RETROFIT NOISE BARRIER STUDY

STATE ROUTE 14
FROM HILLCREST AVENUE TO MATTHEW AVENUE
IN THE CITY OF ROSAMOND

KERN COUNCIL OF GOVERNMENTS

February 2011

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February 2011

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I. EXECUTIVE SUMMARY

The Kern Council of Governments (Kern COG) has identified ten locations throughout Kern County, based on citizen requests over the last 10 years, that are potentially exposed to excessive traffic noise levels from vehicles operating on State facilities. The purpose of this retrofit noise barrier study is to assist Kern COG in identifying impacted noise-sensitive receptors at these locations and evaluate the need for and benefit of retrofit noise barriers along portions of State Route 99 (SR 99) and State Route 58 (SR 58) in the City of Bakersfield, and along a portion of State Route 14 (SR 14) in the City of Rosamond.

The Kern COG has adopted California Department of Transportation's (Caltrans) qualification criteria for retrofit noise abatement projects. Impacted locations are those that are identified as being exposed to traffic noise levels that exceed 67 dBA L_{eq}(h). Any proposed abatement must be designed to reduce traffic noise levels by 5 dBA or more at impacted receptor locations and should be reasonable from a cost perspective. Kern COG has adopted Caltrans reasonable cost allowance calculation procedure for determining abatement to be reasonable.

This report analyzes the traffic noise impacts on sensitive receptors east of SR 14 between Hillcrest Avenue and Rosamond Boulevard, and along both sides of SR 14 south of Rosamond Boulevard to just north of Matthew Avenue. Currently, there are no existing sound barriers located along the State right-of-way in these locations. The sensitive receptors in the study area include both single and multi-family residential land uses.

Short- and long-term ambient noise measurements were taken in this study area to determine the existing ambient noise environment as well as to calibrate the traffic noise model TNM 2.5. Fifty-four receptor locations were modeled to represent outdoor active use areas of noise sensitive land uses in the study area. In order to identify impacted receptor locations, the resulting traffic noise levels at each modeled receptor location under existing conditions were compared to Caltrans' exterior Noise Abatement Criteria (NAC) of 67 dBA L_{eq}(h). Traffic noise levels under anticipated future (year 2035) traffic conditions were also modeled in order to calculate the noise reduction that each receptor location would experience with implementation of noise abatement in the form of a sound barrier.

Of the 54 modeled receptor locations, 13 receptors would exceed the 67 dBA L_{eq}(h) NAC under existing or future year conditions. To reduce this impact, this study analyzed feasible noise abatement in the form of sound barriers. Table ES-1 shows a summary of the reasonableness determination for the feasible sound barriers. The locations of the proposed sound barriers are shown in Figure ES 1-1 and ES 1-2. The results show that the modeled sound barriers **SB1**, **SB3**, and **SB4** would be feasible and meet the preliminary reasonable cost-effectiveness criteria. Therefore, it is recommended that the retrofit sound barrier analysis for these identified impacted receptor locations proceed to the next step of preparation of a Noise Barrier Scope Summary Report (NBSSR). Once the NBSSR is prepared, Kern COG can prioritize the list of sound barriers and proceed to the design and construction phases based on the availability of funds.

Table ES-1: Summary of Reasonableness Determination for Feasible Sound Barriers

Sound Barrier Number	Protected Modeled Receptor Locations [a]	Height (ft)	Number of Benefited Residences	Reasonable Allowance per Residence	Total Reasonable Allowance	Estimated Sound Barrier Cost [b]	Preliminarily Reasonable?
SB1	R1-R5	6	15	$37,000	$555,000	$516,480	Yes
	R1-R5	8	15	$37,000	$555,000	$688,640	No
	R1-R5, R8, R9, R13, R14	10	25	$39,000	$975,000	$860,800	Yes
	R1-R11, R13-R15, R20	12	37	$39,000	$1,443,000	$1,032,960	Yes
	R1-R11, R13-R15, R20	14	37	$41,000	$1,517,000	$1,205,120	Yes
SB2	R28	6	1	$33,000	$33,000	$286,080	No
	R27, R28	8	2	$35,000	$70,000	$381,440	No
	R27, R28	10	2	$35,000	$70,000	$476,800	No
	R26-R28, R31	12	6	$35,000	$210,000	$572,160	No
	R23, R25-R29, R31, R32	14	14	$35,000	$490,000	$667,520	No
	R23, R25-R29, R31-R33	16	17	$35,000	$595,000	$762,880	No
SB3	R42	6	4	$35,000	$140,000	$144,480	No
	R42	8	4	$37,000	$148,000	$192,640	No
	R42	10	4	$37,000	$148,000	$240,800	No
	R42, R43	12	8	$37,000	$296,000	$288,960	Yes
	R42, R43	14	8	$37,000	$296,000	$337,120	No
	R42, R43	16	8	$37,000	$296,000	$385,280	No
SB4	R44, R47, R52	6	8	$37,000	$296,000	$276,000	Yes
	R44, R47, R52	8	8	$37,000	$296,000	$368,000	No
	R44, R47, R52	10	8	$37,000	$296,000	$460,000	No
	R44, R47, R49, R50, R52, R53	12	19	$37,000	$703,000	$552,000	Yes
	R44, R47, R49, R50, R52, R53	14	19	$37,000	$703,000	$644,000	Yes
	R44, R47, R49, R50, R52, R53	16	19	$37,000	$703,000	$736,000	No

[a] Modeled receptor locations that would experience a minimum 5 dBA reduction in traffic noise levels with the indicated sound barrier.
[b] Cost calculations were based on a construction cost estimate of $40 per square foot for each sound barrier.
dBA = A-weighted decibel
ft = feet

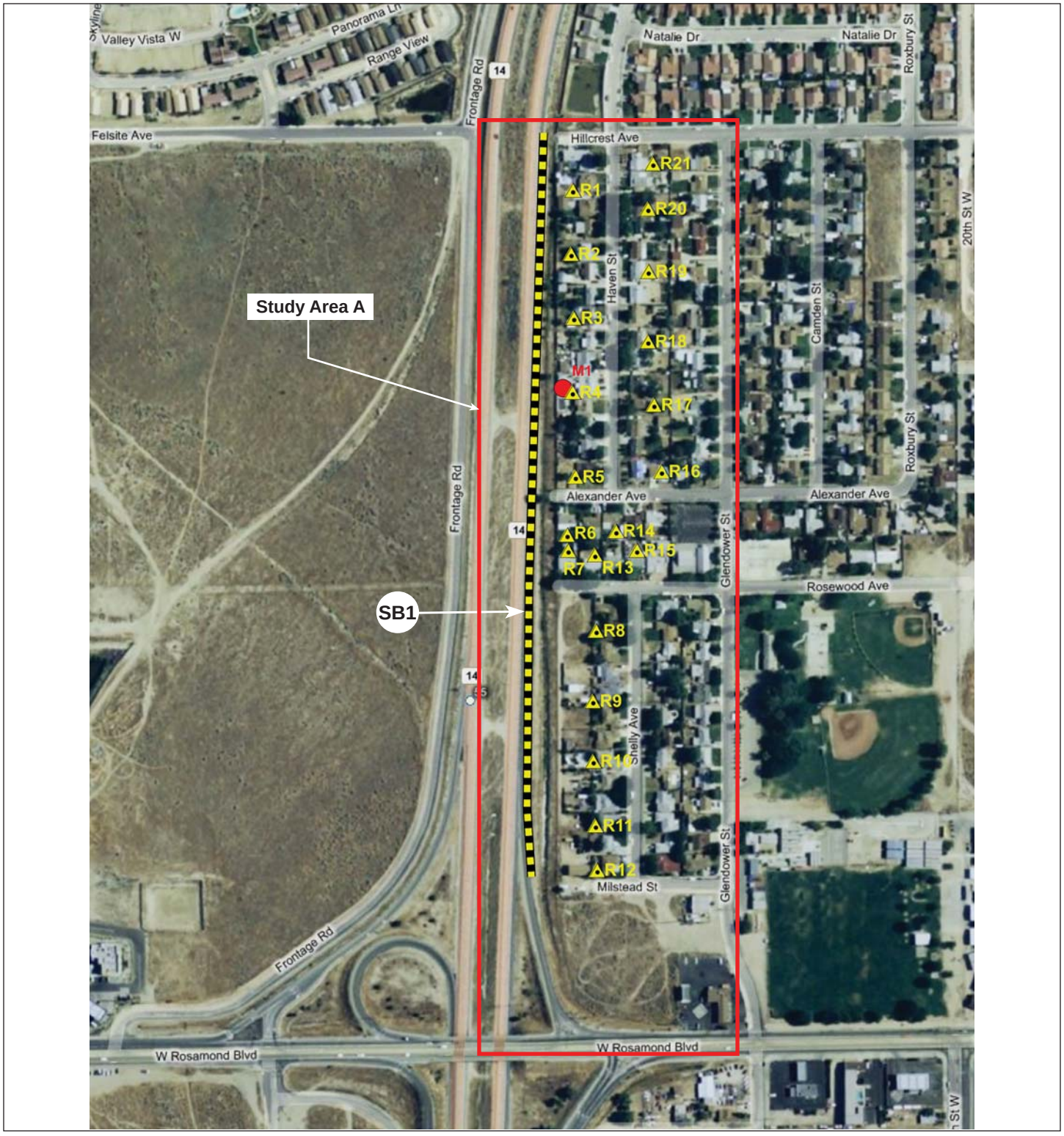

FIGURE ES 1-1

NOISE MONITORING LOCATIONS

MODELED RECEPTOR LOCATIONS

24-HOUR MONITOR LOCATION

STUDY AREA

EXISTING SOUND BARRIERS

PROPOSED SOUND BARRIERS

N

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State Route 14 Retrofit Noise Barrier Study

Monitoring, Modeled Receptors, and Sound Barrier Locations

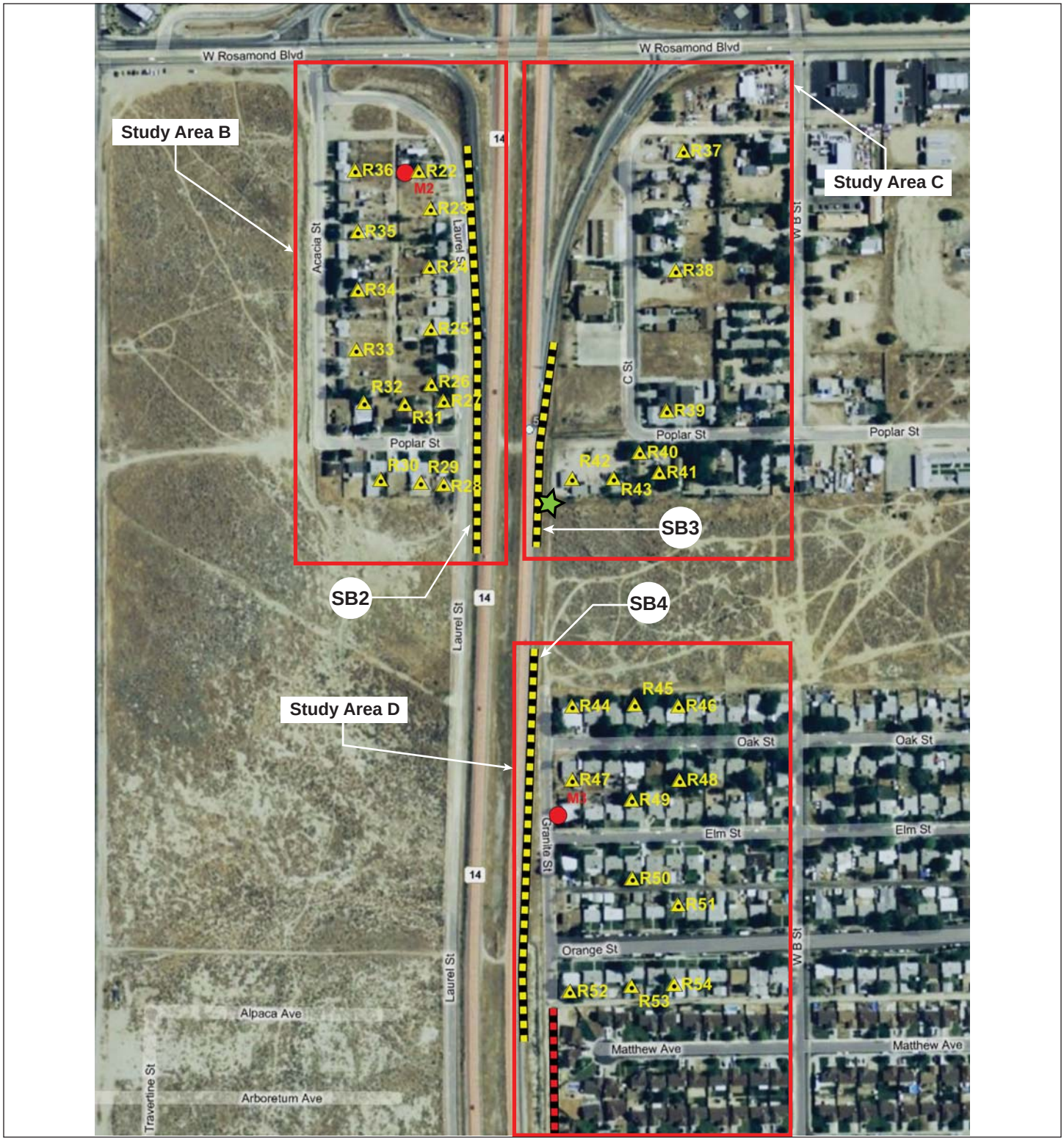

FIGURE ES 1-2

NOISE MONITORING LOCATIONS

MODELED RECEPTOR LOCATIONS

24-HOUR MONITOR LOCATION

STUDY AREA

EXISTING SOUND BARRIERS

PROPOSED SOUND BARRIERS

N

0 200 400

FEET

State Route 14 Retrofit Noise Barrier Study

Monitoring, Modeled Receptors, and Sound Barrier Locations

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II. RETROFIT NOISE BARRIER STUDY

A. INTRODUCTION

Kern Council of Governments (Kern COG) has identified ten locations throughout Kern County, based on citizen requests over the last 10 years, that are potentially exposed to excessive traffic noise levels from vehicles operating on State facilities. The purpose of this retrofit noise barrier study is to assist Kern COG in identifying impacted noise-sensitive receptor locations and evaluating the need for and benefit of retrofit noise barriers along portions of State Route 99 (SR 99) and SR 58 in the City of Bakersfield, and along a portion of SR 14 in the City of Rosamond.

This report provides the data with which the Kern COG can make an informed decision in prioritizing retrofit noise barrier projects and determining which projects should proceed to the next level of analysis: the preparation of an NBSSR for Caltrans approval. This retrofit noise barrier study has been conducted based on Caltrans' qualification criteria for retrofit noise abatement projects.

B. STUDY DESCRIPTION

This report analyzes the traffic noise impacts on sensitive receptors east of SR 14 between Hillcrest Avenue and Rosamond Boulevard, and along both sides of SR 14 south of Rosamond Boulevard to just north of Matthew Avenue. Currently, there are no existing sound barriers located along the State right-of-way in these locations. The sensitive receptors in the study area include both single- and multi-family residential land uses. The regional location and study area are shown in Figure 1.

This analysis includes both long-term and short-term noise measurements at representative sensitive receptors in the study area. Roadway traffic noise modeling was performed using the Federal Highway Administration (FHWA) approved Traffic Noise Model (TNM) 2.5. Existing traffic noise levels were then compared to the FWHA Noise Abatement Criteria (NAC) for the identified land uses. Where existing or predicted future traffic noise levels exceed the NAC, noise abatement in the form of a retrofit sound barrier was then analyzed.

C. FUNDAMENTALS OF TRAFFIC NOISE

This section provides a brief discussion of fundamental traffic noise concepts. For a detailed discussion, refer to the Caltrans *Technical Noise Supplement*,[1] which is available on the Caltrans web site at www.dot.ca.gov/hq/env/noise.

Sound, Noise, and Acoustics

Sound can be described as the mechanical energy of a vibrating object transmitted by pressure waves through a liquid or gaseous medium (e.g., air) to a hearing organ, such as a human ear. Noise is

[1] Caltrans, 2009. *Technical Noise Supplement*. November.

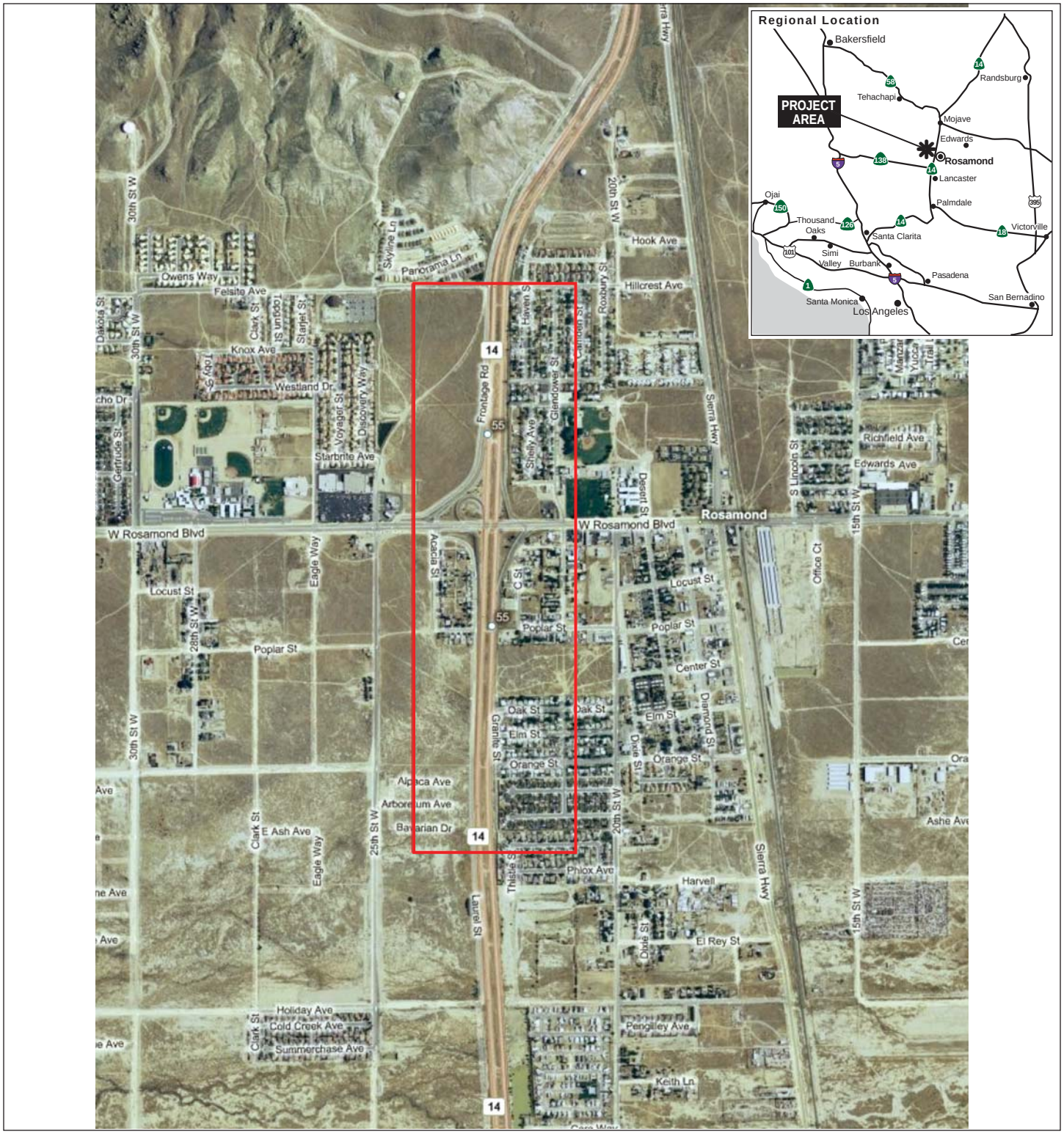

FIGURE 1

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STUDY AREA

State Route 14 Retrofit Noise Barrier Study

Regional Location and Study Area

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defined as loud, unexpected, or annoying sound. In the science of acoustics, the fundamental model consists of a sound (or noise) source, a receptor, and the propagation path between the two. The loudness of the noise source and obstructions or atmospheric factors affecting the propagation path to the receptor determine the sound level and characteristics of the noise perceived by the receptor. The field of acoustics deals primarily with the propagation and control of sound.

Frequency and Hertz

Continuous sound can be described by frequency (pitch) and amplitude (loudness). A low-frequency sound is perceived as low in pitch. Frequency is expressed in terms of cycles per second, or Hertz (Hz) (e.g., a frequency of 250 cycles per second is referred to as 250 Hz). High frequencies are sometimes more conveniently expressed in kilohertz (kHz), or thousands of Hertz. The audible frequency range for humans is generally between 20 Hz and 20,000 Hz.

Sound Pressure Levels and Decibels

The amplitude of pressure waves generated by a sound source determines the loudness of that source. Sound pressure amplitude is measured in micro-Pascals (mPa).One mPa is approximately one hundred billionth (0.00000000001) of normal atmospheric pressure. Sound pressure amplitudes for different kinds of noise environments can range from less than 100 to 100,000,000 mPa. Because of this huge range of values, sound is rarely expressed in terms of mPa. Instead, a logarithmic scale is used to describe sound pressure level (SPL) in terms of decibels (dB). The threshold of hearing for young people is about 0 dB, which corresponds to 20 mPa.

Addition of Decibels

Because decibels are logarithmic units, SPL cannot be added or subtracted through ordinary arithmetic. Under the decibel scale, a doubling of sound energy corresponds to a 3 dB increase. In other words, when two identical sources are each producing sound of the same loudness, the resulting sound level at a given distance would be 3 dB higher than one source under the same conditions. For example, if one automobile produces an SPL of 70 dB when it passes an observer, two cars passing simultaneously would not produce 140 dB—rather, they would combine to produce 73 dB. Under the decibel scale, three sources of equal loudness together produce a sound level 5 dB louder than one source.

A-Weighted Decibels

The decibel scale alone does not adequately characterize how humans perceive noise. The dominant frequencies of a sound have a substantial effect on the human response to that sound. Although the intensity (energy per unit area) of the sound is a purely physical quantity, the loudness or human response is determined by the characteristics of the human ear.

Human hearing is limited in the range of audible frequencies as well as in the way it perceives the SPL in that range. In general, people are most sensitive to the frequency range of 1,000–8,000 Hz, and perceive sounds within that range better than sounds of the same amplitude in higher or lower frequencies. To approximate the response of the human ear, sound levels of individual frequency bands are weighted, depending on the human sensitivity to those frequencies. Then, an “A-weighted” sound level (expressed in units of dBA) can be computed based on this information.

The A-weighting network approximates the frequency response of the average young ear when listening to most ordinary sounds. When people make judgments of the relative loudness or annoyance of a sound, their judgments correlate well with the A-scale sound levels of those sounds. Other weighting networks have been devised to address high noise levels or other special problems (e.g., B-, C-, and D-scales), but these scales are rarely used in conjunction with highway-traffic noise. Noise levels for traffic noise reports are typically reported in terms of A-weighted decibels or dBA. Table 1 describes typical A-weighted noise levels for various noise sources.

Table 1: Typical A-Weighted Noise Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	— 110 —	Rock band
Jet fly-over at 1000 feet		
	— 100 —	
Gas lawn mower at 3 feet		
	— 90 —	
Diesel truck at 50 feet at 50 mph		Food blender at 3 feet
	— 80 —	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawn mower, 100 feet	**— 70 —**	Vacuum cleaner at 10 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	**— 60 —**	
		Large business office
Quiet urban daytime	**— 50 —**	Dishwasher next room
Quiet urban nighttime	**— 40 —**	Theater, large conference room (background)
Quiet suburban nighttime		
	— 30 —	Library
Quiet rural nighttime		Bedroom at night, concert
	— 20 —	
		Broadcast/recording studio
	— 10 —	
Lowest threshold of human hearing	**— 0 —**	Lowest threshold of human hearing

Source: Caltrans, November 2009.
dBA = A-Weighted decibels
mph = miles per hour

Human Response to Changes in Noise Levels

As discussed above, doubling sound energy results in a 3 dB increase in sound. However, given a sound level change measured with precise instrumentation, the subjective human perception of a doubling of loudness will usually be different than what is measured.

Under controlled conditions in an acoustical laboratory, the trained, healthy human ear is able to discern 1 dB changes in sound levels, when exposed to steady, single-frequency ("pure-tone") signals in the midfrequency (1,000 Hz–8,000 Hz) range. In typical noisy environments, changes in noise of 1 to 2 dB are generally not perceptible. However, it is widely accepted that people are able to begin to detect sound level increases of 3 dB in typical noisy environments. Further, a 5 dB increase is generally perceived as a distinctly noticeable increase, and a 10 dB increase is generally perceived as a doubling of loudness. Therefore, a doubling of sound energy (e.g., doubling the volume of traffic on a

highway) that would result in a 3 dB increase in sound, would generally be perceived as barely detectable.

Noise Descriptors

Noise in the daily environment fluctuates over time. Some of the fluctuations are minor; some are substantial. Some noise levels occur in regular patterns; others are random. Some noise levels fluctuate rapidly, others slowly. Some noise levels vary widely; others are relatively constant. Various noise descriptors have been developed to describe time-varying noise levels. The following is a list of the noise descriptors most commonly used in traffic noise analysis:

- Equivalent Sound Level (L_{eq}): L_{eq} represents an average of the sound energy occurring over a specified period. L_{eq} is, in effect, the steady-state sound level that, in a stated period, would contain the same acoustical energy as the time-varying sound that actually occurs during the same period. The 1-hour A-weighted equivalent sound level, $L_{eq}(h)$, is the energy average of the A-weighted sound levels occurring during a 1-hour period and is the basis for the Noise Abatement Criteria (NAC) used by Caltrans and FHWA.
- Percentile-Exceeded Sound Level (L_x): L_x represents the sound level exceeded for a given percentage of a specified period. For example, L_{10} is the sound level exceeded 10 percent of the time, and L_{90} is the sound level exceeded 90 percent of the time.
- Maximum Sound Level (L_{max}): L_{max} is the highest instantaneous sound level measured during a specified period.
- Day-Night Level (L_{dn}): L_{dn} is the energy average of A-weighted sound levels occurring over a 24-hour period, with a 10 dB penalty applied to A-weighted sound levels occurring during nighttime hours between 10:00 p.m. and 7:00 a.m.
- Community Noise Equivalent Level (CNEL): The 24-hour A-weighted average sound level from midnight to midnight, obtained after the addition of 5 dBA to sound levels occurring in the evening from 7:00 p.m. to 10:00 p.m. and after the addition of 10 dBA to sound levels occurring in the night between 10:00 p.m. and 7:00 a.m.

Sound Propagation

When sound propagates over a distance, it changes in both level and frequency content. The manner in which noise reduces with distance depends on the following factors.

Geometric Spreading. Sound from a localized source (i.e., a point source) propagates uniformly outward in a spherical pattern. The sound level attenuates (or decreases) at a rate of 6 dB for each doubling of distance from a point source. Highways consist of several localized noise sources on a defined path, and hence can be treated as a line source, which approximates the effect of several point sources. Noise from a line source propagates outward in a cylindrical pattern, often referred to as cylindrical spreading. Sound levels attenuate at a rate of 3 dB for each doubling of distance from a line source.

Ground Absorption. The propagation path of noise from a highway to a receptor is usually very close to the ground. Noise attenuation from ground absorption and reflective-wave canceling adds to the attenuation associated with geometric spreading. Traditionally, the excess attenuation has also been expressed in terms of attenuation per doubling of distance. This approximation is usually

sufficiently accurate for distances of less than 200 feet. For acoustically hard sites (i.e., sites with a reflective surface between the source and the receptor, such as a parking lot or body of water), no excess ground attenuation is assumed. For acoustically absorptive or soft sites (i.e., those sites with an absorptive ground surface between the source and the receptor, such as soft dirt, grass, or scattered bushes and trees), an excess ground-attenuation value of 1.5 dB per doubling of distance is normally assumed. When added to the cylindrical spreading, the excess ground attenuation results in an overall drop-off rate of 4.5 dB per doubling of distance.

Atmospheric Effects. Receptors located downwind from a source can be exposed to increased noise levels relative to calm conditions, whereas locations upwind can have lowered noise levels. Sound levels can be increased at large distances (e.g., more than 500 feet) from the highway due to atmospheric temperature inversion (i.e., increasing temperature with elevation). Other factors such as air temperature, humidity, and turbulence can also have significant effects.

Shielding by Natural and Human-Made Features. A large object or barrier in the path between a noise source and a receptor can substantially attenuate noise levels at the receptor. The amount of attenuation provided by shielding depends on the size of the object and the frequency content of the noise source. Natural terrain features (e.g., hills and dense woods) and human-made features (e.g., buildings and walls) can substantially reduce noise levels. Walls are often constructed between a source and a receptor specifically to reduce noise. A barrier that breaks the line of sight between a source and a receptor will typically result in at least 5 dB of noise reduction. Taller barriers provide increased noise reduction. Vegetation between the highway and receptor is rarely effective in reducing noise because it does not create a solid barrier.

D. REGULATORY FRAMEWORK

This section provides a brief discussion of the applicable federal, State, and local regulations, standards, and policies.

National Environmental Policy Act

The National Environmental Policy Act (NEPA) is a federal law that establishes environmental policy for the nation, provides an interdisciplinary framework for federal agencies to prevent environmental damage, and contains action-forcing procedures to ensure that federal agency decision makers take environmental factors into account. Under the NEPA, impacts and measures to mitigate adverse impacts must be identified, including the identification of impacts for which no mitigation or only partial mitigation is available. The FHWA regulations discussed below constitute the federal noise standard.

FHWA Regulations

On July 13, 2010, FHWA issued the Title 23, Part 772 of the Code of Federal Regulations (23 CFR 772)[2] Final Rule. This final rule amended the Federal regulations on the Procedures for Abatement of Highway traffic Noise and Construction Noise. The final rule clarifies and adds definitions, the applicability of this regulation, certain analysis requirements, and the use of Federal funds for noise

[2] Federal Highway Administration, Title 23, Code of Federal Regulations, Part 772, Final Rule.

abatement measures. The effective date of the final rule is July 13, 2011. It is anticipated that preparation of a NBSSR for this study area will not occur until after that date. Therefore, in order to provide the most helpful information possible toward the preparation of that report, the analysis provided in this report is based on the requirements of this final rule.

The final rule of 23 CFR Part 772 outlines the procedures for conducting highway project noise studies and implementing noise abatement measures to help protect the public health and welfare, supplies the Noise Abatement Criteria (NAC) for designated activity categories, and establishes requirements for information to be given to local officials for use in planning and designing highways. Under this regulation, noise abatement can be considered for a Type II project if traffic noise impacts have been identified. The FHWA defines retrofit noise abatement projects, or Type II projects, as projects receiving Federal or Federal-aid highway projects for noise abatement on an existing highway. For a Type II project to be eligible for Federal-aid funding, the retrofit noise barrier analysis must be performed in accordance with the State's adopted Type II program requirements.

For Type II projects, a traffic noise impact is considered to occur when the existing traffic noise levels at the exterior of dwelling unit areas exceed the 67 dBA L_{eq}(h) NAC specified in the regulation. Table 2 summarizes the FHWA NAC for each activity category area.

California Environmental Quality Act

The California Environmental Quality Act (CEQA) is the foundation of environmental law and policy in California. The main objectives of CEQA are to disclose to decision makers and the public the significant environmental effects of proposed activities and to identify ways to avoid or reduce those effects by requiring implementation of feasible alternatives or mitigation measures. Under CEQA, a substantial noise increase may result in a significant adverse environmental effect; if so, the noise increase must be mitigated or identified as a noise impact for which it is likely that only partial (or no) mitigation measures are available. Specific economic, social, environmental, legal, and technological conditions may make noise mitigation measures infeasible.

Caltrans Traffic Noise Analysis Protocol for Retrofit Noise Abatement Projects

The *Traffic Noise Analysis Protocol* (Protocol)[3] addresses Caltrans' policies on retrofit noise abatement on existing transportation facilities for projects proposed within the State right-of-way or projects proposed by any agency using Type II federal aid funds under 23 CFR 772. Qualification criteria for retrofit noise abatement projects include: (1) residential area must be developed before construction of the highway or before any expansion or alteration of the highway that would result in increased traffic noise at the residential areas; (2) existing worst-hour noise level at the exterior of dwelling unit areas must exceed 67 dBA L_{eq}(h); and (3) any other FHWA-approved criteria established and implemented by sponsoring Regional Transportation Planning Agencies (RTPAs) responsible for retrofit noise abatement program must be met.

Kern Council of Governments

Kern COG is the designated Federal Metropolitan Planning Organization and the State Regional Transportation Planning Agency for Kern County. Under current state law, Regional Transportation Planning Agencies, such as the Kern COG, are the responsible agencies for sponsoring retrofit noise

[3] Caltrans, 2006. *Traffic Noise Analysis Protocol*. August.

abatement projects. However, abatement proposed for construction within the State right-of-way must be approved by Caltrans and therefore must meet certain minimum requirements.

Table 2: Activity Categories and Noise Abatement Criteria (NAC)

Activity Category	Activity Criteria $L_{eq}(h)$[a]	Evaluation Location	Activity Description
A	57	Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose
B[b]	67 52	Exterior Interior	Residential
C[b]	67	Exterior	Active sport areas, amphitheatres, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings
D	52	Interior	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios
E[b]	72	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F
F	--	--	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing
G	--	--	Undeveloped lands that are not permitted

[a] The Leq(h) Activity Criteria values are for impact determination only, and are not design standards for noise abatement measures.
[b] Includes undeveloped lands permitted for this activity category.
Source: FHWA 23 CFR 772

The Kern COG has adopted the Caltrans' qualification criteria for retrofit noise abatement projects. The Kern COG provides a process to evaluate noise complaints on an ongoing basis and the needed funding to begin to address Kern County's sound barrier needs. Impacted locations are those that are identified as being exposed to traffic noise levels that exceed 67 dBA $L_{eq}(h)$. Any proposed abatement must be designed to reduce traffic noise levels by 5 dBA or more at impacted receptor locations and should be reasonable from a cost perspective. Kern COG has adopted Caltrans reasonable cost allowance calculation procedure for determining abatement to be reasonable. The opinions of affected property owners are also considered in reaching a final decision on the noise abatement measures to be provided. Noise abatement within the State right-of-way will not be provided if more than 50 percent of the affected property owners do not want it. Noise abatement will not be provided on private property unless 100 percent of the owners of the property on which the abatement will be located want it.

Kern County General Plan Noise Policies

The Noise Element in the Kern County General Plan[4] identifies goals and policies indicating their intentions regarding noise and noise sources. The policy objective is to ensure that residents of Kern County are protected from excessive noise and that moderate noise levels are maintained. By utilizing

[4] Kern County, 2007. *Kern County General Plan*. March 13.

good land use planning principles and by prohibiting new noise-sensitive land uses in noise-impacted areas unless effective mitigation measures are incorporated, incompatible land uses near known noise producing sources can be prevented. The County's policy requires that mitigation be designed to reduce noise levels to 65 dB L_{dn} or less in outdoor activity areas.

E. STUDY METHODS AND PROCEDURES

This section outlines the methodology for conducting the short- and long-term ambient noise measurements and the methodology and data input for the traffic noise modeling using TNM 2.5.

Site Selection

Noise sensitive land uses in the study area were identified through land use maps, aerial photography, and site inspection. Noise-sensitive land uses in the study area include single and multifamily residences. As retrofit noise barrier projects are limited to residential areas, no receptors were modeled to represent hotels, retail, and commercial land uses. The generalized land use data and location of particular sensitive receptors were the basis for the selection of the noise monitoring and analysis sites. A total of 54 receptor locations were modeled to represent the noise-sensitive land uses in the study area. The short- and long-term noise monitoring as well as the modeled receptor locations are shown in Figure 2.

Noise Level Measurement Program

Existing noise levels in the study area were sampled during off-peak traffic hours when traffic was flowing freely (8:50 a.m. to10:00 a.m.). All short-term measurements were made using a Larson Davis Model 820 Type 2 sound level meter (Serial No. 0519).

Concurrent counts of bi-directional traffic volumes on each roadway segment were taken during each short-term measurement. The traffic counts were noted for the following vehicle types: automobiles, medium trucks, and heavy trucks. An automobile is defined as a vehicle with two axles and four tires that are designed primarily to carry passengers; small vans and light trucks are included in this category. Medium-duty trucks include all cargo vehicles with two-axles and six wheels, not including dually pick-up trucks. Heavy-duty trucks include all vehicles with three or more axles. The posted speeds as well as the observed average travel speeds were documented.

The following measurement procedures were utilized:

- Calibrate sound level meter.
- Set up sound level meter at a height of 5 feet.
- Commence noise monitoring.
- Collect site-specific data such as date, time, direction of traffic, and distance from sound level meter to the right-of-way.
- Count passing vehicles by classification for a period of 15 minutes.
- Stop measurement after 15 minutes.
- Calibrate sound level meter.
- Proceed to next monitoring site and repeat.

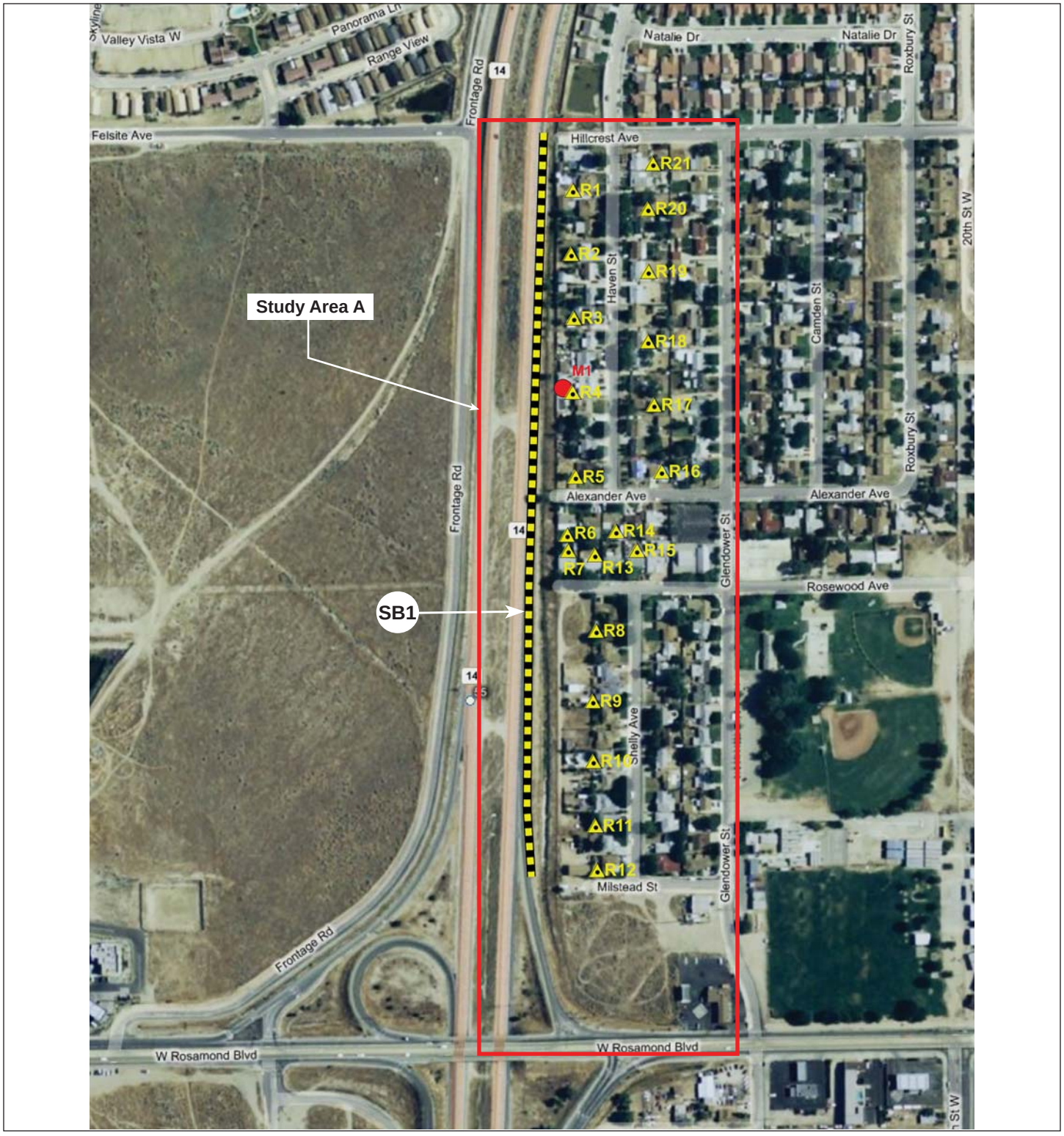

FIGURE 2-1

NOISE MONITORING LOCATIONS

MODELED RECEPTOR LOCATIONS

24-HOUR MONITOR LOCATION

STUDY AREA

EXISTING SOUND BARRIERS

PROPOSED SOUND BARRIERS

N

0 225 450

FEET

State Route 14 Retrofit Noise Barrier Study

Monitoring, Modeled Receptors, and Sound Barrier Locations

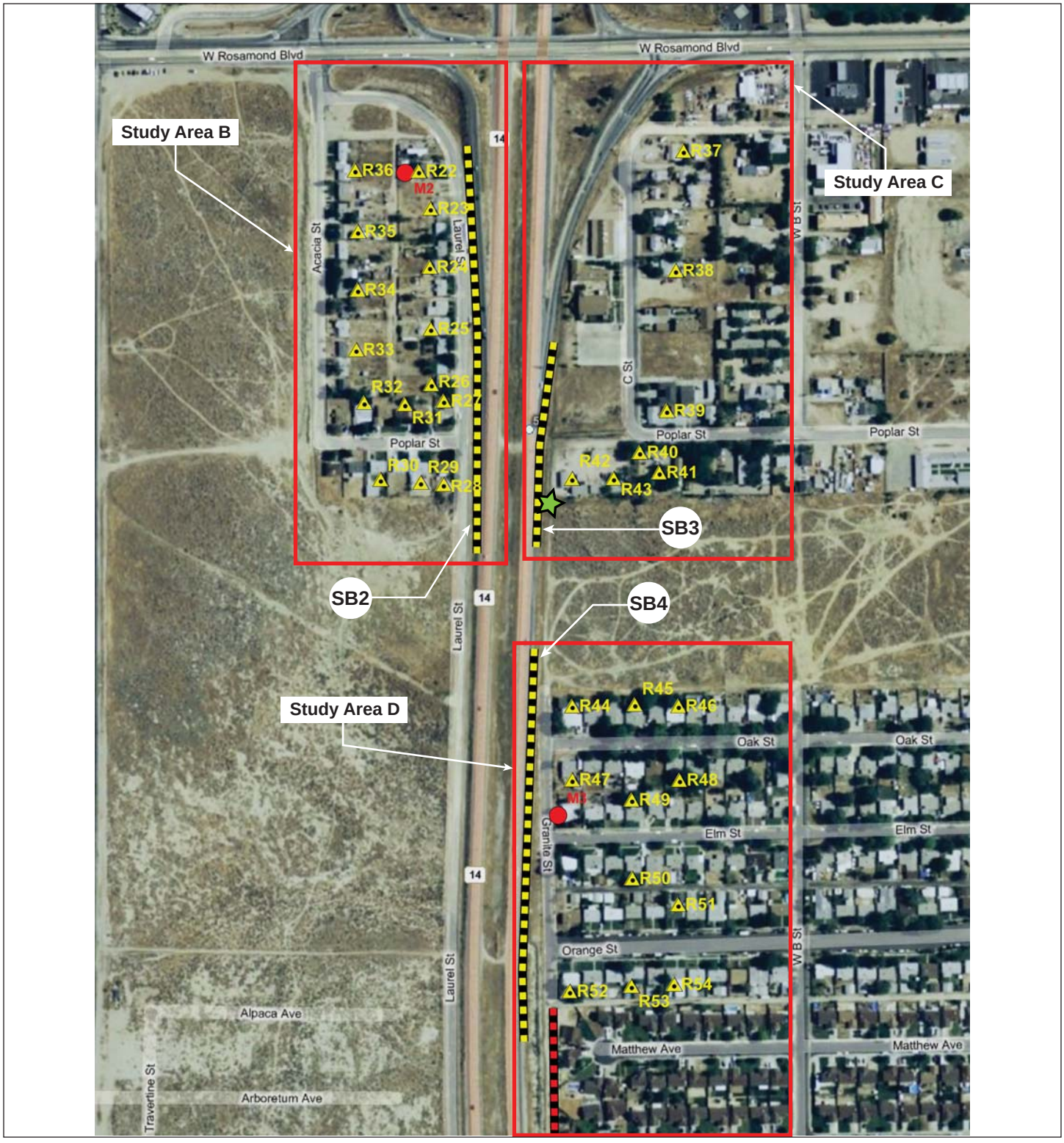

FIGURE 2-2

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The traffic counts were subsequently expanded to hourly volumes (multiplied to normalize the results to hourly values) and entered into the TNM 2.5 model runs for each monitoring site. The short-term ambient noise monitoring results were used to calibrate the model outputs as described in the following discussion.

