

<b>8</b>	<b>NOISE</b>
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## **8.1 INTRODUCTION**

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The Noise chapter of the EIR describes the existing noise environment in the project vicinity, and identifies potential impacts and mitigation measures related to noise associated with the construction and operation of the proposed project. The method by which the potential impacts are analyzed is discussed, followed by the identification of potential impacts and recommended mitigation measures to reduce impacts as necessary. The Noise chapter is primarily based on the *UAIC Tribal School Revised Noise Study Report* prepared by Environmental Science Associates (ESA) (see Appendix L),<sup>1</sup> the Placer County General Plan,<sup>2</sup> and associated EIR,<sup>3</sup> the *Horseshoe Bar/Penryn Community Plan*<sup>4</sup>, and the *Placer County Noise Ordinance*.<sup>5</sup>

## **8.2 EXISTING ENVIRONMENTAL SETTING**

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The Existing Environmental Setting section includes a discussion of fundamentals and terminology for noise assessments, the effects of noise on people, noise attenuation, existing sensitive receptors in the project vicinity, the existing noise environment in the project vicinity, and ground-borne vibration.

### **Fundamentals and Terminology**

Sound is defined as any pressure variation in the air that the human ear can detect. Sound, traveling in the form of waves from a source, exerts a sound pressure level (referred to as sound level) which is measured in decibels (dB), with zero dB corresponding roughly to the threshold of human hearing and 120 to 140 dB corresponding to the threshold of pain. Sound pressure fluctuations can be measured in units of hertz (Hz), which correspond to the frequency of a particular sound. Typically, sound does not consist of a single frequency, but rather a broad band of frequencies varying in levels of magnitude, or sound power. The sound pressure level, therefore, constitutes the additive force exerted by a sound corresponding to the frequency/sound power level spectrum.

The typical human ear is not equally sensitive to all frequencies of the audible sound spectrum. As such, when assessing potential noise impacts, sound is measured using an electronic filter that de-emphasizes the frequencies below 1,000 Hz and above 5,000 Hz in a manner corresponding to the human ear's decreased sensitivity to low and extremely high frequencies instead of the frequency mid-range. The method of adjusting frequency weighting based on human perception is referred

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<sup>1</sup> Environmental Science Associates. *UAIC Tribal School Revised Noise Study Report*. April 2018.

<sup>2</sup> Placer County. *Countywide General Plan Policy Document*. August 1994 (updated May 2013).

<sup>3</sup> Placer County. *Countywide General Plan EIR*. July 1994.

<sup>4</sup> Placer County. *Horseshoe Bar/Penryn Community Plan*. Revised December 2005.

<sup>5</sup> Placer County. *Placer County Noise Ordinance*. 2004.

to as “A” weighting and is expressed in units of A-weighted decibels (dBA). Frequency A-weighting follows an international standard methodology of frequency de-emphasis and is typically applied to community noise measurements. Considering the standardized nature of A-weighting, the A-weighted sound level has become the standard tool of environmental noise assessment. Some representative noise sources and their corresponding A-weighted noise levels are shown in Figure 8-1.

Noise exposure is a measure of noise over a period of time. Noise level is a measure of noise at a given instant in time. Community noise varies continuously over a period of time with respect to the contributing sound sources of the community noise environment. Community noise is primarily the product of many distant noise sources, which constitute a relatively stable background noise exposure, with the individual contributors unidentifiable. The background noise level changes throughout a typical day, but does so gradually, corresponding with the addition and subtraction of distant noise sources such as traffic and atmospheric conditions. What makes community noise constantly variable throughout a day, besides the slowly changing background noise, is the addition of short duration single event noise sources (e.g., aircraft flyovers, motor vehicles, sirens), which are readily identifiable to the individual receptor. Such successive additions of sound to the community noise environment vary the community noise level from instant to instant, requiring the measurement of noise exposure over a period of time to legitimately characterize a community noise environment and evaluate cumulative noise impacts.

The time-varying characteristic of environmental noise is described using statistical noise descriptors. The most frequently used noise descriptors are summarized below:

- L<sub>eq</sub>:** The energy-equivalent sound level is used to describe noise over a specified period of time, typically one hour, in terms of a single numerical value. The L<sub>eq</sub> is the constant sound level which would contain the same acoustic energy as the varying sound level, during the same time period (i.e., the average noise exposure level for the given time period).
- L<sub>max</sub>:** The instantaneous maximum noise level for a specified period of time.
- L<sub>50</sub>:** The noise level that is equaled or exceeded 50 percent of the specified time period. The L<sub>50</sub> represents the median sound level.
- L<sub>90</sub>:** The noise level that is equaled or exceeded 90 percent of the specific time period. The L<sub>90</sub> is considered the background noise level during a given time period.
- L<sub>dn</sub>:** The L<sub>dn</sub> is a 24-hour, day and night, A-weighted noise exposure level which accounts for the greater sensitivity of most people to nighttime noise by weighting noise levels at night (“penalizing” nighttime noises). Noise between 10:00 PM and 7:00 AM is weighted (penalized) by adding 10 dB to take into account the greater annoyance of nighttime noises.

**Figure 8-1  
 Typical Noise Levels**

COMMON OUTDOOR ACTIVITIES	NOISE LEVEL (dBA)	COMMON INDOOR ACTIVITIES
	110	Rock band
Jet flyover at 1,000 feet	100	
Gas lawnmower at 3 feet	90	
Diesel truck at 50 feet at 50 mph	80	Food blender at 3 feet
Noisy urban area, daytime	70	Garbage disposal at 3 feet
Gas lawnmower at 100 feet	60	Normal speech at 3 feet
Commercial area	50	Large business office
Heavy traffic at 300 feet	40	Dishwasher in next room
Quiet urban daytime	30	Theater, large conference room (background)
Quiet urban nighttime	20	Library
Quiet suburban nighttime	10	Bedroom at night, concert hall (background)
Quiet rural nighttime	0	Broadcast/recording studio

Source: Environmental Science Associates, UAIC Tribal School Revised Noise Study Report, April 2018.

The  $L_{eq}$  is the foundation of the  $L_{dn}$  and shows very good correlation with community response to noise. Because  $L_{dn}$  represents a 24-hour average, it tends to disguise short-term variations in the noise environment.  $L_{dn}$ -based noise standards are commonly used to assess noise impacts associated with traffic, railroad and aircraft noise sources. As a general rule, in areas where the noise environment is dominated by traffic, the  $L_{eq}$  during the peak-hour is generally within one to two decibels of the  $L_{dn}$  at that location.

### **Effects of Noise on People**

When a new noise is introduced to an environment, human reaction can be predicted by comparing the new noise to the ambient noise level. The ambient noise level is defined as the existing noise level comprised of all sources of noise in a given location. In general, the more a new noise exceeds the ambient noise level, the less acceptable the new noise will be judged by those hearing the new noise. With regard to increases in A-weighted noise level, the following relationships occur:

- Except in carefully controlled laboratory experiments, a change of 1-dB cannot be perceived;
- Outside of the laboratory, a 3-dB change is considered a barely perceivable difference;
- A change in level of at least 5-dB is required before any noticeable change in human response would be expected; and
- A 10-dB change is subjectively heard as approximately a doubling in loudness, and could cause an adverse response.

