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# NOISE

## INTRODUCTION

This report has been prepared to address the noise impacts due to and upon the proposed Sierra Vista Specific Plan development located in the western region of the City of Roseville, California. The project is generally located north of Baseline Road and west of Fiddymont Road near the western boundaries of the City. The proposed project covers an area of approximately 2,064 acres. Figure 1 shows the project site plan.

The project would include the following land use designations:

- Approximately 6,655 residential units ranging from low to high density residential;
- Approximately 215 acres of general commercial;
- 70.7 acres of public/quasi-public uses, and;
- 528.4 acres of parks, open space (256.9 acres), paseo, landscaped corridors, and roadways.

This analysis includes consideration of four land use alternatives which would result in both higher and lower residential densities ranging from 4,929 to 6,663 units. The alternatives would also vary the amount open space included in the project from approximately 257 acres to 599 acres.

This section discusses the existing noise environment in the immediate project vicinity, and identifies potential impacts and mitigation measures related to the project.

## ACOUSTIC TERMINOLOGY<sup>1</sup>

### *Fundamentals of Acoustics*

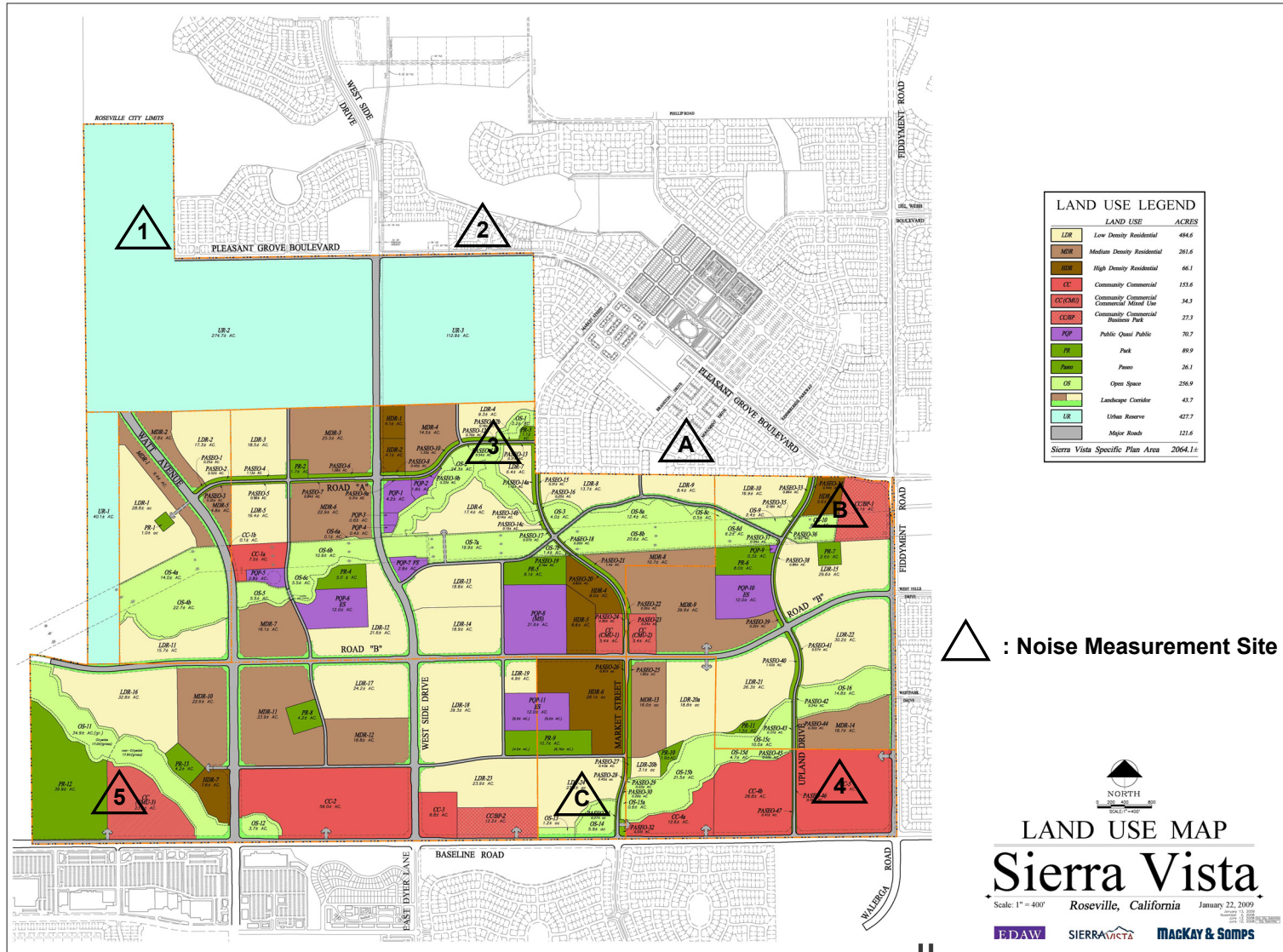
Acoustics is the science of sound. Sound may be thought of as mechanical energy of a vibrating object transmitted by pressure waves through a medium to human (or animal) ears. If the pressure variations occur frequently enough (at least 20 times per second), then they can be heard and are called sound. The number of pressure variations per second is called the frequency of sound, and is expressed as cycles per second or Hertz (Hz).

Noise is a subjective reaction to different types of sounds. Noise is typically defined as (airborne) sound that is loud, unpleasant, unexpected or undesired, and may therefore be classified as a more specific group of sounds. Perceptions of sound and noise are highly subjective from person to person.

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<sup>1</sup> For an explanation of these terms, see Appendix A: "Acoustical Terminology"

**Figure 1**  
 Silver Vista Specific Plan – City of Roseville, California  
 Site Plan and Noise Measurement Locations



j.c. brennan & associates  
*consultants in acoustics*

Measuring sound directly in terms of pressure would require a very large and awkward range of numbers. To avoid this, the decibel scale was devised. The decibel scale uses the hearing threshold (20 micropascals), as a point of reference, defined as 0 dB. Other sound pressures are then compared to this reference pressure, and the logarithm is taken to keep the numbers in a practical range. The decibel scale allows a million-fold increase in pressure to be expressed as 120 dB, and changes in levels (dB) correspond closely to human perception of relative loudness.

The perceived loudness of sounds is dependent upon many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable, and can be approximated by A-weighted sound levels. There is a strong correlation between A-weighted sound levels (expressed as dBA) and the way the human ear perceives sound. For this reason, the A-weighted sound level has become the standard tool of environmental noise assessment. All noise levels reported in this section are in terms of A-weighted levels, but are expressed as dB, unless otherwise noted.

The decibel scale is logarithmic, not linear. In other words, two sound levels 10 dB apart differ in acoustic energy by a factor of 10. When the standard logarithmic decibel is A-weighted, an increase of 10 dBA is generally perceived as a doubling in loudness. For example, a 70 dBA sound is half as loud as an 80 dBA sound, and twice as loud as a 60 dBA sound.

Community noise is commonly described in terms of the ambient noise level, which is defined as the all-encompassing noise level associated with a given environment. A common statistical tool to measure the ambient noise level is the average, or equivalent, sound level ( $L_{eq}$ ), which corresponds to a steady-state A weighted sound level containing the same total energy as a time varying signal over a given time period (usually one hour). The  $L_{eq}$  is the foundation of the composite noise descriptor,  $L_{dn}$ , and shows very good correlation with community response to noise.

The day/night average level ( $L_{dn}$ ) is based upon the average noise level over a 24-hour day, with a +10 decibel weighing applied to noise occurring during nighttime (10:00 p.m. to 7:00 a.m.) hours. The nighttime penalty is based upon the assumption that people react to nighttime noise exposures as though they were twice as loud as daytime exposures. Because  $L_{dn}$  represents a 24-hour average, it tends to disguise short-term variations in the noise environment. CNEL is similar to  $L_{dn}$ , but includes a +3 dB penalty for evening noise.

Table 1 lists several examples of the noise levels associated with common situations.

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

The effects of noise on people can be placed in three categories:

- Subjective effects of annoyance, nuisance, and dissatisfaction
- Interference with activities such as speech, sleep, and learning
- Physiological effects such as hearing loss or sudden startling

Environmental noise typically produces effects in the first two categories. Workers in industrial plants can experience noise in the last category. There is no completely satisfactory way to measure the subjective effects of noise or the corresponding reactions of annoyance and dissatisfaction. A wide variation in individual thresholds of annoyance exists and different tolerances to noise tend to develop based on an individual's past experiences with noise.

Thus, an important way of predicting a human reaction to a new noise environment is the way it compares to the existing environment to which one has adapted: the so-called ambient noise level. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by those hearing it.

With regard to increases in A-weighted noise level, the following relationships occur:

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

**Table 1  
Typical Noise Levels**

<b>Common Outdoor Activities</b>	<b>Noise Level (dBA)</b>	<b>Common Indoor Activities</b>
	--110--	Rock Band
Jet Fly-over at 300 m (1,000 ft)	--100--	
Gas Lawn Mower at 1 m (3 ft)	--90--	
Diesel Truck at 15 m (50 ft), at 80 km/hr (50 mph)	--80--	Food Blender at 1 m (3 ft) Garbage Disposal at 1 m (3 ft)
Noisy Urban Area, Daytime Gas Lawn Mower, 30 m (100 ft)	--70--	Vacuum Cleaner at 3 m (10 ft)
Commercial Area Heavy Traffic at 90 m (300 ft)	--60--	Normal Speech at 1 m (3 ft)
Quiet Urban Daytime	--50--	Large Business Office Dishwasher in Next Room
Quiet Urban Nighttime	--40--	Theater, Large Conference Room (Background)
Quiet Suburban Nighttime	--30--	Library
Quiet Rural Nighttime	--20--	Bedroom at Night, Concert Hall (Background)
	--10--	Broadcast/Recording Studio
Lowest Threshold of Human Hearing	--0--	Lowest Threshold of Human Hearing

Source: Caltrans, Technical Noise Supplement, Traffic Noise Analysis Protocol. October 1998.

Stationary point sources of noise – including stationary mobile sources such as idling vehicles – attenuate (lessen) at a rate of approximately 6 dB per doubling of distance from the source, depending on environmental conditions (i.e. atmospheric conditions and either vegetative or manufactured noise barriers, etc.). Widely distributed noises, such as a large industrial facility spread over many acres, or a street with moving vehicles, would typically attenuate at a lower rate.

## **MAJOR NOISE SOURCES IN THE PROJECT VICINITY**

### *Transportation:*

Motor vehicle traffic are the major contributors to the existing transportation noise environment in the project vicinity. Vehicular noise within the immediate project vicinity occurs primarily along Baseline Road and Fiddymment Road.

McClellan Airfield is located approximately 4.25 miles south of the project site. Occasional overflights from McClellan Airfield were observed during visits to the project site. The County of Sacramento Department of Economic Development owns and oversees McClellan Airfield, as it is no longer a military establishment. Noise contours for the re-use of the airfield have been prepared and are provided later in this document.

### *Non-Transportation:*

Existing non-transportation noise sources in the project area consist primarily of activities associated with the City of Roseville Pleasant Grove Wastewater Treatment Plant (WWTP) and the City of Roseville Energy Park located approximately 0.5-0.75 miles north of the project site. It should be noted that these uses were not noted to be significant noise sources at the project site.

## **Major Vibration Sources in the Project Vicinity**

No major sources of groundborne vibration were observed at the project site.

## **Noise-Sensitive Land Uses in the Project Vicinity**

Noise sensitive land uses in the immediate project vicinity consist of single-family residential uses located south of Baseline Road, near the intersection of Walerga Road, and along the east side of Fiddymment Road. The Westpark residential development is also located north of the project site. The development is currently under construction and includes existing and future sensitive receptors along the northern project boundaries. Several rural residential uses are also located north of Baseline Road, west of the project site.

## **EXISTING NOISE ENVIRONMENT IN THE PROJECT VICINITY**

### ***Existing Traffic Noise Levels***

To determine the existing traffic noise levels at the identified sensitive receivers within the project vicinity, the Federal Highway Administration Highway Traffic Noise Prediction Model (FHWA-RD-77-108) was used with the California Vehicle Noise Emission Levels. The FHWA Model is based upon the Calvenno reference noise factors for automobiles, medium trucks and heavy trucks, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and the acoustical characteristics of the site. Traffic volumes were obtained from DKS Associates in the form of ADT traffic volumes. Truck usage and vehicle speeds on the project roadways were estimated from field observations posted speed limits.

Table 2 shows the predicted existing traffic noise levels in terms of the Ldn descriptor at a standard distance of 100 feet from the centerlines of the existing project-area roadways for existing conditions, as well as distances to existing traffic noise contours. The extent of which existing land uses in the project vicinity are affected by traffic noise depends on their respective proximity to the roadways and their individual sensitivity to noise. Appendix B provides the complete inputs and results to the FHWA model.

<b>Table 2</b>					
<b>Existing No Project Traffic Noise Levels</b>					
<b>Sierra Vista Specific Plan Development – City of Roseville, California</b>					
Roadway	Segment	Traffic Noise Level, Ldn (dBA)	Distance to Contours (feet) <sup>1</sup>		
			70 dB Ldn	65 dB Ldn	60 dB Ldn
Blue Oaks	Fiddymment to Woodcreek	62.0	29	63	135
Blue Oaks	Woodcreek to Foothills	67.7	71	152	328
Pleasant Grove	West of Fiddymment	58.6	17	37	81
Pleasant Grove	Fiddymment to Woodcreek	63.4	36	78	169
Pleasant Grove	Woodcreek to Foothills	67.4	67	144	309
Junction	Woodcreek to Foothills	63.2	35	76	163
Baseline	West of Watt	65.1	47	102	219
Baseline	Watt to Walerga	66.6	59	128	275
Baseline	Walerga to Junction	64.3	42	90	195
Baseline	Junction to Woodcreek	63.1	35	75	162
Baseline	Woodcreek to Foothills	64.9	46	98	212
Fiddymment	North of Blue Oaks	60.0	22	47	101
Fiddymment	Blue Oaks to Pleasant Grove	63.5	37	79	170
Fiddymment	Pleasant Grove to Baseline	66.4	57	123	266
Walerga	South of Baseline	65.1	47	102	219
Watt	Road "B" to Road "A"	--	--	--	--
Watt	Baseline to Road "B"	--	--	--	--
Watt	South of Baseline	60.6	24	51	110
Westside	North of Pleasant Grove	--	--	--	--
Westside	Pleasant Grove to Road "A"	--	--	--	--
Westside	Road "A" to Road "B"	--	--	--	--
Market Drive	Project Site	--	--	--	--
Upland Drive	Project Site	--	--	--	--
Road "B"	Project Site	--	--	--	--

<sup>1</sup>Distances are measured from the centerline of the roadway.  
-- Roadway does not exist under this scenario.

***Existing Aviation Noise Levels***

Aviation activity associated with McClellan Airfield has the potential to occur over the project site.

As a means of addressing single event noise levels due to aircraft overflights associated with the McClellan Airfield on the project site, j.c. brennan & associates, Inc. conducted continuous and short-term noise level measurements and observations of aircraft flyovers on May 27-29, 2009.

Sound level meters were programmed to collect single event noise level (SEL) data due to aircraft flyovers, as well as overall hourly noise level data.

Field observations of aircraft primarily included single engine aircraft and the Coast Guard C-130 turboprop aircraft. Figure 1 shows the locations of the noise measurements sites on the project site. Figure 2 shows the predicted “Theoretic Capacity” noise contours for the re-use plan of McClellan Airfield. Table 3 shows a summary of the aircraft flyovers at each noise level measurement site.

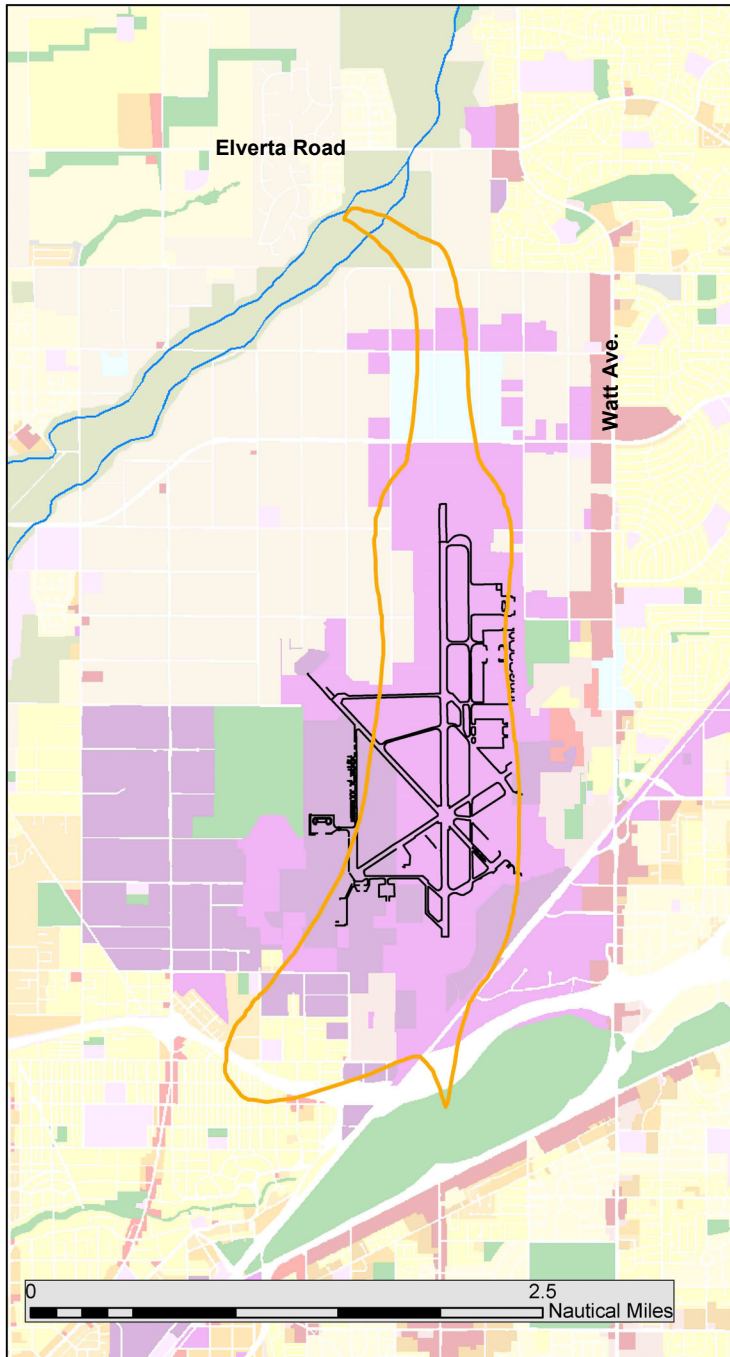
<b>Table 3</b>						
<b>Summary of Individual Aircraft Noise Levels</b>						
<b>Sierra Vista Specific Plan – City of Roseville, California</b>						
Aircraft	No. Events	dB, SEL				
		High		Low		
<i>Observed Events May 27<sup>th</sup> &amp; May 29<sup>th</sup> 2009</i>						
<b>Site D</b>						
SEP	7	70.4		62.8		
TEP	0	--		--		
Biz Jet	1	67.7		67.7		
Helicopter	1	64.4		64.4		
C-130	5	78.5		63.4		
Com Jet	--	--		--		
<b>Site 6</b>						
SEP	5	71.2		59.7		
TEP	0	--		--		
Biz Jet	0	--		--		
Helicopter	2	62.9		60.4		
C-130	1	74.7		74.7		
Com Jet	--	--		--		
<i>Unattended Recorded Events May 28<sup>th</sup> 2009 – 24 hour Period</i>						
<b>Site D</b>						
Daytime (7:00 a.m. to 10:00 p.m.)				Nighttime (10:00 p.m. to 7:00 a.m.)		
Date	No. Events	High, dB SEL	Low, dB SEL	No. Events	High, dB SEL	Low, dB SEL
May 28, 2009	57	78.4	60.6	19	76.9	63.8
Source: j.c. brennan & associates, Inc. – 2009.						

Instrumentation consisted of a LDL Model 820 and LDL Model 824 precision integrating sound level meters. The measurement systems were calibrated using a LDL Model CAL200 acoustical calibrator before testing. The measurement equipment meets all of the pertinent requirements of the American National Standards Institute (ANSI) for Type 1 (precision) sound level meters.

A complete discussion of potential airport noise impacts is provided later in this document.

**Figure 2**  
 McClellan Airport Noise Contours – 60 dB CNEL  
 Sierra Vista Specific Plan – City of Roseville, California

Theoretic Capacity Contour  
 McClellan Airport (MCC)



**Adopted**

05/17/2005

**LEGEND**

**Landuse**

- Rural Residential
- Very Low Density Residential
- Low Density Residential
- Medium Density Residential
- Medium High Density Residential
- High Density Residential
- High-Intensity Office
- Moderate-Intensity Office
- Community/Neighborhood Commercial/Office
- Regional Commercial/Office
- Community/Neighborhood Retail
- Regional Retail
- Light Industrial
- Heavy Industrial
- Public/Quasi-Public
- Mixed Use
- Urban Reserve
- Agriculture
- Open Space
- Forest
- Water
- 60 CNEL Theoretic Capacity Contour

LANDUSE Sources:  
 SACOG - Sacramento, El Dorado, Placer Counties  
 CASIL - Amador, San Joaquin Counties

MCC\_Theoretic\_Cap\_Contour\_Adopted\_05172005

**Existing Roseville Energy Park Noise Levels:**

Based upon observations and noise measurements conducted at the project site, the existing Roseville Energy Park was not observed to be a significant noise producer at the project site. Ambient noise level measurements of the Energy park indicated that the park produced noise levels that were barely audible and in the range of 37-38 dB at Site 1, which is shown on Figure 1.

**Existing Ambient Noise Levels:**

To quantify existing ambient noise levels in the vicinity of the project site, j.c. brennan & associates, Inc. staff conducted short-term and continuous (24-hour) noise level measurements at various locations on the project site. See Figure 1 for noise measurement locations. The noise level measurements were conducted between April 20<sup>th</sup> and 21<sup>st</sup>, 2009. The noise level measurements were conducted to determine typical background noise levels and for comparison to the project related noise levels. Table 4 shows a summary of the noise measurement results. Figure 3 graphically shows the results of the continuous noise level measurements. Appendix C provides the complete results of the continuous ambient noise measurements.

