

4.8 NOISE

The purpose of this chapter is to analyze project-related noise source impacts onsite and to surrounding land uses. This chapter evaluates short-term construction-related impacts, as well as future buildout conditions. Information in this chapter was obtained from the Acoustical Report prepared for the project by j.c. brennan and associates (July 2016) and the Acoustical Study Addendum prepared by Saxelby Acoustics (June 2018), included as Appendix I of this EIR. Additional data was obtained from the Noise Element of the Placer County General Plan, the Granite Bay Community Plan, and traffic information provided by the traffic consultant.

Appendix A includes the Notice of Preparation (NOP) and Initial Study prepared for the proposed project. A letter from the Granite Bay Community Association, included in Appendix A, raised concerns about potential noise impacts generated from emergency response vehicles serving the project.

4.8.1 ENVIRONMENTAL SETTING

Noise Scales and Definitions

Sound is described in terms of the loudness (amplitude) of the sound and frequency (pitch) of the sound. The standard unit of measurement of the loudness of sound is the decibel (dB). Since the human ear is not equally sensitive to sound at all frequencies, a special frequency-dependent rating scale has been devised to relate noise to human sensitivity. The A-weighted decibel scale (dBA) performs this compensation by discriminating against frequencies in a manner approximating the sensitivity of the human ear.

Decibels are based on the logarithmic scale. The logarithmic scale compresses the wide range in sound pressure levels to a more usable range of numbers in a manner similar to the Richter scale used to measure earthquakes. In terms of human response to noise, a sound 10 dBA higher than another is judged to be twice as loud, and 20 dBA higher four times as loud, and so forth. Everyday sounds normally range from 30 dBA (very quiet) to 100 dBA (very loud). Examples of various sound levels in different environments are illustrated on *Table 4.8-1: Sound Levels and Human Response*.

Many methods have been developed for evaluating community noise to account for, among other things:

- The variation of noise levels over time;

- The influence of periodic individual loud events; and
- The community response to changes in the community noise environment.

Numerous methods have been developed to measure sound over a period of time; these methods are summarized in *Table 4.8-2: Noise Descriptors*.

Table 4.8-1: Sound Levels and Human Response

dB(A)	Overall Level - Sound Pressure Level Reference: 0.0002 Microbars	Community (Outdoor) ¹	Home or Industry ¹	Loudness - Human Judgment of Different Sound Levels
130		- Military jet aircraft take-off with after-burner from aircraft carrier @ 50 feet (130)	- Oxygen torch (121)	120 dB(A) 32 times as loud
120 110	Uncomfortably loud	- Turbo-fan aircraft @ take-off power @ 200 feet (110)	- Riveting machine (110) - Rock and roll band (108-114)	110 dB(A) 16 times as loud
100		- Jet flyover @ 1,000 feet (103) - Boeing 707, DC-8 @ 6,080 feet before landing (106) - Bell J-2A helicopter @ 100 feet (100)		100 dB(A) 8 times as loud
90	Very loud	- Power mower (96) - Boeing 737, DC-9 @ 6,080 feet before landing (97) - Motorcycle @ 25 feet (90)	- Newspaper press (97)	90 dB(A) 4 times as loud
80		- Car wash @ 20 feet (89) - Prop airplane flyover @ 1,000 feet (88) - Diesel truck, 40 mph @ 50 feet (84) - Diesel train, 45 mph @ 100 feet (83)	- Food blender (88) - Milling machine (85) - Garbage disposal (80)	80 dB(A) 2 times as loud
70	Moderately loud	- High urban ambient sound (80) - Passenger car, 65 mph @ 25 feet (77) - Freeway @ 50 feet from pavement edge, 10:00 a.m. (76 ±6)	- Living room music (76) - TV audio, vacuum cleaner	70 dB(A)

Table 4.8-1: Sound Levels and Human Response

dB(A)	Overall Level - Sound Pressure Level Reference: 0.0002 Microbars	Community (Outdoor) ¹	Home or Industry ¹	Loudness - Human Judgment of Different Sound Levels
60		- Air conditioning unit @ 100 feet (60)	- Cash register @ 10 feet (65-70) - Electric typewriter @ 10 feet (64) - Dishwasher (rinse) @ 10 feet (60) - Conversation (60)	60 dB(A) half as loud
50	Quiet	- Large transformers @ 100 feet (50)		50 dB(A) one-quarter as loud
40		- Bird calls (44) - Lower limit urban ambient sound (40)		40 dB(A) one-eighth as loud
20	Just audible	- Desert at night (dB(A) scale interrupted)		
10	Threshold of hearing			

Notes:

1 Numbers in Parentheses are the A-Scale Weighted Sound Levels for that Noise Event.

Table 4.8-2: Noise Descriptors

Term	Definition
Decibel (dB)	The unit for measuring the volume of sound equal to 10 times the logarithm (base 10) of the ratio of the pressure of a measured sound to a reference pressure (20 micropascals).
A-Weighted Decibel (dBA)	A sound measurement scale that adjusts the pressure of individual frequencies according to human sensitivities. The scale accounts for the fact that the region of highest sensitivity for the human ear is between 2,000 and 4,000 cycles per second (hertz).
Equivalent Sound Level (Leq)	The sound level containing the same total energy as a time varying signal over a given time period. The Leq is the value that expresses the time averaged total energy of a fluctuating sound level.
Maximum Sound Level (Lmax)	The highest individual sound level (dBA) occurring over a given time period.
Minimum Sound Level (Lmin)	The lowest individual sound level (dBA) occurring over a given time period.

Table 4.8-2: Noise Descriptors

Term	Definition
Community Noise Equivalent Level (CNEL)	A rating of community noise exposure to all sources of sound that differentiates between daytime, evening, and nighttime noise exposure. These adjustments are +5 dBA for the evening, 7:00 p.m. to 10:00 p.m., and +10 dBA for the night, 10:00 p.m. to 7:00 a.m.
Day/Night Average (Ldn)	The Ldn is a measure of the 24-hour average noise level at a given location. It was adopted by the U.S. Environmental Protection Agency (EPA) for developing criteria for the evaluation of community noise exposure. It is based on a measure of the average noise level over a given time period called the Leq. The Ldn is calculated by averaging the Leq's for each hour of the day at a given location after penalizing the "sleeping hours" (defined as 10:00 p.m. to 7:00 a.m.), by 10 dBA to account for the increased sensitivity of people to noises that occur at night.
Exceedance Level (Ln)	The A-weighted noise levels that are exceeded 1%, 10%, 50%, and 90% (L01, L10, L50, L90, respectively) of the time during the measurement period.

Source: Cyril M. Harris, Handbook of Noise Control, 1979.

Health Effects of Noise

Human response to sound is highly individualized. Annoyance is the most common issue regarding community noise. The percentage of people claiming to be annoyed by noise generally increases with the environmental sound level. However, many factors also influence people's response to noise. The factors can include the character of the noise, the variability of the sound level, the presence of tones or impulses, and the time of day of the occurrence. Additionally, non-acoustical factors, such as the person's opinion of the noise source, the ability to adapt to the noise, the attitude towards the source and those associated with it, and the predictability of the noise, all influence people's response. As such, response to noise varies widely from one person to another and with any particular noise, individual responses will range from "not annoyed" to "highly annoyed."