The perceived increases in noise levels shown above are applicable to both mobile and stationary noise sources. Such relationships occur in part because of the logarithmic nature of sound and the decibel system. The human ear perceives sound in a non-linear fashion, hence the decibel scale was developed. Because the decibel scale is based on logarithms, two noise sources do not combine in a simple additive fashion, rather logarithmically. For example, if two identical noise sources produce noise levels of 50 dBA, the combined sound level would be 53 dBA, not 100 dBA. This methodology also applies to the traffic noise such that when traffic volume is doubled, the resulting noise level increase would be 3 dB.

### **Noise Attenuation**

Stationary point sources of noise, including stationary mobile sources such as idling vehicles, attenuate (lessen) at a rate between 6 dB for hard sites and 7.5 dB for soft sites for each doubling of distance from the reference measurement. Hard sites are those with a reflective surface between the source and the receiver such as parking lots or smooth bodies of water. Excess ground attenuation is not assumed for hard sites and the changes in noise levels with distance (drop-off rate) is simply the geometric spreading of the noise from the source. Soft sites have an absorptive ground surface such as soft dirt, grass or scattered bushes and trees. In addition to geometric spreading, an excess ground attenuation value of 1.5 dB (per doubling distance) is normally assumed for soft sites. Line sources (such as traffic noise from vehicles) attenuate at a rate between 3 dB for hard sites and 4.5 dB for soft sites for each doubling of distance from the reference measurement.

**Existing Sensitive Receptors in the Project Vicinity**

Noise sensitive land uses are typically defined as residences, schools, institutions, places of worship, hospitals, care centers, and hotels. The nearest sensitive receptors to the project site would be the single-family residences abutting the western boundary of the project site, as well as scattered single-family residences on larger lots located approximately 35 feet to the south and 205 feet to the east of the project site boundary.

**Existing Noise Environment in the Project Vicinity**

The ambient noise environment surrounding the project site is primarily the result of traffic noise from Taylor Road and Interstate 80 (I-80). Other noise sources in the area include wildlife sounds such as birds chirping and distant dogs barking.

Ambient noise measurements were conducted at the project site from January 5, 2017 to January 6, 2017. To quantify the existing ambient noise environment in the vicinity of the project site, two 24-hour long-term and two 15-minute short-term noise measurements were conducted on the project site adjacent to off-site sensitive land uses. The locations of all long-term and short-term noise measurements are shown in Figure 8-2. Results of the noise measurements are presented in Table 8-1 (short-term measurements) and Table 8-2 (long-term measurements).

<b>Table 8-1 15-Minute Short-Term Noise Measurement Results</b>					
Measurement Location	Start Time	L <sub>eq</sub> (dBA)	L <sub>max</sub> (dBA)	L <sub>min</sub> (dBA)	Primary Noise Source(s)
ST-1	12:14 PM	49	68	32	Traffic Noise along Taylor Road
ST-2	11:49 AM	39	49	36	Natural Sounds (e.g., crickets, birds)

*Source: Environmental Science Associates, April 2018.*

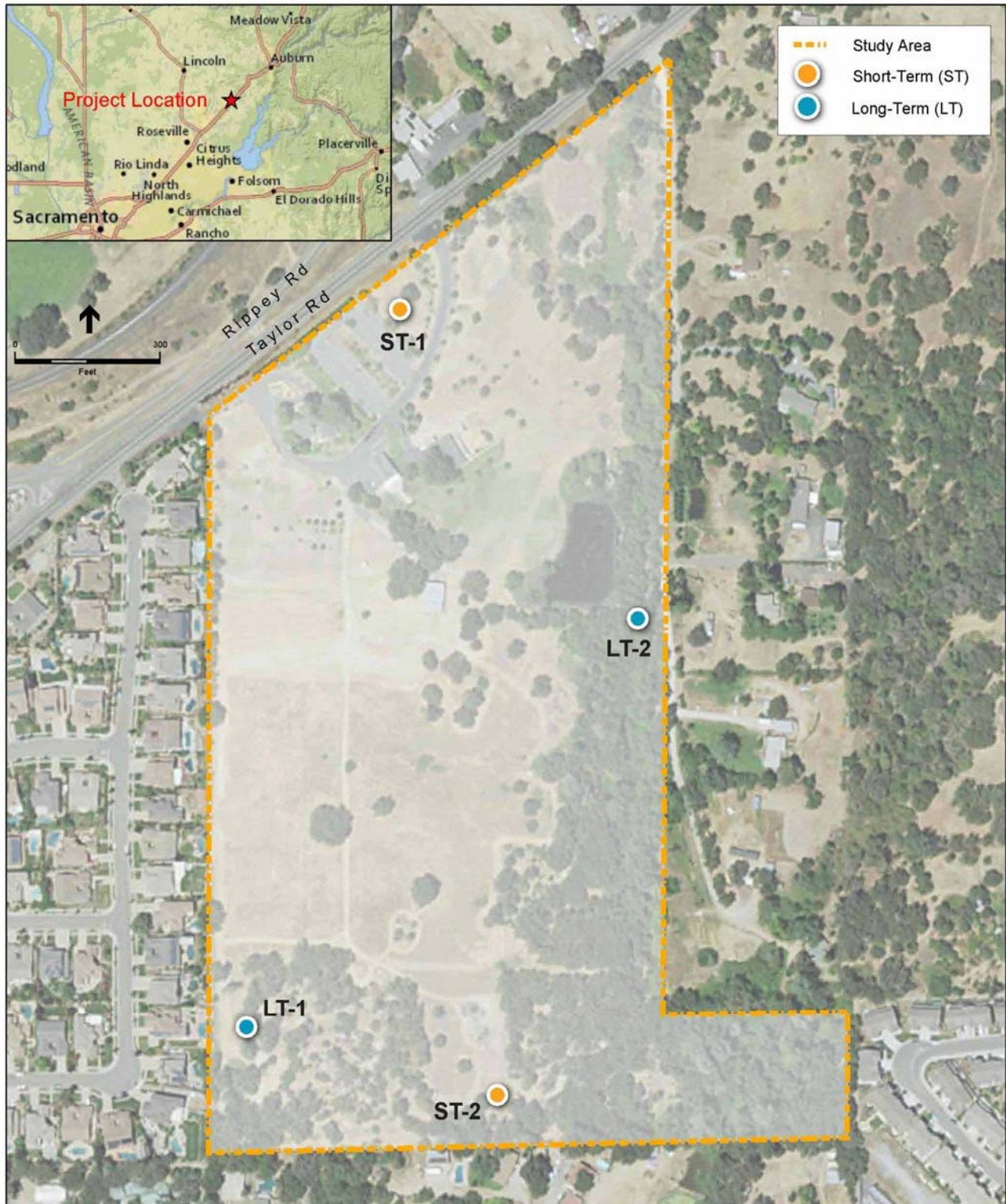
<b>Table 8-2 24-Hour Long-Term Noise Measurement Results</b>				
Measurement Location	School-Hour L <sub>eq</sub> (dBA)	L <sub>dn</sub> (dBA)	L <sub>max</sub> (dBA)	L <sub>min</sub> (dBA)
LT-1	51	57	85	35
LT-2	50	55	85	32

*Source: Environmental Science Associates, April 2018.*

**Ground-Borne Vibration**

Ground-borne vibration can be a concern for nearby neighbors, causing buildings to shake and rumbling sounds to be heard. In contrast to airborne noise, ground-borne vibration and noise is not a common environmental problem. Some common sources of ground-borne vibration are trains, buses on rough roads, and construction activities such as blasting, sheet pile-driving, and operating heavy earth-moving equipment. Vibration is typically measured in the peak particle velocity in inches per second (PPV) and can be expressed in vibration decibels (VdB).