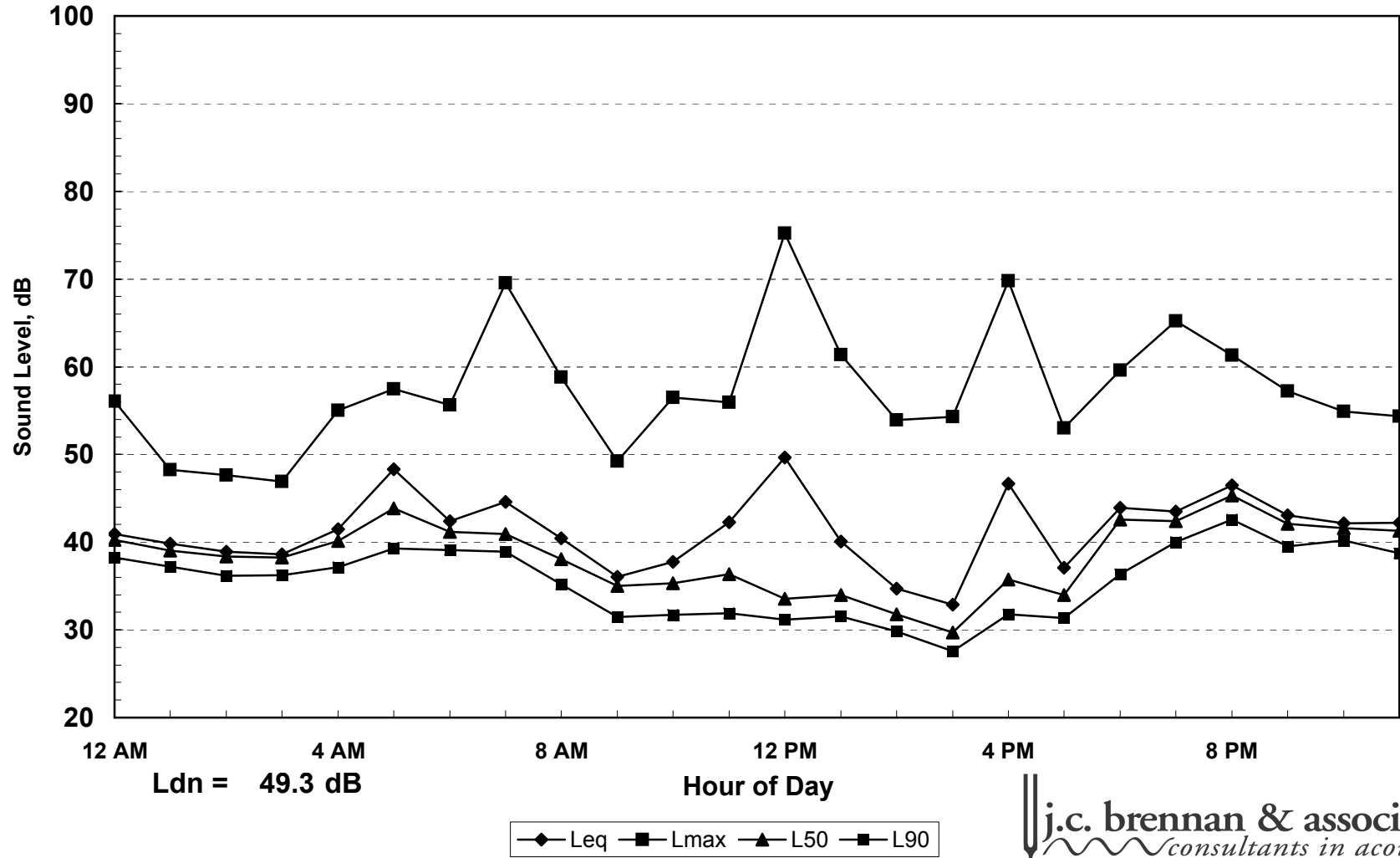
Larson Davis Laboratories (LDL) Model 820 precision integrating sound level meters were used for the continuous noise level measurement surveys. An LDL model 824 sound level meter was used for each of the short-term noise level measurements. The meters were calibrated before and after use with an LDL Model CAL200 acoustical calibrator to ensure the accuracy of the measurements. The equipment used meets all pertinent specifications of the American National Standards Institute for Type 1 sound level meters (ANSI S1.4).

<p align="center"><b>Table 4</b>  <b>Existing Noise Monitoring Results</b>  <b>Sierra Vista Specific Plan Development – City of Roseville, California</b></p>										
Site	Location	Date	Duration	Average Measured Hourly Noise Levels, (dBA)						
				24-hr L <sub>dn</sub>	Daytime (7:00 am - 10:00 pm)			Nighttime (10:00 pm - 7 am)		
					L <sub>eq</sub>	L <sub>50</sub>	L <sub>max</sub>	L <sub>eq</sub>	L <sub>50</sub>	L <sub>max</sub>
Continuous (24-hour) Noise Measurements										
A	Backyard - 1240 Kirkhill Drive, NE project boundary.	April 21, 2009	24 hour	49.3	43.5	37.1	60.1	42.7	40.4	52.9
B	Project site, 175 feet west of Fiddymont Road centerline.	April 21, 2009	24 hour	66.4	61.5	59.1	76.8	59.7	52.6	75.2
C	Project Site, 150 feet north of Baseline Road centerline.	April 21, 2009	24 hour	64.5	59.3	55.4	72.7	57.9	47.4	71.3
D	Central project site	May 28, 2009	24 hour	51.8	47.5	37.7	64.8	44.9	37.5	51.1

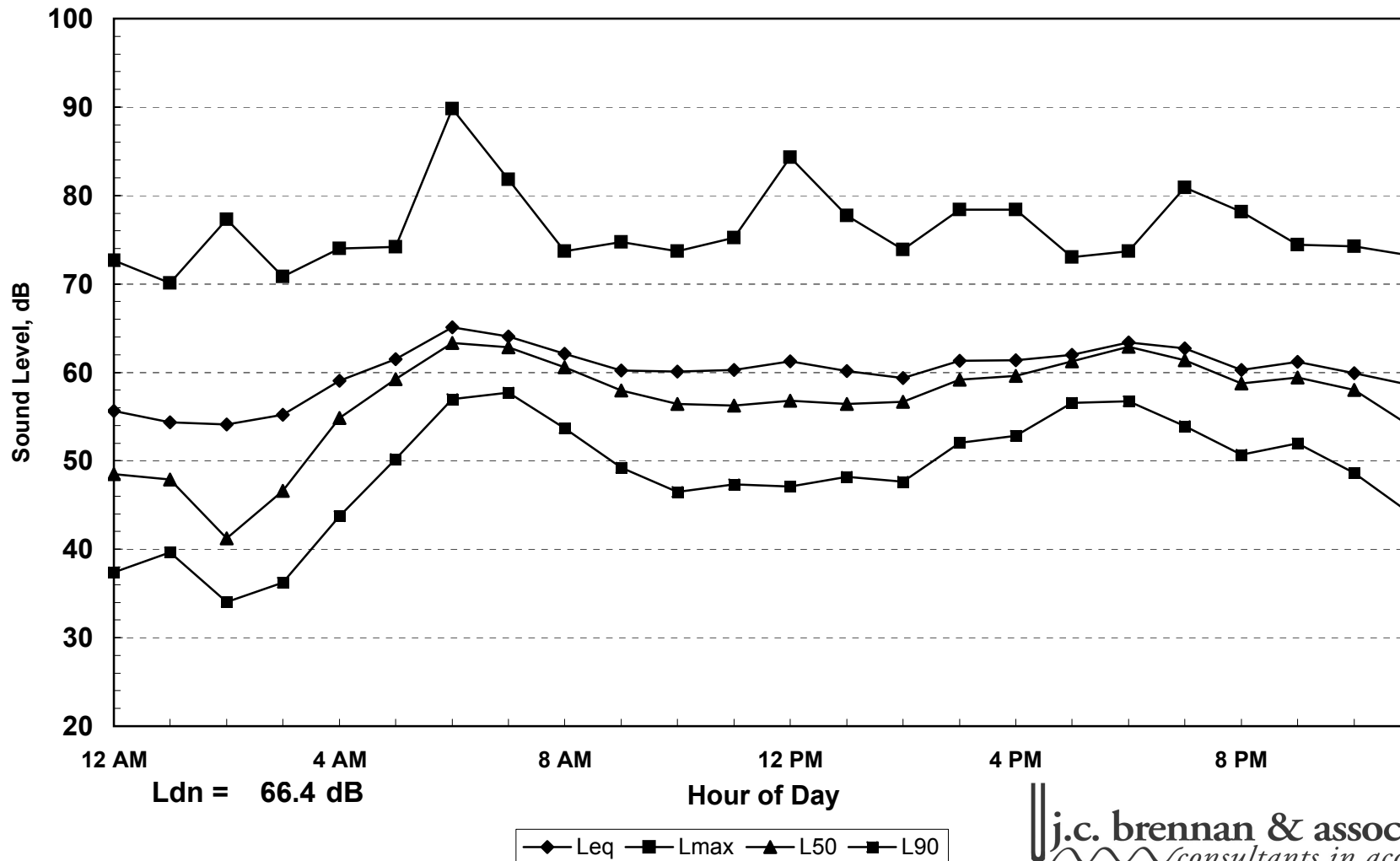
**Table 4  
Existing Noise Monitoring Results  
Sierra Vista Specific Plan Development – City of Roseville, California**

Site	Location	Date	Duration	Average Measured Hourly Noise Levels, (dBA)						
				24-hr L <sub>dn</sub>	Daytime (7:00 am - 10:00 pm)			Nighttime (10:00 pm - 7 am)		
					L <sub>eq</sub>	L <sub>50</sub>	L <sub>max</sub>	L <sub>eq</sub>	L <sub>50</sub>	L <sub>max</sub>
<b>Short Term Noise Measurements</b>										
1	NW corner of site, approximately 0.75 miles south of WWTP.	April 20-21, 2009	10:00	NA	11:06 a.m.			10:19 p.m.		
					40.6	39.6	54.2	40.1	40.0	45.1
2	NE corner of site, at existing terminus of Pleasant Grove Blvd.	April 20-21, 2009	10:00	NA	11:28 a.m.			10:37 p.m.		
					46.7	41.5	61.5	36.0	35.7	44.4
3	North project boundary, at existing terminus of Market Street.	April 20-21, 2009	10:00	NA	11:51 a.m.			11:03 p.m.		
					37.6	36.9	42.0	36.0	35.7	44.4
4	SE corner of site, near intersection of Baseline Road & Fiddymont Road.	April 20-21, 2009	10:00	NA	12:05 p.m.			11:25 p.m.		
					70.8	67.7	80.2	62.3	53.8	77.4
5	SW corner of site on project site, north of Baseline Road.	April 20-21, 2009	10:00	NA	12:18 p.m.			11:44 p.m.		
					68.0	55.0	82.6	63.9	42.5	84.2
Source - j.c. brennan & associates, Inc. 2009										

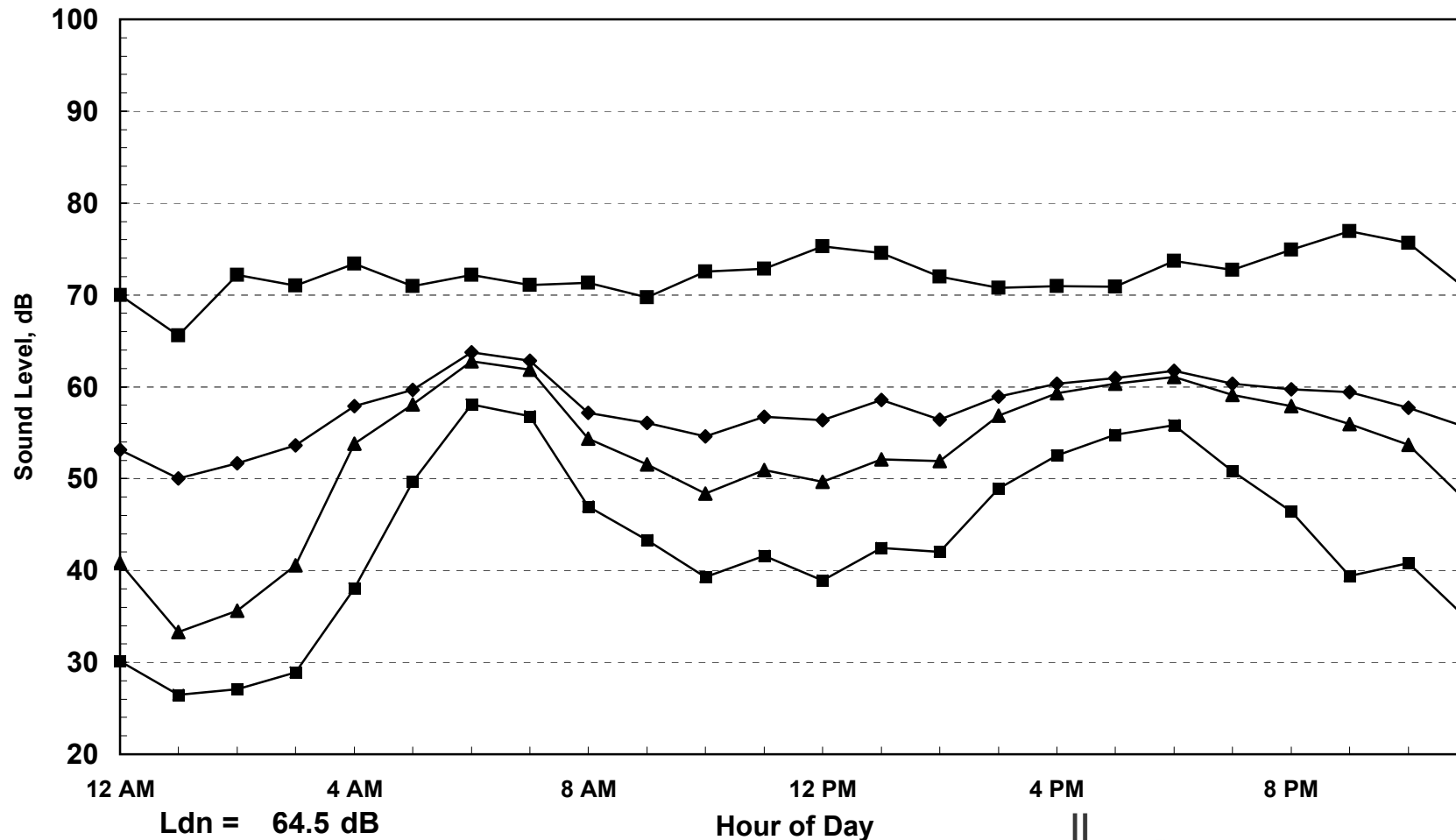
**Figure 3A**  
 Sierra Vista Specific Plan - City of Roseville, California  
 24hr Continuous Noise Monitoring - Site A  
 Tuesday, April 21, 2009



**Figure 3B**  
 Sierra Vista Specific Plan - City of Roseville, California  
 24hr Continuous Noise Monitoring - Site B  
 Tuesday, April 21, 2009



**Figure 3C**  
 Sierra Vista Specific Plan - City of Roseville, California  
 24hr Continuous Noise Monitoring - Site C  
 Tuesday, April 21, 2009

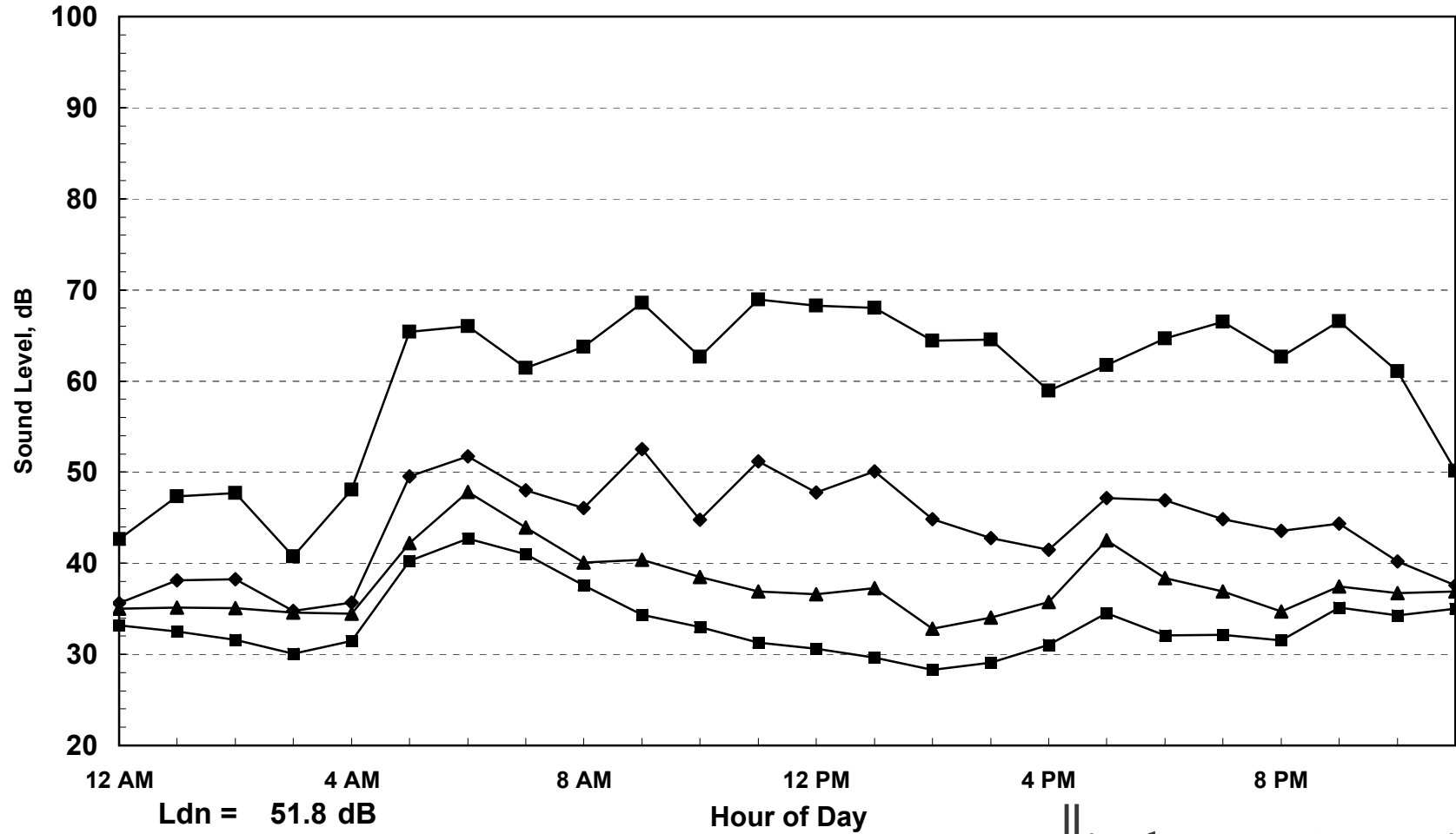


Ldn = 64.5 dB

◆ Leq    ■ Lmax    ▲ L50    ■ L90

*j.c. brennan & associates*  
 consultants in acoustics

**Figure 3D**  
 Sierra Vista Specific Plan - City of Roseville, California  
 24hr Continuous Noise Monitoring - Site D  
 Thursday, May 28, 2009



## **REGULATORY SETTING**

### **FEDERAL**

There are no federal regulations related to noise that apply to the Proposed Project.

### **STATE**

The State Building Code, Title 24, Part 2 of the State of California Code of Regulations establishes uniform minimum noise insulation performance standards to protect persons within new buildings which house people, including hotels, motels, dormitories, apartment houses and dwellings other than single-family dwellings. Title 24 mandates that interior noise levels attributable to exterior sources shall not exceed 45 dB  $L_{dn}$  or CNEL in any habitable room. Title 24 also mandates that for structures containing noise-sensitive uses to be located where the  $L_{dn}$  or CNEL exceeds 60 dB, an acoustical analysis must be prepared to identify mechanisms for limiting exterior noise to the prescribed allowable interior levels. If the interior allowable noise levels are met by requiring that windows be kept close, the design for the structure must also specify a ventilation or air conditioning system to provide a habitable interior environment.

### **LOCAL**

The City of Roseville General Plan Noise Element provides the following goals and policies relative to noise.

#### **Goals:**

1. Protect City residents from the harmful and annoying effects of exposure to excessive noise.
2. Protect the economic base of the City by preventing incompatible land uses from encroaching upon existing or planned noise-producing uses.

#### **Policies – Transportation Noise**

1. Allow the development of new noise-sensitive land uses (which include but are not limited to residential, schools, and hospitals) only in areas exposed to existing or projected levels of noise from transportation noise sources which satisfy the levels specified in Table IX-1. Noise mitigation measures may be required to reduce noise in outdoor activity areas and interior spaces to the levels specified in Table IX-1.

**Policies – Fixed Noise Source**

6. Allow the development of new noise-sensitive uses (which include, but are not limited to, residential, school, and hospitals) only where the noise level due to fixed (non-transportation) noise sources satisfies the noise level standards of Table IX-3. Noise mitigation may be required to meet Table IX-3 performance standards.
7. Require proposed fixed noise sources adjacent to noise-sensitive uses to be mitigated so as not to exceed the noise level performance standards of Table IX-3.

**Policies – General**

9. Where noise mitigation measures are required to achieve the standards of Tables IX-1 and IX- 3, the emphasis of such measures should be placed on site planning and project design. These measures may include, but are not limited to, building orientation, setbacks, landscaping, and building construction practices. The use of noise barriers, such as soundwalls, should be considered as a means of achieving the noise standards only after all other practical design-related noise mitigation measures have been integrated into the project.
10. Regulate construction-related noise to reduce impacts on adjacent uses consistent with the City's Noise Ordinance.

**Table 5**  
**(Table IX-1 of the Roseville General Plan Noise Element)**  
**Maximum Allowable Noise Exposure Transportation Noise Sources**

Land Use	Outdoor Activity Areas <sup>1</sup> Ldn/CNEL, dB	Interior Spaces	
		Ldn/CNEL, dB	Leq, dB <sup>2</sup>
Residential	60 <sup>3</sup>	45	--
Transient Lodging	60 <sup>3</sup>	45	--
Hospitals & Nursing Homes	60 <sup>3</sup>	45	--
Theaters, Auditoriums, Music Halls	--	--	35
Churches, Meeting Halls	60 <sup>3</sup>	--	40
Office Buildings	65	--	45
Schools, Libraries, Museums	--	--	45
Playgrounds, Neighborhood Parks	70	--	--

1. Outdoor activity areas for residential developments are considered to be the back yard patios or decks of single family dwelling, and the patios or common areas where people generally congregate for multi-family development.

Outdoor activity areas for non-residential developments are considered to be those common areas where people generally congregate, including pedestrian plazas, seating areas and outside lunch facilities.

Where the location of outdoor activity areas is unknown, the exterior noise level standard shall be applied to the property line of the receiving land use.

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

3. Where it is not possible to reduce noise in outdoor activity areas to 60 dB 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 area in compliance with this table.

**Note:** Where a proposed use is not specifically listed on this table, the use shall comply with the noise exposure standards for the nearest similar use as determined by the Planning Department. Commercial and industrial uses have not been listed because such uses are not considered to be particularly sensitive to noise exposure.

Source: City of Roseville, 2020 General Plan.