When the noise level of an activity rises above 70 dBA, the chance of receiving a complaint is possible, and as the noise level rises, dissatisfaction among the public steadily increases. However, an individual's reaction to a particular noise depends on many factors, such as the source of the sound, its loudness relative to the background noise, and the time of day. The reaction to noise can also be highly subjective; the perceived effect of a particular noise can vary widely among individuals in a community.

The effects of noise are often only transitory, but adverse effects can be cumulative with prolonged or repeated exposure. The effects of noise on the community can be organized into six broad categories:

- Noise-Induced Hearing Loss;
- Interference with Communication;
- Effects of Noise on Sleep;
- Effects on Performance and Behavior;
- Extra-Auditory Health Effects; and
- Annoyance.

Although it often causes discomfort and sometimes pain, noise-induced hearing loss usually takes years to develop. Noise-induced hearing loss can impair the quality of life through a reduction in the ability to hear important sounds and to communicate with family and friends. Hearing loss is one of the most obvious and easily quantified effects of excessive exposure to noise. While the loss may be temporary at first, it could become permanent after continued exposure. When combined with hearing loss associated with aging, the amount of hearing loss directly caused by the environment is difficult to quantify. Although the major cause of noise-induced hearing loss is occupational, substantial damage can be caused by non-occupational sources.

According to the United States Public Health Service, nearly ten million of the estimated 21 million Americans with hearing impairments owe their losses to noise exposure. Noise can mask important sounds and disrupt communication between individuals in a variety of settings. This process can cause anything from a slight irritation to a serious safety hazard, depending on the circumstance. Noise can disrupt face-to-face communication and telephone communication, and the enjoyment of music and television in the home. It can also disrupt effective communication between teachers and pupils in schools, and can cause fatigue and vocal strain in those who need to communicate in spite of the noise.

Interference with communication has proved to be one of the most important components of noise-related annoyance. Noise-induced sleep interference is one of the critical components of community annoyance. Sound level, frequency distribution, duration, repetition, and variability can make it difficult to fall asleep and may cause momentary shifts in the natural sleep pattern, or level of sleep. It can produce short-term adverse effects on mood changes and job performance, with the possibility of more serious effects on health if it continues over long

periods. Noise can cause adverse effects on task performance and behavior at work, and non-occupational and social settings. These effects are the subject of some controversy, since the presence and degree of effects depends on a variety of intervening variables. Most research in this area has focused mainly on occupational settings, where noise levels must be sufficiently high and the task sufficiently complex for effects on performance to occur.

Recent research indicates that more moderate noise levels can produce disruptive after-effects, commonly manifested as a reduced tolerance for frustration, increased anxiety, decreased incidence of “helping” behavior, and increased incidence of “hostile” behavior. Noise has been implicated in the development or exacerbation of a variety of health problems, ranging from hypertension to psychosis. As with other categories, quantifying these effects is difficult due to the amount of variables that need to be considered in each situation. As a biological stressor, noise can influence the entire physiological system. Most effects seem to be transitory, but with continued exposure some effects have been shown to be chronic in laboratory animals.

Annoyance can be viewed as the expression of negative feelings resulting from interference with activities, as well as the disruption of one’s peace of mind and the enjoyment of one’s environment. Field evaluations of community annoyance are useful for predicting the consequences of planned actions involving highways, airports, road traffic, railroads, or other noise sources. The consequences of noise-induced annoyance are privately held dissatisfaction, publicly expressed complaints to authorities, and potential adverse health effects, as discussed above. In a study conducted by the United States Department of Transportation, the effects of annoyance to the community were quantified. In areas where noise levels were consistently above 60 dBA CNEL, approximately nine percent of the community is highly annoyed. When levels exceed 65 dBA CNEL, that percentage rises to 15 percent. Although evidence for the various effects of noise have differing levels of certainty, it is clear that noise can affect human health. Most of the effects are, to a varying degree, stress related.

Vibration Descriptors

Vibrations caused by construction activities can be interpreted as energy transmitted in waves through the ground. These energy waves generally dissipate with distance from the vibration source (e.g., pile driving or sheet pile driving). Energy is lost during the transfer of energy from one particle to another, and vibration becomes less perceptible as distance from the source increases. Vibration attenuates as a function of the distance between the source and receptor. Vibration emanating from a single location (a “point source”) attenuates at a rate of approximately 50 percent for each doubling of distance from the source (termed the “inverse square law”). This calculation tends to underestimate attenuation, and thus provides a “worst-case” estimate of vibration at the receptor.

Vibration is an oscillatory motion that can be described in terms of displacement, velocity, or acceleration. Peak particle velocity (PPV) is defined as the maximum instantaneous positive or negative peak of the vibration signal. PPV is used to assess the potential for damage to buildings and structures and is expressed in inches per second (in/sec).

The responses of human receptors and structures to vibration are influenced by a combination of factors, including soil/rock type, distance from the source, duration, and the number of perceived vibration events. Energy transmitted through the ground as vibration can reach levels that cause structural damage; however, humans are very sensitive to vibration, and the vibration amplitudes that can be perceived by humans are well below the levels that cause architectural or structural damage.

Some reference values for vibration are as follows: (1) a freight train passing at a distance of 100 feet can result in vibrations of 0.1 in/sec PPV, and (2) a strong earthquake can produce vibrations in the range of 10 in/sec PPV.

Sensitive Receptors

Land uses surrounding the proposed project site consist of residential uses. Noise sensitive land uses are typically defined as residences, schools, institutions, places of worship, hospitals, care centers and hotels. The closest single-family home to the project site is approximately 50 feet from the project's western boundary. Other noise-sensitive land uses near the project site include a residential single-family home located approximately 60 feet from the project's northern boundary.

Existing Noise Environment

Existing Traffic Noise Levels

Two continuous 24-hour noise level measurements were conducted on the project site on Wednesday, July 20th, 2016 by j.c. brennan & associates, Inc. staff. The noise measurement locations are shown in **Figure 4.8-1: Noise Measurement Locations**. The sound level meters were programmed to collect hourly noise level intervals during the survey. The maximum value (L_{max}) represents the highest noise level measured during each one-hour period, the average value (L_{eq}) represents the energy average of all of the noise measured during each one-hour period, and the median value (L_{50}) represents the sound level exceeded 50 percent of the time during each one-hour period.

The noise level measurement survey results are provided in *Table 4.8-3: Summary of Existing Background Noise Measurements*. The complete results of the continuous noise level measurements are included in Appendix I of this EIR.