**Figure 8-2**  
**Noise Measurement Location Map**



Source: Environmental Science Associates, UAIC Tribal School Revised Noise Study Report, April 2018.

The effects of ground-borne vibration include movement of building floors, rattling of windows, shaking of items on shelves or hanging on walls, and rumbling sounds. In extreme cases, the vibration can cause damage to buildings. Building damage is not a factor for most projects, with the occasional exception of blasting and sheet pile-driving during construction. Annoyance from vibration often occurs when the vibration exceeds the threshold of perception by only a small margin. A vibration level that causes annoyance can be well below the damage threshold for normal buildings.

### **8.3 REGULATORY CONTEXT**

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In order to limit exposure to physically and/or psychologically damaging noise levels the federal government, State of California, and the County have established standards and ordinances to control noise. The following provides a general overview of the existing federal and local regulations that are relevant to the proposed project.

#### **Federal Regulations**

The following are the federal policies relevant to noise.

##### Federal Transit Administration

The Federal Transit Administration (FTA) has adopted vibration standards that are used to evaluate potential building damage impacts related to construction activities. In addition to standards associated with building damage related to vibration from new construction, the FTA has adopted standards associated with human annoyance due to ground-borne vibrations.

#### **Local Regulations**

The following are the local environmental goals and policies relevant to noise.

##### Placer County General Plan

The relevant goals and policies from the Placer County General Plan related to noise are presented below.

Goal 9.A            To protect County residents from the harmful and annoying effects of exposure to excessive noise.

Policy 9.A.1        The County shall not allow development of new noise-sensitive uses where the noise level due to non-transportation noise sources will exceed the noise level standards of Table 9-1 (see Table 8-3) 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 Table 9-1 (see Table 8-3).

**Table 8-3**  
**Allowable L<sub>dn</sub> Noise Levels within Specified Zone Districts**  
**Applicable to New Projects Affected by or Including Non-Transportation Noise Sources<sup>1</sup>**

Zone District of Receptor	Property Line of Receiving Use (L <sub>dn</sub> , dB)	Interior Spaces <sup>2</sup>
Residential Adjacent to Industrial <sup>3</sup>	60	45
Other Residential <sup>4</sup>	50	45
Office/Professional	70	45
Transient Lodging	65	45
Neighborhood Commercial	70	45
General Commercial	70	45
Heavy Commercial	75	45
Limited Industrial	75	45
Highway Service	75	45
Shopping Center	70	45
Industrial	---	45
Industrial Park	75	45
Industrial Reserve	---	---
Airport	---	45
Unclassified	---	---
Farm	--- <sup>6</sup>	---
Agriculture Exclusive	--- <sup>6</sup>	---
Forestry	---	---
Timberland Preserve	---	---
Recreation & Forestry	70	---
Open Space	---	---
Mineral Reserve	---	---

Notes:

- Except where noted otherwise, noise exposures will be those which occur at the property line of the receiving use.
- Where existing transportation noise levels exceed the standards of this table, the allowable L<sub>dn</sub> shall be raised to the same level as that of the ambient level.
- If the noise source generated by, or affecting, the uses shown above consists primarily of speech or music, or if the noise source is impulsive in nature, the noise standards shown above shall be decreased by 5 dB.
- Where a use permit has established noise level standards for an existing use, those standards shall supersede the levels specified in Table 9-1 and Table 9-3 (see Table 8-3 and see Table 8-4). Similarly, where an existing use which is not subject to a use permit causes noise in excess of the allowable levels in Tables 9-1 and 9-3 (see Table 8-3 and see Table 8-4), said excess noise shall be considered the allowable level. If a new development is proposed which will be affected by noise from such an existing use, it will ordinarily be assumed that the noise levels already existing or those levels allowed by the existing use permit, whichever are greater, are those levels actually produced by the existing use.
- Existing industry located in industrial zones will be given the benefit of the doubt in being allowed to emit increased noise consistent with the state of the art<sup>5</sup> at the time of expansion. In no case will expansion of an existing industrial operation because to decrease allowable noise emission limits. Increased emissions above those normally allowable should be limited to a one-time 5 dB increase at the discretion of the decision-making body.
- The noise level standards applicable to land uses containing incidental residential uses, such as caretaker dwellings at industrial facilities and homes on agriculturally zoned land, shall be the standards applicable to the zone district, not those applicable to residential uses.
- Where no noise level standards have been provided for a specific zone district, it is assumed that the interior and/or exterior spaces of these uses are effectively insensitive to noise.

(Continued on next page)



<sup>1</sup> Overriding policy on interpretation of allowable noise levels: Industrial-zoned properties are confined to unique areas of the County, and are irreplaceable. Industries which provide primary wage-earner jobs in the County, if forced to relocate, will likely be forced to leave the County. For this reason, industries operating upon industrial zoned properties must be afforded reasonable opportunity to exercise the rights/privileges conferred upon them by their zoning. Whenever the allowable noise levels herein fall subject to interpretation relative to industrial activities, the benefit of the doubt shall be afforded to the industrial use.

Where an industrial use is subject to infrequent and unplanned upset or breakdown of operations resulting in increased noise emissions, where such upsets and breakdowns are reasonable considering the type of industry, and where the industrial use exercises due diligence in preventing as well as correcting such upsets and breakdowns, noise generated during such upsets and breakdowns shall not be included in calculations to determine conformance with allowable noise levels.

<sup>2</sup> 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.

<sup>3</sup> Noise from industrial operations may be difficult to mitigate in a cost-effective manner. In recognition of this fact, the exterior noise standards for residential zone districts immediately adjacent to industrial, limited industrial, industrial park, and industrial reserve zone districts have been increased by 10 dB as compared to residential districts adjacent to other land uses.

For purposes of the Noise Element, residential zone districts are defined to include the following zoning classifications: AR, R-1, R-2, R-3, FR, RP, TR-1, TR-2, TR-3, and TR-4.

<sup>4</sup> Where a residential zone district is located within an -SP combining district, the exterior noise level standards are applied at the outer boundary of the -SP district. If an existing industrial operation within an -SP district is expanded or modified, the noise level standards at the outer boundary of the -SP district may be increased as described above in these standards.

Where a new residential use is proposed in an -SP zone, an Administrative Review Permit is required, which may require mitigation measures at the residence for noise levels existing and/or allowed by use permit as described under "NOTES," above, in these standards.

<sup>5</sup> State of the art should include the use of modern equipment with lower noise emissions, site design, and plant orientation to mitigate offsite noise impacts, and similar methodology.