**Table 6**  
**(Table IX-3 of the City of Roseville General Plan Noise Element)**  
**Performance Standards for Non-Transportation Noise Sources**

Noise Level Descriptor	Daytime (7 a.m. - 10 p.m.)	Nighttime (10 p.m. - 7 a.m.)
Hourly Average (Leq)	50 dB	45 dB
Maximum Level (Lmax)	70 dB	65 dB

Each of the noise levels specified above should be lowered by five dB for simple tone noises, noises consisting primarily of speech or music, or for recurring impulsive noises. Such noises are generally considered by residents to be particularly annoying and are a primary source of noise complaints. These noise level standards do not apply to residential units established in conjunction with industrial or commercial uses (e.g., caretaker dwellings).

No standards have been included for interior noise levels. Standard construction practices should, with exterior noise levels identified, result in acceptable interior noise levels.

Source: City of Roseville, 2020 General Plan.

### **Roseville Municipal Code**

The City of Roseville Noise Ordinance, Chapter 9.24 of the Municipal Code establishes procedures and policies for handling noise complaints within the City. The ordinance also establishes limits on noise sources, such as amplified music or sound.

The ordinance also exempts noise from private construction (e.g., construction, alteration or repair activities) between the hours of 7:00 a.m. and 7:00 p.m. Monday through Friday, and between the hours of 8:00 a.m. and 8:00 p.m. Saturday and Sunday; provided, however, that all construction equipment is fitted with factory installed muffling devices and that all construction equipment shall be maintained in good working order.

### **Determination of a Significant Increase in Noise Levels**

Another means of determining a potential noise impact is to assess a person’s reaction to changes in noise levels due to a project. Table 7 is commonly used to show expected public reaction to changes in environmental noise levels. This table was developed on the basis of test subjects' reactions to changes in the levels of steady-state pure tones or broad-band noise and to changes in levels of a given noise source. It is probably most applicable to noise levels in the range of 50 to 70 dBA, as this is the usual range of voice and interior noise levels.

<p align="center"><b>Table 7</b>  <b>Subjective Reaction to Changes in Noise Levels of Similar Sources</b></p>		
Change in Level, dBA	Subjective Reaction	Factor Change in Acoustical Energy
1	Imperceptible (Except for Tones)	1.3
3	Just Barely Perceptible	2.0
6	Clearly Noticeable	4.0
10	About Twice (or half) as Loud	10.0
Source: Architectural Acoustics, M. David Egan, 1988.		

**IMPACTS AND MITIGATION MEASURES**

Generally, a project may have a significant effect on the environment if it will substantially increase the ambient noise levels for adjoining areas or expose people to severe noise levels. In practice, more specific professional standards have been developed. These standards state that a noise impact may be considered significant if it would generate noise that would conflict with local planning criteria or ordinances, or substantially increase noise levels at noise-sensitive land uses.

**STANDARDS OF SIGNIFICANCE**

CEQA guidelines state that implementation of the project would result in significant noise impacts if the project would result in either of the following:

- a. Exposure of persons to or generation of noise levels in excess of standards established in the City of Roseville General Plan. Specifically, exterior and interior noise levels as outlined in Tables 5 and 6 of this document.
- b. Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.
- c. A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project, typically defined as 4 dB.
- d. A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project, typically defined as 4 dB.
- e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, where the project would expose people residing or working in the area to excessive noise levels.

- f. For a project within the vicinity of a private airstrip, where the project would expose people residing or working in the project area to excessive noise levels.

There are no existing or proposed major sources of groundborne vibration or noise associated with the project, therefore, item “b” would also not apply to the project.

## **Analysis Methodology**

### ***Traffic Noise Impact Assessment Methodology***

To assess noise impacts due to project-related traffic increases on the local roadway network, traffic noise levels are predicted at a representative distance for both short term and future, project and no-project conditions for the Proposed Project. Noise impacts are identified at existing noise-sensitive areas if the noise levels generated by the project create significant increase in existing noise levels.

To describe existing and projected noise levels due to traffic, the Federal Highway Administration Highway Traffic Noise Prediction Model (FHWA RD-77-108) was used. The model is based upon the Calveno reference noise factors for automobiles, medium trucks and heavy trucks, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and the acoustical characteristics of the site.

The FHWA model was developed to predict hourly  $L_{eq}$  values for free-flowing traffic conditions. To predict traffic noise levels in terms of  $L_{dn}$ , it is necessary to adjust the input volume to account for the day/night distribution of traffic.

Inputs to the FHWA model included ADT traffic volumes which were provided by the project traffic consultant (DKS Associates), truck usage and vehicle speeds on the local area roadways were estimated from field observations. The predicted increases in traffic noise levels on the local roadway network for baseline and future conditions which would result from the project are provided in terms of  $L_{dn}$  at a standard distance of 100 feet from the centerlines of the project-area roadways.

### ***Construction Noise Impact Methodology***

Construction noise was analyzed using data compiled for various pieces of construction equipment at a representative distance of 50 feet. Construction activities are discussed relative to the applicable City of Roseville Noise Ordinance policies. Potential impacts and mitigation measures are discussed.

### ***Aviation Noise Impact Methodology***

Aviation noise was addressed through a combination of short-term and continuous site noise measurements of aircraft operations and review of adopted airport land-use compatibility policies and noise contours. The potential for sleep disturbance is discussed based upon the results of single event noise measurements conducted on the project site.

### ***Stationary Noise Impact Methodology***

Noise impacts associated with future commercial and park land uses were analyzed using previously collected file data for the various types of uses proposed.

### **Overview of Noise Mitigation Options**

The following overview is provided since the site plan is in the preliminary land use stages, and may be of use during finalization of the project site plans.

Any noise problem may be considered as being composed of three basic elements: the noise source, a transmission path, and a receiver. The appropriate acoustical treatment for a given project should consider the nature of the noise source and the sensitivity of the receiver. The problem should be defined in terms of appropriate criteria (CNEL, Leq, or Lmax), the location of the sensitive receiver (inside or outside), and when the problem occurs (daytime or nighttime). Noise control techniques should then be selected to provide an acceptable noise environment for the receiving property while remaining consistent with local aesthetic standards and practical structural and economic limits. Fundamental noise control options include the following:

#### Use of Setbacks:

Noise exposure may be reduced by increasing the distance between the noise source and receiving use. Setback areas can take the form of open space, frontage roads, recreational areas, storage yards, etc. The available noise attenuation from this technique is limited by the characteristics of the noise source, but is generally about 4 to 6 dB per doubling of distance from the source.

#### Use of Barriers:

Shielding by barriers can be obtained by placing walls, berms or other structures, such as buildings, between the noise source and the receiver. The effectiveness of a barrier depends upon blocking line-of-sight between the source and receiver, and is improved with increasing the distance the sound must travel to pass over the barrier as compared to a straight line from source to receiver. The difference between the distance over a barrier and a straight line between source and receiver is called the "path length difference," and is the basis for calculating barrier noise reduction.

Barrier effectiveness depends upon the relative heights of the source, barrier and receiver. In general, barriers are most effective when placed close to either the receiver or the source. An intermediate barrier location yields a smaller path-length-difference for a given increase in barrier height than does a location closer to either source or receiver.

For maximum effectiveness, barriers must be continuous and relatively airtight along their length and height. To ensure that sound transmission through the barrier is insignificant, barrier mass should be about 4 lbs./square foot, although a lesser mass may be acceptable if the barrier material provides sufficient transmission loss. Satisfaction of the above criteria requires substantial and well-fitted barrier materials, placed to intercept line of sight to all significant noise sources. Earth, in the form of berms or the face of a depressed area, is also an effective barrier material.

There are practical limits to the noise reduction provided by barriers. For vehicle traffic or railroad noise, a 5 to 10 dB noise reduction may often be reasonably attained. A 15 dB noise reduction is sometimes possible, but a 20 dB noise reduction is extremely difficult to achieve. Barriers usually are provided in the form of walls, berms, or berm/wall combinations. The use of an earth berm in lieu of a solid wall may provide up to 3 dB additional attenuation over that attained by a solid wall alone, due to the absorption provided by the earth. Berm/wall combinations offer slightly better acoustical performance than solid walls, and are often preferred for aesthetic reasons.

#### Site Design:

Buildings can be placed on a project site to shield other structures or areas, to remove them from noise-impacted areas, and to prevent an increase in noise level caused by reflections. The use of one building to shield another can significantly reduce overall project noise control costs, particularly if the shielding structure is insensitive to noise.

Site design should guard against the creation of reflecting surfaces which may increase onsite noise levels. For example, two buildings placed at an angle facing a noise source may cause noise levels within that angle to increase by up to 3 dB. The open end of "U"-shaped buildings should point away from noise sources for the same reason. Landscaping walls or noise barriers located within a development may inadvertently reflect noise back to a noise-sensitive area unless carefully located. Avoidance of these problems while attaining an aesthetic site design requires close coordination between local agencies, the project engineer and architect, and the noise consultant.

#### Noise Reduction by Building Facades:

When interior noise levels are of concern in a noisy environment, noise reduction may be obtained through acoustical design of building facades. Standard construction practices provide 10-15 dB noise reduction for building facades with open windows, and approximately 25 dB noise reduction when windows are closed. Thus a 25 dB exterior-to-interior noise reduction can be obtained by the requirement that building design include adequate ventilation systems, allowing windows on a noise-impacted facade to remain closed under any weather condition.

Where greater noise reduction is required, acoustical treatment of the building facade is necessary. Reduction of relative window area is the most effective control technique, followed by providing acoustical glazing (thicker glass or increased air space between panes) in low air infiltration rate frames, use of fixed (non-movable) acoustical glazing or the elimination of windows. Noise transmitted through walls can be reduced by increasing wall mass (using stucco or brick in lieu of wood siding), isolating wall members by the use of double or staggered stud walls, or mounting interior walls on resilient channels. Noise control for exterior doorways is provided by reducing

door area, using solid-core doors, and by acoustically sealing door perimeters with suitable gaskets. Roof treatments may include the use of plywood sheathing under roofing materials.

#### Use of Vegetation:

Trees and other vegetation are often thought to provide significant noise attenuation. However, approximately 100 feet of dense foliage (so that no visual path extends through the foliage) is required to achieve a 5 dB attenuation of traffic noise. Thus the use of vegetation as a noise barrier should not be considered a practical method of noise control unless large tracts of dense foliage are part of the existing landscape.

Vegetation can be used to acoustically "soften" intervening ground between a noise source and receiver, increasing ground absorption of sound and thus increasing the attenuation of sound with distance. Planting of trees and shrubs is also of aesthetic and psychological value, and may reduce adverse public reaction to a noise source by removing the source from view, even though noise levels will be largely unaffected. It should be noted, however, that trees planted on the top of a noise control berm can actually slightly degrade the acoustical performance of the barrier. This effect can occur when high frequency sounds are diffracted (bent) by foliage and directed downward over a barrier.

In summary, the effects of vegetation upon noise transmission are minor, and are primarily limited to increased absorption of high frequency sounds and to reducing adverse public reaction to the noise by providing aesthetic benefits.

## SPECIFIC IMPACTS AND MITIGATION MEASURES

**Impact 4.11-1 Short-Term Construction-Generated Noise Levels.** Implementation of the proposed project would result in short-term construction activities associated with individual development projects in the Plan area. These construction activities could potentially expose sensitive receptors to noise levels in excess of the applicable noise standards and/or result in a noticeable increase in ambient noise levels. This is considered to be a **potentially significant** impact.

### *Construction Noise Impact Assessment Methodology*

During the construction phases of the project, noise from construction activities would add to the noise environment in the immediate project vicinity. Activities involved in typical construction and demolition would generate maximum noise levels, as indicated in Table 8, ranging from 76 to 90 dB at a distance of 50 feet.

A significant project-generated noise source would include truck traffic associated with transport of heavy materials and equipment to and from construction sites and the movement of heavy construction equipment on the project site. This noise increase would be of short duration, and would occur primarily during daytime hours, as regulated by the City of Roseville Noise Ordinance.

<b>Table 8</b> <b>Construction Equipment Noise</b> <b>Sierra Vista Specific Plan Development – City of Roseville, California</b>	
Type of Equipment	Maximum Level, dB at 50 feet
Backhoe	78
Compactor	83
Compressor (air)	78
Concrete Saw	90
Dozer	82
Dump Truck	76
Excavator	81
Generator	81
Jackhammer	89
Pneumatic Tools	85

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

The *City of Roseville Municipal Code* exempts construction-generated noise that occurs between the hours of 7 a.m. to 7 p.m. Monday through Friday, and 8 a.m. and 8 p.m. Saturday and Sunday from the applicable noise standards, provided that all construction equipment is fitted with factory installed muffling devices and maintained in good working order. This impact is considered **potentially-significant**.

### **Mitigation for Impact 1**

The following mitigation measures are required for the Proposed Project to minimize construction noise impacts.

***MM1a:*** Construction activities shall comply with the requirements of the City of Roseville Noise Ordinance.

***MM1b:*** Locate fixed construction equipment such as compressors and generators as far as possible from sensitive receptors. Shroud or shield all impact tools, and muffle or shield all intake and exhaust ports on power construction equipment.

***MM1c :*** Designate a disturbance coordinator and conspicuously post this person's number around the project site and in adjacent public spaces. The disturbance coordinator will receive all public complaints about construction noise disturbances and will be responsible for determining the cause of the complaint, and implement any feasible measures to be taken to alleviate the problem.

**Significance after Mitigation: Less-than-significant.**

**Impact 4.11-2**      **Long-Term Traffic Noise Levels at Existing Noise-Sensitive Receivers.** Implementation of the proposed project would result in an increase of average daily vehicle trips in the Plan area. The increased traffic volumes would result in a noticeable (4 dB or greater) increase in traffic noise along roadways in and within the vicinity of the Plan area. This is considered to be a **potentially significant** impact.

Long-term operation of the proposed project would result in an increase in ADT volumes on the local roadway network and, consequently, an increase in noise levels from traffic sources along affected segments.

To examine the affect of project-generated traffic increases, traffic noise levels associated with the proposed project were calculated for roadway segments in the project study area using the FHWA Highway Noise Prediction Model (FHWA-RD-77-108). Traffic noise levels were modeled under Existing, Cumulative (2025) conditions, and Capital Improvement Plan (CIP) 2025, with and without the implementation of the Specific Plan. Traffic volumes were obtained from the project traffic consultant (DKS Associates). Vehicle speeds and truck volumes on local area roadways were determined based on field observations and posted speeds. Tables 9 through 12 summarize the modeled traffic noise levels at 100 feet from the centerline of affected roadway segments in the Plan vicinity. Appendix A provides the complete inputs and results of the FHWA traffic modeling.

**Table 9**  
**Predicted Existing and Existing Plus Project Traffic Noise Levels – Proposed Project**  
**Sierra Vista Specific Plan Development – City of Roseville, California**

Roadway	Segment	Distance (Feet)	Traffic Noise Levels (Ldn dBA)			Distance to contours (feet) Existing			Distance to Contours (feet) Existing Plus Project		
			Existing	Existing + Project	Change	70 dB Ldn	65 dB Ldn	60 dB Ldn	70 dB Ldn	65 dB Ldn	60 dB Ldn
Blue Oaks	Fiddymment to Woodcreek	100	62.0	63.3	1.3	29	63	135	36	77	165
Blue Oaks	Woodcreek to Foothills	100	67.7	68.0	0.3	71	152	328	73	157	339
Pleasant Grove	West of Fiddymment	100	58.6	61.7	3.1	17	37	81	28	61	131
Pleasant Grove	Fiddymment to Woodcreek	100	63.4	67.4	4.0	36	78	169	67	145	312
Pleasant Grove	Woodcreek to Foothills	100	67.4	67.9	0.5	67	144	309	73	156	337
Junction	Woodcreek to Foothills	100	63.2	64.0	0.8	35	76	163	40	86	184
Baseline	West of Watt	100	65.1	68.7	3.6	47	102	219	82	176	380
Baseline	Watt to Walerga	100	66.6	69.3	2.7	59	128	275	90	193	416
Baseline	Walerga to Junction	100	64.3	66.2	1.9	42	90	195	56	120	259
Baseline	Junction to Woodcreek	100	63.1	64.6	1.5	35	75	162	43	94	202
Baseline	Woodcreek to Foothills	100	64.9	66.6	1.7	46	98	212	60	129	277
Fiddymment	North of Blue Oaks	100	60.0	61.2	1.2	22	47	101	26	56	120
Fiddymment	Blue Oaks to Pleasant Grove	100	63.5	64.9	1.4	37	79	170	46	99	213
Fiddymment	Pleasant Grove to Baseline	100	66.4	67.7	1.3	57	123	266	70	151	325
Walerga	South of Baseline	100	65.1	65.9	0.8	47	102	219	53	114	247
Watt	Road "B" to Road "A"	100	--	58.8	NA	--	--	--	18	39	84
Watt	Baseline to Road "B"	100	--	61.2	NA	--	--	--	26	56	120
Watt	South of Baseline	100	60.6	65.6	<b>5.0</b>	24	51	110	51	110	236
Westside	North of Pleasant Grove	100	--	--	NA	--	--	--	--	--	--
Westside	Pleasant Grove to Road "A"	100	--	41.8	NA	--	--	--	1	3	6
Westside	Road "A" to Road "B"	100	--	60.0	NA	--	--	--	22	46	100
Market Drive	Project Site	100	--	52.2	NA	--	--	--	7	14	30
Upland Drive	Project Site	100	--	53.9	NA	--	--	--	8	18	39
Road "B"	Project Site	100	--	59.7	NA	--	--	--	21	44	95

<sup>1</sup>Distances are measured from the centerline of the roadway.  
-- Roadway does not exist under this scenario.

**Table 10**  
**Predicted Cumulative 2025 and Cumulative 2025 Plus Project Traffic Noise Levels**  
**Sierra Vista Specific Plan Development – City of Roseville, California**

Roadway	Segment	Distance (Feet)	Traffic Noise Levels (Ldn dBA)			Distance to contours (feet) Cumulative 2025			Distance to Contours (feet) Cumulative 2025 Plus Project		
			Cumulative 2025	Cumulative 2025 Plus Project	Change	70 dB Ldn	65 dB Ldn	60 dB Ldn	70 dB Ldn	65 dB Ldn	60 dB Ldn
Blue Oaks	Fiddymment to Woodcreek	100	69.2	69.2	0.0	88	190	409	89	192	413
Blue Oaks	Woodcreek to Foothills	100	71.4	71.4	0.0	124	267	576	124	268	578
Pleasant Grove	West of Fiddymment	100	67.3	67.6	0.3	67	143	309	69	149	321
Pleasant Grove	Fiddymment to Woodcreek	100	67.5	68.9	1.4	68	146	316	84	181	389
Pleasant Grove	Woodcreek to Foothills	100	69.6	69.9	0.3	94	203	436	98	211	455
Junction	Woodcreek to Foothills	100	63.5	64.5	1.0	37	80	171	43	93	200
Baseline	West of Watt	100	71.0	72.8	1.8	116	251	540	153	329	709
Baseline	Watt to Walerga	100	71.5	72.5	1.0	126	272	587	147	316	682
Baseline	Walerga to Junction	100	69.2	71.0	1.8	89	192	413	117	253	545
Baseline	Junction to Woodcreek	100	67.3	68.7	1.4	66	142	306	82	178	383
Baseline	Woodcreek to Foothills	100	67.9	69.4	1.5	73	157	339	92	197	425
Fiddymment	North of Blue Oaks	100	68.0	68.5	0.5	74	159	341	79	171	368
Fiddymment	Blue Oaks to Pleasant Grove	100	68.6	69.2	0.6	80	173	373	88	190	408
Fiddymment	Pleasant Grove to Baseline	100	70.7	70.2	-0.5	112	240	518	103	221	476
Walerga	South of Baseline	100	68.7	68.9	0.2	82	176	378	85	183	393
Watt	Road "B" to Road "A"	100	69.1	70.0	0.9	87	188	405	101	217	467
Watt	Baseline to Road "B"	100	69.1	70.1	1.0	87	188	405	101	218	470
Watt	South of Baseline	100	67.5	68.8	1.3	68	146	315	83	179	385
Westside	North of Pleasant Grove	100	63.9	67.9	4.0	39	85	183	73	156	337
Westside	Pleasant Grove to Road "A"	100	--	66.6	NA	--	--	--	59	127	274
Westside	Road "A" to Road "B"	100	--	67.2	NA	--	--	--	65	140	301
Market Drive	Project Site	100	--	54.2	NA	--	--	--	9	19	41
Upland Drive	Project Site	100	--	56.9	NA	--	--	--	13	29	62
Road "B"	Project Site	100	--	59.8	NA	--	--	--	21	45	97

<sup>1</sup>Distances are measured from the centerline of the roadway.  
-- Roadway does not exist under this scenario.

**Table 11  
Predicted 2025 Capital Improvement Plan (CIP) and 2025 CIP Plus Project Traffic Noise Levels  
Sierra Vista Specific Plan Development – City of Roseville, California**

Roadway	Segment	Distance (Feet)	Traffic Noise Levels (Ldn dBA)			Distance to contours (feet) 2025 CIP			Distance to Contours (feet) 2025 CIP Plus Project		
			2025 CIP	2025 CIP Plus Project	Change	70 dB Ldn	65 dB Ldn	60 dB Ldn	70 dB Ldn	65 dB Ldn	60 dB Ldn
Blue Oaks	Fiddymt to Woodcreek	100	69.2	69.9	0.7	89	191	412	99	212	457
Blue Oaks	Woodcreek to Foothills	100	71.9	72.1	0.2	135	290	625	138	297	640
Pleasant Grove	West of Fiddymt	100	67.1	66.8	-0.3	64	137	296	61	132	285
Pleasant Grove	Fiddymt to Woodcreek	100	67.8	69.0	1.2	71	153	330	86	185	399
Pleasant Grove	Woodcreek to Foothills	100	70.0	70.2	0.2	99	214	462	103	221	477
Junction	Woodcreek to Foothills	100	64.7	65.3	0.6	44	95	205	49	105	227
Baseline	West of Watt	100	70.6	71.6	1.0	110	238	512	128	275	593
Baseline	Watt to Walerga	100	72.5	71.7	-0.8	146	314	677	131	282	607
Baseline	Walerga to Junction	100	69.8	70.2	0.4	97	209	451	104	224	482
Baseline	Junction to Woodcreek	100	67.6	67.8	0.2	69	149	320	72	155	333
Baseline	Woodcreek to Foothills	100	67.8	68.5	0.7	72	155	333	79	170	367
Fiddymt	North of Blue Oaks	100	68.1	68.2	0.1	75	161	346	75	162	349
Fiddymt	Blue Oaks to Pleasant Grove	100	68.7	68.5	-0.2	81	175	378	80	172	370
Fiddymt	Pleasant Grove to Baseline	100	71.0	69.5	-1.5	117	252	543	93	200	430
Walerga	South of Baseline	100	68.4	68.8	0.4	79	170	366	83	179	387
Watt	Road "B" to Road "A"	100	67.4	66.7	-0.7	67	145	312	60	130	280
Watt	Baseline to Road "B"	100	67.4	66.9	-0.5	67	145	312	62	133	287
Watt	South of Baseline	100	65.6	66.6	1.0	51	110	237	60	129	277
Westside	North of Pleasant Grove	100	61.9	66.4	4.5	29	62	134	57	123	266
Westside	Pleasant Grove to Road "A"	100	--	66.2	NA	--	--	--	56	120	258
Westside	Road "A" to Road "B"	100	--	66.1	NA	--	--	--	55	118	255
Market Drive	Project Site	100	--	53.2	NA	--	--	--	8	16	35
Upland Drive	Project Site	100	--	55.8	NA	--	--	--	11	24	52
Road "B"	Project Site	100	--	60.2	NA	--	--	--	22	48	103

<sup>1</sup>Distances are measured from the centerline of the roadway.  
-- Roadway does not exist under this scenario.

