4.5 Noise

This section examines the existing noise environment in the Planning Area and the changes that would occur to noise levels as a result of the proposed project. This section defines terminology used to describe noise, identifies sources of noise, and analyzes the ambient noise environment in the Planning Area. Key issues addressed in this section include construction noise, traffic noise, operational noise, groundborne vibration, and overall increases in noise resulting from implementation of the proposed General Plan Update. General Plan policies and mitigation measures that would serve to reduce impacts and relevant federal, state, and local regulatory agencies and codes regarding noise are also identified. The analysis in this section is based on the *Noise Impact Assessment for City of Rocklin General Plan Update* (Ambient Air Quality & Noise Consulting 2009). Supporting materials from this report are located in **Appendix D**. Abbreviated citations for each information source are provided in the text, with full references provided at the end of this section.

4.5.1 EXISTING SETTING

TECHNICAL BACKGROUND

Acoustic Fundamentals

Noise is generally defined as sound that is loud, disagreeable, or unexpected. Sound is mechanical energy transmitted in the form of a wave because of a disturbance or vibration. Sound levels are described in terms of both amplitude and frequency. Amplitude is defined as the difference between ambient air pressure and the peak pressure of the sound wave. Amplitude is measured in decibels (dB) on a logarithmic scale. For example, a 65 dB source of sound, such as a truck, when joined by another 65 dB source results in a sound amplitude of 68 dB, not 130 dB (i.e., doubling the source strength increases the sound pressure by 3 dB). Amplitude is interpreted by the ear as corresponding to different degrees of loudness. Laboratory measurements correlate a 10 dB increase in amplitude with a perceived doubling of loudness and establish a 3 dB change in amplitude as the minimum audible difference perceptible to the average person.

The frequency of a sound is defined as the number of fluctuations of the pressure wave per second. The unit of frequency is the Hertz (Hz). One Hz equals one cycle per second. The human ear is not equally sensitive to sound of different frequencies. For instance, the human ear is more sensitive to sound in the higher portion of this range than in the lower, and sound waves below 16 Hz or above 20,000 Hz cannot be heard at all. To approximate the sensitivity of the human ear to changes in frequency, environmental sound is usually measured in what is referred to as "A-weighted decibels" (dBA). On this scale, the normal range of human hearing extends from about 10 dBA to about 140 dBA (EPA 1971).

Noise can be generated by a number of sources, including mobile sources, such as automobiles, trucks and airplanes, and stationary sources, such as construction sites, machinery, and industrial operations. Common community noise sources and associated noise levels, in dBA, are depicted in **Figure 4.5-1**. Noise generated by mobile sources typically attenuates at a rate between 3.0 to 4.5 dBA per doubling of distance. The rate depends on the ground surface and the number or type of objects between the noise source and the receiver. Mobile transportation sources, such as highways, hard and flat surfaces, such as concrete or asphalt, have an attenuation rate of 3.0 dBA per doubling of distance. Soft surfaces, such as uneven or vegetated terrain, have an attenuation rate of about 4.5 dBA per doubling of distance from the source. Noise generated by stationary sources typically attenuates at a rate of approximately 6.0 to 7.5 dBA per doubling of distance from the source (EPA 1971).

NOISE DESCRIPTORS

The intensity of environmental noise fluctuates over time, and several descriptors of time-averaged noise levels are used. The three most commonly used descriptors are L_{eq}, L_{dn}, and CNEL. The energy-equivalent noise level, L_{eq}, is a measure of the average energy content (intensity) of noise over any given period. The L_{eq} metric is commonly applied to measure of the impact of a series of events during a given time period. Many communities use 24-hour descriptors of noise levels to regulate noise. The day-night average noise level, L_{dn}, is the 24-hour average of the noise intensity, with a 10-dBA "penalty" added for nighttime noise (10:00 p.m. to 7:00 a.m.) to account for the greater sensitivity to noise during this period. CNEL, the Community Noise Equivalent Level, is similar to L_{dn} but adds an additional 5-dBA penalty for evening noise (7:00 p.m. to 10:00 p.m.) Another descriptor that is commonly used is the sound exposure level (SEL). The SEL is a composite metric that represents both the intensity of a sound and its duration. Individual time-varying noise events (e.g., aircraft overflights) have two main characteristics: a sound level that changes throughout the event, and a period of time during which the event is heard. SEL provides a measure of the net impact of the entire acoustic event, but it does not directly represent the sound level heard at any given time. Noise analyses may also depend on measurements of L_{max}, the maximum instantaneous noise level during a specific period of time, and L_{min}, the minimum instantaneous noise level during a specific period. Common noise level descriptors are summarized in **Table 4.5-1**.

TABLE 4.5-1
COMMON ACOUSTICAL DESCRIPTORS

Descriptor	Definition
Community Noise Equivalent Level (CNEL)	The CNEL is similar to the L_{dn} described above, but with an additional 5 dBA "penalty" added to noise events that occur between the hours of 7:00 p.m. to 10:00 p.m. The calculated CNEL is typically approximately 0.5 dBA higher than the calculated L_{dn}.
Day-Night Average Noise Level (DNL or L_{dn})	The 24-hour L_{eq} with a 10 dBA "penalty" for noise events that occur during the noise-sensitive hours between 10:00 p.m. and 7:00 a.m. In other words, 10 dBA is "added" to noise events that occur in the nighttime hours to account for increases sensitivity to noise during these hours.
Energy Equivalent Noise Level (L_{eq})	The energy mean (average) noise level. The instantaneous noise levels during a specific period of time in dBA are converted to relative energy values. From the sum of the relative energy values, an average energy value (in dBA) is calculated.
Impulsive Noise	Having a high peak of short duration or a sequence of such peaks. A sequence of impulses in rapid succession is termed repetitive impulsive noise.
Minimum Noise Level (L_{min})	The lowest sound level measured during a single event (e.g., an aircraft overflight) in which the sound level changes value with time.
Maximum Noise Level (L_{max})	The highest sound level measured during a single event in which the sound level changes value with time. Used to describe single events, such as train horn soundings and aircraft flyovers.
Single Event Noise Exposure Level (SENEL)/Sound Exposure Level (SEL)	SENEL/SEL is a logarithmic measure of the total acoustic energy transmitted to the listener during the event. Mathematically, it represents the sound level of a constant sound that would, over the duration of the event (typically one second or less), generate the same acoustic energy as the actual time-varying noise event. Used to describe single events, such as train horn soundings and aircraft flyovers.

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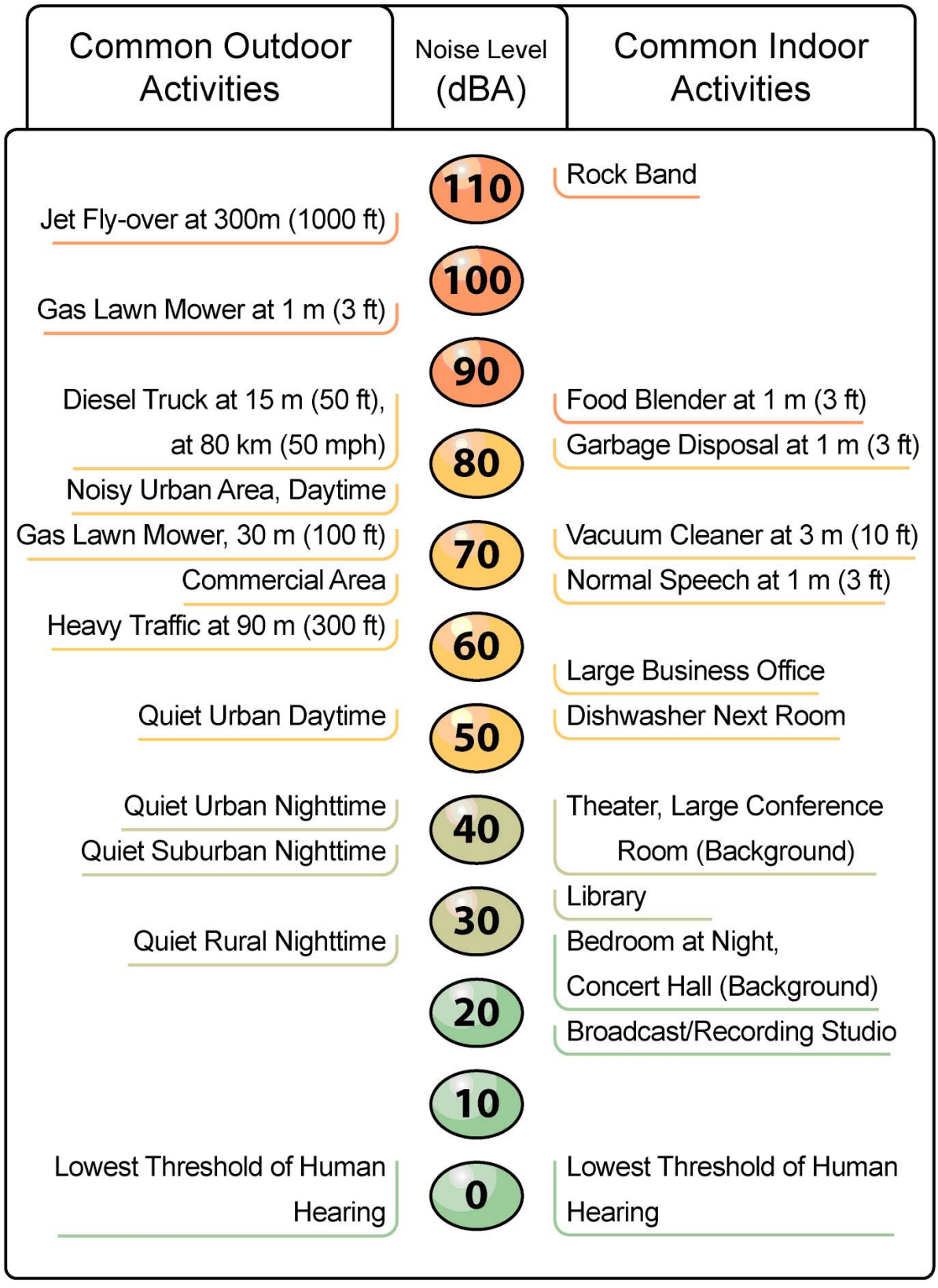

Source: AMBIENT, 2009

Figure 4.5-1
Typical Community Noise Levels

HUMAN RESPONSE TO NOISE

The human response to environmental noise is subjective and varies considerably from individual to individual. Noise in the community has often been cited as a health problem, not in terms of actual physiological damage, such as hearing impairment, but in terms of inhibiting general well-being and contributing to undue stress and annoyance. The health effects of noise in the community arise from interference with human activities, including sleep, speech, recreation, and tasks that demand concentration or coordination. Hearing loss can occur at the highest noise intensity levels. When community noise interferes with human activities or contributes to stress, public annoyance with the noise source increases. The acceptability of noise and the threat to public well-being are the basis for land use planning policies preventing exposure to excessive community noise levels.

Unfortunately, there is no completely satisfactory way to measure the subjective effects of noise or of the corresponding reactions of annoyance and dissatisfaction. This is primarily because of the wide variation in individual thresholds of annoyance and habituation to noise over differing individual experiences with noise. Thus, an important way of determining a person's subjective reaction to a new noise is the comparison of it to the existing environment to which one has adapted, referred to as the "ambient" environment. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged. With regard to human response, the following relationships are often relied upon when evaluating noise levels and potential impacts:

- Except in carefully controlled laboratory experiments, a change of 1 dB cannot be perceived by humans;
- Outside of the laboratory, a 3 dB change is considered a just-perceivable difference;
- A change in level of at least 5 dB is required before any noticeable change in community response would be expected.
- A 10 dB change is subjectively heard as an approximate doubling in loudness and would almost certainly cause a change in community response.

NOISE REDUCTION

Various methods can be employed to reduce noise levels, including enclosures, barriers, and sound-dampening materials. The methods employed are dependent on various factors, including source and receptor characteristics as well as environmental conditions. With regard to typical community noise sources, noise reduction techniques typically focus on the isolation or shielding of the noise source from nearby noise-sensitive receptors. The more common methods include the use of buffers, enclosures, and barriers. In general, these techniques contribute to decreasing noise levels only when the structure breaks the "line of sight" between the source and the receiver. Buildings, concrete walls, and berms can all act as effective noise barriers. Wooden fences or broad areas of dense foliage can also reduce noise but are less effective than solid barriers. Changes in design specifications and use of equipment noise control devices (e.g., mufflers and silencers) are also commonly employed to reduce stationary-source (i.e., non-transportation) noise levels. Additional noise control techniques commonly used for transportation noise sources include traffic control, such as prohibiting heavy-duty trucks and reducing speed limits along primarily affected corridors. However, an approximate 20 mile per hour reduction in speed would typically be required to achieve a noticeable decrease in noise

levels. In some instances, the use of noise-reducing pavements, such as rubberized asphalt, has also been used to reduce traffic noise.

EXISTING NOISE ENVIRONMENT

NOISE-SENSITIVE LAND USES

Noise-sensitive land uses are generally considered to include those uses that would result in noise exposure that could cause health-related risks to individuals. Places where quiet is essential are considered noise-sensitive uses. Residential dwellings are of primary concern because of the potential for increased and prolonged exposure of individuals to both interior and exterior noise levels. Other land uses such as parks, historic sites, cemeteries, and recreation areas are also considered sensitive to increases in exterior noise levels. School classrooms, places of assembly, hotels, libraries, and other places where low interior noise levels are essential are also considered noise-sensitive land uses.