Table 4.8-3: Summary of Existing Background Noise Measurements

Site	Location	Date	Ldn	Average Measured Hourly Noise Levels, dB					
				Daytime (7am-10pm)			Nighttime (10pm-7am)		
				Leq	L50	Lmax	Leq	L50	Lmax
Continuous (24-hour) Noise Level Measurements									
A	Old Auburn Rd., 42 ft. from centerline	7/20/2016	64	61	58	82	56	46	77
B	Sierra College Blvd., 111 ft. from centerline	7/20/2016	70	67	64	82	63	52	79

Source: j.c. brennan & associates, Inc., 2016.



Source: j.c. brennan and associates, 2016

FIGURE 4.8-1: Noise Measurement Locations
Placer Retirement Residence
Placer County

4.8.2 REGULATORY AND PLANNING FRAMEWORK

Federal, state, and local noise guidelines and ordinances that are relevant to the proposed project are summarized below.

FEDERAL

Federal regulations establish noise limits for medium and heavy trucks (more than 4.8 tons, gross vehicle weight rating) under 40 Code of Federal Regulations (CFR), Part 205, Subpart B. These controls are implemented through regulatory controls on truck manufacturers. The federal truck pass-by noise standard is 80 dBA at 15 meters from the vehicle pathway centerline. These controls are implemented through regulatory controls on truck manufacturers. The FTA has developed criteria for estimating the significance of vibration levels at acoustically sensitive receptors. These criteria are summarized in *Table 4.8-4: Groundborne Vibration Impact Criteria for General Assessment*.

Table 4.8-4: Groundborne Vibration Impact Criteria for General Assessment

Land Use Category	GVB Impact Levels (VdB re: 1 micro-inch/second)		
	Frequent Events ¹	Occasional Events ²	Infrequent Events ³
Category 1: Buildings where vibration would interfere with interior operations	654	654	654
Category 2: Residences and buildings where people normally sleep	72	75	80
Category 3: Institutional land uses with primarily daytime uses	75	78	83

Notes:

- 1 "Frequent Events" is defined as more than 70 vibration events of the same source per day.
- 2 "Occasional Events" is defined as between 30 and 70 vibration events of the same source per day.
- 3 "Infrequent Events" is defined as fewer than 30 vibration events of the same source per day.
- 4 This criterion limit is based on levels that are acceptable for most moderately sensitive equipment. Vibration-sensitive manufacturing or research will require detailed evaluation to define the acceptable vibration levels.

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

STATE

The State Building Code, Title 24, Part 2 of the State of California Code of Regulations establishes uniform minimum noise insulation performance standards to protect persons within new buildings which house people, including hotels, motels, dormitories, apartment houses and dwellings other than single-family dwellings. Title 24 mandates that interior noise levels attributable to exterior sources shall not exceed 45 dB Ldn or CNEL in any habitable room.

Title 24 also mandates that for structures containing noise-sensitive uses to be located where the Ldn or CNEL exceeds 60 dB, an acoustical analysis must be prepared to identify mechanisms for limiting exterior noise to the prescribed allowable interior levels. If the interior allowable noise levels are met by requiring that windows be kept closed, the design for the structure must also specify a ventilation or air conditioning system to provide a habitable interior environment.

COUNTY

Placer County General Plan. The goals and policies of the Placer County General Plan Noise Element applicable to the proposed project are discussed in *Table 4.8-6: General Plan Goals and Policies – Noise*.

Additionally, Policy 9.A.12 of the General Plan states:

Where noise mitigation measures are required to achieve the standards of Tables 9-1 and 9-3, the emphasis of such measures shall be placed upon site planning and project design. The use of noise barriers shall be considered as a means of achieving the noise standards only after all other practical design-related noise mitigation measure have been integrated into the project.

More specifically, *Table 4.8-5: Allowable Noise Levels for New Projects Affected by Non-Transportation Noise Sources*, provides a summary of the allowable noise levels for new projects that could be affected by non-transportation noise sources.

**Table 4.8-5: Allowable Noise Levels for New Projects Affected by Non-Transportation Noise Sources
(Table 9-1 of the Placer County General Plan)**

Zone District of Receptor	Property Line of Receiving Use	Interior Space ¹
Residential adjacent to industrial	60 dBA	45 dBA
Other Residential	50 dBA	45 dBA
Office/Professional	70 dBA	45 dBA
Open Space	---	---
Neighborhood Commercial	70 dBA	45 dBA

Notes:

- Except where noted otherwise, noise exposures will be those which occur at the property line of the receiving use.
- Where existing transportation noise levels exceed the standards of this table, the allowable L_{dn} shall be raised to the same level as that of the ambient level.
- If the noise source generated by, or affecting, the uses shown above consists primarily of speech or music, or if the noise source is impulsive in nature, the noise standards shown above shall be decreased by 5 dB.

¹ 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.

Table 9-1 of the Placer County General Plan Noise Element has been summarized for use on this project; please see the Placer County General Plan Noise Element for the full Table and Footnotes.

Granite Bay Community Plan. The Granite Bay Community Plan establishes specific goals and policies which are intended to provide a means to achieve noise-compatible land uses in the vicinity of existing or planned noise producing sources. The goals and policies of the Granite Bay Community Plan Health and Safety Element applicable to the proposed project are discussed in *Table 4.8-7: Granite Bay Community Plan Goals and Policies – Noise*.

Table 4.8-6 General Plan Goals and Policies – Noise

General Plan Goals and Policies	Consistency Determination	Analysis
<p>Goal 9A: To protect County residents from the harmful and annoying effects of exposure to excessive noise.</p>	Consistent	<p>The project is consistent with this goal. The project proposes a residential care home for seniors on an 8.9-acre lot with building setbacks that far exceed 30-foot side setback and 50-foot front setback required by the RA zone. As such, the project would not expose residents to excessive transportation noise and does not require the use of sound walls. The proposed project is a residential use and is not considered to be a land use that would be anticipated to generate excessive noise.</p>
<p>Policy 9.A.1: New development of noise-sensitive uses shall not be permitted where the noise level due to non-transportation noise sources will exceed the noise level standards of Table 9-1 as measured immediately within the property line of the new development, unless effective noise mitigation measures have been incorporated into the development design to achieve the standards specified in 9-1.</p>	Consistent	<p>The project is consistent with this policy. The project would not locate future residents close to any non-transportation noise source that would exceed the noise level standards of Table 9-1. No significant non-transportation noise sources have been identified in the surrounding community.</p>
<p>Policy 9.A.6: The feasibility of proposed projects with respect to existing and future transportation noise levels shall be evaluated by comparison to Table 9-3.</p>	Consistent	<p>The project is consistent with this policy. The project includes a building design and building setbacks that would shield future residents from excessive noise levels (both interior and exterior) that would exceed the noise level standards of Table 9-3.</p>
<p>Policy 9.A.8: New development of noise-sensitive land uses shall not be permitted in areas exposed to existing or projected levels of noise from transportation noise sources, including airports, which exceed the levels</p>	Consistent	<p>The project is consistent with this policy. The project would not be exposed to excessive levels of transportation noise, including airports which would exceed the noise level standards of Table 9-3. The proposed courtyard outdoor use area would comply with the Placer County 60 dB Ldn exterior noise level standard and no exterior noise control measures would be required. Based upon the data in Table 4.8-11, the</p>