<sup>6</sup> Normally, agricultural uses are noise insensitive and will be treated in this way. However, conflicts with agricultural noise emissions can occur where single-family residences exist within agricultural zone districts. Therefore, where effects of agricultural noise upon residences located in these agricultural zones is a concern, an  $L_{dn}$  of 70 dBA will be considered acceptable outdoor exposure at a residence.

*Source: Placer County General Plan, 2013.*

Policy 9.A.2 Noise created by new proposed non-transportation noise sources shall be mitigated so as not to exceed the noise level standards of Table 9-1 (see Table 8-3) as measured immediately within the property line of lands designated for noise-sensitive uses: provided, however, the noise created by occasional events occurring within a stadium on land zoned for university purposes may temporarily exceed these standards as provided in an approved Specific Plan.

Policy 9.A.6 The feasibility of proposed projects with respect to existing and future transportation noise levels shall be evaluated by comparison to Table 9-3 (see Table 8-4).

<b>Table 8-4</b>			
<b>Maximum Allowable Noise Exposure Transportation Noise Sources</b>			
<b>Noise Sensitive Land Uses</b>	<b>Outdoor Activity Area<sup>1</sup></b>	<b>Interior Spaces</b>	
	<b>L<sub>dn</sub>, dB</b>	<b>L<sub>dn</sub>/CNEL, dB</b>	<b>L<sub>eq</sub>, dB<sup>2</sup></b>
Residential	60 <sup>3</sup>	45	--
Transient Lodging <sup>4</sup>	60 <sup>3</sup>	45	--
Hospitals, Nursing Homes	60 <sup>3</sup>	45	--
Theaters, Auditoriums, Music Halls	--	--	35
Churches, Meeting Halls	60 <sup>3</sup>	--	40
Office Buildings	--	--	45
Schools, Libraries, Museums	--	--	45
Playgrounds, Neighborhood Parks	70	--	--

<sup>1</sup> Where the location of outdoor activity areas is unknown, the exterior noise level standard shall be applied to the property line of the receiving land use.  
<sup>2</sup> As determined for a typical worst-case hour during periods of use.  
<sup>3</sup> Where it is not possible to reduce noise in outdoor activity areas to 60 dB L<sub>dn</sub>/CNEL or less using a practical application of the best-available noise reduction measures, an exterior noise level of up to 65 dB L<sub>dn</sub>/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.

*Source: Placer County General Plan, 2013.*

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 specified in Table 9-3 (see Table 8-4), 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 (see Table 8-4).

- Policy 9.A.9 Noise created by new transportation noise sources, including roadway improvement projects, shall be mitigated so as not to exceed the levels specified in Table 9-3 (see Table 8-4) or the performance standards in Table 9-3 (see Table 8-4) at outdoor activity areas or interior spaces of existing noise sensitive land uses.
- 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:
- a. Rerouting traffic onto streets that have available traffic capacity and that do not adjoin noise-sensitive land uses;
  - b. Lowering speed limits, if feasible and practical;
  - c. Programs to pay for noise mitigation such as low cost loans to owners of noise-impacted property or establishment of developer fees;
  - d. Acoustical treatment of buildings; or,
  - e. Construction of noise barriers.
- Policy 9.A.12 Where noise mitigation measures are required to achieve the standards of Tables 9-1 and 9-3 (see Table 8-3 and see Table 8-4), the emphasis of such measure 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.
- Policy 9.B.1 The County shall require that new noise-sensitive land uses established next to existing industrial areas be responsible for self-mitigating noise impacts from industrial activities.

#### Horseshoe Bar/Penryn Community Plan

The Community Development Element of the Horseshoe Bar/Penryn Community Plan noise policies that are applicable to the proposed project are presented below:

#### *Land Use*

- Policy B(3)(c) Individual sites shall be landscaped attractively so as to integrate - the entire development visually with the overall natural qualities of the planning area. Appropriately

landscaped buffer areas of adequate size shall be provided to shield adjacent residential developments from commercial or industrial activities. Residential areas shall be protected from noise, unsightliness, odor, and other nuisances. Indigenous materials shall be used where practical.

- Policy B(3)(q) Encourage the use of greenbelts or landscaped areas along roadways as a design feature of any development in order to mitigate noise impacts and screen the project from public thoroughfares.

#### *Public Facilities and Services*

- Policy C(2)(b)(10) The intensity of use of an institutional site shall be limited to that which is compatible with adjoining uses and in keeping with the rural character of the Plan area; the institutional use shall not generate excessive noise or traffic.

#### *Community Noise*

- Policy D(2)(a) New development of noise-sensitive uses shall not be allowed where the noise level due to non-transportation noise sources will exceed the noise level standards of Table 8 (of the Horseshoe Bar/Penryn Community Plan – see Table 8-3 of this EIR) 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 Table 8 (of the Horseshoe Bar/Penryn Community Plan – see Table 8-3 of this EIR).
- Policy D(2)(b) Noise created by new proposed non-transportation noise sources shall be mitigated so as not to exceed the noise level standards of Table 8 (of the Horseshoe Bar/Penryn Community Plan – see Table 8-3 of this EIR) as measured immediately within the property line of lands designated for noise-sensitive uses.
- Policy D(2)(d) The feasibility of proposed projects with respect to existing and future transportation noise levels shall be evaluated by comparison to Table 9 (of the Horseshoe Bar/Penryn Community Plan – see Table 8-4 of this EIR).
- Policy D(2)(i) Require that wherever noise mitigation measures are identified as necessary to insure an acceptable noise

environment, that these measures are implemented as a part of project approval.

Placer County Noise Ordinance

Section 9.36.060 of the Placer County Code establishes non-transportation noise level standards for noise-sensitive receptors. The purpose of the Noise Ordinance is to implement the noise level standards identified in the *Placer County General Plan*. The specific language of Section 9.36.060 is provided below:

- A. It is unlawful for any person at any location to create any sound, or to allow the creation of any sound, on property owned, leased, occupied or otherwise controlled by such person that:
  - 1. Causes the exterior sound levels when measured at the property line of any affected sensitive receptor to exceed the ambient sound level by five (5) dBA; or
  - 2. Exceeds the sound level standards as set forth in Table 1 (see Table 8-5 of this EIR), whichever is the greater.

<b>Table 8-5</b>		
<b>Noise Level Standards for Non-Transportation Noise Sources</b>		
<b>Sound Level Descriptor</b>	<b>Daytime (7 AM to 10 PM)</b>	<b>Nighttime (10 PM to 7 AM)</b>
Hourly $L_{eq}$ , dB	55	45
$L_{max}$ , dB	70	65
<i>Source: Placer County Noise Ordinance.</i>		

- B. Each of the sound level standards specified in Table 1 (see Table 8-5 of this EIR) shall be reduced by five (5) dB for simple tone noises, consisting of speech and music. However, in no case shall the sound level standard be lower than the ambient sound level plus five (5) dB.
- C. If the intruding sound source is continuous and cannot reasonably be discontinued or stopped for a time period whereby the ambient sound level can be measured, the sound level measured while the source is in operation shall be compared directly to the sound level standards of Table 1 (see Table 8-5 of this EIR).

