Appendix 2 Noise Report

El Dorado County

Green Valley Road Corridor

Noise Study

July 2014

rincon

Environmental Scientists Planners Engineers

Green Valley Road Corridor

Noise Study

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GREEN VALLEY ROAD CORRIDOR
EL DORADO COUNTY
NOISE STUDY

This report is an analysis of existing traffic noise exposure along the Green Valley Road Corridor located in El Dorado County. The report has been prepared by Rincon Consultants, Inc. under contract to Kittelson & Associates, to assess existing noise related to traffic on Green Valley Road. The purpose of this study is to analyze the Corridor's existing noise levels and noise exposure from transportation-related sources.

EXISTING NOISE SETTING

Overview of Sound Measurement

Noise level (or volume) is generally measured in decibels (dB) using the A-weighted sound pressure level (dBA). The A-weighting scale is an adjustment to the actual sound pressure levels to be consistent with that of human hearing response, which is most sensitive to frequencies around 4,000 Hertz (about the highest note on a piano) and less sensitive to low frequencies (below 100 Hertz).

Sound pressure level is measured on a logarithmic scale with the 0 dB level based on the lowest detectable sound pressure level that people can perceive (an audible sound that is not zero sound pressure level). Based on the logarithmic scale, a doubling of sound energy is equivalent to an increase of 3 dBA, and a sound that is 10 dBA less than the ambient sound level has no effect on ambient noise. Because of the nature of the human ear, a sound must be about 10 dBA greater than the reference sound to be judged as twice as loud. In general, a 3 dBA change in community noise levels is noticeable, while 1-2 dBA changes generally are not perceived. Quiet suburban areas typically have noise levels in the range of 40-50 dBA, while arterial streets are in the 50-60+ dBA range. Normal conversational levels are in the 60-65 dBA range, and ambient noise levels greater than 65 dBA can interrupt conversations.

Noise levels typically attenuate (or drop off) at a rate of 6 dBA per doubling of distance from point sources (such as industrial machinery). Noise from lightly traveled roads typically attenuates at a rate of about 4.5 dB per doubling of distance. Noise from heavily traveled roads typically attenuates at about 3 dB per doubling of distance. Noise levels may also be reduced by intervening structures; generally, a single row of buildings between the receptor and the noise source reduces the noise level by about 5 dBA, while a solid wall or berm reduces noise levels by 5 to 10 dBA. Standard new residential construction typically provides a reduction of exterior-to-interior noise levels of 25 dBA or more with windows closed (Federal Transit Administration, May 2006).

In addition to the actual instantaneous measurement of sound levels, the duration of sound is important since sounds that occur over a long period of time are more likely to be an annoyance or cause direct physical damage or environmental stress. One of the most frequently used noise metrics that considers both duration and sound power level is the equivalent noise level (Leq). The Leq is defined as the single steady A-weighted level that is equivalent to the same amount

of energy as that contained in the actual fluctuating levels over a period of time (essentially, the average noise level). Typically, Leq is summed over a one-hour period. Lmax is the highest RMS (root mean squared) sound pressure level within the measuring period, and Lmin is the lowest RMS sound pressure level within the measuring period.

The time period in which noise occurs is also important since noise that occurs at night tends to be more disturbing than that which occurs during the day. Community noise is usually measured using Day-Night Average Level (Ldn), which is the 24-hour average noise level with a 10-dBA penalty for noise occurring during nighttime (10 p.m. to 7 a.m.) hours, or Community Noise Equivalent Level (CNEL), which is the 24-hour average noise level with a 5 dBA penalty for noise occurring from 7 p.m. to 10 p.m. and a 10 dBA penalty for noise occurring from 10 p.m. to 7 a.m. Noise levels described by Ldn and CNEL usually do not differ by more than 1 dB.

