source Noise Levels

Roadway Segment	Estimated dBA, Ldn at Adjacent Sensitive Receptors			
	Future No Project	Future Plus Project	Project Change	Significant Impact?
Town Center Boulevard East of Post Street	55.0	55.4	0.4	**No**
Latrobe Road South of White Rock Road	69.1	69.2	0.1	**No**
White Rock Road from Post Street to Valley View Parkway	68.9	69.0	0.1	**No**
Valley View Parkway South of White Rock Road	63.2	63.3	0.1	**No**
Silva Valley Parkway North of U.S.50	67.0	67.0	0.0	**No**

Source: Impact Sciences, 2017.

Mitigation Measures: No mitigation measures are required.

Cumulative Impact C-NOI-2: Construction activities associated with the proposed project along with other construction projects in El Dorado County would not result in a substantial temporary or periodic cumulative increase in ambient noise levels. (*No Impact)*

With respect to cumulative construction noise impacts, those would occur only if other development projects in El Dorado Hills were to be under construction at the same time as the proposed project and if these concurrent projects would be in close proximity of the same sensitive receptors adjacent to the project site and would expose those receptors to their construction noise. There are no proposed projects that would be located near the proposed project that would result in a cumulative construction noise impact on the nearby receptors. As such, there would not be a cumulative construction noise impact.

Mitigation Measures: No mitigation measures are required.

4.6.5 REFERENCES

De Novo Planning Group. 2017. Air Quality and Greenhouse Gas Analysis for the El Dorado Hills Apartments Project. May.

California Department of Transportation (Caltrans). 2013. *Transportation and Construction Vibration Guidance Manual.* September.

California Office of Planning and Research (OPR). 2003. *General Plan Guidelines, Noise Element Guidelines (Appendix C).*

County of El Dorado. 2004. *El Dorado County General Plan -Public Health, Safety, and Noise Element*. Adopted July 19. Last amended December 2015.

El Dorado County Airport Land Use Commission (ALUC). 2012. *El Dorado County Airport Land Use Compatibility Plan*. June.

Federal Highway Administration (FWHA). 2006. *Highway Construction Noise Handbook.*

Federal Transit Administration (FTA). 2006. *Transit Noise and Vibration Impact Assessment*. May.

Fehr & Peers. 2017. *El Dorado Hills Town Center Apartments Transportation Impact Analysis*. June.

J.C. Brennan & Associates. 2014. *Environmental Noise Assessment El Dorado Hills Apartments*. April.

Michael Brandman Associates (MBA). 2011. *El Dorado County – Diamond Dorado Retail Center Draft EIR, SCH No. 2008012004.* December.

National Institute on Deafness and Other Communication Disorders (NIDCD). 2017. *Noise-Induced Hearing Loss.* February. Available at: www.nidcd.nih.gov/health/noise-induced-hearing-loss. Accessed April 27, 2017.

Sacramento County Department of Airports. 2013. *2013 Draft Mather Airport Master Plan*. May.