Per Section 9.36.030 of the Placer County Code (Exemptions), sound or noise emanating from construction activities between the hours of 6:00 AM and 8:00 PM Monday through Friday, and between the hours of 8:00 AM and 8:00 PM Saturday and Sunday, is exempt from Section 9.36.060 of the Placer County Code Noise Ordinance, provided that all construction equipment is fitted with factory installed muffling devices and that all construction equipment is maintained in good working order. 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: a) Monday through Friday, 6:00 a.m. to 8:00 p.m. (during daylight savings) b) Monday through Friday, 7:00 a.m. to 8:00 p.m. (during standard time) c) 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.

With regard to exceptions for non-construction noise sources, Section 9.36.080 of the Placer County Code states the following:

D. If the applicant can show to the County, or his or her designee that immediate compliance with the requirements of this chapter would not result in a hazardous condition or nuisance, and strict compliance would be unreasonable due to the circumstances of the requested exception, a permit to allow exception from the provisions contained in all or a portion of this chapter may be issued. Factors considered for all requests for exceptions, other than construction or special events, shall include but not be limited to the following:

1. Conformance with the intent of this chapter and General Plan Policies;
2. Uses of property and existence of sensitive receptors within the area affected by sound;
3. Factors related to initiating and completing all remedial work;
4. Age and useful life of the existing sound source;
5. Hardship to the applicant, or community of not granting the exception;
6. The time of day or night the exception will occur;
7. The duration of the exception; and
8. The general public interest, welfare and safety.

In addition, the following exemptions specified in the Placer County Code, Article 9.36.030, would apply to the project:

- Sound sources associated with property maintenance (e.g., lawn mowers, edgers, snow blowers, blowers, pool pumps, power tools, etc.) provided such activities take place between the hours of 7:00 AM and 9:00 PM;
- Construction (e.g., construction, alteration or repair activities) between the hours of 6:00 AM and 8:00 PM Monday through Friday and between the hours of 8:00 AM and 8:00 PM on Saturdays provided, however, that all construction equipment shall be fitted with factory installed muffling devices and that all construction equipment shall be maintained in good working order; and
- The normal operation of public and private schools typically consisting of classes and other school-sponsored activities.

## 8.4 IMPACTS AND MITIGATION MEASURES

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The following section describes the standards of significance and methodology used to analyze and determine the proposed project's potential impacts related to noise and vibration. In addition, a discussion of the project's impacts, as well as mitigation measures where necessary, is also presented.

### Standards of Significance

Consistent with Appendix G of the CEQA Guidelines and the County's Initial Study Checklist, the effects of a project are evaluated to determine if they would result in a significant adverse impact on the environment. For the purposes of this EIR, an impact is considered significant if the proposed project would result in:

- 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;
  - Per the Placer County General Plan standards, exposure of residential land uses (not adjacent to industrial development) to noise levels in excess of 60 dB L<sub>dn</sub> from transportation related sources and 50 dBA L<sub>dn</sub> from non-transportation related sources;
- Exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels;
  - Per the FTA's Transit Noise and Vibration Impact Assessment, a vibration threshold level of 0.2 PPV for building damage and an exposure of residences to vibration levels of 80 VdB or more shall be used to assess potential project-related impacts;<sup>6</sup>
- A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project;
  - Per the Placer County Noise Ordinance, a substantial permanent increase in ambient noise levels would occur should the project result in an increase in ambient noise levels of 5 dB or more;
- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project;
  - In terms of determining the temporary noise increase due to project-related construction activities, an impact would occur if construction activity would noticeably increase ambient noise levels above background levels. For this analysis, a noticeable increase in ambient noise levels is assumed to occur where noise levels increase by 5 dB or more over existing ambient noise levels;
- 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, where the project would expose people residing or working in the area to excessive noise levels; or
- 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.

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<sup>6</sup> Federal Transit Administration (FTA). *Transit Noise and Vibration Impact Assessment*. May 2006.

Issues Not Discussed Further

The Initial Study prepared for the proposed project (see Appendix C) determined that development of the proposed project would result in no impact related to the following:

- 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; and
- 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.

The closest airport to the proposed project site is the Auburn Municipal Airport, located approximately nine miles northeast of the proposed project site. Because the proposed project site is located beyond two miles from a public or private airstrip, the proposed project would not result in the expose of students or people working in the proposed project area to excessive aircraft noise levels. Accordingly, impacts related to the above are not further analyzed or discussed in this EIR chapter.

Construction Vibration

As stated above, the FTA has adopted vibration standards that are used to evaluate potential building damage impacts related to construction activities. The FTA vibration damage criteria are shown in Table 8-6.

<b>Table 8-6</b>	
<b>Construction Vibration Damage Criteria</b>	
<b>Building Category</b>	<b>PPV (in/sec)</b>
I. Reinforced-concrete, steel, or timber (no plaster)	0.5
II. Engineered concrete and masonry (no plaster)	0.3
III. Non-engineered timber and masonry buildings	0.2
IV. Buildings extremely susceptible to vibration damage	0.12

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

In addition, the FTA has also adopted standards associated with human annoyance for ground-borne vibration impacts for the following three land use categories: Vibration Category 1–High Sensitivity; Vibration Category 2–Residential; and Vibration Category 3–Institutional. The FTA defines Category 1 as buildings where vibration would interfere with operations within the building, including vibration-sensitive research and manufacturing facilities, hospitals with vibration-sensitive equipment, and university research operations. Vibration-sensitive equipment includes, but is not limited to, electron microscopes, high-resolution lithographic equipment, and normal optical microscopes. Category 2 refers to all residential land uses and any buildings where people sleep, such as hotels and hospitals. Category 3 refers to institutional land uses such as schools, churches, other institutions, and quiet offices that do not have vibration-sensitive equipment but still have the potential for activity interference. The vibration thresholds associated with human annoyance for the three land use categories are shown in Table 8-7. Thresholds have not been adopted or recommended for commercial and office uses. Because the project-induced



vibration would be from construction activities, the impact thresholds for the proposed project are based on the “Infrequent Events” criteria included in Table 8-7 in terms of vibration decibels (VdB).

<b>Table 8-7 Ground-Borne Vibration Impact Criteria For General Assessment</b>			
<b>Land Use Category</b>	<b>Frequent Events<sup>1</sup></b>	<b>Occasional Events<sup>2</sup></b>	<b>Infrequent Events<sup>3</sup></b>
<b>Category 1:</b> Buildings where vibration would interfere with interior operations	65 VdB <sup>4</sup>	65 VdB <sup>4</sup>	65 VdB <sup>4</sup>
<b>Category 2:</b> Residences and buildings where people normally sleep	72 VdB	75 VdB	80 VdB
<b>Category 3:</b> Institutional land uses with primarily daytime use	75 VdB	78 VdB	83 VdB
<sup>1</sup> “Frequent Events” is defined as more than 70 vibration events of the same source per day. <sup>2</sup> “Occasional Events” is defined as between 30 and 70 vibration events of the same source per day. <sup>3</sup> “Infrequent Events” is defined as fewer than 30 vibration events of the same kind per day. <sup>4</sup> This criterion is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes.			
<i>Source: Federal Transit Administration (FTA). Transit Noise and Vibration Impact Assessment. May 2006.</i>			

### Method of Analysis

Below are descriptions of the methodologies utilized to measure ambient noise and estimate future traffic noise, construction noise, and vibration. Further modeling details and calculations are provided in Appendix L to this EIR. The results of the noise and vibration impact analyses were compared to the standards of significance discussed above in order to determine the associated level of impact.