Noise Modeling

The FHWA-approved traffic noise prediction model TNM 2.5 was used for the traffic noise computations. Key inputs to the traffic noise model include the locations and elevations of existing roadways, shielding features (e.g., topography and buildings), noise barriers, and receptors. Three-dimensional representations of the project impact study areas were generated and used to mark all existing roadway, terrain features, existing buildings, and noise sensitive receptor locations. ArcGIS software was used to provide an interface between this digital terrain data and TNM 2.5. ArcGIS was used to capture the coordinates of the roadway segment points, as well as sensitive receptor coordinates.

To validate the accuracy of the model, calibration runs were performed to compare the measured traffic noise levels to modeled noise levels for each field measurement location as needed. The traffic counts by vehicle classification that were documented during each of the short-term noise measurements were expanded to hourly volumes (multiplied to normalize the results to hourly values) and entered into TNM 2.5. The results of these model runs were compared to the measured ambient noise levels to ensure the accuracy of the TNM 2.5 model outputs. Correction factors, known as K-factors, were calculated as measured sound levels minus the modeled sound levels. As necessary, K-factors calculated through the calibration modeling were applied to each of the modeled receptor locations so that the measured and modeled noise levels were the same.

Existing traffic noise levels were calculated at representative receptor locations along each project roadway segment using the FHWA traffic noise prediction model TNM 2.5. A sufficient number of receptor points located at first- and second-row residences were analyzed so that all existing traffic noise level impacts along modeled roadway segments were identified.

Long-term noise measurements can be used to estimate worst-hour traffic noise levels from levels measured during non-worst traffic hour times. However, because the PM peak-hour traffic volumes for existing conditions were used in modeling the existing traffic noise levels, the modeled existing traffic noise levels were not adjusted for peak-hour noise levels using the long-term monitoring results or otherwise existing traffic noise levels would be overestimated. To provide the most conservative estimate of existing traffic noise levels at all 54 modeled sensitive receptor locations, existing roadway conditions were modeled using the PM peak-hour traffic volumes assuming that traffic would remain free flowing at the posted speeds. The modeled existing PM peak hour traffic noise levels were compared to the 67 dBA $L_{eq}(h)$ NAC to determine existing traffic noise impacts. For receptor locations that experience traffic noise levels in excess of 67 dBA $L_{eq}(h)$, noise abatement measures were considered to reduce the noise impacts.

The future noise conditions at all 54 modeled sensitive receptor locations both without and with noise abatement measures were also modeled. In order to provide the most conservative estimate of future traffic noise levels, the predicted future PM peak hour traffic volumes for the year 2035 were used. The predicted PM peak hour traffic volumes for both the mainline and side roads in the study area were obtained from the results of the Kern COG regional transportation model.

The TNM 2.5 model is sensitive to the volume of trucks on the roadway because trucks contribute disproportionally to the traffic noise. Vehicle distributions from the Caltrans Truck Traffic Study (2008 Annual Average Daily Truck Traffic on the California State Highway System) were used for the mainline vehicle percentage calculations; the vehicle percentage calculation for the side roads utilized the traffic count data provided in the Kern COG Regional Transportation Plan count summaries. The PM peak hour traffic volumes were obtained from the Kern COG Regional Transportation Plan modeling results. The posted speed limit on this portion of SR 14 is 65 miles per hour (mph) for autos and 55 mph for trucks and autos with trailers. Traffic volumes and vehicle distribution on SR 14 and the modeled side roads in the study area are shown in Table 3.

Table 3: Traffic Volumes and Vehicle Distribution

Roadway	Existing / Future PM Peak Hour Volumes	Automobiles (%)	Medium Trucks (%)	Heavy Trucks (%)
SR 14 (Northbound)	1166 / 2068	93.2	3.6	3.2
SR 14 (Southbound)	797 / 1490	93.2	3.6	3.2
Rosamond Boulevard Segment 1 (Westbound)	1130 / 2480	93.2	3.6	3.2
Rosamond Boulevard Segment 2 (Westbound)	858 / 1361	93.2	3.6	3.2
Rosamond Boulevard Segment 1 (Eastbound)	622 / 1124	93.2	3.6	3.2
Rosamond Boulevard Segment 2 (Eastbound)	736 / 1425	93.2	3.6	3.2

Source: Caltrans *2008 Truck Traffic Volumes* and Kern COG 2006 and 2035 Regional Transportation Plan model results and 2007 Regional Transportation Plan count summaries.

F. EXISTING NOISE ENVIRONMENT

This section describes the existing ambient noise conditions in the study area based on the results of the short- and long-term noise measurements, and describes the methodology for and results of calibration of the traffic noise model TNM 2.5.

The primary source for noise at sensitive receptor locations is traffic on the SR 14. Ambient short-term (15-minute) noise measurements were conducted on Thursday, July 22, 2010, to document existing noise levels at three representative sensitive receptor locations in the project area. The noise level measurements were performed using a Larson Davis Model 820 Type 1 sound level meter. Table 4 contains the results of these measurements. Table 5 describes the physical location of the noise monitoring. These noise measurements were used to calibrate the noise model for the K-factors that were used to predict the noise levels at all 54 modeled sensitive receptors in the project area. The noise monitoring locations are shown in Figure 2. The noise monitoring results and traffic counts are included in Appendix A. The model input and output data for the calibration model runs are provided in Appendix B.

Table 4: Short-Term (15-minute) Ambient Noise Monitoring Results

Monitor Number	Location Description	Start Time	dBA L_{eq}	Noise Sources
M1	3355 Haven Street	11:08 AM	64.6	Traffic on SR 14
M2	2931 Laurel Street	10:32 AM	54.6	Traffic on SR 14
M3	2196 Oak Street	9:53 AM	66.3	Traffic on SR 14

Table 5: Meteorological Conditions of Noise Measurements

Monitor Number	Temperature	Relative Humidity (%)	Maximum Wind Velocity (mph)	Average wind Velocity (mph)
M1	96	15	5.1	1.2
M2	97	12	5.3	0.9
M3	93	16	6.0	1.6

Three separate model runs were performed using the traffic numbers collected during the short-term ambient noise monitoring. The results of these model runs were compared to the measured ambient noise levels to ensure the accuracy of the TNM 2.5 model. Correction factors, known as K-factors, are calculated as measured sound levels minus the modeled sound levels. Table 6 shows the ambient noise level, the modeled noise level, and the K-factor at both of the monitored locations. The results show that the predicted sound levels at each of the modeled noise monitoring locations were found to be within 3 dBA of the measured sound levels. Therefore, based on FHWA guidelines, K-factors within 3 dBA are considered to be in reasonable agreement with the measured sound levels and no calibration of the model is required.

Table 6: Model Calibration

Monitor Number	Monitored Noise Level (dBA)	Modeled Noise Level (dBA)	K-Factor (dBA)
M1	64.6	66.6	-2.0
M2	54.6	56.3	-1.7
M3	66.3	68.9	-2.6

Long-term noise monitoring was conducted using a Larson Davis Model 720 Type 2 sound level meter (serial number 0519). The long-term noise measurement was performed at the edge of right-of-way in the open space between SR 14 and the residential land uses at the north end of Granite Street from 12:00 p.m. on Wednesday, July 21, 2010, to 12:00 p.m. on Thursday, July 22, 2010. Table 7 summarizes the results of the long-term monitoring. As shown in Table 7, traffic noise in the project area peaks during the 6:00 a.m. and the 7:00 a.m. hours. The long-term noise monitoring location is shown on Figure 2.

Table 7: 24-Hour Ambient Noise Monitoring Results

Date	Time	Noise Level (dBA L_{eq}(h))
Wednesday, July 21, 2010	12:00 PM	**74** [a]
Wednesday, July 21, 2010	1:00 PM	**74**
Wednesday, July 21, 2010	2:00 PM	**74**
Wednesday, July 21, 2010	3:00 PM	**75**
Wednesday, July 21, 2010	4:00 PM	**75**
Wednesday, July 21, 2010	5:00 PM	**75**
Wednesday, July 21, 2010	6:00 PM	**74**
Wednesday, July 21, 2010	7:00 PM	**74**
Wednesday, July 21, 2010	8:00 PM	**73**
Wednesday, July 21, 2010	9:00 PM	**72**
Wednesday, July 21, 2010	10:00 PM	**71**
Wednesday, July 21, 2010	11:00 PM	**68**
Thursday, July 22, 2010	12:00 AM	67
Thursday, July 22, 2010	1:00 AM	66
Thursday, July 22, 2010	2:00 AM	65
Thursday, July 22, 2010	3:00 AM	67
Thursday, July 22, 2010	4:00 AM	**71**
Thursday, July 22, 2010	5:00 AM	**75**
Thursday, July 22, 2010	6:00 AM	**76** [b]
Thursday, July 22, 2010	7:00 AM	**76** [b]
Thursday, July 22, 2010	8:00 AM	**74**
Thursday, July 22, 2010	9:00 AM	**74**
Thursday, July 22, 2010	10:00 AM	**73**
Thursday, July 22, 2010	11:00 AM	**73**

[a] Numbers in **bold** indicate noise levels that exceed the 67 dBA L_{eq}(h) NAC.
[b] Peak noise hour(s).

Land uses in the project area have been grouped into a series of lettered analysis areas that are identified in Figure 2. Each of these analysis areas is considered to be acoustically equivalent.

Area A: Area A is located on the east side of SR 14, north of Rosamond Boulevard. A residential subdivision is located in this area. This area is generally flat. The backyards of first row receptors face the highway. The northern portion of the adjacent segment of SR 14 rises sharply in elevation above the land uses in Area A. There is no existing sound barrier to protect these receptor locations from traffic noise on SR 14. Modeled receptors R1 to R21, representing a total of 52 residences in Area A, are shown in Figure 2.

Area B: Area B is located on the west side of SR 14, south of Rosamond Boulevard. A residential subdivision is located in this area. This area is generally flat. The front yards of the majority of the first row receptors face the highway, the sides of the backyards of two residences face the highway. There is no existing sound barrier to protect these receptor locations from traffic noise on SR 14. Modeled receptors R22 to R36, representing a total of 33 residences in Area B, are shown in Figure 2.

Area C: Area C is located on the east side of SR 14, south of Rosamond Boulevard. Single and multi-family residential uses are located in this area. This area is generally flat. The buildings of the first row, multi-family units provide some shielding for the corresponding outdoor active use areas. There is no existing sound barrier to protect these receptor locations from traffic noise on SR 14. Modeled receptors R37 to R43, representing a total of 25 residences in Area C, are shown in Figure 2.

Area D: Area D is located on the east side of SR 14, south of Rosamond Boulevard. A residential subdivision is located in this area. This area is generally flat. The sides of the backyards of first row receptors face the highway. While there is an existing 8 foot sound wall along the property line of the residential land uses south of Area D, there, is no existing sound barrier to protect these receptor locations from traffic noise on SR 14. Modeled receptors R44 to R54, representing a total of 34 residences in Area D, are shown in Figure 2.

G. NOISE IMPACTS AND CONSIDERED ABATEMENT

This section presents the results of the traffic noise modeling, identifies impacted modeled sensitive receptor locations, and describes the results of the modeled noise abatement in the form of sound barriers.

Traffic Noise Impact Assessment

The existing traffic noise levels at all 54 modeled sensitive receptor locations were calculated using the PM peak-hour traffic volumes assuming that traffic would remain free flowing at the posted speeds. The existing traffic noise levels at each modeled receptor location were compared to the exterior NAC of 67 dBA L_{eq}(h) for residential Activity Category B uses. The existing traffic noise level modeling results for each modeled sensitive receptor locations are shown in Table 8. Traffic noise levels exceeding of the NAC are shown in bold. The model input and output data for the existing conditions are included in Appendix C.

Traffic noise levels under anticipated future (year 2035) traffic conditions were also modeled in order to calculate the insertion loss (noise reduction) that each receptor location would experience with implementation of noise abatement in the form of a sound barrier. A conservative calculation of the future traffic noise levels at the modeled sensitive receptor locations within the study area were determined assuming existing terrain and building features (i.e., without modeled sound barriers) using the future year 2035 PM peak hour traffic volumes as described in Section E.

The traffic noise model results for both existing and future (year 2035) conditions without noise abatement measures are shown in Table 9. The modeled future traffic noise levels were also compared to the NAC to determine whether traffic noise impacts would still occur under predicted future year traffic conditions. The model input and output data for the future conditions without modeled sound barriers are included in Appendix D.

Table 8: Existing Traffic Noise Levels

Study Area	Receptor Number	Location	Type of Development	Number of Units Represented	Noise Abatement Category	Modeled Existing Noise Level (dBA L_{eq}(h))
Area A	**R1**	Haven Street	Residential	3	B (67)	66
	R2	Haven Street	Residential	3	B (67)	**68** [a]
	R3	Haven Street	Residential	3	B (67)	67
	R4	Haven Street	Residential	3	B (67)	**68**
	R5	Haven Street	Residential	3	B (67)	**68**
	R6	Alexander Avenue	Residential	2	B (67)	64
	R7	Rosewood Avenue	Residential	1	B (67)	64
	R8	Shelly Avenue	Residential	3	B (67)	64
	R9	Shelly Avenue	Residential	3	B (67)	65
	R10	Shelly Avenue	Residential	3	B (67)	65
	R11	Shelly Avenue	Residential	2	B (67)	64
	R12	Shelly Avenue	Residential	1	B (67)	63
	R13	Rosewood Avenue	Residential	2	B (67)	63
	R14	Alexander Avenue	Residential	2	B (67)	62
	R15	Rosewood Avenue	Residential	2	B (67)	59
	R16	Haven Street	Residential	3	B (67)	56
	R17	Haven Street	Residential	3	B (67)	55
	R18	Haven Street	Residential	3	B (67)	54
	R19	Haven Street	Residential	3	B (67)	53
	R20	Haven Street	Residential	2	B (67)	56
	R21	Haven Street	Residential	2	B (67)	56
Area B	**R22**	Laurel Street	Residential	2	B (67)	60
	R23	Laurel Street	Residential	2	B (67)	62
	R24	Laurel Street	Residential	3	B (67)	58
	R25	Laurel Street	Residential	3	B (67)	61
	R26	Laurel Street	Residential	2	B (67)	62
	R27	Laurel Street	Residential	1	B (67)	67
	R28	Poplar Street	Residential	1	B (67)	**68**
	R29	Poplar Street	Residential	1	B (67)	64
	R30	Poplar Street	Residential	2	B (67)	59
	R31	Poplar Street	Residential	2	B(67)	60
	R32	Poplar Street	Residential	2	B(67)	57
	R33	Acacia Street	Residential	3	B(67)	58
	R34	Acacia Street	Residential	3	B(67)	57
	R35	Acacia Street	Residential	3	B(67)	57
	R36	Acacia Street	Residential	3	B(67)	58
Area C	**R37**	C Street	Residential	3	B(67)	60
	R38	C Street	Residential	3	B(67)	57
	R39	C Street	Residential	3	B(67)	59
	R40	Poplar Street	Residential	4	B(67)	60
	R41	Poplar Street	Residential	4	B(67)	59
	R42	Poplar Street	Residential	4	B(67)	65
	R43	Poplar Street	Residential	4	B(67)	61
Area D	**R44**	Oak Street	Residential	2	B(67)	**68**
	R45	Oak Street	Residential	3	B(67)	60
	R46	Oak Street	Residential	2	B(67)	57
	R47	Elm Street	Residential	4	B(67)	**68**
	R48	Elm Street	Residential	4	B(67)	56
	R49	Elm Street	Residential	4	B(67)	60
	R50	Elm Street	Residential	4	B(67)	59
	R51	Orange Street	Residential	4	B(67)	57
	R52	Orange Street	Residential	2	B(67)	67
	R53	Orange Street	Residential	3	B(67)	60
	R54	Orange Street	Residential	2	B(67)	57

[a] Numbers in **bold** indicate noise levels that exceed the 67 dBA Leq(h) NAC.

Of the 54 modeled receptor locations, 6 receptor locations would exceed the 67 dBA L_{eq}(h) NAC under existing conditions while 13 would exceed under future conditions. Modeled receptors that would experience a noise level that exceeds the 67 dBA L_{eq}(h) NAC are shown in bold in Table 9. Sound barriers were analyzed for these identified impacted receptor locations.

The following is a discussion of impacted receptor locations for each evaluation area.

- **Area A – Impacted Receptor Locations R1 to R5, R9, and R10.** These receptor locations represent existing single family residences located on Haven Street and Shelly Avenue along the east side of SR 14, north of Rosamond Boulevard. Modeled traffic noise levels at these impacted receptors range from 68 dBA to 71 dBA L_{eq}(h). All of these impacted receptors are first row receptors, the residences with outdoor active use areas nearest the highway. The northern portion of the adjacent segment of SR 14 rises sharply in elevation above the land uses in Area A. There is no existing sound barrier to protect these impacted receptor locations from traffic noise on SR 14. Because the existing and predicted future noise levels exceed 67 dBA L_{eq}(h), traffic noise impacts are predicted at residences in this area, and noise abatement must be considered. Impacted receptors R1 to R5, R9, and R10 represent a total of 21 residences in Area A.
- **Area B - Impacted Receptor Locations R27 and R28.** These receptor locations represent existing single family residences located on Laurel Street and Poplar Street along the west side of SR 14, south of Rosamond Boulevard. Modeled traffic noise levels at these impacted receptors range from 68 dBA to 71 dBA L_{eq}(h). These impacted receptors are first row receptors, the residences with outdoor active use areas nearest the highway. There is no existing sound barrier to protect these impacted receptor locations from traffic noise on SR 14. Because the existing and predicted future noise levels exceed 67 dBA L_{eq}(h), traffic noise impacts are predicted at residences in this area, and noise abatement must be considered. Impacted receptors R27 and R28 represent a total of 2 residences in Area B.
- **Area C - Impacted Receptor Location R42.** This receptor location represents existing multi-family residences located on Poplar Street along the east side of SR 14, south of Rosamond Boulevard. Modeled traffic noise levels at this impacted receptor ranges up to 68 dBA L_{eq}(h) under future conditions. This impacted receptor is a first row receptor, a residence with outdoor active use areas nearest the highway. There is no existing sound barrier to protect impacted receptor locations in this area from traffic noise on SR 14. Because the predicted future noise levels exceed 67 dBA L_{eq}(h), traffic noise impacts are predicted at residences in this area, and noise abatement must be considered. Impacted receptor R42 represents a total of 4 residences in Area B.
- **Area D - Impacted Receptor Locations R44, R47, and R52.** These receptor locations represent existing single family residences located on Oak Street, Elm Street, and Orange Street along the east side of SR 14, south of Rosamond Boulevard. Modeled traffic noise levels at these impacted receptors range from 68 dBA to 71 dBA L_{eq}(h). These impacted receptors are first row receptors, the residences with outdoor active use areas nearest the highway. There is an existing 8 foot sound wall along the property line of the residential land uses south of Area D; however, there is no existing sound barrier to protect the impacted receptor locations in Area D from traffic noise on SR 14. Because the existing and predicted future noise levels exceed 67 dBA L_{eq}(h), traffic noise impacts are predicted at residences in this area, and noise abatement must be considered. Impacted receptors R44, R47, and R52 represent a total of 8 residences in Area B.

Table 9: Existing and Projected Future (2035) Traffic Noise Levels

Study Area	Receptor Number	Location	Existing Noise Level (dBA L_{eq}(h))	Future (2035) Noise Levels (dBA L_{eq}(h))	Change from Existing Level (dBA L_{eq}(h))
Area A	**R1**	Haven Street	66	**68**	2
	R2	Haven Street	**68** [a]	**70**	2
	R3	Haven Street	67	**70**	3
	R4	Haven Street	**68**	**71**	3
	R5	Haven Street	**68**	**70**	2
	R6	Alexander Avenue	64	67	3
	R7	Rosewood Avenue	64	67	3
	R8	Shelly Avenue	64	67	3
	R9	Shelly Avenue	65	**68**	3
	R10	Shelly Avenue	65	**68**	3
	R11	Shelly Avenue	64	66	2
	R12	Shelly Avenue	63	65	2
	R13	Rosewood Avenue	63	66	3
	R14	Alexander Avenue	62	65	3
	R15	Rosewood Avenue	59	62	3
	R16	Haven Street	56	58	2
	R17	Haven Street	55	57	2
	R18	Haven Street	54	57	3
	R19	Haven Street	53	56	3
	R20	Haven Street	56	59	3
	R21	Haven Street	56	59	3
Area B	**R22**	Laurel Street	60	61	1
	R23	Laurel Street	62	64	2
	R24	Laurel Street	58	60	2
	R25	Laurel Street	61	62	1
	R26	Laurel Street	62	64	2
	R27	Laurel Street	67	**68**	1
	R28	Poplar Street	**68**	**71**	3
	R29	Poplar Street	64	66	2
	R30	Poplar Street	59	61	2
	R31	Poplar Street	60	63	3
	R32	Poplar Street	57	59	2
	R33	Acacia Street	58	60	2
	R34	Acacia Street	57	58	1
	R35	Acacia Street	57	59	2
	R36	Acacia Street	58	59	1
Area C	**R37**	C Street	60	62	2
	R38	C Street	57	59	2
	R39	C Street	59	61	2
	R40	Poplar Street	60	63	3
	R41	Poplar Street	59	61	2
	R42	Poplar Street	65	**68**	3
	R43	Poplar Street	61	64	3
Area D	**R44**	Oak Street	**68**	**71**	3
	R45	Oak Street	60	62	2
	R46	Oak Street	57	59	2
	R47	Elm Street	**68**	**70**	2
	R48	Elm Street	56	59	3
	R49	Elm Street	60	62	2
	R50	Elm Street	59	62	3
	R51	Orange Street	57	59	2
	R52	Orange Street	67	**70**	3
	R53	Orange Street	60	63	3
	R54	Orange Street	57	59	2

[a] Numbers in **bold** indicate noise levels that exceed the 67 dBA L_{eq}(h) NAC.

Modeling of Sound Barriers

Modeled locations that would experience traffic noise levels in excess of the 67 dBA $L_{eq}(h)$ NAC are considered impacted receptors and abatement should be considered. Therefore, noise abatement in the form of sound barriers was analyzed for each of these impacted sensitive receptor locations. Sound barriers were modeled between the SR 14 and the residential property lines. The TNM 2.5 printouts for the sound barrier model runs are located in Appendix E. The following details the sound barriers analyzed to protect the impacted sensitive receptor locations, locations that would experience traffic noise levels exceeding the 67 dBA $L_{eq}(h)$ NAC:

- **Area A - Sound Barrier 'SB1.'** Detailed modeling analysis was conducted for a barrier located at the edge of the shoulder of SR 14 adjacent to study Area A. The barrier evaluated is identified as barrier SB1 in Figure 2. Due to topographic differences between the roadway and adjacent land uses in Area A, the sound barrier must be located at the edge of shoulder in order to be feasible. In addition, as portions of the sound barrier would be located within 14 feet of the edge of the travel lane, sound barrier heights greater than 14 feet were not considered feasible. Therefore, barrier heights in the range of 6 to 14 feet were evaluated in 2-foot increments. Table 10 summarizes the results of the barrier analysis for each receiver location in Area A. Table 11 summarizes the calculated noise reductions for each modeled barrier height. Sound barrier SB1, approximately 2,152 feet in length, begins approximately 460 feet north of Rosamond Boulevard and extends to the north to provide protection to the impacted modeled receptor locations R1 through R5, R9, and R10, representing a total of 21 impacted single family residential units.
- **Area B - Sound Barrier 'SB2.'** Detailed modeling analysis was conducted for a barrier located at the edge of the shoulder of SR 14 adjacent to study Area B. The barrier evaluated is identified as barrier SB2 in Figure 2. Barrier heights in the range of 6 to 16 feet were evaluated in 2-foot increments. Table 10 summarizes the results of the barrier analysis for each receiver location in Area B. Table 11 summarizes the calculated noise reductions for each modeled barrier height. Sound barrier SB2, approximately 1,192 feet in length, begins approximately 245 feet south of Rosamond Boulevard and extends to the south to provide protection to the impacted modeled receptor locations R27 and R28, representing a total of 2 impacted single family residential units.
- **Area C - Sound Barrier 'SB3.'** Detailed modeling analysis was conducted for a barrier located at the edge of the shoulder of SR 14 adjacent to study Area C. The barrier evaluated is identified as barrier SB3 in Figure 2. Barrier heights in the range of 6 to 16 feet were evaluated in 2-foot increments. Table 10 summarizes the results of the barrier analysis for each receiver location in Area C. Table 11 summarizes the calculated noise reductions for each modeled barrier height. Sound barrier SB2, approximately 602 feet in length, begins approximately 820 feet south of Rosamond Boulevard and extends to the south to provide protection to the impacted modeled receptor location R42, representing a total of 4 impacted multi-family residential units.
- **Area D - Sound Barrier 'SB4.'** Detailed modeling analysis was conducted for a barrier located at the edge of the shoulder of SR 14 adjacent to study Area D. The barrier evaluated is identified as barrier SB4 in Figure 2. Barrier heights in the range of 6 to 16 feet were evaluated in 2-foot increments. Table 10 summarizes the results of the barrier analysis for each receiver location in Area C. Table 11 summarizes the calculated noise reductions for each modeled barrier height. Sound barrier SB4, approximately 2,152 feet in length, begins approximately 1,720 feet south of Rosamond Boulevard and extends to the south to provide protection to the impacted modeled receptor locations R44, R47, and R52, representing a total of 8 impacted single family residential units.

Table 10: Sound Barrier Modeling Results, dBA $L_{eq}(h)$

Study Area	Sound Barrier Number	Receptor Number	Existing $L_{eq(h)}$	Future (2035) w/o Barriers $L_{eq(h)}$	With 6 ft Barrier		With 8 ft Barrier		With 10 ft Barrier		With 12 ft Barrier		With 14 ft Barrier		With 16 ft Barrier	
					$L_{eq(h)}$	I.L.	$L_{eq(h)}$	I.L.	$L_{eq(h)}$	I.L.	$L_{eq(h)}$	I.L.	$L_{eq(h)}$	I.L.	$L_{eq(h)}$	I.L.
Area A	SB1	**R1**	66	**68**	62	6	62	6	60	8	59	9	58	10	NF	-
		R2	**68**	**70**	63	7	62	8	61	9	59	11	58	12	NF	-
		R3	67	**70**	63	7	62	8	61	9	59	11	58	12	NF	-
		R4	**68**	**71**	65	6	63	8	62	9	60	11	58	13	NF	-
		R5	**68**	**70**	65	5	63	7	62	8	60	10	59	11	NF	-
		R6	64	67	66	1	64	3	63	4	61	6	59	8	NF	-
		R7	64	67	65	2	64	3	63	4	61	6	60	7	NF	-
		R8	64	67	64	3	63	4	62	5	60	7	58	9	NF	-
		R9	65	68	66	2	64	4	63	5	62	6	60	8	NF	-
		R10	65	**68**	66	2	66	2	64	4	63	5	61	7	NF	-
		R11	64	66	64	2	63	3	62	4	61	5	61	5	NF	-
		R12	63	65	64	1	63	2	63	2	62	3	62	3	NF	-
		R13	63	66	64	2	62	4	61	5	60	6	58	8	NF	-
		R14	62	65	62	3	61	4	60	5	59	6	57	8	NF	-
		R15	59	62	60	2	59	3	58	4	57	5	56	6	NF	-
		R16	56	58	58	0	57	1	56	2	55	3	54	4	NF	-
		R17	55	57	56	1	56	1	55	2	54	3	53	4	NF	-
		R18	54	57	55	2	55	2	55	2	54	3	53	4	NF	-
		R19	53	56	54	2	54	2	53	3	52	4	52	4	NF	-
		R20	56	59	56	3	56	3	55	4	54	5	54	5	NF	-
		R21	56	59	57	2	57	2	57	2	57	2	57	2	NF	-
Area B	SB2	**R22**	60	61	59	2	59	2	58	3	58	3	58	3	57	4
		R23	62	64	63	1	62	2	61	3	60	4	59	5	59	5
		R24	59	60	58	2	58	2	57	3	57	3	56	4	56	4
		R25	61	62	60	2	60	2	59	3	58	4	57	5	57	5
		R26	62	64	62	2	61	3	60	4	59	5	59	5	58	6
		R27	**69**	**68**	65	3	63	5	62	6	60	8	59	9	58	10
		R28	**69**	**71**	66	5	65	6	65	6	63	8	63	8	63	8
		R29	65	66	63	3	63	3	63	3	62	4	61	5	61	5
		R30	59	61	60	1	59	2	59	2	58	3	58	3	58	3
		R31	60	63	60	3	60	3	59	4	57	6	56	7	56	7

[a] Numbers in **bold** indicate noise levels that exceed the 67 dBA $L_{eq}(h)$ NAC.
[b] Underlined values indicated insertion losses greater than the minimum 5 dBA reduction required for noise abatement to be considered feasible.
ft = feet $L_{eq(h)}$ = Equivalent Sound Level per Hour
I.L. = Insertion Loss, the decibel reduction with insertion of the modeled sound barrier
NF = Not Feasible at this height due to terrain features restricting sound barrier location.

Study Area	Sound Barrier Number	Receptor Number	Existing $L_{eq(h)}$	Future (2035) w/o Barriers $L_{eq(h)}$	With 6 ft Barrier		With 8 ft Barrier		With 10 ft Barrier		With 12 ft Barrier		With 14 ft Barrier		With 16 ft Barrier	
					$L_{eq(h)}$	I.L.	$L_{eq(h)}$	I.L.	$L_{eq(h)}$	I.L.	$L_{eq(h)}$	I.L.	$L_{eq(h)}$	I.L.	$L_{eq(h)}$	I.L.
Area B	**SB2**	**R32**	56	59	57	2	57	2	56	3	55	4	54	5	54	5
		R33	58	60	58	2	58	2	57	3	56	4	56	4	55	5
		R34	57	58	57	1	57	1	57	1	56	2	55	3	55	3
		R35	57	59	58	1	58	1	57	2	57	2	56	3	56	3
		R36	57	59	59	0	59	0	59	0	58	1	58	1	58	1
Area C	**SB3**	**R37**	61	62	62	0	62	0	62	0	62	0	62	0	62	0
		R38	57	59	58	1	58	1	58	1	58	1	58	1	58	1
		R39	59	61	60	1	59	2	59	2	58	3	58	3	58	3
		R40	60	63	60	3	60	3	60	3	59	4	59	4	59	4
		R41	59	61	59	2	59	2	59	2	58	3	58	3	58	3
		R42	66	**68**	63	5	62	6	62	6	61	7	60	8	60	8
		R43	61	64	61	3	60	4	60	4	59	5	58	6	58	6
Area D	**SB4**	**R44**	**68**	**71**	65	6	65	6	64	7	63	8	63	8	63	8
		R45	60	62	60	2	60	2	59	3	59	3	58	4	58	4
		R46	57	59	58	1	57	2	57	2	57	2	56	3	56	3
		R47	**68**	**70**	64	6	63	7	62	8	61	9	60	10	60	10
		R48	56	59	57	2	56	3	56	3	55	4	55	4	55	4
		R49	60	62	59	3	59	3	58	4	57	5	57	5	57	5
		R50	59	62	59	3	58	4	58	4	57	5	56	6	56	6
		R51	57	59	57	2	57	2	56	3	55	4	55	4	55	4
		R52	67	**70**	65	5	64	6	64	6	63	7	63	7	63	7
		R53	60	63	60	3	59	4	59	4	58	5	58	5	58	5
		R54	57	59	57	2	57	2	56	3	56	3	55	4	55	4

[a] Numbers in **bold** indicate noise levels that exceed the 67 dBA L_{eq}(h) NAC.
[b] Underlined values indicated insertion losses greater than the minimum 5 dBA reduction required for noise abatement to be considered feasible.
ft = feet $L_{eq(h)}$ = Equivalent Sound Level per Hour
I.L. = Insertion Loss, the decibel reduction with insertion of the modeled sound barrier
NF = Not Feasible at this height due to terrain features restricting sound barrier location.

H. FEASIBILITY AND REASONABLE ALLOWANCE CALCULATION

This section outlines the criteria for determination of feasible and reasonable noise abatement, and presents the preliminary feasible and reasonable cost allowance calculation for the modeled sound barriers. Noise barriers were considered to protect the impacted properties in the study area, where sensitive receptors currently are and would continue to be exposed to traffic noise levels exceeding 67 dBA L_{eq}(h). A noise abatement analysis was conducted to determine the noise attenuation provided by sound barriers of heights varying from 6 to 16 feet. Caltrans criteria, as outlined in the Protocol, were used for the determination of feasible abatement and for the calculation of the reasonable cost allowance.

Feasibility. Section 3 of the Protocol states that a minimum noise reduction of 5 dBA must be achieved at the impacted receptors in order for the proposed noise abatement measure to be considered feasible. The feasibility criterion is not necessarily a noise abatement design goal. Greater noise reductions are encouraged if they can be reasonably achieved. The following elements may restrict feasibility:

- Topography
- Access requirements for driveways, ramps, etc.
- Location of local streets in relation to the proposed project
- Other noise sources in the area
- Safety considerations

Table 10 shows the sound levels at the sensitive receptors with and without the sound barriers for future PM peak traffic noise conditions. As shown in Table 10, the modeled sound barriers for each study area, would reduce traffic noise levels by 5 dBA or more at impacted modeled receptor locations and are therefore determined to be feasible.

All feasible sound barriers for each of the build alternatives are listed in Table11. Table 11 shows the heights and lengths of each feasible sound barrier, the critical receptor and protected receptor locations, the number of benefited residences, reasonable allowance per residence, and the total reasonable allowance. Each modeled receptor location that is attenuated by at least 5 dBA is considered to be a benefited receptor. The locations of the feasible sound barriers and the modeled receptor locations are shown in Figure 2. In summary, sound barriers SB1, SB2, SB3, and SB4 were all determined to be feasible at a minimum height of 6 feet.

Table 11: Summary of Reasonable Allowance Calculation for Feasible Sound Barriers

Sound Barrier Number	Critical Receptor	Length (ft)	Height (ft)	Noise Reduction Range (dBA)	Protected Modeled Receptor Locations [a]	Number of Benefited Residences	Reasonable Allowance per Residence	Total Reasonable Allowance	Estimated Sound Barrier Cost [b]	Preliminarily Reasonable?
SB1	**R4**	2,152	6	0 - 7	R1-R5	15	$37,000	$555,000	$516,480	Yes
			8	1 - 8	R1-R5	15	$37,000	$555,000	$688,640	No
			10	2 - 9	R1-R5, R8, R9, R13, R14	25	$39,000	$975,000	$860,800	Yes
			12	2 - 11	R1-R11, R13-R15, R20	37	$39,000	$1,443,000	$1,032,960	Yes
			14	2 - 13	R1-R11, R13-R15, R20	37	$41,000	$1,517,000	$1,205,120	Yes
SB2	**R28**	1,192	6	0 - 5	R28	1	$33,000	$33,000	$286,080	No
			8	0 - 6	R27, R28	2	$35,000	$70,000	$381,440	No
			10	0 - 6	R27, R28	2	$35,000	$70,000	$476,800	No
			12	1 - 8	R26-R28, R31	6	$35,000	$210,000	$572,160	No
			14	1 - 9	R23, R25-R29, R31, R32	14	$35,000	$490,000	$667,520	No
			16	1 - 10	R23, R25-R29, R31-R33	17	$35,000	$595,000	$762,880	No
SB3	**R42**	602	6	0 - 5	R42	4	$35,000	$140,000	$144,480	No
			8	0 - 6	R42	4	$37,000	$148,000	$192,640	No
			10	0 - 6	R42	4	$37,000	$148,000	$240,800	No
			12	0 - 7	R42, R43	8	$37,000	$296,000	$288,960	Yes
			14	0 - 8	R42, R43	8	$37,000	$296,000	$337,120	No
			16	0 - 8	R42, R43	8	$37,000	$296,000	$385,280	No
SB4	**R44**	1,150	6	1 - 6	R44, R47, R52	8	$37,000	$296,000	$276,000	Yes
			8	2 - 7	R44, R47, R52	8	$37,000	$296,000	$368,000	No
			10	2 - 8	R44, R47, R52	8	$37,000	$296,000	$460,000	No
			12	2 - 9	R44, R47, R49, R50, R52, R53	19	$37,000	$703,000	$552,000	Yes
			14	3 - 10	R44, R47, R49, R50, R52, R53	19	$37,000	$703,000	$644,000	Yes
			16	3 - 10	R44, R47, R49, R50, R52, R53	19	$37,000	$703,000	$736,000	No

[a] Modeled receptor locations that would experience a minimum 5 dBA reduction in traffic noise levels with the indicated sound barrier.
[b] Cost calculations were based on a construction cost estimate of $40 per square foot for each sound barrier.
dBA = A-weighted decibel ft = feet

Reasonable Allowance. For each noise barrier found to be acoustically feasible, preliminary reasonable cost allowances were calculated. Worksheets provided in Appendix F summarize the reasonable cost allowance calculations at the critical design receptor based on the allowance calculation procedure identified in the Protocol.[5]

A preliminary reasonableness analysis is based on an estimated sound barrier cost. For any noise barrier to be considered reasonable from a cost perspective, the estimated cost of the noise barrier should be equal to or less than the total cost allowance calculated for the barrier. A preliminary construction cost estimate for each feasible sound barrier is provided in Table 11. These preliminary construction cost calculations were based on a conservative cost estimate of $40 per square foot. During the Noise Barrier Scope Summary Report (NBSSR) phase, when an actual project design and sound barrier construction cost is available, the design team will conduct a detailed cost effectiveness analysis.

During the NBSSR phase, a community meeting will be arranged to obtain community input to determine whether residents favor the sound barrier. Noise abatement measures using sound barriers along the State right-of-way will not be provided if 50 percent or more of the affected residents are not in favor of the barrier.

The overall reasonableness of noise abatement is determined by considering a multitude of factors including but not necessarily limited to the following:

a) Cost of the abatement;

b) Absolute noise levels;

c) Change in noise levels;

d) Noise abatement benefits;

e) Date of development along the highway;

f) Life cycle of abatement measures;

g) Environmental impact of abatement construction;

h) Views (opinions) of impacted residents;

i) Input from the public and local agencies; and

j) Social, economic, environmental, legal, and technological factors.

Based on the studies completed so far, the barriers identified in Table 11 have been determined to be feasible and preliminarily reasonable. If the proposed modeled sound barriers are selected for construction, final construction cost estimates will be prepared by the project engineer and would be presented in the NBSSR. The NBSSR is a design responsibility and is prepared to compile information from this noise barrier study, other relevant environmental studies, and design considerations into a single, comprehensive document before public review of the project. The final decision on noise barriers will be made upon completion of the project design and public involvement processes. The public involvement process will include a public hearing or community meeting. As

[5] Refer to the Protocol for the definition of the critical design receptor.

previously stated, barriers will not be provided if 50 percent or more of the affected residents do not favor the barriers.

The design of noise barriers presented in this report is preliminary and has been conducted at a level appropriate for preliminary environmental review and not for final design of the project. Preliminary information on the physical location, length, and height of noise barriers is provided in this report. If pertinent parameters change substantially during the final project design, preliminary noise barrier designs may be modified or eliminated from the final project. A final decision on the construction of the noise abatement will be made upon completion of the project design.

Conclusion

This noise report has identified traffic noise impacts on existing noise sensitive receptors in the study area. To reduce this impact, this study analyzed the feasible and reasonable noise abatement in the form of sound barriers. The results show that sound barriers **SB1**, **SB2**, **SB3**, and **SB4** would be feasible because these barriers would provide at least 5 dBA noise reduction at impacted sensitive receptors in the study areas. However, only sound barriers **SB1**, **SB3**, and **SB4** are shown to be preliminarily reasonable because they meet the preliminary reasonable cost-effective criteria for the following indicated heights; while sound barrier **SB2** does not meet the preliminary reasonable cost-effective criteria at any modeled height.

- **SB1** – at heights of 6, 10, 12, and 14 feet;
- **SB3** – at a height of 12 feet; and
- **SB4** – at heights of 6, 12, and 14 feet.

Therefore, it is recommended that the retrofit sound barrier analysis for the identified impacted receptor locations proceed to the next step of preparation of an NBSSR.

Once the NBSSR is prepared, Kern COG should prioritize the list of sound barriers and then proceed to the design and construction phases based on the availability of funds. If, during final design, conditions have substantially changed, these noise barriers may not be provided. The final decision on noise barriers will be made upon completion of the project design and public involvement processes. The public involvement process will include a public hearing or community meeting. Based on FHWA guidelines, retrofit sound barriers will not be provided if 50 percent or more of the affected residents do not favor the barriers.

APPENDIX A

NOISE MONITORING RESULTS AND TRAFFIC DATA

Project Number: KCG1001 Sheet ___of___
Project Name: _____
Test Personnel: N. Shiffler

Noise Measurement Survey

Site Number: M1 Date: 7/22/10 Time: From 11:08 To 11:23

Site Location: 3355 Haven St.