Green Valley Road Site Setting

The focus of this noise study is along a portion of Green Valley Road located in El Dorado County, and spanning over approximately ten miles beginning just outside the City of Folsom and passing through the communities of El Dorado Hills, Cameron Park, and Rescue. The project area contains numerous hills and varying height elevations. As part of the traffic study, Kittelson & Associates divided the project area into study segments and pinpointed intersections where traffic count data was collected. The segments and intersections included in the project area include the following:

Green Valley Road Segments:

1. County line to Sophia Parkway
2. Sophia Parkway to Francisco Drive
3. Francisco Drive to El Dorado Hills Blvd./Salmon Falls Road
4. El Dorado Hills Blvd./Salmon Falls Road to Silva Valley Parkway/Allegheny Road
5. Silva Valley Parkway/Allegheny Road to Malcolm Dixon Road
6. Malcolm Dixon Road to Deer Valley Road (West)
7. Deer Valley Road (West) to Bass Lake Road
8. Bass Lake Road to Cameron Park Drive
9. Cameron Park Drive to Ponderosa Road
10. Ponderosa Road to N. Shingle Road
11. N. Shingle Road to Lotus Road

Intersections

1. Green Valley Road at Sophia Parkway
2. Green Valley Road at Francisco Drive
3. Green Valley Road at El Dorado Hills Blvd./Salmon Falls Road
4. Green Valley Road at Silva Valley Parkway/Allegheny Road
5. Green Valley Road at Deer Valley Road (West)
6. Green Valley Road at Bass Lake Road
7. Green Valley Road at Cambridge Road/Peridot Drive
8. Green Valley Road at Cameron Park Drive/Starbuck Road
9. Green Valley Road at Deer Valley Road (East)
10. Green Valley Road at Ponderosa Road

11. Green Valley Road at N. Shingle Road
12. Green Valley Road at Lotus Road
13. Green Valley Road at Loch Way
14. Green Valley Road at Malcolm Dixon Road
15. Green Valley Road at Rocky Springs Road/Steves Way
16. Green Valley Road at Pleasont Grove Middle School

The most prominent sources of noise in the project vicinity are motor vehicles (e.g., automobiles, buses, trucks, and motorcycles) along Green Valley Road. Motor vehicle noise from Green Valley Road is a major influence on noise levels to nearby sensitive receptors due to the substantial level and speed of traffic, especially during peak hours. Motor vehicle noise is of concern because it is characterized by a high number of individual events, which often create a sustained noise level, and because of its proximity to noise sensitive uses. In general, Green Valley Road consists of one or two lanes in each direction with speed limits of 40 miles per hour (mph)-50 mph.

The surrounding area is characterized by hills. This results in both Green Valley Road and surrounding sensitive noise receptors to be at various heights, which may affect how traffic noise travels and its associated impact to nearby noise receptors. Additionally, the speed limits on Green Valley Road may frequently change due to vehicles needing to slow down around wide turns. Because vehicles may be constantly accelerating and decelerating, this can also be a factor influencing the level of traffic noise.

Regulatory Setting

Noise exposure goals for various types of land uses reflect the varying noise sensitivities associated with those uses. The El Dorado County General Plan Public Health, Safety, and Noise Elements describe a variety of land use and development types as noise sensitive including but not limited to residences, lodging, hospitals, churches, schools, parks, and office buildings. Maximum allowable noise standards for transportation noise sources are established according to land use as shown in Table 1. The segments of Green Valley Road that the project area comprises begin at the county line near Sophia Parkway and extend approximately 10 miles to Lotus Road. Sensitive receptors along this Corridor include numerous residences, at least two public schools, and a church.

Table 1
Maximum Allowable Noise Exposure for Transportation Noise Sources

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

Source: El Dorado County Public Health, Safety, and Noise Element. July 2004 (Amended March 2009)
Notes:
[1] In Communities and Rural Centers, where the location of outdoor activity areas is not clearly defined, the exterior noise level standard shall be applied to the property line of the receiving land use. For residential uses with front yards facing the identified noise source, an exterior noise level criterion of 65 dB L_{dn} shall be applied at the building façade, in addition to a 60 dB L_{dn} criterion at the outdoor activity area. In Rural Regions, an exterior noise level criterion of 60 dB L_{dn} shall be applied at a 100 foot radius from the residence unless it is within Platted Lands where the underlying land use designation is consistent with Community Region densities in which case the 65 dB L_{dn} may apply. The 100-foot radius applies to properties which are five acres and larger; the balance will fall under the property line requirement.
[2] As determined for a typical worse-case hour during periods of use.
[3]Where it is not possible to reduce noise in outdoor activity areas to 60 dB L_{dn}/CNEL or less using a practical application of the best-available noise reduction measures, an exterior noise level of up to 65 dB L_{dn}/CNEL may be allowed provided that available exterior noise level reduction measures have been implemented and interior noise levels are in compliance with this table.