**Table 12**  
**Predicted 2025 Capital Improvement Plan (CIP) and 2025 CIP Plus Project Alts. 1-4 Traffic Noise Levels**  
**Sierra Vista Specific Plan Development – City of Roseville, California**

Roadway	Segment	Distance (Feet)	Traffic Noise Levels (Ldn dBA)								
			2025 CIP No Project	Alt 1 – No Project	Change	Alt 2	Change	Alt 3	Change	Alt 4	Change
Blue Oaks	Fiddymont to Woodcreek	100	69.2	69.2	0.0	69.9	0.7	69.9	0.7	69.9	0.7
Blue Oaks	Woodcreek to Foothills	100	71.9	71.9	0.0	72.1	0.2	72.1	0.2	72.1	0.2
Pleasant Grove	West of Fiddymont	100	67.1	67.1	0.0	66.9	-0.2	66.8	-0.3	66.7	-0.4
Pleasant Grove	Fiddymont to Woodcreek	100	67.8	67.8	0.0	69.0	1.2	68.9	1.1	68.9	1.1
Pleasant Grove	Woodcreek to Foothills	100	70.0	70.0	0.0	70.2	0.2	70.1	0.1	70.1	0.1
Junction	Woodcreek to Foothills	100	64.7	64.7	0.0	65.4	0.7	65.2	0.5	65.2	0.5
Baseline	West of Watt	100	70.6	70.6	0.0	71.3	0.7	71.3	0.7	71.4	0.8
Baseline	Watt to Walerga	100	72.5	72.5	0.0	71.7	-0.8	71.7	-0.8	71.7	-0.8
Baseline	Walerga to Junction	100	69.8	69.8	0.0	70.2	0.4	70.1	0.3	70.1	0.3
Baseline	Junction to Woodcreek	100	67.6	67.6	0.0	67.8	0.2	67.8	0.2	67.8	0.2
Baseline	Woodcreek to Foothills	100	67.8	67.8	0.0	68.4	0.6	68.4	0.6	68.4	0.6
Fiddymont	North of Blue Oaks	100	68.1	68.1	0.0	68.1	0.0	68.1	0.0	68.2	0.1
Fiddymont	Blue Oaks to Pleasant Grove	100	68.7	68.7	0.0	68.5	-0.2	68.5	-0.2	68.5	-0.2
Fiddymont	Pleasant Grove to Baseline	100	71.0	71.0	0.0	69.5	-1.5	69.6	-1.4	69.5	-1.5
Walerga	South of Baseline	100	68.4	68.4	0.0	68.7	0.3	68.7	0.3	68.8	0.4
Watt	Road "B" to Road "A"	100	67.4	67.4	0.0	66.6	-0.8	66.4	-1.0	66.5	-0.9
Watt	Baseline to Road "B"	100	67.4	67.4	0.0	66.9	-0.5	66.6	-0.8	66.7	-0.7
Watt	South of Baseline	100	65.6	65.6	0.0	66.4	0.8	66.2	0.6	66.4	0.8
Westside	North of Pleasant Grove	100	61.9	61.9	0.0	66.3	<b>4.4</b>	66.2	<b>4.3</b>	66.2	<b>4.3</b>
Westside	Pleasant Grove to Road "A"	100	--	--	--	66.1	NA	65.8	NA	65.9	NA
Westside	Road "A" to Road "B"	100	--	--	--	65.9	NA	65.7	NA	65.8	NA
Market Drive	Project Site	100	--	--	--	52.2	NA	51.2	NA	52.2	NA
Upland Drive	Project Site	100	--	--	--	55.1	NA	55.2	NA	55.5	NA
Road "B"	Project Site	100	--	--	--	59.9	NA	59.6	NA	59.7	NA

<sup>1</sup>Distances are measured from the centerline of the roadway.

-- Roadway does not exist under this scenario.

The Table 9 data indicate that Existing traffic noise level increases resulting from the proposed project would range from 0.3 dB to 5.0 dB relative to Existing conditions. The largest increase would occur on Watt Ave, south of Baseline. This increase would exceed the 4 dB threshold of significance.

The Table 10 data indicate that Cumulative 2025 traffic noise level increases resulting from the proposed project would range from 0.2 dB to 4.0 dB relative to No Project conditions. The largest increase would occur on Westside Drive, north of Pleasant Grove. This increase would not exceed the 4 dB threshold of significance. Additionally, there are no existing sensitive receptors along this roadway segment, as it does not currently exist.

The Table 11 and Table 12 data indicate that 2025 Capital Improvement Plan (CIP) traffic noise level increases resulting from the proposed and project alternatives project would range from 0.2 dB to 4.5 dB relative to No Project conditions. The largest increase would occur on Westside Drive, north of Pleasant Grove. This increase would exceed the 4 dB threshold of significance. However, there are no existing sensitive receptors along this roadway segment, as it does not currently exist.

**Mitigation for Impact 2: None Available.**

Significant traffic noise impacts at existing noise-sensitive areas associated with growth of communities are generally very difficult to mitigate. This is because some areas may already have noise barriers, or new noise barriers may be infeasible from a cost standpoint or ineffective due to openings in the barriers that are commonly required for roadway ingress and egress. Because it would not likely be feasible to reduce the project-related traffic noise level increases to a less than significant level at all existing noise-sensitive land uses along the affected segment, this impact would be considered **significant unavoidable** under the Existing + Project conditions. Under the Cumulative 2025 + Project and 2025 CIP + Project conditions, the impact is considered **less-than significant**.

Existing + Project Significance: **Significant and unavoidable.**

Cumulative 2025 + Project Significance: **Less-than significant.**

2025 CIP + Project Significance: **Less-than significant.**

**Impact 4.11-3** **Traffic Noise Impacts at Future Noise-Sensitive Land Uses Developed Within the Project Area.** Proposed residential land uses located adjacent to any of the major project-area arterial roadways may be impacted by exterior noise levels exceeding 60 dB Ldn and interior noise levels exceeding 45 dB Ldn. Because it is likely that residential uses will be developed within areas exposed to projected future traffic noise levels in excess of the applicable noise standards, this impact is considered significant according to the Project's Significance Criteria. This is considered to be a **potentially significant** impact.

**Traffic Noise Levels at Proposed Residential Uses**

The FHWA traffic noise prediction model was used to predict 2025 CIP + Project traffic noise levels at the proposed residential land uses associated with the project. Table 13 shows the predicted traffic noise levels at the proposed residential uses adjacent to the major project-area arterial roadways. Table 13 also indicates the property line noise barrier heights required to achieve compliance with an exterior noise level standard of 60 dB Ldn.

Appendix D provides the complete inputs and results to the FHWA traffic noise prediction model and barrier calculations. The modeled noise barriers assume flat site conditions where roadway elevations, base of wall elevations, and building pad elevations are approximately equivalent.

<b>Table 13</b>								
<b>2025 CIP + Project Traffic Noise Levels At Proposed Residential Uses</b>								
<b>Sierra Vista Specific Plan Development – City of Roseville, California</b>								
Roadway	Segment	Approximate Residential Setback, feet <sup>1</sup>	ADT	Predicted Traffic Noise Levels, Ldn <sup>2</sup>				
				No Wall	6' Wall	7' Wall	8' Wall	9' Wall
Baseline	Watt to Walerga	215' (LDR 24)	44,800	67	61	<b>60</b>	59	58
Fiddymment	Pleasant Grove to Baseline	100' (Various Res.)	44,300	70	64	62	61	<b>60</b>
Watt	Road "B" to Road "A"	116' (Various Res.)	23,200	66	<b>60</b>	59	58	56
Watt	Baseline to Road "B"	116' (Various Res.)	24,100	66	<b>60</b>	59	58	57
Westside	Pleasant Grove to Road "A"	100' (Various Res.)	27,400	66	<b>60</b>	59	58	57
Westside	Road "A" to Road "B"	100' (Various Res.)	26,800	66	<b>60</b>	59	58	57
Market Drive	Project Site	62' @ HDR (20' Paseo)	1,900	56	--	--	--	--
		92' (60' Paseo)		54	--	--	--	--
Upland Drive	Project Site	62' @ HDR (20' Paseo)	3,400	59	--	--	--	--
		92' (60' Paseo)		56	--	--	--	--
Road "B"	Project Site	88' (Various Res.)	9,500	61	<b>55</b>	54	53	52

<sup>1</sup> Setback distances are measured in feet from the centerlines of the roadways to the center of residential backyards.  
<sup>2</sup> The modeled noise barriers assume flat site conditions where roadway elevations, base of wall elevations, and building pad elevations are approximately equivalent.  
 -- Meets the City of Roseville's exterior noise criterion without mitigation.  
 Source: FHWA-RD-77-108 with inputs from DKS, and j.c. brennan & associates, Inc. 2009.

The Table 13 data indicate that noise barriers ranging in height from 6-9 feet could be used to achieve compliance with the City of Roseville 60 dB Ldn exterior noise level standard for the proposed residential uses.

Additionally, interior noise levels could exceed the City's 45 dB Ldn interior noise level standard. Modern residential construction typically provides an exterior-to-interior noise level reduction of 25 dB. First floor noise exposures at the residential uses along the project roadways are predicted to range between 54-70 dB Ldn. Noise levels at 2<sup>nd</sup>/3<sup>rd</sup> floor levels are typically 2-3 dB louder, or 57-73 dB Ldn. Therefore, the residential receptors along Fiddymment Road are predicted to be exposed to interior noise levels exceeding 45 dB Ldn at second floor locations. Therefore, noise reduction measures would be required for these receptors.

**Mitigation for Impact 3:**

***MM 3a:*** Sound walls and/or landscaped berms should be constructed along the major project-area roadways, adjacent to proposed residential uses. The Table 13 data should be consulted to determine appropriate barrier heights. If the assumptions shown in Table 13 vary considerably, a detailed analysis of exterior and interior mitigation measures should be conducted when tentative maps become available.

***MM 3b*** Noise barrier walls should be constructed of concrete panels, concrete masonry units, earthen berms, or any combination of these materials. Wood is not recommended due to eventual warping and degradation of acoustical performance.

***MM3c:*** Future residential uses located along Fiddymment Road should be required to submit an analysis of interior noise levels. The report shall be conducted by a qualified acoustical engineer and should specify the measures required to achieve compliance with the City of Roseville 45 dB Ldn interior noise level standard.

**Significance after Mitigation:        Less than Significant.**

**Impact 4.11-4**      **Impacts of Commercial Noise Sources on Planned Noise-Sensitive Uses in the Project Area.** Because the zoning of the commercial uses would allow for certain uses which could generate significant noise levels, the potential for off-site adverse noise impacts exists, even though it cannot practically be quantified at this time. This is considered to be a **potentially significant** impact.

***Recommendations for Commercial Uses***

In general, where these land uses adjoin residential property lines, mitigation measures should be included. The primary noise sources are parking lot noise, HVAC equipment and light truck deliveries. In this case, 6-7 foot tall sound walls would typically provide adequate isolation of parking lot and delivery truck activities. HVAC equipment should be located either at ground level or when located on roof-tops, the building facades should include parapets for shielding.

Where commercial uses adjoin common residential property lines, and loading docks or truck circulation routes face the residential areas, the following mitigation measures should be included in the project design:

- Loading docks and truck delivery areas should maintain a minimum distance of 30 feet from residential property lines;
- Property line barriers should be 6 to 8 feet in height. Circulation routes for trucks should be located a minimum of 30-feet from residential property lines;
- All heating, cooling and ventilation equipment should be located within mechanical rooms where possible;
- All heating, cooling and ventilation equipment shall be shielded from view with solid barriers;
- Emergency generators shall comply with the local noise criteria at the nearest noise-sensitive receivers;
- In cases where loading docks or truck delivery circulation routes are located less than 100 feet from residential property lines, an acoustical evaluation shall be submitted to verify compliance with the City of Roseville Noise Level Performance Standards.

**Mitigation for Impact 4:**

**MM 4:**      Where commercial uses abut residential property lines or loading docks/truck circulation routes face residential areas, the following mitigation measures should be included in the project design:

- Loading docks and truck delivery areas should maintain a minimum distance of 30 feet from residential property lines;
- Property line barriers should be 6 to 8 feet in height. Circulation routes for trucks should be located a minimum of 30-feet from residential property lines;

- All heating, cooling and ventilation equipment should be located within mechanical rooms where possible;
- All heating, cooling and ventilation equipment shall be shielded from view with solid barriers or building parapets;
- Emergency generators shall comply with the City of Roseville Municipal Code Noise Ordinance at the nearest noise-sensitive receivers.
- Delivery/loading activities shall comply with the requirements of the City of Roseville Municipal Code Noise Ordinance.

**Significance after Mitigation:        Less than Significant.**

**Impact 4.11-5        Impacts of Neighborhood Park Noise Sources on Planned Noise-Sensitive Uses in the Project Area.**  
 Noise from active recreation parks could generate noise levels in excess of the City of Roseville standards. This is considered to be a **potentially significant** impact.

***Signature Park:***

The proposed project includes a 40-acre citywide park, which would be located at the southwest corner of the project site. A description of the proposed park is contained in the Sierra Vista Specific Plan:

*“As a “Signature Park” intended to promote tourism in the City, the park will enhance Roseville’s reputation as a place with state of the art sporting facilities by providing a venue for large scale recreational events and tournaments. Ultimately, full buildout of the park is envisioned to include a variety of recreation facilities for soccer, baseball, and softball tournaments. Final design and programming of this facility will be determined in the future.”*

Elements of the park could include:

- Lighted tournament-level ball fields
- Stadium lighted ball fields (3)
- Soccer/multi sport (football, lacrosse, rugby) lighted all weather fields (3)
- Batting cages
- Restaurants
- Large outdoor spaces or plazas for fairs and other large events

## **On-Site Activity Noise Source Prediction Methodology**

The prediction of noise levels due to on-site activities such as parking lots, softball/baseball games, soccer games, etc. are based upon noise measurement data collected by j.c. brennan & associates, Inc. for similar activities. In addition, sound propagation and spherical spreading modeling is based upon industry standards.

### ***Outdoor Recreational Noise Impact Assessment:***

For softball and baseball games, the focal point of noise generation tends to be in the vicinity of the pitchers mound, with the participants and spectators all centrally located around and generally facing that position. For soccer/rugby games, the focal point is more variable, with considerable excitement generated when the ball is near either goal, but with the sound of the participants generally spread out over the entire field and the sounds of spectators spread out along the sidelines.

To provide a representation of the noise generation of these facilities, this analysis assumed that the cumulative noise generation of the softball and baseball fields is centered near the pitchers mounds and center of the noise source for the soccer fields is at the approximate center of the soccer fields.

The softball/baseball fields have effective centers at the pitchers mound between 550-650 feet from the nearest residential land uses while the nearest soccer field would be located approximately 530 feet from the nearest residential land uses.

Noise sources associated with recreational games would primarily consist of occasional shouting and cheering of the participants and observers during the contests and practices. j.c. brennan & associates, Inc., file data collected at various softball/baseball and soccer venues indicate that average noise levels generated during games are approximately 60 dB Leq at a distance of 100 feet from the focal point or effective noise center of the playing fields. For this analysis, it is assumed that there will be no sound amplification equipment associated with the propose project.

Based upon the distances listed about, noise levels from the proposed athletic fields are predicted to range between 44-46 dB Leq at the nearest residential receptors. These noise levels would comply with the City of Roseville 50 dB Leq daytime exterior noise level standard, but could exceed the City's 45 dB Leq nighttime noise level standard at the high density residential uses closest to the park site. Therefore, this impact would be considered **potentially significant**.

### ***Neighborhood Parks:***

Children playing at neighborhood parks are often considered potentially significant noise sources which could adversely affect adjacent noise-sensitive land uses. Typical noise levels associated with groups of approximately 50 children playing at a distance of 50 feet generally range from 55 to 60 dB Leq, with maximum noise levels ranging from 70 to 75 dB. It is expected that the playground areas would be utilized during daytime hours. Therefore, noise levels from the playgrounds would need to comply with the City of Roseville 50 dB Leq and 70 dB Lmax exterior noise level standards at the nearest residential uses. Based upon the reference noise level data discussed above, the 50 dB Leq noise contour would be located approximately 158 feet from the center of playgrounds. The 70 dB Lmax contour would be located at approximately 90 feet from the center of playgrounds.

Given the proximity of most parks to residential uses, the potential for exceedance of the City of Roseville noise standards exists, depending on the orientation and proximity of the play areas to those nearest residences, the number of children using the play areas at a given time, and the types of activities the children are engaged in.

If park areas are separated from residential uses by local roadways, no additional mitigation measures would typically be considered necessary. However, where neighborhood parks abut residential uses, a 6-foot tall sound wall, or 160 foot setback to play areas should be considered.

It is anticipated that these mitigation measures will result in compliance with the applicable City of Roseville noise standards; however, because sounds consisting of speech have been shown to be more annoying than broad-band noise, the potential for annoyance associated with these uses cannot practically be eliminated.

**Mitigation for Impact 5:**

***MM5a:*** Activities at the proposed Signature Park should be scheduled to occur during daytime hours (7:00 a.m. to 10:00 p.m.).

***MM5b:*** Public address (PA) systems should be designed, installed, and tested to comply with the requirements of the City of Roseville Municipal Code Noise Ordinance at the nearest sensitive receptors.

***MM 5c:*** 6 foot tall sound walls, or 160 foot setbacks adjacent to active recreation areas, should be included in the project design where neighborhood parks abut residential uses.

**Significance after Mitigation:      Less than Significant.**

**Impact 4.11-6**      **Impacts of Aviation Noise on Planned Noise-Sensitive Uses in the Project Area.** Aviation noise from the McClellan Airfield could exceed allowable standards and be a cause for sleep disturbance to new sensitive receptors established as part of the proposed project. This is considered to be a **potentially significant** impact.

***Exterior Noise Level Standard:***

Figure 2 indicates that the 60 dB CNEL “Theoretic Capacity” noise contour for McClellan Airfield would remain south of Elverta Road. Therefore, exterior noise levels from aircraft operations are not predicted to exceed the City of Roseville 60 dB Ldn/CNEL exterior noise level standard on the project site. Additionally, aircraft operations are not predicted to exceed the City’s 45 dB Ldn/CNEL interior noise level standard on the project site.

***Sleep Disturbance:***

The California Airport Noise Regulations provides a discussion on the potential for sleep disturbance from aircraft operations. The following are excerpts from that study:

*The extent to which environmental noise disturbs human sleep patterns varies greatly from individual to individual as well as from one time to another for any particular individual. Whether an individual is aroused by a noise depends upon the individual’s sleep state and sleep habits, the loudness or suddenness of the noise, the information value of the noise (a child crying, for example), and other factors.*

*Early studies of the effects of noise on sleep disturbance produced varying results. A major factor in these differences, though, is whether the study evaluated people sleeping in a laboratory or in their own homes. Generally laboratory studies have shown considerably more sleep disturbance than is evident in field studies. More recent studies, all conducted in the field, have produced relatively consistent results. These studies have included:*

- *A 1990 British Study;*
- *A 1992 U.S. Air Force study on residents near Castle Air Force Base and Los Angeles International Airport; and*
- *A 1995 study comparing the effects of the closure of Stapleton International Airport with the opening of Denver International Airport.*

*In 1997, the Federal Interagency Committee on Aviation Noise (FICAN) sought to put the subject to rest with publication of a recommended new dose-response curve predicting awakening. This curve was calculated using data from the above three studies, among others. The 1997 FICAN curve represents the upper limit of the observed field data and should be interpreted as predicting the maximum percent of the exposed population expected to be behaviorally awakened.*

For the purposes of evaluating the potential for sleep disturbance due to interior noise from aircraft operations over the project site, j.c. brennan & associates, Inc. utilized the methods described in

ANSI/ASA S12.9-2008/Part 6, along with the FICAN research, as described in Annex B of the ANSI procedures. The ANSI procedures calculate the probability of behavioral awakenings while accounting for the predicted mean indoor sound exposure level (SEL) at the future residential uses on the project site and the number of observed nighttime aircraft events. Appendix E provides the complete inputs and results of the sleep disturbance calculations.

During the 3 days of noise monitoring aircraft operations were measured to average approximately 77 dB SEL with several events at approximately 85 dB SEL.

Using an average exterior SEL of 77 dB, and assuming that typical construction practices will achieve an exterior to interior noise level reduction of 25 dB with the windows in the closed position, the interior SEL would be approximately 52 dB. Based upon the ANSI procedures, the maximum percent awakened would be approximately 3.4 percent. FICAN explained that, “because the adopted curve represents the upper limit of the data presented, it should be interpreted as predicting the maximum percent of the exposed population expected to be behaviorally awakened, or the maximum percent awakened” (FICAN 1997).

While the maximum percent awakened is considered to be fairly low, there is still a potential for annoyance to future residents in the Sierra Vista Specific Plan area. Therefore, this impact is considered **potentially significant**.

**Mitigation for Impact 6:**

**MM6:** Buyers and renters in the Sierra Vista Specific Plan area should be notified that aircraft flyovers occur during the daytime and nighttime periods.

**Significance after Mitigation:**      **Less than Significant.**

## Appendix A Acoustical Terminology

<b>Acoustics</b>	The science of sound.
<b>Ambient Noise</b>	The distinctive acoustical characteristics of a given space consisting of all noise sources audible at that location. In many cases, the term ambient is used to describe an existing or pre-project condition such as the setting in an environmental noise study.
<b>Attenuation</b>	The reduction of an acoustic signal.
<b>A-Weighting</b>	A frequency-response adjustment of a sound level meter that conditions the output signal to approximate human response.
<b>Decibel or dB</b>	Fundamental unit of sound, A Bell is defined as the logarithm of the ratio of the sound pressure squared over the reference pressure squared. A Decibel is one-tenth of a Bell.
<b>CNEL</b>	Community Noise Equivalent Level. Defined as the 24-hour average noise level with noise occurring during evening hours (7 - 10 p.m.) weighted by a factor of three and nighttime hours weighted by a factor of 10 prior to averaging.
<b>Frequency</b>	The measure of the rapidity of alterations of a periodic signal, expressed in cycles per second or hertz.
<b>Ldn</b>	Day/Night Average Sound Level. Similar to CNEL but with no evening weighting.
<b>Leq</b>	Equivalent or energy-averaged sound level.
<b>Lmax</b>	The highest root-mean-square (RMS) sound level measured over a given period of time.
<b>L(n)</b>	The sound level exceeded a described percentile over a measurement period. For instance, an hourly L50 is the sound level exceeded 50% of the time during the one hour period.
<b>Loudness</b>	A subjective term for the sensation of the magnitude of sound.
<b>Noise</b>	Unwanted sound.
<b>Peak Noise</b>	The level corresponding to the highest (not RMS) sound pressure measured over a given period of time. This term is often confused with the "Maximum" level, which is the highest RMS level.
<b>RT<sub>60</sub></b>	The time it takes reverberant sound to decay by 60 dB once the source has been removed.
<b>Sabin</b>	The unit of sound absorption. One square foot of material absorbing 100% of incident sound has an absorption of 1 sabin.
<b>SEL</b>	A rating, in decibels, of a discrete event, such as an aircraft flyover or train passby, that compresses the total sound energy into a one-second event.
<b>Threshold of Hearing</b>	The lowest sound that can be perceived by the human auditory system, generally considered to be 0 dB for persons with perfect hearing.
<b>Threshold of Pain</b>	Approximately 120 dB above the threshold of hearing.
<b>Impulsive</b>	Sound of short duration, usually less than one second, with an abrupt onset and rapid decay.
<b>Simple Tone</b>	Any sound which can be judged as audible as a single pitch or set of single pitches.