Primary Noise Sources: _____

Measurement Results

	dBA
Leq	64.6
Lmax	76.1
Lmin	44.7
Lpeak	108.1
L2	73.7
L8	68.2
L25	61.7
L50	54.0
SEL	

Observed Noise Sources/Events

Time	Noise Source/Event	dBA

Comments: offset 114.3

Equipment: Larson Davis 720 SLM; Kestrel 3000 Calibration Offset: _____dBA
Settings: A-Weighted☐ Other☐_____ Slow☐ Fast☐ Windscreen☐

Atmospheric Conditions:

Maximum Wind Velocity (mph)	Average Wind Velocity (mph)	Temperature (F)	Relative Humidity (%)	
~~tt~~ 5.1	SW 1.2	95.5	14.6	
Comments:				

Photos Taken:

Photo Number	Location/Description

Traffic Description:

Roadway	# Lanes	Posted Speed	Average Speed	NB/EB Counts	SB/WB Counts
SR 14				366	390
				30	54
				84	108
				6	0

Diagram/Further Comments:

Project Number: KCG 1001 Sheet ___ of ___
Project Name: _____
Test Personnel: N. Shiffler

Noise Measurement Survey

Site Number: M2 Date: 7/22/10 Time: From 10:32 To 10:47

Site Location: 2931 Laurel St.

Primary Noise Sources: _____

Measurement Results

	dBA
Leq	54.6
Lmax	75.7
Lmin	45.2
Lpeak	107.3
L2	64.7
L8	56.2
L25	52.1
L50	48.2
SEL	

Observed Noise Sources/Events

Time	Noise Source/Event	dBA

Comments: Offset 114.2

Equipment: Larson Davis 720 SLM; Kestrel 3000 Calibration Offset: _____dBA
Settings: A-Weighted☐ Other☐_____ Slow☐ Fast☐ Windscreen☐

Atmospheric Conditions:

Maximum Wind Velocity (mph)	Average Wind Velocity (mph)	Temperature (F)	Relative Humidity (%)	
5.3	0.9	97.0	12.1	
Comments:				

Photos Taken:

Photo Number	Location/Description

Traffic Description:

Roadway	# Lanes	Posted Speed	Average Speed	NB/EB Counts	SB/WB Counts
SR 14				444	822
				54	36
				84	48
				6	6

Diagram/Further Comments:

Project Number: KC1001 Sheet ___ of ___
Project Name: _____
Test Personnel: N. Shaffer

Noise Measurement Survey

Site Number: M3 Date: 7/22/10 Time: From 9:53 To 10:08

Site Location: 2196 Oak St. - backyard

Primary Noise Sources: _____

Measurement Results

	dBA
Leq	66.3
Lmax	76.4
Lmin	51.2
Lpeak	112.9
L2	73.5
L8	69.6
L25	64.6
L50	58.3
SEL	

Observed Noise Sources/Events

Time	Noise Source/Event	dBA

Comments: Offset 114.2

Equipment: Larson Davis 720 SLM; Kestrel 3000 Calibration Offset: _____ dBA
Settings: A-Weighted☐ Other☐_____ Slow☐ Fast☐ Windscreen☐

Atmospheric Conditions:

Maximum Wind Velocity (mph)	Average Wind Velocity (mph)	Temperature (F)	Relative Humidity (%)	
1.6	6.0	93.2	16.2	
Comments:				

Photos Taken:

Photo Number	Location/Description

Traffic Description:

Roadway	# Lanes	Posted Speed	Average Speed	NB/EB Counts	SB/WB Counts
SR 14				480	612
				66	18
				78	72
				6	0

Diagram/Further Comments:

C:\LARDAV\SLMUTIL\SR14~1.bin Interval Data

Date	Time	Duration	Leq	SEL	Lmax	Lmin	Peak	L(10)	L(25)	L(50)	L(90)
21Jul 10	11:36:35	1404.2	74.7	106.2	93	56.8	130.7	78	75.2	71.2	63.4
21Jul 10	12:00:00	3600	74.1	109.7	89.9	53.4	113.6	78.1	75	70.9	62.8
21Jul 10	13:00:00	3600	73.8	109.4	88.1	47.6	103.9	78.1	75	70.4	61.7
21Jul 10	14:00:00	3600	73.7	109.3	86.4	52.2	100.5	77.8	74.9	70.8	62.7
21Jul 10	15:00:00	3600	74.9	110.4	92.9	54.6	108	78.6	75.9	72	64.4
21Jul 10	16:00:00	3600	75.3	110.9	93	55.8	108.4	79	76.8	73.3	66
21Jul 10	17:00:00	3600	75.2	110.8	89	55.1	106.5	78.9	76.6	73.3	66.2
21Jul 10	18:00:00	3600	74.4	110	91.7	53.8	107.3	78.3	75.8	72	63.5
21Jul 10	19:00:00	3600	73.5	109.1	87	50.5	105.3	77.7	74.9	70.3	61.2
21Jul 10	20:00:00	3600	73	108.6	87.2	51.3	100.5	77.1	74.3	70	60.6
21Jul 10	21:00:00	3600	71.9	107.4	86.9	47.3	99.8	76.2	73.2	67.9	58.3
21Jul 10	22:00:00	3600	70.6	106.2	86.6	43.1	105.2	75.1	71.1	64.3	54.4
21Jul 10	23:00:00	3600	68.4	103.9	85.5	41.1	98.4	72.9	67.6	60.2	49.8
22Jul 10	0:00:00	3600	67.4	103	84.1	36.5	98	71.2	64	57.2	45
22Jul 10	1:00:00	3600	65.8	101.4	83.7	33.7	98.3	69.4	61.3	53.1	40.4
22Jul 10	2:00:00	3600	65.4	101	82.4	33.4	98.3	68.7	61.4	54.2	40.1
22Jul 10	3:00:00	3600	67.3	102.9	85	36.2	101.1	70.6	63.5	57.2	45.4
22Jul 10	4:00:00	3600	70.7	106.3	85.3	45	100.8	75	70.2	64.1	55
22Jul 10	5:00:00	3600	74.6	110.2	86.3	52.8	100.6	78.7	76	72.1	62.7
22Jul 10	6:00:00	3600	76.3	111.8	90.4	54.6	106.1	79.8	77.7	74.5	65.4
22Jul 10	7:00:00	3600	75.7	111.2	89	52.9	110.2	79.6	77.2	73.5	64.2
22Jul 10	8:00:00	3600	74.1	109.7	86.7	51.4	101.3	78.3	75.4	71.2	61.6
22Jul 10	9:00:00	3600	73.6	109.2	87.7	49.7	104.7	77.8	74.5	70.1	61.2
22Jul 10	10:00:00	3600	73.1	108.7	86.9	49.9	104.4	77.4	74.1	69.2	60.5
22Jul 10	11:00:00	3071.8	72.8	107.7	85.5	47.5	117.2	77.1	73.8	68.8	59.6

Ldn Calculations					
	Time	Hourly Leq	Leq'	0.1*Leq	antiLog
Day	12:00:00	74.1	74.1	7.41	25703958
21-Jun	13:00:00	73.8	73.8	7.38	23988329
	14:00:00	73.7	73.7	7.37	23442288
	15:00:00	74.9	74.9	7.49	30902954
	16:00:00	75.3	75.3	7.53	33884416
	17:00:00	75.2	75.2	7.52	33113112
	18:00:00	74.4	74.4	7.44	27542287
	19:00:00	73.5	73.5	7.35	22387211
	20:00:00	73.0	73.0	7.3	19952623
	21:00:00	71.9	71.9	7.19	15488166
Night	22:00:00	80.6	80.6	8.06	1.15E+08
21-Jun	23:00:00	78.4	78.4	7.84	69183097
22-Jun	0:00:00	77.4	77.4	7.74	54954087
	1:00:00	75.8	85.8	8.58	3.8E+08
	2:00:00	75.4	85.4	8.54	3.47E+08
	3:00:00	77.3	87.3	8.73	5.37E+08
	4:00:00	80.7	90.7	9.07	1.17E+09
	5:00:00	84.6	94.6	9.46	2.88E+09
	6:00:00	86.3	96.3	9.63	4.27E+09
Day	7:00:00	75.7	85.7	8.57	3.72E+08
	8:00:00	74.1	84.1	8.41	2.57E+08
	9:00:00	73.6	83.6	8.36	2.29E+08
	10:00:00	73.1	73.1	7.31	20417379
	11:00:00	72.8	72.8	7.28	19054607
			Sum		1.1E+10
			Sum/48		4.58E+08
			Log10(Sum/48)		8.660438
			10*Log10(Sum/48)		86.60438
			24 Hour Ldn		87

RTE	DIST	CNTY	POST MILE	L E G	DESCRIPTION	VEHICLE AADT TOTAL	TRUCK AADT TOTAL	TRUCK % TOT VEH	TRUCK AADT TOTAL By Axle 2	3	4	5+	% TRUCK AADT By Axle 2	3	4	5+	EAL 2-WAY (1000)	YEAR VER/ EST
014	07	LA	R24.788	A	SB OFF TO SB RTE 5 & JCT. RTE. 5, GOLDEN STATE FREEWAY INTERCHANGE	162000	9104	5.62	4194	712	394	3804	46.07	7.82	4.33	41.78	1583	08E
014	07	LA	R54.543	B	ANGELES FOREST HIGHWAY INTERCHANGE	97000	5160	5.32	2031	463	276	2389	39.37	8.98	5.35	46.3	978	08V
014	07	LA	R59.803	B	PALMDALE, SOUTH JCT. RTE. 138, PALMDALE BOULEVARD	78000	4618	5.92	2017	373	228	2000	43.68	8.08	4.94	43.3	828	08E
014	07	LA	R59.803	A	PALMDALE, SOUTH JCT. RTE. 138, PALMDALE BOULEVARD	88000	3722	4.23	1786	268	169	1500	47.98	7.19	4.53	40.3	630	08E
014	07	LA	R74.003	B	NORTH JCT. RTE. 138; AVENUE D INTERCHANGE	36000	2448	6.8	1280	154	101	913	52.29	6.29	4.12	37.3	389	08E
014	07	LA	R74.003	A	NORTH JCT. RTE. 138; AVENUE D INTERCHANGE	34000	2312	6.8	1209	145	95	862	52.29	6.29	4.12	37.3	367	08E
014	06	KER	R0	A	AVENUE A INTERCHANGE, LOS ANGELES/KERN COUNTY LINE	31000	2108	6.8	1102	133	87	786	52.29	6.29	4.12	37.3	335	08E
014	06	KER	L17.384	B	JCT. RTE. 58	18300	3294	18	593	198	66	2438	18	6	2	74	890	04E
014	06	KER	16.07	A	JCT. RTE. 58	17800	1780	10	392	71	53	1264	22	4	3	71	464	04E
014	06	KER	21.29	A	RANDSBURG CUT-OFF ROAD,CALIFORNIA CITY/BAKERSFIELD ROAD	6800	1227	18.05	270	196	123	638	22	16	10	52	266	08E
014	06	KER	57.767	B	FREEMAN JUNCTION, JCT. RTE. 178 WEST	5400	1026	19	123	56	26	821	12	5.5	2.5	80	297	08E
014	06	KER	57.767	A	FREEMAN JUNCTION, JCT. RTE. 178 WEST	5400	1018	18.85	150	75	53	740	14.75	7.37	5.19	72.69	275	08E
014	06	KER	64.559	B	HOMESTEAD NORTH JUNCTION, JCT. RTE. 395	2900	564	19.45	80	62	41	381	14.18	10.99	7.27	67.55	146	08V

Vehicle Percentage Calculations

Existing Traffic Volumes

		Traffic Distribution			Traffic Volumes			
	PM Peak*	Autos**	Medium Trucks**	Heavy Trucks**	Autos	Medium Trucks	Heavy Trucks	Speeds
SR 14 (NB)	1166	0.93	0.04	0.03	1085	47	35	65/55
SR 14 (SB)	792	0.93	0.04	0.03	737	32	24	65/55
On Ramp fr Rosamond Blvd (NB)	229	0.93	0.04	0.03	213	9	7	35
Off Ramp to Rosamond Blvd (NB)	778	0.93	0.04	0.03	724	31	23	35
On Ramp fr Rosamond Blvd (SB)	533	0.93	0.04	0.03	496	21	16	35
Rosamond Blvd Segment 1 (WB)	1130	0.93	0.04	0.03	1051	99	74	40
Rosamond Blvd Segment 2 (WB)	858	0.93	0.04	0.03	798	54	41	40
Rosamond Blvd Segment 1 (EB)	622	0.93	0.04	0.03	579	45	34	40
Rosamond Blvd Segment 2 (EB)	736	0.93	0.04	0.03	684	57	43	40

* PM Peak Hour Volumes from Kern COG Regional Tranpsortation Improvement Plan Count Summaries for year 2007
**Vehicle percentages based on Caltrans *2008 Truck Traffic Volumes*

Future Traffic Volumes

		Traffic Distribution			Traffic Volumes			
	PM Peak*	Autos**	Medium Trucks**	Heavy Trucks**	Autos	Medium Trucks	Heavy Trucks	Speeds
SR 14 (NB)	2068	0.93	0.04	0.03	1923	83	62	65/55
SR 14 (SB)	1490	0.93	0.04	0.03	1386	60	45	65/55
On Ramp fr Rosamond Blvd (NB)	758	0.93	0.04	0.03	705	30	23	35
Off Ramp to Rosamond Blvd (NB)	1226	0.93	0.04	0.03	1140	49	37	35
On Ramp fr Rosamond Blvd (SB)	991	0.93	0.04	0.03	922	40	30	35
Rosamond Blvd Segment 1 (WB)	2480	0.93	0.04	0.03	2307	99	74	40
Rosamond Blvd Segment 2 (WB)	1361	0.93	0.04	0.03	1265	54	41	40
Rosamond Blvd Segment 1 (EB)	1124	0.93	0.04	0.03	1046	45	34	40
Rosamond Blvd Segment 2 (EB)	1425	0.93	0.04	0.03	1325	57	43	40

* PM Peak Hour Volumes from Kern COG Regional Tranpsortation Improvement Plan Count Summaries for year 2007
**Vehicle percentages based on Caltrans *2008 Truck Traffic Volumes*

APPENDIX B

TRAFFIC NOISE MODEL (TNM) 2.5 PRINTOUTS FOR CALIBRATION RUNS

LSA Associates, Inc.
P. Ault
16 September 2010
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: Kern COG Retrofit Noise Barrier
RUN: Calibration 1
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 96 deg F, 15% 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	Crit'n	Increase over existing Calculated	Increase over existing Crit'n Sub'l Inc	With Barrier Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Noise Reduction Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
M1	38	1	0.0	66.6	66	66.6	12	Snd Lvl	66.6	0.0	5	-5.0

Dwelling Units	# DUs	Noise Reduction Min	Noise Reduction Avg	Noise Reduction Max
		dB	dB	dB
All Selected	1	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

LSA Associates, Inc. 16 September 2010
P. Ault TNM 2.5

INPUT: ROADWAYS
PROJECT/CONTRACT: Kern COG Retrofit Noise Barrier
RUN: Calibration 1

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

Roadway Name	Width	Points Name	No.	Coordinates (pavement) X	Y	Z	Flow Control Control Device	Speed Constraint	Percent Vehicles Affected	Segment Pvmt Type	On Struct?
	ft			ft	ft	ft		mph	%		
SR14 (SB)	44.0	0	1	6,510,367.0	2,139,960.0	2,386.00				Average	
		1	2	6,510,329.0	2,139,740.0	2,378.00				Average	
		2	3	6,510,307.0	2,139,514.0	2,368.00				Average	
		3	4	6,510,301.0	2,139,294.0	2,362.00				Average	
		4	5	6,510,293.0	2,139,071.0	2,355.00				Average	
		5	6	6,510,288.0	2,138,878.0	2,352.00				Average	
		6	7	6,510,282.0	2,138,642.0	2,348.00				Average	
		7	8	6,510,269.0	2,138,379.0	2,344.00				Average	
		8	9	6,510,260.0	2,138,130.0	2,340.00				Average	
		9	10	6,510,252.0	2,137,895.0	2,338.00				Average	
		10	11	6,510,244.0	2,137,653.0	2,338.00				Average	
		11	12	6,510,234.0	2,137,419.0	2,338.00				Average	
		12	13	6,510,226.0	2,137,182.0	2,332.00				Average	
		13	14	6,510,210.0	2,136,893.0	2,330.00				Average	
		14	15	6,510,207.0	2,136,663.0	2,330.00				Average	
		15	16	6,510,199.0	2,136,435.0	2,330.00				Average	
		16	17	6,510,191.0	2,136,216.0	2,330.00				Average	
		17	18	6,510,184.0	2,136,048.0	2,328.00				Average	
		18	19	6,510,177.0	2,135,816.0	2,328.00				Average	
		19	20	6,510,168.0	2,135,590.0	2,328.00				Average	
		20	21	6,510,160.0	2,135,381.0	2,328.00				Average	
		21	22	6,510,154.0	2,135,168.0	2,327.00				Average	
		22	23	6,510,151.0	2,135,045.0	2,326.00				Average	
		23	24	6,510,141.0	2,134,835.0	2,326.00				Average	
		24	25	6,510,136.0	2,134,616.0	2,326.00				Average	

		25	26	6,510,127.0	2,134,401.0	2,326.00				Average	
		26	27	6,510,123.0	2,134,291.0	2,326.00				Average	
		27	28	6,510,125.0	2,134,069.0	2,326.00				Average	
		28	29	6,510,125.0	2,133,933.0	2,326.00				Average	
		29	30	6,510,141.0	2,133,650.0	2,324.00				Average	
		30	31	6,510,151.0	2,133,443.0	2,324.00					
SR14 (NB)	44.0	31	32	6,510,027.0	2,133,442.0	2,324.00				Average	
		32	33	6,510,009.0	2,134,403.0	2,326.00				Average	
		33	34	6,510,015.0	2,134,613.0	2,326.00				Average	
		34	35	6,510,023.0	2,134,836.0	2,326.00				Average	
		35	36	6,510,035.0	2,135,049.0	2,326.00				Average	
		36	37	6,510,038.0	2,135,170.0	2,327.00				Average	
		37	38	6,510,043.0	2,135,383.0	2,328.00				Average	
		38	39	6,510,048.0	2,135,591.0	2,328.00				Average	
		39	40	6,510,059.0	2,135,818.0	2,328.00				Average	
		40	41	6,510,066.0	2,136,052.0	2,328.00				Average	
		41	42	6,510,073.0	2,136,218.0	2,330.00				Average	
		42	43	6,510,078.0	2,136,439.0	2,330.00				Average	
		43	44	6,510,088.0	2,136,664.0	2,330.00				Average	
		44	45	6,510,097.0	2,136,895.0	2,330.00				Average	
		45	46	6,510,108.0	2,137,185.0	2,332.00				Average	
		46	47	6,510,117.0	2,137,421.0	2,338.00				Average	
		47	48	6,510,124.0	2,137,659.0	2,338.00				Average	
		48	49	6,510,132.0	2,137,896.0	2,338.00				Average	
		49	50	6,510,142.0	2,138,137.0	2,340.00				Average	
		50	51	6,510,152.0	2,138,386.0	2,344.00				Average	
		51	52	6,510,161.0	2,138,635.0	2,348.00				Average	
		52	53	6,510,170.0	2,138,884.0	2,352.00				Average	
		53	54	6,510,177.0	2,139,077.0	2,355.00				Average	
		54	55	6,510,182.0	2,139,317.0	2,362.00				Average	
		55	56	6,510,191.0	2,139,540.0	2,370.00				Average	
		56	57	6,510,212.0	2,139,750.0	2,380.00				Average	
		57	58	6,510,255.0	2,139,982.0	2,388.00					
On ramp fr Rosamond Blvd (NB)	20.0	0	116	6,511,587.0	2,136,997.0	2,340.00				Average	
		1	117	6,510,437.0	2,137,012.0	2,348.00				Average	
		2	118	6,510,326.0	2,137,240.0	2,341.00				Average	
		3	119	6,510,292.0	2,137,420.0	2,340.00				Average	
		4	120	6,510,277.0	2,137,660.0	2,338.00				Average	
		5	121	6,510,274.0	2,137,894.0	2,338.00				Average	

		6	122	6,510,278.0	2,138,130.0	2,340.00				Average	
		7	123	6,510,269.0	2,138,379.0	2,344.00					
Off ramp to Rosamond Blvd (NB)	36.0	8	124	6,510,178.0	2,135,818.2	2,328.00				Average	
		9	125	6,510,214.5	2,136,047.2	2,328.00				Average	
		10	126	6,510,235.0	2,136,213.0	2,330.00				Average	
		11	127	6,510,287.0	2,136,436.0	2,330.00				Average	
		12	128	6,510,385.0	2,136,662.0	2,336.00				Average	
		13	129	6,510,601.0	2,136,903.0	2,344.00				Average	
		14	130	6,511,474.0	2,136,959.5	2,340.00					
On ramp fr W Rosamond Blvd (SB)	36.0	15	131	6,509,509.5	2,136,925.0	2,338.00				Average	
		16	132	6,509,930.0	2,136,900.0	2,350.00				Average	
		17	133	6,510,013.0	2,136,666.0	2,340.00				Average	
		18	134	6,510,022.0	2,136,436.0	2,335.00				Average	
		19	135	6,510,036.0	2,136,216.0	2,333.00				Average	
		20	136	6,510,041.0	2,136,051.0	2,330.00				Average	
		21	137	6,510,041.0	2,135,816.0	2,330.00				Average	
		22	138	6,510,036.0	2,135,592.0	2,328.00				Average	
		23	139	6,510,043.0	2,135,383.2	2,328.00					
Hillcrest Ave	36.0	0	140	6,510,885.0	2,139,600.0	2,364.00				Average	
		1	141	6,510,383.0	2,139,584.0	2,360.00					
Alexander Ave	36.0	2	142	6,510,886.0	2,138,554.0	2,354.00				Average	
		3	143	6,510,375.0	2,138,551.0	2,347.00					
Haven St	36.0	4	144	6,510,539.0	2,139,566.0	2,360.00				Average	
		5	145	6,510,540.0	2,138,564.0	2,352.00					
Rosewood Ave to Milstead	36.0	6	146	6,510,382.0	2,138,289.0	2,348.00				Average	
		7	147	6,510,599.0	2,138,292.0	2,352.00				Average	
		8	148	6,510,601.0	2,137,430.0	2,340.00				Average	
		9	149	6,510,405.0	2,137,425.0	2,341.00					
Rosamond Blvd WB	36.0	10	150	6,511,584.0	2,136,997.0	2,340.00				Average	
		11	151	6,510,265.0	2,136,967.0	2,352.00				Average	Y
		12	152	6,510,032.0	2,136,964.0	2,351.00				Average	
		13	153	6,509,607.0	2,136,961.0	2,341.00					
Rosamond Blvd EB	36.0	14	154	6,509,509.5	2,136,925.0	2,338.00				Average	
		15	155	6,510,032.0	2,136,938.0	2,351.00				Average	Y
		16	156	6,510,266.0	2,136,939.0	2,352.00				Average	
		17	157	6,510,489.0	2,136,938.0	2,349.00				Average	
		18	158	6,510,494.0	2,136,938.0	2,344.00				Average	
		19	159	6,511,478.0	2,136,960.0	2,340.00					
Laurel St to Poplar St	36.0	20	160	6,509,550.0	2,136,808.0	2,332.00				Average	

		21	161	6,509,782.0	2,136,799.0	2,330.00				Average	
		22	162	6,509,933.0	2,136,673.0	2,328.00				Average	
		23	163	6,509,968.0	2,135,807.0	2,330.00				Average	
		24	164	6,509,558.0	2,135,801.0	2,328.00					
C st to Poplar St	36.0	25	165	6,510,941.0	2,136,720.0	2,336.00				Average	
		26	166	6,510,487.0	2,136,712.0	2,336.00				Average	
		27	167	6,510,470.0	2,135,826.0	2,328.00				Average	
		28	168	6,510,948.0	2,135,814.0	2,332.00					
W B St	36.0	29	169	6,510,963.0	2,134,301.0	2,324.00				Average	
		30	170	6,510,962.0	2,135,077.0	2,326.00					
Oak St	36.0	31	171	6,510,954.5	2,134,933.8	2,326.00				Average	
		32	172	6,510,229.0	2,134,920.0	2,326.00					
Elm St	36.0	33	173	6,510,953.5	2,134,663.0	2,326.00				Average	
		34	174	6,510,228.0	2,134,644.0	2,326.00					
Orange St	36.0	35	175	6,510,954.0	2,134,341.2	2,324.00				Average	
		36	176	6,510,239.0	2,134,322.0	2,326.00					
Granite St	36.0	37	177	6,510,216.0	2,135,058.0	2,326.00				Average	
		38	178	6,510,223.0	2,134,156.0	2,326.00					

LSA Associates, Inc. **16 September 2010**
P. Ault **TNM 2.5**

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: Kern COG Retrofit Noise Barrier
RUN: Calibration 1

Roadway	Points											
Name	Name	No.	Segment									
			Autos		MTrucks		HTrucks		Buses		Motorcycles	
			V	S	V	S	V	S	V	S	V	S
			veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph
SR14 (SB)	0	1	390	65	54	65	108	55	0	0	0	0
	1	2	390	65	54	65	108	55	0	0	0	0
	2	3	390	65	54	65	108	55	0	0	0	0
	3	4	390	65	54	65	108	55	0	0	0	0
	4	5	390	65	54	65	108	55	0	0	0	0
	5	6	390	65	54	65	108	55	0	0	0	0
	6	7	390	65	54	65	108	55	0	0	0	0
	7	8	390	65	54	65	108	55	0	0	0	0
	8	9	390	65	54	65	108	55	0	0	0	0
	9	10	390	65	54	65	108	55	0	0	0	0
	10	11	390	65	54	65	108	55	0	0	0	0
	11	12	390	65	54	65	108	55	0	0	0	0
	12	13	390	65	54	65	108	55	0	0	0	0
	13	14	390	65	54	65	108	55	0	0	0	0
	14	15	390	65	54	65	108	55	0	0	0	0
	15	16	390	65	54	65	108	55	0	0	0	0
	16	17	390	65	54	65	108	55	0	0	0	0
	17	18	390	65	54	65	108	55	0	0	0	0
	18	19	390	65	54	65	108	55	0	0	0	0
	19	20	390	65	54	65	108	55	0	0	0	0
	20	21	390	65	54	65	108	55	0	0	0	0
	21	22	390	65	54	65	108	55	0	0	0	0
	22	23	390	65	54	65	108	55	0	0	0	0

	23	24	390	65	54	65	108	55	0	0	0	0
	24	25	390	65	54	65	108	55	0	0	0	0
	25	26	390	65	54	65	108	55	0	0	0	0
	26	27	390	65	54	65	108	55	0	0	0	0
	27	28	390	65	54	65	108	55	0	0	0	0
	28	29	390	65	54	65	108	55	0	0	0	0
	29	30	390	65	54	65	108	55	0	0	0	0
	30	31										
SR14 (NB)	31	32	366	65	30	65	84	55	0	0	6	65
	32	33	366	65	30	65	84	55	0	0	6	65
	33	34	366	65	30	65	84	55	0	0	6	65
	34	35	366	65	30	65	84	55	0	0	6	65
	35	36	366	65	30	65	84	55	0	0	6	65
	36	37	366	65	30	65	84	55	0	0	6	65
	37	38	366	65	30	65	84	55	0	0	6	65
	38	39	366	65	30	65	84	55	0	0	6	65
	39	40	366	65	30	65	84	55	0	0	6	65
	40	41	366	65	30	65	84	55	0	0	6	65
	41	42	366	65	30	65	84	55	0	0	6	65
	42	43	366	65	30	65	84	55	0	0	6	65
	43	44	366	65	30	65	84	55	0	0	6	65
	44	45	366	65	30	65	84	55	0	0	6	65
	45	46	366	65	30	65	84	55	0	0	6	65
	46	47	366	65	30	65	84	55	0	0	6	65
	47	48	366	65	30	65	84	55	0	0	6	65
	48	49	366	65	30	65	84	55	0	0	6	65
	49	50	366	65	30	65	84	55	0	0	6	65
	50	51	366	65	30	65	84	55	0	0	6	65
	51	52	366	65	30	65	84	55	0	0	6	65
	52	53	366	65	30	65	84	55	0	0	6	65
	53	54	366	65	30	65	84	55	0	0	6	65
	54	55	366	65	30	65	84	55	0	0	6	65
	55	56	366	65	30	65	84	55	0	0	6	65
	56	57	366	65	30	65	84	55	0	0	6	65
	57	58										
On ramp fr Rosamond Blvd (NB)	0	116	0	0	0	0	0	0	0	0	0	0

	1	117	0	0	0	0	0	0	0	0	0	0
	2	118	0	0	0	0	0	0	0	0	0	0
	3	119	0	0	0	0	0	0	0	0	0	0
	4	120	0	0	0	0	0	0	0	0	0	0
	5	121	0	0	0	0	0	0	0	0	0	0
	6	122	0	0	0	0	0	0	0	0	0	0
	7	123										
Off ramp to Rosamond Blvd (NB)	8	124	0	0	0	0	0	0	0	0	0	0
	9	125	0	0	0	0	0	0	0	0	0	0
	10	126	0	0	0	0	0	0	0	0	0	0
	11	127	0	0	0	0	0	0	0	0	0	0
	12	128	0	0	0	0	0	0	0	0	0	0
	13	129	0	0	0	0	0	0	0	0	0	0
	14	130										
On ramp fr W Rosamond Blvd (SB)	15	131	0	0	0	0	0	0	0	0	0	0
	16	132	0	0	0	0	0	0	0	0	0	0
	17	133	0	0	0	0	0	0	0	0	0	0
	18	134	0	0	0	0	0	0	0	0	0	0
	19	135	0	0	0	0	0	0	0	0	0	0
	20	136	0	0	0	0	0	0	0	0	0	0
	21	137	0	0	0	0	0	0	0	0	0	0
	22	138	0	0	0	0	0	0	0	0	0	0
	23	139										
Hillcrest Ave	0	140	0	0	0	0	0	0	0	0	0	0
	1	141										
Alexander Ave	2	142	0	0	0	0	0	0	0	0	0	0
	3	143										
Haven St	4	144	0	0	0	0	0	0	0	0	0	0
	5	145										
Rosewood Ave to Milstead	6	146	0	0	0	0	0	0	0	0	0	0
	7	147	0	0	0	0	0	0	0	0	0	0
	8	148	0	0	0	0	0	0	0	0	0	0
	9	149										
Rosamond Blvd WB	10	150	0	0	0	0	0	0	0	0	0	0
	11	151	0	0	0	0	0	0	0	0	0	0
	12	152	0	0	0	0	0	0	0	0	0	0

	13	153										
Rosamond Blvd EB	14	154	0	0	0	0	0	0	0	0	0	0
	15	155	0	0	0	0	0	0	0	0	0	0
	16	156	0	0	0	0	0	0	0	0	0	0
	17	157	0	0	0	0	0	0	0	0	0	0
	18	158	0	0	0	0	0	0	0	0	0	0
	19	159										
Laurel St to Poplar St	20	160	0	0	0	0	0	0	0	0	0	0
	21	161	0	0	0	0	0	0	0	0	0	0
	22	162	0	0	0	0	0	0	0	0	0	0
	23	163	0	0	0	0	0	0	0	0	0	0
	24	164										
C st to Poplar St	25	165	0	0	0	0	0	0	0	0	0	0
	26	166	0	0	0	0	0	0	0	0	0	0
	27	167	0	0	0	0	0	0	0	0	0	0
	28	168										
W B St	29	169	0	0	0	0	0	0	0	0	0	0
	30	170										
Oak St	31	171	0	0	0	0	0	0	0	0	0	0
	32	172										
Elm St	33	173	0	0	0	0	0	0	0	0	0	0
	34	174										
Orange St	35	175	0	0	0	0	0	0	0	0	0	0
	36	176										
Granite St	37	177	0	0	0	0	0	0	0	0	0	0
	38	178										

LSA Associates, Inc. 16 September 2010
P. Ault TNM 2.5

INPUT: RECEIVERS
PROJECT/CONTRACT: Kern COG Retrofit Noise Barrier
RUN: Calibration 1

Receiver Name	No.	#DUs	Coordinates (ground) X	Y	Z	Height above Ground	Input Sound Levels and Criteria: Existing LAeq1h	Impact Criteria LAeq1h	Impact Criteria Sub'l	NR Goal	Active in Calc.
			ft	ft	ft	ft	dBA	dBA	dB	dB	
M1	38	1	6,510,394.0	2,138,865.0	2,344.00	4.92	0.00	66	12.0	5.0	Y

LSA Associates, Inc. 16 September 2010
P. Ault TNM 2.5

INPUT: BARRIERS
PROJECT/CONTRACT: Kern COG Retrofit Noise Barrier
RUN: Calibration 1

Barrier									Points										
Name	Type	Height		If Wall	If Berm			Add'tnl	Name	No.	Coordinates (bottom)			Height	Segment				
		Min	Max	$ per	$ per	Top	Run:Rise	$ per			X	Y	Z	at	Seg Ht Perturbs			On	Important
				Unit	Unit	Width		Unit						Point	Incre-	#Up	#Dn	Struct?	Reflec-
				Area	Vol.			Length							ment				tions?
		ft	ft	$/sq ft	$/cu yd	ft	ft:ft	$/ft			ft	ft	ft	ft	ft				
Barrier1	W	0.00	99.99	0.00				0.00	0	1	6,510,312.0	2,136,173.0	2,332.00	15.00	0.00	0	0		
									1	2	6,510,387.0	2,136,181.0	2,332.00	15.00	0.00	0	0		
									2	3	6,510,382.0	2,136,233.0	2,332.00	15.00	0.00	0	0		
									3	4	6,510,312.0	2,136,236.0	2,332.00	15.00	0.00	0	0		
									4	5	6,510,310.0	2,136,186.0	2,332.00	15.00					
Barrier2	W	0.00	99.99	0.00				0.00	5	6	6,510,292.0	2,136,280.0	2,332.00	15.00	0.00	0	0		
									6	7	6,510,340.0	2,136,280.0	2,332.00	15.00	0.00	0	0		
									7	8	6,510,340.0	2,136,323.0	2,332.00	15.00	0.00	0	0		
									8	9	6,510,290.0	2,136,338.0	2,332.00	15.00	0.00	0	0		
									9	10	6,510,294.0	2,136,291.0	2,332.00	15.00					
Barrier3	W	0.00	99.99	0.00				0.00	10	11	6,510,352.0	2,136,356.0	2,332.00	15.00	0.00	0	0		
									11	12	6,510,412.0	2,136,357.0	2,332.00	15.00	0.00	0	0		
									12	13	6,510,413.0	2,136,456.0	2,332.00	15.00	0.00	0	0		
									13	14	6,510,352.0	2,136,456.0	2,332.00	15.00	0.00	0	0		
									14	15	6,510,349.0	2,136,368.0	2,332.00	15.00					

LSA Associates, Inc. **16 September 2010**
P. Ault **TNM 2.5**

INPUT: BUILDING ROWS
PROJECT/CONTRACT: Kern COG Retrofit Noise Barrier
RUN: Calibration 1

Building Row Name	Average Height	Building Percent	Points No.	Coordinates (ground) X	Y	Z
	ft	%		ft	ft	ft
Building1	15.00	80	1	6,510,460.0	2,139,539.0	2,358.00
			2	6,510,454.0	2,138,597.0	2,351.00
Building2	15.00	80	3	6,510,616.0	2,139,543.0	2,360.00
			4	6,510,615.0	2,138,604.0	2,352.00
Building3	15.00	80	5	6,510,381.0	2,138,476.0	2,350.00
			6	6,510,382.0	2,138,358.0	2,350.00
Building4	15.00	80	7	6,510,628.0	2,138,359.0	2,350.00
			8	6,510,627.0	2,138,486.0	2,350.00
Building5	15.00	80	9	6,510,529.0	2,138,235.0	2,348.00
			10	6,510,516.0	2,137,460.0	2,342.00
Building7	15.00	80	13	6,509,796.0	2,136,616.0	2,330.00
			14	6,509,886.0	2,136,614.0	2,330.00
Building8	15.00	80	15	6,509,908.0	2,136,506.0	2,334.00
			16	6,509,910.0	2,135,949.0	2,330.00
Building9	15.00	80	17	6,509,940.0	2,135,893.0	2,330.00
			18	6,509,607.0	2,135,888.0	2,328.00
Building10	15.00	80	19	6,509,934.0	2,135,729.0	2,328.00
			20	6,509,576.0	2,135,723.0	2,328.00
Building11	15.00	80	21	6,509,635.0	2,135,942.0	2,328.00
			22	6,509,632.0	2,136,678.0	2,332.00
Building12	15.00	80	23	6,510,605.0	2,136,671.0	2,334.00
			24	6,510,527.0	2,136,578.0	2,336.00
			41	6,510,535.0	2,136,363.0	2,332.00
			42	6,510,581.0	2,136,293.0	2,332.00

Building13	15.00	80	25	6,510,270.0	2,135,716.0	2,328.00
			26	6,510,274.0	2,135,665.0	2,328.00
			43	6,510,442.0	2,135,670.0	2,326.00
Building14	15.00	80	27	6,510,491.0	2,135,758.0	2,326.00
			28	6,510,490.0	2,135,656.0	2,326.00
			44	6,510,610.0	2,135,656.0	2,328.00
			45	6,510,603.0	2,135,765.0	2,328.00
Building15	15.00	80	29	6,510,539.0	2,135,982.0	2,330.00
			30	6,510,535.0	2,135,853.0	2,330.00
			46	6,510,635.0	2,135,852.0	2,330.00
			47	6,510,631.0	2,135,969.0	2,330.00
Building16	15.00	80	31	6,510,266.0	2,135,001.0	2,326.00
			32	6,510,673.0	2,135,009.0	2,326.00
Building17	15.00	80	33	6,510,265.0	2,134,846.0	2,326.00
			34	6,510,679.0	2,134,845.0	2,326.00
Building18	15.00	80	37	6,510,271.0	2,134,718.0	2,326.00
			38	6,510,673.0	2,134,721.0	2,326.00
Building19	15.00	80	39	6,510,269.0	2,134,555.0	2,326.00
			40	6,510,682.0	2,134,572.0	2,326.00
Building20	15.00	20	48	6,510,270.0	2,134,421.0	2,326.00
			49	6,510,684.0	2,134,430.0	2,328.00
Building21	15.00	20	50	6,510,264.0	2,134,222.0	2,326.00
			51	6,510,685.0	2,134,231.0	2,326.00

LSA Associates, Inc.
P. Ault
16 September 2010
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: Kern COG Retrofit Noise Barrier
RUN: Calibration 2
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 97 deg F, 12% 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	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
M2	38	1	0.0	56.3	66	56.3	12	----	56.3	0.0	5	-5.0

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

LSA Associates, Inc. 16 September 2010
P. Ault TNM 2.5

INPUT: ROADWAYS
PROJECT/CONTRACT: Kern COG Retrofit Noise Barrier
RUN: Calibration 2

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

Roadway Name	Width	Points Name	No.	Coordinates (pavement) X	Y	Z	Flow Control Control Device	Speed Constraint	Percent Vehicles Affected	Segment Pvmt Type	On Struct?
	ft			ft	ft	ft		mph	%		
SR14 (SB)	44.0	0	1	6,510,367.0	2,139,960.0	2,386.00				Average	
		1	2	6,510,329.0	2,139,740.0	2,378.00				Average	
		2	3	6,510,307.0	2,139,514.0	2,368.00				Average	
		3	4	6,510,301.0	2,139,294.0	2,362.00				Average	
		4	5	6,510,293.0	2,139,071.0	2,355.00				Average	
		5	6	6,510,288.0	2,138,878.0	2,352.00				Average	
		6	7	6,510,282.0	2,138,642.0	2,348.00				Average	
		7	8	6,510,269.0	2,138,379.0	2,344.00				Average	
		8	9	6,510,260.0	2,138,130.0	2,340.00				Average	
		9	10	6,510,252.0	2,137,895.0	2,338.00				Average	
		10	11	6,510,244.0	2,137,653.0	2,338.00				Average	
		11	12	6,510,234.0	2,137,419.0	2,338.00				Average	
		12	13	6,510,226.0	2,137,182.0	2,332.00				Average	
		13	14	6,510,210.0	2,136,893.0	2,330.00				Average	
		14	15	6,510,207.0	2,136,663.0	2,330.00				Average	
		15	16	6,510,199.0	2,136,435.0	2,330.00				Average	
		16	17	6,510,191.0	2,136,216.0	2,330.00				Average	
		17	18	6,510,184.0	2,136,048.0	2,328.00				Average	
		18	19	6,510,177.0	2,135,816.0	2,328.00				Average	
		19	20	6,510,168.0	2,135,590.0	2,328.00				Average	
		20	21	6,510,160.0	2,135,381.0	2,328.00				Average	
		21	22	6,510,154.0	2,135,168.0	2,327.00				Average	
		22	23	6,510,151.0	2,135,045.0	2,326.00				Average	
		23	24	6,510,141.0	2,134,835.0	2,326.00				Average	
		24	25	6,510,136.0	2,134,616.0	2,326.00				Average	

		25	26	6,510,127.0	2,134,401.0	2,326.00				Average	
		26	27	6,510,123.0	2,134,291.0	2,326.00				Average	
		27	28	6,510,125.0	2,134,069.0	2,326.00				Average	
		28	29	6,510,125.0	2,133,933.0	2,326.00				Average	
		29	30	6,510,141.0	2,133,650.0	2,324.00				Average	
		30	31	6,510,151.0	2,133,443.0	2,324.00					
SR14 (NB)	44.0	31	32	6,510,027.0	2,133,442.0	2,324.00				Average	
		32	33	6,510,009.0	2,134,403.0	2,326.00				Average	
		33	34	6,510,015.0	2,134,613.0	2,326.00				Average	
		34	35	6,510,023.0	2,134,836.0	2,326.00				Average	
		35	36	6,510,035.0	2,135,049.0	2,326.00				Average	
		36	37	6,510,038.0	2,135,170.0	2,327.00				Average	
		37	38	6,510,043.0	2,135,383.0	2,328.00				Average	
		38	39	6,510,048.0	2,135,591.0	2,328.00				Average	
		39	40	6,510,059.0	2,135,818.0	2,328.00				Average	
		40	41	6,510,066.0	2,136,052.0	2,328.00				Average	
		41	42	6,510,073.0	2,136,218.0	2,330.00				Average	
		42	43	6,510,078.0	2,136,439.0	2,330.00				Average	
		43	44	6,510,088.0	2,136,664.0	2,330.00				Average	
		44	45	6,510,097.0	2,136,895.0	2,330.00				Average	
		45	46	6,510,108.0	2,137,185.0	2,332.00				Average	
		46	47	6,510,117.0	2,137,421.0	2,338.00				Average	
		47	48	6,510,124.0	2,137,659.0	2,338.00				Average	
		48	49	6,510,132.0	2,137,896.0	2,338.00				Average	
		49	50	6,510,142.0	2,138,137.0	2,340.00				Average	
		50	51	6,510,152.0	2,138,386.0	2,344.00				Average	
		51	52	6,510,161.0	2,138,635.0	2,348.00				Average	
		52	53	6,510,170.0	2,138,884.0	2,352.00				Average	
		53	54	6,510,177.0	2,139,077.0	2,355.00				Average	
		54	55	6,510,182.0	2,139,317.0	2,362.00				Average	
		55	56	6,510,191.0	2,139,540.0	2,370.00				Average	
		56	57	6,510,212.0	2,139,750.0	2,380.00				Average	
		57	58	6,510,255.0	2,139,982.0	2,388.00					
On ramp fr Rosamond Blvd (NB)	20.0	0	116	6,511,587.0	2,136,997.0	2,340.00				Average	
		1	117	6,510,437.0	2,137,012.0	2,348.00				Average	
		2	118	6,510,326.0	2,137,240.0	2,341.00				Average	
		3	119	6,510,292.0	2,137,420.0	2,340.00				Average	
		4	120	6,510,277.0	2,137,660.0	2,338.00				Average	
		5	121	6,510,274.0	2,137,894.0	2,338.00				Average	