Sensitive Receptors

There are various land uses along Green Valley Road. From the county line just outside the city of Folsom limits to El Dorado Hills Boulevard there are various commercial-use properties such as restaurants, gas stations, and supermarkets. The nearest sensitive receptors on this segment are residences that sit on hills behind these commercial-use properties. From El Dorado Hills to Bass Lake Road the land uses along the Corridor become more rural-residential, with large ranch-sized properties (greater than one-acre lot sizes) and undeveloped land between more densely-populated neighborhoods containing single-family homes with multiple units per acre. In addition to the residences along Green Valley Road that are sensitive receptors in this segment, there is also a church near Loch Way. Sensitive receptors are higher in density on this stretch proceeding east, due to the presence of Pleasant Grove Middle School and the neighborhood surrounding it. From Bass Lake Road to Cameron Park Drive the density of single-home residences increases. Proceeding generally east on Green Valley Road from Cameron Park Drive to Lotus Way, surrounding land-uses transition back to rural-residential, with an increasing density of trees on the side of the road and ranch-style homes. Sensitive

receptors along this stretch of Green Valley Road include Rescue Elementary School and the Rescue Community Center.

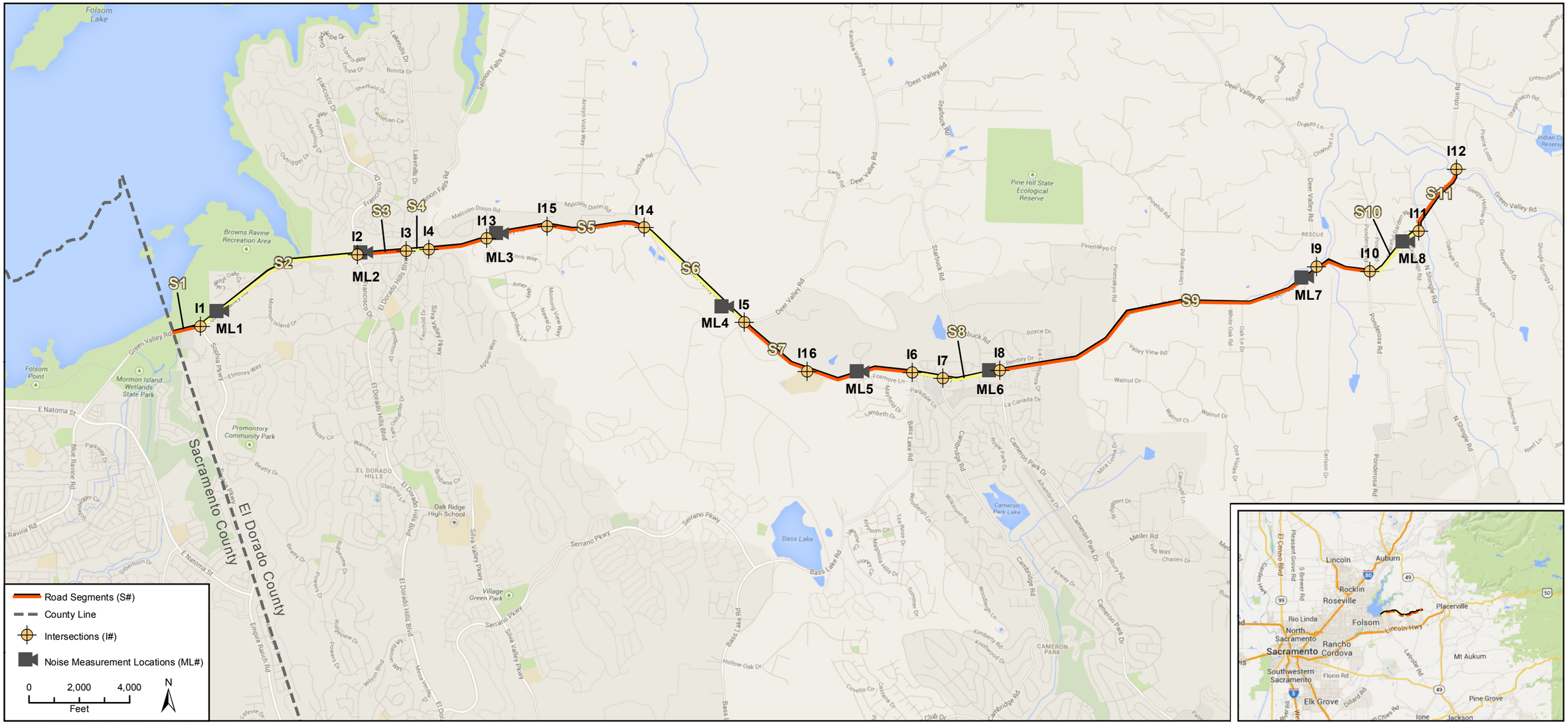
Summary of Findings

Methodology

Traffic Data Collection for the Green Valley Road Traffic Study occurred between May 3rd and May 9th, 2014 on the established study segments. To determine existing noise levels on the project site, eight weekday afternoon 15-minute noise measurements were taken using a Rion NL-21 sound level meter on May 7th and May 8th, 2014. The date and locations of noise measurements were selected to correlate and to be consistent with the traffic data collection study time and location as well. These on-site measurements provide existing noise levels during the 3p.m.-6p.m. peak hour period, which are primarily due to roadway noise from Green Valley Road. Figure 1 shows the on-site noise measurement locations and Table 2 identifies the measured noise levels.