AMBIENT NOISE ENVIRONMENT

Several sources of noise that could affect local residents were identified within the City of Rocklin. These sources include noise generated from non-transportation sources (e.g., commercial and industrial uses), railroad operations, and vehicle traffic on area roadways and highways. Ambient noise measurements were conducted for the purpose of documenting and measuring the existing noise environment in various areas of the city. Noise measurement surveys were conducted on October 28 and 29, 2008; November 11and 13, 2008; and January 30, 2009. A total of two long-term (i.e., 24-hour) noise measurements were conducted along the Interstate 80 and State Route 65 corridors. Short-term (i.e., 10-minute) noise measurements were conducted at 21 locations throughout the city during the daytime, evening, and nighttime hours. All noise measurements were conducted using a Larson Davis Laboratories, Model 820, Type I sound-level meter placed at a height of approximately 4.5 feet above the ground surface. Ambient noise measurement locations and corresponding measured values are summarized in **Table 4.5-2**. The noise measurement locations are depicted in **Figure 4.5-2**.

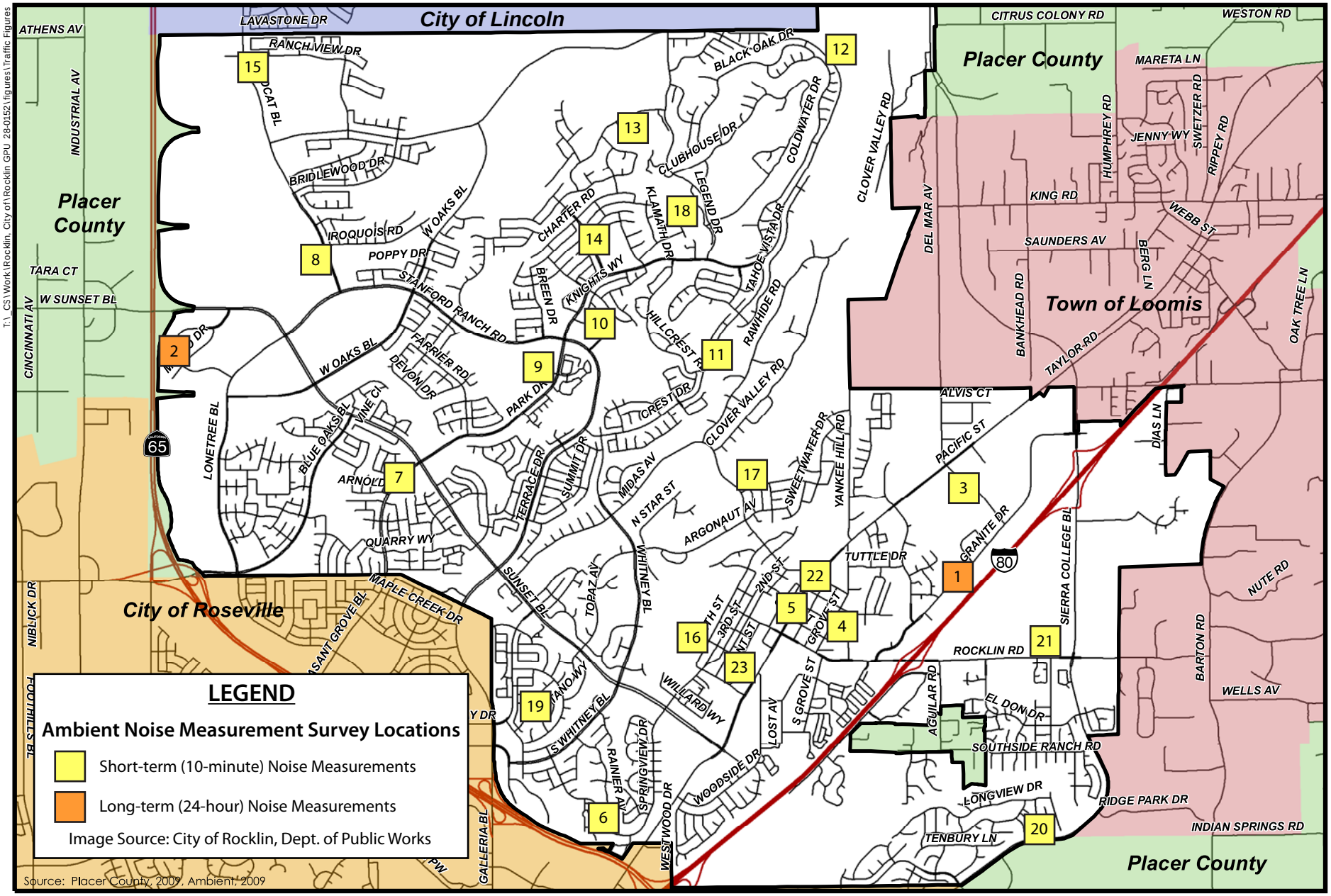

Figure 4.5-2
Ambient Noise Monitoring Locations

TABLE 4.5-2
AMBIENT NOISE MEASUREMENT SURVEYS

Location		Monitoring Period		Noise Level (dBA)[1]		
		Date	Time[2]	L_{eq}	L_{max}	CNEL[3]
1	I-80, Rocklin Emporium, 100 feet from Roadway Centerline	10/28/08–10/29/08	24 Hours	75.3	81.6	78
				73.1	81.2	
				70.8	79.9	
2	Highway 65, Five Star Plaza, 150 feet from Roadway Centerline	10/28/08–10/29/08	24 Hours	63.7	69.4	67
				62.2	67.7	
				60.2	67.4	
3	Sierra Pine, 4300 Dominguez Road, Property Line	10/28/08	8:00–8:10	67.1	78.2	73.1
		11/11/08	19:00–19:10	66.8	67.5	
		11/13/08	23:15–23:25	66.5	68.2	
4	Rocklin Elementary School, 5025 Meyers Street, Property Line	10/28/08	09:10–09:20	55.1	73.6	59.3
		11/11/08	19:30–19:40	53.1	62.1	
		11/13/08	22:35–22:45	52.4	62.6	
5	Pacific Street at Pine Street, 50 feet from Roadway Centerline	10/28/08	09:30–09:40	65.4	75.6	69
		11/11/08	20:05–20:15	62.0	71.6	
		11/13/08	22:10–22:20	60.7	71.9	
6	Antelope Creek Elementary School, 6185 Springview Drive, Property Line	10/28/08	10:10–10:20	59.7	69.0	65
		11/11/08	20:45–20:55	58.4	71.2	
		11/12/08	00:35–00:45	58.1	69.2	
7	Rock Creek Plaza, 6151 Park Drive, Property Line	10/28/08	17:25–17:35	63.5	75.5	66
		10/28/08	20:00–20:10	60.1	72.5	
		10/29/08	23:50–24:00	57.1	73.5	
8	Margaret Azevedo Community Park, Wildcat Boulevard, 50 feet from Roadway Centerline	10/28/08	18:05–18:15	59.8	72.3	60
		10/28/08	19:25–19:35	52.3	68.9	
		10/29/08	00:20–00:30	47.8	56.7	
9	Twin Oaks Community Park, 5500 Park Drive, 50 feet from Roadway Centerline	10/28/08	16:45–16:55	60.5	68.3	65
		10/28/08	20:35–20:45	58.5	71.9	
		10/29/08	23:15–23:25	57.1	68.9	
10	Rocklin High School, 5301 Victory Drive, 50 feet from Roadway Centerline	10/28/08	16:10–16:20	53.4	65.4	56
		10/28/08	21:10–21:20	48.6	60.4	
		10/29/08	22:45–22:55	47.9	61.8	
11	Valley View Elementary School, 3000 Crest Drive, 50 feet from Roadway Centerline	10/28/08	12:25–12:35	58.2	68.3	61
		10/29/08	20:30–20:40	54.6	72.0	
		11/12/08	00:05–00:15	52.9	69.8	

Location		Monitoring Period		Noise Level (dBA)[1]		
		Date	Time[2]	L_{eq}	L_{max}	CNEL[3]
12	Boulder Ridge Park, Park Drive, 100 feet from Roadway Centerline	10/28/08	13:15–13:25	52.4	65.1	54
		10/29/08	20:00–20:10	48.3	65.8	
		10/28/08	23:25–23:35	47.9	68.4	
13	Whitney Oaks Golf Course Maintenance Facility, Pebble Beach Drive, Property Line	10/28/08	13:55–14:05	54.7	72.3	54
		10/29/08	19:30–19:40	42.6	68.2	
		10/28/08	22:55–23:05	38.9	46.4	
14	Granite Oaks Middle School, 2600 Wyckford Boulevard, 75 feet from Roadway Centerline	10/28/08	14:40–14:50	57.5	65.5	61
		10/29/08	19:00–19:10	54.7	64.7	
		10/28/08	22:20–22:40	52.8	66.1	
15	Whitney High School, 701 Wildcat Boulevard, 100 feet from Roadway Centerline	10/29/08	09:45–09:55	55.1	66.8	60
		10/28/08	19:00–19:10	53.9	64.7	
		10/29/08	00:50–01:00	52.8	65.3	
16	Johnson Springview Park, 5480 5th Street, 100 feet from Roadway Centerline	10/28/08	11:20–11:30	50.3	64.8	55
		10/29/08	21:30–21:40	48.9	63.2	
		11/11/08	22:55–23:05	48.1	64.4	
17	Clover Valley Park, Clover Valley Road, 50 feet from Roadway Centerline	10/28/08	11:45–11:55	55.4	68.1	56
		10/29/08	21:00–21:10	47.9	71.0	
		11/11/08	23:25–23:35	46.8	68.2	
18	Monument Park, Ketchikan Drive, 75 feet from Roadway Centerline	10/28/08	15:30–15-40	45.2	65.1	51
		10/28/08	21:50–22:00	44.9	62.3	
		10/29/08	22:05–22:15	44.5	63.4	
19	Vista Grande Park, Onyx Drive, 75 feet from Roadway Centerline	10/28/08	10:55–11:05	44.9	65.8	50
		11/11/08	21:15–21:25	44.2	63.7	
		11/11/08	22:25–22:35	43.6	62.9	
20	Sierra College Boulevard at Nightwatch Drive, 60 feet from Roadway Centerline	01/30/09	11:20–11:30	67.1	80.3	70
		01/30/09	20:00–20:10	65.4	78.2	
		01/30/09	22:25–22:35	61.5	78.5	
21	Sierra College, 5000 Rocklin Road, 50 feet from Roadway Centerline	01/30/09	10:45–10:55	62.1	73.1	66
		01/30/09	19:30–19:40	60.8	72.4	
		01/30/09	22:00–22:10	56.4	72.9	
22	Railroad Avenue at Pine Street, 40 feet from Railroad Track Centerline. Wayside maximum noise level associated with freight-train passby with horns soundings.	01/30/09	12:40	NM	105.7	NM

Location		Monitoring Period		Noise Level (dBA)[1]		
		Date	Time[2]	L_{eq}	L_{max}	CNEL[3]
23	Front Street, 400 feet north of Farron Street, 40 feet from Railroad Track Centerline. Wayside maximum noise level associated with Amtrak train passby with horns soundings.	01/30/09	13:58	NM	101.4	NM

Source: Ambient 2009

Notes:

1. *Noise measurements were conducted using a Larson Davis Laboratories, Model 820 sound-level meter.*
2. *Short-term measurements (Sites 3–21) were conducted during the daytime (7 a.m.–7 p.m.), evening (7 p.m.–10 p.m.), and nighttime (10 p.m.–7 a.m.) hours. Measurement site locations 22 and 23 reflect maximum measured intermittent noise levels associated with freight and Amtrak train passbys, with horn soundings.*
3. *CNEL for 24-hour measurement locations (Sites 1 & 2) are based on measured values. CNEL for short-term measurement locations (Sites 3–21) are calculated approximations based on the short-term measurements conducted.*

dBA = A-weighted Decibel Scale (frequency weighting that best approximates the response of the human ear)

Leq = Equivalent (Energy-Average) Noise Level

Lmax = Maximum Noise Level

CNEL = Community Noise Equivalent Level.

NM = Not Measured

Noise Sources

Noise levels associated with major non-transportation and transportation noise sources within the city are discussed in more detail below.

Non-Transportation Sources

Many industrial processes produce noise, even when the best available noise control technology is applied. Noise exposures within industrial facilities are controlled by federal and state employee health and safety regulations (i.e., regulations of the Occupational Safety and Health Administration of the U.S. Department of Labor [OSHA] and the California Division of Occupational Safety and Health [Cal-OSHA]). Exterior noise levels that affect neighboring parcels are typically subject to local standards. Commercial, recreational, and public facility activities can also produce noise that may affect adjacent noise-sensitive land uses. These noise sources can be continuous or intermittent and may contain tonal components that are annoying to individuals who live nearby. For instance, emergency-use sirens and backup alarms are often considered nuisance noise sources, but may not occur frequently enough to be considered incompatible with noise-sensitive land uses. In addition, noise generation from fixed noise sources may vary based upon climate conditions, time of day, and existing ambient noise levels.