		6	122	6,510,278.0	2,138,130.0	2,340.00				Average	
		7	123	6,510,269.0	2,138,379.0	2,344.00					
Off ramp to Rosamond Blvd (NB)	36.0	8	124	6,510,178.0	2,135,818.2	2,328.00				Average	
		9	125	6,510,214.5	2,136,047.2	2,328.00				Average	
		10	126	6,510,235.0	2,136,213.0	2,330.00				Average	
		11	127	6,510,287.0	2,136,436.0	2,330.00				Average	
		12	128	6,510,385.0	2,136,662.0	2,336.00				Average	
		13	129	6,510,601.0	2,136,903.0	2,344.00				Average	
		14	130	6,511,474.0	2,136,959.5	2,340.00					
On ramp fr W Rosamond Blvd (SB)	36.0	15	131	6,509,509.5	2,136,925.0	2,338.00				Average	
		16	132	6,509,930.0	2,136,900.0	2,350.00				Average	
		17	133	6,510,013.0	2,136,666.0	2,340.00				Average	
		18	134	6,510,022.0	2,136,436.0	2,335.00				Average	
		19	135	6,510,036.0	2,136,216.0	2,333.00				Average	
		20	136	6,510,041.0	2,136,051.0	2,330.00				Average	
		21	137	6,510,041.0	2,135,816.0	2,330.00				Average	
		22	138	6,510,036.0	2,135,592.0	2,328.00				Average	
		23	139	6,510,043.0	2,135,383.2	2,328.00					
Hillcrest Ave	36.0	0	140	6,510,885.0	2,139,600.0	2,364.00				Average	
		1	141	6,510,383.0	2,139,584.0	2,360.00					
Alexander Ave	36.0	2	142	6,510,886.0	2,138,554.0	2,354.00				Average	
		3	143	6,510,375.0	2,138,551.0	2,347.00					
Haven St	36.0	4	144	6,510,539.0	2,139,566.0	2,360.00				Average	
		5	145	6,510,540.0	2,138,564.0	2,352.00					
Rosewood Ave to Milstead	36.0	6	146	6,510,382.0	2,138,289.0	2,348.00				Average	
		7	147	6,510,599.0	2,138,292.0	2,352.00				Average	
		8	148	6,510,601.0	2,137,430.0	2,340.00				Average	
		9	149	6,510,405.0	2,137,425.0	2,341.00					
Rosamond Blvd WB	36.0	10	150	6,511,584.0	2,136,997.0	2,340.00				Average	
		11	151	6,510,265.0	2,136,967.0	2,352.00				Average	Y
		12	152	6,510,032.0	2,136,964.0	2,351.00				Average	
		13	153	6,509,607.0	2,136,961.0	2,341.00					
Rosamond Blvd EB	36.0	14	154	6,509,509.5	2,136,925.0	2,338.00				Average	
		15	155	6,510,032.0	2,136,938.0	2,351.00				Average	Y
		16	156	6,510,266.0	2,136,939.0	2,352.00				Average	
		17	157	6,510,489.0	2,136,938.0	2,349.00				Average	
		18	158	6,510,494.0	2,136,938.0	2,344.00				Average	
		19	159	6,511,478.0	2,136,960.0	2,340.00					
Laurel St to Poplar St	36.0	20	160	6,509,550.0	2,136,808.0	2,332.00				Average	

		21	161	6,509,782.0	2,136,799.0	2,330.00				Average	
		22	162	6,509,933.0	2,136,673.0	2,328.00				Average	
		23	163	6,509,968.0	2,135,807.0	2,330.00				Average	
		24	164	6,509,558.0	2,135,801.0	2,328.00					
C st to Poplar St	36.0	25	165	6,510,941.0	2,136,720.0	2,336.00				Average	
		26	166	6,510,487.0	2,136,712.0	2,336.00				Average	
		27	167	6,510,470.0	2,135,826.0	2,328.00				Average	
		28	168	6,510,948.0	2,135,814.0	2,332.00					
W B St	36.0	29	169	6,510,963.0	2,134,301.0	2,324.00				Average	
		30	170	6,510,962.0	2,135,077.0	2,326.00					
Oak St	36.0	31	171	6,510,954.5	2,134,933.8	2,326.00				Average	
		32	172	6,510,229.0	2,134,920.0	2,326.00					
Elm St	36.0	33	173	6,510,953.5	2,134,663.0	2,326.00				Average	
		34	174	6,510,228.0	2,134,644.0	2,326.00					
Orange St	36.0	35	175	6,510,954.0	2,134,341.2	2,324.00				Average	
		36	176	6,510,239.0	2,134,322.0	2,326.00					
Granite St	36.0	37	177	6,510,216.0	2,135,058.0	2,326.00				Average	
		38	178	6,510,223.0	2,134,156.0	2,326.00					

LSA Associates, Inc. **16 September 2010**
P. Ault **TNM 2.5**

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: **Kern COG Retrofit Noise Barrier**
RUN: **Calibration 2**

Roadway	Points											
Name	Name	No.	Segment									
			Autos		MTrucks		HTrucks		Buses		Motorcycles	
			V	S	V	S	V	S	V	S	V	S
			veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph
SR14 (SB)	0	1	822	65	36	65	48	55	0	0	6	65
	1	2	822	65	36	65	48	55	0	0	6	65
	2	3	822	65	36	65	48	55	0	0	6	65
	3	4	822	65	36	65	48	55	0	0	6	65
	4	5	822	65	36	65	48	55	0	0	6	65
	5	6	822	65	36	65	48	55	0	0	6	65
	6	7	822	65	36	65	48	55	0	0	6	65
	7	8	822	65	36	65	48	55	0	0	6	65
	8	9	822	65	36	65	48	55	0	0	6	65
	9	10	822	65	36	65	48	55	0	0	6	65
	10	11	822	65	36	65	48	55	0	0	6	65
	11	12	822	65	36	65	48	55	0	0	6	65
	12	13	822	65	36	65	48	55	0	0	6	65
	13	14	822	65	36	65	48	55	0	0	6	65
	14	15	822	65	36	65	48	55	0	0	6	65
	15	16	822	65	36	65	48	55	0	0	6	65
	16	17	822	65	36	65	48	55	0	0	6	65
	17	18	822	65	36	65	48	55	0	0	6	65
	18	19	822	65	36	65	48	55	0	0	6	65
	19	20	822	65	36	65	48	55	0	0	6	65
	20	21	822	65	36	65	48	55	0	0	6	65
	21	22	822	65	36	65	48	55	0	0	6	65
	22	23	822	65	36	65	48	55	0	0	6	65

	23	24	822	65	36	65	48	55	0	0	6	65
	24	25	822	65	36	65	48	55	0	0	6	65
	25	26	822	65	36	65	48	55	0	0	6	65
	26	27	822	65	36	65	48	55	0	0	6	65
	27	28	822	65	36	65	48	55	0	0	6	65
	28	29	822	65	36	65	48	55	0	0	6	65
	29	30	822	65	36	65	48	55	0	0	6	65
	30	31										
SR14 (NB)	31	32	444	65	54	65	84	55	0	0	6	65
	32	33	444	65	54	65	84	55	0	0	6	65
	33	34	444	65	54	65	84	55	0	0	6	65
	34	35	444	65	54	65	84	55	0	0	6	65
	35	36	444	65	54	65	84	55	0	0	6	65
	36	37	444	65	54	65	84	55	0	0	6	65
	37	38	444	65	54	65	84	55	0	0	6	65
	38	39	444	65	54	65	84	55	0	0	6	65
	39	40	444	65	54	65	84	55	0	0	6	65
	40	41	444	65	54	65	84	55	0	0	6	65
	41	42	444	65	54	65	84	55	0	0	6	65
	42	43	444	65	54	65	84	55	0	0	6	65
	43	44	444	65	54	65	84	55	0	0	6	65
	44	45	444	65	54	65	84	55	0	0	6	65
	45	46	444	65	54	65	84	55	0	0	6	65
	46	47	444	65	54	65	84	55	0	0	6	65
	47	48	444	65	54	65	84	55	0	0	6	65
	48	49	444	65	54	65	84	55	0	0	6	65
	49	50	444	65	54	65	84	55	0	0	6	65
	50	51	444	65	54	65	84	55	0	0	6	65
	51	52	444	65	54	65	84	55	0	0	6	65
	52	53	444	65	54	65	84	55	0	0	6	65
	53	54	444	65	54	65	84	55	0	0	6	65
	54	55	444	65	54	65	84	55	0	0	6	65
	55	56	444	65	54	65	84	55	0	0	6	65
	56	57	444	65	54	65	84	55	0	0	6	65
	57	58										
On ramp fr Rosamond Blvd (NB)	0	116	0	0	0	0	0	0	0	0	0	0

	1	117	0	0	0	0	0	0	0	0	0	0
	2	118	0	0	0	0	0	0	0	0	0	0
	3	119	0	0	0	0	0	0	0	0	0	0
	4	120	0	0	0	0	0	0	0	0	0	0
	5	121	0	0	0	0	0	0	0	0	0	0
	6	122	0	0	0	0	0	0	0	0	0	0
	7	123										
Off ramp to Rosamond Blvd (NB)	8	124	0	0	0	0	0	0	0	0	0	0
	9	125	0	0	0	0	0	0	0	0	0	0
	10	126	0	0	0	0	0	0	0	0	0	0
	11	127	0	0	0	0	0	0	0	0	0	0
	12	128	0	0	0	0	0	0	0	0	0	0
	13	129	0	0	0	0	0	0	0	0	0	0
	14	130										
On ramp fr W Rosamond Blvd (SB)	15	131	0	0	0	0	0	0	0	0	0	0
	16	132	0	0	0	0	0	0	0	0	0	0
	17	133	0	0	0	0	0	0	0	0	0	0
	18	134	0	0	0	0	0	0	0	0	0	0
	19	135	0	0	0	0	0	0	0	0	0	0
	20	136	0	0	0	0	0	0	0	0	0	0
	21	137	0	0	0	0	0	0	0	0	0	0
	22	138	0	0	0	0	0	0	0	0	0	0
	23	139										
Hillcrest Ave	0	140	0	0	0	0	0	0	0	0	0	0
	1	141										
Alexander Ave	2	142	0	0	0	0	0	0	0	0	0	0
	3	143										
Haven St	4	144	0	0	0	0	0	0	0	0	0	0
	5	145										
Rosewood Ave to Milstead	6	146	0	0	0	0	0	0	0	0	0	0
	7	147	0	0	0	0	0	0	0	0	0	0
	8	148	0	0	0	0	0	0	0	0	0	0
	9	149										
Rosamond Blvd WB	10	150	0	0	0	0	0	0	0	0	0	0
	11	151	0	0	0	0	0	0	0	0	0	0
	12	152	0	0	0	0	0	0	0	0	0	0

	13	153										
Rosamond Blvd EB	14	154	0	0	0	0	0	0	0	0	0	0
	15	155	0	0	0	0	0	0	0	0	0	0
	16	156	0	0	0	0	0	0	0	0	0	0
	17	157	0	0	0	0	0	0	0	0	0	0
	18	158	0	0	0	0	0	0	0	0	0	0
	19	159										
Laurel St to Poplar St	20	160	0	0	0	0	0	0	0	0	0	0
	21	161	0	0	0	0	0	0	0	0	0	0
	22	162	0	0	0	0	0	0	0	0	0	0
	23	163	0	0	0	0	0	0	0	0	0	0
	24	164										
C st to Poplar St	25	165	0	0	0	0	0	0	0	0	0	0
	26	166	0	0	0	0	0	0	0	0	0	0
	27	167	0	0	0	0	0	0	0	0	0	0
	28	168										
W B St	29	169	0	0	0	0	0	0	0	0	0	0
	30	170										
Oak St	31	171	0	0	0	0	0	0	0	0	0	0
	32	172										
Elm St	33	173	0	0	0	0	0	0	0	0	0	0
	34	174										
Orange St	35	175	0	0	0	0	0	0	0	0	0	0
	36	176										
Granite St	37	177	0	0	0	0	0	0	0	0	0	0
	38	178										

LSA Associates, Inc. 16 September 2010
P. Ault TNM 2.5

INPUT: RECEIVERS
PROJECT/CONTRACT: Kern COG Retrofit Noise Barrier
RUN: Calibration 2

Receiver Name	No.	#DUs	Coordinates (ground) X	Y	Z	Height above Ground	Input Sound Levels and Criteria: Existing LAeq1h	Impact Criteria LAeq1h	Impact Criteria Sub'l	NR Goal	Active in Calc.
			ft	ft	ft	ft	dBA	dBA	dB	dB	
M2	38	1	6,509,807.0	2,136,592.0	2,330.00	4.92	0.00	66	12.0	5.0	Y

LSA Associates, Inc. 16 September 2010
P. Ault TNM 2.5

INPUT: BARRIERS
PROJECT/CONTRACT: Kern COG Retrofit Noise Barrier
RUN: Calibration 2

Barrier									Points										
Name	Type	Height		If Wall	If Berm			Add'tnl	Name	No.	Coordinates (bottom)			Height	Segment				
		Min	Max	$ per	$ per	Top	Run:Rise	$ per			X	Y	Z	at	Seg Ht Perturbs			On	Important
				Unit	Unit	Width		Unit						Point	Incre-	#Up	#Dn	Struct?	Reflec-
				Area	Vol.			Length							ment				tions?
		ft	ft	$/sq ft	$/cu yd	ft	ft:ft	$/ft			ft	ft	ft	ft	ft				
Barrier1	W	0.00	99.99	0.00				0.00	0	1	6,510,312.0	2,136,173.0	2,332.00	15.00	0.00	0	0		
									1	2	6,510,387.0	2,136,181.0	2,332.00	15.00	0.00	0	0		
									2	3	6,510,382.0	2,136,233.0	2,332.00	15.00	0.00	0	0		
									3	4	6,510,312.0	2,136,236.0	2,332.00	15.00	0.00	0	0		
									4	5	6,510,310.0	2,136,186.0	2,332.00	15.00					
Barrier2	W	0.00	99.99	0.00				0.00	5	6	6,510,292.0	2,136,280.0	2,332.00	15.00	0.00	0	0		
									6	7	6,510,340.0	2,136,280.0	2,332.00	15.00	0.00	0	0		
									7	8	6,510,340.0	2,136,323.0	2,332.00	15.00	0.00	0	0		
									8	9	6,510,290.0	2,136,338.0	2,332.00	15.00	0.00	0	0		
									9	10	6,510,294.0	2,136,291.0	2,332.00	15.00					
Barrier3	W	0.00	99.99	0.00				0.00	10	11	6,510,352.0	2,136,356.0	2,332.00	15.00	0.00	0	0		
									11	12	6,510,412.0	2,136,357.0	2,332.00	15.00	0.00	0	0		
									12	13	6,510,413.0	2,136,456.0	2,332.00	15.00	0.00	0	0		
									13	14	6,510,352.0	2,136,456.0	2,332.00	15.00	0.00	0	0		
									14	15	6,510,349.0	2,136,368.0	2,332.00	15.00					

LSA Associates, Inc. 16 September 2010
P. Ault TNM 2.5

INPUT: BUILDING ROWS
PROJECT/CONTRACT: Kern COG Retrofit Noise Barrier
RUN: Calibration 2

Building Row Name	Average Height	Building Percent	Points No.	Coordinates (ground) X	Y	Z
	ft	%		ft	ft	ft
Building1	15.00	80	1	6,510,460.0	2,139,539.0	2,358.00
			2	6,510,454.0	2,138,597.0	2,351.00
Building2	15.00	80	3	6,510,616.0	2,139,543.0	2,360.00
			4	6,510,615.0	2,138,604.0	2,352.00
Building3	15.00	80	5	6,510,381.0	2,138,476.0	2,350.00
			6	6,510,382.0	2,138,358.0	2,350.00
Building4	15.00	80	7	6,510,628.0	2,138,359.0	2,350.00
			8	6,510,627.0	2,138,486.0	2,350.00
Building5	15.00	80	9	6,510,529.0	2,138,235.0	2,348.00
			10	6,510,516.0	2,137,460.0	2,342.00
Building7	15.00	80	13	6,509,796.0	2,136,616.0	2,330.00
			14	6,509,886.0	2,136,614.0	2,330.00
Building8	15.00	80	15	6,509,908.0	2,136,506.0	2,334.00
			16	6,509,910.0	2,135,949.0	2,330.00
Building9	15.00	80	17	6,509,940.0	2,135,893.0	2,330.00
			18	6,509,607.0	2,135,888.0	2,328.00
Building10	15.00	80	19	6,509,934.0	2,135,729.0	2,328.00
			20	6,509,576.0	2,135,723.0	2,328.00
Building11	15.00	80	21	6,509,635.0	2,135,942.0	2,328.00
			22	6,509,632.0	2,136,678.0	2,332.00
Building12	15.00	80	23	6,510,605.0	2,136,671.0	2,334.00
			24	6,510,527.0	2,136,578.0	2,336.00
			41	6,510,535.0	2,136,363.0	2,332.00
			42	6,510,581.0	2,136,293.0	2,332.00

Building13	15.00	80	25	6,510,270.0	2,135,716.0	2,328.00
			26	6,510,274.0	2,135,665.0	2,328.00
			43	6,510,442.0	2,135,670.0	2,326.00
Building14	15.00	80	27	6,510,491.0	2,135,758.0	2,326.00
			28	6,510,490.0	2,135,656.0	2,326.00
			44	6,510,610.0	2,135,656.0	2,328.00
			45	6,510,603.0	2,135,765.0	2,328.00
Building15	15.00	80	29	6,510,539.0	2,135,982.0	2,330.00
			30	6,510,535.0	2,135,853.0	2,330.00
			48	6,510,635.0	2,135,852.0	2,330.00
			49	6,510,631.0	2,135,969.0	2,330.00
Building16	15.00	80	31	6,510,266.0	2,135,001.0	2,326.00
			32	6,510,673.0	2,135,009.0	2,326.00
Building17	15.00	80	33	6,510,265.0	2,134,846.0	2,326.00
			34	6,510,679.0	2,134,845.0	2,326.00
Building18	15.00	80	37	6,510,271.0	2,134,718.0	2,326.00
			38	6,510,673.0	2,134,721.0	2,326.00
Building19	15.00	80	39	6,510,269.0	2,134,555.0	2,326.00
			40	6,510,682.0	2,134,572.0	2,326.00
Building20	15.00	20	50	6,510,270.0	2,134,421.0	2,326.00
			51	6,510,684.0	2,134,430.0	2,328.00
Building21	15.00	20	52	6,510,264.0	2,134,222.0	2,326.00
			53	6,510,685.0	2,134,231.0	2,326.00

LSA Associates, Inc.
P. Ault
16 September 2010
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: Kern COG Retrofit Noise Barrier
RUN: Calibration 3
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 93 deg F, 16% 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	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
M3	38	1	0.0	68.9	66	68.9	12	Snd Lvl	68.9	0.0	5	-5.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	1	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

LSA Associates, Inc. 16 September 2010
P. Ault TNM 2.5

INPUT: ROADWAYS
PROJECT/CONTRACT: Kern COG Retrofit Noise Barrier
RUN: Calibration 3

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

Roadway Name	Width	Points Name	No.	Coordinates (pavement) X	Y	Z	Flow Control Control Device	Speed Constraint	Percent Vehicles Affected	Segment Pvmt Type	On Struct?
	ft			ft	ft	ft		mph	%		
SR14 (SB)	44.0	0	1	6,510,367.0	2,139,960.0	2,386.00				Average	
		1	2	6,510,329.0	2,139,740.0	2,378.00				Average	
		2	3	6,510,307.0	2,139,514.0	2,368.00				Average	
		3	4	6,510,301.0	2,139,294.0	2,362.00				Average	
		4	5	6,510,293.0	2,139,071.0	2,355.00				Average	
		5	6	6,510,288.0	2,138,878.0	2,352.00				Average	
		6	7	6,510,282.0	2,138,642.0	2,348.00				Average	
		7	8	6,510,269.0	2,138,379.0	2,344.00				Average	
		8	9	6,510,260.0	2,138,130.0	2,340.00				Average	
		9	10	6,510,252.0	2,137,895.0	2,338.00				Average	
		10	11	6,510,244.0	2,137,653.0	2,338.00				Average	
		11	12	6,510,234.0	2,137,419.0	2,338.00				Average	
		12	13	6,510,226.0	2,137,182.0	2,332.00				Average	
		13	14	6,510,210.0	2,136,893.0	2,330.00				Average	
		14	15	6,510,207.0	2,136,663.0	2,330.00				Average	
		15	16	6,510,199.0	2,136,435.0	2,330.00				Average	
		16	17	6,510,191.0	2,136,216.0	2,330.00				Average	
		17	18	6,510,184.0	2,136,048.0	2,328.00				Average	
		18	19	6,510,177.0	2,135,816.0	2,328.00				Average	
		19	20	6,510,168.0	2,135,590.0	2,328.00				Average	
		20	21	6,510,160.0	2,135,381.0	2,328.00				Average	
		21	22	6,510,154.0	2,135,168.0	2,327.00				Average	
		22	23	6,510,151.0	2,135,045.0	2,326.00				Average	
		23	24	6,510,141.0	2,134,835.0	2,326.00				Average	
		24	25	6,510,136.0	2,134,616.0	2,326.00				Average	

		25	26	6,510,127.0	2,134,401.0	2,326.00				Average	
		26	27	6,510,123.0	2,134,291.0	2,326.00				Average	
		27	28	6,510,125.0	2,134,069.0	2,326.00				Average	
		28	29	6,510,125.0	2,133,933.0	2,326.00				Average	
		29	30	6,510,141.0	2,133,650.0	2,324.00				Average	
		30	31	6,510,151.0	2,133,443.0	2,324.00					
SR14 (NB)	44.0	31	32	6,510,027.0	2,133,442.0	2,324.00				Average	
		32	33	6,510,009.0	2,134,403.0	2,326.00				Average	
		33	34	6,510,015.0	2,134,613.0	2,326.00				Average	
		34	35	6,510,023.0	2,134,836.0	2,326.00				Average	
		35	36	6,510,035.0	2,135,049.0	2,326.00				Average	
		36	37	6,510,038.0	2,135,170.0	2,327.00				Average	
		37	38	6,510,043.0	2,135,383.0	2,328.00				Average	
		38	39	6,510,048.0	2,135,591.0	2,328.00				Average	
		39	40	6,510,059.0	2,135,818.0	2,328.00				Average	
		40	41	6,510,066.0	2,136,052.0	2,328.00				Average	
		41	42	6,510,073.0	2,136,218.0	2,330.00				Average	
		42	43	6,510,078.0	2,136,439.0	2,330.00				Average	
		43	44	6,510,088.0	2,136,664.0	2,330.00				Average	
		44	45	6,510,097.0	2,136,895.0	2,330.00				Average	
		45	46	6,510,108.0	2,137,185.0	2,332.00				Average	
		46	47	6,510,117.0	2,137,421.0	2,338.00				Average	
		47	48	6,510,124.0	2,137,659.0	2,338.00				Average	
		48	49	6,510,132.0	2,137,896.0	2,338.00				Average	
		49	50	6,510,142.0	2,138,137.0	2,340.00				Average	
		50	51	6,510,152.0	2,138,386.0	2,344.00				Average	
		51	52	6,510,161.0	2,138,635.0	2,348.00				Average	
		52	53	6,510,170.0	2,138,884.0	2,352.00				Average	
		53	54	6,510,177.0	2,139,077.0	2,355.00				Average	
		54	55	6,510,182.0	2,139,317.0	2,362.00				Average	
		55	56	6,510,191.0	2,139,540.0	2,370.00				Average	
		56	57	6,510,212.0	2,139,750.0	2,380.00				Average	
		57	58	6,510,255.0	2,139,982.0	2,388.00					
On ramp fr Rosamond Blvd (NB)	20.0	0	116	6,511,587.0	2,136,997.0	2,340.00				Average	
		1	117	6,510,437.0	2,137,012.0	2,348.00				Average	
		2	118	6,510,326.0	2,137,240.0	2,341.00				Average	
		3	119	6,510,292.0	2,137,420.0	2,340.00				Average	
		4	120	6,510,277.0	2,137,660.0	2,338.00				Average	
		5	121	6,510,274.0	2,137,894.0	2,338.00				Average	

		6	122	6,510,278.0	2,138,130.0	2,340.00				Average	
		7	123	6,510,269.0	2,138,379.0	2,344.00					
Off ramp to Rosamond Blvd (NB)	36.0	8	124	6,510,178.0	2,135,818.2	2,328.00				Average	
		9	125	6,510,214.5	2,136,047.2	2,328.00				Average	
		10	126	6,510,235.0	2,136,213.0	2,330.00				Average	
		11	127	6,510,287.0	2,136,436.0	2,330.00				Average	
		12	128	6,510,385.0	2,136,662.0	2,336.00				Average	
		13	129	6,510,601.0	2,136,903.0	2,344.00				Average	
		14	130	6,511,474.0	2,136,959.5	2,340.00					
On ramp fr W Rosamond Blvd (SB)	36.0	15	131	6,509,509.5	2,136,925.0	2,338.00				Average	
		16	132	6,509,930.0	2,136,900.0	2,350.00				Average	
		17	133	6,510,013.0	2,136,666.0	2,340.00				Average	
		18	134	6,510,022.0	2,136,436.0	2,335.00				Average	
		19	135	6,510,036.0	2,136,216.0	2,333.00				Average	
		20	136	6,510,041.0	2,136,051.0	2,330.00				Average	
		21	137	6,510,041.0	2,135,816.0	2,330.00				Average	
		22	138	6,510,036.0	2,135,592.0	2,328.00				Average	
		23	139	6,510,043.0	2,135,383.2	2,328.00					
Hillcrest Ave	36.0	0	140	6,510,885.0	2,139,600.0	2,364.00				Average	
		1	141	6,510,383.0	2,139,584.0	2,360.00					
Alexander Ave	36.0	2	142	6,510,886.0	2,138,554.0	2,354.00				Average	
		3	143	6,510,375.0	2,138,551.0	2,347.00					
Haven St	36.0	4	144	6,510,539.0	2,139,566.0	2,360.00				Average	
		5	145	6,510,540.0	2,138,564.0	2,352.00					
Rosewood Ave to Milstead	36.0	6	146	6,510,382.0	2,138,289.0	2,348.00				Average	
		7	147	6,510,599.0	2,138,292.0	2,352.00				Average	
		8	148	6,510,601.0	2,137,430.0	2,340.00				Average	
		9	149	6,510,405.0	2,137,425.0	2,341.00					
Rosamond Blvd WB	36.0	10	150	6,511,584.0	2,136,997.0	2,340.00				Average	
		11	151	6,510,265.0	2,136,967.0	2,352.00				Average	Y
		12	152	6,510,032.0	2,136,964.0	2,351.00				Average	
		13	153	6,509,607.0	2,136,961.0	2,341.00					
Rosamond Blvd EB	36.0	14	154	6,509,509.5	2,136,925.0	2,338.00				Average	
		15	155	6,510,032.0	2,136,938.0	2,351.00				Average	Y
		16	156	6,510,266.0	2,136,939.0	2,352.00				Average	
		17	157	6,510,489.0	2,136,938.0	2,349.00				Average	
		18	158	6,510,494.0	2,136,938.0	2,344.00				Average	
		19	159	6,511,478.0	2,136,960.0	2,340.00					
Laurel St to Poplar St	36.0	20	160	6,509,550.0	2,136,808.0	2,332.00				Average	

		21	161	6,509,782.0	2,136,799.0	2,330.00				Average	
		22	162	6,509,933.0	2,136,673.0	2,328.00				Average	
		23	163	6,509,968.0	2,135,807.0	2,330.00				Average	
		24	164	6,509,558.0	2,135,801.0	2,328.00					
C st to Poplar St	36.0	25	165	6,510,941.0	2,136,720.0	2,336.00				Average	
		26	166	6,510,487.0	2,136,712.0	2,336.00				Average	
		27	167	6,510,470.0	2,135,826.0	2,328.00				Average	
		28	168	6,510,948.0	2,135,814.0	2,332.00					
W B St	36.0	29	169	6,510,963.0	2,134,301.0	2,324.00				Average	
		30	170	6,510,962.0	2,135,077.0	2,326.00					
Oak St	36.0	31	171	6,510,954.5	2,134,933.8	2,326.00				Average	
		32	172	6,510,229.0	2,134,920.0	2,326.00					
Elm St	36.0	33	173	6,510,953.5	2,134,663.0	2,326.00				Average	
		34	174	6,510,228.0	2,134,644.0	2,326.00					
Orange St	36.0	35	175	6,510,954.0	2,134,341.2	2,324.00				Average	
		36	176	6,510,239.0	2,134,322.0	2,326.00					
Granite St	36.0	37	177	6,510,216.0	2,135,058.0	2,326.00				Average	
		38	178	6,510,223.0	2,134,156.0	2,326.00					

LSA Associates, Inc. **16 September 2010**
P. Ault **TNM 2.5**

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: Kern COG Retrofit Noise Barrier
RUN: Calibration 3

Roadway	Points											
Name	Name	No.	Segment									
			Autos		MTrucks		HTrucks		Buses		Motorcycles	
			V	S	V	S	V	S	V	S	V	S
			veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph
SR14 (SB)	0	1	612	65	18	65	72	55	0	0	0	0
	1	2	612	65	18	65	72	55	0	0	0	0
	2	3	612	65	18	65	72	55	0	0	0	0
	3	4	612	65	18	65	72	55	0	0	0	0
	4	5	612	65	18	65	72	55	0	0	0	0
	5	6	612	65	18	65	72	55	0	0	0	0
	6	7	612	65	18	65	72	55	0	0	0	0
	7	8	612	65	18	65	72	55	0	0	0	0
	8	9	612	65	18	65	72	55	0	0	0	0
	9	10	612	65	18	65	72	55	0	0	0	0
	10	11	612	65	18	65	72	55	0	0	0	0
	11	12	612	65	18	65	72	55	0	0	0	0
	12	13	612	65	18	65	72	55	0	0	0	0
	13	14	612	65	18	65	72	55	0	0	0	0
	14	15	612	65	18	65	72	55	0	0	0	0
	15	16	612	65	18	65	72	55	0	0	0	0
	16	17	612	65	18	65	72	55	0	0	0	0
	17	18	612	65	18	65	72	55	0	0	0	0
	18	19	612	65	18	65	72	55	0	0	0	0
	19	20	612	65	18	65	72	55	0	0	0	0
	20	21	612	65	18	65	72	55	0	0	0	0
	21	22	612	65	18	65	72	55	0	0	0	0
	22	23	612	65	18	65	72	55	0	0	0	0

	23	24	612	65	18	65	72	55	0	0	0	0
	24	25	612	65	18	65	72	55	0	0	0	0
	25	26	612	65	18	65	72	55	0	0	0	0
	26	27	612	65	18	65	72	55	0	0	0	0
	27	28	612	65	18	65	72	55	0	0	0	0
	28	29	612	65	18	65	72	55	0	0	0	0
	29	30	612	65	18	65	72	55	0	0	0	0
	30	31										
SR14 (NB)	31	32	480	65	66	65	78	55	0	0	6	65
	32	33	480	65	66	65	78	55	0	0	6	65
	33	34	480	65	66	65	78	55	0	0	6	65
	34	35	480	65	66	65	78	55	0	0	6	65
	35	36	480	65	66	65	78	55	0	0	6	65
	36	37	480	65	66	65	78	55	0	0	6	65
	37	38	480	65	66	65	78	55	0	0	6	65
	38	39	480	65	66	65	78	55	0	0	6	65
	39	40	480	65	66	65	78	55	0	0	6	65
	40	41	480	65	66	65	78	55	0	0	6	65
	41	42	480	65	66	65	78	55	0	0	6	65
	42	43	480	65	66	65	78	55	0	0	6	65
	43	44	480	65	66	65	78	55	0	0	6	65
	44	45	480	65	66	65	78	55	0	0	6	65
	45	46	480	65	66	65	78	55	0	0	6	65
	46	47	480	65	66	65	78	55	0	0	6	65
	47	48	480	65	66	65	78	55	0	0	6	65
	48	49	480	65	66	65	78	55	0	0	6	65
	49	50	480	65	66	65	78	55	0	0	6	65
	50	51	480	65	66	65	78	55	0	0	6	65
	51	52	480	65	66	65	78	55	0	0	6	65
	52	53	480	65	66	65	78	55	0	0	6	65
	53	54	480	65	66	65	78	55	0	0	6	65
	54	55	480	65	66	65	78	55	0	0	6	65
	55	56	480	65	66	65	78	55	0	0	6	65
	56	57	480	65	66	65	78	55	0	0	6	65
	57	58										
On ramp fr Rosamond Blvd (NB)	0	116	0	0	0	0	0	0	0	0	0	0

	1	117	0	0	0	0	0	0	0	0	0	0
	2	118	0	0	0	0	0	0	0	0	0	0
	3	119	0	0	0	0	0	0	0	0	0	0
	4	120	0	0	0	0	0	0	0	0	0	0
	5	121	0	0	0	0	0	0	0	0	0	0
	6	122	0	0	0	0	0	0	0	0	0	0
	7	123										
Off ramp to Rosamond Blvd (NB)	8	124	0	0	0	0	0	0	0	0	0	0
	9	125	0	0	0	0	0	0	0	0	0	0
	10	126	0	0	0	0	0	0	0	0	0	0
	11	127	0	0	0	0	0	0	0	0	0	0
	12	128	0	0	0	0	0	0	0	0	0	0
	13	129	0	0	0	0	0	0	0	0	0	0
	14	130										
On ramp fr W Rosamond Blvd (SB)	15	131	0	0	0	0	0	0	0	0	0	0
	16	132	0	0	0	0	0	0	0	0	0	0
	17	133	0	0	0	0	0	0	0	0	0	0
	18	134	0	0	0	0	0	0	0	0	0	0
	19	135	0	0	0	0	0	0	0	0	0	0
	20	136	0	0	0	0	0	0	0	0	0	0
	21	137	0	0	0	0	0	0	0	0	0	0
	22	138	0	0	0	0	0	0	0	0	0	0
	23	139										
Hillcrest Ave	0	140	0	0	0	0	0	0	0	0	0	0
	1	141										
Alexander Ave	2	142	0	0	0	0	0	0	0	0	0	0
	3	143										
Haven St	4	144	0	0	0	0	0	0	0	0	0	0
	5	145										
Rosewood Ave to Milstead	6	146	0	0	0	0	0	0	0	0	0	0
	7	147	0	0	0	0	0	0	0	0	0	0
	8	148	0	0	0	0	0	0	0	0	0	0
	9	149										
Rosamond Blvd WB	10	150	0	0	0	0	0	0	0	0	0	0
	11	151	0	0	0	0	0	0	0	0	0	0
	12	152	0	0	0	0	0	0	0	0	0	0

	13	153										
Rosamond Blvd EB	14	154	0	0	0	0	0	0	0	0	0	0
	15	155	0	0	0	0	0	0	0	0	0	0
	16	156	0	0	0	0	0	0	0	0	0	0
	17	157	0	0	0	0	0	0	0	0	0	0
	18	158	0	0	0	0	0	0	0	0	0	0
	19	159										
Laurel St to Poplar St	20	160	0	0	0	0	0	0	0	0	0	0
	21	161	0	0	0	0	0	0	0	0	0	0
	22	162	0	0	0	0	0	0	0	0	0	0
	23	163	0	0	0	0	0	0	0	0	0	0
	24	164										
C st to Poplar St	25	165	0	0	0	0	0	0	0	0	0	0
	26	166	0	0	0	0	0	0	0	0	0	0
	27	167	0	0	0	0	0	0	0	0	0	0
	28	168										
W B St	29	169	0	0	0	0	0	0	0	0	0	0
	30	170										
Oak St	31	171	0	0	0	0	0	0	0	0	0	0
	32	172										
Elm St	33	173	0	0	0	0	0	0	0	0	0	0
	34	174										
Orange St	35	175	0	0	0	0	0	0	0	0	0	0
	36	176										
Granite St	37	177	0	0	0	0	0	0	0	0	0	0
	38	178										

LSA Associates, Inc. 16 September 2010
P. Ault TNM 2.5

INPUT: RECEIVERS
PROJECT/CONTRACT: Kern COG Retrofit Noise Barrier
RUN: Calibration 3

Receiver Name	No.	#DUs	Coordinates (ground) X	Y	Z	Height above Ground	Input Sound Levels and Criteria: Existing LAeq1h	Impact Criteria LAeq1h	Impact Criteria Sub'l	NR Goal	Active in Calc.
			ft	ft	ft	ft	dBA	dBA	dB	dB	
M3	38	1	6,510,254.0	2,134,713.0	2,326.00	4.92	0.00	66	12.0	5.0	Y

LSA Associates, Inc. 16 September 2010
P. Ault TNM 2.5

INPUT: BARRIERS
PROJECT/CONTRACT: Kern COG Retrofit Noise Barrier
RUN: Calibration 3

Barrier									Points										
Name	Type	Height		If Wall	If Berm			Add'tnl	Name	No.	Coordinates (bottom)			Height	Segment				
		Min	Max	$ per	$ per	Top	Run:Rise	$ per			X	Y	Z	at	Seg Ht Perturbs			On	Important
				Unit	Unit	Width		Unit						Point	Incre-	#Up	#Dn	Struct?	Reflec-
				Area	Vol.			Length							ment				tions?
		ft	ft	$/sq ft	$/cu yd	ft	ft:ft	$/ft			ft	ft	ft	ft	ft				
Barrier1	W	0.00	99.99	0.00				0.00	0	1	6,510,312.0	2,136,173.0	2,332.00	15.00	0.00	0	0		
									1	2	6,510,387.0	2,136,181.0	2,332.00	15.00	0.00	0	0		
									2	3	6,510,382.0	2,136,233.0	2,332.00	15.00	0.00	0	0		
									3	4	6,510,312.0	2,136,236.0	2,332.00	15.00	0.00	0	0		
									4	5	6,510,310.0	2,136,186.0	2,332.00	15.00					
Barrier2	W	0.00	99.99	0.00				0.00	5	6	6,510,292.0	2,136,280.0	2,332.00	15.00	0.00	0	0		
									6	7	6,510,340.0	2,136,280.0	2,332.00	15.00	0.00	0	0		
									7	8	6,510,340.0	2,136,323.0	2,332.00	15.00	0.00	0	0		
									8	9	6,510,290.0	2,136,338.0	2,332.00	15.00	0.00	0	0		
									9	10	6,510,294.0	2,136,291.0	2,332.00	15.00					
Barrier3	W	0.00	99.99	0.00				0.00	10	11	6,510,352.0	2,136,356.0	2,332.00	15.00	0.00	0	0		
									11	12	6,510,412.0	2,136,357.0	2,332.00	15.00	0.00	0	0		
									12	13	6,510,413.0	2,136,456.0	2,332.00	15.00	0.00	0	0		
									13	14	6,510,352.0	2,136,456.0	2,332.00	15.00	0.00	0	0		
									14	15	6,510,349.0	2,136,368.0	2,332.00	15.00					

LSA Associates, Inc.					**16 September 2010**	
P. Ault					**TNM 2.5**	
INPUT: BUILDING ROWS						
PROJECT/CONTRACT:	**Kern COG Retrofit Noise Barrier**					
RUN:	**Calibration 3**					
Building Row			**Points**			
Name	**Average Height**	**Building Percent**	**No.**	**Coordinates (ground) X**	**Y**	**Z**
	ft	%		ft	ft	ft
Building1	15.00	80	1	6,510,460.0	2,139,539.0	2,358.00
			2	6,510,454.0	2,138,597.0	2,351.00
Building2	15.00	80	3	6,510,616.0	2,139,543.0	2,360.00
			4	6,510,615.0	2,138,604.0	2,352.00
Building3	15.00	80	5	6,510,381.0	2,138,476.0	2,350.00
			6	6,510,382.0	2,138,358.0	2,350.00
Building4	15.00	80	7	6,510,628.0	2,138,359.0	2,350.00
			8	6,510,627.0	2,138,486.0	2,350.00
Building5	15.00	80	9	6,510,529.0	2,138,235.0	2,348.00
			10	6,510,516.0	2,137,460.0	2,342.00
Building7	15.00	80	13	6,509,796.0	2,136,616.0	2,330.00
			14	6,509,886.0	2,136,614.0	2,330.00
Building8	15.00	80	15	6,509,908.0	2,136,506.0	2,334.00
			16	6,509,910.0	2,135,949.0	2,330.00
Building9	15.00	80	17	6,509,940.0	2,135,893.0	2,330.00
			18	6,509,607.0	2,135,888.0	2,328.00
Building10	15.00	80	19	6,509,934.0	2,135,729.0	2,328.00
			20	6,509,576.0	2,135,723.0	2,328.00
Building11	15.00	80	21	6,509,635.0	2,135,942.0	2,328.00
			22	6,509,632.0	2,136,678.0	2,332.00
Building12	15.00	80	23	6,510,605.0	2,136,671.0	2,334.00
			24	6,510,527.0	2,136,578.0	2,336.00
			41	6,510,535.0	2,136,363.0	2,332.00
			42	6,510,581.0	2,136,293.0	2,332.00