In addition to noise measurements, for calibration, existing traffic noise along Green Valley Road was also calculated using the Federal Highway Administration Traffic Noise Model (TNM) Version 2.5 (U.S. Department of Transportation, Federal Highway Administration [FHWA], April 2004) (noise modeling data sheets are provided in the Appendix). The model calculations are based on the traffic counts performed by Kittelson and contained within the traffic study (June 2014).

Green Valley Road Noise Measurement Locations



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Intersections (I#)

I1 - Green Valley Road at Sophia Parkway
I2 - Green Valley Road at Francisco Drive
I3 - Green Valley Road at El Dorado Hills Blvd./Salmon Falls Road
I4 - Green Valley Road at Silva Valley Parkway/Allegheny Road
I5 - Green Valley Road at Deer Valley Road (West)
I6 - Green Valley Road at Bass Lake Road
I7 - Green Valley Road atCambridge Road/Peridot Drive
I8 - Green Valley Road at Cameron Park Drive/Starbuck Road
I9 - Green Valley Road at Deer Valley Road (East)
I10 - Green Valley Road at Ponderosa Road
I11 Green Valley Road at N. Shingle Road
I12 - Green Valley Road at Lotus Road
I13 - Green Valley Road at Loch Way
I14 - Green Valley Road at Malcolm Dixon Road
I15 - Green Valley Road at Rocky Springs Road/Steves Way
I16 - Green Valley Road at Pleasant Grove Middle School

Road Segments (S1)

S1 - County LIne to Sophia Parkway
S2 - Sophia Parkway to Francisco Drive
S3 - Francisco Drive to El Dorado Hills Blvd/Salmon Falls Road
S4 - El Dorado Hills Blvd/Salmon Falls Road to Silva Valley Parkway/Allegheny Road
S5 - Silva ValleyParkway/Allegheny Road to Malcolm Dixon Road
S6 - Malcolm Dixon Road to Deer Valley Road (West)
S7 - Deer Valley Road (West) to Bass Lake Road
S8 - Bass Lake Road to Cameron Park Drive
S9 - Cameron Park Drive to Ponderosa Road
S10 - Ponderosa Road to N. Shingle Road
S11 - N. Shingle Road to Lotus Road