#### Construction Noise

Construction noise levels for the proposed project were estimated using the Federal Highway Administration (FHWA) *Roadway Construction Noise Model (RCNM)*.<sup>7</sup> FHWA’s RCNM provides reference noise levels for construction equipment that are typically used during building construction. The reference noise levels are representative of what would be heard during project construction and were used to estimate the project-related construction noise impacts.

#### Operational Noise

The County exempts noise generated from the normal operation of public and private schools (Placer County Municipal Code, Chapter 9.36.030(A)(4)), which would include noise sources such as the use of heating, ventilation, and air conditioning (HVAC) units, bells to signal the beginning and end of class periods, on-site maintenance activities, and the use of PA systems. Notwithstanding the exemption for normal school operations, the County has elected to evaluate potential operational school noise impacts to the surrounding community.

<sup>7</sup> Federal Highway Administration (FHWA). *Roadway Construction Noise Model User’s Guide*. January 2006.

Project-related traffic noise was evaluated by using the FHWA's Traffic Noise Model (TNM) version 2.5 to compare the increase of noise levels with and without the project under Existing and Cumulative conditions. Traffic volumes were derived from the project's traffic impact study dated March 16, 2018.

Project-related stationary noise sources such as general school and recreational activities, emergency generators, HVAC units and on-site special events were evaluated using noise data on human voices found in the Environmental Protection Agency's *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety* and other published documents.<sup>8</sup>

### Construction Vibration

The methodology described in the FTA's *Transit Noise and Vibration Impact Assessment* was used to evaluate project-related vibration effects to nearby sensitive land uses. Construction activities known to generate excessive vibration levels such as impact pile driving and blasting are not anticipated to occur during construction of the proposed project.

Other than construction, appreciable sources of vibration are not included in the proposed project. As a result, only construction-related vibration impacts were assessed. Given that construction activities would occur during the daytime hours and would be intermittent, the criteria for "infrequent" events was used for the analysis. As such, the proposed project would only result in a significant vibration impact if buildings would be exposed to the FTA's vibration threshold level of 0.2 PPV for building damage or if sensitive receptors would be exposed to a vibration level of 80 VdB for residential land uses.

### **Project Impacts and Mitigation Measures**

The following discussion of impacts is based on implementation of the proposed project in comparison with the standards of significance identified in Section 8.3 (Regulatory Context).

#### **8-1 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. Based on the analysis below, the impact is *less than significant*.**

As mentioned previously, although noise from school activities are exempt under Article 9.36.030 of the Placer County Code, operational noise from the school has been estimated and compared to the County's standards.

#### *General School Activities*

The noise from general school activities would include school bells, PA systems, HVAC, and recess and recreational activities. The U.S. Environmental Protection Agency's

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<sup>8</sup> U.S. Environmental Protection Agency. *Information on levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*. March 1974.

(USEPA) published document *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety* includes a study on typical noise exposure patterns on school children. According to the USEPA study, students in a class room setting are typically exposed to noise levels of approximately 60 dBA and noise levels as high as 65 dBA during lunch and outdoor play time.<sup>9</sup> These noise levels are presented in the study as average hourly  $L_{eq}$ . Therefore, the highest hourly  $L_{eq}$  noise level a student could generate during a typical school day is assumed to be 65 dBA from a reference distance of 25 feet, which is an assumed typical distance between a source and a receiver. Assuming a propagation rate of 7.5 dB per doubling of distance, the nearest residential property line located approximately 150 feet west of the proposed school buildings and field areas could be exposed to normal school-related noise levels of approximately 46 dBA  $L_{eq}$ , which is below the County's exterior noise standard of 50 dBA.

### *Recreational Activities*

Students could be outside at the playground between Buildings A and C, as well as at the playing field south of Building B after school or on weekends. The analysis assumed the playing field would not be used after 10:00 PM, given that elementary and middle school student sports typically end before 10:00 PM. The USEPA's published document *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety* (USEPA, 1974) estimates the noise level of raised voices at 72 dBA  $L_{eq}$  from a reference distance of 3.3 feet. Because students would be scattered within the playing field during on-site recreational activities, the distance from the center of the playing field and the nearest residence was used to evaluate potential noise impacts during on-site recreational activities. Assuming 30 students scattered within the playing field, the total combined reference noise level would be 87 dBA  $L_{eq}$  from a distance of 3.3 feet. The distance between the center of the playing field and the nearest residential property line to the west is approximately 250 feet. Based on the propagation rate of 7.5 dB per doubling the distance, the noise level at the closest residential property line would be 40 dBA  $L_{eq}$ , which is lower than the 55 dBA hourly  $L_{eq}$  presented in Table 8-5.

### *Emergency Generators*

A transformer and two emergency generators would be located at the northwest corner of Building E. The proposed generators would be used for emergency purposes only and tested, at most, once a month. Both emergency generators would be installed in sound enclosures and surrounded by fencing. The nearest residential property line along the western boundary of the project site is approximately 200 feet away from the anticipated location of the generators. According to the specification of the generators, the sound pressure level from one of the proposed generators would be 75 dBA at 25 feet with the muffler and silencer installed. Assuming that both generators would be tested at the same time, the combined sound pressure level would be 78 dBA from a distance of 25 feet. Based on the propagation rate of 7.5 dB per doubling the distance, during such limited times when

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<sup>9</sup> U.S. Environmental Protection Agency. *Information on levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*. March 1974.

the generator is being tested, the noise level at the closest residence would be 55 dBA  $L_{eq}$ , which meets the County's exterior noise ordinance standard.

#### *HVAC Units*

HVAC units could be placed at each building. Building E would have an HVAC unit closest to the residence to the west. As such, the distance between an HVAC unit and the closest residential property line would be approximately 160 feet. The sound power level of the HVAC unit on Building E was assumed to be 74 dBA. Based on the propagation rate of 7.5 dB per doubling the distance, the noise level at the closest residence would be 22 dBA  $L_{eq}$ , which is below the County's exterior noise ordinance standard. It should be noted that the HVAC unit usage would be intermittent.

#### Conclusion

As previously discussed, normal operations of schools are exempt from Placer County's noise standards. As such, the proposed project would not result in any impact related to generation of noise in excess of standards established in the Horseshoe Bar/Penryn Community Plan, General Plan, noise ordinance, and all other applicable standards. Although the proposed project is exempt, the analysis of operational noise presented above demonstrates that the proposed project would not result in the generation of noise in excess of Placer County's noise ordinance standards, which are more stringent than the General Plan standards. Consequently, the proposed project would not expose people or generate noise in excess of established standards, and implementation of the proposed project would result in a *less-than-significant* impact.

#### Mitigation Measure(s)

*None required.*

- 8-2 Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project, due to operation of the proposed project? Based on the analysis below and with implementation of mitigation, the impact is *less than significant*.**

Aside from the exempted school-related noise sources, which are addressed in Impact 8-1, the primary source of noise from operation of the project would be associated with increased vehicle traffic on Taylor Road and special events held within the proposed school facility. Both potential future sources of noise are discussed in further depth below.