From a land use planning perspective, stationary-source noise control issues focus on two goals: (1) preventing the introduction of new noise-producing uses in noise-sensitive areas; and (2) preventing encroachment of noise-sensitive uses upon existing noise-producing facilities. The first goal can be achieved by applying noise performance standards to proposed new noise-producing uses. The second goal can be met by requiring that new noise-sensitive uses near noise-producing facilities include mitigation measures to ensure compliance with noise performance standards. Each of these goals stresses the importance of avoiding the location of new uses that may be incompatible with adjoining uses. Noise levels associated with non-transportation noise sources can vary depending on various factors, including site conditions, equipment operated, and the specific activities being conducted. As a result, actual noise

levels at nearby noise-sensitive receptors will likely vary depending on the above-mentioned conditions and other influences, such as location, distance from source, shielding provided by intervening terrain and structures, and ground attenuation rates. For these reasons, noise generated by such uses and impacts to nearby noise-sensitive land uses should be evaluated on a project-by-project and site-specific basis.

Within the City of Rocklin, major non-transportation noise sources consist predominantly of industrial and commercial land uses. Major noise-generating industrial land uses consist primarily of wood-product processing facilities located along Pacific Street. To a somewhat lesser extent, other non-transportation noise sources within the community include automotive/equipment repair and maintenance facilities, recreational uses, and construction activities. Noise levels associated with non-transportation noise sources are discussed below.

Industrial Uses

As noted above, industrial land uses within the City of Rocklin are primarily located along Pacific Street and consist predominantly of wood-product processing facilities. To a lesser extent, other noise-generating land uses located in these areas, including distribution centers, lumber handling and sales establishments, and assorted automotive service facilities, also contribute to the ambient noise environment.

Sierra Pine

Sierra Pine is a privately held composite wood products company specializing in the production of medium-density fiberboard (MDF) and particleboard. The plant operates up to 24 hours per day.

Noise measurements of plant operations were conducted on October 28, November 11, and November 13 of 2008 (refer to **Table 4.5-2**) along the eastern and southern boundaries of the plant. Average-hourly noise levels measured approximately 67 dB L_{eq} at approximately 200 feet from the plant. Ambient noise levels at the southern boundary of the plant measured approximately 59 dBA L_{eq}. Assuming a maximum noise level of 67 dBA L_{eq} at 200 feet, the predicted 60 L_{eq} noise contour would extend to a distance of approximately 475 feet from the plant. However, because of the directional aspects of on-site noise sources and shielding provided by on-site structures, operational noise levels at off-site locations are highly variable. As a result, operational noise levels and distances to predicted noise contours will vary depending on several factors, including the specific operational activities being conducted, orientation of off-site receptors to on-site sources, and meteorological conditions.

Other Wood Processing Facilities

Other wood processing facilities generally produce noise levels that are largely masked by background noise from Sierra Pine, local traffic, and railroad operations. Operational noise levels and distances to predicted noise contours will vary as discussed above.

Other Non-Transportation Noise Sources

Various other non-transportation noise sources can contribute to noticeable increases in ambient noise levels. Such sources would include, but are not limited to, recreational uses or events, particularly those that utilize amplified sound systems (e.g., sporting events, public events), automotive repair facilities, commercial uses, building mechanical systems, and

construction activities. Noise generated by such sources is often directional and can vary depending on site and operational characteristics.

Recreational Events

Recreational events involving large spectator crowds, particularly those involving the use of amplified sound systems, can result in substantial temporary or periodic increases in ambient noise levels. Outdoor events that include the use of an amplified sound system and involve relatively small spectator crowds can generate noise levels of approximately 70 to 80 dBA L_{eq} at 50 feet from the stage area/speaker locations. Based on these noise levels, the predicted 60 dBA L_{eq} noise contour for such uses would extend to a distance of approximately 525 feet. Noise levels generated by such sources are primarily a function of the type of performance being provided and can vary substantially depending on the use.

For stadiums that draw large spectator crowds and are equipped with multi-speaker amplified sound systems, predicted exterior noise levels can range from approximately 57 to 72 dBA L_{eq} at approximately 500 feet during recreational events. Outdoor musical and band performances, such as marching band performances during halftime and pre-game shows, have measured approximately 57 to 76 dBA L_{eq} at 500 feet. Predicted noise levels at stadiums are dependent on various factors including stadium design and orientation, the activities conducted, spectator crowd size, and type of public address amplification system installed, as well as speaker placement. Depending on such factors, the predicted 60 dBA L_{eq} noise contour for larger stadiums would extend to distances ranging from approximately 370 to 3,100 feet (SAUSD 2005.)

Automotive Maintenance & Repair

Typical automotive maintenance and repair activities often include the use of pneumatic tools, air compressors, and power generators. Other equipment operations, such as the use of power hand tools (e.g., sanders, drills, grinders), typically generate a lesser degree of noise. The use of air compressors, power generators, and pneumatic tools can generate noise levels of up to approximately 85 dBA at 50 feet. Noise levels generated by the use of handheld tools, such as sanders, drills, and grinders, typically average between 63 and 87 dBA at 3 feet. Simultaneous use of multiple hand tools, such as grinders being used on metal, can generate levels of 87 to 97 dBA L_{eq} at 3 feet (EPA 1971). Noise levels associated with these facilities would be dependent on the specific activities performed and source/facility characteristics. Assuming an exterior operational noise level of 97 dBA L_{eq} at 3 feet, the 60 dBA L_{eq} noise contour would extend to a distance of approximately 225 feet.

Commercial Uses

Potential sources of noise associated with these types of land uses can vary substantially. Noise associated with such uses can include occasional parking lot-related noise (e.g., opening and closing of vehicle doors, people talking), loading dock operations (e.g., use of forklifts, hydraulic lifts), trash compactors, and air compressors. Early morning truck deliveries and dumpster pickup may also be a source of intermittent elevated noise levels at nearby receptors. Noise from such equipment can reach intermittent levels of approximately 90 dBA at 50 feet from the source (EPA 1971). Average-hourly noise levels can vary, depending on the activities being conducted and duration of the event.

Building Mechanical Systems

The majority of electrical and mechanical equipment in buildings is used for air circulation systems. In addition, pumping and piping systems are used for water and fluid circulation, elevators and escalators are used for movement of personnel, and various conveyance systems are used for moving material. Much of this equipment is located in mechanical equipment rooms or in areas that provide shielding from direct public/personnel exposure (i.e., above ceilings, in walls, or behind enclosures). Equipment located within exterior areas can result in increases in ambient noise levels, particularly when located in unshielded areas and within line of sight of nearby receptors. Such equipment would include air conditioning units, cooling towers, compressors, fans/turbines, electrical transformers, chillers, and pumps. Noise levels associated with these sources can vary depending on the specific equipment being operated, facility/equipment design, and operational characteristics. Typical noise levels associated with building mechanical equipment can range from less than 50 to 110 dBA at 3 feet, with the highest noise levels reaching approximately 85 dBA L_{eq} at 50 feet from the source (EPA 1971). Assuming an exterior operational noise level of 85 dBA L_{eq} at 50 feet, the 60 dBA L_{eq} noise contour would extend to a distance of approximately 930 feet.

Construction Activities

Construction noise typically occurs intermittently and varies depending upon the nature or phase (e.g., demolition/land clearing, grading and excavation, erection) of construction. Noise generated by construction equipment, including earthmovers, material handlers, and portable generators, can reach high levels. Individual equipment noise levels typically range from approximately 74 to 88 dBA L_{eq} at 50 feet. Typical operating cycles may involve 2 minutes of full power, followed by 3 or 4 minutes at lower settings. Intermittent noise levels can range from approximately 77 to 95 dBA L_{max}, the loudest of which include blasting, and the use of pile drivers and impact devices (e.g., hoe rams, impact hammers).

Transportation Sources

Railroads

The Union Pacific Railroad (UPRR) operates a double-track parallel mainline that extends in an east-west direction located parallel to and north of Pacific Street. Near the intersection of Railroad Avenue and Pine Street, the two tracks diverge with the eastbound track curving in a northerly direction parallel to Sierra College Boulevard. The westbound track continues in an easterly direction along the north side of Taylor Road-Pacific Street.

The UPRR tracks are used for both freight transport and Amtrak passenger service. The number of freight trains can vary from day to day, depending on demand, and there are currently no hourly restrictions pertaining to freight transport along this railroad corridor. The total number of freight trains traveling along this corridor typically averages approximately 16 trains per day (Smith 2009). Based on site reconnaissance surveys, Union Pacific freight trains are estimated to travel at speeds of approximately 35–40 miles per hour (mph). Amtrak passenger trains typically run between the daytime hours of 7:00 a.m. and 10:00 p.m., and average approximately 10 trains per day (Amtrak 2009). Average train lengths can vary from approximately 85 railcars for freight trains to approximately 8 passenger cars for Amtrak trains.

The Federal Transit Administration's (FTA) Transit Noise and Vibration Impact Assessment Guidelines (FTA 2006) were used for the calculation of train noise levels, based on the above-discussed operations. Predicted noise levels at 50 feet from the track centerline and distance to

predicted noise contours are summarized in **Table 4.5-3**. Existing 60 and 65 L_{dn}/CNEL noise contours for major transportation noise sources, including the UPRR corridors, are depicted in **Figure 4.5-3**. It is important to note that projected noise levels do not include shielding or reflection of noise from intervening terrain or structures. In addition, actual train noise levels will vary depending on various factors, such as train speed, the number of engines used, track conditions (e.g., welded vs. jointed), and the condition of the train wheels. Additional factors, such as the sounding of train horns and the operation of roadside signaling devices, can also contribute to overall noise levels. Although these predicted noise contours are not considered site-specific, they are useful for determining potential land use conflicts.

TABLE 4.5-3
PREDICTED RAILROAD NOISE LEVELS

Railroad Corridor	Wayside Noise Level at 50 feet from Track Centerline (dBA CNEL)		Distance from Track Centerline to CNEL Noise Contour (feet)			
	Without Horns Sounding	With Horns Sounding	Without Horns Sounding		With Horns Sounding	
			60 dBA	65 dBA	60 dBA	65 dBA
Single-Track	68	80	185	85	1,000	540
Double-Track Mainline	71	83	280	130	1,480	750

Source: Ambient 2009

Notes: Noise levels were calculated based on methodology obtained from the Federal Transit Administration's Transit Noise and Vibration Impact Assessment Guidelines (FTA 2006). Assumes 16 freight trains, distributed equally over a 24-hour period,, and 10 Amtrak trains between the daytime hours of 7 a.m. and 10 p.m. The sounding of locomotive horns typically occurs within distances of approximately 1,000 feet of at-grade crossings. Noise contours do not include shielding due to intervening terrain or structures.

Based on the modeling conducted, the predicted 60 dBA CNEL noise contour for the UPRR mainline would extend to approximately 280 feet from the track centerline without the sounding of train warning horns and to approximately 1,480 feet with the sounding of train horns. Along the single-track eastbound and westbound railroad corridors, the predicted 60 dBA CNEL noise contours would extend to approximately 185 feet from the track centerline without the sounding of train warning horns and to approximately 1,000 feet with the sounding of train horns.

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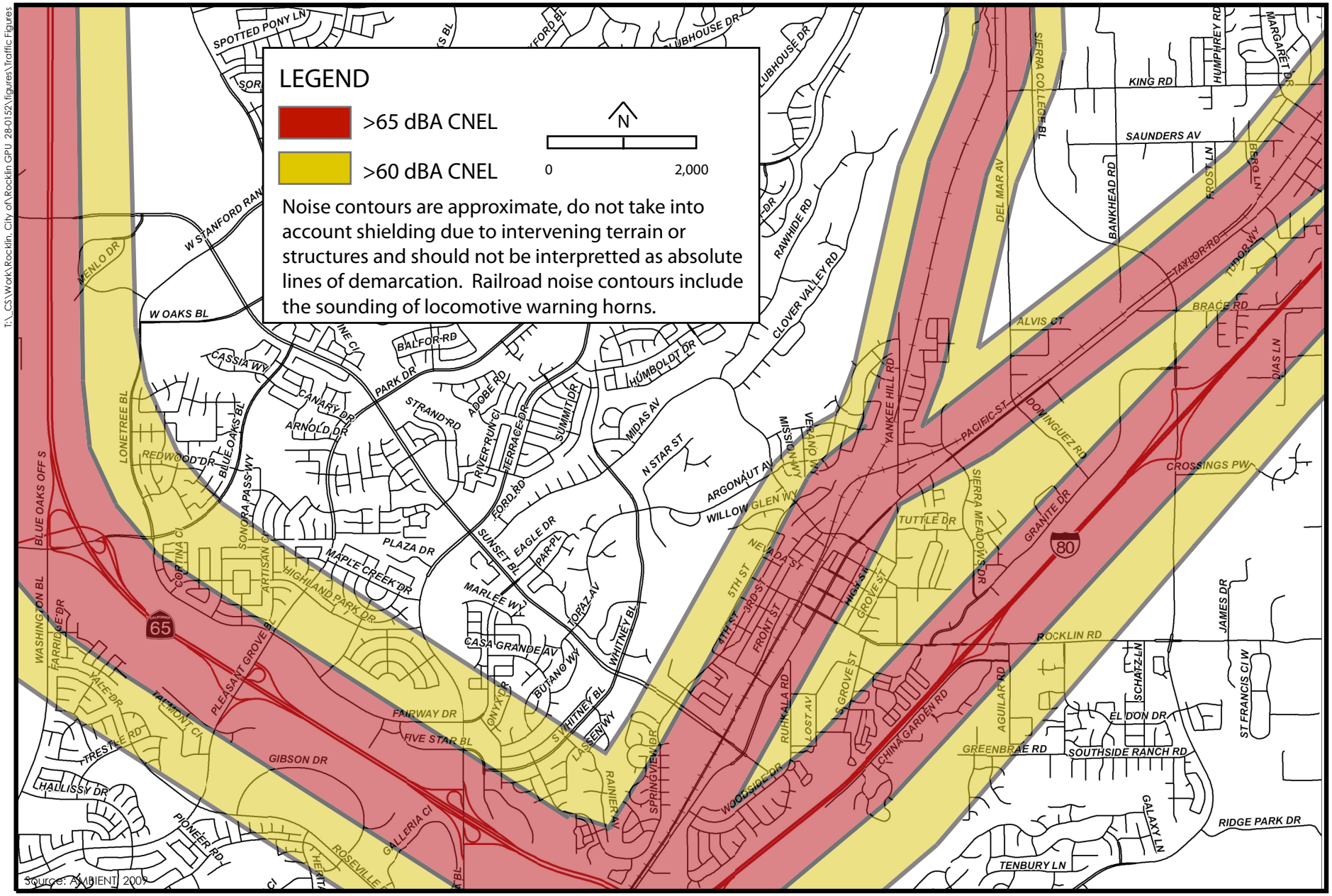