Building13	15.00	80	25	6,510,270.0	2,135,716.0	2,328.00
			26	6,510,274.0	2,135,665.0	2,328.00
			43	6,510,442.0	2,135,670.0	2,326.00
Building14	15.00	80	27	6,510,491.0	2,135,758.0	2,326.00
			28	6,510,490.0	2,135,656.0	2,326.00
			44	6,510,610.0	2,135,656.0	2,328.00
			45	6,510,603.0	2,135,765.0	2,328.00
Building15	15.00	80	29	6,510,539.0	2,135,982.0	2,330.00
			30	6,510,535.0	2,135,853.0	2,330.00
			46	6,510,635.0	2,135,852.0	2,330.00
			47	6,510,631.0	2,135,969.0	2,330.00
Building16	15.00	80	31	6,510,266.0	2,135,001.0	2,326.00
			32	6,510,673.0	2,135,009.0	2,326.00
Building17	15.00	80	33	6,510,265.0	2,134,846.0	2,326.00
			34	6,510,679.0	2,134,845.0	2,326.00
Building18	15.00	80	37	6,510,271.0	2,134,718.0	2,326.00
			38	6,510,673.0	2,134,721.0	2,326.00
Building19	15.00	80	39	6,510,269.0	2,134,555.0	2,326.00
			40	6,510,682.0	2,134,572.0	2,326.00
Building20	15.00	20	48	6,510,270.0	2,134,421.0	2,326.00
			49	6,510,684.0	2,134,430.0	2,328.00
Building21	15.00	20	50	6,510,264.0	2,134,222.0	2,326.00
			51	6,510,685.0	2,134,231.0	2,326.00

APPENDIX C

TRAFFIC NOISE MODEL (TNM) 2.5 PRINTOUTS FOR EXISTING CONDITIONS

APPENDIX D

TRAFFIC NOISE MODEL (TNM) 2.5 PRINTOUTS FOR FUTURE (2035) CONDITIONS

LSA Associates, Inc.
P. Ault
16 September 2010
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: Kern COG Retrofit Noise Barrier
RUN: Future
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	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R1	38	1	0.0	68.1	66	68.1	12	Snd Lvl	68.1	0.0	5	-5.0
R2	39	1	0.0	70.2	66	70.2	12	Snd Lvl	70.2	0.0	5	-5.0
R3	40	1	0.0	70.0	66	70.0	12	Snd Lvl	70.0	0.0	5	-5.0
R4	41	1	0.0	70.8	66	70.8	12	Snd Lvl	70.8	0.0	5	-5.0
R5	42	1	0.0	70.2	66	70.2	12	Snd Lvl	70.2	0.0	5	-5.0
R6	43	1	0.0	67.0	66	67.0	12	Snd Lvl	67.0	0.0	5	-5.0
R7	44	1	0.0	67.0	66	67.0	12	Snd Lvl	67.0	0.0	5	-5.0
R8	45	1	0.0	66.7	66	66.7	12	Snd Lvl	66.7	0.0	5	-5.0
R9	46	1	0.0	67.7	66	67.7	12	Snd Lvl	67.7	0.0	5	-5.0
R10	47	1	0.0	68.0	66	68.0	12	Snd Lvl	68.0	0.0	5	-5.0
R11	48	1	0.0	66.4	66	66.4	12	Snd Lvl	66.4	0.0	5	-5.0
R12	49	1	0.0	65.4	66	65.4	12	----	65.4	0.0	5	-5.0
R13	50	1	0.0	65.9	66	65.9	12	----	65.9	0.0	5	-5.0
R14	51	1	0.0	64.6	66	64.6	12	----	64.6	0.0	5	-5.0
R15	52	1	0.0	61.5	66	61.5	12	----	61.5	0.0	5	-5.0
R16	53	1	0.0	58.2	66	58.2	12	----	58.2	0.0	5	-5.0
R17	54	1	0.0	57.3	66	57.3	12	----	57.3	0.0	5	-5.0
R18	55	1	0.0	57.0	66	57.0	12	----	57.0	0.0	5	-5.0
R19	56	1	0.0	55.7	66	55.7	12	----	55.7	0.0	5	-5.0
R20	57	1	0.0	58.6	66	58.6	12	----	58.6	0.0	5	-5.0
R21	58	1	0.0	59.0	66	59.0	12	----	59.0	0.0	5	-5.0
R22	59	1	0.0	60.6	66	60.6	12	----	60.6	0.0	5	-5.0
R23	60	1	0.0	64.3	66	64.3	12	----	64.3	0.0	5	-5.0
R24	61	1	0.0	59.8	66	59.8	12	----	59.8	0.0	5	-5.0

R25	62	1	0.0	62.0	66	62.0	12	----	62.0	0.0	5	-5.0
R26	63	1	0.0	63.8	66	63.8	12	----	63.8	0.0	5	-5.0
R27	64	1	0.0	68.2	66	68.2	12	Snd Lvl	68.2	0.0	5	-5.0
R28	65	1	0.0	70.5	66	70.5	12	Snd Lvl	70.5	0.0	5	-5.0
R29	66	1	0.0	66.4	66	66.4	12	Snd Lvl	66.4	0.0	5	-5.0
R30	67	1	0.0	61.4	66	61.4	12	----	61.4	0.0	5	-5.0
R31	68	1	0.0	62.7	66	62.7	12	----	62.7	0.0	5	-5.0
R32	69	1	0.0	58.5	66	58.5	12	----	58.5	0.0	5	-5.0
R33	70	1	0.0	59.8	66	59.8	12	----	59.8	0.0	5	-5.0
R34	71	1	0.0	58.4	66	58.4	12	----	58.4	0.0	5	-5.0
R35	72	1	0.0	59.1	66	59.1	12	----	59.1	0.0	5	-5.0
R36	73	1	0.0	59.3	66	59.3	12	----	59.3	0.0	5	-5.0
R37	74	1	0.0	61.5	66	61.5	12	----	61.5	0.0	5	-5.0
R38	75	1	0.0	58.7	66	58.7	12	----	58.7	0.0	5	-5.0
R39	76	1	0.0	61.1	66	61.1	12	----	61.1	0.0	5	-5.0
R40	77	1	0.0	62.6	66	62.6	12	----	62.6	0.0	5	-5.0
R41	78	1	0.0	61.0	66	61.0	12	----	61.0	0.0	5	-5.0
R42	79	1	0.0	68.0	66	68.0	12	Snd Lvl	68.0	0.0	5	-5.0
R43	80	1	0.0	63.6	66	63.6	12	----	63.6	0.0	5	-5.0
R44	81	1	0.0	70.5	66	70.5	12	Snd Lvl	70.5	0.0	5	-5.0
R45	82	1	0.0	62.3	66	62.3	12	----	62.3	0.0	5	-5.0
R46	83	1	0.0	59.1	66	59.1	12	----	59.1	0.0	5	-5.0
R47	84	1	0.0	70.2	66	70.2	12	Snd Lvl	70.2	0.0	5	-5.0
R48	85	1	0.0	58.8	66	58.8	12	----	58.8	0.0	5	-5.0
R49	86	1	0.0	62.4	66	62.4	12	----	62.4	0.0	5	-5.0
R50	87	1	0.0	61.9	66	61.9	12	----	61.9	0.0	5	-5.0
R51	88	1	0.0	59.2	66	59.2	12	----	59.2	0.0	5	-5.0
R52	89	1	0.0	69.7	66	69.7	12	Snd Lvl	69.7	0.0	5	-5.0
R53	90	1	0.0	62.6	66	62.6	12	----	62.6	0.0	5	-5.0
R54	91	1	0.0	59.2	66	59.2	12	----	59.2	0.0	5	-5.0

Dwelling Units	**# DUs**	**Noise Reduction**		
		Min	**Avg**	**Max**
		dB	**dB**	**dB**
All Selected	54	0.0	0.0	0.0
All Impacted	18	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

LSA Associates, Inc. 16 September 2010
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INPUT: ROADWAYS
PROJECT/CONTRACT: Kern COG Retrofit Noise Barrier
RUN: Future

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

Roadway Name	Width	Points Name	No.	Coordinates (pavement) X	Y	Z	Flow Control Control Device	Speed Constraint	Percent Vehicles Affected	Segment Pvmt Type	On Struct?
	ft			ft	ft	ft		mph	%		
SR14 (SB)	44.0	0	1	6,510,367.0	2,139,960.0	2,386.00				Average	
		1	2	6,510,329.0	2,139,740.0	2,378.00				Average	
		2	3	6,510,307.0	2,139,514.0	2,368.00				Average	
		3	4	6,510,301.0	2,139,294.0	2,362.00				Average	
		4	5	6,510,293.0	2,139,071.0	2,355.00				Average	
		5	6	6,510,288.0	2,138,878.0	2,352.00				Average	
		6	7	6,510,282.0	2,138,642.0	2,348.00				Average	
		7	8	6,510,269.0	2,138,379.0	2,344.00				Average	
		8	9	6,510,260.0	2,138,130.0	2,340.00				Average	
		9	10	6,510,252.0	2,137,895.0	2,338.00				Average	
		10	11	6,510,244.0	2,137,653.0	2,338.00				Average	
		11	12	6,510,234.0	2,137,419.0	2,338.00				Average	
		12	13	6,510,226.0	2,137,182.0	2,332.00				Average	
		13	14	6,510,210.0	2,136,893.0	2,330.00				Average	
		14	15	6,510,207.0	2,136,663.0	2,330.00				Average	
		15	16	6,510,199.0	2,136,435.0	2,330.00				Average	
		16	17	6,510,191.0	2,136,216.0	2,330.00				Average	
		17	18	6,510,184.0	2,136,048.0	2,328.00				Average	
		18	19	6,510,177.0	2,135,816.0	2,328.00				Average	
		19	20	6,510,168.0	2,135,590.0	2,328.00				Average	
		20	21	6,510,160.0	2,135,381.0	2,328.00				Average	
		21	22	6,510,154.0	2,135,168.0	2,327.00				Average	
		22	23	6,510,151.0	2,135,045.0	2,326.00				Average	
		23	24	6,510,141.0	2,134,835.0	2,326.00				Average	
		24	25	6,510,136.0	2,134,616.0	2,326.00				Average	

		25	26	6,510,127.0	2,134,401.0	2,326.00				Average	
		26	27	6,510,123.0	2,134,291.0	2,326.00				Average	
		27	28	6,510,125.0	2,134,069.0	2,326.00				Average	
		28	29	6,510,125.0	2,133,933.0	2,326.00				Average	
		29	30	6,510,141.0	2,133,650.0	2,324.00				Average	
		30	31	6,510,151.0	2,133,443.0	2,324.00					
SR14 (NB)	44.0	31	32	6,510,027.0	2,133,442.0	2,324.00				Average	
		32	33	6,510,009.0	2,134,403.0	2,326.00				Average	
		33	34	6,510,015.0	2,134,613.0	2,326.00				Average	
		34	35	6,510,023.0	2,134,836.0	2,326.00				Average	
		35	36	6,510,035.0	2,135,049.0	2,326.00				Average	
		36	37	6,510,038.0	2,135,170.0	2,327.00				Average	
		37	38	6,510,043.0	2,135,383.0	2,328.00				Average	
		38	39	6,510,048.0	2,135,591.0	2,328.00				Average	
		39	40	6,510,059.0	2,135,818.0	2,328.00				Average	
		40	41	6,510,066.0	2,136,052.0	2,328.00				Average	
		41	42	6,510,073.0	2,136,218.0	2,330.00				Average	
		42	43	6,510,078.0	2,136,439.0	2,330.00				Average	
		43	44	6,510,088.0	2,136,664.0	2,330.00				Average	
		44	45	6,510,097.0	2,136,895.0	2,330.00				Average	
		45	46	6,510,108.0	2,137,185.0	2,332.00				Average	
		46	47	6,510,117.0	2,137,421.0	2,338.00				Average	
		47	48	6,510,124.0	2,137,659.0	2,338.00				Average	
		48	49	6,510,132.0	2,137,896.0	2,338.00				Average	
		49	50	6,510,142.0	2,138,137.0	2,340.00				Average	
		50	51	6,510,152.0	2,138,386.0	2,344.00				Average	
		51	52	6,510,161.0	2,138,635.0	2,348.00				Average	
		52	53	6,510,170.0	2,138,884.0	2,352.00				Average	
		53	54	6,510,177.0	2,139,077.0	2,355.00				Average	
		54	55	6,510,182.0	2,139,317.0	2,362.00				Average	
		55	56	6,510,191.0	2,139,540.0	2,370.00				Average	
		56	57	6,510,212.0	2,139,750.0	2,380.00				Average	
		57	58	6,510,255.0	2,139,982.0	2,388.00					
On ramp fr Rosamond Blvd (NB)	20.0	0	116	6,511,587.0	2,136,997.0	2,340.00				Average	
		1	117	6,510,437.0	2,137,012.0	2,348.00				Average	
		2	118	6,510,326.0	2,137,240.0	2,341.00				Average	
		3	119	6,510,292.0	2,137,420.0	2,340.00				Average	
		4	120	6,510,277.0	2,137,660.0	2,338.00				Average	
		5	121	6,510,274.0	2,137,894.0	2,338.00				Average	

		6	122	6,510,278.0	2,138,130.0	2,340.00				Average	
		7	123	6,510,269.0	2,138,379.0	2,344.00					
Off ramp to Rosamond Blvd (NB)	20.0	8	124	6,510,178.0	2,135,818.2	2,328.00				Average	
		9	125	6,510,214.5	2,136,047.2	2,328.00				Average	
		10	126	6,510,235.0	2,136,213.0	2,330.00				Average	
		11	127	6,510,287.0	2,136,436.0	2,330.00				Average	
		12	128	6,510,385.0	2,136,662.0	2,336.00				Average	
		13	129	6,510,601.0	2,136,903.0	2,344.00				Average	
		14	130	6,511,474.0	2,136,959.5	2,340.00					
SB On ramp fr W Rosamond Blvd	20.0	15	131	6,509,510.0	2,136,925.0	2,338.00				Average	
		16	132	6,509,930.0	2,136,900.0	2,350.00				Average	
		0	183	6,509,979.0	2,136,849.0	2,347.00				Average	
		0	184	6,510,002.0	2,136,798.0	2,343.00				Average	
		17	185	6,510,013.0	2,136,666.0	2,340.00				Average	
		18	186	6,510,022.0	2,136,436.0	2,335.00				Average	
		19	187	6,510,036.0	2,136,216.0	2,333.00				Average	
		20	188	6,510,041.0	2,136,051.0	2,330.00				Average	
		21	189	6,510,041.0	2,135,816.0	2,330.00				Average	
		22	190	6,510,036.0	2,135,592.0	2,328.00				Average	
		23	191	6,510,043.0	2,135,383.0	2,328.00					
Hillcrest Ave	36.0	0	140	6,510,885.0	2,139,600.0	2,364.00				Average	
		1	141	6,510,383.0	2,139,584.0	2,360.00					
Alexander Ave	36.0	2	142	6,510,886.0	2,138,554.0	2,354.00				Average	
		3	143	6,510,375.0	2,138,551.0	2,347.00					
Haven St	36.0	4	144	6,510,539.0	2,139,566.0	2,360.00				Average	
		5	145	6,510,540.0	2,138,564.0	2,352.00					
Rosewood Ave to Milstead	36.0	6	146	6,510,382.0	2,138,289.0	2,348.00				Average	
		7	147	6,510,599.0	2,138,292.0	2,352.00				Average	
		8	148	6,510,601.0	2,137,430.0	2,340.00				Average	
		9	149	6,510,405.0	2,137,425.0	2,341.00					
Rosamond Blvd WB	36.0	10	150	6,511,584.0	2,136,997.0	2,340.00				Average	
		11	151	6,510,265.0	2,136,967.0	2,352.00				Average	Y
		12	152	6,510,032.0	2,136,964.0	2,351.00				Average	
		13	153	6,509,607.0	2,136,961.0	2,341.00					
Rosamond Blvd EB	36.0	14	154	6,509,509.5	2,136,925.0	2,338.00				Average	
		15	155	6,510,032.0	2,136,938.0	2,351.00				Average	Y
		16	156	6,510,266.0	2,136,939.0	2,352.00				Average	
		17	157	6,510,489.0	2,136,938.0	2,349.00				Average	
		18	158	6,510,494.0	2,136,938.0	2,344.00				Average	

		19	159	6,511,478.0	2,136,960.0	2,340.00					
Laurel St to Poplar St	36.0	20	160	6,509,550.0	2,136,808.0	2,332.00				Average	
		21	161	6,509,782.0	2,136,799.0	2,330.00				Average	
		22	162	6,509,933.0	2,136,673.0	2,328.00				Average	
		23	163	6,509,968.0	2,135,807.0	2,330.00				Average	
		24	164	6,509,558.0	2,135,801.0	2,328.00					
C st to Poplar St	36.0	25	165	6,510,941.0	2,136,720.0	2,336.00				Average	
		26	166	6,510,487.0	2,136,712.0	2,336.00				Average	
		27	167	6,510,470.0	2,135,826.0	2,328.00				Average	
		28	168	6,510,948.0	2,135,814.0	2,332.00					
W B St	36.0	29	169	6,510,963.0	2,134,301.0	2,324.00				Average	
		30	170	6,510,962.0	2,135,077.0	2,326.00					
Oak St	36.0	31	171	6,510,954.5	2,134,933.8	2,326.00				Average	
		32	172	6,510,229.0	2,134,920.0	2,326.00					
Elm St	36.0	33	173	6,510,953.5	2,134,663.0	2,326.00				Average	
		34	174	6,510,228.0	2,134,644.0	2,326.00					
Orange St	36.0	35	175	6,510,954.0	2,134,341.2	2,324.00				Average	
		36	176	6,510,239.0	2,134,322.0	2,326.00					
Granite St	36.0	37	177	6,510,216.0	2,135,058.0	2,326.00				Average	
		38	178	6,510,223.0	2,134,156.0	2,326.00					

LSA Associates, Inc. 16 September 2010
P. Ault TNM 2.5

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: Kern COG Retrofit Noise Barrier
RUN: Future

Roadway Name	Points Name	No.	Segment Autos V veh/hr	Autos S mph	MTrucks V veh/hr	MTrucks S mph	HTrucks V veh/hr	HTrucks S mph	Buses V veh/hr	Buses S mph	Motorcycles V veh/hr	Motorcycles S mph
SR14 (SB)	0	1	1386	65	60	65	45	55	0	0	0	0
	1	2	1386	65	60	65	45	55	0	0	0	0
	2	3	1386	65	60	65	45	55	0	0	0	0
	3	4	1386	65	60	65	45	55	0	0	0	0
	4	5	1386	65	60	65	45	55	0	0	0	0
	5	6	1386	65	60	65	45	55	0	0	0	0
	6	7	1386	65	60	65	45	55	0	0	0	0
	7	8	1386	65	60	65	45	55	0	0	0	0
	8	9	1386	65	60	65	45	55	0	0	0	0
	9	10	1386	65	60	65	45	55	0	0	0	0
	10	11	1386	65	60	65	45	55	0	0	0	0
	11	12	1386	65	60	65	45	55	0	0	0	0
	12	13	1386	65	60	65	45	55	0	0	0	0
	13	14	1386	65	60	65	45	55	0	0	0	0
	14	15	1386	65	60	65	45	55	0	0	0	0
	15	16	1386	65	60	65	45	55	0	0	0	0
	16	17	1386	65	60	65	45	55	0	0	0	0
	17	18	1386	65	60	65	45	55	0	0	0	0
	18	19	1386	65	60	65	45	55	0	0	0	0
	19	20	1386	65	60	65	45	55	0	0	0	0
	20	21	1386	65	60	65	45	55	0	0	0	0
	21	22	1386	65	60	65	45	55	0	0	0	0
	22	23	1386	65	60	65	45	55	0	0	0	0

	23	24	1386	65	60	65	45	55	0	0	0	0
	24	25	1386	65	60	65	45	55	0	0	0	0
	25	26	1386	65	60	65	45	55	0	0	0	0
	26	27	1386	65	60	65	45	55	0	0	0	0
	27	28	1386	65	60	65	45	55	0	0	0	0
	28	29	1386	65	60	65	45	55	0	0	0	0
	29	30	1386	65	60	65	45	55	0	0	0	0
	30	31										
SR14 (NB)	31	32	1923	65	83	65	62	55	0	0	0	0
	32	33	1923	65	83	65	62	55	0	0	0	0
	33	34	1923	65	83	65	62	55	0	0	0	0
	34	35	1923	65	83	65	62	55	0	0	0	0
	35	36	1923	65	83	65	62	55	0	0	0	0
	36	37	1923	65	83	65	62	55	0	0	0	0
	37	38	1923	65	83	65	62	55	0	0	0	0
	38	39	1923	65	83	65	62	55	0	0	0	0
	39	40	1923	65	83	65	62	55	0	0	0	0
	40	41	1923	65	83	65	62	55	0	0	0	0
	41	42	1923	65	83	65	62	55	0	0	0	0
	42	43	1923	65	83	65	62	55	0	0	0	0
	43	44	1923	65	83	65	62	55	0	0	0	0
	44	45	1923	65	83	65	62	55	0	0	0	0
	45	46	1923	65	83	65	62	55	0	0	0	0
	46	47	1923	65	83	65	62	55	0	0	0	0
	47	48	1923	65	83	65	62	55	0	0	0	0
	48	49	1923	65	83	65	62	55	0	0	0	0
	49	50	1923	65	83	65	62	55	0	0	0	0
	50	51	1923	65	83	65	62	55	0	0	0	0
	51	52	1923	65	83	65	62	55	0	0	0	0
	52	53	1923	65	83	65	62	55	0	0	0	0
	53	54	1923	65	83	65	62	55	0	0	0	0
	54	55	1923	65	83	65	62	55	0	0	0	0
	55	56	1923	65	83	65	62	55	0	0	0	0
	56	57	1923	65	83	65	62	55	0	0	0	0
	57	58										
On ramp fr Rosamond Blvd (NB)	0	116	705	35	30	35	23	35	0	0	0	0

	1	117	705	35	30	35	23	35	0	0	0	0
	2	118	705	35	30	35	23	35	0	0	0	0
	3	119	705	35	30	35	23	35	0	0	0	0
	4	120	705	35	30	35	23	35	0	0	0	0
	5	121	705	35	30	35	23	35	0	0	0	0
	6	122	705	35	30	35	23	35	0	0	0	0
	7	123										
Off ramp to Rosamond Blvd (NB)	8	124	1140	35	49	35	37	35	0	0	0	0
	9	125	1140	35	49	35	37	35	0	0	0	0
	10	126	1140	35	49	35	37	35	0	0	0	0
	11	127	1140	35	49	35	37	35	0	0	0	0
	12	128	1140	35	49	35	37	35	0	0	0	0
	13	129	1140	35	49	35	37	35	0	0	0	0
	14	130										
SB On ramp fr W Rosamond Blvd	15	131	922	35	40	35	30	35	0	0	0	0
	16	132	922	35	40	35	30	35	0	0	0	0
	0	183	0	0	0	0	0	0	0	0	0	0
	0	184	0	0	0	0	0	0	0	0	0	0
	17	185	0	0	0	0	0	0	0	0	0	0
	18	186	0	0	0	0	0	0	0	0	0	0
	19	187	0	0	0	0	0	0	0	0	0	0
	20	188	0	0	0	0	0	0	0	0	0	0
	21	189	0	0	0	0	0	0	0	0	0	0
	22	190	0	0	0	0	0	0	0	0	0	0
	23	191										
Hillcrest Ave	0	140	0	0	0	0	0	0	0	0	0	0
	1	141										
Alexander Ave	2	142	0	0	0	0	0	0	0	0	0	0
	3	143										
Haven St	4	144	0	0	0	0	0	0	0	0	0	0
	5	145										
Rosewood Ave to Milstead	6	146	0	0	0	0	0	0	0	0	0	0
	7	147	0	0	0	0	0	0	0	0	0	0
	8	148	0	0	0	0	0	0	0	0	0	0
	9	149										
Rosamond Blvd WB	10	150	2307	40	99	40	74	40	0	0	0	0

	11	0	1265	40	54	40	41	40	0	0	0	0
	12	152	1265	40	54	40	41	40	0	0	0	0
	13	153										
Rosamond Blvd EB	14	154	1046	40	45	40	34	40	0	0	0	0
	15	155	1325	40	57	40	43	40	0	0	0	0
	16	156	1325	40	57	40	43	40	0	0	0	0
	17	157	1325	40	57	40	43	40	0	0	0	0
	18	158	1325	40	57	40	43	40	0	0	0	0
	19	159										
Laurel St to Poplar St	20	160	0	0	0	0	0	0	0	0	0	0
	21	161	0	0	0	0	0	0	0	0	0	0
	22	162	0	0	0	0	0	0	0	0	0	0
	23	163	0	0	0	0	0	0	0	0	0	0
	24	164										
C st to Poplar St	25	165	0	0	0	0	0	0	0	0	0	0
	26	166	0	0	0	0	0	0	0	0	0	0
	27	167	0	0	0	0	0	0	0	0	0	0
	28	168										
W B St	29	169	0	0	0	0	0	0	0	0	0	0
	30	170										
Oak St	31	171	0	0	0	0	0	0	0	0	0	0
	32	172										
Elm St	33	173	0	0	0	0	0	0	0	0	0	0
	34	174										
Orange St	35	175	0	0	0	0	0	0	0	0	0	0
	36	176										
Granite St	37	177	0	0	0	0	0	0	0	0	0	0
	38	178										

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INPUT: RECEIVERS
PROJECT/CONTRACT: Kern COG Retrofit Noise Barrier
RUN: Future

Receiver Name	No.	#DUs	Coordinates (ground) X	Y	Z	Height above Ground	Input Sound Levels and Criteria: Existing LAeq1h	Impact Criteria LAeq1h	Impact Criteria Sub'l	NR Goal	Active in Calc.
			ft	ft	ft	ft	dBA	dBA	dB	dB	
R1	38	1	6,510,420.0	2,139,438.0	2,358.00	4.92	0.00	66	12.0	5.0	Y
R2	39	1	6,510,416.0	2,139,253.0	2,356.00	4.92	0.00	66	12.0	5.0	Y
R3	40	1	6,510,423.0	2,139,068.0	2,352.00	4.92	0.00	66	12.0	5.0	Y
R4	41	1	6,510,419.0	2,138,853.0	2,352.00	4.92	0.00	66	12.0	5.0	Y
R5	42	1	6,510,428.0	2,138,609.0	2,349.00	4.92	0.00	66	12.0	5.0	Y
R6	43	1	6,510,404.0	2,138,441.0	2,350.00	4.92	0.00	66	12.0	5.0	Y
R7	44	1	6,510,407.0	2,138,396.0	2,350.00	4.92	0.00	66	12.0	5.0	Y
R8	45	1	6,510,488.0	2,138,165.0	2,347.00	4.92	0.00	66	12.0	5.0	Y
R9	46	1	6,510,479.0	2,137,961.0	2,348.00	4.92	0.00	66	12.0	5.0	Y
R10	47	1	6,510,480.0	2,137,788.0	2,350.00	4.92	0.00	66	12.0	5.0	Y
R11	48	1	6,510,486.0	2,137,601.0	2,344.00	4.92	0.00	66	12.0	5.0	Y
R12	49	1	6,510,491.0	2,137,472.0	2,342.00	4.92	0.00	66	12.0	5.0	Y
R13	50	1	6,510,484.0	2,138,384.0	2,350.00	4.92	0.00	66	12.0	5.0	Y
R14	51	1	6,510,546.0	2,138,451.0	2,352.00	4.92	0.00	66	12.0	5.0	Y
R15	52	1	6,510,606.0	2,138,396.0	2,350.00	4.92	0.00	66	12.0	5.0	Y
R16	53	1	6,510,677.0	2,138,624.0	2,352.00	4.92	0.00	66	12.0	5.0	Y
R17	54	1	6,510,655.0	2,138,817.0	2,354.00	4.92	0.00	66	12.0	5.0	Y
R18	55	1	6,510,638.0	2,139,000.0	2,356.00	4.92	0.00	66	12.0	5.0	Y
R19	56	1	6,510,639.0	2,139,203.0	2,356.00	4.92	0.00	66	12.0	5.0	Y
R20	57	1	6,510,638.0	2,139,384.0	2,360.00	4.92	0.00	66	12.0	5.0	Y
R21	58	1	6,510,652.0	2,139,515.0	2,360.00	4.92	0.00	66	12.0	5.0	Y
R22	59	1	6,509,845.0	2,136,598.0	2,330.00	4.92	0.00	66	12.0	5.0	Y

R23	60	1	6,509,879.0	2,136,489.0	2,334.00	4.92	0.00	66	12.0	5.0	Y
R24	61	1	6,509,877.0	2,136,317.0	2,328.00	4.92	0.00	66	12.0	5.0	Y
R25	62	1	6,509,880.0	2,136,137.0	2,330.00	4.92	0.00	66	12.0	5.0	Y
R26	63	1	6,509,882.0	2,135,974.0	2,330.00	4.92	0.00	66	12.0	5.0	Y
R27	64	1	6,509,918.0	2,135,925.0	2,330.00	4.92	0.00	66	12.0	5.0	Y
R28	65	1	6,509,917.0	2,135,681.0	2,328.00	4.92	0.00	66	12.0	5.0	Y
R29	66	1	6,509,850.0	2,135,687.0	2,328.00	4.92	0.00	66	12.0	5.0	Y
R30	67	1	6,509,733.0	2,135,695.0	2,328.00	4.92	0.00	66	12.0	5.0	Y
R31	68	1	6,509,804.0	2,135,916.0	2,330.00	4.92	0.00	66	12.0	5.0	Y
R32	69	1	6,509,685.0	2,135,921.0	2,328.00	4.92	0.00	66	12.0	5.0	Y
R33	70	1	6,509,661.0	2,136,075.0	2,330.00	4.92	0.00	66	12.0	5.0	Y
R34	71	1	6,509,666.0	2,136,250.0	2,328.00	4.92	0.00	66	12.0	5.0	Y
R35	72	1	6,509,666.0	2,136,421.0	2,330.00	4.92	0.00	66	12.0	5.0	Y
R36	73	1	6,509,658.0	2,136,601.0	2,330.00	4.92	0.00	66	12.0	5.0	Y
R37	74	1	6,510,620.0	2,136,657.0	2,334.00	4.92	0.00	66	12.0	5.0	Y
R38	75	1	6,510,597.0	2,136,307.0	2,332.00	4.92	0.00	66	12.0	5.0	Y
R39	76	1	6,510,571.0	2,135,897.0	2,330.00	4.92	0.00	66	12.0	5.0	Y
R40	77	1	6,510,492.0	2,135,775.0	2,326.00	4.92	0.00	66	12.0	5.0	Y
R41	78	1	6,510,549.0	2,135,716.0	2,327.00	4.92	0.00	66	12.0	5.0	Y
R42	79	1	6,510,293.0	2,135,698.0	2,328.00	4.92	0.00	66	12.0	5.0	Y
R43	80	1	6,510,415.0	2,135,699.0	2,326.00	4.92	0.00	66	12.0	5.0	Y
R44	81	1	6,510,294.0	2,135,034.0	2,326.00	4.92	0.00	66	12.0	5.0	Y
R45	82	1	6,510,478.0	2,135,038.0	2,326.00	4.92	0.00	66	12.0	5.0	Y
R46	83	1	6,510,605.0	2,135,034.0	2,326.00	4.92	0.00	66	12.0	5.0	Y
R47	84	1	6,510,294.0	2,134,818.0	2,326.00	4.92	0.00	66	12.0	5.0	Y
R48	85	1	6,510,608.0	2,134,817.0	2,326.00	4.92	0.00	66	12.0	5.0	Y
R49	86	1	6,510,469.0	2,134,759.0	2,326.00	4.92	0.00	66	12.0	5.0	Y
R50	87	1	6,510,470.0	2,134,529.0	2,326.00	4.92	0.00	66	12.0	5.0	Y
R51	88	1	6,510,604.0	2,134,453.0	2,328.00	4.92	0.00	66	12.0	5.0	Y
R52	89	1	6,510,287.0	2,134,199.0	2,326.00	4.92	0.00	66	12.0	5.0	Y
R53	90	1	6,510,467.0	2,134,214.0	2,328.00	4.92	0.00	66	12.0	5.0	Y
R54	91	1	6,510,592.0	2,134,219.0	2,328.00	4.92	0.00	66	12.0	5.0	Y

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INPUT: BARRIERS
PROJECT/CONTRACT: Kern COG Retrofit Noise Barrier
RUN: Future

Barrier									Points											
Name	Type	Height		If Wall	If Berm			Add'tnl	Name	No.	Coordinates (bottom)			Height	Segment				
		Min	Max	$ per	$ per	Top	Run:Rise	$ per			X	Y	Z	at	Seg Ht Perturbs			On	Important
				Unit	Unit	Width		Unit						Point	Incre-	#Up	#Dn	Struct?	Reflec-
				Area	Vol.			Length							ment				tions?
		ft	ft	$/sq ft	$/cu yd	ft	ft:ft	$/ft			ft	ft	ft	ft	ft				
Barrier1	W	0.00	99.99	0.00				0.00	0	1	6,510,312.0	2,136,173.0	2,332.00	15.00	0.00	0	0		
									1	2	6,510,387.0	2,136,181.0	2,332.00	15.00	0.00	0	0		
									2	3	6,510,382.0	2,136,233.0	2,332.00	15.00	0.00	0	0		
									3	4	6,510,312.0	2,136,236.0	2,332.00	15.00	0.00	0	0		
									4	5	6,510,310.0	2,136,186.0	2,332.00	15.00					
Barrier2	W	0.00	99.99	0.00				0.00	5	6	6,510,292.0	2,136,280.0	2,332.00	15.00	0.00	0	0		
									6	7	6,510,340.0	2,136,280.0	2,332.00	15.00	0.00	0	0		
									7	8	6,510,340.0	2,136,323.0	2,332.00	15.00	0.00	0	0		
									8	9	6,510,290.0	2,136,338.0	2,332.00	15.00	0.00	0	0		
									9	10	6,510,294.0	2,136,291.0	2,332.00	15.00					
Barrier3	W	0.00	99.99	0.00				0.00	10	11	6,510,352.0	2,136,356.0	2,332.00	15.00	0.00	0	0		
									11	12	6,510,412.0	2,136,357.0	2,332.00	15.00	0.00	0	0		
									12	13	6,510,413.0	2,136,456.0	2,332.00	15.00	0.00	0	0		
									13	14	6,510,352.0	2,136,456.0	2,332.00	15.00	0.00	0	0		
									14	15	6,510,349.0	2,136,368.0	2,332.00	15.00					
SB1	W	0.00	12.00	0.00				0.00	15	16	6,510,355.0	2,139,737.0	2,378.00	0.00	2.00	6	0		
									16	17	6,510,350.0	2,139,701.0	2,376.00	0.00	2.00	6	0		
									17	18	6,510,345.0	2,139,659.0	2,374.00	0.00	2.00	6	0		
									18	19	6,510,338.0	2,139,603.0	2,372.00	0.00	2.00	6	0		
									19	20	6,510,334.0	2,139,549.0	2,370.00	0.00	2.00	6	0		
									20	21	6,510,332.0	2,139,493.0	2,368.00	0.00	2.00	6	0		
									21	22	6,510,330.0	2,139,438.0	2,366.00	0.00	2.00	6	0		
									22	23	6,510,329.0	2,139,389.0	2,364.00	0.00	2.00	6	0		
									23	24	6,510,327.0	2,139,340.0	2,362.00	0.00	2.00	6	0		
									24	25	6,510,324.0	2,139,291.0	2,362.00	0.00	2.00	6	0		
									25	26	6,510,323.0	2,139,242.0	2,360.00	0.00	2.00	6	0		
									26	27	6,510,322.0	2,139,202.0	2,358.00	0.00	2.00	6	0		
									27	28	6,510,320.0	2,139,153.0	2,356.00	0.00	2.00	6	0		
									28	29	6,510,317.0	2,139,103.0	2,356.00	0.00	2.00	6	0		
									29	30	6,510,316.0	2,139,052.0	2,355.00	0.00	2.00	6	0		
									30	31	6,510,315.0	2,139,004.0	2,354.00	0.00	2.00	6	0		
									31	32	6,510,312.0	2,138,953.0	2,353.00	0.00	2.00	6	0		
									32	33	6,510,312.0	2,138,904.0	2,352.00	0.00	2.00	6	0		
									33	34	6,510,311.0	2,138,853.0	2,352.00	0.00	2.00	6	0		
									34	35	6,510,310.0	2,138,804.0	2,351.00	0.00	2.00	6	0		

									35	36	6,510,309.0	2,138,755.0	2,350.00	0.00	2.00	6	0		
									36	37	6,510,307.0	2,138,704.0	2,348.00	0.00	2.00	6	0		
									37	38	6,510,306.0	2,138,654.0	2,348.00	0.00	2.00	6	0		
									38	39	6,510,304.0	2,138,604.0	2,346.00	0.00	2.00	6	0		
									39	40	6,510,302.0	2,138,553.0	2,346.00	0.00	2.00	6	0		
									40	41	6,510,300.0	2,138,504.0	2,346.00	0.00	2.00	6	0		
									41	42	6,510,297.0	2,138,454.0	2,345.00	0.00	2.00	6	0		
									42	43	6,510,296.0	2,138,404.0	2,344.00	0.00	2.00	6	0		
									43	44	6,510,297.0	2,138,353.0	2,344.00	0.00	2.00	6	0		
									44	45	6,510,296.0	2,138,304.0	2,343.00	0.00	2.00	6	0		
									45	46	6,510,296.0	2,138,254.0	2,342.00	0.00	2.00	6	0		
									46	47	6,510,297.0	2,138,203.0	2,341.00	0.00	2.00	6	0		
									47	48	6,510,293.0	2,138,153.0	2,340.00	0.00	2.00	6	0		
									48	49	6,510,293.0	2,138,103.0	2,340.00	0.00	2.00	6	0		
									49	50	6,510,292.0	2,138,054.0	2,339.00	0.00	2.00	6	0		
									50	51	6,510,291.0	2,138,003.0	2,338.00	0.00	2.00	6	0		
									51	52	6,510,287.0	2,137,954.0	2,338.00	0.00	2.00	6	0		
									52	53	6,510,288.0	2,137,904.0	2,338.00	0.00	2.00	6	0		
									53	54	6,510,289.0	2,137,854.0	2,338.00	0.00	2.00	6	0		
									54	55	6,510,289.0	2,137,805.0	2,338.00	0.00	2.00	6	0		
									55	56	6,510,287.0	2,137,754.0	2,338.00	0.00	2.00	6	0		
									56	57	6,510,287.0	2,137,703.0	2,338.00	0.00	2.00	6	0		
									57	58	6,510,292.0	2,137,653.2	2,338.00	0.00	2.00	6	0		
									58	59	6,510,294.0	2,137,604.0	2,338.00	0.00	2.00	6	0		
									59	60	6,510,294.0	2,137,554.0	2,338.00	0.00	2.00	6	0		
									109	110	6,510,297.0	2,137,504.0	2,338.00	0.00	2.00	6	0		
									110	111	6,510,303.0	2,137,453.0	2,338.00	0.00	2.00	6	0		
									111	112	6,510,309.0	2,137,403.0	2,338.00	0.00					
SB2	W	0.00	16.00	0.00				0.00	103	61	6,509,986.0	2,136,720.0	2,330.00	0.00	2.00	8	0		
									104	62	6,509,989.0	2,136,670.0	2,330.00	0.00	2.00	8	0		
									105	63	6,509,993.0	2,136,621.0	2,330.00	0.00	2.00	8	0		
									106	64	6,509,997.0	2,136,571.0	2,330.00	0.00	2.00	8	0		
									107	65	6,510,000.0	2,136,520.0	2,330.00	0.00	2.00	8	0		
									108	66	6,510,004.0	2,136,471.0	2,330.00	0.00	2.00	8	0		
									109	67	6,510,008.0	2,136,421.0	2,330.00	0.00	2.00	8	0		
									110	68	6,510,009.0	2,136,372.0	2,330.00	0.00	2.00	8	0		
									111	69	6,510,012.0	2,136,323.0	2,330.00	0.00	2.00	8	0		
									112	70	6,510,013.0	2,136,272.0	2,330.00	0.00	2.00	8	0		
									113	71	6,510,016.0	2,136,222.0	2,330.00	0.00	2.00	8	0		
									114	72	6,510,018.0	2,136,173.0	2,330.00	0.00	2.00	8	0		
									115	73	6,510,019.0	2,136,123.0	2,329.00	0.00	2.00	8	0		
									116	74	6,510,022.0	2,136,071.0	2,328.00	0.00	2.00	8	0		
									117	113	6,510,023.0	2,136,025.0	2,328.00	0.00	2.00	8	0		
									118	114	6,510,022.0	2,135,975.0	2,328.00	0.00	2.00	8	0		
									119	115	6,510,022.0	2,135,926.0	2,328.00	0.00	2.00	8	0		
									120	116	6,510,021.0	2,135,875.0	2,328.00	0.00	2.00	8	0		
									121	117	6,510,021.0	2,135,826.0	2,328.00	0.00	2.00	8	0		
									122	118	6,510,021.0	2,135,776.0	2,328.00	0.00	2.00	8	0		
									123	119	6,510,020.0	2,135,728.0	2,328.00	0.00	2.00	8	0		

									124	120	6,510,019.0	2,135,679.0	2,328.00	0.00	2.00	8	0		
									125	121	6,510,018.0	2,135,629.0	2,328.00	0.00	2.00	8	0		
									126	122	6,510,018.0	2,135,579.0	2,328.00	0.00	2.00	8	0		
									127	123	6,510,018.0	2,135,527.0	2,328.00	0.00	2.00	8	0		
									128	124	6,510,017.0	2,135,479.0	2,328.00	0.00					
SB3	W	0.00	16.00	0.00				0.00	89	75	6,510,248.0	2,136,146.0	2,328.00	0.00	2.00	8	0		
									90	76	6,510,242.0	2,136,096.0	2,328.00	0.00	2.00	8	0		
									91	77	6,510,234.0	2,136,046.0	2,328.00	0.00	2.00	8	0		
									92	78	6,510,228.0	2,135,996.0	2,328.00	0.00	2.00	8	0		
									93	79	6,510,221.0	2,135,945.0	2,328.00	0.00	2.00	8	0		
									94	80	6,510,211.0	2,135,896.0	2,328.00	0.00	2.00	8	0		
									95	81	6,510,208.0	2,135,847.0	2,328.00	0.00	2.00	8	0		
									96	82	6,510,201.0	2,135,797.0	2,328.00	0.00	2.00	8	0		
									97	83	6,510,197.0	2,135,747.0	2,328.00	0.00	2.00	8	0		
									98	125	6,510,195.0	2,135,697.0	2,328.00	0.00	2.00	8	0		
									99	126	6,510,194.0	2,135,647.0	2,328.00	0.00	2.00	8	0		
									100	127	6,510,193.0	2,135,597.0	2,328.00	0.00	2.00	8	0		
									101	128	6,510,192.0	2,135,547.0	2,328.00	0.00	2.00	8	0		
									102	129	6,510,191.0	2,135,497.0	2,328.00	0.00					
SB4	W	0.00	16.00	0.00				0.00	83	84	6,510,186.0	2,135,249.0	2,327.00	0.00	2.00	8	0		
									84	85	6,510,185.0	2,135,200.0	2,327.00	0.00	2.00	8	0		
									85	86	6,510,182.0	2,135,150.0	2,327.00	0.00	2.00	8	0		
									86	87	6,510,179.0	2,135,101.0	2,326.00	0.00	2.00	8	0		
									87	88	6,510,176.0	2,135,051.0	2,326.00	0.00	2.00	8	0		
									88	89	6,510,174.0	2,135,000.0	2,326.00	0.00	2.00	8	0		
									89	90	6,510,171.0	2,134,950.0	2,326.00	0.00	2.00	8	0		
									90	91	6,510,170.0	2,134,901.0	2,326.00	0.00	2.00	8	0		
									91	92	6,510,166.0	2,134,851.0	2,326.00	0.00	2.00	8	0		
									92	93	6,510,166.0	2,134,801.0	2,326.00	0.00	2.00	8	0		
									93	94	6,510,166.0	2,134,751.0	2,326.00	0.00	2.00	8	0		
									94	95	6,510,165.0	2,134,701.0	2,326.00	0.00	2.00	8	0		
									95	96	6,510,162.0	2,134,650.0	2,326.00	0.00	2.00	8	0		
									96	97	6,510,160.0	2,134,600.0	2,326.00	0.00	2.00	8	0		
									97	98	6,510,158.0	2,134,551.0	2,326.00	0.00	2.00	8	0		
									98	99	6,510,156.0	2,134,500.0	2,326.00	0.00	2.00	8	0		
									99	100	6,510,156.0	2,134,450.0	2,326.00	0.00	2.00	8	0		
									100	101	6,510,156.0	2,134,400.0	2,326.00	0.00	2.00	8	0		
									101	102	6,510,153.0	2,134,350.0	2,326.00	0.00	2.00	8	0		
									102	103	6,510,152.0	2,134,301.0	2,326.00	0.00	2.00	8	0		
									103	104	6,510,150.0	2,134,250.0	2,326.00	0.00	2.00	8	0		
									104	105	6,510,150.0	2,134,201.0	2,326.00	0.00	2.00	8	0		
									105	106	6,510,151.0	2,134,150.0	2,326.00	0.00	2.00	8	0		
									106	107	6,510,152.0	2,134,101.0	2,326.00	0.00	2.00	8	0		
									107	108	6,510,155.0	2,134,051.0	2,326.00	0.00	2.00	8	0		
									108	109	6,510,156.0	2,134,000.0	2,326.00	0.00					