#### Transportation-Related Noise

Operation of the proposed project would involve the use of passenger vans for student drop-off and pick-up, which are relatively quieter as compared to typical school buses. Vehicle speeds within the project site would not exceed 10 miles per hour, and, as a result, internal vehicle circulation is not considered a significant source of noise. However, the noise levels along Taylor Road would increase due to the additional traffic with the

proposed project. Table 8-8 compares traffic volumes and the resultant noise level increases that could occur in the existing plus project condition. It should be noted that the traffic impact study evaluates traffic volumes during three peak periods. Because the AM peak hour traffic volumes are the largest, the AM peak hour traffic volumes were used to represent the environmental worst-case scenario for this traffic noise analysis.

As presented in Table 8-8, the maximum traffic noise increase along Taylor Road would be approximately 0.3 dB. For comparison, noise level increases are generally only perceptible above 3 dB. In areas of the County where traffic noise currently exceeds 60 dBA L<sub>dn</sub>, per industry standard methodology, an impact would occur should project related traffic increase noise in the area by 5 dB or more. Considering that project related traffic would increase traffic-related noise by a maximum of 0.3 dB, operation of the proposed project would not result in a substantial increase in ambient noise levels in the project vicinity due to increased traffic volumes in the area.

<b>Table 8-8</b>			
<b>AM Peak Hour Traffic Volumes and Noise Increase</b>			
<b>Roadway Segment</b>	<b>AM Peak Hour Traffic Volumes</b>		<b>Noise Level Increase (dB)</b>
	<b>Existing No Project</b>	<b>Existing Plus Project</b>	
North of Taylor Road	832	883	+0.3
South of Taylor Road	832	859	+0.1
Note: Noise Increase is based on 10*LOG (Traffic with project / Traffic without project)			
Sources:			
<ul style="list-style-type: none"> <li>• <i>KD Anderson &amp; Associates, Inc., 2018.</i></li> <li>• <i>Environmental Science Associates, UAIC Tribal School Revised Noise Study Report, April 2018.</i></li> </ul>			

Events

As discussed in Chapter 3, Project Description, the proposed ballfield and other portions of the project site may be used for events during project operations. Events would not begin earlier than 7:00 AM or continue past 10:00 PM. The largest potential events could occur up to three times a year and could take place during school hours, from approximately 10:00 AM to 2:00 PM on weekdays, or outside of school hours, from approximately 5:00 PM to 8:00 PM in the evening. The large events could accommodate approximately 200 people, though some students and staff may already be on school property. Events could include outdoor and/or indoor activity. Typical noise sources associated with special events would consist of amplified sound for speeches or music and crowd noise (i.e., people talking and laughing).

Although specific plans for speakers had not been finalized at the time of preparation of the Noise Study for the proposed project, the project is assumed to include two speakers that would be operated during events. The speakers would generate noise levels as high as 85 dBA from a distance of 25 feet. Concurrently, during a large event, raised speaking voices are anticipated to generate noise up to 72 dBA L<sub>eq</sub> from a reference distance of 3.3 feet. Should the speakers be directed away from the nearest residential property line,

combined noise from speakers and event attendees is anticipated to generate noise levels of up to 60 dBA  $L_{eq}$ , as shown in Table 8-9 below.

Currently, the highest existing measured ambient noise level at the nearest residential property line is 57 dBA  $L_{eq}$ . Over a three-hour event, assuming that the speakers are directed away from the nearest residential property line, as presented in Table 8-9, the combined noise level at the nearest residential property line would be elevated to 59 dBA  $L_{eq}$ , which would represent a 4 dB increase over existing ambient noise levels. Per Section 9.36.060 of the Placer County Code, an impact would occur if a proposed project increased ambient noise levels by 5 dB or more. Considering that operation of the proposed project would result in a temporary increase in ambient noise level of up to 4 dB during events, the proposed project would not exceed Placer County’s 5 dB standard. However, should speakers be directed towards the nearest residential property line, events using such speakers may result in temporary ambient noise levels at the nearest residential property line increasing by 5 dB or more, which would be considered a temporary violation of Placer County’s ambient noise level increase threshold.

Noise Source	Noise Level (dBA $L_{eq}$ )
Speakers <sup>1</sup>	59
Raised Voices <sup>2,3</sup>	48
Combined Noise Level	59
Highest Measured Existing Ambient During a Special Event <sup>4</sup>	57
Project Plus Existing Ambient	61
Project Increase Over Existing Ambient (dB)	4
Increase Existing Ambient by 5 dB or more? <sup>5</sup>	No
<sup>1</sup> Assumed the two outdoor speakers would generate a noise level of 85 dBA $L_{eq}$ from a distance of 25 feet and would be pointed away from the nearest off-site residential property line. Assumed speakers are facing away from residential properties at a distance of 270 feet. <sup>2</sup> Noise generated by raised normal speaking raised voices are assumed to be 60 dBA $L_{eq}$ from a reference distance of 3.3 feet. <sup>3</sup> Assumed 200 attendee maximum event. <sup>4</sup> The measured hourly $L_{eq}$ was obtained from a 24-hour long-term noise survey conducted from January 5 – 6, 2017 at LT-1 was used because the closest sensitive receptor is to the west of the project site between the hours of 5:00 PM and 8:00 PM. <sup>5</sup> Noise Standards specified in the Placer County Municipal Code Article 9.36.060.	
<i>Source: Environmental Science Associates. UAIC Tribal School Revised Noise Study Report. April 2018.</i>	

**Conclusion**

Article 9.36.030 of the Placer County Code exempts noise generated by the normal operation of public and private schools, and, as discussed above, the proposed project would result in minor increases to ambient noise levels related to traffic in the project area.

Should speakers be directed away from the nearest residential property line, speakers used during on-site special events would not expose nearby sensitive receptors to noise levels that would result in temporary increases to ambient noise as defined in Article 9.36.030 of the Placer County Code. However, if speakers are oriented towards the nearest residential property line during on-site special events, the use of such speakers would expose nearby sensitive receptors to noise levels that would result in temporary increases to ambient noise levels in excess of the County's standard, which would be considered a *significant* impact.

Mitigation Measure(s)

Implementation of the following mitigation measure would reduce the above impact to a *less-than-significant* level.

8-2            *All speakers used during special events shall be located at least 270 feet from the nearest residential property line. Additionally, speakers used during special events shall be oriented away from the nearest residential property line. The orientation of the speakers shall be inspected by a designated operations manager for the UAIC school facilities. The language of this mitigation shall be included as a Condition of Approval for the requested Minor Use Permit.*

**8-3    Exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels. Based on the analysis below and with implementation of mitigation, the impact is *less than significant*.**

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. On- and off-site construction activities may generate perceptible vibration when heavy equipment or impact tools such as jackhammers or hoe rams are used. Pile driving can cause excessive vibrations; while specific construction details are unknown at this time, pile driving is not anticipated to be required during construction of the proposed project. Construction activities for the proposed project would include demolition, excavation, site preparation work, foundation work, and new building, framing, and finishing.