NO SCALE

N

Figure 4.5-3

Predicted Noise Contours - Major Transportation Noise Sources - Existing Conditions

Roadway Traffic

Ambient noise levels in many portions of the city are defined primarily by traffic on major roadways, including State Route 65 (SR 65) and Interstate 80 (I-80). The FHWA Highway Traffic Noise Prediction model (FHWA-RD-77-108) was used to predict traffic noise levels along major area roadways. The FHWA modeling was based on the Calveno noise emission factors for automobiles and medium- and heavy-duty trucks. Input data used in the model included average-daily traffic volumes, day/night percentages of automobiles and medium and heavy trucks, vehicle speeds, ground attenuation factors, and roadway widths. Modeling was conducted for major roadways evaluated in the traffic analysis prepared for this project, for which traffic volumes were available. Vehicle distribution percentages were based on traffic data obtained during the site reconnaissance conducted for this project, as well as heavy-duty truck distribution percentages for major highways obtained from the California Department of Transportation (Caltrans 2007).

In 2002, traffic noise measurements were taken at various locations throughout Rocklin to support the Noise Element (refer to **Appendix D**). Predicted traffic noise levels for roadway segments within the city, including distances to the predicted existing 60, 65, and 70 dBA L_{dn}/CNEL noise contours, are summarized in **Table 4.5-4** based on roadway segments included in the traffic modeling that has been updated since 2002. Predicted 60 and 65 L_{dn}/CNEL noise contours for major transportation noise sources, including SR 65, I-80, and the UPRR corridors, are depicted in **Figure 4.5-4**. Predicted noise contours are approximate and do not take into account shielding or reflection of noise due to intervening terrain or structures. As a result, predicted noise contours should be considered to represent bands of similar noise exposure along roadway segments, rather than absolute lines of demarcation. Although these predicted noise contours are not considered site-specific, they are useful for determining potential land use conflicts.

TABLE 4.5-4
EXISTING TRAFFIC NOISE LEVELS IN THE PLANNING AREA

Roadway Segment	ADT	CNEL at 50 Feet from Near Travel-lane Centerline	Distance (feet) from Roadway Centerline to CNEL Contour		
			70	65	60
Sierra College Boulevard from I-80 Eastbound Ramps to Rocklin Road	14,800	67.08	--	99	209
Sierra College Boulevard, Rocklin Road to Scarborough Drive	21,500	69.86	73	149	319
Rocklin Road, Sierra College Boulevard to El Don Drive	17,000	64.99	--	74	153
Rocklin Road, El Don Drive to Interstate 80	24,300	66.55	--	92	193
Rocklin Road, Interstate 80 to Granite Drive	30,300	67.50	--	106	223
Rocklin Road, Granite Drive to Grove Street	18,900	65.45	--	79	163
Rocklin Road, Grove Street to Pacific Street	17,600	65.14	--	76	156
Pacific Street, Dominguez Road to Sierra Meadows Drive	12,800	65.18	--	76	157
Pacific Street, Sierra Meadows Drive to Grove Street	14,300	65.66	--	81	169
Pacific Street, Grove Street to Rocklin Road	15,000	64.45	--	69	141
Pacific Street, Rocklin Road to Civic Center Drive	22,400	66.19	--	87	183
Pacific Street, Civic Center Drive to Sunset Boulevard	23,300	66.36	--	90	187
Pacific Street, Sunset Boulevard to State Route 65	22,000	66.11	--	86	181
Sunset Boulevard, State Route 65 to Atherton Road	13,800	65.51	--	79	165
Sunset Boulevard, Atherton Road to W. Stanford Ranch Road	13,800	65.13	--	79	165
Sunset Boulevard, W. Stanford Ranch Road to Park Drive	21,400	67.03	--	106	220
Sunset Boulevard, Park Drive to Little Rock Road	24,800	68.95	70	139	294
Sunset Boulevard, Little Rock Road to Stanford Ranch Road	21,500	68.33	65	127	268
Sunset Boulevard, Stanford Ranch Road to Topaz Avenue	19,000	67.79	61	118	247
Sunset Boulevard, Topaz Avenue to Whitney Boulevard	19,200	68.21	58	117	248
Sunset Boulevard, Whitney Boulevard to Pacific Street	24,400	69.25	67	137	291

Roadway Segment	ADT	CNEL at 50 Feet from Near Travel-lane Centerline	Distance (feet) from Roadway Centerline to CNEL Contour		
			70	65	60
Stanford Ranch Road, Sunset Boulevard to Wildcat Boulevard	13,900	65.16	--	82	166
Stanford Ranch Road, Wildcat Boulevard to W. Oaks Boulevard	6,700	61.99	--	--	105
Stanford Ranch Road, W. Oaks Boulevard to Park Drive	10,400	63.90	--	69	138
Stanford Ranch Road, Park Drive to Crest Drive	15,800	65.72	--	88	181
Stanford Ranch Road, west of Crest Drive	13,400	65.00	--	80	163
Stanford Ranch Road, Sunset Boulevard to Crest Drive	17,500	66.16	--	94	193
Stanford Ranch Road, Sunset Boulevard to Fairway Drive	23,600	68.73	68	135	285
Stanford Ranch Road, Fairway Drive to State Route 65	48,800	70.61	87	178	379
Interstate 80, State Route 65 to Rocklin Road	122,000	79.98	410	877	1,885
Interstate 80, Rocklin Road to Sierra College Boulevard	97,000	78.99	353	753	1,618
Interstate 80, Sierra College Boulevard to Horseshoe Road	96,000	78.94	350	748	1,607
State Route 65, Interstate 80 to Stanford Ranch Road	108,000	80.52	467	1000	2,152
State Route 65, Stanford Ranch Road to Pleasant Grove Boulevard	96,000	80.01	433	925	1,989
State Route 65, Pleasant Grove Boulevard to Blue Oaks Boulevard	82,000	79.33	390	833	1,791
State Route 65, Blue Oaks Boulevard to Sunset Boulevard	69,000	78.58	349	743	1,597
State Route 65, Sunset Boulevard to Twelve Bridges Drive	55,000	77.59	302	640	1,373

Source: Ambient 2009

Noise levels/contours were calculated using the FHWA roadway noise model based on Calveno vehicle reference noise levels and traffic data obtained from the traffic analysis prepared for this project. Refer to ***Appendix D*** *for modeling output files.*

-- Contours are within roadway right-of-way.

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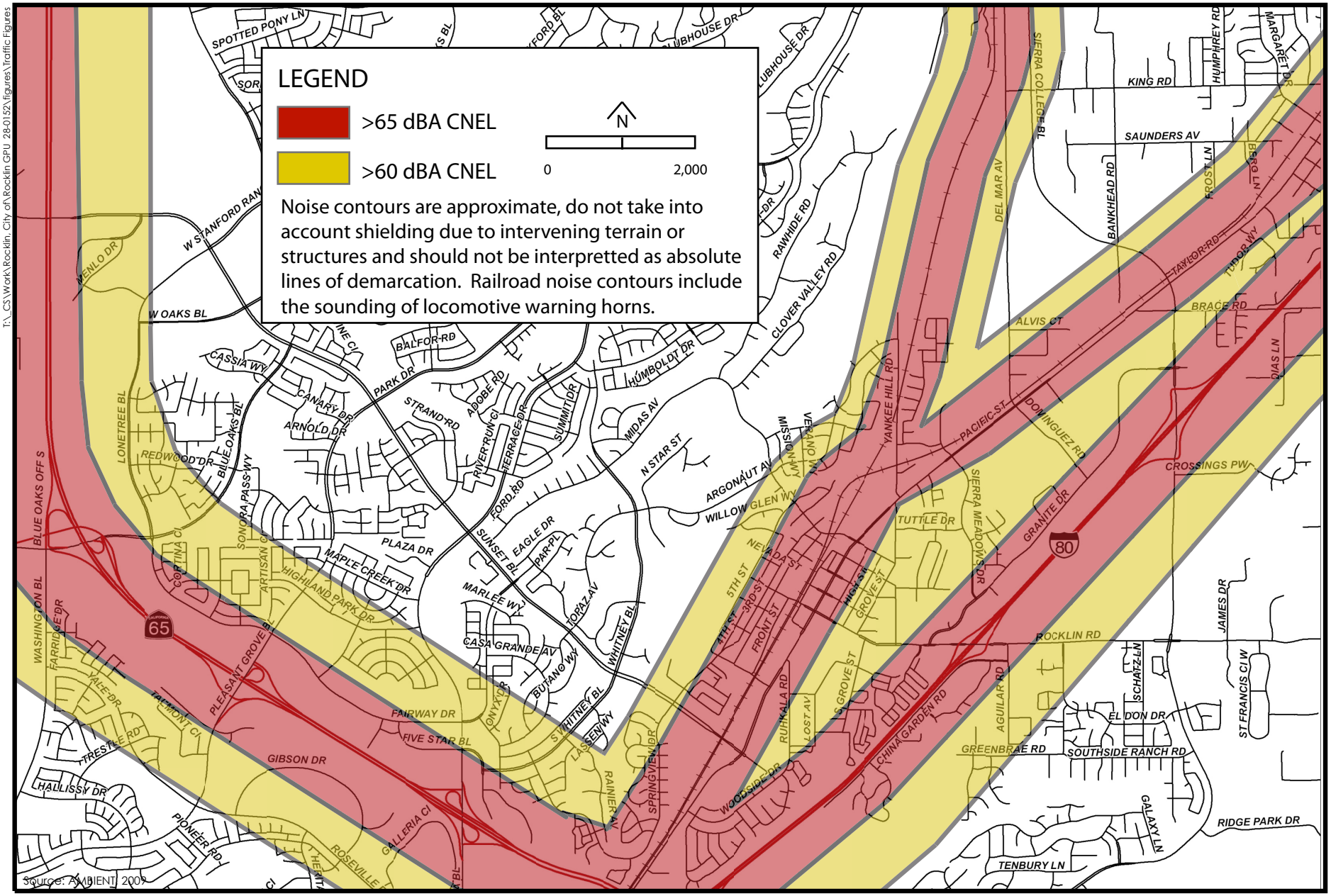

NO SCALE

N

Figure 4.5-4

Predicted Noise Contours - Major Transportation Noise Sources Future Cumulative Plus Proposed General Plan

4.5.3 REGULATORY FRAMEWORK

Federal, state, and local governments have established noise standards and guidelines to protect citizens from potential hearing damage and various other adverse physiological and social effects associated with noise. Those regulations most applicable to the community are summarized below.

FEDERAL

Federal Railroad Administration

The federal government, in response to safety concerns at at-grade crossings, enacted the Swift Rail Development Act of 1994. This act mandated that the Secretary of Transportation issue regulations requiring the use of locomotive horns at public grade crossings, but gave the agency the authority to make reasonable exceptions. On January 13, 2000, the Federal Railroad Administration published a Notice of Proposed Rule Making in the Federal Register addressing the use of locomotive horns at public road-rail grade crossings. Accordingly, locomotive horns must be sounded on approach and while entering public grade crossings, unless there is no significant risk of increased grade crossing collisions, the use of a locomotive horn is impractical, or where safety measures can be installed to fully compensate for the absence of the warning provided by the horn. The sounding of warning horns can greatly affect predicted noise contours within the community.

U.S. Environmental Protection Agency

In 1974, the EPA Office of Noise Abatement and Control published a report entitled Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety. Although this document does not constitute EPA regulations or standards, it is useful in identifying noise levels at which increased levels of annoyance would be anticipated. Based on an annual-average day-night noise level (expressed as L_{dn} or DNL), the document states that "undue interference with activity and annoyance" will not occur if outdoor noise levels in residential areas are below 55 dBA L_{dn} and indoor levels are below 45 dBA L_{dn} (EPA 1974).

Department of Housing and Urban Development

The Federal Department of Housing and Urban Development (HUD) guidelines for the acceptability of residential land uses are set forth in the Code of Federal Regulations, Title 24, Part 51, Environmental Criteria and Standards. These guidelines identify an exterior noise exposure of 65 dBA L_{dn}, or less, as acceptable. Exterior noise levels of 65 to 75 dBA L_{dn} are considered normally acceptable, provided appropriate sound attenuation is provided to reduce interior noise levels to within acceptable levels. Exterior noise levels above 75 dBA L_{dn} are considered unacceptable. The goal of the interior noise levels for residential, hotel, and hospital/nursing home uses is 45 dBA L_{dn}. These guidelines apply only to new construction supported by HUD grants and are not binding upon local communities (Caltrans 2002a).