LSA Associates, Inc.					**16 September 2010**	
P. Ault					**TNM 2.5**	
INPUT: BUILDING ROWS						
PROJECT/CONTRACT:	**Kern COG Retrofit Noise Barrier**					
RUN:	**Future**					
Building Row			**Points**			
Name	**Average**	**Building**	**No.**	**Coordinates (ground)**		
	Height	**Percent**		**X**	**Y**	**Z**
	ft	%		ft	ft	ft
Building1	15.00	80	1	6,510,460.0	2,139,539.0	2,358.00
			2	6,510,454.0	2,138,597.0	2,351.00
Building2	15.00	80	3	6,510,616.0	2,139,543.0	2,360.00
			4	6,510,615.0	2,138,604.0	2,352.00
Building3	15.00	80	5	6,510,381.0	2,138,476.0	2,350.00
			6	6,510,382.0	2,138,358.0	2,350.00
Building4	15.00	80	7	6,510,628.0	2,138,359.0	2,350.00
			8	6,510,627.0	2,138,486.0	2,350.00
Building5	15.00	80	9	6,510,529.0	2,138,235.0	2,348.00
			10	6,510,516.0	2,137,460.0	2,342.00
Building7	15.00	80	13	6,509,796.0	2,136,616.0	2,330.00
			14	6,509,886.0	2,136,614.0	2,330.00
Building8	15.00	80	15	6,509,908.0	2,136,506.0	2,334.00
			16	6,509,910.0	2,135,949.0	2,330.00
Building9	15.00	80	17	6,509,940.0	2,135,893.0	2,330.00
			18	6,509,607.0	2,135,888.0	2,328.00
Building10	15.00	80	19	6,509,934.0	2,135,729.0	2,328.00
			20	6,509,576.0	2,135,723.0	2,328.00
Building11	15.00	80	21	6,509,635.0	2,135,942.0	2,328.00
			22	6,509,632.0	2,136,678.0	2,332.00
Building12	15.00	80	23	6,510,605.0	2,136,671.0	2,334.00
			24	6,510,527.0	2,136,578.0	2,336.00
			41	6,510,535.0	2,136,363.0	2,332.00
			42	6,510,581.0	2,136,293.0	2,332.00

Building13	15.00	80	25	6,510,270.0	2,135,716.0	2,328.00
			26	6,510,274.0	2,135,665.0	2,328.00
			43	6,510,442.0	2,135,670.0	2,326.00
Building14	15.00	80	27	6,510,491.0	2,135,758.0	2,326.00
			28	6,510,490.0	2,135,656.0	2,326.00
			44	6,510,610.0	2,135,656.0	2,328.00
			45	6,510,603.0	2,135,765.0	2,328.00
Building15	0.00	80	29	6,510,539.0	2,135,982.0	2,330.00
			30	6,510,535.0	2,135,853.0	2,330.00
			46	6,510,635.0	2,135,852.0	2,330.00
			47	6,510,631.0	2,135,969.0	2,330.00
Building16	0.00	80	31	6,510,266.0	2,135,001.0	2,326.00
			32	6,510,673.0	2,135,009.0	2,326.00
Building17	0.00	80	33	6,510,265.0	2,134,846.0	2,326.00
			34	6,510,679.0	2,134,845.0	2,326.00
Building18	0.00	80	37	6,510,271.0	2,134,718.0	2,326.00
			38	6,510,673.0	2,134,721.0	2,326.00
Building19	0.00	80	39	6,510,269.0	2,134,555.0	2,326.00
			40	6,510,682.0	2,134,572.0	2,326.00
Building20	0.00	20	48	6,510,270.0	2,134,421.0	2,326.00
			49	6,510,684.0	2,134,430.0	2,328.00
Building21	0.00	20	50	6,510,264.0	2,134,222.0	2,326.00
			51	6,510,685.0	2,134,231.0	2,326.00

LSA Associates, Inc.
P. Ault
16 September 2010
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: Kern COG Retrofit Noise Barrier
RUN: Existing
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	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R1	38	1	0.0	65.6	66	65.6	12	----	65.6	0.0	5	-5.0
R2	39	1	0.0	67.5	66	67.5	12	Snd Lvl	67.5	0.0	5	-5.0
R3	40	1	0.0	67.4	66	67.4	12	Snd Lvl	67.4	0.0	5	-5.0
R4	41	1	0.0	68.1	66	68.1	12	Snd Lvl	68.1	0.0	5	-5.0
R5	42	1	0.0	67.5	66	67.5	12	Snd Lvl	67.5	0.0	5	-5.0
R6	43	1	0.0	64.3	66	64.3	12	----	64.3	0.0	5	-5.0
R7	44	1	0.0	64.3	66	64.3	12	----	64.3	0.0	5	-5.0
R8	45	1	0.0	63.9	66	63.9	12	----	63.9	0.0	5	-5.0
R9	46	1	0.0	64.7	66	64.7	12	----	64.7	0.0	5	-5.0
R10	47	1	0.0	64.9	66	64.9	12	----	64.9	0.0	5	-5.0
R11	48	1	0.0	63.6	66	63.6	12	----	63.6	0.0	5	-5.0
R12	49	1	0.0	62.8	66	62.8	12	----	62.8	0.0	5	-5.0
R13	50	1	0.0	63.2	66	63.2	12	----	63.2	0.0	5	-5.0
R14	51	1	0.0	61.9	66	61.9	12	----	61.9	0.0	5	-5.0
R15	52	1	0.0	58.8	66	58.8	12	----	58.8	0.0	5	-5.0
R16	53	1	0.0	55.6	66	55.6	12	----	55.6	0.0	5	-5.0
R17	54	1	0.0	54.8	66	54.8	12	----	54.8	0.0	5	-5.0
R18	55	1	0.0	54.4	66	54.4	12	----	54.4	0.0	5	-5.0
R19	56	1	0.0	53.2	66	53.2	12	----	53.2	0.0	5	-5.0
R20	57	1	0.0	55.9	66	55.9	12	----	55.9	0.0	5	-5.0
R21	58	1	0.0	56.3	66	56.3	12	----	56.3	0.0	5	-5.0
R22	59	1	0.0	59.5	66	59.5	12	----	59.5	0.0	5	-5.0
R23	60	1	0.0	61.9	66	61.9	12	----	61.9	0.0	5	-5.0
R24	61	1	0.0	58.4	66	58.4	12	----	58.4	0.0	5	-5.0

R25	62	1	0.0	60.5	66	60.5	12	----	60.5	0.0	5	-5.0
R26	63	1	0.0	61.9	66	61.9	12	----	61.9	0.0	5	-5.0
R27	64	1	0.0	66.5	66	66.5	12	Snd Lvl	66.5	0.0	5	-5.0
R28	65	1	0.0	68.2	66	68.2	12	Snd Lvl	68.2	0.0	5	-5.0
R29	66	1	0.0	64.3	66	64.3	12	----	64.3	0.0	5	-5.0
R30	67	1	0.0	59.1	66	59.1	12	----	59.1	0.0	5	-5.0
R31	68	1	0.0	60.4	66	60.4	12	----	60.4	0.0	5	-5.0
R32	69	1	0.0	56.6	66	56.6	12	----	56.6	0.0	5	-5.0
R33	70	1	0.0	57.7	66	57.7	12	----	57.7	0.0	5	-5.0
R34	71	1	0.0	56.6	66	56.6	12	----	56.6	0.0	5	-5.0
R35	72	1	0.0	57.3	66	57.3	12	----	57.3	0.0	5	-5.0
R36	73	1	0.0	57.6	66	57.6	12	----	57.6	0.0	5	-5.0
R37	74	1	0.0	59.8	66	59.8	12	----	59.8	0.0	5	-5.0
R38	75	1	0.0	56.6	66	56.6	12	----	56.6	0.0	5	-5.0
R39	76	1	0.0	58.7	66	58.7	12	----	58.7	0.0	5	-5.0
R40	77	1	0.0	60.1	66	60.1	12	----	60.1	0.0	5	-5.0
R41	78	1	0.0	58.5	66	58.5	12	----	58.5	0.0	5	-5.0
R42	79	1	0.0	65.4	66	65.4	12	----	65.4	0.0	5	-5.0
R43	80	1	0.0	61.1	66	61.1	12	----	61.1	0.0	5	-5.0
R44	81	1	0.0	67.8	66	67.8	12	Snd Lvl	67.8	0.0	5	-5.0
R45	82	1	0.0	59.7	66	59.7	12	----	59.7	0.0	5	-5.0
R46	83	1	0.0	56.5	66	56.5	12	----	56.5	0.0	5	-5.0
R47	84	1	0.0	67.5	66	67.5	12	Snd Lvl	67.5	0.0	5	-5.0
R48	85	1	0.0	56.3	66	56.3	12	----	56.3	0.0	5	-5.0
R49	86	1	0.0	59.7	66	59.7	12	----	59.7	0.0	5	-5.0
R50	87	1	0.0	59.3	66	59.3	12	----	59.3	0.0	5	-5.0
R51	88	1	0.0	56.6	66	56.6	12	----	56.6	0.0	5	-5.0
R52	89	1	0.0	67.0	66	67.0	12	Snd Lvl	67.0	0.0	5	-5.0
R53	90	1	0.0	59.9	66	59.9	12	----	59.9	0.0	5	-5.0
R54	91	1	0.0	56.5	66	56.5	12	----	56.5	0.0	5	-5.0

Dwelling Units	**# DUs**	**Noise Reduction**		
		Min	**Avg**	**Max**
		dB	**dB**	**dB**
All Selected	54	0.0	0.0	0.0
All Impacted	9	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

LSA Associates, Inc. 16 September 2010
P. Ault TNM 2.5

INPUT: ROADWAYS
PROJECT/CONTRACT: Kern COG Retrofit Noise Barrier
RUN: Existing

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

Roadway		Points									
Name	Width	Name	No.	Coordinates (pavement)			Flow Control			Segment	
				X	Y	Z	Control Device	Speed Constraint	Percent Vehicles Affected	Pvmt Type	On Struct?
	ft			ft	ft	ft		mph	%		
SR14 (SB)	44.0	0	1	6,510,367.0	2,139,960.0	2,386.00				Average	
		1	2	6,510,329.0	2,139,740.0	2,378.00				Average	
		2	3	6,510,307.0	2,139,514.0	2,368.00				Average	
		3	4	6,510,301.0	2,139,294.0	2,362.00				Average	
		4	5	6,510,293.0	2,139,071.0	2,355.00				Average	
		5	6	6,510,288.0	2,138,878.0	2,352.00				Average	
		6	7	6,510,282.0	2,138,642.0	2,348.00				Average	
		7	8	6,510,269.0	2,138,379.0	2,344.00				Average	
		8	9	6,510,260.0	2,138,130.0	2,340.00				Average	
		9	10	6,510,252.0	2,137,895.0	2,338.00				Average	
		10	11	6,510,244.0	2,137,653.0	2,338.00				Average	
		11	12	6,510,234.0	2,137,419.0	2,338.00				Average	
		12	13	6,510,226.0	2,137,182.0	2,332.00				Average	
		13	14	6,510,210.0	2,136,893.0	2,330.00				Average	
		14	15	6,510,207.0	2,136,663.0	2,330.00				Average	
		15	16	6,510,199.0	2,136,435.0	2,330.00				Average	
		16	17	6,510,191.0	2,136,216.0	2,330.00				Average	
		17	18	6,510,184.0	2,136,048.0	2,328.00				Average	
		18	19	6,510,177.0	2,135,816.0	2,328.00				Average	
		19	20	6,510,168.0	2,135,590.0	2,328.00				Average	
		20	21	6,510,160.0	2,135,381.0	2,328.00				Average	
		21	22	6,510,154.0	2,135,168.0	2,327.00				Average	
		22	23	6,510,151.0	2,135,045.0	2,326.00				Average	
		23	24	6,510,141.0	2,134,835.0	2,326.00				Average	
		24	25	6,510,136.0	2,134,616.0	2,326.00				Average	

		25	26	6,510,127.0	2,134,401.0	2,326.00				Average	
		26	27	6,510,123.0	2,134,291.0	2,326.00				Average	
		27	28	6,510,125.0	2,134,069.0	2,326.00				Average	
		28	29	6,510,125.0	2,133,933.0	2,326.00				Average	
		29	30	6,510,141.0	2,133,650.0	2,324.00				Average	
		30	31	6,510,151.0	2,133,443.0	2,324.00					
SR14 (NB)	44.0	31	32	6,510,027.0	2,133,442.0	2,324.00				Average	
		32	33	6,510,009.0	2,134,403.0	2,326.00				Average	
		33	34	6,510,015.0	2,134,613.0	2,326.00				Average	
		34	35	6,510,023.0	2,134,836.0	2,326.00				Average	
		35	36	6,510,035.0	2,135,049.0	2,326.00				Average	
		36	37	6,510,038.0	2,135,170.0	2,327.00				Average	
		37	38	6,510,043.0	2,135,383.0	2,328.00				Average	
		38	39	6,510,048.0	2,135,591.0	2,328.00				Average	
		39	40	6,510,059.0	2,135,818.0	2,328.00				Average	
		40	41	6,510,066.0	2,136,052.0	2,328.00				Average	
		41	42	6,510,073.0	2,136,218.0	2,330.00				Average	
		42	43	6,510,078.0	2,136,439.0	2,330.00				Average	
		43	44	6,510,088.0	2,136,664.0	2,330.00				Average	
		44	45	6,510,097.0	2,136,895.0	2,330.00				Average	
		45	46	6,510,108.0	2,137,185.0	2,332.00				Average	
		46	47	6,510,117.0	2,137,421.0	2,338.00				Average	
		47	48	6,510,124.0	2,137,659.0	2,338.00				Average	
		48	49	6,510,132.0	2,137,896.0	2,338.00				Average	
		49	50	6,510,142.0	2,138,137.0	2,340.00				Average	
		50	51	6,510,152.0	2,138,386.0	2,344.00				Average	
		51	52	6,510,161.0	2,138,635.0	2,348.00				Average	
		52	53	6,510,170.0	2,138,884.0	2,352.00				Average	
		53	54	6,510,177.0	2,139,077.0	2,355.00				Average	
		54	55	6,510,182.0	2,139,317.0	2,362.00				Average	
		55	56	6,510,191.0	2,139,540.0	2,370.00				Average	
		56	57	6,510,212.0	2,139,750.0	2,380.00				Average	
		57	58	6,510,255.0	2,139,982.0	2,388.00					
On ramp fr Rosamond Blvd (NB)	20.0	0	116	6,511,587.0	2,136,997.0	2,340.00				Average	
		1	117	6,510,437.0	2,137,012.0	2,348.00				Average	
		2	118	6,510,326.0	2,137,240.0	2,341.00				Average	
		3	119	6,510,292.0	2,137,420.0	2,340.00				Average	
		4	120	6,510,277.0	2,137,660.0	2,338.00				Average	
		5	121	6,510,274.0	2,137,894.0	2,338.00				Average	

		6	122	6,510,278.0	2,138,130.0	2,340.00				Average	
		7	123	6,510,269.0	2,138,379.0	2,344.00					
Off ramp to Rosamond Blvd (NB)	20.0	8	124	6,510,178.0	2,135,818.2	2,328.00				Average	
		9	125	6,510,214.5	2,136,047.2	2,328.00				Average	
		10	126	6,510,235.0	2,136,213.0	2,330.00				Average	
		11	127	6,510,287.0	2,136,436.0	2,330.00				Average	
		12	128	6,510,385.0	2,136,662.0	2,336.00				Average	
		13	129	6,510,601.0	2,136,903.0	2,344.00				Average	
		14	130	6,511,474.0	2,136,959.5	2,340.00					
On ramp fr W Rosamond Blvd (SB)	20.0	15	131	6,509,509.5	2,136,925.0	2,338.00				Average	
		16	132	6,509,930.0	2,136,900.0	2,350.00				Average	
		17	133	6,510,013.0	2,136,666.0	2,340.00				Average	
		18	134	6,510,022.0	2,136,436.0	2,335.00				Average	
		19	135	6,510,036.0	2,136,216.0	2,333.00				Average	
		20	136	6,510,041.0	2,136,051.0	2,330.00				Average	
		21	137	6,510,041.0	2,135,816.0	2,330.00				Average	
		22	138	6,510,036.0	2,135,592.0	2,328.00				Average	
		23	139	6,510,043.0	2,135,383.2	2,328.00					
Hillcrest Ave	36.0	0	140	6,510,885.0	2,139,600.0	2,364.00				Average	
		1	141	6,510,383.0	2,139,584.0	2,360.00					
Alexander Ave	36.0	2	142	6,510,886.0	2,138,554.0	2,354.00				Average	
		3	143	6,510,375.0	2,138,551.0	2,347.00					
Haven St	36.0	4	144	6,510,539.0	2,139,566.0	2,360.00				Average	
		5	145	6,510,540.0	2,138,564.0	2,352.00					
Rosewood Ave to Milstead	36.0	6	146	6,510,382.0	2,138,289.0	2,348.00				Average	
		7	147	6,510,599.0	2,138,292.0	2,352.00				Average	
		8	148	6,510,601.0	2,137,430.0	2,340.00				Average	
		9	149	6,510,405.0	2,137,425.0	2,341.00					
Rosamond Blvd WB	36.0	10	150	6,511,584.0	2,136,997.0	2,340.00				Average	
		11	151	6,510,265.0	2,136,967.0	2,352.00				Average	Y
		12	152	6,510,032.0	2,136,964.0	2,351.00				Average	
		13	153	6,509,607.0	2,136,961.0	2,341.00					
Rosamond Blvd EB	36.0	14	154	6,509,509.5	2,136,925.0	2,338.00				Average	
		15	155	6,510,032.0	2,136,938.0	2,351.00				Average	Y
		16	156	6,510,266.0	2,136,939.0	2,352.00				Average	
		17	157	6,510,489.0	2,136,938.0	2,349.00				Average	
		18	158	6,510,494.0	2,136,938.0	2,344.00				Average	
		19	159	6,511,478.0	2,136,960.0	2,340.00					
Laurel St to Poplar St	36.0	20	160	6,509,550.0	2,136,808.0	2,332.00				Average	

		21	161	6,509,782.0	2,136,799.0	2,330.00				Average	
		22	162	6,509,933.0	2,136,673.0	2,328.00				Average	
		23	163	6,509,968.0	2,135,807.0	2,330.00				Average	
		24	164	6,509,558.0	2,135,801.0	2,328.00					
C st to Poplar St	36.0	25	165	6,510,941.0	2,136,720.0	2,336.00				Average	
		26	166	6,510,487.0	2,136,712.0	2,336.00				Average	
		27	167	6,510,470.0	2,135,826.0	2,328.00				Average	
		28	168	6,510,948.0	2,135,814.0	2,332.00					
W B St	36.0	29	169	6,510,963.0	2,134,301.0	2,324.00				Average	
		30	170	6,510,962.0	2,135,077.0	2,326.00					
Oak St	36.0	31	171	6,510,954.5	2,134,933.8	2,326.00				Average	
		32	172	6,510,229.0	2,134,920.0	2,326.00					
Elm St	36.0	33	173	6,510,953.5	2,134,663.0	2,326.00				Average	
		34	174	6,510,228.0	2,134,644.0	2,326.00					
Orange St	36.0	35	175	6,510,954.0	2,134,341.2	2,324.00				Average	
		36	176	6,510,239.0	2,134,322.0	2,326.00					
Granite St	36.0	37	177	6,510,216.0	2,135,058.0	2,326.00				Average	
		38	178	6,510,223.0	2,134,156.0	2,326.00					

LSA Associates, Inc. **16 September 2010**
P. Ault **TNM 2.5**

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: Kern COG Retrofit Noise Barrier
RUN: Existing

Roadway	Points		Segment									
Name	Name	No.	Autos		MTrucks		HTrucks		Buses		Motorcycles	
			V	S	V	S	V	S	V	S	V	S
			veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph
SR14 (SB)	0	1	737	65	32	65	24	55	0	0	0	0
	1	2	737	65	32	65	24	55	0	0	0	0
	2	3	737	65	32	65	24	55	0	0	0	0
	3	4	737	65	32	65	24	55	0	0	0	0
	4	5	737	65	32	65	24	55	0	0	0	0
	5	6	737	65	32	65	24	55	0	0	0	0
	6	7	737	65	32	65	24	55	0	0	0	0
	7	8	737	65	32	65	24	55	0	0	0	0
	8	9	737	65	32	65	24	55	0	0	0	0
	9	10	737	65	32	65	24	55	0	0	0	0
	10	11	737	65	32	65	24	55	0	0	0	0
	11	12	737	65	32	65	24	55	0	0	0	0
	12	13	737	65	32	65	24	55	0	0	0	0
	13	14	737	65	32	65	24	55	0	0	0	0
	14	15	737	65	32	65	24	55	0	0	0	0
	15	16	737	65	32	65	24	55	0	0	0	0
	16	17	737	65	32	65	24	55	0	0	0	0
	17	18	737	65	32	65	24	55	0	0	0	0
	18	19	737	65	32	65	24	55	0	0	0	0
	19	20	737	65	32	65	24	55	0	0	0	0
	20	21	737	65	32	65	24	55	0	0	0	0
	21	22	737	65	32	65	24	55	0	0	0	0
	22	23	737	65	32	65	24	55	0	0	0	0

	23	24	737	65	32	65	24	55	0	0	0	0
	24	25	737	65	32	65	24	55	0	0	0	0
	25	26	737	65	32	65	24	55	0	0	0	0
	26	27	737	65	32	65	24	55	0	0	0	0
	27	28	737	65	32	65	24	55	0	0	0	0
	28	29	737	65	32	65	24	55	0	0	0	0
	29	30	737	65	32	65	24	55	0	0	0	0
	30	31										
SR14 (NB)	31	32	1085	65	47	65	35	55	0	0	0	0
	32	33	1085	65	47	65	35	55	0	0	0	0
	33	34	1085	65	47	65	35	55	0	0	0	0
	34	35	1085	65	47	65	35	55	0	0	0	0
	35	36	1085	65	47	65	35	55	0	0	0	0
	36	37	1085	65	47	65	35	55	0	0	0	0
	37	38	1085	65	47	65	35	55	0	0	0	0
	38	39	1085	65	47	65	35	55	0	0	0	0
	39	40	1085	65	47	65	35	55	0	0	0	0
	40	41	1085	65	47	65	35	55	0	0	0	0
	41	42	1085	65	47	65	35	55	0	0	0	0
	42	43	1085	65	47	65	35	55	0	0	0	0
	43	44	1085	65	47	65	35	55	0	0	0	0
	44	45	1085	65	47	65	35	55	0	0	0	0
	45	46	1085	65	47	65	35	55	0	0	0	0
	46	47	1085	65	47	65	35	55	0	0	0	0
	47	48	1085	65	47	65	35	55	0	0	0	0
	48	49	1085	65	47	65	35	55	0	0	0	0
	49	50	1085	65	47	65	35	55	0	0	0	0
	50	51	1085	65	47	65	35	55	0	0	0	0
	51	52	1085	65	47	65	35	55	0	0	0	0
	52	53	1085	65	47	65	35	55	0	0	0	0
	53	54	1085	65	47	65	35	55	0	0	0	0
	54	55	1085	65	47	65	35	55	0	0	0	0
	55	56	1085	65	47	65	35	55	0	0	0	0
	56	57	1085	65	47	65	35	55	0	0	0	0
	57	58										
On ramp fr Rosamond Blvd (NB)	0	116	213	35	9	35	7	35	0	0	0	0

	1	117	213	35	9	35	7	35	0	0	0	0
	2	118	213	35	9	35	7	35	0	0	0	0
	3	119	213	35	9	35	7	35	0	0	0	0
	4	120	213	35	9	35	7	35	0	0	0	0
	5	121	213	35	9	35	7	35	0	0	0	0
	6	122	213	35	9	35	7	35	0	0	0	0
	7	123										
Off ramp to Rosamond Blvd (NB)	8	124	724	35	31	35	23	35	0	0	0	0
	9	125	724	35	31	35	23	35	0	0	0	0
	10	126	724	35	31	35	23	35	0	0	0	0
	11	127	724	35	31	35	23	35	0	0	0	0
	12	128	724	35	31	35	23	35	0	0	0	0
	13	129	724	35	31	35	23	35	0	0	0	0
	14	130										
On ramp fr W Rosamond Blvd (SB)	15	131	496	35	21	35	16	35	0	0	0	0
	16	132	496	35	21	35	16	35	0	0	0	0
	17	133	496	35	21	35	16	35	0	0	0	0
	18	134	496	35	21	35	16	35	0	0	0	0
	19	135	496	35	21	35	16	35	0	0	0	0
	20	136	496	35	21	35	16	35	0	0	0	0
	21	137	496	35	21	35	16	35	0	0	0	0
	22	138	496	35	21	35	16	35	0	0	0	0
	23	139										
Hillcrest Ave	0	140	0	0	0	0	0	0	0	0	0	0
	1	141										
Alexander Ave	2	142	0	0	0	0	0	0	0	0	0	0
	3	143										
Haven St	4	144	0	0	0	0	0	0	0	0	0	0
	5	145										
Rosewood Ave to Milstead	6	146	0	0	0	0	0	0	0	0	0	0
	7	147	0	0	0	0	0	0	0	0	0	0
	8	148	0	0	0	0	0	0	0	0	0	0
	9	149										
Rosamond Blvd WB	10	150	1051	40	99	40	74	40	0	0	0	0
	11	151	798	40	54	40	41	40	0	0	0	0
	12	152	798	40	54	40	41	40	0	0	0	0

	13	153										
Rosamond Blvd EB	14	154	579	40	45	40	34	40	0	0	0	0
	15	155	684	40	57	40	43	40	0	0	0	0
	16	156	684	40	57	40	43	40	0	0	0	0
	17	157	684	40	57	40	43	40	0	0	0	0
	18	158	684	40	57	40	43	40	0	0	0	0
	19	159										
Laurel St to Poplar St	20	160	0	0	0	0	0	0	0	0	0	0
	21	161	0	0	0	0	0	0	0	0	0	0
	22	162	0	0	0	0	0	0	0	0	0	0
	23	163	0	0	0	0	0	0	0	0	0	0
	24	164										
C st to Poplar St	25	165	0	0	0	0	0	0	0	0	0	0
	26	166	0	0	0	0	0	0	0	0	0	0
	27	167	0	0	0	0	0	0	0	0	0	0
	28	168										
W B St	29	169	0	0	0	0	0	0	0	0	0	0
	30	170										
Oak St	31	171	0	0	0	0	0	0	0	0	0	0
	32	172										
Elm St	33	173	0	0	0	0	0	0	0	0	0	0
	34	174										
Orange St	35	175	0	0	0	0	0	0	0	0	0	0
	36	176										
Granite St	37	177	0	0	0	0	0	0	0	0	0	0
	38	178										

LSA Associates, Inc. 16 September 2010
P. Ault TNM 2.5

INPUT: RECEIVERS
PROJECT/CONTRACT: Kern COG Retrofit Noise Barrier
RUN: Existing

Receiver Name	No.	#DUs	Coordinates (ground) X	Y	Z	Height above Ground	Input Sound Levels and Criteria Existing LAeq1h	Impact Criteria LAeq1h	Impact Criteria Sub'l	NR Goal	Active in Calc.
			ft	ft	ft	ft	dBA	dBA	dB	dB	
R1	38	1	6,510,420.0	2,139,438.0	2,358.00	4.92	0.00	66	12.0	5.0	Y
R2	39	1	6,510,416.0	2,139,253.0	2,356.00	4.92	0.00	66	12.0	5.0	Y
R3	40	1	6,510,423.0	2,139,068.0	2,352.00	4.92	0.00	66	12.0	5.0	Y
R4	41	1	6,510,419.0	2,138,853.0	2,352.00	4.92	0.00	66	12.0	5.0	Y
R5	42	1	6,510,428.0	2,138,609.0	2,349.00	4.92	0.00	66	12.0	5.0	Y
R6	43	1	6,510,404.0	2,138,441.0	2,350.00	4.92	0.00	66	12.0	5.0	Y
R7	44	1	6,510,407.0	2,138,396.0	2,350.00	4.92	0.00	66	12.0	5.0	Y
R8	45	1	6,510,488.0	2,138,165.0	2,347.00	4.92	0.00	66	12.0	5.0	Y
R9	46	1	6,510,479.0	2,137,961.0	2,348.00	4.92	0.00	66	12.0	5.0	Y
R10	47	1	6,510,480.0	2,137,788.0	2,350.00	4.92	0.00	66	12.0	5.0	Y
R11	48	1	6,510,486.0	2,137,601.0	2,344.00	4.92	0.00	66	12.0	5.0	Y
R12	49	1	6,510,491.0	2,137,472.0	2,342.00	4.92	0.00	66	12.0	5.0	Y
R13	50	1	6,510,484.0	2,138,384.0	2,350.00	4.92	0.00	66	12.0	5.0	Y
R14	51	1	6,510,546.0	2,138,451.0	2,352.00	4.92	0.00	66	12.0	5.0	Y
R15	52	1	6,510,606.0	2,138,396.0	2,350.00	4.92	0.00	66	12.0	5.0	Y
R16	53	1	6,510,677.0	2,138,624.0	2,352.00	4.92	0.00	66	12.0	5.0	Y
R17	54	1	6,510,655.0	2,138,817.0	2,354.00	4.92	0.00	66	12.0	5.0	Y
R18	55	1	6,510,638.0	2,139,000.0	2,356.00	4.92	0.00	66	12.0	5.0	Y
R19	56	1	6,510,639.0	2,139,203.0	2,356.00	4.92	0.00	66	12.0	5.0	Y
R20	57	1	6,510,638.0	2,139,384.0	2,360.00	4.92	0.00	66	12.0	5.0	Y
R21	58	1	6,510,652.0	2,139,515.0	2,360.00	4.92	0.00	66	12.0	5.0	Y
R22	59	1	6,509,845.0	2,136,598.0	2,330.00	4.92	0.00	66	12.0	5.0	Y

R23	60	1	6,509,879.0	2,136,489.0	2,334.00	4.92	0.00	66	12.0	5.0	Y
R24	61	1	6,509,877.0	2,136,317.0	2,328.00	4.92	0.00	66	12.0	5.0	Y
R25	62	1	6,509,880.0	2,136,137.0	2,330.00	4.92	0.00	66	12.0	5.0	Y
R26	63	1	6,509,882.0	2,135,974.0	2,330.00	4.92	0.00	66	12.0	5.0	Y
R27	64	1	6,509,918.0	2,135,925.0	2,330.00	4.92	0.00	66	12.0	5.0	Y
R28	65	1	6,509,917.0	2,135,681.0	2,328.00	4.92	0.00	66	12.0	5.0	Y
R29	66	1	6,509,850.0	2,135,687.0	2,328.00	4.92	0.00	66	12.0	5.0	Y
R30	67	1	6,509,733.0	2,135,695.0	2,328.00	4.92	0.00	66	12.0	5.0	Y
R31	68	1	6,509,804.0	2,135,916.0	2,330.00	4.92	0.00	66	12.0	5.0	Y
R32	69	1	6,509,685.0	2,135,921.0	2,328.00	4.92	0.00	66	12.0	5.0	Y
R33	70	1	6,509,661.0	2,136,075.0	2,330.00	4.92	0.00	66	12.0	5.0	Y
R34	71	1	6,509,666.0	2,136,250.0	2,328.00	4.92	0.00	66	12.0	5.0	Y
R35	72	1	6,509,666.0	2,136,421.0	2,330.00	4.92	0.00	66	12.0	5.0	Y
R36	73	1	6,509,658.0	2,136,601.0	2,330.00	4.92	0.00	66	12.0	5.0	Y
R37	74	1	6,510,620.0	2,136,657.0	2,334.00	4.92	0.00	66	12.0	5.0	Y
R38	75	1	6,510,597.0	2,136,307.0	2,332.00	4.92	0.00	66	12.0	5.0	Y
R39	76	1	6,510,571.0	2,135,897.0	2,330.00	4.92	0.00	66	12.0	5.0	Y
R40	77	1	6,510,492.0	2,135,775.0	2,326.00	4.92	0.00	66	12.0	5.0	Y
R41	78	1	6,510,549.0	2,135,716.0	2,327.00	4.92	0.00	66	12.0	5.0	Y
R42	79	1	6,510,293.0	2,135,698.0	2,328.00	4.92	0.00	66	12.0	5.0	Y
R43	80	1	6,510,415.0	2,135,699.0	2,326.00	4.92	0.00	66	12.0	5.0	Y
R44	81	1	6,510,294.0	2,135,034.0	2,326.00	4.92	0.00	66	12.0	5.0	Y
R45	82	1	6,510,478.0	2,135,038.0	2,326.00	4.92	0.00	66	12.0	5.0	Y
R46	83	1	6,510,605.0	2,135,034.0	2,326.00	4.92	0.00	66	12.0	5.0	Y
R47	84	1	6,510,294.0	2,134,818.0	2,326.00	4.92	0.00	66	12.0	5.0	Y
R48	85	1	6,510,608.0	2,134,817.0	2,326.00	4.92	0.00	66	12.0	5.0	Y
R49	86	1	6,510,469.0	2,134,759.0	2,326.00	4.92	0.00	66	12.0	5.0	Y
R50	87	1	6,510,470.0	2,134,529.0	2,326.00	4.92	0.00	66	12.0	5.0	Y
R51	88	1	6,510,604.0	2,134,453.0	2,328.00	4.92	0.00	66	12.0	5.0	Y
R52	89	1	6,510,287.0	2,134,199.0	2,326.00	4.92	0.00	66	12.0	5.0	Y
R53	90	1	6,510,467.0	2,134,214.0	2,328.00	4.92	0.00	66	12.0	5.0	Y
R54	91	1	6,510,592.0	2,134,219.0	2,328.00	4.92	0.00	66	12.0	5.0	Y

LSA Associates, Inc. 16 September 2010
P. Ault TNM 2.5

INPUT: BARRIERS
PROJECT/CONTRACT: Kern COG Retrofit Noise Barrier
RUN: Existing

Barrier									Points										
Name	Type	Height		If Wall	If Berm			Add'tnl	Name	No.	Coordinates (bottom)			Height	Segment				
		Min	Max	$ per	$ per	Top	Run:Rise	$ per			X	Y	Z	at	Seg Ht Perturbs			On	Important
				Unit	Unit	Width		Unit						Point	Incre-	#Up	#Dn	Struct?	Reflec-
				Area	Vol.			Length							ment				tions?
		ft	ft	$/sq ft	$/cu yd	ft	ft:ft	$/ft			ft	ft	ft	ft	ft				
Barrier1	W	0.00	99.99	0.00				0.00	0	1	6,510,312.0	2,136,173.0	2,332.00	15.00	0.00	0	0		
									1	2	6,510,387.0	2,136,181.0	2,332.00	15.00	0.00	0	0		
									2	3	6,510,382.0	2,136,233.0	2,332.00	15.00	0.00	0	0		
									3	4	6,510,312.0	2,136,236.0	2,332.00	15.00	0.00	0	0		
									4	5	6,510,310.0	2,136,186.0	2,332.00	15.00					
Barrier2	W	0.00	99.99	0.00				0.00	5	6	6,510,292.0	2,136,280.0	2,332.00	15.00	0.00	0	0		
									6	7	6,510,340.0	2,136,280.0	2,332.00	15.00	0.00	0	0		
									7	8	6,510,340.0	2,136,323.0	2,332.00	15.00	0.00	0	0		
									8	9	6,510,290.0	2,136,338.0	2,332.00	15.00	0.00	0	0		
									9	10	6,510,294.0	2,136,291.0	2,332.00	15.00					
Barrier3	W	0.00	99.99	0.00				0.00	10	11	6,510,352.0	2,136,356.0	2,332.00	15.00	0.00	0	0		
									11	12	6,510,412.0	2,136,357.0	2,332.00	15.00	0.00	0	0		
									12	13	6,510,413.0	2,136,456.0	2,332.00	15.00	0.00	0	0		
									13	14	6,510,352.0	2,136,456.0	2,332.00	15.00	0.00	0	0		
									14	15	6,510,349.0	2,136,368.0	2,332.00	15.00					

LSA Associates, Inc.					**16 September 2010**	
P. Ault					**TNM 2.5**	
INPUT: BUILDING ROWS						
PROJECT/CONTRACT:	**Kern COG Retrofit Noise Barrier**					
RUN:	**Existing**					
Building Row			**Points**			
Name	**Average Height**	**Building Percent**	**No.**	**Coordinates (ground) X**	**Y**	**Z**
	ft	%		ft	ft	ft
Building1	15.00	80	1	6,510,460.0	2,139,539.0	2,358.00
			2	6,510,454.0	2,138,597.0	2,351.00
Building2	15.00	80	3	6,510,616.0	2,139,543.0	2,360.00
			4	6,510,615.0	2,138,604.0	2,352.00
Building3	15.00	80	5	6,510,381.0	2,138,476.0	2,350.00
			6	6,510,382.0	2,138,358.0	2,350.00
Building4	15.00	80	7	6,510,628.0	2,138,359.0	2,350.00
			8	6,510,627.0	2,138,486.0	2,350.00
Building5	15.00	80	9	6,510,529.0	2,138,235.0	2,348.00
			10	6,510,516.0	2,137,460.0	2,342.00
Building7	15.00	80	13	6,509,796.0	2,136,616.0	2,330.00
			14	6,509,886.0	2,136,614.0	2,330.00
Building8	15.00	80	15	6,509,908.0	2,136,506.0	2,334.00
			16	6,509,910.0	2,135,949.0	2,330.00
Building9	15.00	80	17	6,509,940.0	2,135,893.0	2,330.00
			18	6,509,607.0	2,135,888.0	2,328.00
Building10	15.00	80	19	6,509,934.0	2,135,729.0	2,328.00
			20	6,509,576.0	2,135,723.0	2,328.00
Building11	15.00	80	21	6,509,635.0	2,135,942.0	2,328.00
			22	6,509,632.0	2,136,678.0	2,332.00
Building12	15.00	80	23	6,510,605.0	2,136,671.0	2,334.00
			24	6,510,527.0	2,136,578.0	2,336.00
			41	6,510,535.0	2,136,363.0	2,332.00
			42	6,510,581.0	2,136,293.0	2,332.00

Building13	15.00	80	25	6,510,270.0	2,135,716.0	2,328.00
			26	6,510,274.0	2,135,665.0	2,328.00
			43	6,510,442.0	2,135,670.0	2,326.00
Building14	15.00	80	27	6,510,491.0	2,135,758.0	2,326.00
			28	6,510,490.0	2,135,656.0	2,326.00
			44	6,510,610.0	2,135,656.0	2,328.00
			45	6,510,603.0	2,135,765.0	2,328.00
Building15	0.00	80	29	6,510,539.0	2,135,982.0	2,330.00
			30	6,510,535.0	2,135,853.0	2,330.00
			46	6,510,635.0	2,135,852.0	2,330.00
			47	6,510,631.0	2,135,969.0	2,330.00
Building16	0.00	80	31	6,510,266.0	2,135,001.0	2,326.00
			32	6,510,673.0	2,135,009.0	2,326.00
Building17	0.00	80	33	6,510,265.0	2,134,846.0	2,326.00
			34	6,510,679.0	2,134,845.0	2,326.00
Building18	0.00	80	37	6,510,271.0	2,134,718.0	2,326.00
			38	6,510,673.0	2,134,721.0	2,326.00
Building19	0.00	80	39	6,510,269.0	2,134,555.0	2,326.00
			40	6,510,682.0	2,134,572.0	2,326.00
Building20	0.00	20	48	6,510,270.0	2,134,421.0	2,326.00
			49	6,510,684.0	2,134,430.0	2,328.00
Building21	0.00	20	50	6,510,264.0	2,134,222.0	2,326.00
			51	6,510,685.0	2,134,231.0	2,326.00

APPENDIX E

TRAFFIC NOISE MODEL (TNM) 2.5 PRINTOUTS FOR FUTURE (2035) CONDITIONS WITH SOUND BARRIERS

LSA Associates, Inc.
P. Ault
16 September 2010
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: Kern COG Retrofit Noise Barrier
RUN: Future
BARRIER DESIGN: SB1 - 6ft
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	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	With Barrier Type Impact	Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R1	38	1	0.0	68.1	66	68.1	12	Snd Lvl	62.3	5.8	5	0.8
R2	39	1	0.0	70.2	66	70.2	12	Snd Lvl	63.4	6.8	5	1.8
R3	40	1	0.0	70.0	66	70.0	12	Snd Lvl	63.3	6.7	5	1.7
R4	41	1	0.0	70.8	66	70.8	12	Snd Lvl	64.5	6.3	5	1.3
R5	42	1	0.0	70.2	66	70.2	12	Snd Lvl	64.9	5.3	5	0.3
R6	43	1	0.0	67.0	66	67.0	12	Snd Lvl	65.5	1.5	5	-3.5
R7	44	1	0.0	67.0	66	67.0	12	Snd Lvl	65.4	1.6	5	-3.4
R8	45	1	0.0	66.7	66	66.7	12	Snd Lvl	64.0	2.7	5	-2.3
R9	46	1	0.0	67.7	66	67.7	12	Snd Lvl	65.8	1.9	5	-3.1
R10	47	1	0.0	68.0	66	68.0	12	Snd Lvl	66.4	1.6	5	-3.4
R11	48	1	0.0	66.4	66	66.4	12	Snd Lvl	64.1	2.3	5	-2.7
R12	49	1	0.0	65.4	66	65.4	12	----	63.7	1.7	5	-3.3
R13	50	1	0.0	65.9	66	65.9	12	----	63.7	2.2	5	-2.8
R14	51	1	0.0	64.6	66	64.6	12	----	62.1	2.5	5	-2.5
R15	52	1	0.0	61.5	66	61.5	12	----	60.0	1.5	5	-3.5
R16	53	1	0.0	58.2	66	58.2	12	----	57.6	0.6	5	-4.4
R17	54	1	0.0	57.3	66	57.3	12	----	56.3	1.0	5	-4.0
R18	55	1	0.0	57.0	66	57.0	12	----	55.4	1.6	5	-3.4
R19	56	1	0.0	55.7	66	55.7	12	----	54.2	1.5	5	-3.5
R20	57	1	0.0	58.6	66	58.6	12	----	55.7	2.9	5	-2.1
R21	58	1	0.0	59.0	66	59.0	12	----	57.3	1.7	5	-3.3