**Appendix B**

**FHWA-RD-77-108 Highway Traffic Noise Prediction Model**

**Data Input Sheet**

Project #: 2009-114 Sierra Vista SP

Description: Existing - No Project

Ldn/CNEL: Ldn

Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Blue Oaks	Fiddymment to Woodcreek	7,800	83		17	2	1	45	100	
2	Blue Oaks	Woodcreek to Foothills	29,500	83		17	2	1	45	100	
3	Pleasant Grove	West of Fiddymment	3,600	83		17	2	1	45	100	
4	Pleasant Grove	Fiddymment to Woodcreek	10,900	83		17	2	1	45	100	
5	Pleasant Grove	Woodcreek to Foothills	27,000	83		17	2	1	45	100	
6	Junction	Woodcreek to Foothills	13,700	83		17	2	1	40	100	
7	Baseline	West of Watt	9,700	83		17	2	1	55	100	
8	Baseline	Watt to Walerga	13,700	83		17	2	1	55	100	
9	Baseline	Walerga to Junction	13,500	83		17	2	1	45	100	
10	Baseline	Junction to Woodcreek	10,200	83		17	2	1	45	100	
11	Baseline	Woodcreek to Foothills	15,300	83		17	2	1	45	100	
12	Fiddymment	North of Blue Oaks	5,000	83		17	2	1	45	100	
13	Fiddymment	Blue Oaks to Pleasant Grove	11,000	83		17	2	1	45	100	
14	Fiddymment	Pleasant Grove to Baseline	21,500	83		17	2	1	45	100	
15	Walerga	South of Baseline	16,100	83		17	2	1	45	100	
16	Watt	Road "B" to Road "A"	0	83			2	1	45	100	
17	Watt	Baseline to Road "B"	0	83			2	1	45	100	
18	Watt	South of Baseline	5,700	83		17	2	1	45	100	
19	Westside	North of Pleasant Grove	0	83			2	1	40	100	
20	Westside	Pleasant Grove to Road "A"	0	83			2	1	40	100	
21	Westside	Road "A" to Road "B"	0	83			2	1	40	100	
22	Market Drive	Project Site	0	83			2	1	35	100	
23	Upland Drive	Project Site	0	83			2	1	35	100	
24	Road "B"	Project Site	0	83			2	1	35	100	

**Appendix B****FHWA-RD-77-108 Highway Traffic Noise Prediction Model****Predicted Levels**

Project #: 2009-114 Sierra Vista SP  
Description: Existing - No Project  
Ldn/CNEL: Ldn  
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Blue Oaks	Fiddymment to Woodcreek	60.7	52.1	53.6	62.0
2	Blue Oaks	Woodcreek to Foothills	66.5	57.9	59.4	67.7
3	Pleasant Grove	West of Fiddymment	57.4	48.8	50.2	58.6
4	Pleasant Grove	Fiddymment to Woodcreek	62.2	53.6	55.1	63.4
5	Pleasant Grove	Woodcreek to Foothills	66.1	57.5	59.0	67.4
6	Junction	Woodcreek to Foothills	61.7	53.8	55.6	63.2
7	Baseline	West of Watt	64.2	54.4	55.3	65.1
8	Baseline	Watt to Walerga	65.7	55.9	56.8	66.6
9	Baseline	Walerga to Junction	63.1	54.5	56.0	64.3
10	Baseline	Junction to Woodcreek	61.9	53.3	54.8	63.1
11	Baseline	Woodcreek to Foothills	63.6	55.0	56.5	64.9
12	Fiddymment	North of Blue Oaks	58.8	50.2	51.7	60.0
13	Fiddymment	Blue Oaks to Pleasant Grove	62.2	53.6	55.1	63.5
14	Fiddymment	Pleasant Grove to Baseline	65.1	56.5	58.0	66.4
15	Walerga	South of Baseline	63.9	55.3	56.7	65.1
18	Watt	South of Baseline	59.4	50.8	52.2	60.6

**Appendix B**  
**FHWA-RD-77-108 Highway Traffic Noise Prediction Model**  
**Noise Contour Output**

Project #: 2009-114 Sierra Vista SP  
Description: Existing - No Project  
Ldn/CNEL: Ldn  
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	----- Distances to Traffic Noise Contours -----				
			75	70	65	60	55
1	Blue Oaks	Fiddymment to Woodcreek	14	29	63	135	291
2	Blue Oaks	Woodcreek to Foothills	33	71	152	328	707
3	Pleasant Grove	West of Fiddymment	8	17	37	81	174
4	Pleasant Grove	Fiddymment to Woodcreek	17	36	78	169	364
5	Pleasant Grove	Woodcreek to Foothills	31	67	144	309	667
6	Junction	Woodcreek to Foothills	16	35	76	163	351
7	Baseline	West of Watt	22	47	102	219	471
8	Baseline	Watt to Walerga	28	59	128	275	593
9	Baseline	Walerga to Junction	19	42	90	195	420
10	Baseline	Junction to Woodcreek	16	35	75	162	348
11	Baseline	Woodcreek to Foothills	21	46	98	212	457
12	Fiddymment	North of Blue Oaks	10	22	47	101	217
13	Fiddymment	Blue Oaks to Pleasant Grove	17	37	79	170	366
14	Fiddymment	Pleasant Grove to Baseline	27	57	123	266	573
15	Walerga	South of Baseline	22	47	102	219	472
18	Watt	South of Baseline	11	24	51	110	236

**Appendix B**

**FHWA-RD-77-108 Highway Traffic Noise Prediction Model**

**Data Input Sheet**

Project #: 2009-114 Sierra Vista SP

Description: Existing + Project

Ldn/CNEL: Ldn

Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Blue Oaks	Fiddymment to Woodcreek	10,500	83		17	2	1	45	100	
2	Blue Oaks	Woodcreek to Foothills	31,000	83		17	2	1	45	100	
3	Pleasant Grove	West of Fiddymment	7,400	83		17	2	1	45	100	
4	Pleasant Grove	Fiddymment to Woodcreek	27,400	83		17	2	1	45	100	
5	Pleasant Grove	Woodcreek to Foothills	30,700	83		17	2	1	45	100	
6	Junction	Woodcreek to Foothills	16,500	83		17	2	1	40	100	
7	Baseline	West of Watt	22,200	83		17	2	1	55	100	
8	Baseline	Watt to Walerga	25,400	83		17	2	1	55	100	
9	Baseline	Walerga to Junction	20,700	83		17	2	1	45	100	
10	Baseline	Junction to Woodcreek	14,200	83		17	2	1	45	100	
11	Baseline	Woodcreek to Foothills	22,900	83		17	2	1	45	100	
12	Fiddymment	North of Blue Oaks	6,500	83		17	2	1	45	100	
13	Fiddymment	Blue Oaks to Pleasant Grove	15,400	83		17	2	1	45	100	
14	Fiddymment	Pleasant Grove to Baseline	29,100	83		17	2	1	45	100	
15	Walerga	South of Baseline	19,200	83		17	2	1	45	100	
16	Watt	Road "B" to Road "A"	3,800	83		17	2	1	45	100	
17	Watt	Baseline to Road "B"	6,500	83		17	2	1	45	100	
18	Watt	South of Baseline	18,000	83		17	2	1	45	100	
19	Westside	North of Pleasant Grove	0	83			2	1	40	100	
20	Westside	Pleasant Grove to Road "A"	100	83		17	2	1	40	100	
21	Westside	Road "A" to Road "B"	6,600	83		17	2	1	40	100	
22	Market Drive	Project Site	1,500	83		17	2	1	35	100	
23	Upland Drive	Project Site	2,200	83		17	2	1	35	100	
24	Road "B"	Project Site	8,400	83		17	2	1	35	100	

**Appendix B**

**FHWA-RD-77-108 Highway Traffic Noise Prediction Model**

**Predicted Levels**

Project #: 2009-114 Sierra Vista SP  
 Description: Existing + Project  
 Ldn/CNEL: Ldn  
 Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Blue Oaks	Fiddymment to Woodcreek	62.0	53.4	54.9	63.3
2	Blue Oaks	Woodcreek to Foothills	66.7	58.1	59.6	68.0
3	Pleasant Grove	West of Fiddymment	60.5	51.9	53.4	61.7
4	Pleasant Grove	Fiddymment to Woodcreek	66.2	57.6	59.1	67.4
5	Pleasant Grove	Woodcreek to Foothills	66.7	58.1	59.6	67.9
6	Junction	Woodcreek to Foothills	62.5	54.6	56.4	64.0
7	Baseline	West of Watt	67.8	58.0	58.9	68.7
8	Baseline	Watt to Walerga	68.4	58.6	59.5	69.3
9	Baseline	Walerga to Junction	65.0	56.4	57.8	66.2
10	Baseline	Junction to Woodcreek	63.3	54.7	56.2	64.6
11	Baseline	Woodcreek to Foothills	65.4	56.8	58.3	66.6
12	Fiddymment	North of Blue Oaks	59.9	51.3	52.8	61.2
13	Fiddymment	Blue Oaks to Pleasant Grove	63.7	55.1	56.6	64.9
14	Fiddymment	Pleasant Grove to Baseline	66.4	57.8	59.3	67.7
15	Walerga	South of Baseline	64.6	56.0	57.5	65.9
16	Watt	Road "B" to Road "A"	57.6	49.0	50.5	58.8
17	Watt	Baseline to Road "B"	59.9	51.3	52.8	61.2
18	Watt	South of Baseline	64.4	55.7	57.2	65.6
20	Westside	Pleasant Grove to Road "A"	40.3	32.4	34.2	41.8
21	Westside	Road "A" to Road "B"	58.5	50.6	52.4	60.0
22	Market Drive	Project Site	50.4	43.3	45.4	52.2
23	Upland Drive	Project Site	52.1	44.9	47.1	53.9
24	Road "B"	Project Site	57.9	50.7	52.9	59.7

**Appendix B**

**FHWA-RD-77-108 Highway Traffic Noise Prediction Model**

**Noise Contour Output**

Project #: 2009-114 Sierra Vista SP

Description: Existing + Project

Ldn/CNEL: Ldn

Hard/Soft: Soft

Segment	Roadway Name	Segment Description	----- Distances to Traffic Noise Contours -----				
			75	70	65	60	55
1	Blue Oaks	Fiddymment to Woodcreek	16	36	77	165	355
2	Blue Oaks	Woodcreek to Foothills	34	73	157	339	731
3	Pleasant Grove	West of Fiddymment	13	28	61	131	281
4	Pleasant Grove	Fiddymment to Woodcreek	31	67	145	312	673
5	Pleasant Grove	Woodcreek to Foothills	34	73	156	337	726
6	Junction	Woodcreek to Foothills	18	40	86	184	397
7	Baseline	West of Watt	38	82	176	380	819
8	Baseline	Watt to Walerga	42	90	193	416	896
9	Baseline	Walerga to Junction	26	56	120	259	558
10	Baseline	Junction to Woodcreek	20	43	94	202	434
11	Baseline	Woodcreek to Foothills	28	60	129	277	597
12	Fiddymment	North of Blue Oaks	12	26	56	120	258
13	Fiddymment	Blue Oaks to Pleasant Grove	21	46	99	213	459
14	Fiddymment	Pleasant Grove to Baseline	33	70	151	325	701
15	Walerga	South of Baseline	25	53	114	247	531
16	Watt	Road "B" to Road "A"	8	18	39	84	180
17	Watt	Baseline to Road "B"	12	26	56	120	258
18	Watt	South of Baseline	24	51	110	236	509
20	Westside	Pleasant Grove to Road "A"	1	1	3	6	13
21	Westside	Road "A" to Road "B"	10	22	46	100	215
22	Market Drive	Project Site	3	7	14	30	65
23	Upland Drive	Project Site	4	8	18	39	84
24	Road "B"	Project Site	10	21	44	95	205

**Appendix B**

**FHWA-RD-77-108 Highway Traffic Noise Prediction Model**

**Data Input Sheet**

Project #: 2009-114 Sierra Vista SP

Description: Cumulative 2025

Ldn/CNEL: Ldn

Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Blue Oaks	Fiddymment to Woodcreek	41,000	83		17	2	1	45	100	
2	Blue Oaks	Woodcreek to Foothills	68,500	83		17	2	1	45	100	
3	Pleasant Grove	West of Fiddymment	26,900	83		17	2	1	45	100	
4	Pleasant Grove	Fiddymment to Woodcreek	27,800	83		17	2	1	45	100	
5	Pleasant Grove	Woodcreek to Foothills	45,200	83		17	2	1	45	100	
6	Junction	Woodcreek to Foothills	14,800	83		17	2	1	40	100	
7	Baseline	West of Watt	37,600	83		17	2	1	55	100	
8	Baseline	Watt to Walerga	42,600	83		17	2	1	55	100	
9	Baseline	Walerga to Junction	41,600	83		17	2	1	45	100	
10	Baseline	Junction to Woodcreek	26,600	83		17	2	1	45	100	
11	Baseline	Woodcreek to Foothills	30,900	83		17	2	1	45	100	
12	Fiddymment	North of Blue Oaks	31,300	83		17	2	1	45	100	
13	Fiddymment	Blue Oaks to Pleasant Grove	35,700	83		17	2	1	45	100	
14	Fiddymment	Pleasant Grove to Baseline	58,400	83		17	2	1	45	100	
15	Walerga	South of Baseline	36,500	83		17	2	1	45	100	
16	Watt	Road "B" to Road "A"	40,500	83		17	2	1	45	100	
17	Watt	Baseline to Road "B"	40,500	83		17	2	1	45	100	
18	Watt	South of Baseline	27,700	83		17	2	1	45	100	
19	Westside	North of Pleasant Grove	16,300	83		17	2	1	40	100	
20	Westside	Pleasant Grove to Road "A"	0	83			2	1	40	100	
21	Westside	Road "A" to Road "B"	0	83			2	1	40	100	
22	Market Drive	Project Site	0	83			2	1	35	100	
23	Upland Drive	Project Site	0	83			2	1	35	100	
24	Road "B"	Project Site	0	83			2	1	35	100	

**Appendix B****FHWA-RD-77-108 Highway Traffic Noise Prediction Model****Predicted Levels**

Project #: 2009-114 Sierra Vista SP

Description: Cumulative 2025

Ldn/CNEL: Ldn

Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Blue Oaks	Fiddymment to Woodcreek	67.9	59.3	60.8	69.2
2	Blue Oaks	Woodcreek to Foothills	70.2	61.5	63.0	71.4
3	Pleasant Grove	West of Fiddymment	66.1	57.5	59.0	67.3
4	Pleasant Grove	Fiddymment to Woodcreek	66.2	57.6	59.1	67.5
5	Pleasant Grove	Woodcreek to Foothills	68.4	59.7	61.2	69.6
6	Junction	Woodcreek to Foothills	62.0	54.1	55.9	63.5
7	Baseline	West of Watt	70.1	60.3	61.2	71.0
8	Baseline	Watt to Walerga	70.6	60.8	61.8	71.5
9	Baseline	Walerga to Junction	68.0	59.4	60.9	69.2
10	Baseline	Junction to Woodcreek	66.0	57.4	58.9	67.3
11	Baseline	Woodcreek to Foothills	66.7	58.1	59.6	67.9
12	Fiddymment	North of Blue Oaks	66.8	58.1	59.6	68.0
13	Fiddymment	Blue Oaks to Pleasant Grove	67.3	58.7	60.2	68.6
14	Fiddymment	Pleasant Grove to Baseline	69.5	60.9	62.3	70.7
15	Walerga	South of Baseline	67.4	58.8	60.3	68.7
16	Watt	Road "B" to Road "A"	67.9	59.3	60.8	69.1
17	Watt	Baseline to Road "B"	67.9	59.3	60.8	69.1
18	Watt	South of Baseline	66.2	57.6	59.1	67.5
19	Westside	North of Pleasant Grove	62.4	54.5	56.3	63.9

**Appendix B****FHWA-RD-77-108 Highway Traffic Noise Prediction Model****Noise Contour Output**

Project #: 2009-114 Sierra Vista SP

Description: Cumulative 2025

Ldn/CNEL: Ldn

Hard/Soft: Soft

Segment	Roadway Name	Segment Description	----- Distances to Traffic Noise Contours -----				
			75	70	65	60	55
1	Blue Oaks	Fiddymment to Woodcreek	41	88	190	409	881
2	Blue Oaks	Woodcreek to Foothills	58	124	267	576	1240
3	Pleasant Grove	West of Fiddymment	31	67	143	309	665
4	Pleasant Grove	Fiddymment to Woodcreek	32	68	146	316	680
5	Pleasant Grove	Woodcreek to Foothills	44	94	203	436	940
6	Junction	Woodcreek to Foothills	17	37	80	171	369
7	Baseline	West of Watt	54	116	251	540	1163
8	Baseline	Watt to Walerga	59	126	272	587	1264
9	Baseline	Walerga to Junction	41	89	192	413	889
10	Baseline	Junction to Woodcreek	31	66	142	306	660
11	Baseline	Woodcreek to Foothills	34	73	157	339	729
12	Fiddymment	North of Blue Oaks	34	74	159	341	736
13	Fiddymment	Blue Oaks to Pleasant Grove	37	80	173	373	803
14	Fiddymment	Pleasant Grove to Baseline	52	112	240	518	1115
15	Walerga	South of Baseline	38	82	176	378	815
16	Watt	Road "B" to Road "A"	41	87	188	405	874
17	Watt	Baseline to Road "B"	41	87	188	405	874
18	Watt	South of Baseline	31	68	146	315	678
19	Westside	North of Pleasant Grove	18	39	85	183	394

**Appendix B**

**FHWA-RD-77-108 Highway Traffic Noise Prediction Model**

**Data Input Sheet**

Project #: 2009-114 Sierra Vista SP  
 Description: Cumulative 2025 + Project  
 Ldn/CNEL: Ldn  
 Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Blue Oaks	Fiddymment to Woodcreek	41,700	83		17	2	1	45	100	
2	Blue Oaks	Woodcreek to Foothills	68,900	83		17	2	1	45	100	
3	Pleasant Grove	West of Fiddymment	28,500	83		17	2	1	45	100	
4	Pleasant Grove	Fiddymment to Woodcreek	38,100	83		17	2	1	45	100	
5	Pleasant Grove	Woodcreek to Foothills	48,100	83		17	2	1	45	100	
6	Junction	Woodcreek to Foothills	18,600	83		17	2	1	40	100	
7	Baseline	West of Watt	46,600	80		20	2	2	55	100	
8	Baseline	Watt to Walerga	43,900	80		20	2	2	55	100	
9	Baseline	Walerga to Junction	50,100	80		20	2	2	45	100	
10	Baseline	Junction to Woodcreek	29,500	80		20	2	2	45	100	
11	Baseline	Woodcreek to Foothills	34,500	80		20	2	2	45	100	
12	Fiddymment	North of Blue Oaks	31,700	80		20	2	1	45	100	
13	Fiddymment	Blue Oaks to Pleasant Grove	37,000	80		20	2	1	45	100	
14	Fiddymment	Pleasant Grove to Baseline	46,600	80		20	2	1	45	100	
15	Walerga	South of Baseline	38,700	83		17	2	1	45	100	
16	Watt	Road "B" to Road "A"	39,700	80		20	2	2	45	100	
17	Watt	Baseline to Road "B"	40,100	80		20	2	2	45	100	
18	Watt	South of Baseline	29,800	80		20	2	2	45	100	
19	Westside	North of Pleasant Grove	40,800	83		17	2	1	40	100	
20	Westside	Pleasant Grove to Road "A"	30,000	83		17	2	1	40	100	
21	Westside	Road "A" to Road "B"	34,400	83		17	2	1	40	100	
22	Market Drive	Project Site	2,400	83		17	2	1	35	100	
23	Upland Drive	Project Site	4,400	83		17	2	1	35	100	
24	Road "B"	Project Site	8,600	83		17	2	1	35	100	

**Appendix B****FHWA-RD-77-108 Highway Traffic Noise Prediction Model****Predicted Levels**

Project #: 2009-114 Sierra Vista SP  
 Description: Cumulative 2025 + Project  
 Ldn/CNEL: Ldn  
 Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Blue Oaks	Fiddymment to Woodcreek	68.0	59.4	60.9	69.2
2	Blue Oaks	Woodcreek to Foothills	70.2	61.6	63.1	71.4
3	Pleasant Grove	West of Fiddymment	66.3	57.7	59.2	67.6
4	Pleasant Grove	Fiddymment to Woodcreek	67.6	59.0	60.5	68.9
5	Pleasant Grove	Woodcreek to Foothills	68.6	60.0	61.5	69.9
6	Junction	Woodcreek to Foothills	63.0	55.1	56.9	64.5
7	Baseline	West of Watt	71.4	61.7	65.6	72.8
8	Baseline	Watt to Walerga	71.1	61.4	65.4	72.5
9	Baseline	Walerga to Junction	69.2	60.6	65.1	71.0
10	Baseline	Junction to Woodcreek	66.9	58.3	62.8	68.7
11	Baseline	Woodcreek to Foothills	67.6	59.0	63.5	69.4
12	Fiddymment	North of Blue Oaks	67.3	58.6	60.1	68.5
13	Fiddymment	Blue Oaks to Pleasant Grove	67.9	59.3	60.8	69.2
14	Fiddymment	Pleasant Grove to Baseline	68.9	60.3	61.8	70.2
15	Walerga	South of Baseline	67.7	59.1	60.6	68.9
16	Watt	Road "B" to Road "A"	68.2	59.6	64.1	70.0
17	Watt	Baseline to Road "B"	68.2	59.7	64.2	70.1
18	Watt	South of Baseline	66.9	58.4	62.9	68.8
19	Westside	North of Pleasant Grove	66.4	58.5	60.3	67.9
20	Westside	Pleasant Grove to Road "A"	65.1	57.2	59.0	66.6
21	Westside	Road "A" to Road "B"	65.7	57.8	59.6	67.2
22	Market Drive	Project Site	52.5	45.3	47.5	54.2
23	Upland Drive	Project Site	55.1	47.9	50.1	56.9
24	Road "B"	Project Site	58.0	50.8	53.0	59.8