Table 4.8-6 General Plan Goals and Policies – Noise

General Plan Goals and Policies	Consistency Determination	Analysis
<p>specified in Table 9-3, unless the project design includes effective mitigation measures to reduce noise in outdoor activity areas and interior spaces to the levels specified in Table 9-3.</p>		<p>maximum exterior building facade noise level is 69 dB Ldn. Therefore, as long as exterior noise levels at the building facades do not exceed 70 dB Ldn, the interior noise levels would typically comply with the interior noise level standard of 45 dB Ldn. Therefore, no additional interior noise control measures would be required.</p>
<p>Policy 9.A.10: Where noise-sensitive land uses are proposed in areas exposed to existing or projected exterior noise levels exceeding the levels specified in Table 9-1 or the performance standards of Table 9-1, 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.</p>	<p>Consistent</p>	<p>The project is consistent with this policy. A project specific noise analysis was prepared for the project and is included in the analysis in this chapter below. The project would not exceed the sound levels or performance standards specified in Table 9-3.</p>
<p>Policy 9.A.11: The County shall require one or more of the following mitigation measures where existing noise levels significantly impact existing noise-sensitive land uses, or where the cumulative increase in noise levels resulting from new development significantly impacts noise-sensitive land uses:</p> <ul style="list-style-type: none"> a. Rerouting traffic onto streets that have available traffic capacity and that do not adjoin noise-sensitive land uses; 	<p>Consistent</p>	<p>The project is consistent with this policy. With the exception of the project’s construction period, the proposed project would not create a significant operational noise effect for existing noise-sensitive land uses. Noise impacts during construction on existing noise sensitive land uses would be mitigated by compliance with Section 9.36.030 A.7 of the Placer County Noise Ordinance, which places limitations on construction times as defined in the County Code. The mitigation measures listed in Policy 9.A.11 would not be required.</p>

Table 4.8-6 General Plan Goals and Policies – Noise

General Plan Goals and Policies	Consistency Determination	Analysis
<ul style="list-style-type: none"> b. Lowering speed limits, if feasible and practical; c. Programs to pay for noise mitigation such as low-cost loans to owners of noise-impacted property or establishment of developer fees; d. Acoustical treatment of buildings; or, e. Construction of noise barriers. 		
<p>Policy 9.A.12: Where noise mitigation measures are required to achieve the standards of Tables 9-1 and 9-3, the emphasis of such measures shall be placed upon site planning and project design. The use of noise barriers shall be considered as a means of achieving the noise standards only after all other practical design-related noise mitigation measures have been integrated into the project.</p>	<p>Consistent</p>	<p>The project is consistent with this policy. No noise mitigation measures are required for the project and no sound walls are required nor proposed.</p>

Table 4.8-7: Granite Bay Community Plan Goals and Policies – Noise

Granite Bay Community Plan Goals and Policies	Consistency Determination	Analysis
<p>Goal 8.1.1: Provide for the health, safety and welfare of the Granite Bay area residents by providing a livable environment free from excessive noise.</p>	Consistent	<p>The project is consistent with this goal. The project proposes a residential care home for seniors on an 8.9-acre lot with building setbacks that far exceed 30-foot side setback and 50-foot front setback required by the RA zone. As such, the project would not expose residents to excessive transportation noise and does not require the use of sound walls. The proposed project is a residential use and is not considered to be a land use that would be anticipated to generate excessive noise.</p>
<p>Policy 8.1.1: Encourage the use of greenbelts or natural areas along roadways as a design feature of any development in order to mitigate noise impacts.</p>	Consistent	<p>The project is consistent with this policy. As shown in Figure 3-10, the project proposes an extensive landscape plan and proposes to retain as many existing trees as possible. Between the two roadway frontage option proposed, Option 2: Modified Frontage Improvements would retain more of the existing mature trees along Old Auburn Road.</p>
<p>Policy 8.1.2: Ensure compliance with noise standards adopted in the General Plan Noise Element.</p>	Consistent	<p>The project is consistent with this policy. A project specific noise analysis was prepared for the project and is included in the analysis in this chapter below. The project would not exceed the sound levels or performance standards specified in the General Plan.</p>
<p>Policy 8.1.3: Avoid the interface of noise-producing and noise-sensitive land uses.</p>	Consistent	<p>The project is consistent with this policy. The proposed project is a residential use and is not considered to be a land use that would be anticipated to generate excessive noise. The project is surrounded by other residential uses.</p>
<p>Policy 8.1.4: Noise emanating from construction activity that requires a grading or building permit is prohibited on Sundays and federal holidays, and shall only occur:</p> <ul style="list-style-type: none"> • Monday through Friday, 6 AM to 8 PM (during daylight savings) 	Consistent	<p>The project is consistent with this policy. The project would comply with Section 9.36.030 A.7 of the Placer County Noise Ordinance which places the limitations on construction times.</p>

Table 4.8-7: Granite Bay Community Plan Goals and Policies – Noise

Granite Bay Community Plan Goals and Policies	Consistency Determination	Analysis
<ul style="list-style-type: none"> • Monday through Friday, 7 AM to 8 PM (during standard time) • Saturdays, 8 AM to 6 PM 		
<p>Policy 8.1.6: New development of noise-sensitive land uses shall not be permitted in areas exposed to existing or projected levels of noise from transportation noise sources which exceed the levels specified in Table 8.1.3 (of the GBCP), unless the project includes effective mitigation measures to reduce exterior noise levels in interior spaces to the levels specified in Table 8.1.3.</p>	Consistent	The project is consistent with this policy. The proposed building setbacks far exceed the 30-foot side setback and 50-foot front setback required by the RA zone. As such, the project would not expose residents to excessive transportation noise and does not require the use of sound walls.
<p>Policy 8.1.7: Where noise mitigation measures are required to achieve the standards of Tables 8.1.2 and 8.1.3 (of the GBCP), the emphasis of such measures shall be placed upon site planning and project design. The use of noise barriers shall be considered as a means of achieving the noise standards only after all other practical design-related noise mitigation measures have been integrated into the project.</p>	Consistent	The project is consistent with this policy. No noise mitigation measures are required for the project and no sound walls are required nor proposed.
<p>Policy 8.1.8: The County shall employ procedures to ensure that noise mitigation measures required pursuant to an acoustical analysis are implemented in the project review process and, as</p>	Consistent	The project is consistent with this policy. A project specific acoustical analysis was prepared for the project and concluded that no noise mitigation measures are required.