The potential use of bulldozers during fine-site grading would be expected to generate the highest vibration levels during construction. Vibration levels would vary depending on soil conditions, construction methods, and equipment used. According to the FTA's *Transit Noise and Vibration Impact Assessment*, a large bulldozer typically generates vibration levels of 87 VdB and 0.089 inch/second PPV at a distance of 25 feet.<sup>10</sup>

As previously discussed, the proposed project would only result in a significant vibration impact if buildings would be exposed to the FTA's vibration threshold level of 0.2 PPV for building damage or if sensitive receptors would be exposed to a vibration level of 80 VdB for residential land uses. In order to exceed the 80 VdB threshold for human

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<sup>10</sup> Federal Transit Administration (FTA). *Transit Noise and Vibration Impact Assessment*. May 2006.

annoyance, a large bulldozer needs to be within 45 feet of a structure. In order to exceed the 0.2 in/sec PPV threshold for building damage, a large bulldozer would need to be within 15 feet of a structure. The nearest inhabited structure to the proposed off-site signal improvement area would be more than 100 feet away from the off-site disturbance areas, and, thus, construction activity would not be anticipated to result in vibrations in excess of 0.2 in/sec PPV or 80 VdB.

Although the exact extent of ground disturbance associated with project construction is currently unknown, assuming that the proposed project would include ground disturbing activity up to the property line, the nearest existing structure to the project site would be a minimum of approximately 25 feet from construction equipment. As such, construction equipment expected to generate the highest vibration levels would not exceed the 0.2 PPV threshold for building damage but could exceed the 80 VdB threshold for annoyance. Therefore, given the potential proximity of the nearest structure from construction equipment, the proposed project could cause potential annoyance to off-site sensitive receptors during construction. Therefore, impacts resulting from exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels could be *significant*.

Mitigation Measure(s)

Implementation of the following mitigation measure would reduce the above impact to a *less-than-significant* level.

8-3            *The following criteria shall be included in the grading plan submitted by the applicant for review and approval by the Engineering and Surveying Division prior to issuance of Improvement Plans:*

- *Large construction equipment, such as large bulldozer and loaded trucks, shall be replaced with smaller equipment when the construction equipment is within 45 feet of an occupied residence.*

**8-4    A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project during project construction. Based on the analysis below and with implementation of mitigation, the impact is *less than significant*.**

Construction activity noise levels at the project site and off-site signal construction area would fluctuate depending on the particular type, number, and duration of use of various pieces of construction equipment and would periodically increase noise levels in the vicinity of the project site. Construction activities associated with the proposed project would involve excavation, grading and earth movement, as well as construction of the classrooms and faculty buildings. Additionally, off-site improvements to the intersection of Taylor Road and Penryn Road would include construction of a traffic signal and paving activity. Considering the nature of the proposed on-site and off-site construction activities, on-site construction activities would be considered more intensive, and, thus, would have a greater potential to result in increased noise levels. Table 8-10 shows typical reference



noise levels of off-road construction equipment likely to be used during project construction.

<b>Table 8-10</b>		
<b>Reference Construction Equipment Noise Levels</b>		
<b>(50 feet from source)</b>		
<b>Types of Equipment</b>	<b>L<sub>max</sub>, dBA</b>	<b>Hourly L<sub>eq</sub>, dBA Percent Use</b>
Backhoe	80	76/40
Grader	85	81/40
Concrete Mixer Truck	85	81/40
Loader	80	76/40
Pneumatic Tools	85	76/40
Air Compressor	80	81/40
Excavator	85	81/40
<i>Source: FHWA, 2006.</i>		

Land uses surrounding the project site consist of single-family residences located within 25 feet of the western boundary of the project site and scattered single-family residences on larger lots located as close as approximately 35 feet to the south and 205 feet to the east of the project site. On-site construction activity is anticipated to occur at a minimum distance of 20 feet from the nearest residential property line. The loudest source of noise during project construction would occur during the grading phase. Using the reference noise levels provided in Table 8-10, a grader would generate a maximum noise level of 85 dBA and hourly L<sub>eq</sub> of 81 dBA at a distance of 50 feet. Assuming an attenuation rate of 7.5 dB per doubling of distance, the nearest residential property line could be exposed to a maximum noise level of 95 dBA and an hourly L<sub>eq</sub> of 91 dBA.

The highest measured daytime hourly L<sub>eq</sub> levels at the western proposed project boundary is 57 dBA. Noise generated during the grading phase of the proposed project could expose the nearest residential property line to noise levels that would temporarily elevate the existing ambient by up to 34 dB, which would exceed the applied 5 dB noise increase threshold. It should be noted that the presented noise levels represent worst case conditions that would only persist for a short period of time, as construction equipment would generally not be anticipated to remain in any one location within the project site for an extended period of time. Furthermore, as noted above, Article 9.36.030 of the Placer County Code exempts construction-related noise provided such activity occurs during specified weekday and weekend hours. Notwithstanding the exemption for construction activity occurring during the hours specified in Article 9.36.030, the foregoing analysis has been completed to assess the potential for such exempted construction-related noise to result in temporarily increased noise levels.

Because the predicted construction noise levels could potentially result in an increase of 5 dB or more, despite the exemption granted to construction-related noise during the hours specified in Article 9.36.030 of the Placer County Code, the proposed project could be considered to result in a substantial temporary or periodic increase in ambient noise levels

in the project vicinity above levels existing without the project. Therefore, impacts would be considered *significant*.

Mitigation Measure(s)

Implementation of the following mitigation measure would reduce the above impact to a *less-than-significant* level.

8-4 *The following criteria shall be included in the grading plan submitted by the applicant/developer for review and approval by the Department of Public Works and Facilities and Engineering and Surveying Division prior to issuance of Improvement Plans. Exceptions to allow expanded construction activities shall be reviewed on a case-by-case basis as determined by the Community Development Resource Agency Director and/or County Engineer.*

- *Noise-generating construction activities (e.g. construction, alteration or repair activities), including truck traffic coming to and from the project site for any purpose, shall be limited to the hours outlined in Placer County Board of Supervisors Minute Order 90-08; specifically, a) Monday through Friday, 6:00 AM to 8:00 PM (during daylight savings); b) Monday through Friday, 7:00 AM to 8:00 PM (during standard time); and c) Saturdays, 8:00 AM to 6:00 PM.*
- *Equipment and trucks used for project construction shall utilize the best available noise control techniques, such as improved mufflers, equipment redesign, use of intake silencers, ducts, engine enclosures and acoustically-attenuating shields or shrouds. The implementation of best control techniques could result in a noise reduction of 10 dB.*
- *Impact tools (i.e., jack hammers, pavement breakers, and rock drills) used for project construction shall be hydraulically or electrically powered wherever possible to avoid noise associated with compressed air exhaust from pneumatically powered tools. However, where use of pneumatic tools is unavoidable, an exhaust muffler on the compressed air exhaust shall be used; this muffler can lower noise levels from the exhaust by up to about 10-dB. External jackets on the tools themselves shall be used, to achieve a reduction of 5 dB. Quieter procedures shall be used, such as drills rather than impact equipment.*
- *Stationary noise sources shall be located as far from adjacent receptors as possible, and they will be muffled and enclosed within temporary sheds, incorporate insulation barriers, or other measures. The use of temporary enclosures or barriers around stationary noise sources (e.g., generators, compressors, pumps, etc.) would result in a noise reduction of up to 10 dB.*