**Appendix B**  
**FHWA-RD-77-108 Highway Traffic Noise Prediction Model**  
**Noise Contour Output**

Project #: 2009-114 Sierra Vista SP  
Description: Cumulative 2025 + Project  
Ldn/CNEL: Ldn  
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	----- Distances to Traffic Noise Contours -----				
			75	70	65	60	55
1	Blue Oaks	Fiddymment to Woodcreek	41	89	192	413	891
2	Blue Oaks	Woodcreek to Foothills	58	124	268	578	1245
3	Pleasant Grove	West of Fiddymment	32	69	149	321	691
4	Pleasant Grove	Fiddymment to Woodcreek	39	84	181	389	839
5	Pleasant Grove	Woodcreek to Foothills	45	98	211	455	980
6	Junction	Woodcreek to Foothills	20	43	93	200	430
7	Baseline	West of Watt	71	153	329	709	1528
8	Baseline	Watt to Walerga	68	147	316	682	1468
9	Baseline	Walerga to Junction	54	117	253	545	1174
10	Baseline	Junction to Woodcreek	38	82	178	383	825
11	Baseline	Woodcreek to Foothills	42	92	197	425	916
12	Fiddymment	North of Blue Oaks	37	79	171	368	794
13	Fiddymment	Blue Oaks to Pleasant Grove	41	88	190	408	880
14	Fiddymment	Pleasant Grove to Baseline	48	103	221	476	1026
15	Walerga	South of Baseline	39	85	183	393	848
16	Watt	Road "B" to Road "A"	47	101	217	467	1005
17	Watt	Baseline to Road "B"	47	101	218	470	1012
18	Watt	South of Baseline	39	83	179	385	830
19	Westside	North of Pleasant Grove	34	73	156	337	726
20	Westside	Pleasant Grove to Road "A"	27	59	127	274	591
21	Westside	Road "A" to Road "B"	30	65	140	301	648
22	Market Drive	Project Site	4	9	19	41	89
23	Upland Drive	Project Site	6	13	29	62	133
24	Road "B"	Project Site	10	21	45	97	209

**Appendix B**

**FHWA-RD-77-108 Highway Traffic Noise Prediction Model**

**Data Input Sheet**

Project #: 2009-114 Sierra Vista SP  
 Description: 2025 Capital Improvement Plan (CIP)  
 Ldn/CNEL: Ldn  
 Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Blue Oaks	Fiddymment to Woodcreek	41,500	83		17	2	1	45	100	
2	Blue Oaks	Woodcreek to Foothills	77,500	83		17	2	1	45	100	
3	Pleasant Grove	West of Fiddymment	25,200	83		17	2	1	45	100	
4	Pleasant Grove	Fiddymment to Woodcreek	29,700	83		17	2	1	45	100	
5	Pleasant Grove	Woodcreek to Foothills	49,200	83		17	2	1	45	100	
6	Junction	Woodcreek to Foothills	19,400	83		17	2	1	40	100	
7	Baseline	West of Watt	34,700	83		17	2	1	55	100	
8	Baseline	Watt to Walerga	52,800	83		17	2	1	55	100	
9	Baseline	Walerga to Junction	47,500	83		17	2	1	45	100	
10	Baseline	Junction to Woodcreek	28,400	83		17	2	1	45	100	
11	Baseline	Woodcreek to Foothills	30,200	83		17	2	1	45	100	
12	Fiddymment	North of Blue Oaks	31,900	83		17	2	1	45	100	
13	Fiddymment	Blue Oaks to Pleasant Grove	36,400	83		17	2	1	45	100	
14	Fiddymment	Pleasant Grove to Baseline	62,700	83		17	2	1	45	100	
15	Walerga	South of Baseline	34,700	83		17	2	1	45	100	
16	Watt	Road "B" to Road "A"	27,300	83		17	2	1	45	100	
17	Watt	Baseline to Road "B"	27,300	83		17	2	1	45	100	
18	Watt	South of Baseline	18,100	83		17	2	1	45	100	
19	Westside	North of Pleasant Grove	10,200	83		17	2	1	40	100	
20	Westside	Pleasant Grove to Road "A"	0	83			2	1	40	100	
21	Westside	Road "A" to Road "B"	0	83			2	1	40	100	
22	Market Drive	Project Site	0	83			2	1	35	100	
23	Upland Drive	Project Site	0	83			2	1	35	100	
24	Road "B"	Project Site	0	83			2	1	35	100	

**Appendix B****FHWA-RD-77-108 Highway Traffic Noise Prediction Model****Predicted Levels**

Project #: 2009-114 Sierra Vista SP  
Description: 2025 Capital Improvement Plan (CIP)  
Ldn/CNEL: Ldn  
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Blue Oaks	Fiddymont to Woodcreek	68.0	59.4	60.9	69.2
2	Blue Oaks	Woodcreek to Foothills	70.7	62.1	63.6	71.9
3	Pleasant Grove	West of Fiddymont	65.8	57.2	58.7	67.1
4	Pleasant Grove	Fiddymont to Woodcreek	66.5	57.9	59.4	67.8
5	Pleasant Grove	Woodcreek to Foothills	68.7	60.1	61.6	70.0
6	Junction	Woodcreek to Foothills	63.2	55.3	57.1	64.7
7	Baseline	West of Watt	69.7	60.0	60.9	70.6
8	Baseline	Watt to Walerga	71.5	61.8	62.7	72.5
9	Baseline	Walerga to Junction	68.6	60.0	61.4	69.8
10	Baseline	Junction to Woodcreek	66.3	57.7	59.2	67.6
11	Baseline	Woodcreek to Foothills	66.6	58.0	59.5	67.8
12	Fiddymont	North of Blue Oaks	66.8	58.2	59.7	68.1
13	Fiddymont	Blue Oaks to Pleasant Grove	67.4	58.8	60.3	68.7
14	Fiddymont	Pleasant Grove to Baseline	69.8	61.2	62.7	71.0
15	Walerga	South of Baseline	67.2	58.6	60.1	68.4
16	Watt	Road "B" to Road "A"	66.2	57.6	59.0	67.4
17	Watt	Baseline to Road "B"	66.2	57.6	59.0	67.4
18	Watt	South of Baseline	64.4	55.8	57.3	65.6
19	Westside	North of Pleasant Grove	60.4	52.5	54.3	61.9

**Appendix B****FHWA-RD-77-108 Highway Traffic Noise Prediction Model****Noise Contour Output**

Project #: 2009-114 Sierra Vista SP

Description: 2025 Capital Improvement Plan (CIP)

Ldn/CNEL: Ldn

Hard/Soft: Soft

Segment	Roadway Name	Segment Description	----- Distances to Traffic Noise Contours -----				
			75	70	65	60	55
1	Blue Oaks	Fiddymont to Woodcreek	41	89	191	412	888
2	Blue Oaks	Woodcreek to Foothills	62	135	290	625	1347
3	Pleasant Grove	West of Fiddymont	30	64	137	296	637
4	Pleasant Grove	Fiddymont to Woodcreek	33	71	153	330	710
5	Pleasant Grove	Woodcreek to Foothills	46	99	214	462	995
6	Junction	Woodcreek to Foothills	21	44	95	205	442
7	Baseline	West of Watt	51	110	238	512	1103
8	Baseline	Watt to Walerga	68	146	314	677	1459
9	Baseline	Walerga to Junction	45	97	209	451	972
10	Baseline	Junction to Woodcreek	32	69	149	320	690
11	Baseline	Woodcreek to Foothills	33	72	155	333	718
12	Fiddymont	North of Blue Oaks	35	75	161	346	745
13	Fiddymont	Blue Oaks to Pleasant Grove	38	81	175	378	814
14	Fiddymont	Pleasant Grove to Baseline	54	117	252	543	1169
15	Walerga	South of Baseline	37	79	170	366	788
16	Watt	Road "B" to Road "A"	31	67	145	312	672
17	Watt	Baseline to Road "B"	31	67	145	312	672
18	Watt	South of Baseline	24	51	110	237	511
19	Westside	North of Pleasant Grove	13	29	62	134	288

**Appendix B**

**FHWA-RD-77-108 Highway Traffic Noise Prediction Model**

**Data Input Sheet**

Project #: 2009-114 Sierra Vista SP

Description: 2025 Capital Improvement Plan (CIP) + Project

Ldn/CNEL: Ldn

Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Blue Oaks	Fiddymment to Woodcreek	48,500	83		17	2	1	45	100	
2	Blue Oaks	Woodcreek to Foothills	80,400	83		17	2	1	45	100	
3	Pleasant Grove	West of Fiddymment	23,900	83		17	2	1	45	100	
4	Pleasant Grove	Fiddymment to Woodcreek	39,600	83		17	2	1	45	100	
5	Pleasant Grove	Woodcreek to Foothills	51,700	83		17	2	1	45	100	
6	Junction	Woodcreek to Foothills	22,600	83		17	2	1	40	100	
7	Baseline	West of Watt	43,300	83		17	2	1	55	100	
8	Baseline	Watt to Walerga	44,800	83		17	2	1	55	100	
9	Baseline	Walerga to Junction	52,500	83		17	2	1	45	100	
10	Baseline	Junction to Woodcreek	30,200	83		17	2	1	45	100	
11	Baseline	Woodcreek to Foothills	34,900	83		17	2	1	45	100	
12	Fiddymment	North of Blue Oaks	32,400	83		17	2	1	45	100	
13	Fiddymment	Blue Oaks to Pleasant Grove	35,300	83		17	2	1	45	100	
14	Fiddymment	Pleasant Grove to Baseline	44,300	83		17	2	1	45	100	
15	Walerga	South of Baseline	37,700	83		17	2	1	45	100	
16	Watt	Road "B" to Road "A"	23,200	83		17	2	1	45	100	
17	Watt	Baseline to Road "B"	24,100	83		17	2	1	45	100	
18	Watt	South of Baseline	22,900	83		17	2	1	45	100	
19	Westside	North of Pleasant Grove	28,600	83		17	2	1	40	100	
20	Westside	Pleasant Grove to Road "A"	27,400	83		17	2	1	40	100	
21	Westside	Road "A" to Road "B"	26,800	83		17	2	1	40	100	
22	Market Drive	Project Site	1,900	83		17	2	1	35	100	
23	Upland Drive	Project Site	3,400	83		17	2	1	35	100	
24	Road "B"	Project Site	9,500	83		17	2	1	35	100	

**Appendix B****FHWA-RD-77-108 Highway Traffic Noise Prediction Model****Predicted Levels**

Project #: 2009-114 Sierra Vista SP  
Description: 2025 Capital Improvement Plan (CIP) + Project  
Ldn/CNEL: Ldn  
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Blue Oaks	Fiddymment to Woodcreek	68.7	60.1	61.5	69.9
2	Blue Oaks	Woodcreek to Foothills	70.9	62.2	63.7	72.1
3	Pleasant Grove	West of Fiddymment	65.6	57.0	58.5	66.8
4	Pleasant Grove	Fiddymment to Woodcreek	67.8	59.2	60.7	69.0
5	Pleasant Grove	Woodcreek to Foothills	68.9	60.3	61.8	70.2
6	Junction	Woodcreek to Foothills	63.9	55.9	57.8	65.3
7	Baseline	West of Watt	70.7	60.9	61.8	71.6
8	Baseline	Watt to Walerga	70.8	61.1	62.0	71.7
9	Baseline	Walerga to Junction	69.0	60.4	61.9	70.2
10	Baseline	Junction to Woodcreek	66.6	58.0	59.5	67.8
11	Baseline	Woodcreek to Foothills	67.2	58.6	60.1	68.5
12	Fiddymment	North of Blue Oaks	66.9	58.3	59.8	68.2
13	Fiddymment	Blue Oaks to Pleasant Grove	67.3	58.7	60.2	68.5
14	Fiddymment	Pleasant Grove to Baseline	68.3	59.7	61.1	69.5
15	Walerga	South of Baseline	67.6	59.0	60.4	68.8
16	Watt	Road "B" to Road "A"	65.5	56.8	58.3	66.7
17	Watt	Baseline to Road "B"	65.6	57.0	58.5	66.9
18	Watt	South of Baseline	65.4	56.8	58.3	66.6
19	Westside	North of Pleasant Grove	64.9	57.0	58.8	66.4
20	Westside	Pleasant Grove to Road "A"	64.7	56.8	58.6	66.2
21	Westside	Road "A" to Road "B"	64.6	56.7	58.5	66.1
22	Market Drive	Project Site	51.4	44.3	46.5	53.2
23	Upland Drive	Project Site	54.0	46.8	49.0	55.8
24	Road "B"	Project Site	58.4	51.3	53.5	60.2

**Appendix B**  
**FHWA-RD-77-108 Highway Traffic Noise Prediction Model**  
**Noise Contour Output**

Project #: 2009-114 Sierra Vista SP  
Description: 2025 Capital Improvement Plan (CIP) + Project  
Ldn/CNEL: Ldn  
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	----- Distances to Traffic Noise Contours -----				
			75	70	65	60	55
1	Blue Oaks	Fiddymment to Woodcreek	46	99	212	457	985
2	Blue Oaks	Woodcreek to Foothills	64	138	297	640	1380
3	Pleasant Grove	West of Fiddymment	29	61	132	285	615
4	Pleasant Grove	Fiddymment to Woodcreek	40	86	185	399	861
5	Pleasant Grove	Woodcreek to Foothills	48	103	221	477	1028
6	Junction	Woodcreek to Foothills	23	49	105	227	490
7	Baseline	West of Watt	59	128	275	593	1278
8	Baseline	Watt to Walerga	61	131	282	607	1307
9	Baseline	Walerga to Junction	48	104	224	482	1039
10	Baseline	Junction to Woodcreek	33	72	155	333	718
11	Baseline	Woodcreek to Foothills	37	79	170	367	791
12	Fiddymment	North of Blue Oaks	35	75	162	349	753
13	Fiddymment	Blue Oaks to Pleasant Grove	37	80	172	370	797
14	Fiddymment	Pleasant Grove to Baseline	43	93	200	430	927
15	Walerga	South of Baseline	39	83	179	387	833
16	Watt	Road "B" to Road "A"	28	60	130	280	603
17	Watt	Baseline to Road "B"	29	62	133	287	618
18	Watt	South of Baseline	28	60	129	277	597
19	Westside	North of Pleasant Grove	27	57	123	266	573
20	Westside	Pleasant Grove to Road "A"	26	56	120	258	557
21	Westside	Road "A" to Road "B"	25	55	118	255	548
22	Market Drive	Project Site	4	8	16	35	76
23	Upland Drive	Project Site	5	11	24	52	112
24	Road "B"	Project Site	10	22	48	103	223

**Appendix B**

**FHWA-RD-77-108 Highway Traffic Noise Prediction Model**

**Data Input Sheet**

Project #: 2009-114 Sierra Vista SP

Description: 2025 Capital Improvement Plan (CIP) + Alt 2

Ldn/CNEL: Ldn

Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Blue Oaks	Fiddymment to Woodcreek	48,600	83		17	2	1	45	100	
2	Blue Oaks	Woodcreek to Foothills	80,900	83		17	2	1	45	100	
3	Pleasant Grove	West of Fiddymment	24,300	83		17	2	1	45	100	
4	Pleasant Grove	Fiddymment to Woodcreek	39,400	83		17	2	1	45	100	
5	Pleasant Grove	Woodcreek to Foothills	52,000	83		17	2	1	45	100	
6	Junction	Woodcreek to Foothills	22,900	83		17	2	1	40	100	
7	Baseline	West of Watt	40,500	83		17	2	1	55	100	
8	Baseline	Watt to Walerga	44,300	83		17	2	1	55	100	
9	Baseline	Walerga to Junction	51,600	83		17	2	1	45	100	
10	Baseline	Junction to Woodcreek	29,900	83		17	2	1	45	100	
11	Baseline	Woodcreek to Foothills	34,700	83		17	2	1	45	100	
12	Fiddymment	North of Blue Oaks	32,300	83		17	2	1	45	100	
13	Fiddymment	Blue Oaks to Pleasant Grove	35,500	83		17	2	1	45	100	
14	Fiddymment	Pleasant Grove to Baseline	44,300	83		17	2	1	45	100	
15	Walerga	South of Baseline	37,000	83		17	2	1	45	100	
16	Watt	Road "B" to Road "A"	22,500	83		17	2	1	45	100	
17	Watt	Baseline to Road "B"	24,100	83		17	2	1	45	100	
18	Watt	South of Baseline	21,500	83		17	2	1	45	100	
19	Westside	North of Pleasant Grove	28,100	83		17	2	1	40	100	
20	Westside	Pleasant Grove to Road "A"	26,900	83		17	2	1	40	100	
21	Westside	Road "A" to Road "B"	25,900	83		17	2	1	40	100	
22	Market Drive	Project Site	1,500	83		17	2	1	35	100	
23	Upland Drive	Project Site	2,900	83		17	2	1	35	100	
24	Road "B"	Project Site	8,800	83		17	2	1	35	100	

**Appendix B**

**FHWA-RD-77-108 Highway Traffic Noise Prediction Model**

**Predicted Levels**

Project #: 2009-114 Sierra Vista SP  
 Description: 2025 Capital Improvement Plan (CIP) + Alt 2  
 Ldn/CNEL: Ldn  
 Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Blue Oaks	Fiddymment to Woodcreek	68.7	60.1	61.5	69.9
2	Blue Oaks	Woodcreek to Foothills	70.9	62.3	63.8	72.1
3	Pleasant Grove	West of Fiddymment	65.7	57.0	58.5	66.9
4	Pleasant Grove	Fiddymment to Woodcreek	67.8	59.1	60.6	69.0
5	Pleasant Grove	Woodcreek to Foothills	69.0	60.4	61.8	70.2
6	Junction	Woodcreek to Foothills	63.9	56.0	57.8	65.4
7	Baseline	West of Watt	70.4	60.6	61.6	71.3
8	Baseline	Watt to Walerga	70.8	61.0	61.9	71.7
9	Baseline	Walerga to Junction	68.9	60.3	61.8	70.2
10	Baseline	Junction to Woodcreek	66.6	57.9	59.4	67.8
11	Baseline	Woodcreek to Foothills	67.2	58.6	60.1	68.4
12	Fiddymment	North of Blue Oaks	66.9	58.3	59.8	68.1
13	Fiddymment	Blue Oaks to Pleasant Grove	67.3	58.7	60.2	68.5
14	Fiddymment	Pleasant Grove to Baseline	68.3	59.7	61.1	69.5
15	Walerga	South of Baseline	67.5	58.9	60.4	68.7
16	Watt	Road "B" to Road "A"	65.3	56.7	58.2	66.6
17	Watt	Baseline to Road "B"	65.6	57.0	58.5	66.9
18	Watt	South of Baseline	65.1	56.5	58.0	66.4
19	Westside	North of Pleasant Grove	64.8	56.9	58.7	66.3
20	Westside	Pleasant Grove to Road "A"	64.6	56.7	58.5	66.1
21	Westside	Road "A" to Road "B"	64.5	56.5	58.3	65.9
22	Market Drive	Project Site	50.4	43.3	45.4	52.2
23	Upland Drive	Project Site	53.3	46.1	48.3	55.1
24	Road "B"	Project Site	58.1	50.9	53.1	59.9

**Appendix B**  
**FHWA-RD-77-108 Highway Traffic Noise Prediction Model**  
**Noise Contour Output**

Project #: 2009-114 Sierra Vista SP  
Description: 2025 Capital Improvement Plan (CIP) + Alt 2  
Ldn/CNEL: Ldn  
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	----- Distances to Traffic Noise Contours -----				
			75	70	65	60	55
1	Blue Oaks	Fiddymment to Woodcreek	46	99	213	458	987
2	Blue Oaks	Woodcreek to Foothills	64	139	299	643	1386
3	Pleasant Grove	West of Fiddymment	29	62	134	288	621
4	Pleasant Grove	Fiddymment to Woodcreek	40	86	185	398	858
5	Pleasant Grove	Woodcreek to Foothills	48	103	222	479	1032
6	Junction	Woodcreek to Foothills	23	49	106	229	494
7	Baseline	West of Watt	57	122	263	567	1222
8	Baseline	Watt to Walerga	60	130	280	602	1298
9	Baseline	Walerga to Junction	48	103	221	477	1027
10	Baseline	Junction to Woodcreek	33	71	154	331	714
11	Baseline	Woodcreek to Foothills	37	79	170	366	788
12	Fiddymment	North of Blue Oaks	35	75	162	349	751
13	Fiddymment	Blue Oaks to Pleasant Grove	37	80	172	371	800
14	Fiddymment	Pleasant Grove to Baseline	43	93	200	430	927
15	Walerga	South of Baseline	38	82	177	382	823
16	Watt	Road "B" to Road "A"	27	59	127	274	590
17	Watt	Baseline to Road "B"	29	62	133	287	618
18	Watt	South of Baseline	27	57	123	266	573
19	Westside	North of Pleasant Grove	26	57	122	263	566
20	Westside	Pleasant Grove to Road "A"	26	55	118	255	550
21	Westside	Road "A" to Road "B"	25	54	115	249	536
22	Market Drive	Project Site	3	7	14	30	65
23	Upland Drive	Project Site	5	10	22	47	101
24	Road "B"	Project Site	10	21	46	98	212

**Appendix B**

**FHWA-RD-77-108 Highway Traffic Noise Prediction Model**

**Data Input Sheet**

Project #: 2009-114 Sierra Vista SP

Description: 2025 Capital Improvement Plan (CIP) + Alt 3

Ldn/CNEL: Ldn

Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Blue Oaks	Fiddymment to Woodcreek	48,100	83		17	2	1	45	100	
2	Blue Oaks	Woodcreek to Foothills	79,900	83		17	2	1	45	100	
3	Pleasant Grove	West of Fiddymment	23,800	83		17	2	1	45	100	
4	Pleasant Grove	Fiddymment to Woodcreek	38,700	83		17	2	1	45	100	
5	Pleasant Grove	Woodcreek to Foothills	51,300	83		17	2	1	45	100	
6	Junction	Woodcreek to Foothills	21,900	83		17	2	1	40	100	
7	Baseline	West of Watt	40,700	83		17	2	1	55	100	
8	Baseline	Watt to Walerga	44,100	83		17	2	1	55	100	
9	Baseline	Walerga to Junction	50,200	83		17	2	1	45	100	
10	Baseline	Junction to Woodcreek	29,700	83		17	2	1	45	100	
11	Baseline	Woodcreek to Foothills	34,300	83		17	2	1	45	100	
12	Fiddymment	North of Blue Oaks	32,300	83		17	2	1	45	100	
13	Fiddymment	Blue Oaks to Pleasant Grove	35,400	83		17	2	1	45	100	
14	Fiddymment	Pleasant Grove to Baseline	45,500	83		17	2	1	45	100	
15	Walerga	South of Baseline	37,000	83		17	2	1	45	100	
16	Watt	Road "B" to Road "A"	21,500	83		17	2	1	45	100	
17	Watt	Baseline to Road "B"	22,700	83		17	2	1	45	100	
18	Watt	South of Baseline	20,900	83		17	2	1	45	100	
19	Westside	North of Pleasant Grove	27,300	83		17	2	1	40	100	
20	Westside	Pleasant Grove to Road "A"	25,300	83		17	2	1	40	100	
21	Westside	Road "A" to Road "B"	24,800	83		17	2	1	40	100	
22	Market Drive	Project Site	1,200	83		17	2	1	35	100	
23	Upland Drive	Project Site	3,000	83		17	2	1	35	100	
24	Road "B"	Project Site	8,300	83		17	2	1	35	100	