STATE

The State of California regulates vehicular and freeway noise affecting classrooms, sets standards for sound transmission and occupational noise control, and identifies noise insulation standards and airport noise/land use compatibility criteria.

California Building Code

Title 24 of the California Code of Regulations contains standards for allowable interior noise levels associated with exterior noise sources (California Building Code, 1998 edition, Volume 1, Appendix Chapter 12, Section 1208A). The standards apply to new hotels, motels, dormitories, apartment houses, and dwellings other than detached single-family residences. The standards state that the interior noise level attributable to exterior sources shall not exceed 45 dBA in any habitable room. Proposed residential structures to be located where the CNEL/L_{dn} exceeds 60 dBA shall require an acoustical analysis showing that the proposed building design would achieve the prescribed allowable interior noise standard. Worst-case noise levels, either existing or future, shall be used as the basis for determining compliance with these standards (Caltrans 2002a).

LOCAL

City of Rocklin Municipal Code

The City of Rocklin Municipal Code regulates loud, unnecessary, and disturbing noise from various sources within the city. The City's Municipal Code does not, however, include specific noise standards for noise sources, nor does the Municipal Code identify specific hourly limitations for construction-related activities (City of Rocklin 2009). However, the City of Rocklin does have Construction Noise Guidelines, which restrict construction-related noise-generating activities within or near residential areas to between 7:00 a.m. and 7:00 p.m. on weekdays, and between 8:00 a.m. and 7:00 p.m. on weekends.

4.5.4 IMPACTS AND MITIGATION MEASURES

STANDARDS OF SIGNIFICANCE

The impact analysis provided below is based on the following California Environmental Quality Act (CEQA) Guidelines Appendix G thresholds of significance. A noise impact is considered significant if implementation of the proposed General Plan Update would:

1. Result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance or of applicable standards of other agencies.

2. Result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.

3. Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.

4. Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

5. Expose people residing or working in the project area to excessive noise levels for a project located within an airport land use plan area or, where such a plan has not been adopted, or within 2 miles of a public airport or a public use airport.

6. Expose people residing or working in the project area to excessive noise levels for a project within the vicinity of a private airstrip.

METHODOLOGY

A combination of use of existing literature and general application of accepted noise thresholds was used to determine the impact of ambient noise levels resulting from and on development within the General Plan Planning Area. Short- and long-term impacts associated with transportation and non-transportation noise sources were qualitatively assessed based on potential increases in ambient noise levels anticipated to occur at noise-sensitive land uses. Traffic noise levels along major area roadways were estimated using the FHWA Highway Traffic Noise Prediction model (FHWA-RD-77-108.) The FHWA modeling was based on the Calveno noise emission factors for automobiles and medium- and heavy-duty trucks. Input data used in the model included average-daily traffic volumes, day/night percentages of automobiles and medium and heavy trucks, vehicle speeds, ground attenuation factors, roadway widths, and ground elevation data. Traffic volumes were derived from the traffic analysis prepared for this project. Roadway data and vehicle distribution percentages were based on traffic data obtained during the site reconnaissance conducted for this project, as well as heavy-duty truck distribution percentages for major highways obtained from Caltrans.

The analysis considers both stationary and transportation noise standards included in the proposed General Plan Update. Noise level design standards for stationary noise sources are contained in Table 2-1 of the Rocklin General Plan Update. Table 2-1 is shown below.

ROCKLIN GENERAL PLAN UPDATE TABLE 2-1
EXTERIOR NOISE LEVEL DESIGN STANDARDS FOR NEW PROJECTS
AFFECTED BY OR INCLUDING STATIONARY NOISE SOURCES

Noise Level Descriptor	Daytime (7 a.m. to 10 p.m.)	Nighttime (10 p.m. to 7 a.m.)
Hourly L_{eq}, dB	**55 dBA**	**45 dBA**

The City can impose noise level standards that are more restrictive than those specified above based upon determination of existing low ambient noise levels.

"Fixed" noise sources which are typically of concern include, but are not limited to the following:

HVAC Systems	Cooling Towers/Evaporative Condensers
Pump Stations	Lift Stations
Emergency Generators	Boilers
Steam Valves	Steam Turbines
Generators	Fans
Air Compressors	Heavy Equipment
Conveyor Systems	Transformers
Pile Drivers	Grinders
Drill Rigs	Gas or Diesel Motors
Welders	Cutting Equipment
Outdoor Speakers	Blowers
Loading Docks	Amplified Music and Voice

The types of uses which may typically produce the noise sources described above include but are not limited to industrial facilities including pump stations, trucking operations, tire shops, auto maintenance shops, metal fabricating shops, shopping centers, drive-up windows, businesses using amplified sound systems, car washes, loading docks, batch plants, bottling and canning plants, recycling centers, electric generating stations, race tracks, landfills, sand and gravel operations, schools, playgrounds, and athletic fields.

NOTE: The point of measurement for noise levels is at a location at least 5 feet inside the property line of the receiving land use and at a point 5 feet above ground level. In the case of lots where the noise-sensitive use has a reasonable outdoor activity area for outdoor enjoyment, the stationary noise source criteria can be applied at a designated outdoor activity area (at the discretion of the City).

Transportation noise standards applicable to various land uses are specified in Table 2-2 of the Rocklin General Plan Update, which is shown below.

ROCKLIN GENERAL PLAN UPDATE TABLE 2-2
MAXIMUM ALLOWABLE NOISE EXPOSURE TRANSPORTATION NOISE SOURCES

Affected/Receiving Land Use	Outdoor Activity Areas[1] L_{dn}/CNEL, dB	Interior Spaces	
		L_{dn}/CNEL,dB	L_{eq}, dB[2]
Residential	60[3]	45	–
Transient Lodging	65	45	–
Hospitals, Nursing Homes	60[3]	45	–
Theaters, Auditoriums, Music Halls	–	–	35
Non-Commercial Places of Public Assembly	60[3]	–	40
Office Buildings	–	–	45
Schools, Libraries, Museums	–	–	45
Playgrounds, Neighborhood Parks	70	–	–

[1] *The outdoor activity area is generally considered to be the location where individuals may generally congregate for relaxation, or where individuals may require adequate speech intelligibility. Such places may include patios of residences, picnic facilities, or instructional areas.*

Where it is not practical to mitigate exterior noise levels at patio or balconies of apartment complexes, a common area such as a pool or recreation area may be designated as the outdoor activity area.

At the discretion of the City, where no outdoor activity areas are provided or known, only the interior noise level criteria can be applied to the project.

[2] *As determined for a typical worst-case hour during periods of use.*

3 *Where it is not possible to reduce noise in outdoor activity areas to 60 dB Ldn/CNEL or less using a practical application of the best-available noise reduction measures, an exterior noise level of up to 65 dB Ldn/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.*

Note: Existing dwellings and new single-family dwellings on existing lots are not subject to further discretionary review with respect to compliance with the standards of the Noise Element. As a consequence, such dwellings may be located in areas where noise levels exceed the standards of the Noise Element.

Since the city is not located adjacent to a public or private airport nor within the noise contours of an airport, significant airport noise impacts are not expected and are not addressed in this Draft EIR.

PROJECT IMPACTS AND MITIGATION MEASURES

Noise Impacts Associated with Development and Operation of Land Uses of Proposed Project

Impact 4.5.1 The proposed project could result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance or of applicable standards of other agencies. Although the proposed General Plan Update has mitigating policies and associated action steps designed to minimize the effects of this impact, these policies and associated action steps will not reduce the impact to a less than significant level. Therefore, this would be considered a **significant** impact.

The City's existing General Plan Noise Element identifies the goal of protecting residents from health hazards and annoyance associated with excessive noise levels. The existing General Plan Noise Element also identifies noise compatibility guidelines to evaluate new development and sets forth policies to require noise analysis of proposed development projects, noise monitoring, and sound mitigation for transportation-related noise sources.

The potential for noise conflicts from development under the proposed General Plan Update includes conflicts as a result of adjacent land uses and their operational aspects. While generally addressed through the land use designation and zoning identification process, there is the potential that some development allowed under current land use designations and zoning would have operational aspects that could create noise impacts on other adjacent land uses. In addition, there is also the potential that some development allowed under current land use designations and zoning would be located in areas which are subject to high noise levels in excess of City standards and that such noise levels cannot be mitigated through physical improvements such as noise barriers, additional insulation, low-noise-transmission windows, and increased setbacks. The establishment of outdoor seating, dining, or gathering areas in the Downtown area where traffic and railroad noise levels are elevated is representative of such a situation. The City's proposed noise policies and their associated action steps provide expanded protection geared toward eliminating land use conflicts with respect to noise, including specific numeric noise level standards for new projects affected by or including both transportation and non-transportation noise sources and guidance in evaluating noise impacts and for identification of noise mitigation measures.

Additionally, as part of the proposed project, the City plans to amend the Redevelopment Plan to increase tax increment limitations, increase the limit on the principal amount of bonded indebtedness secured by tax increment revenue, and extend the time limit for the commencement of eminent domain proceedings to acquire non-residential property. These amendments are intended to provide the City's Redevelopment Agency with the financial and administrative resources necessary to continue assisting projects that implement its program of blight elimination within the Redevelopment Project Area. While the extended time and financial limits authorized by the Sixth Amendment may foster and encourage new development that might not occur without the Sixth Amendment, or may occur faster than had the Sixth Amendment not been adopted, all development would be consistent with the City's General Plan and with the development assumptions analyzed throughout this DEIR. All development resulting from amending the Redevelopment Plan would occur in areas designated for such development by the General Plan, as the land uses permitted by the Redevelopment Plan are the allowable uses under the City's General Plan. Therefore, the noise-related impacts associated with the proposed Sixth Amendment to the Redevelopment Plan would be the same as those analyzed for the General Plan Update.

In addition to the activities identified above, the project also includes a Climate Action Plan (CAP) to address climate change and identify greenhouse gas (GHG) emission reduction measures. The City of Rocklin CAP augments the objectives, goals, policies, and actions of the City of Rocklin General Plan Update related to the reduction of GHG emissions; however, the CAP is intended to be updated on a more frequent basis than the General Plan, ensuring that implementation of City efforts to reduce GHG emissions is in compliance with current regulation. The CAP determines whether implementation of the proposed General Plan Update would be consistent with the state's ability to attain the goals identified in Assembly Bill (AB) 32, identifies GHG emission reduction measures, and provides monitoring of the effectiveness of GHG emission reduction measures. Therefore, the CAP would not result in noise-related impacts beyond those analyzed for the General Plan Update.

Proposed General Plan Update Policies That Provide Mitigation

The following proposed General Plan policies would assist in avoiding or minimizing noise impacts associated with the proposed project.

Policy N-1 *Determine noise compatibility between land uses, and to provide a basis for developing noise mitigation, an acoustical analysis shall be required as part of the environmental review process for all noise-sensitive land uses which are proposed in areas exposed to existing or projected exterior noise levels exceeding the level standards contained within this Noise Element.*

Policy N-3 *Ensure that stationary noise sources do not interfere with sleep by applying an interior hourly maximum noise level design standard of 45 dBA in the enclosed sleeping areas of residences affected by stationary noise sources. This standard assumes doors and windows are closed.*

Policy N-4 *Restrict development of noise-sensitive land uses where the noise levels due to existing or planned stationary noise sources will exceed the exterior stationary noise level design standards of the Noise Element, unless effective noise mitigation measures have been incorporated into the project.*

Policy N-5 *Mitigate noise created by proposed stationary noise sources so that the exterior stationary noise level design standards of the Noise Element are not exceeded.*

Policy N-6 *Apply the noise level design standards contained within Table 2-1* of the Noise Element to Policies N-4 and N-5 of the Noise Element.*

*Table 2-1 of the Noise Element is presented earlier in this section in the Methodology discussion.

Mitigation Measures

Implementation of the proposed General Plan Update noise policies identified above and their associated action steps would reduce potential noise impacts associated with development and operation of land uses of the proposed General Plan Update. Future development projects would be required to analyze project-related noise impacts and incorporate necessary noise reduction measures sufficient to achieve the applicable noise standards of the City's Noise Element. Implementation of these policies and actions will help to reduce impacts associated with proposed development. Noise reduction measures typically implemented to reduce traffic noise include increased insulation, setbacks, and construction of sound barriers. Some measures, such as construction of sound barriers, may have secondary impacts related to aesthetics and safety. The feasibility of these measures would be determined on a project-by-project basis. However, it may not be possible to fully mitigate noise in excess of City standards in all areas, particularly in existing development that may be constrained due to age, placement, or other factors which limit the feasibility of mitigation (e.g., residences fronting on the roadway that limits the ability to utilize noise barrier). As a result, the proposed General Plan Update could result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance or of applicable standards of other agencies, which is considered to be a **significant and unavoidable** impact**.**

Exposure to Construction Noise

Impact 4.5.2 Construction activities associated with the proposed project could result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above existing conditions and could result in exposure of

persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance or of applicable standards of other agencies. However, the proposed General Plan Update includes Action Step NA-3 that limits the hours of work. This impact would be considered **potentially significant**.