Noise Measurement Locations

Figure 1

Table 2
On-Site Noise Measurement Results

Measurement Number	Measurement Location	Distance from Nearest Roadway[1]	Sample Time	Leq (dBA)
1	Green Valley Road near Sophia Parkway, next to Chevron Gas Station	45ft	Weekday between 3 and 6pm	70.7
2	Green Valley Road near Francisco Drive, in front of Chase Bank	50ft	Weekday between 3 and 6pm	68.3
3	Green Valley Road near Loch Way, entrance of church	42ft	Weekday between 3 and 6pm	69.2
4	Green Valley Road near Deer Valley Road (West), at mouth of abandoned road (Old Green Valley Road)	35ft	Weekday between 3 and 6pm	71.8
5	Green Valley Road at entrance of Travois Circle (between Alexandrite Drive and Bass Lake Drive, residential neighborhood	40ft	Weekday between 3 and 6pm	70.8
6	Green Valley Road near Cameron Park Drive/Starbuck Road, Rite-Aid parking lot	40ft	Weekday between 3 and 6pm	65.7
7	Green Valley Road near Deer Valley Road (East), Rescue Community Center	25ft	Weekday between 3 and 6pm	69.7
8	Green Valley Road near N. Shingle Road, entrance of Dunnings Road.	30ft	Weekday between 3 and 6pm	67.5

Source: Field visit on May 7th, 2014 and May 8th, 2014 using Rion NL-21 sound level meter.
1: Distance is approximate from the centerline of Green Valley Road.
2: L_{eq} refers to equivalent continuous sound pressure level [dB] Refer to Figure 1 for noise measurement locations.
Refer to the Appendix for noise monitoring data sheets

Table 3 contains the noise calculations based on the existing traffic at each of the eight segments and the anticipated noise levels at sensitive receptors in close proximity to the roadway. Existing noise levels were calculated using the FHWA TNM Version 2.5. Noise modeling was conducted on the same areas where measurements were taken (as listed in Table 2). These areas are where sensitive receivers and traffic volumes on Green Valley Road are most heavily concentrated; and thus, are the locations anticipated to have the highest noise levels associated with traffic on the roadway. Noise calculations are based on traffic volumes provided in the Traffic Impact Study (Kittelson, 2014). Related information on roadway geometrics, speeds and terrain elevation were incorporated into the model. Table 3 shows modeled noise levels associated with existing traffic conditions.

Table 3
TNM Noise Modeling Results

Location No.	Receiver	Measured Leq (dBA)*	Modeled Leq (dBA)**
1	Green Valley Road near Sophia Parkway, next to Chevron Gas Station	70.7	71.3
2	Green Valley Road near Francisco Drive, in front of Chase Bank	68.3	69.4
3	Green Valley Road near Loch Way, entrance of church	69.2	71.4
4	Green Valley Road near Deer Valley Road (West), at mouth of abandoned road (Old Green Valley Road)	71.8	73.9
5	Green Valley Road at entrance of Travois Circle (between Alexandrite Drive and Bass Lake Drive, residential neighborhood	69.7	69.7
6	Green Valley Road near Cameron Park Drive/Starbuck Road, Rite-Aid parking lot	65.7	66
7	Green Valley Road near Deer Valley Road (East), Rescue Community Center	69.7	71.2
8	Green Valley Road near N. Shingle Road, entrance of Dunnings Road.	67.5	68.3

** Measured results as shown in Table 2 above.*
*** Modeled results are contained in full in the Appendix.*

As shown in Table 3, the modeled noise levels are fairly accurate when compared to the measured noise level. Although the modeled noise levels for each of the measurement locations showed simulated results that were fairly consistent with slight variation to the measured noise levels, the difference in dBA (approximately 2.2 or less) is not to a degree that is generally perceptible to the human ear. As previously mentioned in the Overview of Sound Measurement, in general, a 3 dBA change in community noise levels is noticeable, while 1-2 dBA changes generally are not perceived. The TNM noise model is designed to model existing traffic noise exclusively. Due to the nature of the area, which is characterized by hills, frequent change in elevation, and changes in vehicle speeds due to curvature in the road at various

points throughout the Green Valley Corridor, there are factors not replicated in the TNM noise model that create variations in measured noise level.