**Appendix B**

**FHWA-RD-77-108 Highway Traffic Noise Prediction Model**

**Predicted Levels**

Project #: 2009-114 Sierra Vista SP  
 Description: 2025 Capital Improvement Plan (CIP) + Alt 3  
 Ldn/CNEL: Ldn  
 Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Blue Oaks	Fiddymment to Woodcreek	68.6	60.0	61.5	69.9
2	Blue Oaks	Woodcreek to Foothills	70.8	62.2	63.7	72.1
3	Pleasant Grove	West of Fiddymment	65.6	57.0	58.4	66.8
4	Pleasant Grove	Fiddymment to Woodcreek	67.7	59.1	60.6	68.9
5	Pleasant Grove	Woodcreek to Foothills	68.9	60.3	61.8	70.1
6	Junction	Woodcreek to Foothills	63.7	55.8	57.6	65.2
7	Baseline	West of Watt	70.4	60.6	61.6	71.3
8	Baseline	Watt to Walerga	70.8	61.0	61.9	71.7
9	Baseline	Walerga to Junction	68.8	60.2	61.7	70.1
10	Baseline	Junction to Woodcreek	66.5	57.9	59.4	67.8
11	Baseline	Woodcreek to Foothills	67.2	58.5	60.0	68.4
12	Fiddymment	North of Blue Oaks	66.9	58.3	59.8	68.1
13	Fiddymment	Blue Oaks to Pleasant Grove	67.3	58.7	60.2	68.5
14	Fiddymment	Pleasant Grove to Baseline	68.4	59.8	61.3	69.6
15	Walerga	South of Baseline	67.5	58.9	60.4	68.7
16	Watt	Road "B" to Road "A"	65.1	56.5	58.0	66.4
17	Watt	Baseline to Road "B"	65.4	56.8	58.2	66.6
18	Watt	South of Baseline	65.0	56.4	57.9	66.2
19	Westside	North of Pleasant Grove	64.7	56.8	58.6	66.2
20	Westside	Pleasant Grove to Road "A"	64.4	56.4	58.2	65.8
21	Westside	Road "A" to Road "B"	64.3	56.3	58.2	65.7
22	Market Drive	Project Site	49.4	42.3	44.5	51.2
23	Upland Drive	Project Site	53.4	46.3	48.4	55.2
24	Road "B"	Project Site	57.8	50.7	52.9	59.6

**Appendix B**

**FHWA-RD-77-108 Highway Traffic Noise Prediction Model**

**Noise Contour Output**

Project #: 2009-114 Sierra Vista SP  
 Description: 2025 Capital Improvement Plan (CIP) + Alt 3  
 Ldn/CNEL: Ldn  
 Hard/Soft: Soft

Segment	Roadway Name	Segment Description	----- Distances to Traffic Noise Contours -----				
			75	70	65	60	55
1	Blue Oaks	Fiddymment to Woodcreek	45	98	211	455	980
2	Blue Oaks	Woodcreek to Foothills	64	137	296	638	1374
3	Pleasant Grove	West of Fiddymment	28	61	132	284	613
4	Pleasant Grove	Fiddymment to Woodcreek	39	85	183	393	848
5	Pleasant Grove	Woodcreek to Foothills	47	102	220	475	1023
6	Junction	Woodcreek to Foothills	22	48	103	222	479
7	Baseline	West of Watt	57	123	264	569	1226
8	Baseline	Watt to Walerga	60	129	279	600	1294
9	Baseline	Walerga to Junction	47	101	217	468	1008
10	Baseline	Junction to Woodcreek	33	71	153	330	710
11	Baseline	Woodcreek to Foothills	36	78	168	363	782
12	Fiddymment	North of Blue Oaks	35	75	162	349	751
13	Fiddymment	Blue Oaks to Pleasant Grove	37	80	172	371	799
14	Fiddymment	Pleasant Grove to Baseline	44	94	203	438	944
15	Walerga	South of Baseline	38	82	177	382	823
16	Watt	Road "B" to Road "A"	27	57	123	266	573
17	Watt	Baseline to Road "B"	28	59	128	276	594
18	Watt	South of Baseline	26	56	121	261	562
19	Westside	North of Pleasant Grove	26	56	120	258	555
20	Westside	Pleasant Grove to Road "A"	24	53	114	245	528
21	Westside	Road "A" to Road "B"	24	52	112	242	521
22	Market Drive	Project Site	3	6	12	26	56
23	Upland Drive	Project Site	5	10	22	48	103
24	Road "B"	Project Site	9	20	44	95	204

**Appendix B**

**FHWA-RD-77-108 Highway Traffic Noise Prediction Model**

**Data Input Sheet**

Project #: 2009-114 Sierra Vista SP

Description: 2025 Capital Improvement Plan (CIP) + Alt 4

Ldn/CNEL: Ldn

Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	Blue Oaks	Fiddymment to Woodcreek	48,000	83		17	2	1	45	100	
2	Blue Oaks	Woodcreek to Foothills	79,700	83		17	2	1	45	100	
3	Pleasant Grove	West of Fiddymment	23,300	83		17	2	1	45	100	
4	Pleasant Grove	Fiddymment to Woodcreek	38,700	83		17	2	1	45	100	
5	Pleasant Grove	Woodcreek to Foothills	51,100	83		17	2	1	45	100	
6	Junction	Woodcreek to Foothills	21,800	83		17	2	1	40	100	
7	Baseline	West of Watt	41,100	83		17	2	1	55	100	
8	Baseline	Watt to Walerga	44,600	83		17	2	1	55	100	
9	Baseline	Walerga to Junction	50,900	83		17	2	1	45	100	
10	Baseline	Junction to Woodcreek	29,800	83		17	2	1	45	100	
11	Baseline	Woodcreek to Foothills	34,400	83		17	2	1	45	100	
12	Fiddymment	North of Blue Oaks	32,400	83		17	2	1	45	100	
13	Fiddymment	Blue Oaks to Pleasant Grove	35,300	83		17	2	1	45	100	
14	Fiddymment	Pleasant Grove to Baseline	44,700	83		17	2	1	45	100	
15	Walerga	South of Baseline	37,400	83		17	2	1	45	100	
16	Watt	Road "B" to Road "A"	22,200	83		17	2	1	45	100	
17	Watt	Baseline to Road "B"	23,300	83		17	2	1	45	100	
18	Watt	South of Baseline	21,600	83		17	2	1	45	100	
19	Westside	North of Pleasant Grove	27,500	83		17	2	1	40	100	
20	Westside	Pleasant Grove to Road "A"	25,800	83		17	2	1	40	100	
21	Westside	Road "A" to Road "B"	25,200	83		17	2	1	40	100	
22	Market Drive	Project Site	1,500	83		17	2	1	35	100	
23	Upland Drive	Project Site	3,200	83		17	2	1	35	100	
24	Road "B"	Project Site	8,500	83		17	2	1	35	100	

**Appendix B**

**FHWA-RD-77-108 Highway Traffic Noise Prediction Model**

**Predicted Levels**

Project #: 2009-114 Sierra Vista SP  
 Description: 2025 Capital Improvement Plan (CIP) + Alt 4  
 Ldn/CNEL: Ldn  
 Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Blue Oaks	Fiddymment to Woodcreek	68.6	60.0	61.5	69.9
2	Blue Oaks	Woodcreek to Foothills	70.8	62.2	63.7	72.1
3	Pleasant Grove	West of Fiddymment	65.5	56.9	58.4	66.7
4	Pleasant Grove	Fiddymment to Woodcreek	67.7	59.1	60.6	68.9
5	Pleasant Grove	Woodcreek to Foothills	68.9	60.3	61.8	70.1
6	Junction	Woodcreek to Foothills	63.7	55.8	57.6	65.2
7	Baseline	West of Watt	70.4	60.7	61.6	71.4
8	Baseline	Watt to Walerga	70.8	61.0	62.0	71.7
9	Baseline	Walerga to Junction	68.9	60.3	61.7	70.1
10	Baseline	Junction to Woodcreek	66.5	57.9	59.4	67.8
11	Baseline	Woodcreek to Foothills	67.2	58.6	60.0	68.4
12	Fiddymment	North of Blue Oaks	66.9	58.3	59.8	68.2
13	Fiddymment	Blue Oaks to Pleasant Grove	67.3	58.7	60.2	68.5
14	Fiddymment	Pleasant Grove to Baseline	68.3	59.7	61.2	69.5
15	Walerga	South of Baseline	67.5	58.9	60.4	68.8
16	Watt	Road "B" to Road "A"	65.3	56.7	58.1	66.5
17	Watt	Baseline to Road "B"	65.5	56.9	58.4	66.7
18	Watt	South of Baseline	65.1	56.5	58.0	66.4
19	Westside	North of Pleasant Grove	64.7	56.8	58.6	66.2
20	Westside	Pleasant Grove to Road "A"	64.4	56.5	58.3	65.9
21	Westside	Road "A" to Road "B"	64.3	56.4	58.2	65.8
22	Market Drive	Project Site	50.4	43.3	45.4	52.2
23	Upland Drive	Project Site	53.7	46.5	48.7	55.5
24	Road "B"	Project Site	58.0	50.8	53.0	59.7

**Appendix B**  
**FHWA-RD-77-108 Highway Traffic Noise Prediction Model**  
**Noise Contour Output**

Project #: 2009-114 Sierra Vista SP  
Description: 2025 Capital Improvement Plan (CIP) + Alt 4  
Ldn/CNEL: Ldn  
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	----- Distances to Traffic Noise Contours -----				
			75	70	65	60	55
1	Blue Oaks	Fiddymment to Woodcreek	45	98	211	454	978
2	Blue Oaks	Woodcreek to Foothills	64	137	296	637	1372
3	Pleasant Grove	West of Fiddymment	28	60	130	280	604
4	Pleasant Grove	Fiddymment to Woodcreek	39	85	183	393	848
5	Pleasant Grove	Woodcreek to Foothills	47	102	220	473	1020
6	Junction	Woodcreek to Foothills	22	48	103	222	478
7	Baseline	West of Watt	57	123	266	573	1234
8	Baseline	Watt to Walerga	61	130	281	605	1303
9	Baseline	Walerga to Junction	47	102	219	472	1017
10	Baseline	Junction to Woodcreek	33	71	153	330	712
11	Baseline	Woodcreek to Foothills	36	78	169	364	784
12	Fiddymment	North of Blue Oaks	35	75	162	349	753
13	Fiddymment	Blue Oaks to Pleasant Grove	37	80	172	370	797
14	Fiddymment	Pleasant Grove to Baseline	43	93	201	433	933
15	Walerga	South of Baseline	38	83	178	385	828
16	Watt	Road "B" to Road "A"	27	59	126	272	585
17	Watt	Baseline to Road "B"	28	60	130	280	604
18	Watt	South of Baseline	27	57	124	267	575
19	Westside	North of Pleasant Grove	26	56	120	259	558
20	Westside	Pleasant Grove to Road "A"	25	53	115	248	535
21	Westside	Road "A" to Road "B"	24	53	113	244	526
22	Market Drive	Project Site	3	7	14	30	65
23	Upland Drive	Project Site	5	11	23	50	108
24	Road "B"	Project Site	10	21	45	96	207

**Appendix C**

Sierra Vista Specific Plan - City of Roseville, California

24hr Continuous Noise Monitoring - Site A

Tuesday, April 21, 2009

Hour	Leq	Lmax	L50	L90
0:00	41	56	40	38
1:00	40	48	39	37
2:00	39	48	38	36
3:00	39	47	38	36
4:00	41	55	40	37
5:00	48	57	44	39
6:00	42	56	41	39
7:00	45	70	41	39
8:00	40	59	38	35
9:00	36	49	35	31
10:00	38	56	35	32
11:00	42	56	36	32
12:00	50	75	34	31
13:00	40	61	34	32
14:00	35	54	32	30
15:00	33	54	30	28
16:00	47	70	36	32
17:00	37	53	34	31
18:00	44	60	43	36
19:00	43	65	42	40
20:00	47	61	45	43
21:00	43	57	42	40
22:00	42	55	42	40
23:00	42	54	41	39

Statistical Summary						
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	49.7	32.9	43.5	48.3	38.6	42.7
Lmax (Maximum)	75.2	49.3	60.1	57.5	46.9	52.9
L50 (Median)	45.3	29.7	37.1	43.8	38.2	40.4
L90 (Background)	42.6	27.6	34.1	40.2	36.2	38.0

Computed Ldn, dB	49.3
% Daytime Energy	67%
% Nighttime Energy	33%

**Appendix C**

Sierra Vista Specific Plan - City of Roseville, California

24hr Continuous Noise Monitoring - Site B

Tuesday, April 21, 2009

Hour	Leq	Lmax	L50	L90
0:00	56	73	49	37
1:00	54	70	48	40
2:00	54	77	41	34
3:00	55	71	47	36
4:00	59	74	55	44
5:00	62	74	59	50
6:00	65	90	63	57
7:00	64	82	63	58
8:00	62	74	61	54
9:00	60	75	58	49
10:00	60	74	56	47
11:00	60	75	56	47
12:00	61	84	57	47
13:00	60	78	56	48
14:00	59	74	57	48
15:00	61	78	59	52
16:00	61	78	60	53
17:00	62	73	61	57
18:00	63	74	63	57
19:00	63	81	61	54
20:00	60	78	59	51
21:00	61	74	59	52
22:00	60	74	58	49
23:00	59	73	54	44

Statistical Summary						
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	64.1	59.4	61.5	65.1	54.1	59.7
Lmax (Maximum)	84.3	73.0	76.8	89.8	70.1	75.2
L50 (Median)	62.9	56.2	59.1	63.3	41.3	52.6
L90 (Background)	57.7	46.5	51.5	57.0	34.0	43.4

Computed Ldn, dB	66.4
% Daytime Energy	72%
% Nighttime Energy	28%

**Appendix C**

Sierra Vista Specific Plan - City of Roseville, California  
 24hr Continuous Noise Monitoring - Site C  
 Tuesday, April 21, 2009

Hour	Leq	Lmax	L50	L90
0:00	53	70	41	30
1:00	50	66	33	26
2:00	52	72	36	27
3:00	54	71	41	29
4:00	58	73	54	38
5:00	60	71	58	50
6:00	64	72	63	58
7:00	63	71	62	57
8:00	57	71	54	47
9:00	56	70	52	43
10:00	55	73	48	39
11:00	57	73	51	42
12:00	56	75	50	39
13:00	59	75	52	42
14:00	56	72	52	42
15:00	59	71	57	49
16:00	60	71	59	53
17:00	61	71	60	55
18:00	62	74	61	56
19:00	60	73	59	51
20:00	60	75	58	46
21:00	59	77	56	39
22:00	58	76	54	41
23:00	56	71	48	35

Statistical Summary						
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	62.8	54.6	59.3	63.8	50.0	57.9
Lmax (Maximum)	76.9	69.8	72.7	75.6	65.6	71.3
L50 (Median)	61.9	48.4	55.4	62.8	33.3	47.4
L90 (Background)	56.8	38.9	46.7	58.1	26.4	37.1

Computed Ldn, dB	64.5
% Daytime Energy	70%
% Nighttime Energy	30%

**Appendix C**

Sierra Vista Specific Plan - City of Roseville, California

24hr Continuous Noise Monitoring - Site D

Thursday, May 28, 2009

Hour	Leq	Lmax	L50	L90
0:00	36	43	35	33
1:00	38	47	35	33
2:00	38	48	35	32
3:00	35	41	35	30
4:00	36	48	34	31
5:00	50	65	42	40
6:00	52	66	48	43
7:00	48	61	44	41
8:00	46	64	40	38
9:00	53	69	40	34
10:00	45	63	38	33
11:00	51	69	37	31
12:00	48	68	37	31
13:00	50	68	37	30
14:00	45	64	33	28
15:00	43	65	34	29
16:00	42	59	36	31
17:00	47	62	43	35
18:00	47	65	38	32
19:00	45	67	37	32
20:00	44	63	35	32
21:00	44	67	37	35
22:00	40	61	37	34
23:00	38	50	37	35

Statistical Summary						
Daytime (7 a.m. - 10 p.m.)				Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	52.5	41.5	47.5	51.7	34.8	44.9
Lmax (Maximum)	68.9	58.9	64.8	66.0	40.8	52.1
L50 (Median)	44.0	32.8	37.7	47.8	34.5	37.5
L90 (Background)	41.0	28.3	32.8	42.7	30.1	34.6

Computed Ldn, dB	51.8
% Daytime Energy	75%
% Nighttime Energy	25%

**Appendix D**

**FHWA-RD-77-108 Highway Traffic Noise Prediction Model**

**Data Input Sheet**

Project #: Sierra Vista SP  
Description: 2025 CIP + Project  
Ldn/CNEL: Ldn  
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med.	% Hvy.	Speed	Distance	Offset
1	Baseline	Watt to Walerga	44,800	83		17	2	1	55	215	
2	Fiddymment	Pleasant Grove to Baseline	44,300	83		17	2	1	45	100	
3	Watt	Road "B" to Road "A"	23,200	83		17	2	1	45	116	
4	Watt	Baseline to Road "B"	24,100	83		17	2	1	45	116	
5	Westside	Pleasant Grove to Road "A"	27,400	83		17	2	1	40	100	
6	Westside	Road "A" to Road "B"	26,800	83		17	2	1	40	100	
7	Market Drive	Project Site	1,900	83		17	2	1	35	62	
8	Market Drive	Project Site	1,900	83		17	2	1	35	92	
9	Upland Drive	Project Site	3,400	83		17	2	1	35	62	
10	Upland Drive	Project Site	3,400	83		17	2	1	35	92	
11	Road "B"	Project Site	9,500	83		17	2	1	35	88	

**Appendix D**  
**FHWA-RD-77-108 Highway Traffic Noise Prediction Model**  
**Predicted Levels**

Project #: Sierra Vista SP  
 Description: 2025 CIP + Project  
 Ldn/CNEL: Ldn  
 Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	Baseline	Watt to Walerga	66	56	57	67
2	Fiddymont	Pleasant Grove to Baseline	68	60	61	70
3	Watt	Road "B" to Road "A"	64	56	57	66
4	Watt	Baseline to Road "B"	65	56	58	66
5	Westside	Pleasant Grove to Road "A"	65	57	59	66
6	Westside	Road "A" to Road "B"	65	57	58	66
7	Market Drive	Project Site	55	47	50	56
8	Market Drive	Project Site	52	45	47	54
9	Upland Drive	Project Site	57	50	52	59
10	Upland Drive	Project Site	55	47	50	56
11	Road "B"	Project Site	59	52	54	61

Appendix D

**FHWA Traffic Noise Prediction Model (FHWA-RD-77-108)**

**Noise Barrier Effectiveness Prediction Worksheet**

**Project Information:**

Job Number: Sierra Vista SP  
 Description 2025 CIP + Project  
 Roadway Name: Baseline  
 Location(s): 1

**Noise Level Data:**

Year: 2025  
 Auto L<sub>dn</sub>, dB: 66  
 Medium Truck L<sub>dn</sub>, dB: 56  
 Heavy Truck L<sub>dn</sub>, dB: 57

**Site Geometry:**

Receiver Description: Watt to Walerga  
 Centerline to Barrier Distance (C<sub>1</sub>): 200  
 Barrier to Receiver Distance (C<sub>2</sub>): 15  
 Automobile Elevation: 0  
 Medium Truck Elevation: 2  
 Heavy Truck Elevation: 8  
 Pad/Ground Elevation at Receiver: 0  
 Receiver Elevation<sup>1</sup>: 5  
 Base of Barrier Elevation: 0  
 Starting Barrier Height 6

**Barrier Effectiveness:**

Top of Barrier Elevation (ft)	Barrier Height <sup>2</sup> (ft)	----- L <sub>dn</sub> , dB -----				Barrier Breaks Line of Sight to...		
		Autos	Medium Trucks	Heavy Trucks	Total	Autos?	Medium Trucks?	Heavy Trucks?
6	6	60	51	52	61	Yes	Yes	Yes
7	7	59	49	51	60	Yes	Yes	Yes
8	8	58	48	50	59	Yes	Yes	Yes
9	9	57	47	49	58	Yes	Yes	Yes
10	10	56	46	47	57	Yes	Yes	Yes
11	11	55	45	47	56	Yes	Yes	Yes
12	12	54	44	46	55	Yes	Yes	Yes
13	13	53	43	45	54	Yes	Yes	Yes
14	14	52	43	44	53	Yes	Yes	Yes

**Notes:** 1. Standard receiver elevation is five feet above grade/pad elevations at the receiver location(s)



Appendix D

**FHWA Traffic Noise Prediction Model (FHWA-RD-77-108)**

**Noise Barrier Effectiveness Prediction Worksheet**

**Project Information:**

Job Number: Sierra Vista SP  
 Description 2025 CIP + Project  
 Roadway Name: Fiddymont  
 Location(s): 2

**Noise Level Data:**

Year: 2025  
 Auto L<sub>dn</sub>, dB: 68  
 Medium Truck L<sub>dn</sub>, dB: 60  
 Heavy Truck L<sub>dn</sub>, dB: 61

**Site Geometry:**

Receiver Description: Pleasant Grove to Baseline  
 Centerline to Barrier Distance (C<sub>1</sub>): 85  
 Barrier to Receiver Distance (C<sub>2</sub>): 15  
 Automobile Elevation: 0  
 Medium Truck Elevation: 2  
 Heavy Truck Elevation: 8  
 Pad/Ground Elevation at Receiver: 0  
 Receiver Elevation<sup>1</sup>: 5  
 Base of Barrier Elevation: 0  
 Starting Barrier Height 6

**Barrier Effectiveness:**

Top of Barrier Elevation (ft)	Barrier Height <sup>2</sup> (ft)	----- L <sub>dn</sub> , dB -----				Barrier Breaks Line of Sight to...		
		Autos	Medium Trucks	Heavy Trucks	Total	Autos?	Medium Trucks?	Heavy Trucks?
6	6	62	54	56	<b>64</b>	Yes	Yes	Yes
7	7	61	53	55	<b>62</b>	Yes	Yes	Yes
8	8	60	51	54	<b>61</b>	Yes	Yes	Yes
9	9	58	50	53	<b>60</b>	Yes	Yes	Yes
10	10	58	49	52	<b>59</b>	Yes	Yes	Yes
11	11	57	48	51	<b>58</b>	Yes	Yes	Yes
12	12	56	47	50	<b>57</b>	Yes	Yes	Yes
13	13	55	46	49	<b>56</b>	Yes	Yes	Yes
14	14	54	46	48	<b>56</b>	Yes	Yes	Yes