Table 4.8-7: Granite Bay Community Plan Goals and Policies – Noise

Granite Bay Community Plan Goals and Policies	Consistency Determination	Analysis
<p>may be determined necessary, through the building permit process.</p>		
<p>Policy 8.1.9: Noise created by new proposed non-transportation noise sources shall be mitigated as not to exceed the noise level standards of Table 8.1.3 (of the GBCP) as measured immediately within the property line of lands designated for noise-sensitive uses such as residential.</p>	<p>Consistent</p>	<p>The project is consistent with this policy. The acoustical analysis prepared for the project concluded that the project would not generate non-transportation noise, or any noise that would exceed the sound level thresholds of Table 8.1.3 of the GBCP.</p>
<p>Policy 8.1.10: Protect Placer County's agricultural resources from noise complaints that may result from routine farming practices, through the enforcement of the Placer County Right-to-Farm Ordinance.</p>	<p>Consistent</p>	<p>The project is consistent with this policy. The project includes MM II-1 from the Initial Study (included in Appendix A) which requires the future facility managers of the proposed project to notify all future tenants of Placer County's Right-to-Farm Ordinance (Placer County Code Section 5.24.040).</p>

Placer County Noise Ordinance

The Placer County Code, Section 9.36.060 establishes sound limits for sensitive receptors, as shown in *Table 4.8-8: Hourly Exterior Noise Performance Standards for Stationary (Non-Transportation) Noise Sources*. The standards are measures at the property line of the receiving sensitive receptor. It should be noted that the County also applies a limit of 5 dB over the existing ambient noise level or the Table 4.8-5 standards, whichever is greater.

Section 9.36.020 of the code defines a sensitive receptor as “a land use in which there is a reasonable degree of sensitivity to noise. Such uses include single-family and multi-family residential uses, frequently used outbuildings, schools, hospitals, churches, rest homes, cemeteries, public libraries and other sensitive uses as determined by the enforcement officer.” The purpose of the Noise Ordinance is to implement the Noise Standards identified in the Placer County General Plan. The County Noise Ordinance is enforced with the Penal Code to establish standards for reported nuisance abatement and enforcement within the County.

Table 4.8-8: Hourly Exterior Noise Performance Standards for Stationary (Non- Transportation) Noise Sources

Noise Metric	Acceptable Noise Level, dBA	
	Daytime (7 a.m. – 10 p.m.)	Nighttime (10 p.m. – 7 a.m.)
L_{eq}	55	45
L_{max}	70	65

Section 9.36.030 A.7 of the Ordinance provides an exception for construction noise so long as all construction equipment is “fitted with factory installed muffling devices and that all construction equipment shall be maintained in good working order.” Allowable time periods for this construction noise are as follows: 6 a.m. to 8 p.m., Monday through Friday; and 8 a.m. to 8 p.m., Saturdays and Sundays. However, Planning Commission revisions to the Placer County Board of Supervisors Minute Order 90-08 indicate the following:

“Construction noise emanating from any construction activities for which a Grading or Building Permit is required is prohibited on Sundays and Federal Holidays, and shall only occur:

- Monday through Friday, 6:00 a.m. to 8:00 p.m. (during daylight savings)
- Monday through Friday, 7:00 a.m. to 8:00 p.m. (during standard time)
- Saturdays, 8:00 a.m. to 6:00 p.m.

In addition, temporary signs shall be located throughout the project, as determined by the Development Review Committee, at key intersections depicting the above construction hour limitations.”

Summary of Placer County Noise Standards

Transportation Noise

The Placer County General Plan Noise Element applies 60 dB Ldn/CNEL (exterior) and 45 dB (interior) Ldn/CNEL noise level standards for residential uses affected by transportation noise sources. Placer County may conditionally allow exterior noise levels between 60-65 dB Ldn for residential uses, provided that practical noise reduction measures have been implemented and interior noise levels remain in compliance with the 45 dB Ldn interior standard.

Non-Transportation Noise

For non-transportation noise sources, the Placer County Noise Ordinance standards shown in Table 4.8-8 are more restrictive than those contained in the Placer County General Plan. Therefore, the standards of the noise ordinance will be applied to non-transportation noise sources associated with the project.

Substantial Increase Criteria

The noise standards applicable to the project include the relevant portions of Placer County General Plan, the Placer County Noise Ordinance described in the Regulatory Framework section above, and the following common practice guidelines.

Generally, a project may have a significant effect on the environment if it will substantially increase the ambient noise levels for adjoining areas or expose people to measurably severe noise levels. In practice, a noise impact may be considered significant if it would generate noise that would conflict with local project criteria or ordinances, or substantially increase noise levels at noise sensitive land uses. The potential increase in traffic noise from the project is a factor in determining significance. Research into the human perception of changes in sound level indicates the following:

- A 3-dB change is barely perceptible,
- A 5-dB change is clearly perceptible, and
- A 10-dB change is perceived as being twice or half as loud.

Placer County, like many jurisdictions, does not have an adopted policy regarding significant increases in ambient noise. A common practice in many jurisdictions is to use a 3-5 dB increase as a threshold of significance. In Placer County, a 4-5 dB threshold is typically applied. For this project, the lower threshold of 4 dB will be applied.

Vibration Standards

Vibration is like noise in that it involves a source, a transmission path, and a receiver. While vibration is related to noise, it differs in that noise is generally considered to be pressure waves transmitted through air, whereas vibration usually consists of the excitation of a structure or surface. As with noise, vibration consists of an amplitude and frequency. A person’s perception to the vibration will depend on their individual sensitivity to vibration, as well as the amplitude and frequency of the source and the response of the system which is vibrating.

Vibration can be measured in terms of acceleration, velocity, or displacement. A common practice is to monitor vibration measures in terms of peak particle velocities in inches per second. Standards pertaining to perception as well as damage to structures have been developed for vibration levels defined in terms of peak particle velocities.

Placer County does not have specific policies pertaining to vibration levels. However, vibration levels associated with construction activities and project operations are addressed as potential noise impacts associated with project implementation.

Human and structural response to different vibration levels is influenced by a number of factors, including ground type, distance between source and receptor, duration, and the number of perceived vibration events. *Table 4.8-9: Effects of Vibration on People and Buildings* from CalTrans indicates that the threshold for damage to structures ranges from 0.2 to 0.6 peak particle velocity in inches per second (in/sec p.p.v). The general threshold at which human annoyance could occur is noted as 0.1 in/sec p.p.v.

Table 4.8-9: Effects of Vibration on People and Buildings

Peak Particle Velocity		Human Reaction	Effect on Buildings
mm/sec.	in./sec.		
0.15-0.30	0.006-0.019	Threshold of perception; possibility of intrusion	Vibrations unlikely to cause damage of any type
2.0	0.08	Vibrations readily perceptible	Recommended upper level of the vibration to which ruins and ancient monuments should be subjected

Table 4.8-9: Effects of Vibration on People and Buildings

Peak Particle Velocity		Human Reaction	Effect on Buildings
mm/sec.	in./sec.		
2.5	0.10	Level at which continuous vibrations begin to annoy people	Virtually no risk of “architectural” damage to normal buildings
5.0	0.20	Vibrations annoying to people in buildings (this agrees with the levels established for people standing on bridges and subjected to relative short periods of vibrations)	Threshold at which there is a risk of “architectural” damage to normal dwelling - houses with plastered walls and ceilings. Special types of finish such as lining of walls, flexible ceiling treatment, etc., would minimize “architectural” damage
10-15	0.4-0.6	Vibrations considered unpleasant by people subjected to continuous vibrations and unacceptable to some people walking on bridges	Vibrations at a greater level than normally expected from traffic but would cause “architectural” damage and possibly minor structural damage.