The noise measurement locations were on the side of roadways on public space where entry and access was both safe and legally permissible. Although these measurement locations are intended to characterize sound levels to nearby sensitive receptors, the receptors in question generally are further away from the road centerline than the measurement locations but have restricted access. Therefore, to provide a general estimate of exterior noise levels at nearby sensitive receptors, in addition to the noise measurement locations, some sensitive receptors nearest to the road centerline were selected as sample noise receivers to be modeled in TNM for each of the road segments of the traffic study where a noise measurement was taken. These sample sensitive receptors include private residences, a school, and a church along the Green Valley Corridor. The modeled exterior noise levels at sensitive receptors are shown in Table 4.

Table 4
TNM Noise Modeling Results for Nearby Sensitive Receptors

Location No.	Receiver	Nearby Sensitive Receptors	Distance from Centerline	Modeled Leq (dBA)
1	Green Valley Road near Sophia Parkway, next to Chevron Gas Station	Residences (3 total)	200-275 feet	63.1 63.0 60.5
2	Green Valley Road near Francisco Drive, in front of Chase Bank	Residences	60-100 feet	65.7 67.8
3	Green Valley Road near Loch Way, entrance of church	Church	150 feet	62.7
4	Green Valley Road near Deer Valley Road (West), at mouth of abandoned road (Old Green Valley Road)	Residences	46 feet	71.3
5	Green Valley Road at entrance of Travois Circle (between Alexandrite Drive and Bass Lake Drive, residential neighborhood	Residence, School	61 feet, 200 feet	67.0 63.4
6	Green Valley Road near Cameron Park Drive/Starbuck Road, Rite-Aid parking lot	Residences	70 feet	62.1 62.1
7	Green Valley Road near Deer Valley Road (East), Rescue Community Center	Community Center, Residence	100 feet, 50 feet	64.0 67.1
8	Green Valley Road near N. Shingle Road, entrance of Dunnings Road.	Residence	75 feet	63.3

The modeled noise levels for nearby sensitive receptors will differ from the actual noise measurement locations due to the difference in distance from the road centerline. It is also important to note that these sensitive receptors generally sit at higher elevations and behind hills, fences, or natural sound barriers, unlike the noise measurement locations that were at grade-level and in closer proximity to exterior noise sources. As stated in Overview of Noise Measurements, standard residential construction typically provides a reduction of exterior-to-interior noise levels of 25 dBA or more with windows closed in addition to other natural sound

barriers.These factors are not considered or replicated in the TNM model. Therefore, the existing noise levels for nearby sensitive receptors are likely lower than modeled in TNM.

Nevertheless, if traffic noise levels at sensitive receptors along Green Valley Road exceed County noise standards for existing exterior or interior sound levels, the following general noise reducing measures could reduce noise levels:

- Retrofit of existing structures with sound attenuating building materials where feasible
- Replace existing windows with dual-paned windows
- Install solid core exterior doors with perimeter weather stripping,
- Install air conditioning systems so that windows and doors may remain closed and situate exterior doors away from roadways.
- Relocate roof and attic vents away from Green Valley Road or other roadways.

In instances where use of these interior noise-reducing techniques is not feasible, the use of exterior noise-reducing sound barriers (earthen berms, sound walls, or some combination of the two) could be considered. Whenever possible, a combination of elements should be used, including solid fences, walls, and landscaped berms. Implementation of noise reducing measures (both exterior and interior if applicable) is expected to achieve an interior noise level reduction of approximately 25-30 dBA or greater as well as attenuate exterior noise levels to acceptable levels and would assure that sensitive receptors are not exposed to interior noise levels in excess of County standards.

REFERENCES

El Dorado County. *Public Health, Safety, and Noise Element*. July 2004 (Amended March 2009)

Federal Transit Administration. *Noise and Vibration Manual*. May 2006. Accessed at http://www.fta.dot.gov/documents/FTA_Noise_and_Vibration_Manual.pdf

Kittelson & Associates, Inc. *Summary of Segment Speed Data and Segment Traffic*. June 2014.

U.S. Department of Transportation, Federal Highway Administration. Traffic Noise Model version 2.5. April 2004.