**Notes:** 1. Standard receiver elevation is five feet above grade/pad elevations at the receiver location(s)



Appendix D

**FHWA Traffic Noise Prediction Model (FHWA-RD-77-108)**

**Noise Barrier Effectiveness Prediction Worksheet**

**Project Information:**

Job Number: Sierra Vista SP  
 Description 2025 CIP + Project  
 Roadway Name: Watt  
 Location(s): 3

**Noise Level Data:**

Year: 2025  
 Auto L<sub>dn</sub>, dB: 64  
 Medium Truck L<sub>dn</sub>, dB: 56  
 Heavy Truck L<sub>dn</sub>, dB: 57

**Site Geometry:**

Receiver Description: Road "B" to Road "A"  
 Centerline to Barrier Distance (C<sub>1</sub>): 101  
 Barrier to Receiver Distance (C<sub>2</sub>): 15  
 Automobile Elevation: 0  
 Medium Truck Elevation: 2  
 Heavy Truck Elevation: 8  
 Pad/Ground Elevation at Receiver: 0  
 Receiver Elevation<sup>1</sup>: 5  
 Base of Barrier Elevation: 0  
 Starting Barrier Height 6

**Barrier Effectiveness:**

Top of Barrier Elevation (ft)	Barrier Height <sup>2</sup> (ft)	----- L <sub>dn</sub> , dB -----				Barrier Breaks Line of Sight to...		
		Autos	Medium Trucks	Heavy Trucks	Total	Autos?	Medium Trucks?	Heavy Trucks?
6	6	58	50	52	60	Yes	Yes	Yes
7	7	57	49	51	59	Yes	Yes	Yes
8	8	56	48	50	58	Yes	Yes	Yes
9	9	55	47	49	56	Yes	Yes	Yes
10	10	54	46	48	55	Yes	Yes	Yes
11	11	53	45	47	54	Yes	Yes	Yes
12	12	52	44	46	53	Yes	Yes	Yes
13	13	51	43	45	53	Yes	Yes	Yes
14	14	51	42	44	52	Yes	Yes	Yes

**Notes:** 1. Standard receiver elevation is five feet above grade/pad elevations at the receiver location(s)



Appendix D

**FHWA Traffic Noise Prediction Model (FHWA-RD-77-108)**

**Noise Barrier Effectiveness Prediction Worksheet**

**Project Information:**

Job Number: Sierra Vista SP  
 Description 2025 CIP + Project  
 Roadway Name: Watt  
 Location(s): 4

**Noise Level Data:**

Year: 2025  
 Auto L<sub>dn</sub>, dB: 65  
 Medium Truck L<sub>dn</sub>, dB: 56  
 Heavy Truck L<sub>dn</sub>, dB: 58

**Site Geometry:**

Receiver Description: Baseline to Road "B"  
 Centerline to Barrier Distance (C<sub>1</sub>): 101  
 Barrier to Receiver Distance (C<sub>2</sub>): 15  
 Automobile Elevation: 0  
 Medium Truck Elevation: 2  
 Heavy Truck Elevation: 8  
 Pad/Ground Elevation at Receiver: 0  
 Receiver Elevation<sup>1</sup>: 5  
 Base of Barrier Elevation: 0  
 Starting Barrier Height 6

**Barrier Effectiveness:**

Top of Barrier Elevation (ft)	Barrier Height <sup>2</sup> (ft)	----- L <sub>dn</sub> , dB -----				Barrier Breaks Line of Sight to...		
		Autos	Medium Trucks	Heavy Trucks	Total	Autos?	Medium Trucks?	Heavy Trucks?
6	6	59	50	52	<b>60</b>	Yes	Yes	Yes
7	7	57	49	52	<b>59</b>	Yes	Yes	Yes
8	8	56	48	50	<b>58</b>	Yes	Yes	Yes
9	9	55	47	49	<b>57</b>	Yes	Yes	Yes
10	10	54	46	48	<b>56</b>	Yes	Yes	Yes
11	11	53	45	47	<b>55</b>	Yes	Yes	Yes
12	12	52	44	46	<b>54</b>	Yes	Yes	Yes
13	13	51	43	45	<b>53</b>	Yes	Yes	Yes
14	14	51	42	45	<b>52</b>	Yes	Yes	Yes

**Notes:** 1. Standard receiver elevation is five feet above grade/pad elevations at the receiver location(s)



Appendix D

**FHWA Traffic Noise Prediction Model (FHWA-RD-77-108)**

**Noise Barrier Effectiveness Prediction Worksheet**

**Project Information:**

Job Number: Sierra Vista SP  
 Description 2025 CIP + Project  
 Roadway Name: Westside  
 Location(s): 5

**Noise Level Data:**

Year: 2025  
 Auto L<sub>dn</sub>, dB: 65  
 Medium Truck L<sub>dn</sub>, dB: 57  
 Heavy Truck L<sub>dn</sub>, dB: 59

**Site Geometry:**

Receiver Description: Pleasant Grove to Road "A"  
 Centerline to Barrier Distance (C<sub>1</sub>): 85  
 Barrier to Receiver Distance (C<sub>2</sub>): 15  
 Automobile Elevation: 0  
 Medium Truck Elevation: 2  
 Heavy Truck Elevation: 8  
 Pad/Ground Elevation at Receiver: 0  
 Receiver Elevation<sup>1</sup>: 5  
 Base of Barrier Elevation: 0  
 Starting Barrier Height 6

**Barrier Effectiveness:**

Top of Barrier Elevation (ft)	Barrier Height <sup>2</sup> (ft)	----- L <sub>dn</sub> , dB -----				Barrier Breaks Line of Sight to...		
		Autos	Medium Trucks	Heavy Trucks	Total	Autos?	Medium Trucks?	Heavy Trucks?
6	6	59	51	53	<b>60</b>	Yes	Yes	Yes
7	7	57	50	53	<b>59</b>	Yes	Yes	Yes
8	8	56	49	51	<b>58</b>	Yes	Yes	Yes
9	9	55	47	50	<b>57</b>	Yes	Yes	Yes
10	10	54	46	49	<b>56</b>	Yes	Yes	Yes
11	11	53	45	48	<b>55</b>	Yes	Yes	Yes
12	12	52	44	47	<b>54</b>	Yes	Yes	Yes
13	13	51	44	46	<b>53</b>	Yes	Yes	Yes
14	14	51	43	45	<b>52</b>	Yes	Yes	Yes

**Notes:** 1. Standard receiver elevation is five feet above grade/pad elevations at the receiver location(s)



Appendix D

**FHWA Traffic Noise Prediction Model (FHWA-RD-77-108)**

**Noise Barrier Effectiveness Prediction Worksheet**

**Project Information:**

Job Number: Sierra Vista SP  
 Description 2025 CIP + Project  
 Roadway Name: Westside  
 Location(s): 6

**Noise Level Data:**

Year: 2025  
 Auto L<sub>dn</sub>, dB: 65  
 Medium Truck L<sub>dn</sub>, dB: 57  
 Heavy Truck L<sub>dn</sub>, dB: 58

**Site Geometry:**

Receiver Description: Road "A" to Road "B"  
 Centerline to Barrier Distance (C<sub>1</sub>): 85  
 Barrier to Receiver Distance (C<sub>2</sub>): 15  
 Automobile Elevation: 0  
 Medium Truck Elevation: 2  
 Heavy Truck Elevation: 8  
 Pad/Ground Elevation at Receiver: 0  
 Receiver Elevation<sup>1</sup>: 5  
 Base of Barrier Elevation: 0  
 Starting Barrier Height 6

**Barrier Effectiveness:**

Top of Barrier Elevation (ft)	Barrier Height <sup>2</sup> (ft)	----- L <sub>dn</sub> , dB -----				Barrier Breaks Line of Sight to...		
		Autos	Medium Trucks	Heavy Trucks	Total	Autos?	Medium Trucks?	Heavy Trucks?
6	6	59	51	53	<b>60</b>	Yes	Yes	Yes
7	7	57	50	53	<b>59</b>	Yes	Yes	Yes
8	8	56	48	51	<b>58</b>	Yes	Yes	Yes
9	9	55	47	50	<b>57</b>	Yes	Yes	Yes
10	10	54	46	49	<b>56</b>	Yes	Yes	Yes
11	11	53	45	48	<b>55</b>	Yes	Yes	Yes
12	12	52	44	47	<b>54</b>	Yes	Yes	Yes
13	13	51	43	46	<b>53</b>	Yes	Yes	Yes
14	14	51	43	45	<b>52</b>	Yes	Yes	Yes

**Notes:** 1. Standard receiver elevation is five feet above grade/pad elevations at the receiver location(s)



Appendix D

**FHWA Traffic Noise Prediction Model (FHWA-RD-77-108)**

**Noise Barrier Effectiveness Prediction Worksheet**

**Project Information:**

Job Number: Sierra Vista SP  
 Description 2025 CIP + Project  
 Roadway Name: Market Drive  
 Location(s): 7

**Noise Level Data:**

Year: 2025  
 Auto L<sub>dn</sub>, dB: 55  
 Medium Truck L<sub>dn</sub>, dB: 47  
 Heavy Truck L<sub>dn</sub>, dB: 50

**Site Geometry:**

Receiver Description: Project Site  
 Centerline to Barrier Distance (C<sub>1</sub>): 47  
 Barrier to Receiver Distance (C<sub>2</sub>): 15  
 Automobile Elevation: 0  
 Medium Truck Elevation: 2  
 Heavy Truck Elevation: 8  
 Pad/Ground Elevation at Receiver: 0  
 Receiver Elevation<sup>1</sup>: 5  
 Base of Barrier Elevation: 0  
 Starting Barrier Height 6

**Barrier Effectiveness:**

Top of Barrier Elevation (ft)	Barrier Height <sup>2</sup> (ft)	----- L <sub>dn</sub> , dB -----				Barrier Breaks Line of Sight to...		
		Autos	Medium Trucks	Heavy Trucks	Total	Autos?	Medium Trucks?	Heavy Trucks?
6	6	48	41	45	50	Yes	Yes	Yes
7	7	46	40	44	49	Yes	Yes	Yes
8	8	45	38	43	48	Yes	Yes	Yes
9	9	44	37	41	46	Yes	Yes	Yes
10	10	43	36	40	45	Yes	Yes	Yes
11	11	42	35	39	44	Yes	Yes	Yes
12	12	41	34	38	44	Yes	Yes	Yes
13	13	41	34	37	43	Yes	Yes	Yes
14	14	40	33	36	42	Yes	Yes	Yes

**Notes:** 1. Standard receiver elevation is five feet above grade/pad elevations at the receiver location(s)



Appendix D

**FHWA Traffic Noise Prediction Model (FHWA-RD-77-108)**

**Noise Barrier Effectiveness Prediction Worksheet**

**Project Information:**

Job Number: Sierra Vista SP  
 Description 2025 CIP + Project  
 Roadway Name: Market Drive  
 Location(s): 8

**Noise Level Data:**

Year: 2025  
 Auto L<sub>dn</sub>, dB: 52  
 Medium Truck L<sub>dn</sub>, dB: 45  
 Heavy Truck L<sub>dn</sub>, dB: 47

**Site Geometry:**

Receiver Description: Project Site  
 Centerline to Barrier Distance (C<sub>1</sub>): 77  
 Barrier to Receiver Distance (C<sub>2</sub>): 15  
 Automobile Elevation: 0  
 Medium Truck Elevation: 2  
 Heavy Truck Elevation: 8  
 Pad/Ground Elevation at Receiver: 0  
 Receiver Elevation<sup>1</sup>: 5  
 Base of Barrier Elevation: 0  
 Starting Barrier Height 6

**Barrier Effectiveness:**

Top of Barrier Elevation (ft)	Barrier Height <sup>2</sup> (ft)	----- L <sub>dn</sub> , dB -----				Barrier Breaks Line of Sight to...		
		Autos	Medium Trucks	Heavy Trucks	Total	Autos?	Medium Trucks?	Heavy Trucks?
6	6	46	39	42	<b>48</b>	Yes	Yes	Yes
7	7	44	38	41	<b>47</b>	Yes	Yes	Yes
8	8	43	37	40	<b>45</b>	Yes	Yes	Yes
9	9	42	35	39	<b>44</b>	Yes	Yes	Yes
10	10	41	34	37	<b>43</b>	Yes	Yes	Yes
11	11	40	34	37	<b>42</b>	Yes	Yes	Yes
12	12	39	32	36	<b>41</b>	Yes	Yes	Yes
13	13	39	32	35	<b>41</b>	Yes	Yes	Yes
14	14	38	31	34	<b>40</b>	Yes	Yes	Yes

**Notes:** 1. Standard receiver elevation is five feet above grade/pad elevations at the receiver location(s)



Appendix D

**FHWA Traffic Noise Prediction Model (FHWA-RD-77-108)**

**Noise Barrier Effectiveness Prediction Worksheet**

**Project Information:**

Job Number: Sierra Vista SP  
 Description 2025 CIP + Project  
 Roadway Name: Upland Drive  
 Location(s): 9

**Noise Level Data:**

Year: 2025  
 Auto L<sub>dn</sub>, dB: 57  
 Medium Truck L<sub>dn</sub>, dB: 50  
 Heavy Truck L<sub>dn</sub>, dB: 52

**Site Geometry:**

Receiver Description: Project Site  
 Centerline to Barrier Distance (C<sub>1</sub>): 47  
 Barrier to Receiver Distance (C<sub>2</sub>): 15  
 Automobile Elevation: 0  
 Medium Truck Elevation: 2  
 Heavy Truck Elevation: 8  
 Pad/Ground Elevation at Receiver: 0  
 Receiver Elevation<sup>1</sup>: 5  
 Base of Barrier Elevation: 0  
 Starting Barrier Height 6

**Barrier Effectiveness:**

Top of Barrier Elevation (ft)	Barrier Height <sup>2</sup> (ft)	----- L <sub>dn</sub> , dB -----				Barrier Breaks Line of Sight to...		
		Autos	Medium Trucks	Heavy Trucks	Total	Autos?	Medium Trucks?	Heavy Trucks?
6	6	50	44	47	<b>53</b>	Yes	Yes	Yes
7	7	49	42	47	<b>52</b>	Yes	Yes	Yes
8	8	48	41	45	<b>50</b>	Yes	Yes	Yes
9	9	47	40	44	<b>49</b>	Yes	Yes	Yes
10	10	46	39	43	<b>48</b>	Yes	Yes	Yes
11	11	45	38	42	<b>47</b>	Yes	Yes	Yes
12	12	44	37	41	<b>46</b>	Yes	Yes	Yes
13	13	43	36	40	<b>45</b>	Yes	Yes	Yes
14	14	42	36	39	<b>45</b>	Yes	Yes	Yes

**Notes:** 1. Standard receiver elevation is five feet above grade/pad elevations at the receiver location(s)



Appendix D

**FHWA Traffic Noise Prediction Model (FHWA-RD-77-108)**

**Noise Barrier Effectiveness Prediction Worksheet**

**Project Information:**

Job Number: Sierra Vista SP  
 Description 2025 CIP + Project  
 Roadway Name: Upland Drive  
 Location(s): 10

**Noise Level Data:**

Year: 2025  
 Auto L<sub>dn</sub>, dB: 55  
 Medium Truck L<sub>dn</sub>, dB: 47  
 Heavy Truck L<sub>dn</sub>, dB: 50

**Site Geometry:**

Receiver Description: Project Site  
 Centerline to Barrier Distance (C<sub>1</sub>): 77  
 Barrier to Receiver Distance (C<sub>2</sub>): 15  
 Automobile Elevation: 0  
 Medium Truck Elevation: 2  
 Heavy Truck Elevation: 8  
 Pad/Ground Elevation at Receiver: 0  
 Receiver Elevation<sup>1</sup>: 5  
 Base of Barrier Elevation: 0  
 Starting Barrier Height 6

**Barrier Effectiveness:**

Top of Barrier Elevation (ft)	Barrier Height <sup>2</sup> (ft)	----- L <sub>dn</sub> , dB -----				Barrier Breaks Line of Sight to...		
		Autos	Medium Trucks	Heavy Trucks	Total	Autos?	Medium Trucks?	Heavy Trucks?
6	6	48	42	44	50	Yes	Yes	Yes
7	7	47	40	44	49	Yes	Yes	Yes
8	8	46	39	42	48	Yes	Yes	Yes
9	9	45	38	41	47	Yes	Yes	Yes
10	10	44	37	40	46	Yes	Yes	Yes
11	11	43	36	39	45	Yes	Yes	Yes
12	12	42	35	38	44	Yes	Yes	Yes
13	13	41	34	37	43	Yes	Yes	Yes
14	14	40	34	36	42	Yes	Yes	Yes

**Notes:** 1. Standard receiver elevation is five feet above grade/pad elevations at the receiver location(s)



Appendix D

**FHWA Traffic Noise Prediction Model (FHWA-RD-77-108)**

**Noise Barrier Effectiveness Prediction Worksheet**

**Project Information:**

Job Number: Sierra Vista SP  
 Description 2025 CIP + Project  
 Roadway Name: Road "B"  
 Location(s): 11

**Noise Level Data:**

Year: 2025  
 Auto L<sub>dn</sub>, dB: 59  
 Medium Truck L<sub>dn</sub>, dB: 52  
 Heavy Truck L<sub>dn</sub>, dB: 54

**Site Geometry:**

Receiver Description: Project Site  
 Centerline to Barrier Distance (C<sub>1</sub>): 73  
 Barrier to Receiver Distance (C<sub>2</sub>): 15  
 Automobile Elevation: 0  
 Medium Truck Elevation: 2  
 Heavy Truck Elevation: 8  
 Pad/Ground Elevation at Receiver: 0  
 Receiver Elevation<sup>1</sup>: 5  
 Base of Barrier Elevation: 0  
 Starting Barrier Height 6

**Barrier Effectiveness:**

Top of Barrier Elevation (ft)	Barrier Height <sup>2</sup> (ft)	----- L <sub>dn</sub> , dB -----				Barrier Breaks Line of Sight to...		
		Autos	Medium Trucks	Heavy Trucks	Total	Autos?	Medium Trucks?	Heavy Trucks?
6	6	53	46	49	<b>55</b>	Yes	Yes	Yes
7	7	52	45	48	<b>54</b>	Yes	Yes	Yes
8	8	50	44	47	<b>53</b>	Yes	Yes	Yes
9	9	49	43	46	<b>52</b>	Yes	Yes	Yes
10	10	48	42	45	<b>51</b>	Yes	Yes	Yes
11	11	48	41	44	<b>50</b>	Yes	Yes	Yes
12	12	46	40	43	<b>49</b>	Yes	Yes	Yes
13	13	46	39	42	<b>48</b>	Yes	Yes	Yes
14	14	45	38	41	<b>47</b>	Yes	Yes	Yes

**Notes:** 1. Standard receiver elevation is five feet above grade/pad elevations at the receiver location(s)



## Appendix E

### ANSI Procedure for Calculating Percent Awakening

**Project Name:** Sierra Vista Specific Plan

**Job Number:** 2009-120

**Noise Source:** Aircraft

**Site:** 1

#### One-Third Octave Band Center Frequency (Hz)

125	160	200	250	315	400	500	630	800	1K	1.25K	1.6K	2K	2.5K	3.15K	4K
-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-------	------	----	------	-------	----

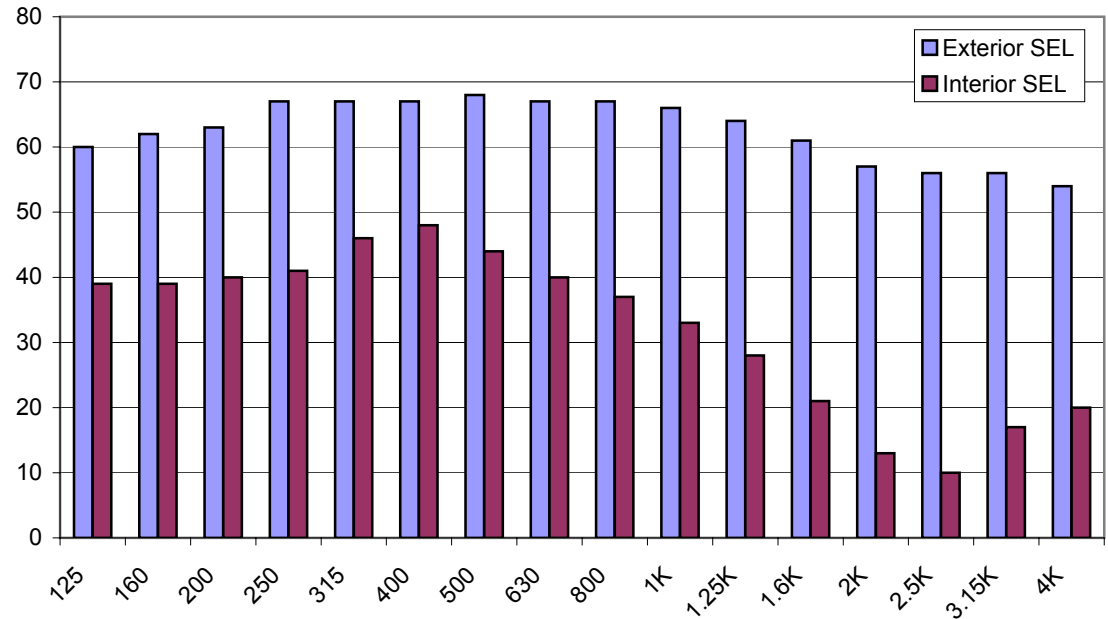
#### Noise Source Information:

Aircraft - McClellan Mean	-17	-15	-14	-10	-10	-10	-9	-10	-10	-11	-13	-16	-20	-21	-21	-23
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Exterior SEL, dB</b>	60	62	63	67	67	67	68	67	67	66	64	61	57	56	56	54
Window - 1/8*1/4*1/8 STC28																
TL of Window	21	23	23	26	21	19	24	27	30	33	36	40	44	46	39	34
<b>Interior SEL, dB</b>	39	39	40	41	46	48	44	40	37	33	28	21	13	10	17	20

Date	Time	SEL >75
<b>Thursday, May 28, 2009</b>	<b>6:22 AM</b>	<b>76.9</b>
<b>Thursday, May 28, 2009</b>	<b>6:39 AM</b>	<b>75.1</b>
Thursday, May 28, 2009	9:44 AM	75.3
Thursday, May 28, 2009	1:22 PM	75.0
Thursday, May 28, 2009	1:40 PM	76.4
Thursday, May 28, 2009	2:02 PM	76.2
Thursday, May 28, 2009	9:56 PM	78.4
Friday, May 29, 2009	12:10 PM	78.5

Mean Exterior SEL: 77  
 Mean Interior SEL<sup>1</sup>: 52  
 Number of Nighttime Events: 2  
**Percent Awakened: 3.4%**

<sup>1</sup>Assumes a typical exterior-to-interior noise level reduction (NLR) of 25 dB provided by STC 28 windows and modern construction practices.



Source: ANSI/ASA S12.9-2008 / Part 6 - Quantities and Procedures for Description and Measurement of Environmental Sound - Part 6: Methods for Estimation of Awakenings Associated with Outdoor Noise Events Heard in Homes.