Source: Caltrans. Transportation Related Earthborne Vibrations. TAV-02-01-R9601 February 20, 2002.

4.8.3 POTENTIAL IMPACTS AND MITIGATION MEASURES

Significance Criteria and Thresholds

Based on criteria derived from Appendix G of the CEQA Guidelines, an impact is considered significant if the proposed project would result in:

- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?
- Exposure of persons to or generation of noise levels in excess of standards established in the local General Plan, Community Plan or noise ordinance, or applicable standards of other agencies?
- A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?
- For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?
- For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

- Expose people to or generate excessive groundborne vibration or groundborne noise levels?

Based on the Project's location, no impacts are anticipated with respect to the following criteria:

- For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?
- For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

These criteria would not apply because the project site is not located in the vicinity of a public airport, within the boundaries of an airport land use plan, or the vicinity of a private airstrip. Temporary noise resulting from construction and permanent noise increases resulting from operation would not expose people residing or working in the vicinity of a public or private airport to excessive noise levels. No further analysis of this issue is required in the EIR.

Methodology

The noise impact assessment evaluates short-term (temporary) impacts associated with project construction as well as long-term (permanent) impacts resulting from project operation. For construction noise, the potential for impacts is assessed by considering several factors, including the proximity of construction-related noise sources to sensitive receptors, typical noise levels associated with construction equipment (including trucks), the potential for construction noise levels to interfere with adjacent residential and hotel activities, the duration that sensitive receptors would be affected, and whether proposed activities would occur outside the construction time limits specified in the Placer County Noise Ordinance. For operational noise, this impact evaluation determines the potential for impact by assessing long-term noise increases from project-related traffic increases on local roadways, emergency vehicles, garbage collection and truck deliveries.

CONSTRUCTION NOISE

Significance Criteria 4.8-1: Would the project result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project? (Less Than Significant Impact)

During the construction of the proposed project, including roads, water and sewer lines, and related infrastructure, noise from construction activities would temporarily add to the noise

environment in the project vicinity. As shown in *Table 4.8-10: Typical Construction Equipment Noise*, activities involved in construction would generate maximum noise levels ranging from 76 to 90 dB at a distance of 50 feet.

Table 4.8-10: Typical Construction Equipment Noise

Type of Equipment	Maximum Level, dB at 50 feet
Auger Drill Rig	84
Backhoe	78
Compactor	83
Compressor (air)	78
Concrete Saw	90
Dozer	82
Dump Truck	76
Excavator	81
Generator	81
Jackhammer	89
Pneumatic Tools	85

Source: Roadway Construction Noise Model User's Guide. Federal Highway Administration. FHWA-HEP-05-054. January 2006.

Residential receptors located around the project are located approximately 50-100 feet from the project site. Assuming worst-case scenario that construction activity would occur at these distances, maximum construction noise levels would be 70-90 dB Lmax. However, the majority of construction activity on the project site would occur at distances much greater than 50 feet. Construction activity occurring in the center of the project site would be located approximately 300 feet from the nearest residential receptors. At this distance construction noise levels would be approximately 60-74 dB Lmax.

Construction could result in periods of elevated ambient noise levels and the potential for annoyance, especially when construction occurs in close proximity to residential receptors, such as during parking lot grading and paving, or during off-site roadway improvements. However, Placer County establishes allowable hours of operation and noise limits for construction activities to minimize disturbance associated with construction activities. Compliance with the County's construction policies would minimize the potential for annoyance and ensure that existing uses are not exposed to excessive noise from construction activities. Therefore, potential impacts are considered **less than significant**.

Option 1: Full Frontage Improvements – (Less Than Significant Impact)

Under the Full Frontage Improvements option, the development would include the same project design as discussed above with the exception of the Old Auburn Road westbound roadway improvements and the eastbound turn lane to southbound Sierra College Boulevard. These

improvements would comply with Placer County allowable hours of operation and noise limits for construction activities to minimize disturbance associated with construction activities. Compliance with the County's construction policies would minimize the potential for annoyance and ensure that existing uses are not exposed to excessive noise from construction activities. Therefore, potential impacts are considered **less than significant**.

Option 2: Modified Frontage Improvements (the Proposed Project) – (Less Than Significant Impact)

The proposed project, under the Modified Frontage Improvements option would have the same project components as what was evaluated above. This option would include roadway frontage improvements within existing right of way areas along Old Auburn Road. Because this option would not involve as much earthwork as the Full Frontage Improvements option, construction noise impacts would be incrementally less under this option. These improvements would comply with Placer County allowable hours of operation and noise limits for construction activities to minimize disturbance associated with construction activities. Compliance with the County's construction policies would minimize the potential for annoyance and ensure that existing uses are not exposed to excessive noise from construction activities. Therefore, potential impacts are considered **less than significant**.

EXPOSURE TO NOISE

Significance Criteria 4.8-2: Would the project result in the exposure of persons to or generation of noise levels in excess of standards established in the local General Plan, Community Plan or noise ordinance, or applicable standards of other agencies? (Less Than Significant Impact).

Future Traffic Noise Levels

To determine the future traffic noise levels on the project site, j.c. brennan & associates, Inc., utilized the noise prediction model and future traffic forecasts obtained from the traffic study prepared for the project. *Table 4.8-11: Predicted Future Traffic Noise Levels* shows the predicted future traffic noise levels on the proposed project.

Table 4.8-11: Predicted Future Traffic Noise Levels

Location	Distance	Predicted Traffic Noise Levels, DNL
Old Auburn Road – Future ADT=14,285		
1st Floor Façade	230 ft.	55 dB
2nd/ 3rd Floor Façade	230 ft.	58 dB
Sierra College Boulevard – Future ADT=35,400		
Courtyard Outdoor Activity Area	350 ft.	58 dB
1st Floor Façade	220 ft.	66 dB
2nd/ 3rd Floor Façade	220 ft.	69 dB

Sources: j.c. brennan & associates, Inc., and FHWA RD-77-108

Exterior Traffic Noise Levels

Based upon the predicted future traffic noise levels shown in Table 4.6-8, the proposed courtyard outdoor use area would comply with the Placer County 60 dB Ldn exterior noise level standard and no exterior noise control measures would be required. Potential impacts on exterior traffic noise levels are considered **less than significant**.

Interior Traffic Noise Levels

Standard construction practices, consistent with the uniform building code typically provide an exterior-to-interior noise level reduction of approximately 25 dB, assuming that air conditioning is included for each unit, which allows residents to close windows for the required acoustical isolation. Therefore, as long as exterior noise levels at the building facades do not exceed 70 dB Ldn, the interior noise levels would typically comply with the interior noise level standard of 45 dB Ldn. Based upon the data in Table 4.8-11, the maximum exterior building facade noise level is 69 dB Ldn. Therefore, no additional interior noise control measures would be required. As a residential care home, the project would have a heating, venting, and air conditioning system that would allow occupants to close windows if desired. Therefore, potential impacts are considered **less than significant**.