Appendix

Noise Measurement Results
TNM 2.5 Modeling Results

Chevron Gas Station		Time	Measurme	**LAeq**	LAE	LAmax	LAmin	LA10	LA33	LA50	LA90	LA95	Lppeak	Over	Under	Pause
	1	5/2/2014 8:23	0:15:00	**70.7**	100.2	85.3	44.6	74.6	69.9	67.5	55.5	52.3	106	-	-	-
Chase Bank		Time	Measurme	**LAeq**	LAE	LAmax	LAmin	LA10	LA33	LA50	LA90	LA95	Lppeak	Over	Under	Pause
	2	5/2/2014 8:53	0:15:00	**68.3**	97.8	90.1	47.6	70.6	66.2	63.8	56.3	54.5	107	-	-	-
Church		Time	Measurme	**LAeq**	LAE	LAmax	LAmin	LA10	LA33	LA50	LA90	LA95	Lppeak	Over	Under	Pause
	3	5/2/2014 9:37	0:15:00	**69.2**	98.8	84.6	37.2	73.6	69.1	66.1	47.5	43.7	99.4	-	-	-
Abandoned Road		Time	Measurme	**LAeq**	LAE	LAmax	LAmin	LA10	LA33	LA50	LA90	LA95	Lppeak	Over	Under	Pause
	4	5/2/2014 17:24	0:15:00	**71.8**	101.3	89	40.6	76.4	71.4	66.7	49.6	47.3	104.8	-	-	-
Travois Circle		Time	Measurme	**LAeq**	LAE	LAmax	LAmin	LA10	LA33	LA50	LA90	LA95	Lppeak	Over	Under	Pause
	5	5/2/2014 17:48	0:15:00	**70.8**	100.3	83.7	43.3	74.8	71.1	68.2	52.8	50.1	103.9	-	-	-
Rite Aid		Time	Measurme	**LAeq**	LAE	LAmax	LAmin	LA10	LA33	LA50	LA90	LA95	Lppeak	Over	Under	Pause
	6	5/2/2014 18:21	0:15:00	**65.7**	95.2	80.7	50.2	69.7	65.5	62.7	55.9	54.4	98.8	-	-	-
Community Center		Time	Measurme	**LAeq**	LAE	LAmax	LAmin	LA10	LA33	LA50	LA90	LA95	Lppeak	Over	Under	Pause
	7	5/2/2014 18:45	0:15:00	**69.7**	99.2	88.1	40.1	74.1	67.1	61	47	45.2	106.6	-	-	-
Dunnings Road Neighborho		Time	Measurme	**LAeq**	LAE	LAmax	LAmin	LA10	LA33	LA50	LA90	LA95	Lppeak	Over	Under	Pause
	8	5/2/2014 19:09	0:15:00	**67.5**	97.1	81.3	38.1	72.3	64.7	58.8	44.8	43	100.3	-	-	-

Rincon Consultants, Inc.
<Analysis By?>

2 July 2014
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: Green Valley Corridor Noise Study
RUN: Chevron Gas Station
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 75 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier					With Barrier			
				LAeq1h		Increase over existing		Type Impact	Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Residence	1	1	0.0	63.1	66	63.1	10	----	63.1	0.0	8	-8.0
Residence	2	1	0.0	63.0	66	63.0	10	----	63.0	0.0	8	-8.0
Residence	3	1	0.0	60.5	66	60.5	10	----	60.5	0.0	8	-8.0
Measurement Location	4	1	0.0	71.3	66	71.3	10	Snd Lvl	71.3	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	4	0.0	0.0	0.0
All Impacted	1	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Rincon Consultants, Inc.
<Analysis By?>

2 July 2014
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: Green Valley Corridor Noise Study
RUN: Chase Bank
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 75 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	No Barrier LAeq1h Crit'n	Increase over existing Calculated	Increase over existing Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Noise Reduction Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Measurement Location	1	1	0.0	69.4	66	69.4	10	Snd Lvl	69.4	0.0	8	-8.0
Residence	2	1	0.0	65.7	66	65.7	10	----	65.7	0.0	8	-8.0
Residence	3	1	0.0	67.8	66	67.8	10	Snd Lvl	67.8	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Noise Reduction Avg	Noise Reduction Max
		dB	dB	dB
All Selected	3	0.0	0.0	0.0
All Impacted	2	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Rincon Consultants, Inc.
<Analysis By?>