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max

			dB	dB	dB							
All Selected		21	0.6	2.8	6.8							
All Impacted		11	1.5	3.9	6.8							
All that meet NR Goal		5	5.3	6.2	6.8							

LSA Associates, Inc. **16 September 2010**
P. Ault **TNM 2.5**

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: **Kern COG Retrofit Noise Barrier**
RUN: **Future**
BARRIER DESIGN: **SB1 - 6ft**

Barriers

Name	Type	Heights along Barrier			Length	If Wall	If Berm			Cost
		Min	Avg	Max		Area	Volume	Top Width	Run:Rise	
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
SB1	W	6.00	6.00	6.00	2152	12913				0
									Total Cost:	0

LSA Associates, Inc.
P. Ault
16 September 2010
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: Kern COG Retrofit Noise Barrier
RUN: Future
BARRIER DESIGN: SB1 - 8ft
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	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	With Barrier Type Impact	Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R1	38	1	0.0	68.1	66	68.1	12	Snd Lvl	61.5	6.6	5	1.6
R2	39	1	0.0	70.2	66	70.2	12	Snd Lvl	62.0	8.2	5	3.2
R3	40	1	0.0	70.0	66	70.0	12	Snd Lvl	61.9	8.1	5	3.1
R4	41	1	0.0	70.8	66	70.8	12	Snd Lvl	63.0	7.8	5	2.8
R5	42	1	0.0	70.2	66	70.2	12	Snd Lvl	63.2	7.0	5	2.0
R6	43	1	0.0	67.0	66	67.0	12	Snd Lvl	64.1	2.9	5	-2.1
R7	44	1	0.0	67.0	66	67.0	12	Snd Lvl	64.4	2.6	5	-2.4
R8	45	1	0.0	66.7	66	66.7	12	Snd Lvl	62.5	4.2	5	-0.8
R9	46	1	0.0	67.7	66	67.7	12	Snd Lvl	63.8	3.9	5	-1.1
R10	47	1	0.0	68.0	66	68.0	12	Snd Lvl	65.5	2.5	5	-2.5
R11	48	1	0.0	66.4	66	66.4	12	Snd Lvl	62.9	3.5	5	-1.5
R12	49	1	0.0	65.4	66	65.4	12	----	63.2	2.2	5	-2.8
R13	50	1	0.0	65.9	66	65.9	12	----	62.4	3.5	5	-1.5
R14	51	1	0.0	64.6	66	64.6	12	----	61.0	3.6	5	-1.4
R15	52	1	0.0	61.5	66	61.5	12	----	59.1	2.4	5	-2.6
R16	53	1	0.0	58.2	66	58.2	12	----	56.7	1.5	5	-3.5
R17	54	1	0.0	57.3	66	57.3	12	----	55.5	1.8	5	-3.2
R18	55	1	0.0	57.0	66	57.0	12	----	54.8	2.2	5	-2.8
R19	56	1	0.0	55.7	66	55.7	12	----	53.7	2.0	5	-3.0
R20	57	1	0.0	58.6	66	58.6	12	----	55.5	3.1	5	-1.9
R21	58	1	0.0	59.0	66	59.0	12	----	57.0	2.0	5	-3.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max

			dB	dB	dB							
All Selected		21	1.5	3.9	8.2							
All Impacted		11	2.5	5.2	8.2							
All that meet NR Goal		5	6.6	7.5	8.2							

LSA Associates, Inc. **16 September 2010**
P. Ault **TNM 2.5**

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: **Kern COG Retrofit Noise Barrier**
RUN: **Future**
BARRIER DESIGN: **SB1 - 8ft**

Barriers

Name	Type	Heights along Barrier			Length	If Wall	If Berm			Cost
		Min	Avg	Max		Area	Volume	Top Width	Run:Rise	
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
SB1	W	8.00	8.00	8.00	2152	17217				0
									Total Cost:	0

LSA Associates, Inc.
P. Ault
16 September 2010
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: Kern COG Retrofit Noise Barrier
RUN: Future
BARRIER DESIGN: SB1 - 10ft
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	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	With Barrier Type Impact	Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R1	38	1	0.0	68.1	66	68.1	12	Snd Lvl	59.8	8.3	5	3.3
R2	39	1	0.0	70.2	66	70.2	12	Snd Lvl	60.7	9.5	5	4.5
R3	40	1	0.0	70.0	66	70.0	12	Snd Lvl	60.7	9.3	5	4.3
R4	41	1	0.0	70.8	66	70.8	12	Snd Lvl	61.7	9.1	5	4.1
R5	42	1	0.0	70.2	66	70.2	12	Snd Lvl	61.9	8.3	5	3.3
R6	43	1	0.0	67.0	66	67.0	12	Snd Lvl	62.5	4.5	5	-0.5
R7	44	1	0.0	67.0	66	67.0	12	Snd Lvl	62.9	4.1	5	-0.9
R8	45	1	0.0	66.7	66	66.7	12	Snd Lvl	61.5	5.2	5	0.2
R9	46	1	0.0	67.7	66	67.7	12	Snd Lvl	62.6	5.1	5	0.1
R10	47	1	0.0	68.0	66	68.0	12	Snd Lvl	63.6	4.4	5	-0.6
R11	48	1	0.0	66.4	66	66.4	12	Snd Lvl	62.3	4.1	5	-0.9
R12	49	1	0.0	65.4	66	65.4	12	----	62.9	2.5	5	-2.5
R13	50	1	0.0	65.9	66	65.9	12	----	61.3	4.6	5	-0.4
R14	51	1	0.0	64.6	66	64.6	12	----	60.0	4.6	5	-0.4
R15	52	1	0.0	61.5	66	61.5	12	----	58.4	3.1	5	-1.9
R16	53	1	0.0	58.2	66	58.2	12	----	56.2	2.0	5	-3.0
R17	54	1	0.0	57.3	66	57.3	12	----	55.0	2.3	5	-2.7
R18	55	1	0.0	57.0	66	57.0	12	----	54.5	2.5	5	-2.5
R19	56	1	0.0	55.7	66	55.7	12	----	53.1	2.6	5	-2.4
R20	57	1	0.0	58.6	66	58.6	12	----	55.0	3.6	5	-1.4
R21	58	1	0.0	59.0	66	59.0	12	----	56.9	2.1	5	-2.9

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max

			dB	dB	dB
All Selected		21	2.0	4.8	9.5
All Impacted		11	4.1	6.5	9.5
All that meet NR Goal		7	5.1	7.8	9.5

LSA Associates, Inc.				**16 September 2010**						
P. Ault				**TNM 2.5**						
RESULTS: BARRIER DESCRIPTIONS										
PROJECT/CONTRACT:	**Kern COG Retrofit Noise Barrier**									
RUN:	**Future**									
BARRIER DESIGN:	**SB1 - 10ft**									
Barriers										
Name	**Type**	**Heights along Barrier**			**Length**	**If Wall**	**If Berm**			**Cost**
		Min	**Avg**	**Max**		**Area**	**Volume**	**Top Width**	**Run:Rise**	
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
SB1	W	10.00	10.00	10.00	2152	21521				0
									Total Cost:	0

LSA Associates, Inc.
P. Ault
16 September 2010
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: Kern COG Retrofit Noise Barrier
RUN: Future
BARRIER DESIGN: SB1 - 12ft
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	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	With Barrier Type Impact	Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R1	38	1	0.0	68.1	66	68.1	12	Snd Lvl	58.8	9.3	5	4.3
R2	39	1	0.0	70.2	66	70.2	12	Snd Lvl	58.8	11.4	5	6.4
R3	40	1	0.0	70.0	66	70.0	12	Snd Lvl	58.6	11.4	5	6.4
R4	41	1	0.0	70.8	66	70.8	12	Snd Lvl	59.6	11.2	5	6.2
R5	42	1	0.0	70.2	66	70.2	12	Snd Lvl	60.0	10.2	5	5.2
R6	43	1	0.0	67.0	66	67.0	12	Snd Lvl	61.0	6.0	5	1.0
R7	44	1	0.0	67.0	66	67.0	12	Snd Lvl	61.4	5.6	5	0.6
R8	45	1	0.0	66.7	66	66.7	12	Snd Lvl	60.2	6.5	5	1.5
R9	46	1	0.0	67.7	66	67.7	12	Snd Lvl	61.7	6.0	5	1.0
R10	47	1	0.0	68.0	66	68.0	12	Snd Lvl	62.5	5.5	5	0.5
R11	48	1	0.0	66.4	66	66.4	12	Snd Lvl	61.2	5.2	5	0.2
R12	49	1	0.0	65.4	66	65.4	12	----	62.4	3.0	5	-2.0
R13	50	1	0.0	65.9	66	65.9	12	----	59.7	6.2	5	1.2
R14	51	1	0.0	64.6	66	64.6	12	----	58.8	5.8	5	0.8
R15	52	1	0.0	61.5	66	61.5	12	----	57.1	4.4	5	-0.6
R16	53	1	0.0	58.2	66	58.2	12	----	55.1	3.1	5	-1.9
R17	54	1	0.0	57.3	66	57.3	12	----	54.0	3.3	5	-1.7
R18	55	1	0.0	57.0	66	57.0	12	----	53.7	3.3	5	-1.7
R19	56	1	0.0	55.7	66	55.7	12	----	52.4	3.3	5	-1.7
R20	57	1	0.0	58.6	66	58.6	12	----	54.4	4.2	5	-0.8
R21	58	1	0.0	59.0	66	59.0	12	----	56.7	2.3	5	-2.7

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max

			dB	dB	dB
All Selected		21	2.3	6.1	11.4
All Impacted		11	5.2	8.0	11.4
All that meet NR Goal		13	5.2	7.7	11.4

LSA Associates, Inc. **16 September 2010**
P. Ault **TNM 2.5**

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: **Kern COG Retrofit Noise Barrier**
RUN: **Future**
BARRIER DESIGN: **SB1 - 12ft**

Barriers

Name	Type	Heights along Barrier			Length	If Wall	If Berm			Cost
		Min	Avg	Max		Area	Volume	Top Width	Run:Rise	
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
SB1	W	12.00	12.00	12.00	2152	25825				0
									Total Cost:	0

LSA Associates, Inc.
P. Ault
16 September 2010
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: Kern COG Retrofit Noise Barrier
RUN: Future
BARRIER DESIGN: SB2 - 6ft
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	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
R22	59	1	0.0	60.6	66	60.6	12	----	59.4	1.2	5	-3.8
R23	60	1	0.0	64.3	66	64.3	12	----	63.0	1.3	5	-3.7
R24	61	1	0.0	59.8	66	59.8	12	----	58.3	1.5	5	-3.5
R25	62	1	0.0	62.0	66	62.0	12	----	60.1	1.9	5	-3.1
R26	63	1	0.0	63.8	66	63.8	12	----	61.8	2.0	5	-3.0
R27	64	1	0.0	68.2	66	68.2	12	Snd Lvl	65.1	3.1	5	-1.9
R28	65	1	0.0	70.5	66	70.5	12	Snd Lvl	65.9	4.6	5	-0.4
R29	66	1	0.0	66.4	66	66.4	12	Snd Lvl	63.4	3.0	5	-2.0
R30	67	1	0.0	61.4	66	61.4	12	----	59.6	1.8	5	-3.2
R31	68	1	0.0	62.7	66	62.7	12	----	60.0	2.7	5	-2.3
R32	69	1	0.0	58.5	66	58.5	12	----	57.4	1.1	5	-3.9
R33	70	1	0.0	59.8	66	59.8	12	----	58.2	1.6	5	-3.4
R34	71	1	0.0	58.4	66	58.4	12	----	57.1	1.3	5	-3.7
R35	72	1	0.0	59.1	66	59.1	12	----	57.7	1.4	5	-3.6
R36	73	1	0.0	59.3	66	59.3	12	----	58.7	0.6	5	-4.4

Dwelling Units	# DUs	Noise Reduction Min	Noise Reduction Avg	Noise Reduction Max
		dB	dB	dB
All Selected	15	0.6	1.9	4.6
All Impacted	3	3.0	3.6	4.6
All that meet NR Goal	0	0.0	0.0	0.0

LSA Associates, Inc. **16 September 2010**
P. Ault **TNM 2.5**

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: **Kern COG Retrofit Noise Barrier**
RUN: **Future**
BARRIER DESIGN: **SB2 - 6ft**

Barriers

Name	Type	Heights along Barrier			Length	If Wall	If Berm			Cost
		Min	Avg	Max		Area	Volume	Top Width	Run:Rise	
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
SB3	W	0.00	0.00	0.00	0	0				0
SB2	W	6.00	6.00	6.00	1192	7153				0
									Total Cost:	0

LSA Associates, Inc.
P. Ault
16 September 2010
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: Kern COG Retrofit Noise Barrier
RUN: Future
BARRIER DESIGN: SB2 - 8ft
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	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
R22	59	1	0.0	60.6	66	60.6	12	----	59.3	1.3	5	-3.7
R23	60	1	0.0	64.3	66	64.3	12	----	61.9	2.4	5	-2.6
R24	61	1	0.0	59.8	66	59.8	12	----	57.9	1.9	5	-3.1
R25	62	1	0.0	62.0	66	62.0	12	----	59.5	2.5	5	-2.5
R26	63	1	0.0	63.8	66	63.8	12	----	61.1	2.7	5	-2.3
R27	64	1	0.0	68.2	66	68.2	12	Snd Lvl	63.4	4.8	5	-0.2
R28	65	1	0.0	70.5	66	70.5	12	Snd Lvl	65.0	5.5	5	0.5
R29	66	1	0.0	66.4	66	66.4	12	Snd Lvl	63.0	3.4	5	-1.6
R30	67	1	0.0	61.4	66	61.4	12	----	59.3	2.1	5	-2.9
R31	68	1	0.0	62.7	66	62.7	12	----	59.5	3.2	5	-1.8
R32	69	1	0.0	58.5	66	58.5	12	----	56.9	1.6	5	-3.4
R33	70	1	0.0	59.8	66	59.8	12	----	57.7	2.1	5	-2.9
R34	71	1	0.0	58.4	66	58.4	12	----	57.3	1.1	5	-3.9
R35	72	1	0.0	59.1	66	59.1	12	----	57.6	1.5	5	-3.5
R36	73	1	0.0	59.3	66	59.3	12	----	58.7	0.6	5	-4.4

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	15	0.6	2.4	5.5
All Impacted	3	3.4	4.6	5.5
All that meet NR Goal	1	5.5	5.5	5.5

LSA Associates, Inc. **16 September 2010**
P. Ault **TNM 2.5**

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: **Kern COG Retrofit Noise Barrier**
RUN: **Future**
BARRIER DESIGN: **SB2 - 8ft**

Barriers

Name	Type	Heights along Barrier			Length	If Wall	If Berm			Cost
		Min	Avg	Max		Area	Volume	Top Width	Run:Rise	
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
SB3	W	0.00	0.00	0.00	0	0				0
SB2	W	8.00	8.00	8.00	1192	9537				0
									Total Cost:	0

LSA Associates, Inc.
P. Ault
16 September 2010
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: Kern COG Retrofit Noise Barrier
RUN: Future
BARRIER DESIGN: SB2 - 10ft
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	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	With Barrier Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Noise Reduction Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R22	59	1	0.0	60.6	66	60.6	12	----	58.3	2.3	5	-2.7
R23	60	1	0.0	64.3	66	64.3	12	----	60.8	3.5	5	-1.5
R24	61	1	0.0	59.8	66	59.8	12	----	57.0	2.8	5	-2.2
R25	62	1	0.0	62.0	66	62.0	12	----	58.6	3.4	5	-1.6
R26	63	1	0.0	63.8	66	63.8	12	----	60.3	3.5	5	-1.5
R27	64	1	0.0	68.2	66	68.2	12	Snd Lvl	62.0	6.2	5	1.2
R28	65	1	0.0	70.5	66	70.5	12	Snd Lvl	64.5	6.0	5	1.0
R29	66	1	0.0	66.4	66	66.4	12	Snd Lvl	62.5	3.9	5	-1.1
R30	67	1	0.0	61.4	66	61.4	12	----	58.9	2.5	5	-2.5
R31	68	1	0.0	62.7	66	62.7	12	----	58.7	4.0	5	-1.0
R32	69	1	0.0	58.5	66	58.5	12	----	56.2	2.3	5	-2.7
R33	70	1	0.0	59.8	66	59.8	12	----	57.3	2.5	5	-2.5
R34	71	1	0.0	58.4	66	58.4	12	----	56.7	1.7	5	-3.3
R35	72	1	0.0	59.1	66	59.1	12	----	57.4	1.7	5	-3.3
R36	73	1	0.0	59.3	66	59.3	12	----	58.6	0.7	5	-4.3

Dwelling Units	# DUs	Noise Reduction Min	Noise Reduction Avg	Noise Reduction Max
		dB	dB	dB
All Selected	15	0.7	3.1	6.2
All Impacted	3	3.9	5.4	6.2
All that meet NR Goal	2	6.0	6.1	6.2

LSA Associates, Inc. **16 September 2010**
P. Ault **TNM 2.5**

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: **Kern COG Retrofit Noise Barrier**
RUN: **Future**
BARRIER DESIGN: **SB2 - 10ft**

Barriers

Name	Type	Heights along Barrier			Length	If Wall	If Berm			Cost
		Min	Avg	Max		Area	Volume	Top Width	Run:Rise	
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
SB3	W	0.00	0.00	0.00	0	0				0
SB2	W	10.00	10.00	10.00	1192	11921				0
									Total Cost:	0

LSA Associates, Inc.
P. Ault
16 September 2010
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: Kern COG Retrofit Noise Barrier
RUN: Future
BARRIER DESIGN: SB2 - 12ft
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	Crit'n	Increase over existing Calculated	Increase over existing Crit'n Sub'l Inc	With Barrier Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Noise Reduction Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R22	59	1	0.0	60.6	66	60.6	12	----	58.0	2.6	5	-2.4
R23	60	1	0.0	64.3	66	64.3	12	----	59.8	4.5	5	-0.5
R24	61	1	0.0	59.8	66	59.8	12	----	56.5	3.3	5	-1.7
R25	62	1	0.0	62.0	66	62.0	12	----	57.8	4.2	5	-0.8
R26	63	1	0.0	63.8	66	63.8	12	----	59.2	4.6	5	-0.4
R27	64	1	0.0	68.2	66	68.2	12	Snd Lvl	59.9	8.3	5	3.3
R28	65	1	0.0	70.5	66	70.5	12	Snd Lvl	63.4	7.1	5	2.1
R29	66	1	0.0	66.4	66	66.4	12	Snd Lvl	61.7	4.7	5	-0.3
R30	67	1	0.0	61.4	66	61.4	12	----	58.2	3.2	5	-1.8
R31	68	1	0.0	62.7	66	62.7	12	----	57.1	5.6	5	0.6
R32	69	1	0.0	58.5	66	58.5	12	----	54.9	3.6	5	-1.4
R33	70	1	0.0	59.8	66	59.8	12	----	56.2	3.6	5	-1.4
R34	71	1	0.0	58.4	66	58.4	12	----	55.8	2.6	5	-2.4
R35	72	1	0.0	59.1	66	59.1	12	----	56.7	2.4	5	-2.6
R36	73	1	0.0	59.3	66	59.3	12	----	58.3	1.0	5	-4.0

Dwelling Units	# DUs	Noise Reduction Min	Noise Reduction Avg	Noise Reduction Max
		dB	dB	dB
All Selected	15	1.0	4.1	8.3
All Impacted	3	4.7	6.7	8.3
All that meet NR Goal	3	5.6	7.0	8.3

LSA Associates, Inc. 16 September 2010
P. Ault TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: Kern COG Retrofit Noise Barrier
RUN: Future
BARRIER DESIGN: SB2 - 12ft

Barriers

Name	Type	Heights along Barrier			Length	If Wall	If Berm			Cost
		Min	Avg	Max		Area	Volume	Top Width	Run:Rise	
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
SB3	W	0.00	0.00	0.00	0	0				0
SB2	W	12.00	12.00	12.00	1192	14306				0
									Total Cost:	0

LSA Associates, Inc.
P. Ault
16 September 2010
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: Kern COG Retrofit Noise Barrier
RUN: Future
BARRIER DESIGN: SB2 - 14ft
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	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
R22	59	1	0.0	60.6	66	60.6	12	----	57.6	3.0	5	-2.0
R23	60	1	0.0	64.3	66	64.3	12	----	59.4	4.9	5	-0.1
R24	61	1	0.0	59.8	66	59.8	12	----	56.1	3.7	5	-1.3
R25	62	1	0.0	62.0	66	62.0	12	----	57.4	4.6	5	-0.4
R26	63	1	0.0	63.8	66	63.8	12	----	58.7	5.1	5	0.1
R27	64	1	0.0	68.2	66	68.2	12	Snd Lvl	58.8	9.4	5	4.4
R28	65	1	0.0	70.5	66	70.5	12	Snd Lvl	63.1	7.4	5	2.4
R29	66	1	0.0	66.4	66	66.4	12	Snd Lvl	61.4	5.0	5	0.0
R30	67	1	0.0	61.4	66	61.4	12	----	58.0	3.4	5	-1.6
R31	68	1	0.0	62.7	66	62.7	12	----	56.3	6.4	5	1.4
R32	69	1	0.0	58.5	66	58.5	12	----	54.3	4.2	5	-0.8
R33	70	1	0.0	59.8	66	59.8	12	----	55.7	4.1	5	-0.9
R34	71	1	0.0	58.4	66	58.4	12	----	55.3	3.1	5	-1.9
R35	72	1	0.0	59.1	66	59.1	12	----	56.4	2.7	5	-2.3
R36	73	1	0.0	59.3	66	59.3	12	----	58.1	1.2	5	-3.8

Dwelling Units	# DUs	Noise Reduction Min	Noise Reduction Avg	Noise Reduction Max
		dB	dB	dB
All Selected	15	1.2	4.5	9.4
All Impacted	3	5.0	7.3	9.4
All that meet NR Goal	5	5.0	6.7	9.4

LSA Associates, Inc. 16 September 2010
P. Ault TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: Kern COG Retrofit Noise Barrier
RUN: Future
BARRIER DESIGN: SB2 - 14ft

Barriers

Name	Type	Heights along Barrier			Length	If Wall	If Berm			Cost
		Min	Avg	Max		Area	Volume	Top Width	Run:Rise	
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
SB3	W	0.00	0.00	0.00	0	0				0
SB2	W	14.00	14.00	14.00	1192	16690				0
									Total Cost:	0

LSA Associates, Inc.
P. Ault
16 September 2010
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: Kern COG Retrofit Noise Barrier
RUN: Future
BARRIER DESIGN: SB2 - 16ft
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	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	With Barrier Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Noise Reduction Goal	Noise Reduction Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R22	59	1	0.0	60.6	66	60.6	12	----	57.3	3.3	5	-1.7
R23	60	1	0.0	64.3	66	64.3	12	----	59.1	5.2	5	0.2
R24	61	1	0.0	59.8	66	59.8	12	----	55.8	4.0	5	-1.0
R25	62	1	0.0	62.0	66	62.0	12	----	57.0	5.0	5	0.0
R26	63	1	0.0	63.8	66	63.8	12	----	58.3	5.5	5	0.5
R27	64	1	0.0	68.2	66	68.2	12	Snd Lvl	58.0	10.2	5	5.2
R28	65	1	0.0	70.5	66	70.5	12	Snd Lvl	62.9	7.6	5	2.6
R29	66	1	0.0	66.4	66	66.4	12	Snd Lvl	61.2	5.2	5	0.2
R30	67	1	0.0	61.4	66	61.4	12	----	57.8	3.6	5	-1.4
R31	68	1	0.0	62.7	66	62.7	12	----	55.7	7.0	5	2.0
R32	69	1	0.0	58.5	66	58.5	12	----	53.8	4.7	5	-0.3
R33	70	1	0.0	59.8	66	59.8	12	----	55.3	4.5	5	-0.5
R34	71	1	0.0	58.4	66	58.4	12	----	54.8	3.6	5	-1.4
R35	72	1	0.0	59.1	66	59.1	12	----	56.2	2.9	5	-2.1
R36	73	1	0.0	59.3	66	59.3	12	----	58.0	1.3	5	-3.7

Dwelling Units	# DUs	Noise Reduction Min	Noise Reduction Avg	Noise Reduction Max
		dB	dB	dB
All Selected	15	1.3	4.9	10.2
All Impacted	3	5.2	7.7	10.2
All that meet NR Goal	7	5.0	6.5	10.2

LSA Associates, Inc. 16 September 2010
P. Ault TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: Kern COG Retrofit Noise Barrier
RUN: Future
BARRIER DESIGN: SB2 - 16ft

Barriers

Name	Type	Heights along Barrier			Length	If Wall	If Berm			Cost
		Min	Avg	Max		Area	Volume	Top Width	Run:Rise	
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
SB3	W	0.00	0.00	0.00	0	0				0
SB2	W	16.00	16.00	16.00	1192	19074				0
									Total Cost:	0

LSA Associates, Inc.
P. Ault
16 September 2010
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: Kern COG Retrofit Noise Barrier
RUN: Future
BARRIER DESIGN: SB3 - 6ft
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	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R37	74	1	0.0	61.5	66	61.5	12	----	61.5	0.0	5	-5.0
R38	75	1	0.0	58.7	66	58.7	12	----	58.4	0.3	5	-4.7
R39	76	1	0.0	61.1	66	61.1	12	----	59.5	1.6	5	-3.4
R40	77	1	0.0	62.6	66	62.6	12	----	60.4	2.2	5	-2.8
R41	78	1	0.0	61.0	66	61.0	12	----	59.1	1.9	5	-3.1
R42	79	1	0.0	68.0	66	68.0	12	Snd Lvl	63.1	4.9	5	-0.1
R43	80	1	0.0	63.6	66	63.6	12	----	60.8	2.8	5	-2.2

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	7	0.0	2.0	4.9
All Impacted	1	4.9	4.9	4.9
All that meet NR Goal	0	0.0	0.0	0.0

LSA Associates, Inc. **16 September 2010**
P. Ault **TNM 2.5**

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: **Kern COG Retrofit Noise Barrier**
RUN: **Future**
BARRIER DESIGN: **SB3 - 6ft**

Barriers

Name	Type	Heights along Barrier			Length	If Wall	If Berm			Cost
		Min	Avg	Max		Area	Volume	Top Width	Run:Rise	
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
SB3	W	6.00	6.00	6.00	602	3614				0
SB2	W	0.00	0.00	0.00	0	0				0
Barrier3	W	15.00	15.00	15.00	308	4621				0
Barrier2	W	15.00	15.00	15.00	190	2856				0
Barrier1	W	15.00	15.00	15.00	248	3717				0
									Total Cost:	0

LSA Associates, Inc.
P. Ault
16 September 2010
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: Kern COG Retrofit Noise Barrier
RUN: Future
BARRIER DESIGN: SB3 - 8ft
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	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	With Barrier Type Impact	Calculated LAeq1h	Noise Reduction Calculated	Noise Reduction Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R37	74	1	0.0	61.5	66	61.5	12	----	61.5	0.0	5	-5.0
R38	75	1	0.0	58.7	66	58.7	12	----	58.3	0.4	5	-4.6
R39	76	1	0.0	61.1	66	61.1	12	----	59.2	1.9	5	-3.1
R40	77	1	0.0	62.6	66	62.6	12	----	60.2	2.4	5	-2.6
R41	78	1	0.0	61.0	66	61.0	12	----	58.9	2.1	5	-2.9
R42	79	1	0.0	68.0	66	68.0	12	Snd Lvl	62.2	5.8	5	0.8
R43	80	1	0.0	63.6	66	63.6	12	----	60.2	3.4	5	-1.6

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	7	0.0	2.3	5.8
All Impacted	1	5.8	5.8	5.8
All that meet NR Goal	1	5.8	5.8	5.8

LSA Associates, Inc. **16 September 2010**
P. Ault **TNM 2.5**

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: **Kern COG Retrofit Noise Barrier**
RUN: **Future**
BARRIER DESIGN: **SB3 - 8ft**

Barriers

Name	Type	Heights along Barrier			Length	If Wall	If Berm			Cost
		Min	Avg	Max		Area	Volume	Top Width	Run:Rise	
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
SB3	W	8.00	8.00	8.00	602	4818				0
SB2	W	0.00	0.00	0.00	0	0				0
Barrier3	W	15.00	15.00	15.00	308	4621				0
Barrier2	W	15.00	15.00	15.00	190	2856				0
Barrier1	W	15.00	15.00	15.00	248	3717				0
									Total Cost:	0

LSA Associates, Inc.
P. Ault
16 September 2010
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: Kern COG Retrofit Noise Barrier
RUN: Future
BARRIER DESIGN: SB3 - 10ft
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	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	With Barrier Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Noise Reduction Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R37	74	1	0.0	61.5	66	61.5	12	----	61.5	0.0	5	-5.0
R38	75	1	0.0	58.7	66	58.7	12	----	58.2	0.5	5	-4.5
R39	76	1	0.0	61.1	66	61.1	12	----	59.0	2.1	5	-2.9
R40	77	1	0.0	62.6	66	62.6	12	----	59.8	2.8	5	-2.2
R41	78	1	0.0	61.0	66	61.0	12	----	58.5	2.5	5	-2.5
R42	79	1	0.0	68.0	66	68.0	12	Snd Lvl	61.7	6.3	5	1.3
R43	80	1	0.0	63.6	66	63.6	12	----	59.5	4.1	5	-0.9

Dwelling Units	# DUs	Noise Reduction Min	Noise Reduction Avg	Noise Reduction Max
		dB	dB	dB
All Selected	7	0.0	2.6	6.3
All Impacted	1	6.3	6.3	6.3
All that meet NR Goal	1	6.3	6.3	6.3

LSA Associates, Inc. **16 September 2010**
P. Ault **TNM 2.5**

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: **Kern COG Retrofit Noise Barrier**
RUN: **Future**
BARRIER DESIGN: **SB3 - 10ft**

Barriers

Name	Type	Heights along Barrier			Length	If Wall	If Berm			Cost
		Min	Avg	Max		Area	Volume	Top Width	Run:Rise	
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
SB3	W	10.00	10.00	10.00	602	6023				0
SB2	W	0.00	0.00	0.00	0	0				0
Barrier3	W	15.00	15.00	15.00	308	4621				0
Barrier2	W	15.00	15.00	15.00	190	2856				0
Barrier1	W	15.00	15.00	15.00	248	3717				0
									Total Cost:	0

LSA Associates, Inc.
P. Ault
16 September 2010
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: Kern COG Retrofit Noise Barrier
RUN: Future
BARRIER DESIGN: SB3 - 12ft
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	Crit'n	Increase over existing Calculated	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
R37	74	1	0.0	61.5	66	61.5	12	----	61.5	0.0	5	-5.0
R38	75	1	0.0	58.7	66	58.7	12	----	58.1	0.6	5	-4.4
R39	76	1	0.0	61.1	66	61.1	12	----	58.4	2.7	5	-2.3
R40	77	1	0.0	62.6	66	62.6	12	----	59.2	3.4	5	-1.6
R41	78	1	0.0	61.0	66	61.0	12	----	58.1	2.9	5	-2.1
R42	79	1	0.0	68.0	66	68.0	12	Snd Lvl	60.6	7.4	5	2.4
R43	80	1	0.0	63.6	66	63.6	12	----	58.5	5.1	5	0.1

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	7	0.0	3.2	7.4
All Impacted	1	7.4	7.4	7.4
All that meet NR Goal	2	5.1	6.2	7.4

LSA Associates, Inc. **16 September 2010**
P. Ault **TNM 2.5**

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: **Kern COG Retrofit Noise Barrier**
RUN: **Future**
BARRIER DESIGN: **SB3 - 12ft**

Barriers

Name	Type	Heights along Barrier			Length	If Wall	If Berm			Cost
		Min	Avg	Max		Area	Volume	Top Width	Run:Rise	
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
SB3	W	12.00	12.00	12.00	602	7228				0
SB2	W	0.00	0.00	0.00	0	0				0
Barrier3	W	15.00	15.00	15.00	308	4621				0
Barrier2	W	15.00	15.00	15.00	190	2856				0
Barrier1	W	15.00	15.00	15.00	248	3717				0
									Total Cost:	0

LSA Associates, Inc.
P. Ault
16 September 2010
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: Kern COG Retrofit Noise Barrier
RUN: Future
BARRIER DESIGN: SB3 - 14ft
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	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	With Barrier Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Noise Reduction Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R37	74	1	0.0	61.5	66	61.5	12	----	61.5	0.0	5	-5.0
R38	75	1	0.0	58.7	66	58.7	12	----	58.0	0.7	5	-4.3
R39	76	1	0.0	61.1	66	61.1	12	----	58.1	3.0	5	-2.0
R40	77	1	0.0	62.6	66	62.6	12	----	58.9	3.7	5	-1.3
R41	78	1	0.0	61.0	66	61.0	12	----	57.9	3.1	5	-1.9
R42	79	1	0.0	68.0	66	68.0	12	Snd Lvl	60.2	7.8	5	2.8
R43	80	1	0.0	63.6	66	63.6	12	----	58.1	5.5	5	0.5

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	7	0.0	3.4	7.8
All Impacted	1	7.8	7.8	7.8
All that meet NR Goal	2	5.5	6.6	7.8

LSA Associates, Inc. **16 September 2010**
P. Ault **TNM 2.5**

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: **Kern COG Retrofit Noise Barrier**
RUN: **Future**
BARRIER DESIGN: **SB3 - 14ft**

Barriers

Name	Type	Heights along Barrier			Length	If Wall	If Berm			Cost
		Min	Avg	Max		Area	Volume	Top Width	Run:Rise	
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
SB3	W	14.00	14.00	14.00	602	8432				0
SB2	W	0.00	0.00	0.00	0	0				0
Barrier3	W	15.00	15.00	15.00	308	4621				0
Barrier2	W	15.00	15.00	15.00	190	2856				0
Barrier1	W	15.00	15.00	15.00	248	3717				0
									Total Cost:	0

LSA Associates, Inc.
P. Ault
16 September 2010
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: Kern COG Retrofit Noise Barrier
RUN: Future
BARRIER DESIGN: SB3 - 16ft
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	Crit'n	Increase over existing Calculated	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
R37	74	1	0.0	61.5	66	61.5	12	----	61.5	0.0	5	-5.0
R38	75	1	0.0	58.7	66	58.7	12	----	57.9	0.8	5	-4.2
R39	76	1	0.0	61.1	66	61.1	12	----	58.0	3.1	5	-1.9
R40	77	1	0.0	62.6	66	62.6	12	----	58.8	3.8	5	-1.2
R41	78	1	0.0	61.0	66	61.0	12	----	57.8	3.2	5	-1.8
R42	79	1	0.0	68.0	66	68.0	12	Snd Lvl	59.9	8.1	5	3.1
R43	80	1	0.0	63.6	66	63.6	12	----	57.8	5.8	5	0.8

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	7	0.0	3.5	8.1
All Impacted	1	8.1	8.1	8.1
All that meet NR Goal	2	5.8	6.9	8.1

LSA Associates, Inc. **16 September 2010**
P. Ault **TNM 2.5**

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: **Kern COG Retrofit Noise Barrier**
RUN: **Future**
BARRIER DESIGN: **SB3 - 16ft**

Barriers

Name	Type	Heights along Barrier			Length	If Wall	If Berm			Cost
		Min	Avg	Max		Area	Volume	Top Width	Run:Rise	
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
SB3	W	16.00	16.00	16.00	602	9637				0
SB2	W	0.00	0.00	0.00	0	0				0
Barrier3	W	15.00	15.00	15.00	308	4621				0
Barrier2	W	15.00	15.00	15.00	190	2856				0
Barrier1	W	15.00	15.00	15.00	248	3717				0
									Total Cost:	0

LSA Associates, Inc.
P. Ault
16 September 2010
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: Kern COG Retrofit Noise Barrier
RUN: Future
BARRIER DESIGN: SB4 - 6ft
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	Crit'n	Increase over existing Calculated	Increase over existing Crit'n Sub'l Inc	With Barrier Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Noise Reduction Goal	Noise Reduction Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R44	81	1	0.0	70.5	66	70.5	12	Snd Lvl	65.3	5.2	5	0.2
R45	82	1	0.0	62.3	66	62.3	12	----	59.9	2.4	5	-2.6
R46	83	1	0.0	59.1	66	59.1	12	----	57.5	1.6	5	-3.4
R47	84	1	0.0	70.2	66	70.2	12	Snd Lvl	63.8	6.4	5	1.4
R48	85	1	0.0	58.8	66	58.8	12	----	56.7	2.1	5	-2.9
R49	86	1	0.0	62.4	66	62.4	12	----	59.3	3.1	5	-1.9
R50	87	1	0.0	61.9	66	61.9	12	----	58.9	3.0	5	-2.0
R51	88	1	0.0	59.2	66	59.2	12	----	57.0	2.2	5	-2.8
R52	89	1	0.0	69.7	66	69.7	12	Snd Lvl	64.7	5.0	5	0.0
R53	90	1	0.0	62.6	66	62.6	12	----	59.7	2.9	5	-2.1
R54	91	1	0.0	59.2	66	59.2	12	----	57.0	2.2	5	-2.8

Dwelling Units	# DUs	Noise Reduction Min	Noise Reduction Avg	Noise Reduction Max
		dB	dB	dB
All Selected	11	1.6	3.3	6.4
All Impacted	3	5.0	5.5	6.4
All that meet NR Goal	3	5.0	5.5	6.4

LSA Associates, Inc. 16 September 2010
P. Ault TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: Kern COG Retrofit Noise Barrier
RUN: Future
BARRIER DESIGN: SB4 - 6ft

Barriers

Name	Type	Heights along Barrier			Length	If Wall	If Berm			Cost
		Min	Avg	Max		Area	Volume	Top Width	Run:Rise	
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
SB4	W	6.00	6.00	6.00	1150	6900				0
									Total Cost:	0

LSA Associates, Inc.
P. Ault
16 September 2010
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: Kern COG Retrofit Noise Barrier
RUN: Future
BARRIER DESIGN: SB4 - 8ft
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	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	Noise Reduction Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R44	81	1	0.0	70.5	66	70.5	12	Snd Lvl	64.7	5.8	5	0.8
R45	82	1	0.0	62.3	66	62.3	12	----	59.6	2.7	5	-2.3
R46	83	1	0.0	59.1	66	59.1	12	----	57.3	1.8	5	-3.2
R47	84	1	0.0	70.2	66	70.2	12	Snd Lvl	63.0	7.2	5	2.2
R48	85	1	0.0	58.8	66	58.8	12	----	56.4	2.4	5	-2.6
R49	86	1	0.0	62.4	66	62.4	12	----	58.8	3.6	5	-1.4
R50	87	1	0.0	61.9	66	61.9	12	----	58.3	3.6	5	-1.4
R51	88	1	0.0	59.2	66	59.2	12	----	56.6	2.6	5	-2.4
R52	89	1	0.0	69.7	66	69.7	12	Snd Lvl	64.2	5.5	5	0.5
R53	90	1	0.0	62.6	66	62.6	12	----	59.3	3.3	5	-1.7
R54	91	1	0.0	59.2	66	59.2	12	----	56.6	2.6	5	-2.4

Dwelling Units	# DUs	Noise Reduction Min	Noise Reduction Avg	Noise Reduction Max
		dB	dB	dB
All Selected	11	1.8	3.7	7.2
All Impacted	3	5.5	6.2	7.2
All that meet NR Goal	3	5.5	6.2	7.2

LSA Associates, Inc. **16 September 2010**
P. Ault **TNM 2.5**

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: **Kern COG Retrofit Noise Barrier**
RUN: **Future**
BARRIER DESIGN: **SB4 - 8ft**

Barriers

Name	Type	Heights along Barrier			Length	If Wall	If Berm			Cost
		Min	Avg	Max		Area	Volume	Top Width	Run:Rise	
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
SB4	W	8.00	8.00	8.00	1150	9200				0
									Total Cost:	0

LSA Associates, Inc.
P. Ault
16 September 2010
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: Kern COG Retrofit Noise Barrier
RUN: Future
BARRIER DESIGN: SB4 - 10ft
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	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R44	81	1	0.0	70.5	66	70.5	12	Snd Lvl	64.1	6.4	5	1.4
R45	82	1	0.0	62.3	66	62.3	12	----	59.2	3.1	5	-1.9
R46	83	1	0.0	59.1	66	59.1	12	----	57.1	2.0	5	-3.0
R47	84	1	0.0	70.2	66	70.2	12	Snd Lvl	62.1	8.1	5	3.1
R48	85	1	0.0	58.8	66	58.8	12	----	56.2	2.6	5	-2.4
R49	86	1	0.0	62.4	66	62.4	12	----	58.2	4.2	5	-0.8
R50	87	1	0.0	61.9	66	61.9	12	----	57.7	4.2	5	-0.8
R51	88	1	0.0	59.2	66	59.2	12	----	56.3	2.9	5	-2.1
R52	89	1	0.0	69.7	66	69.7	12	Snd Lvl	63.7	6.0	5	1.0
R53	90	1	0.0	62.6	66	62.6	12	----	59.0	3.6	5	-1.4
R54	91	1	0.0	59.2	66	59.2	12	----	56.4	2.8	5	-2.2

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	11	2.0	4.2	8.1
All Impacted	3	6.0	6.8	8.1
All that meet NR Goal	3	6.0	6.8	8.1

LSA Associates, Inc. **16 September 2010**
P. Ault **TNM 2.5**

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: **Kern COG Retrofit Noise Barrier**
RUN: **Future**
BARRIER DESIGN: **SB4 - 10ft**

Barriers

Name	Type	Heights along Barrier			Length	If Wall	If Berm			Cost
		Min	Avg	Max		Area	Volume	Top Width	Run:Rise	
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
SB4	W	10.00	10.00	10.00	1150	11500				0
									Total Cost:	0