Construction noise typically occurs intermittently and varies depending on the nature or phase (e.g., demolition/land clearing, grading and excavation, erection) of construction. Noise generated by construction equipment, including earthmovers, material handlers, and portable generators, can reach high levels. Temporary increases in ambient noise levels, particularly during the nighttime hours, could result in increased levels of annoyance and potential sleep disruption. Although noise ranges were found to be similar for all construction phases, the grading phase tends to involve the most equipment and result in slightly higher average-hourly noise levels. Typical noise levels for individual pieces of construction equipment and distances to predicted noise contours are summarized in **Table 4.5-5**. As depicted, individual equipment noise levels typically range from approximately 74 to 88 dBA L_{eq} at 50 feet. Typical operating cycles may involve 2 minutes of full power, followed by 3 or 4 minutes at lower settings. Intermittent noise levels can range from approximately 77 to 95 dBA L_{max}, the loudest of which include blasting, and the use of pile drivers and impact devices (e.g., hoe rams, impact hammers).

Assuming a maximum construction noise level of 91 dBA L_{eq} and an average attenuation rate of 6 dBA per doubling of distance from the source, construction activities located within approximately 1,600 feet of noise-sensitive receptors could reach levels of approximately 60 dBA L_{eq}. Activities occurring during the more noise-sensitive evening and nighttime hours may result in increased levels of annoyance and potential sleep disruption to occupants of nearby noise-sensitive land uses (e.g., residential dwellings, schools, hospitals). Depending on distances from nearby noise-sensitive land uses, construction activities associated with buildout of the General Plan Planning Area may result in temporary and periodic increases in ambient noise levels at nearby receptors. Increases in ambient noise levels, particularly during the nighttime hours, could also result in increased levels of annoyance and potential sleep disruption to occupants of nearby dwellings. As a result, because such increases could result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project and could result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance or of applicable standards of other agencies, this impact is considered **potentially significant**.

TABLE 4.5-5
TYPICAL CONSTRUCTION EQUIPMENT NOISE

Equipment	Typical Noise Level (dBA) 50 feet from Source		Distance to NoiseContours (feet, dBA L_{eq})		
	L_{max}	L_{eq}	70 dBA	65 dBA	60 dBA
Air Compressor	80	76	105	187	334
Auger/Rock Drill	85	78	133	236	420
Backhoe/Front End Loader	80	76	105	187	334
Blasting	94	74	83	149	265
Boring Hydraulic Jack/Power Unit	80	77	118	210	374

Equipment	Typical Noise Level (dBA) 50 feet from Source		Distance to NoiseContours (feet, dBA L_{eq})		
Compactor (Ground)	80	73	74	133	236
Concrete Batch Plant	83	75	94	167	297
Concrete Mixer Truck	85	81	187	334	594
Concrete Mixer (Vibratory)	80	73	74	133	236
Concrete Pump Truck	82	75	94	167	297
Concrete Saw	90	83	236	420	748
Crane	85	77	118	210	374
Dozer/Grader/Excavator/Scraper	85	81	187	334	594
Drill Rig Truck	84	77	118	210	374
Generator	82	79	149	265	472
Gradall	85	81	187	334	594
Hydraulic Break Ram	90	80	167	297	529
Jack Hammer	85	78	133	236	420
Impact Hammer/Hoe Ram (Mounted)	90	83	236	420	748
Pavement Scarifier/Roller	85	78	133	236	420
Paver	85	82	210	374	667
Pile Driver (Impact/Vibratory)	95	88	420	748	1,330
Pneumatic Tools	85	82	210	374	667
Pumps	77	74	83	149	265
Truck (Dump/Flat Bed)	84	80	167	297	529

Source: FHWA 2006

Proposed General Plan Update Policies That Provide Mitigation

No applicable proposed General Plan policies have been identified that would reduce this impact. However, as a part of the General Plan Update process, the City has developed action steps that coincide with General Plan policies and identify ways in which the policy will be applied and implemented. To that end, Action Step NA-3 below identifies the procedure and process by which construction noise levels will be addressed.

Action Step NA-3 *Limit construction activity to the hours of 7 a.m. to 7 p.m. on weekdays and 8 a.m. to 7 p.m. on weekends when construction is conducted in proximity to residential or other noise sensitive land uses, unless such restriction would result in increased risk to the health and/or safety of the general public or construction workers, or a determination is made by the City based on substantial evidence that it is in the best interests of the City to approve alternative hours of work.*

Mitigation Measures

No further mitigation is required beyond implementation of the General Plan Update's mitigating policies and associated action steps.

Although the City's General Plan Noise Element does not identify a short-term construction noise level threshold, the Noise Compatibility Guidelines included in the Noise Element identify acceptable and unacceptable noise levels for different types of land uses. The distinction between short- and long-term noise levels is a typical one in both CEQA documents and local noise ordinances, which generally recognize the reality that short-term noise from construction activities is inevitable and cannot be mitigated beyond a certain level. Thus, local agencies frequently tolerate short-term noise at levels that they would not accept for permanent noise sources. A more severe approach would be impractical and might preclude the kind of construction activities that are inevitable from time to time in urban environments. Most residents of urban areas recognize this reality and expect to hear noise from construction activities on occasion. Noise from construction activities is considered to be temporary in the sense that once the construction activities cease, so too will the noise from the construction activities. Noise from construction activities is also considered to be intermittent due to the type, location, and duration of construction equipment being used. In recognition of noise caused by construction activities, projects in the city must comply with the City's Construction Noise Guidelines, which are embodied in Action Step NA-3 noted above; such compliance includes limitations on the hours of construction.

Due to the short-term nature of construction noise, the intermittent frequency of construction noise, and the required compliance with the City's Construction Noise Guidelines, which are referenced in Action Step NA-3, including compliance with hours of construction, construction noise level increases will not result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project and will not result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance or of applicable standards of other agencies. The impact of new construction noise is reduced to a **less than significant** level through the application of General Plan Update Action Step NA-3.

In addition, as discussed in Section 3.0, Project Description, and under Impact 4.5.1 above, the project includes the Sixth Amendment to the Redevelopment Plan and the CAP, both of which would be consistent with the proposed General Plan Update and with the development assumptions analyzed throughout this DEIR. As these project components would not result in land use activities or population growth beyond what is identified in the General Plan Update, they would not result in construction noise impacts beyond what is analyzed for the General Plan Update above. Impacts would be **less than significant**.

Exposure to Surface Transportation Noise

Impact 4.5.3 The proposed project could result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project and could result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance or of applicable standards of other agencies, as a result of increased traffic on the roadway network. Projected increases in traffic noise levels could adversely affect noise-sensitive land uses. In addition, future development of noise-sensitive land uses could be exposed to roadway and/or railroad noise

levels in excess of the City's noise standards. This impact would be considered **potentially significant**.

Surface transportation noise sources within the City of Rocklin include vehicle traffic on area roadways as well as trains traveling along the UPRR tracks. Noise-related impacts associated with roadway vehicle traffic and the UPRR are discussed in more detail below.

Roadway Vehicle Traffic

Projected noise contours for major roadways within the Planning Area for future cumulative conditions with buildout of the proposed General Plan Update are summarized in **Table 4.5-6**. It is important to note that the predicted noise levels and distance to noise contours do not take into account shielding of noise by intervening structures or terrain. As a result, these noise contours should not be considered as absolute lines of demarcation. Because distances to noise contours will vary depending on site-specific conditions, these contours should be used as a guide for evaluating land uses to minimize the exposure of community residents to excessive noise.

TABLE 4.5-6
TRAFFIC NOISE LEVELS
CUMULATIVE CONDITIONS PLUS BUILDOUT OF THE GENERAL PLAN UPDATE

Roadway Segment	ADT	CNEL at 50 Feet from Near Travel-lane Centerline	Distance (feet) from Roadway Centerline to CNEL Contour		
			70	65	60
Sierra College Blvd., North of Rocklin Road	60,000	73.16	116	246	528
Sierra College Blvd., South of Rocklin Road	49,800	73.50	122	259	556
Rocklin Road, Sierra College Blvd. to El Don Drive	28,400	67.22	--	101	213
Rocklin Road, El Don Drive to Interstate 80	38,200	68.51	61	122	259
Rocklin Road, Interstate 80 to Granite Drive	50,000	69.68	71	146	310
Rocklin Road, Granite Drive to Grove Street	35,800	68.23	59	117	249
Rocklin Road, Grove Street to Pacific Street	31,500	67.67	--	108	229
Pacific Street, Dominguez Road to Sierra Meadows Drive	28,700	68.69	62	126	267
Pacific Street, Sierra Meadows Drive to Grove Street	26,200	68.29	59	118	251
Pacific Street, Grove Street to Rocklin Road	23,400	66.38	--	90	188
Pacific Street, Rocklin Road to Civic Center Drive	35,100	68.14	58	116	245
Pacific Street, Civic Center Drive to Sunset Boulevard	45,800	69.30	67	138	293
Pacific Street, Sunset Boulevard to State Route 65	28,100	67.18	--	101	212
Sunset Boulevard, State Route 65 to Atherton Road	60,200	71.91	97	203	436
Sunset Boulevard, Atherton Road to W. Stanford Ranch Road	43,800	70.14	82	166	353
Sunset Boulevard, W. Stanford Ranch Road to Park Drive	46,900	70.44	85	174	369
Sunset Boulevard, Park Drive to Little Rock Road	40,500	71.08	92	191	407

Roadway Segment	ADT	CNEL at 50 Feet from Near Travel-lane Centerline	Distance (feet) from Roadway Centerline to CNEL Contour		
			70	65	60
Sunset Boulevard, Little Rock Road to Stanford Ranch Road	33,800	70.29	83	170	361
Sunset Boulevard, Stanford Ranch Road to Topaz Avenue	39,300	70.94	91	187	399
Sunset Boulevard, Topaz Avenue to Whitney Boulevard	38,400	71.22	88	184	393
Sunset Boulevard, Whitney Boulevard to Pacific Street	43,600	71.78	95	199	427
Stanford Ranch Road, Sunset Boulevard to Wildcat Boulevard	24,900	67.69	60	116	243
Stanford Ranch Road, Wildcat Boulevard to W. Oaks Boulevard	17,500	66.16	--	94	193
Stanford Ranch Road, W. Oaks Boulevard to Park Drive	23,000	67.35	--	111	231
Stanford Ranch Road, Park Drive to Crest Drive	24,400	67.60	59	115	240
Stanford Ranch Road, West of Crest Drive	15,700	66.07	--	86	179
Stanford Ranch Road, East of Sunset Boulevard	18,300	66.73	--	94	198
Stanford Ranch Road, Sunset Boulevard to Fairway Drive	28,200	69.50	75	151	320
Stanford Ranch Road, Fairway Drive to State Route 65	52,700	70.95	91	187	399
Interstate 80, State Route 65 to Rocklin Road	165,700	81.31	501	1074	2,312
Interstate 80, Rocklin Road to Sierra College Boulevard	142,800	80.67	454	973	2,094
Interstate 80, Sierra College Boulevard to Horseshoe Road	133,900	80.39	435	932	2,006
State Route 65, Interstate 80 to Stanford Ranch Road	161,500	82.27	609	1307	2,813
State Route 65, Stanford Ranch Road to Pleasant Grove Boulevard	154,600	82.08	592	1270	2,733
State Route 65, Pleasant Grove Boulevard to Blue Oaks Boulevard	136,000	81.52	544	1166	2,509
State Route 65, Blue Oaks Boulevard to Sunset Boulevard	121,900	81.05	506	1084	2,332
State Route 65, Sunset Boulevard to Twelve Bridges Drive	106,300	80.45	463	990	2,129

– Contours are within roadway right-of-way.

Source: Ambient 2009

Predicted increases in traffic noise levels under future cumulative conditions with buildout of the General Plan Update are compared to existing traffic noise levels in **Table 4.5-7.** As identified, implementation of the proposed General Plan Update, in combination with anticipated growth by the year 2030, would result in noticeable increases in traffic noise. Ten roadway segments (Sierra College Boulevard from Dominguez Road extension to Rocklin Road; Sierra College Boulevard, Rocklin Road to Scarborough Drive; Pacific Street, Dominguez Road to Sierra Meadows Drive; Sunset Boulevard, State Route 65 to Atherton Road; Sunset Boulevard, Atherton Road to West Stanford Ranch Road; Sunset Boulevard, West Stanford Ranch Road to Park Drive; Sunset Boulevard, Stanford Ranch Road to Topaz Avenue; Sunset Boulevard, Topaz Avenue to Whitney Boulevard; Stanford Ranch Road, Wildcat Boulevard to West Oaks Boulevard; Stanford Ranch Road, West Oaks Boulevard to Park Drive) would experience increases in noise levels greater than 3 dBA. Typically a doubling of traffic volumes is required before a noticeable

increase (3 dBA or greater) in traffic noise levels occurs. Based on the noise levels shown in **Table 4.5-7**, it appears that implementation of the proposed General Plan Update would result in a noticeable increase in traffic noise levels on ten roadway segments within the Planning Area. However, the analysis did not take into account existing walls along these ten roadways that would mitigate some of the projected noise increases. Therefore, predicted increases are expected to be lower than those shown in **Table 4.5-7**.