2 July 2014
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: Green Valley Corridor Noise Study
RUN: Church
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 71 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	No Barrier LAeq1h Crit'n	Increase over existing Calculated	Increase over existing Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Noise Reduction Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Measurement Location	1	1	0.0	71.4	66	71.4	10	Snd Lvl	71.4	0.0	8	-8.0
Church	2	1	0.0	62.7	66	62.7	10	----	62.7	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Noise Reduction Avg	Noise Reduction Max
		dB	dB	dB
All Selected	2	0.0	0.0	0.0
All Impacted	1	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Rincon Consultants, Inc.
<Analysis By?>

2 July 2014
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: Green Valley Corridor Noise Study
RUN: Abandoned Road
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier					With Barrier			
				LAeq1h		Increase over existing		Type Impact	Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Residence	1	1	0.0	71.3	66	71.3	10	Snd Lvl	71.3	0.0	8	-8.0
Resience	2	1	0.0	71.3	66	71.3	10	Snd Lvl	71.3	0.0	8	-8.0
Measurement Location	3	1	0.0	73.9	66	73.9	10	Snd Lvl	73.9	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	3	0.0	0.0	0.0
All Impacted	3	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Rincon Consultants, Inc.
<Analysis By?>

2 July 2014
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: Green Valley Corridor Noise Study
RUN: Travois Circle
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	LAeq1h Crit'n	Increase over existing Calculated	Increase over existing Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Noise Reduction Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Measurement Location	1	1	0.0	69.7	66	69.7	10	Snd Lvl	69.7	0.0	8	-8.0
Residence	2	1	0.0	67.0	66	67.0	10	Snd Lvl	67.0	0.0	8	-8.0
School	3	1	0.0	63.4	66	63.4	10	----	63.4	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	3	0.0	0.0	0.0
All Impacted	2	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Rincon Consultants, Inc.
<Analysis By?>

2 July 2014
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: Green Valley Corridor Noise Study
RUN: Rite Aid
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier					With Barrier			
				LAeq1h		Increase over existing		Type Impact	Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Measurement Location	1	1	0.0	66.0	66	66.0	10	Snd Lvl	66.0	0.0	8	-8.0
Residence	2	1	0.0	62.1	66	62.1	10	----	62.1	0.0	8	-8.0
Residence	3	1	0.0	62.1	66	62.1	10	----	62.1	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	3	0.0	0.0	0.0
All Impacted	1	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Rincon Consultants, Inc.
<Analysis By?>

2 July 2014
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: Green Valley Corridor Noise Study
RUN: Community Center
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	No Barrier LAeq1h Crit'n	Increase over existing Calculated	Increase over existing Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Noise Reduction Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Measurement Location	1	1	0.0	71.2	66	71.2	10	Snd Lvl	71.2	0.0	8	-8.0
Rescue Community Center	2	1	0.0	64.0	66	64.0	10	----	64.0	0.0	8	-8.0
Residence	3	1	0.0	67.1	66	67.1	10	Snd Lvl	67.1	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Noise Reduction Avg	Noise Reduction Max
		dB	dB	dB
All Selected	3	0.0	0.0	0.0
All Impacted	2	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Rincon Consultants, Inc.
<Analysis By?>

2 July 2014
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: Green Valley Corridor Noise Study
RUN: Dunnings Road Neighborhood
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	No Barrier LAeq1h Crit'n	Increase over existing Calculated	Increase over existing Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	With Barrier Noise Reduction Calculated	With Barrier Noise Reduction Goal	With Barrier Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Measurement Location	1	1	0.0	68.3	66	68.3	10	Snd Lvl	68.3	0.0	8	-8.0
Residence	2	1	0.0	63.3	66	63.3	10	----	63.3	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Noise Reduction Avg	Noise Reduction Max
		dB	dB	dB
All Selected	2	0.0	0.0	0.0
All Impacted	1	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0