Option 1: Full Frontage Improvements – (Less Than Significant Impact)

Under the Full Frontage Improvements option, the development would include the same project design as discussed above with the exception of the Old Auburn Road westbound roadway improvements and the eastbound turn lane to southbound Sierra College Boulevard. The construction period of these improvements would be temporary and would not expose people or generate noise at a level that exceeds thresholds established by the County. Therefore, potential impacts are considered **less than significant**.

Option 2: Modified Frontage Improvements (the Proposed Project) – (Less Than Significant Impact)

The proposed project, under the Modified Frontage Improvements option would have the same project components as what was evaluated above. This option would include roadway frontage improvements within existing right of way areas along Old Auburn Road. The construction period of these improvements would be temporary and would not expose people or generate noise at a level that exceeds thresholds established by the County. Therefore, potential impacts are considered **less than significant**.

OPERATIONAL NOISE

Significance Criteria 8-3: Would the project result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project? (Less Than Significant Impact)

The proposed residential care home is a use that is not expected to generate a substantial amount of noise. Operational activities include trips to and from the site from residents, visitors, and employees; truck deliveries; weekly refuse collection; and daily activities typical of a senior residential home. Noise generated from emergency vehicles coming to and from the site could potentially increase noise levels in the project vicinity. Comments received from the NOP specifically raised concerns about noise impacts from emergency vehicles. Saxleby Acoustics prepared an Addendum (Appendix I) to the J.C. Brennan & Associates Noise Study to analyze potential noise impacts from emergency vehicles, weekly refuse collection and truck deliveries. The results from the Addendum are discussed below.

Increased Traffic Noise Due to Project

The traffic study prepared for the project indicates that the project could increase traffic on Old Auburn Road by 345 daily trips. This would equate to an increase in traffic noise of approximately 0.1 dB on Old Auburn Road and 0.05 dB on Sierra College Boulevard. These are negligible differences and substantially less than the 4 dB significance criterion used in Placer County. Therefore, potential impacts from project generated traffic noise are **less than significant**.

On-Site Parking Lot Circulation Noise Impact Assessment

Parking lot noise levels generally are a result of vehicles arriving or departing, car doors slamming and people talking. Noise level data for parking lot activities indicate that a typical sound

exposure level (SEL) of 71 dB at a distance of 50 feet characterizes a typical vehicle arrival and departure.

The traffic analysis indicates that the weekday PM peak hour trip movements for the project site would include 27 vehicles entering or exiting the project site. Based upon 27 PM peak hour trips, the noise exposure for parking lot activities can be calculated as follows:

$$Leq = 71 + 10 * \log (27) - 35.6, \text{ dB}$$

71 is the mean sound exposure levels (SEL) for an automobile arrival and departure, and $10 * \log (27)$ is 10 times the logarithm of the number of vehicle trips per hour, and 35.6 is 10 times the logarithm of the number seconds in an hour.

The formula indicates that the predicted peak hour Leq at a distance of 50 feet is 50 dBA Leq. The nearest existing noise sensitive receptors are located further than 50 feet from the nearest parking lots. Therefore, the proposed project is not predicted to generate parking lot noise which would exceed the County's 55 dB Leq noise level standard at adjacent uses. Potential impacts are considered **less than significant**.

Emergency Vehicle Access

Each suite is outfitted with an emergency pull system that notifies onsite managers when a resident needs help. The managers are on site 24-hours a day and they are the first responders to residents in the case of an emergency. Based on similar operations in the other locations throughout the United States and Canada operated by the applicant, the call system and the management team interventions have been able to significantly reduce the overall impact on the emergency services because the staff can assist the residents and help manage non-emergency calls as well as assist residents with transportation needs in non-emergency medical situations.

Noise from emergency response is specifically exempted under the Placer County Noise Ordinance section 9.36.030.A.6. However, noise generated from emergency response vehicles could result in an increase in ambient noise levels in the vicinity above levels existing without the project. Project operations are designed to reduce the need for emergency services in that managers would be available onsite 24 hours per day to assist residents. Compared to nursing homes or facilities specializing in memory care, the proposed project is expected to generate less emergency calls and noise from emergency response vehicles would be temporary. Therefore, potential impacts are considered **less than significant**.

Garbage Collection

The proposed project would receive garbage collection once per week. Garbage collection is a normal component of modern living and as such is typically considered to be exempt under the Placer County Noise Ordinance section 9.36.030.A.1 which exempts sound sources typically associated with residential uses.

It should be noted that garbage collection at the closest single-family residential use currently occurs at approximately 50 feet from that residence. Garbage collection occurring on the proposed project site would occur at approximately 190 feet from the nearest residential use. Therefore, with the increased distance, it is expected that noise levels associated with garbage collection would be 11 dB less than existing garbage collection noise levels at existing offsite receptors. This would be considered half as loud as existing garbage collection noise. As such, potential impacts are considered **less than significant**.

Truck Deliveries

The proposed project would receive food deliveries twice per week by a 20-30-foot semi-truck, bread deliveries twice per week by a panel truck, and daily UPS delivery Monday through Friday.

A typical semi-truck delivery results in a sound exposure level (SEL) of approximately 84 dBA at a distance of 50 feet. UPS and bread trucks typically produce a lower SEL. However, for this analysis it would be assumed that a peak hour of deliveries could include a semi-truck and a UPS or bread truck, both generating 84 dBA SEL at 50 feet.

Assuming a total of two operations, the hourly noise exposure for truck deliveries can be calculated as follows:

$$Leq = 87 + 10 * \log (2) - 35.6, \text{ dB}$$

87 is the mean sound exposure levels (SEL) for a truck delivery, and $10*\log(2)$ is 10 times the logarithm of the number of deliveries per hour, and 35.6 is 10 times the logarithm of the number seconds in an hour.

The formula indicates that the predicted peak hour noise level at 50 feet is 51.4 dBA Leq. The property line of nearest existing noise sensitive receptor is located approximately 185 feet from the truck delivery area located on the north side of the project. At this distance, delivery noise is predicted to be 43 dBA Leq. Therefore, the proposed project is not predicted to generate truck delivery noise which would exceed the County's 55 dB Leq noise level standard at adjacent uses. Potential impacts are considered **less than significant**.

Option 1: Full Frontage Improvements – (Less Than Significant Impact)

Under the Full Frontage Improvements option, the development would include the same project design as discussed above with the exception of the Old Auburn Road westbound roadway improvements and the eastbound turn lane to southbound Sierra College Boulevard. Once constructed, these improvements would not expose people or generate noise at a level that exceeds thresholds established by the County. Therefore, potential impacts are considered **less than significant**.