TABLE 4.5-7
YEAR 2030 TRAFFIC NOISE PROJECTIONS

Roadway Segment	Year 2030 ADT	CNEL at 50 Feet from Near Travel-lane Centerline		Predicted Change in Noise Level (CNEL)
		Existing Conditions	Cumulative with Buildout of the General Plan Update	
Sierra College Boulevard from Dominguez Road extension to Rocklin Road	60,000	67.08	73.16	6.08
Sierra College Boulevard, Rocklin Road to Scarborough Drive	49,800	69.86	73.5	3.64
Rocklin Road, Sierra College Boulevard to El Don Drive	28,400	64.99	67.22	2.23
Rocklin Road, El Don Drive to Interstate 80	38,200	66.55	68.51	1.96
Rocklin Road, Interstate 80 to Granite Drive	50,000	67.5	69.68	2.18
Rocklin Road, Granite Drive to Grove Street	35,800	65.45	68.23	2.78
Rocklin Road, Grove Street to Pacific Street	31,500	65.14	67.67	2.53
Pacific Street, Dominguez Road to Sierra Meadows Drive	28,700	65.18	68.69	3.51
Pacific Street, Sierra Meadows Drive to Grove Street	26,200	65.66	68.29	2.63
Pacific Street, Grove Street to Rocklin Road	23,400	64.45	66.38	1.93
Pacific Street, Rocklin Road to Civic Center Drive	35,100	66.19	68.14	1.95
Pacific Street, Civic Center Drive to Sunset Boulevard	45,800	66.36	69.3	2.94
Pacific Street, Sunset Boulevard to State Route 65	28,100	66.11	67.18	1.07
Sunset Boulevard, State Route 65 to Atherton Road	60,200	65.51	71.91	6.4
Sunset Boulevard, Atherton Road to West Stanford Ranch Road	43,800	65.13	70.14	5.01
Sunset Boulevard, W. Stanford Ranch Road to Park Drive	46,900	67.03	70.44	3.41
Sunset Boulevard, Park Drive to Little Rock Road	40,500	68.95	71.08	2.13

Roadway Segment	Year 2030 ADT	CNEL at 50 Feet from Near Travel-lane Centerline		Predicted Change in Noise Level (CNEL)
		Existing Conditions	Cumulative with Buildout of the General Plan Update	
Sunset Boulevard, Little Rock Road to Stanford Ranch Road	33,800	68.33	70.29	1.96
Sunset Boulevard, Stanford Ranch Road to Topaz Avenue	39,300	67.79	70.94	3.15
Sunset Boulevard, Topaz Avenue to Whitney Boulevard	38,400	68.21	71.22	3.01
Sunset Boulevard, Whitney Boulevard to Pacific Street	43,600	69.25	71.78	2.53
Stanford Ranch Road, Sunset Boulevard to Wildcat Boulevard	24,900	65.16	67.69	2.53
Stanford Ranch Road, Wildcat Boulevard to West Oaks Boulevard	17,500	61.99	66.16	4.17
Stanford Ranch Road, W. Oaks Boulevard to Park Drive	23,000	63.9	67.35	3.45
Stanford Ranch Road, Park Drive to Crest Drive	24,400	65.72	67.6	1.88
Stanford Ranch Road, west of Crest Drive	15,700	65	66.07	1.07
Stanford Ranch Road, East of Sunset Boulevard	18,300	66.16	66.73	0.57
Stanford Ranch Road, Sunset Boulevard to Fairway Drive	28,200	68.73	69.5	0.77
Stanford Ranch Road, Fairway Drive to State Route 65	52,700	70.61	70.95	0.34
Interstate 80, State Route 65 to Rocklin Road	165,700	79.98	81.31	1.33
Interstate 80, Rocklin Road to Sierra College Boulevard	142,800	78.99	80.67	1.68
Interstate 80, Sierra College Boulevard to Horseshoe Road	133,900	78.94	80.39	1.45
State Route 65, Interstate 80 to Stanford Ranch Road	161,500	80.52	82.27	1.75
State Route 65, Stanford Ranch Road to Pleasant Grove Boulevard	154,600	80.01	82.08	2.07
State Route 65, Pleasant Grove Boulevard to Blue Oaks Boulevard	136,000	79.33	81.52	2.19
State Route 65, Blue Oaks Boulevard to Sunset Boulevard	121,900	78.58	81.05	2.47
State Route 65, Sunset Boulevard to Twelve Bridges Drive	106,300	77.59	80.45	2.86

Source: Ambient 2009

*Notes: Noise levels/contours were calculated using the FHWA roadway noise model based on Calveno vehicle reference noise levels and traffic data obtained from the traffic analysis prepared for this project. Refer to **Appendix D** for modeling output files.*

Contours are within roadway right-of-way.

Significant increases in traffic noise levels along some smaller local roadways could also potentially occur, particularly in areas located near proposed future development projects. Development of noise-sensitive land uses could also occur within the projected 60 dBA CNEL noise contours. For these reasons, implementation of the proposed General Plan Update would be considered to result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project and result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance or of applicable standards of other agencies as a result of increased traffic noise levels. As a result, exposure to vehicular traffic noise on area roadways would be considered a **potentially significant** impact.

UPRR

As discussed earlier, the UPRR generally extends in a west-east direction, parallel to and north of Pacific Street. The UPRR tracks are used for both freight transport and Amtrak passenger service, which total approximately 26 trains per day (Smith 2008; Amtrak 2009). Projected volumes for future years are not currently available. Based on conversations with UPRR staff, future train volumes would not be anticipated to increase substantially in comparison to existing conditions. However, as congestion on area roadways increases, it is conceivable that reliance on freight and Amtrak train service could increase.

Within the City of Rocklin, railroad noise levels are highly influenced by the sounding of locomotive warning horns. The use of locomotive horns is typically required by law on approach to public at-grade crossings. As depicted in **Figure 4.5-4**, the predicted 60 dBA CNEL noise contour for the UPRR dual-track mainline would extend to approximately 1,480 feet from the track centerline with the sounding of train horns. Along the eastbound and westbound single-track corridors, the predicted 60 dBA CNEL noise contour would extend to approximately 1,000 feet from the track centerline with the sounding of train horns. This would include anticipated development associated with the Downtown Rocklin Plan Area, which would include residential uses. As a result, exposure to railroad noise would be considered a **potentially significant** impact.

Noise levels/contours were calculated using the FHWA roadway noise model based on Calveno vehicle reference noise levels and traffic data obtained from the traffic analysis prepared for this project. Refer to **Appendix D** for modeling output files.

Proposed General Plan Update Policies That Provide Mitigation

The following proposed General Plan policies would assist in avoiding or minimizing transportation noise impacts associated with the proposed project:

Policy N-1 *Determine noise compatibility between land uses, and to provide a basis for developing noise mitigation, an acoustical analysis shall be required as part of the environmental review process for all noise-sensitive land uses which are proposed in areas exposed to existing or projected exterior noise levels exceeding the level standards contained within this Noise Element.*

Policy N-2 *Emphasize site planning and project design to achieve the standards of this Noise Element. The use of noise barriers shall be considered a means of achieving the noise standards; however, the construction of aesthetically intrusive wall heights shall be discouraged.*

Policy N-7 *Restrict development of noise-sensitive land uses in areas exposed to existing or projected levels of noise from transportation noise sources that exceed the noise level standards contained within the Noise Element, unless the project design includes effective mitigation that results in noise exposure which meets standards.*

Policy N-8 *Mitigate noise created by new roadway noise sources (e.g., truck routes, roadway improvement projects and new roadways) not contained within the General Plan, so as not to exceed the noise level standards of the Noise Element.*

Policy N-9 *Apply the noise level design criteria contained within Table 2-2 of the Noise Element to Policies N-7 and N-8 of the Noise Element.**

*Table 2-2 of the Noise Element is presented earlier in this section within the Methodology discussion.

Mitigation Measures

Implementation of the proposed General Plan Update noise policies identified above would reduce potential transportation noise impacts. Future development projects would be required to analyze project-related noise impacts and incorporate necessary noise reduction measures sufficient to achieve the applicable noise standards of the City's Noise Element. Implementation of these policies and actions will help to reduce impacts associated with proposed development. Noise reduction measures typically implemented to reduce traffic noise include increased insulation, setbacks, and construction of sound barriers. Some measures, such as construction of sound barriers, may have secondary impacts related to aesthetics and safety. The feasibility of these measures would be determined on a project-by-project basis. However, it may not be possible to fully mitigate traffic and/or railroad noise in all areas, particularly in existing development that may be constrained due to age, placement, or other factors that limit the feasibility of mitigation (e.g., residences fronting on a roadway that limits the ability to utilize a noise barrier). As a result, increases in transportation noise associated with the proposed General Plan Update would result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project and would result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance or of applicable standards of other agencies, which is considered to be a **significant and unavoidable** impact**.**

In addition, as discussed in Section 3.0, Project Description, and under Impact 4.5.1 above, the project includes the Sixth Amendment to the Redevelopment Plan and the CAP, both of which would be consistent with the proposed General Plan Update and with the development assumptions analyzed throughout this DEIR. As these project components would not result in land use activities or population growth beyond what is identified in the General Plan Update, they would not result in increased traffic beyond what is analyzed for the General Plan Update. Therefore, transportation noise impacts would be the same as those analyzed for the General Plan Update above.

Exposure to Stationary Noise

Impact 4.5.4 Subsequent development associated with the proposed project could result in new noise-sensitive land uses encroaching upon existing or proposed stationary noise sources or new stationary noise sources encroaching upon

existing or proposed noise-sensitive land uses. This could result in a substantial permanent increase in ambient noise levels in the project vicinity above existing levels or could result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance or of applicable standards of other agencies. As a result, this impact is considered **potentially significant**.

Implementation of the proposed General Plan Update could result in the future development of land uses that generate noise levels in excess of applicable City noise standards. Such land uses may include commercial, industrial, institutional (public schools), and recreational. In addition, new noise-sensitive land uses could be located in areas of existing stationary noise sources. Exposure of noise-sensitive land uses to non-transportation noise levels could result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project and could result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance or of applicable standards of other agencies. As a result, this impact would be considered **potentially significant**.

Proposed General Plan Update Policies That Provide Mitigation

The following proposed General Plan policies would assist in avoiding or minimizing stationary noise impacts:

Policy N-1 *Determine noise compatibility between land uses, and to provide a basis for developing noise mitigation, an acoustical analysis shall be required as part of the environmental review process for all noise-sensitive land uses which are proposed in areas exposed to existing or projected exterior noise levels exceeding the level standards contained within this Noise Element.*

Policy N-2 *Emphasize site planning and project design to achieve the standards of this Noise Element. The use of noise barriers shall be considered a means of achieving the noise standards; however, the construction of aesthetically intrusive wall heights shall be discouraged.*

Policy N-3 *Ensure that stationary noise sources do not interfere with sleep by applying an interior hourly maximum noise level design standard of 45 dBA in the enclosed sleeping areas of residences affected by stationary noise sources. This standard assumes doors and windows are closed.*

Policy N-4 *Restrict development of noise-sensitive land uses where the noise levels due to existing or planned stationary noise sources will exceed the exterior stationary noise level design standards of the Noise Element, unless effective noise mitigation measures have been incorporated into the project.*

Policy N-5 *Mitigate noise created by proposed stationary noise sources so that the exterior stationary noise level design standards of the Noise Element are not exceeded.*

Policy N-6 *Apply the noise level design standards contained within Table 2-1* of the Noise Element to Policies N-4 and N-5 of the Noise Element.*

*Table 2-1 of the Noise Element is presented earlier in this section within the Methodology discussion.

Implementation of the above policies and standards would reduce noise associated with new stationary noise sources and the placement of new noise-sensitive land uses over which the City has jurisdiction (e.g., commercial and industrial sites, residential uses). However, some stationary noise impacts cannot be mitigated to a less than significant level due to limitations on the City to control the exact placement of substantial noise-generating uses (e.g., school facilities) in proximity to noise-sensitive land uses (e.g., residential). Accordingly, stationary source noise levels from activities on uses for which the City has limited control could result in noise levels that exceed the City's maximum allowable noise standards. Thus, this impact is considered **significant and unavoidable.** No additional feasible mitigation has been identified that would further reduce this impact.

In addition, as discussed in Section 3.0, Project Description, and under Impact 4.5.1 above, the project includes the Sixth Amendment to the Redevelopment Plan and the CAP, both of which would be consistent with the proposed General Plan Update and with the development assumptions analyzed throughout this DEIR. As these project components would not result in land use activities or population growth beyond what is identified in the General Plan Update, they would not result in noise-related impacts beyond what is analyzed for the General Plan Update above.

Mitigation Measures

No additional mitigation (beyond application of City policies noted above) is feasible.

Exposure to Groundborne Vibration

Impact 4.5.5 The proposed project could result in exposure of persons to or generation of excessive groundborne vibration levels. However, the proposed General Plan Update includes Action Step NA-3 that limits the hours of work for construction. This impact would be considered **less than significant**.

The effects of ground vibration can vary from no perceptible effects at the lowest levels, low rumbling sounds and detectable vibrations at moderate levels, and slight damage to nearby structures at the highest levels. At the highest levels of vibration, damage to structures is primarily architectural (e.g., loosening and cracking of plaster or stucco coatings) and rarely results in structural damage. The effects of ground vibration are influenced by the duration of the vibration and the distance from the vibration source.

There are no federal, state, or local regulatory standards for vibration. However, various criteria have been established to assist in the evaluation of vibration impacts. For instance, Caltrans has developed vibration criteria based on human perception and structural damage risks. For most structures, Caltrans considers a peak-particle velocity (ppv) threshold of 0.2 inches per second (in/sec) to be the level at which architectural damage (i.e., minor cracking of plaster walls and ceilings) to normal structures may occur. Below 0.10 in/sec there is "virtually no risk of 'architectural' damage to normal buildings." Damage to historic or ancient buildings could occur at levels of 0.08 in/sec ppv. In terms of human annoyance, continuous vibrations in excess of 0.1 in/sec ppv are identified by Caltrans as the minimum level perceptible level for ground vibration. Short periods of ground vibration in excess of 0.2 in/sec ppv can be expected to result in increased levels of annoyance to people within buildings (Caltrans 2002b).