Option 2: Modified Frontage Improvements (the Proposed Project) – (Less Than Significant Impact)

The proposed project, under the Modified Frontage Improvements option would have the same project components as what was evaluated above. This option would include roadway frontage improvements within existing right of way areas along Old Auburn Road. Once constructed, these improvements would be temporary and would not expose people or generate noise at a level that exceeds thresholds established by the County. Therefore, potential impacts are considered **less than significant**.

CONSTRUCTION VIBRATION

Significance Criteria 4.8-4: Would the project expose people to or generate excessive groundborne vibration or groundborne noise levels? (Less Than Significant Impact)

Construction Vibration

Construction vibration impacts include human annoyance and building structural damage. Human annoyance occurs when construction vibration rises significantly above the threshold of perception. Building damage can take the form of cosmetic or structural.

The primary vibration-generating activities associated with the proposed project would occur during construction when activities such as grading, utilities placement, and parking lot construction occur. *Table 4.8-12: Vibration Levels for Various Construction Equipment*, shows the typical vibration levels produced by construction equipment. All or some of this construction equipment may be used during various construction phases of the project.

The Table 4.8-12 data indicate that construction vibration levels anticipated for the project are less than the 0.2 in/sec p.p.v. threshold of damage to buildings and less than the 0.1 in/sec threshold of annoyance criteria at distances of 50 feet. Sensitive receptors which could be impacted by construction related vibrations, especially vibratory compactors/rollers, are located

approximately 50-100 feet, or further, from the project site. At these distances construction vibrations are not predicted to exceed acceptable levels. Additionally, construction activities would be temporary in nature and would likely occur during normal daytime working hours.

Table 4.8-12: Vibration Levels for Various Construction Equipment

Type of Equipment	Peak Particle Velocity at 25 feet (inches/second)	Peak Particle Velocity at 50 feet (inches/second)	Peak Particle Velocity at 100 feet (inches/second)
Large Bulldozer	0.089	0.031	0.011
Loaded Trucks	0.076	0.027	0.010
Small Bulldozer	0.003	0.001	0.000
Auger/drill Rigs	0.089	0.031	0.011
Jackhammer	0.035	0.012	0.004
Vibratory Hammer	0.070	0.025	0.009
Vibratory Compactor/roller	0.210 (Less than 0.200 at 26 feet or more)	0.074	0.026

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

Because construction vibrations are not predicted to cause damage to existing buildings or cause annoyance to sensitive receptors, implementation of the proposed project would not expose persons to or generate excessive groundborne vibration or groundborne noise levels. Potential impacts from groundborne vibration are considered **less than significant**.

Option 1: Full Frontage Improvements – (Less Than Significant Impact)

Under the Full Frontage Improvements option, the development would include the same project design as discussed above with the exception of the Old Auburn Road westbound roadway improvements and the eastbound turn lane to southbound Sierra College Boulevard. The proposed roadway improvements would be similar in scale and duration to other roadway improvements completed for development projects throughout the region using similar equipment in residential areas. No impacts from groundborne vibration or groundborne noise have been identified. Therefore, potential impacts are considered **less than significant**.

Option 2: Modified Frontage Improvements (the Proposed Project) – (Less Than Significant Impact)

The proposed project, under the Modified Frontage Improvements option would have the same project components as what was evaluated above. This option would include roadway frontage improvements within existing right of way areas along Old Auburn Road. The proposed roadway improvements would be similar in scale and duration to other roadway improvements completed

for development projects throughout the region using similar equipment in residential areas. No impacts from groundborne vibration or groundborne noise have been identified. Therefore, potential impacts are considered **less than significant**.

4.8.4 CUMULATIVE IMPACTS

Chapter 5.5 of this EIR provides a list of related projects and other possible development in the area determined as having a direct potential to interact with the proposed project (to the extent that a significant cumulative effect could occur) are identified in *Table 5-1: Cumulative Projects*. **Figure 5-1: Cumulative Projects Map** identifies the location of the cumulative projects.

Cumulative construction noise impacts could result if construction of more than one of the planned projects occurred in the same vicinity at the same time. If this occurred some adjacent receptors could be subject to additive noise from more than one construction project at the same time. One subdivision map, The Park at Granite Bay project located 0.1 mile (500 feet) has been approved to the north of the proposed project. Noise levels from these construction projects would occur at distances of approximately 300 feet or greater from the project site and would not substantially add to noise from construction of the proposed project. The GBCP does not put limits on construction noise levels, only restrictions on the hours of operation:

Construction is prohibited on Sundays and federal holidays, and shall only occur:

- Monday through Friday, 6 AM to 8 PM (during daylight savings)
- Monday through Friday, 7 AM to 8 PM (during standard time)
- Saturdays, 8 AM to 6 PM

The next closest projects are the Ovation Senior Living project, located approximately 0.2-mile (1,000 feet) from the project site, and the Roseville Congregate Care project, located approximately 0.7-mile (3,700 feet). Other cumulative projects are located more than 1 mile away from the project site. Because noise is a highly localized phenomenon, even if construction activities did overlap in time with the project, the intervening distance between projects would diminish any additive effects. Construction activities at other planned and approved projects would be required to take place during daytime hours, and the County and project applicants would be required to evaluate construction noise impacts and implement mitigation, if necessary, to minimize noise impacts. Given these distances, topography and the intervening structures, cumulative construction noise impacts would be **less than significant**.

The project's construction vibration levels would not exceed annoyance thresholds. Given that vibration propagates in waves through the soil, multiple pieces of equipment operating simultaneously would each produce vibration waves in different phases that typically would not increase the magnitude of the vibration. Furthermore, vibration is a highly localized phenomenon, and tends to dissipate to insignificant levels within dozens of feet, as discussed in Significance Criteria 4.9-4. Thus, there would be no possibility for vibration associated with the project to combine with vibration from other projects because of their distances from the project site. Therefore, the project would not contribute to a cumulatively considerable vibration impact. Impacts would **be less than significant**.

Transportation (existing and cumulative) and non-transportation sources of noise at new and existing receptors have been analyzed and determined to be in compliance with the applicable County exterior and interior noise level standards. In addition, other planned and approved projects would be required to mitigate for stationary and transportation-related noise impacts at nearby sensitive receptors. Moreover, stationary noise and transportation noise are localized phenomena and there is a very limited potential for other projects to contribute to cumulative noise impacts, beyond the transportation-related noise that is already analyzed above and found not to be cumulatively significant. As such, the project, in conjunction with other projects, would not cause a cumulatively considerable permanent increase in ambient noise levels in the project vicinity. Impacts would be **less than significant**.

4.8.5 REFERENCES

Kimley-Horn, Placer Retirement Center, Traffic Impact Study. June 2018.

Placer County, 2012. *Granite Bay Community Plan*. July 18. Available:

<https://www.placer.ca.gov/departments/communitydevelopment/planning/documentlibrary/commpplans/granitebaycp>

J.C. Brennan and Associates, 2016. Placer County Retirement Residence, Acoustical Study, July.

Saxelby Acoustics, 2018. Placer County Retirement Residence, Noise Addendum. June.