Groundborne vibration sources located within the city that could potentially affect future development would be primarily associated with railroad operations. Construction activities could also result in short-term groundborne vibration levels that could affect nearby sensitive land uses. Groundborne vibration levels and associated impacts as a result of trains traveling along the UPRR and short-term construction activities are discussed in more detail below.

UPRR

Groundborne vibration levels associated with railroad operations are dependent on various factors, including track type and condition, train speeds, site conditions, and train characteristics, such as the number of engines, number of cars, weight, and wheel type and condition. Site and geologic conditions can also influence how vibration propagates at increasing distance from the track. Based on Caltrans vibration measurement data, the highest train vibration level measured was 0.36 in/sec at 10 feet. Based on this level, Caltrans prepared a "drop-off curve" used to estimate maximum train vibration levels at distance from the track centerline. The curve represents maximum expected vibration levels from trains and thus is considered by Caltrans to be "very conservative" (Caltrans 2002b).

Based on the Caltrans drop-off curve for train vibration levels, predicted maximum groundborne vibration levels along the UPRR corridors would not exceed 0.20 in/sec ppv beyond approximately 7.5 feet from the track centerline, the level above which architectural damage for typical building construction or increased levels of annoyance for individuals in buildings may occur (Caltrans 2002b). The proposed General Plan Update would not result in the development of new land uses within 7.5 feet of railroad track centerlines, which in turn would not result in the exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels. As a result, this impact would be considered **less than significant**.

Construction Activities

With the exception of pavement breaking, blasting, and pile driving, construction activities and related equipment typically generate groundborne vibration levels of less than 0.2 in/sec, which is the architectural damage risk threshold recommended by Caltrans. Based on Caltrans measurement data, use of off-road tractors, dozers, earthmovers, and haul trucks generates groundborne vibration levels of less than 0.10 in/sec, or one-half of the architectural damage risk level, at 10 feet. The highest vibration level associated with a pavement breaker was 2.88 in/sec at 10 feet. During pile driving, vibration levels near the source depend mainly on the soil's penetration resistance as well as the type of pile driver used. Impact pile drivers tend to generate higher vibration levels than vibratory or drilled piles. Groundborne vibration levels of pile drivers can range from approximately 0.17 to 1.5 in/sec ppv. Caltrans indicates that the distance to the 0.2 in/sec ppv criterion for pile driving activities would occur at a distance of approximately 50 feet. However, as with construction-generated noise levels, pile driving can result in a high potential for human annoyance from vibration, and pile-driving activities are typically considered as potentially significant if these activities are performed within 200 feet of occupied structures (Caltrans 2002b). Vibration levels associated with blasting are highly variable, site-specific, and dependent on various factors, such as the amount of explosive used, soil conditions between the blast site and the receptor, and the depth where blasting would take place. Blasting that occurs below the surface would typically produce lower vibration levels at a receptor due to additional attenuation provided by distance and transmission through soil and rock. No applicable Municipal Code sections or General Plan policies have been identified that would reduce this impact.

Proposed General Plan Update Policies That Provide Mitigation

No applicable proposed General Plan policies have been identified that would reduce this impact. However, as a part of the General Plan Update process, the City has developed action steps that coincide with General Plan policies and identify ways in which the policy will be applied and implemented. To that end, Action Step NA-3 below identifies the procedure and process by which construction noise levels will be addressed.

Action Step NA-3 *Limit construction activity to the hours of 7 a.m. to 7 p.m. on weekdays and 8 a.m. to 7 p.m. on weekends when construction is conducted in proximity to residential or other noise sensitive land uses, unless such restriction would result in increased risk to the health and/or safety of the general public or construction workers, or a determination is made by the City based on substantial evidence that it is in the best interests of the City to approve alternative hours of work.*

Similar to short-term noise from construction activities, vibration from construction activities is inevitable and cannot be mitigated beyond a certain level. Thus, local agencies frequently tolerate short-term vibrations at levels that they would not accept for permanent vibration sources. A more severe approach would be impractical and might preclude the kind of construction activities that are inevitable from time to time in urban environments. Most residents of urban areas recognize this reality and expect to experience vibration from construction activities on occasion. Vibration from construction activities is considered to be temporary in the sense that once the construction activities cease, so too will the vibrations from the construction activities. Vibrations from construction activities are also considered to be intermittent due to the type, location, and duration of construction equipment being used. In recognition of vibration caused by construction activities, projects in the city must comply with the City's Construction Noise Guidelines, which are embodied in Action Step NA-3 noted above; such compliance includes limitations on the hours of construction.

In addition, as discussed in Section 3.0, Project Description, and under Impact 4.5.1 above, the project includes the Sixth Amendment to the Redevelopment Plan and the CAP, both of which would be consistent with the proposed General Plan Update and with the development assumptions analyzed throughout this DEIR. As these project components would not result in land use activities or population growth beyond what is identified in the General Plan Update, they would not result in exposure to groundborne vibration impacts beyond what is analyzed for the General Plan Update above.

Mitigation Measures

Due to the short-term nature of construction vibrations, the intermittent frequency of construction vibrations, and the required compliance with the City's Construction Noise Guidelines, which are referenced in Action Step NA-3, including compliance with hours of construction, construction vibration level increases will not result in exposure of persons to or generation of excessive groundborne vibration. By restricting the hours of construction to avoid vibrations during times when it could potentially be more of a nuisance, the impact of new construction vibration is reduced to a **less than significant** level through the application of General Plan Update Action Step NA-3. In addition, individual development projects will be subject to site-specific environmental review, which will necessitate identification of site-specific mitigation in the event significant impacts are identified.

4.5.4 CUMULATIVE SETTING, IMPACTS, AND MITIGATION MEASURES

CUMULATIVE SETTING

The cumulative noise setting includes 2030 development anticipated in association with buildout of the proposed General Plan Update (see **Table 4.0-1** and associated assumptions in Section 4.0). The future (cumulative) ambient noise environment will be affected by buildout of the proposed Rocklin General Plan Update. Development in surrounding communities, including Roseville, Lincoln, Loomis, and other areas in western Placer County, may also contribute to traffic noise levels along some roadway segments in Rocklin. Cumulative development would alter the intensity of land uses in the region and increase housing, employment, shopping, and recreational opportunities. Such development would result in new noise generators and noise-sensitive land uses and potentially increase land use conflicts and hazards associated with noise.

CUMULATIVE IMPACTS AND MITIGATION MEASURES

Cumulative Transportation Noise Impacts Within the Planning Area

Impact 4.5.6 Buildout of the proposed project would increase transportation noise along roadways within the Planning Area. This would be a **cumulatively considerable** impact.

Table 4.5-7 identifies traffic noise conditions predicted at year 2030 (assumed year of buildout of the proposed General Plan Update in the Draft EIR analysis).

As identified in **Table 4.5-7**, implementation of the proposed General Plan Update and its associated project components, in combination with anticipated growth by the year 2030, would result in noticeable increases in traffic noise levels (that is, increases greater than 3 dBA) along ten of the roadway segments evaluated, in comparison to existing conditions. The ten roadway segments are Sierra College Boulevard from Dominguez Road extension to Rocklin Road; Sierra College Boulevard, Rocklin Road to Scarborough Drive; Pacific Street, Dominguez Road to Sierra Meadows Drive; Sunset Boulevard, State Route 65 to Atherton Road; Sunset Boulevard, Atherton Road to West Stanford Ranch Road; Sunset Boulevard, West Stanford Ranch Road to Park Drive; Sunset Boulevard, Stanford Ranch Road to Topaz Avenue; Sunset Boulevard, Topaz Avenue to Whitney Boulevard; Stanford Ranch Road, Wildcat Boulevard to West Oaks Boulevard; Stanford Ranch Road, and West Oaks Boulevard to Park Drive. Typically, a doubling of traffic volumes is required before a noticeable increase (3 dBA or greater) in traffic noise levels occurs. Based on the noise levels shown in **Table 4.5-7**, it appears that implementation of the proposed project would result in a noticeable increase in traffic noise levels on ten roadway segments within the Planning Area. However, the analysis did not take into account existing walls along these ten roadways that would mitigate some of the projected noise increases. Therefore, predicted increases are expected to be lower than those shown in **Table 4.5-7**.

As previously discussed, neither the Sixth Amendment to the Redevelopment Plan nor the CAP would result in impacts associated with transportation noise beyond what is analyzed for the General Plan Update above.

Proposed General Plan Update Policies That Provide Mitigation

The proposed General Plan Update policies listed under Impact 4.5.3 would assist in avoiding or minimizing cumulative transportation noise impacts.

Mitigation Measures

Implementation of the proposed General Plan Update noise policies identified under Impact 4.5.3 would reduce potential transportation noise impacts in the city. Future development projects would be required to analyze project-related noise impacts and incorporate necessary noise reduction measures sufficient to achieve applicable noise standards. Implementation of these policies and actions will help to reduce impacts associated with proposed development. Noise reduction measures typically implemented to reduce transportation noise include increased insulation and building requirements, setbacks, and construction of sound barriers. Some measures, such as construction of sound barriers, may have secondary impacts related to aesthetics and safety. The feasibility of these measures (such as adequate right-of way and cost of the mitigation) would be determined on a project-by-project basis. While General Plan Update noise policies and noise reduction measures would reduce noise levels whenever feasible, there may be some cases when transportation noise impacts cannot be fully mitigated. Therefore, implementation of the proposed project would result in transportation noise impacts that are **cumulatively considerable** and **significant and unavoidable**.

Cumulative Transportation Noise Impacts on Adjacent Jurisdictions

Impact 4.5.7 Implementation of the proposed project, in combination with other development in western Placer County, would increase transportation noise along area roadways adjacent to the city. However, the increases in noise levels would be less than 3 dBA and not be noticeable. Therefore, substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project are considered **less than cumulatively considerable**.

Implementation of the proposed project and its associated project components would result in slight changes in traffic volumes along nearby major roadways that enter/exit the city. A total of 15 roadway segments identified in **Table 4.5-8** were analyzed to determine changes in traffic volumes resulting from project implementation. Changes in traffic volumes along nearby roadways would range from a decrease of approximately 100 trips per day (along Lonetree Boulevard south of Blue Oaks Boulevard) to an increase of approximately 700 trips per day (Pacific Street at Loomis town limits). Based on these changes in traffic volumes, corresponding changes in traffic noise levels along these roadway segments would range from a decrease of approximately 0.02 dBA CNEL to an increase of approximately 0.2 dBA CNEL.

TABLE 4.5-8
CHANGE IN NOISE LEVELS ON NEARBY ROADWAYS WITHIN ADJACENT JURISDICTIONS WITH PROJECT IMPLEMENTATION

Roadway Segment	Traffic Volume (Average Daily Trips)			Estimated Change in Traffic Noise Levels (dBA CNEL)
	2030 No Project	2030 Plus Project	Change	
Blue Oaks Boulevard west of Lonetree Boulevard	44,200	44,400	200	0.02
Blue Oaks Boulevard east of Lonetree Boulevard	15,400	15,500	100	0.02
Lonetree Boulevard south of Blue Oaks Boulevard	31,000	30,900	-100	-0.01
Pleasant Grove Boulevard north of Fairway Drive	41,100	41,100	0	0

Roadway Segment	Traffic Volume (Average Daily Trips)			Estimated Change in Traffic Noise Levels (dBA CNEL)
	2030 No Project	2030 Plus Project	Change	
Pleasant Grove south of Sunset Boulevard	31,100	30,400	300	-0.1
Stanford Ranch south of Sunset Boulevard	28,200	28,200	0	0
Wildcat at Lincoln City Limit	39,500	39,500	0	0
Wildcat/East Lincoln Parkway south of Twelve Bridges	30,700	30,800	100	0.02
Sierra College Boulevard north of Valley View Parkway	34,100	34,000	-100	-0.02
Sierra College Boulevard south of Valley View Parkway	34,700	34,700	0	0
Sierra College Boulevard north of Taylor Road	34,600	34,700	100	0.01
Sierra College Boulevard north of Secret Ravine Parkway	42,600	43,200	600	0.1
Sierra College Boulevard south of Secret Ravine Parkway	37,000	37,200	200	0.03
Pacific Street at Loomis Town Limit	18,500	19,200	700	0.2
Taylor Road west of Horseshoe Bar Road	16,900	16,900	0	0

Source: Ambient 2010

As previously noted, changes in noise levels of less than 3 dBA are typically not discernible to the human ear. Typically a doubling of traffic volumes is required before a noticeable increase (that is, 3 dBA or greater) in traffic noise levels occurs. Based on the analysis conducted, implementation of the proposed project would not result in a noticeable increase in traffic noise levels along the analyzed roadway segments. Therefore, substantial permanent increases in ambient noise levels in the project vicinity above levels existing without the project are considered **less than cumulatively considerable.**

As previously discussed, neither the Sixth Amendment to the Redevelopment Plan nor the CAP would result in impacts on adjacent jurisdictions associated with transportation noise beyond what is analyzed for the General Plan Update above.

Proposed General Plan Update Policies That Provide Mitigation

The proposed General Plan Update policies listed under Impact 4.5.3 would assist in reducing or avoiding transportation noise impacts.

Mitigation Measures

None required.

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