LSA Associates, Inc.
P. Ault
16 September 2010
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: Kern COG Retrofit Noise Barrier
RUN: Future
BARRIER DESIGN: SB4 - 12ft
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	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R44	81	1	0.0	70.5	66	70.5	12	Snd Lvl	63.4	7.1	5	2.1
R45	82	1	0.0	62.3	66	62.3	12	----	58.6	3.7	5	-1.3
R46	83	1	0.0	59.1	66	59.1	12	----	56.6	2.5	5	-2.5
R47	84	1	0.0	70.2	66	70.2	12	Snd Lvl	60.9	9.3	5	4.3
R48	85	1	0.0	58.8	66	58.8	12	----	55.4	3.4	5	-1.6
R49	86	1	0.0	62.4	66	62.4	12	----	57.3	5.1	5	0.1
R50	87	1	0.0	61.9	66	61.9	12	----	56.7	5.2	5	0.2
R51	88	1	0.0	59.2	66	59.2	12	----	55.4	3.8	5	-1.2
R52	89	1	0.0	69.7	66	69.7	12	Snd Lvl	63.0	6.7	5	1.7
R53	90	1	0.0	62.6	66	62.6	12	----	58.2	4.4	5	-0.6
R54	91	1	0.0	59.2	66	59.2	12	----	55.6	3.6	5	-1.4

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	11	2.5	5.0	9.3
All Impacted	3	6.7	7.7	9.3
All that meet NR Goal	5	5.1	6.7	9.3

LSA Associates, Inc. **16 September 2010**
P. Ault **TNM 2.5**

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: **Kern COG Retrofit Noise Barrier**
RUN: **Future**
BARRIER DESIGN: **SB4 - 12ft**

Barriers

Name	Type	Heights along Barrier			Length	If Wall	If Berm			Cost
		Min	Avg	Max		Area	Volume	Top Width	Run:Rise	
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
SB4	W	12.00	12.00	12.00	1150	13800				0
									Total Cost:	0

LSA Associates, Inc.
P. Ault
16 September 2010
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: Kern COG Retrofit Noise Barrier
RUN: Future
BARRIER DESIGN: SB4 - 14ft
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	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R44	81	1	0.0	70.5	66	70.5	12	Snd Lvl	63.1	7.4	5	2.4
R45	82	1	0.0	62.3	66	62.3	12	----	58.3	4.0	5	-1.0
R46	83	1	0.0	59.1	66	59.1	12	----	56.4	2.7	5	-2.3
R47	84	1	0.0	70.2	66	70.2	12	Snd Lvl	60.3	9.9	5	4.9
R48	85	1	0.0	58.8	66	58.8	12	----	55.0	3.8	5	-1.2
R49	86	1	0.0	62.4	66	62.4	12	----	56.8	5.6	5	0.6
R50	87	1	0.0	61.9	66	61.9	12	----	56.2	5.7	5	0.7
R51	88	1	0.0	59.2	66	59.2	12	----	55.0	4.2	5	-0.8
R52	89	1	0.0	69.7	66	69.7	12	Snd Lvl	62.8	6.9	5	1.9
R53	90	1	0.0	62.6	66	62.6	12	----	57.8	4.8	5	-0.2
R54	91	1	0.0	59.2	66	59.2	12	----	55.3	3.9	5	-1.1

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	11	2.7	5.4	9.9
All Impacted	3	6.9	8.1	9.9
All that meet NR Goal	5	5.6	7.1	9.9

LSA Associates, Inc. **16 September 2010**
P. Ault **TNM 2.5**

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: **Kern COG Retrofit Noise Barrier**
RUN: **Future**
BARRIER DESIGN: **SB4 - 14ft**

Barriers

Name	Type	Heights along Barrier			Length	If Wall	If Berm			Cost
		Min	Avg	Max		Area	Volume	Top Width	Run:Rise	
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
SB4	W	14.00	14.00	14.00	1150	16101				0
									Total Cost:	0

LSA Associates, Inc.
P. Ault
16 September 2010
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: Kern COG Retrofit Noise Barrier
RUN: Future
BARRIER DESIGN: SB4 - 16ft
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	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R44	81	1	0.0	70.5	66	70.5	12	Snd Lvl	62.9	7.6	5	2.6
R45	82	1	0.0	62.3	66	62.3	12	----	58.2	4.1	5	-0.9
R46	83	1	0.0	59.1	66	59.1	12	----	56.2	2.9	5	-2.1
R47	84	1	0.0	70.2	66	70.2	12	Snd Lvl	59.9	10.3	5	5.3
R48	85	1	0.0	58.8	66	58.8	12	----	54.8	4.0	5	-1.0
R49	86	1	0.0	62.4	66	62.4	12	----	56.5	5.9	5	0.9
R50	87	1	0.0	61.9	66	61.9	12	----	55.8	6.1	5	1.1
R51	88	1	0.0	59.2	66	59.2	12	----	54.8	4.4	5	-0.6
R52	89	1	0.0	69.7	66	69.7	12	Snd Lvl	62.6	7.1	5	2.1
R53	90	1	0.0	62.6	66	62.6	12	----	57.6	5.0	5	0.0
R54	91	1	0.0	59.2	66	59.2	12	----	55.0	4.2	5	-0.8

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	11	2.9	5.6	10.3
All Impacted	3	7.1	8.3	10.3
All that meet NR Goal	6	5.0	7.0	10.3

LSA Associates, Inc. **16 September 2010**
P. Ault **TNM 2.5**

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: **Kern COG Retrofit Noise Barrier**
RUN: **Future**
BARRIER DESIGN: **SB4 - 16ft**

Barriers

Name	Type	Heights along Barrier			Length	If Wall	If Berm			Cost
		Min	Avg	Max		Area	Volume	Top Width	Run:Rise	
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
SB4	W	16.00	16.00	16.00	1150	18401				0
									Total Cost:	0

APPENDIX F

WORKSHEETS FOR FEASIBILITY AND REASONABLENESS ALLOWANCE CALCULATION

Worksheet A

Reasonable Allowance Calculation for Noise Abatement based on Critical Design Receiver

Base Allowance			
Base Year 2009			$31,000
1. Absolute Noise Levels		check one	
69 dBA or less	Add $2,000	X	$2,000
70 - 74 dBA	Add $4,000		
75 - 78 dBA	Add $6,000		
More than 78 dBA	Add $8,000		
2. Design Year Increase over Existing Noise Levels		check one	
Less than 3 dBA	Add $0		
3 - 7 dBA	Add $2,000	X	$2,000
8 - 11 BA	Add $4,000		
12 dBA or more	Add $6,000		
3. Achievable Noise Reduction		check one	
5 dBA	Add $0		
6 - 8 dBA	Add $2,000	X	$2,000
9 - 11 dBA	Add $4,000		
12 dBA or more	Add $6,000		
4. New Highway Construction of Pre 1978 residences?		check one	
YES on either one	Add $10,000		
NO on both	Add $0	X	$0
Reasonable Allowance for Benefited Residence			$37,000
Unmodified Barrier Allowance			$555,000
Adjusted Reasonable Allowance for Benefited Residence			
Adjusted Unmodified Barrier Allowance			

Adjusted reasonable allowance for Residence and Barrier must be rounded up to nearest $1,000.

County: Kern County
Route: SR 14
Post Mile: (from adjacent Hillcrest Avenue to Matthew Avenue)
Project Exp Auth:
Program Code:

Barrier Name or ID	**SB1**
Barrier Height (feet)	6
Critical Design Receiver	R4
Number of benefited Residences	15
New Hightway Construction	No
Pre 1978 residences	No
ExistingNoise Level	68
Future Noise Level	71
Change in Noise Level	3
Noise Level with Abatement	65
Barrier Insertion Loss	6

Base Allowance			
Base Year 2009			$31,000
1. Absolute Noise Levels		check one	
69 dBA or less	Add $2,000	X	$2,000
70 - 74 dBA	Add $4,000		
75 - 78 dBA	Add $6,000		
More than 78 dBA	Add $8,000		
2. Design Year Increase over Existing Noise Levels		check one	
Less than 3 dBA	Add $0		
3 - 7 dBA	Add $2,000	X	$2,000
8 - 11 BA	Add $4,000		
12 dBA or more	Add $6,000		
3. Achievable Noise Reduction		check one	
5 dBA	Add $0		
6 - 8 dBA	Add $2,000	X	$2,000
9 - 11 dBA	Add $4,000		
12 dBA or more	Add $6,000		
4. New Highway Construction of Pre 1978 residences?		check one	
YES on either one	Add $10,000		
NO on both	Add $0	X	$0
Reasonable Allowance for Benefited Residence			$37,000
Unmodified Barrier Allowance			$555,000
Adjusted Reasonable Allowance for Benefited Residence			
Adjusted Unmodified Barrier Allowance			

Adjusted reasonable allowance for Residence and Barrier must be rounded up to nearest $1,000.

County: Kern County
Route: SR 14
Post Mile: (from adjacent Hillcrest Avenue to Matthew Avenue)
Project Exp Auth:
Program Code:

Barrier Name or ID	**SB1**
Barrier Height (feet)	8
Critical Design Receiver	R4
Number of benefited Residences	15
New Hightway Construction	No
Pre 1978 residences	No
ExistingNoise Level	68
Future Noise Level	71
Change in Noise Level	3
Noise Level with Abatement	63
Barrier Insertion Loss	8

Base Allowance			
Base Year 2009			$31,000
1. Absolute Noise Levels		check one	
69 dBA or less	Add $2,000	X	$2,000
70 - 74 dBA	Add $4,000		
75 - 78 dBA	Add $6,000		
More than 78 dBA	Add $8,000		
2. Design Year Increase over Existing Noise Levels		check one	
Less than 3 dBA	Add $0		
3 - 7 dBA	Add $2,000	X	$2,000
8 - 11 BA	Add $4,000		
12 dBA or more	Add $6,000		
3. Achievable Noise Reduction		check one	
5 dBA	Add $0		
6 - 8 dBA	Add $2,000		
9 - 11 dBA	Add $4,000	X	$4,000
12 dBA or more	Add $6,000		
4. New Highway Construction of Pre 1978 residences?		check one	
YES on either one	Add $10,000		
NO on both	Add $0	X	$0
Reasonable Allowance for Benefited Residence			$39,000
Unmodified Barrier Allowance			$975,000
Adjusted Reasonable Allowance for Benefited Residence			
Adjusted Unmodified Barrier Allowance			

Adjusted reasonable allowance for Residence and Barrier must be rounded up to nearest $1,000.

County: Kern County
Route: SR 14
Post Mile: (from adjacent Hillcrest Avenue to Matthew Avenue)
Project Exp Auth:
Program Code:

Barrier Name or ID	**SB1**
Barrier Height (feet)	10
Critical Design Receiver	R4
Number of benefited Residences	25
New Hightway Construction	No
Pre 1978 residences	No
ExistingNoise Level	68
Future Noise Level	71
Change in Noise Level	3
Noise Level with Abatement	62
Barrier Insertion Loss	9

Base Allowance			
Base Year 2009			$31,000
1. Absolute Noise Levels		check one	
69 dBA or less	Add $2,000	X	$2,000
70 - 74 dBA	Add $4,000		
75 - 78 dBA	Add $6,000		
More than 78 dBA	Add $8,000		
2. Design Year Increase over Existing Noise Levels		check one	
Less than 3 dBA	Add $0		
3 - 7 dBA	Add $2,000	X	$2,000
8 - 11 BA	Add $4,000		
12 dBA or more	Add $6,000		
3. Achievable Noise Reduction		check one	
5 dBA	Add $0		
6 - 8 dBA	Add $2,000		
9 - 11 dBA	Add $4,000	X	$4,000
12 dBA or more	Add $6,000		
4. New Highway Construction of Pre 1978 residences?		check one	
YES on either one	Add $10,000		
NO on both	Add $0	X	$0
Reasonable Allowance for Benefited Residence			$39,000
Unmodified Barrier Allowance			$1,443,000
Adjusted Reasonable Allowance for Benefited Residence			
Adjusted Unmodified Barrier Allowance			

Adjusted reasonable allowance for Residence and Barrier must be rounded up to nearest $1,000.

County: Kern County
Route: SR 14
Post Mile: (from adjacent Hillcrest Avenue to Matthew Avenue)
Project Exp Auth:
Program Code:

Barrier Name or ID	SB1
Barrier Height (feet)	12
Critical Design Receiver	R4
Number of benefited Residences	37
New Hightway Construction	No
Pre 1978 residences	No
ExistingNoise Level	68
Future Noise Level	71
Change in Noise Level	3
Noise Level with Abatement	60
Barrier Insertion Loss	11

Base Allowance			
Base Year 2009			$31,000
1. Absolute Noise Levels		check one	
69 dBA or less	Add $2,000	X	$2,000
70 - 74 dBA	Add $4,000		
75 - 78 dBA	Add $6,000		
More than 78 dBA	Add $8,000		
2. Design Year Increase over Existing Noise Levels		check one	
Less than 3 dBA	Add $0		
3 - 7 dBA	Add $2,000	X	$2,000
8 - 11 BA	Add $4,000		
12 dBA or more	Add $6,000		
3. Achievable Noise Reduction		check one	
5 dBA	Add $0		
6 - 8 dBA	Add $2,000		
9 - 11 dBA	Add $4,000		
12 dBA or more	Add $6,000	X	$6,000
4. New Highway Construction of Pre 1978 residences?		check one	
YES on either one	Add $10,000		
NO on both	Add $0	X	$0
Reasonable Allowance for Benefited Residence			$41,000
Unmodified Barrier Allowance			$1,517,000
Adjusted Reasonable Allowance for Benefited Residence			
Adjusted Unmodified Barrier Allowance			

Adjusted reasonable allowance for Residence and Barrier must be rounded up to nearest $1,000.

County: Kern County
Route: SR 14
Post Mile: (from adjacent Hillcrest Avenue to Matthew Avenue)
Project Exp Auth:
Program Code:

Barrier Name or ID	SB1
Barrier Height (feet)	14
Critical Design Receiver	R4
Number of benefited Residences	37
New Hightway Construction	No
Pre 1978 residences	No
ExistingNoise Level	68
Future Noise Level	71
Change in Noise Level	3
Noise Level with Abatement	58
Barrier Insertion Loss	13

Base Allowance			
Base Year 2009			$31,000
1. Absolute Noise Levels		check one	
69 dBA or less	Add $2,000	X	$2,000
70 - 74 dBA	Add $4,000		
75 - 78 dBA	Add $6,000		
More than 78 dBA	Add $8,000		
2. Design Year Increase over Existing Noise Levels		check one	
Less than 3 dBA	Add $0	X	$0
3 - 7 dBA	Add $2,000		
8 - 11 BA	Add $4,000		
12 dBA or more	Add $6,000		
3. Achievable Noise Reduction		check one	
5 dBA	Add $0	X	$0
6 - 8 dBA	Add $2,000		
9 - 11 dBA	Add $4,000		
12 dBA or more	Add $6,000		
4. New Highway Construction of Pre 1978 residences?		check one	
YES on either one	Add $10,000		
NO on both	Add $0	X	$0
Reasonable Allowance for Benefited Residence			$33,000
Unmodified Barrier Allowance			$33,000
Adjusted Reasonable Allowance for Benefited Residence			
Adjusted Unmodified Barrier Allowance			

Adjusted reasonable allowance for Residence and Barrier must be rounded up to nearest $1,000.

County: Kern County
Route: SR 14
Post Mile: (from adjacent Hillcrest Avenue to Matthew Avenue)
Project Exp Auth:
Program Code:

Barrier Name or ID	SB2
Barrier Height (feet)	6
Critical Design Receiver	R28
Number of benefited Residences	1
New Hightway Construction	No
Pre 1978 residences	No
ExistingNoise Level	69
Future Noise Level	71
Change in Noise Level	2
Noise Level with Abatement	66
Barrier Insertion Loss	5

Base Allowance			
Base Year 2009			$31,000
1. Absolute Noise Levels		check one	
69 dBA or less	Add $2,000	X	$2,000
70 - 74 dBA	Add $4,000		
75 - 78 dBA	Add $6,000		
More than 78 dBA	Add $8,000		
2. Design Year Increase over Existing Noise Levels		check one	
Less than 3 dBA	Add $0	X	$0
3 - 7 dBA	Add $2,000		
8 - 11 BA	Add $4,000		
12 dBA or more	Add $6,000		
3. Achievable Noise Reduction		check one	
5 dBA	Add $0		
6 - 8 dBA	Add $2,000	X	$2,000
9 - 11 dBA	Add $4,000		
12 dBA or more	Add $6,000		
4. New Highway Construction of Pre 1978 residences?		check one	
YES on either one	Add $10,000		
NO on both	Add $0	X	$0
Reasonable Allowance for Benefited Residence			$35,000
Unmodified Barrier Allowance			$70,000
Adjusted Reasonable Allowance for Benefited Residence			
Adjusted Unmodified Barrier Allowance			

Adjusted reasonable allowance for Residence and Barrier must be rounded up to nearest $1,000.

County: Kern County
Route: SR 14
Post Mile: (from adjacent Hillcrest Avenue to Matthew Avenue)
Project Exp Auth:
Program Code:

Barrier Name or ID	SB2
Barrier Height (feet)	8
Critical Design Receiver	R28
Number of benefited Residences	2
New Hightway Construction	No
Pre 1978 residences	No
ExistingNoise Level	69
Future Noise Level	71
Change in Noise Level	2
Noise Level with Abatement	65
Barrier Insertion Loss	6

Base Allowance			
Base Year 2009			$31,000
1. Absolute Noise Levels		check one	
69 dBA or less	Add $2,000	X	$2,000
70 - 74 dBA	Add $4,000		
75 - 78 dBA	Add $6,000		
More than 78 dBA	Add $8,000		
2. Design Year Increase over Existing Noise Levels		check one	
Less than 3 dBA	Add $0	X	$0
3 - 7 dBA	Add $2,000		
8 - 11 BA	Add $4,000		
12 dBA or more	Add $6,000		
3. Achievable Noise Reduction		check one	
5 dBA	Add $0		
6 - 8 dBA	Add $2,000	X	$2,000
9 - 11 dBA	Add $4,000		
12 dBA or more	Add $6,000		
4. New Highway Construction of Pre 1978 residences?		check one	
YES on either one	Add $10,000		
NO on both	Add $0	X	$0
Reasonable Allowance for Benefited Residence			$35,000
Unmodified Barrier Allowance			$70,000
Adjusted Reasonable Allowance for Benefited Residence			
Adjusted Unmodified Barrier Allowance			

Adjusted reasonable allowance for Residence and Barrier must be rounded up to nearest $1,000.

County: Kern County
Route: SR 14
Post Mile: (from adjacent Hillcrest Avenue to Matthew Avenue)
Project Exp Auth:
Program Code:

Barrier Name or ID	SB2
Barrier Height (feet)	10
Critical Design Receiver	R28
Number of benefited Residences	2
New Hightway Construction	No
Pre 1978 residences	No
ExistingNoise Level	69
Future Noise Level	71
Change in Noise Level	2
Noise Level with Abatement	65
Barrier Insertion Loss	6

Base Allowance			
Base Year 2009			$31,000
1. Absolute Noise Levels		check one	
69 dBA or less	Add $2,000	X	$2,000
70 - 74 dBA	Add $4,000		
75 - 78 dBA	Add $6,000		
More than 78 dBA	Add $8,000		
2. Design Year Increase over Existing Noise Levels		check one	
Less than 3 dBA	Add $0	X	$0
3 - 7 dBA	Add $2,000		
8 - 11 BA	Add $4,000		
12 dBA or more	Add $6,000		
3. Achievable Noise Reduction		check one	
5 dBA	Add $0		
6 - 8 dBA	Add $2,000	X	$2,000
9 - 11 dBA	Add $4,000		
12 dBA or more	Add $6,000		
4. New Highway Construction of Pre 1978 residences?		check one	
YES on either one	Add $10,000		
NO on both	Add $0	X	$0
Reasonable Allowance for Benefited Residence			$35,000
Unmodified Barrier Allowance			$210,000
Adjusted Reasonable Allowance for Benefited Residence			
Adjusted Unmodified Barrier Allowance			

Adjusted reasonable allowance for Residence and Barrier must be rounded up to nearest $1,000.

County: Kern County
Route: SR 14
Post Mile: (from adjacent Hillcrest Avenue to Matthew Avenue)
Project Exp Auth:
Program Code:

Barrier Name or ID	SB2
Barrier Height (feet)	12
Critical Design Receiver	R28
Number of benefited Residences	6
New Hightway Construction	No
Pre 1978 residences	No
ExistingNoise Level	69
Future Noise Level	71
Change in Noise Level	2
Noise Level with Abatement	63
Barrier Insertion Loss	8

Base Allowance			
Base Year 2009			$31,000
1. Absolute Noise Levels		check one	
69 dBA or less	Add $2,000	X	$2,000
70 - 74 dBA	Add $4,000		
75 - 78 dBA	Add $6,000		
More than 78 dBA	Add $8,000		
2. Design Year Increase over Existing Noise Levels		check one	
Less than 3 dBA	Add $0	X	$0
3 - 7 dBA	Add $2,000		
8 - 11 BA	Add $4,000		
12 dBA or more	Add $6,000		
3. Achievable Noise Reduction		check one	
5 dBA	Add $0		
6 - 8 dBA	Add $2,000	X	$2,000
9 - 11 dBA	Add $4,000		
12 dBA or more	Add $6,000		
4. New Highway Construction of Pre 1978 residences?		check one	
YES on either one	Add $10,000		
NO on both	Add $0	X	$0
Reasonable Allowance for Benefited Residence			$35,000
Unmodified Barrier Allowance			$490,000
Adjusted Reasonable Allowance for Benefited Residence			
Adjusted Unmodified Barrier Allowance			

Adjusted reasonable allowance for Residence and Barrier must be rounded up to nearest $1,000.

County: Kern County
Route: SR 14
Post Mile: (from adjacent Hillcrest Avenue to Matthew Avenue)
Project Exp Auth:
Program Code:

Barrier Name or ID	SB2
Barrier Height (feet)	14
Critical Design Receiver	R28
Number of benefited Residences	14
New Hightway Construction	No
Pre 1978 residences	No
ExistingNoise Level	69
Future Noise Level	71
Change in Noise Level	2
Noise Level with Abatement	63
Barrier Insertion Loss	8

Base Allowance			
Base Year 2009			$31,000
1. Absolute Noise Levels		check one	
69 dBA or less	Add $2,000	X	$2,000
70 - 74 dBA	Add $4,000		
75 - 78 dBA	Add $6,000		
More than 78 dBA	Add $8,000		
2. Design Year Increase over Existing Noise Levels		check one	
Less than 3 dBA	Add $0	X	$0
3 - 7 dBA	Add $2,000		
8 - 11 BA	Add $4,000		
12 dBA or more	Add $6,000		
3. Achievable Noise Reduction		check one	
5 dBA	Add $0		
6 - 8 dBA	Add $2,000	X	$2,000
9 - 11 dBA	Add $4,000		
12 dBA or more	Add $6,000		
4. New Highway Construction of Pre 1978 residences?		check one	
YES on either one	Add $10,000		
NO on both	Add $0	X	$0
Reasonable Allowance for Benefited Residence			$35,000
Unmodified Barrier Allowance			$595,000
Adjusted Reasonable Allowance for Benefited Residence			
Adjusted Unmodified Barrier Allowance			

Adjusted reasonable allowance for Residence and Barrier must be rounded up to nearest $1,000.

County: Kern County
Route: SR 14
Post Mile: (from adjacent Hillcrest Avenue to Matthew Avenue)
Project Exp Auth:
Program Code:

Barrier Name or ID	SB2
Barrier Height (feet)	16
Critical Design Receiver	R28
Number of benefited Residences	17
New Hightway Construction	No
Pre 1978 residences	No
ExistingNoise Level	69
Future Noise Level	71
Change in Noise Level	2
Noise Level with Abatement	63
Barrier Insertion Loss	8

Base Allowance			
Base Year 2009			$31,000
1. Absolute Noise Levels		check one	
69 dBA or less	Add $2,000	X	$2,000
70 - 74 dBA	Add $4,000		
75 - 78 dBA	Add $6,000		
More than 78 dBA	Add $8,000		
2. Design Year Increase over Existing Noise Levels		check one	
Less than 3 dBA	Add $0	X	$0
3 - 7 dBA	Add $2,000	X	$2,000
8 - 11 BA	Add $4,000		
12 dBA or more	Add $6,000		
3. Achievable Noise Reduction		check one	
5 dBA	Add $0	X	$0
6 - 8 dBA	Add $2,000		
9 - 11 dBA	Add $4,000		
12 dBA or more	Add $6,000		
4. New Highway Construction of Pre 1978 residences?		check one	
YES on either one	Add $10,000		
NO on both	Add $0	X	$0
Reasonable Allowance for Benefited Residence			$35,000
Unmodified Barrier Allowance			$140,000
Adjusted Reasonable Allowance for Benefited Residence			
Adjusted Unmodified Barrier Allowance			

Adjusted reasonable allowance for Residence and Barrier must be rounded up to nearest $1,000.

County: Kern County
Route: SR 14
Post Mile: (from adjacent Hillcrest Avenue to Matthew Avenue)
Project Exp Auth:
Program Code:

Barrier Name or ID	SB3
Barrier Height (feet)	6
Critical Design Receiver	R42
Number of benefited Residences	4
New Hightway Construction	No
Pre 1978 residences	No
ExistingNoise Level	66
Future Noise Level	68
Change in Noise Level	2
Noise Level with Abatement	63
Barrier Insertion Loss	5

Base Allowance			
Base Year 2009			$31,000
1. Absolute Noise Levels		check one	
69 dBA or less	Add $2,000	X	$2,000
70 - 74 dBA	Add $4,000		
75 - 78 dBA	Add $6,000		
More than 78 dBA	Add $8,000		
2. Design Year Increase over Existing Noise Levels		check one	
Less than 3 dBA	Add $0	X	$0
3 - 7 dBA	Add $2,000	X	$2,000
8 - 11 BA	Add $4,000		
12 dBA or more	Add $6,000		
3. Achievable Noise Reduction		check one	
5 dBA	Add $0		
6 - 8 dBA	Add $2,000	X	$2,000
9 - 11 dBA	Add $4,000		
12 dBA or more	Add $6,000		
4. New Highway Construction of Pre 1978 residences?		check one	
YES on either one	Add $10,000		
NO on both	Add $0	X	$0
Reasonable Allowance for Benefited Residence			$37,000
Unmodified Barrier Allowance			$148,000
Adjusted Reasonable Allowance for Benefited Residence			
Adjusted Unmodified Barrier Allowance			

Adjusted reasonable allowance for Residence and Barrier must be rounded up to nearest $1,000.

County: Kern County
Route: SR 14
Post Mile: (from adjacent Hillcrest Avenue to Matthew Avenue)
Project Exp Auth:
Program Code:

Barrier Name or ID	SB3
Barrier Height (feet)	8
Critical Design Receiver	R42
Number of benefited Residences	4
New Hightway Construction	No
Pre 1978 residences	No
ExistingNoise Level	66
Future Noise Level	68
Change in Noise Level	2
Noise Level with Abatement	62
Barrier Insertion Loss	6

Base Allowance			
Base Year 2009			$31,000
1. Absolute Noise Levels		check one	
69 dBA or less	Add $2,000	X	$2,000
70 - 74 dBA	Add $4,000		
75 - 78 dBA	Add $6,000		
More than 78 dBA	Add $8,000		
2. Design Year Increase over Existing Noise Levels		check one	
Less than 3 dBA	Add $0	X	$0
3 - 7 dBA	Add $2,000	X	$2,000
8 - 11 BA	Add $4,000		
12 dBA or more	Add $6,000		
3. Achievable Noise Reduction		check one	
5 dBA	Add $0		
6 - 8 dBA	Add $2,000	X	$2,000
9 - 11 dBA	Add $4,000		
12 dBA or more	Add $6,000		
4. New Highway Construction of Pre 1978 residences?		check one	
YES on either one	Add $10,000		
NO on both	Add $0	X	$0
Reasonable Allowance for Benefited Residence			$37,000
Unmodified Barrier Allowance			$148,000
Adjusted Reasonable Allowance for Benefited Residence			
Adjusted Unmodified Barrier Allowance			

Adjusted reasonable allowance for Residence and Barrier must be rounded up to nearest $1,000.

County: Kern County
Route: SR 14
Post Mile: (from adjacent Hillcrest Avenue to Matthew Avenue)
Project Exp Auth:
Program Code:

Barrier Name or ID	SB3
Barrier Height (feet)	10
Critical Design Receiver	R42
Number of benefited Residences	4
New Hightway Construction	No
Pre 1978 residences	No
ExistingNoise Level	66
Future Noise Level	68
Change in Noise Level	2
Noise Level with Abatement	62
Barrier Insertion Loss	6

Base Allowance			
Base Year 2009			$31,000
1. Absolute Noise Levels		check one	
69 dBA or less	Add $2,000	X	$2,000
70 - 74 dBA	Add $4,000		
75 - 78 dBA	Add $6,000		
More than 78 dBA	Add $8,000		
2. Design Year Increase over Existing Noise Levels		check one	
Less than 3 dBA	Add $0	X	$0
3 - 7 dBA	Add $2,000	X	$2,000
8 - 11 BA	Add $4,000		
12 dBA or more	Add $6,000		
3. Achievable Noise Reduction		check one	
5 dBA	Add $0		
6 - 8 dBA	Add $2,000	X	$2,000
9 - 11 dBA	Add $4,000		
12 dBA or more	Add $6,000		
4. New Highway Construction of Pre 1978 residences?		check one	
YES on either one	Add $10,000		
NO on both	Add $0	X	$0
Reasonable Allowance for Benefited Residence			$37,000
Unmodified Barrier Allowance			$296,000
Adjusted Reasonable Allowance for Benefited Residence			
Adjusted Unmodified Barrier Allowance			

Adjusted reasonable allowance for Residence and Barrier must be rounded up to nearest $1,000.

County: Kern County
Route: SR 14
Post Mile: (from adjacent Hillcrest Avenue to Matthew Avenue)
Project Exp Auth:
Program Code:

Barrier Name or ID	SB3
Barrier Height (feet)	12
Critical Design Receiver	R42
Number of benefited Residences	8
New Hightway Construction	No
Pre 1978 residences	No
ExistingNoise Level	66
Future Noise Level	68
Change in Noise Level	2
Noise Level with Abatement	61
Barrier Insertion Loss	7

Base Allowance			
Base Year 2009			$31,000
1. Absolute Noise Levels		check one	
69 dBA or less	Add $2,000	X	$2,000
70 - 74 dBA	Add $4,000		
75 - 78 dBA	Add $6,000		
More than 78 dBA	Add $8,000		
2. Design Year Increase over Existing Noise Levels		check one	
Less than 3 dBA	Add $0	X	$0
3 - 7 dBA	Add $2,000	X	$2,000
8 - 11 BA	Add $4,000		
12 dBA or more	Add $6,000		
3. Achievable Noise Reduction		check one	
5 dBA	Add $0		
6 - 8 dBA	Add $2,000	X	$2,000
9 - 11 dBA	Add $4,000		
12 dBA or more	Add $6,000		
4. New Highway Construction of Pre 1978 residences?		check one	
YES on either one	Add $10,000		
NO on both	Add $0	X	$0
Reasonable Allowance for Benefited Residence			$37,000
Unmodified Barrier Allowance			$296,000
Adjusted Reasonable Allowance for Benefited Residence			
Adjusted Unmodified Barrier Allowance			

Adjusted reasonable allowance for Residence and Barrier must be rounded up to nearest $1,000.

County: Kern County
Route: SR 14
Post Mile: (from adjacent Hillcrest Avenue to Matthew Avenue)
Project Exp Auth:
Program Code:

Barrier Name or ID	SB3
Barrier Height (feet)	14
Critical Design Receiver	R42
Number of benefited Residences	8
New Hightway Construction	No
Pre 1978 residences	No
ExistingNoise Level	66
Future Noise Level	68
Change in Noise Level	2
Noise Level with Abatement	60
Barrier Insertion Loss	8

Base Allowance			
Base Year 2009			$31,000
1. Absolute Noise Levels		check one	
69 dBA or less	Add $2,000	X	$2,000
70 - 74 dBA	Add $4,000		
75 - 78 dBA	Add $6,000		
More than 78 dBA	Add $8,000		
2. Design Year Increase over Existing Noise Levels		check one	
Less than 3 dBA	Add $0	X	$0
3 - 7 dBA	Add $2,000	X	$2,000
8 - 11 BA	Add $4,000		
12 dBA or more	Add $6,000		
3. Achievable Noise Reduction		check one	
5 dBA	Add $0		
6 - 8 dBA	Add $2,000	X	$2,000
9 - 11 dBA	Add $4,000		
12 dBA or more	Add $6,000		
4. New Highway Construction of Pre 1978 residences?		check one	
YES on either one	Add $10,000		
NO on both	Add $0	X	$0
Reasonable Allowance for Benefited Residence			$37,000
Unmodified Barrier Allowance			$296,000
Adjusted Reasonable Allowance for Benefited Residence			
Adjusted Unmodified Barrier Allowance			

Adjusted reasonable allowance for Residence and Barrier must be rounded up to nearest $1,000.

County: Kern County
Route: SR 14
Post Mile: (from adjacent Hillcrest Avenue to Matthew Avenue)
Project Exp Auth:
Program Code:

Barrier Name or ID	SB3
Barrier Height (feet)	16
Critical Design Receiver	R42
Number of benefited Residences	8
New Hightway Construction	No
Pre 1978 residences	No
ExistingNoise Level	66
Future Noise Level	68
Change in Noise Level	2
Noise Level with Abatement	60
Barrier Insertion Loss	8

Base Allowance			
Base Year 2009			$31,000
1. Absolute Noise Levels		check one	
69 dBA or less	Add $2,000	X	$2,000
70 - 74 dBA	Add $4,000		
75 - 78 dBA	Add $6,000		
More than 78 dBA	Add $8,000		
2. Design Year Increase over Existing Noise Levels		check one	
Less than 3 dBA	Add $0	X	$0
3 - 7 dBA	Add $2,000	X	$2,000
8 - 11 BA	Add $4,000		
12 dBA or more	Add $6,000		
3. Achievable Noise Reduction		check one	
5 dBA	Add $0		
6 - 8 dBA	Add $2,000	X	$2,000
9 - 11 dBA	Add $4,000		
12 dBA or more	Add $6,000		
4. New Highway Construction of Pre 1978 residences?		check one	
YES on either one	Add $10,000		
NO on both	Add $0	X	$0
Reasonable Allowance for Benefited Residence			$37,000
Unmodified Barrier Allowance			$296,000
Adjusted Reasonable Allowance for Benefited Residence			
Adjusted Unmodified Barrier Allowance			

Adjusted reasonable allowance for Residence and Barrier must be rounded up to nearest $1,000.

County: Kern County
Route: SR 14
Post Mile: (from adjacent Hillcrest Avenue to Matthew Avenue)
Project Exp Auth:
Program Code:

Barrier Name or ID	SB4
Barrier Height (feet)	6
Critical Design Receiver	R44
Number of benefited Residences	8
New Hightway Construction	No
Pre 1978 residences	No
ExistingNoise Level	68
Future Noise Level	71
Change in Noise Level	3
Noise Level with Abatement	65
Barrier Insertion Loss	6

Base Allowance			
Base Year 2009			$31,000
1. Absolute Noise Levels		check one	
69 dBA or less	Add $2,000	X	$2,000
70 - 74 dBA	Add $4,000		
75 - 78 dBA	Add $6,000		
More than 78 dBA	Add $8,000		
2. Design Year Increase over Existing Noise Levels		check one	
Less than 3 dBA	Add $0	X	$0
3 - 7 dBA	Add $2,000	X	$2,000
8 - 11 BA	Add $4,000		
12 dBA or more	Add $6,000		
3. Achievable Noise Reduction		check one	
5 dBA	Add $0		
6 - 8 dBA	Add $2,000	X	$2,000
9 - 11 dBA	Add $4,000		
12 dBA or more	Add $6,000		
4. New Highway Construction of Pre 1978 residences?		check one	
YES on either one	Add $10,000		
NO on both	Add $0	X	$0
Reasonable Allowance for Benefited Residence			$37,000
Unmodified Barrier Allowance			$296,000
Adjusted Reasonable Allowance for Benefited Residence			
Adjusted Unmodified Barrier Allowance			

Adjusted reasonable allowance for Residence and Barrier must be rounded up to nearest $1,000.

County: Kern County
Route: SR 14
Post Mile: (from adjacent Hillcrest Avenue to Matthew Avenue)
Project Exp Auth:
Program Code:

Barrier Name or ID	SB4
Barrier Height (feet)	8
Critical Design Receiver	R44
Number of benefited Residences	8
New Hightway Construction	No
Pre 1978 residences	No
ExistingNoise Level	68
Future Noise Level	71
Change in Noise Level	3
Noise Level with Abatement	65
Barrier Insertion Loss	6

Base Allowance			
Base Year 2009			$31,000
1. Absolute Noise Levels		check one	
69 dBA or less	Add $2,000	X	$2,000
70 - 74 dBA	Add $4,000		
75 - 78 dBA	Add $6,000		
More than 78 dBA	Add $8,000		
2. Design Year Increase over Existing Noise Levels		check one	
Less than 3 dBA	Add $0	X	$0
3 - 7 dBA	Add $2,000	X	$2,000
8 - 11 BA	Add $4,000		
12 dBA or more	Add $6,000		
3. Achievable Noise Reduction		check one	
5 dBA	Add $0		
6 - 8 dBA	Add $2,000	X	$2,000
9 - 11 dBA	Add $4,000		
12 dBA or more	Add $6,000		
4. New Highway Construction of Pre 1978 residences?		check one	
YES on either one	Add $10,000		
NO on both	Add $0	X	$0
Reasonable Allowance for Benefited Residence			$37,000
Unmodified Barrier Allowance			$296,000
Adjusted Reasonable Allowance for Benefited Residence			
Adjusted Unmodified Barrier Allowance			

Adjusted reasonable allowance for Residence and Barrier must be rounded up to nearest $1,000.

County: Kern County
Route: SR 14
Post Mile: (from adjacent Hillcrest Avenue to Matthew Avenue)
Project Exp Auth:
Program Code:

Barrier Name or ID	SB4
Barrier Height (feet)	10
Critical Design Receiver	R44
Number of benefited Residences	8
New Hightway Construction	No
Pre 1978 residences	No
ExistingNoise Level	68
Future Noise Level	71
Change in Noise Level	3
Noise Level with Abatement	64
Barrier Insertion Loss	7

Base Allowance			
Base Year 2009			$31,000
1. Absolute Noise Levels		check one	
69 dBA or less	Add $2,000	X	$2,000
70 - 74 dBA	Add $4,000		
75 - 78 dBA	Add $6,000		
More than 78 dBA	Add $8,000		
2. Design Year Increase over Existing Noise Levels		check one	
Less than 3 dBA	Add $0	X	$0
3 - 7 dBA	Add $2,000	X	$2,000
8 - 11 BA	Add $4,000		
12 dBA or more	Add $6,000		
3. Achievable Noise Reduction		check one	
5 dBA	Add $0		
6 - 8 dBA	Add $2,000	X	$2,000
9 - 11 dBA	Add $4,000		
12 dBA or more	Add $6,000		
4. New Highway Construction of Pre 1978 residences?		check one	
YES on either one	Add $10,000		
NO on both	Add $0	X	$0
Reasonable Allowance for Benefited Residence			$37,000
Unmodified Barrier Allowance			$703,000
Adjusted Reasonable Allowance for Benefited Residence			
Adjusted Unmodified Barrier Allowance			

Adjusted reasonable allowance for Residence and Barrier must be rounded up to nearest $1,000.

County: Kern County
Route: SR 14
Post Mile: (from adjacent Hillcrest Avenue to Matthew Avenue)
Project Exp Auth:
Program Code:

Barrier Name or ID	SB4
Barrier Height (feet)	12
Critical Design Receiver	R44
Number of benefited Residences	19
New Hightway Construction	No
Pre 1978 residences	No
ExistingNoise Level	68
Future Noise Level	71
Change in Noise Level	3
Noise Level with Abatement	63
Barrier Insertion Loss	8

Base Allowance			
Base Year 2009			$31,000
1. Absolute Noise Levels		check one	
69 dBA or less	Add $2,000	X	$2,000
70 - 74 dBA	Add $4,000		
75 - 78 dBA	Add $6,000		
More than 78 dBA	Add $8,000		
2. Design Year Increase over Existing Noise Levels		check one	
Less than 3 dBA	Add $0	X	$0
3 - 7 dBA	Add $2,000	X	$2,000
8 - 11 BA	Add $4,000		
12 dBA or more	Add $6,000		
3. Achievable Noise Reduction		check one	
5 dBA	Add $0		
6 - 8 dBA	Add $2,000	X	$2,000
9 - 11 dBA	Add $4,000		
12 dBA or more	Add $6,000		
4. New Highway Construction of Pre 1978 residences?		check one	
YES on either one	Add $10,000		
NO on both	Add $0	X	$0
Reasonable Allowance for Benefited Residence			$37,000
Unmodified Barrier Allowance			$703,000
Adjusted Reasonable Allowance for Benefited Residence			
Adjusted Unmodified Barrier Allowance			

Adjusted reasonable allowance for Residence and Barrier must be rounded up to nearest $1,000.

County: Kern County
Route: SR 14
Post Mile: (from adjacent Hillcrest Avenue to Matthew Avenue)
Project Exp Auth:
Program Code:

Barrier Name or ID	**SB4**
Barrier Height (feet)	14
Critical Design Receiver	R44
Number of benefited Residences	19
New Hightway Construction	No
Pre 1978 residences	No
ExistingNoise Level	68
Future Noise Level	71
Change in Noise Level	3
Noise Level with Abatement	63
Barrier Insertion Loss	8

Base Allowance			
Base Year 2009			$31,000
1. Absolute Noise Levels		check one	
69 dBA or less	Add $2,000	X	$2,000
70 - 74 dBA	Add $4,000		
75 - 78 dBA	Add $6,000		
More than 78 dBA	Add $8,000		
2. Design Year Increase over Existing Noise Levels		check one	
Less than 3 dBA	Add $0	X	$0
3 - 7 dBA	Add $2,000	X	$2,000
8 - 11 BA	Add $4,000		
12 dBA or more	Add $6,000		
3. Achievable Noise Reduction		check one	
5 dBA	Add $0		
6 - 8 dBA	Add $2,000	X	$2,000
9 - 11 dBA	Add $4,000		
12 dBA or more	Add $6,000		
4. New Highway Construction of Pre 1978 residences?		check one	
YES on either one	Add $10,000		
NO on both	Add $0	X	$0
Reasonable Allowance for Benefited Residence			$37,000
Unmodified Barrier Allowance			$703,000
Adjusted Reasonable Allowance for Benefited Residence			
Adjusted Unmodified Barrier Allowance			

Adjusted reasonable allowance for Residence and Barrier must be rounded up to nearest $1,000.

County: Kern County
Route: SR 14
Post Mile: (from adjacent Hillcrest Avenue to Matthew Avenue)
Project Exp Auth:
Program Code:

Barrier Name or ID	**SB4**
Barrier Height (feet)	16
Critical Design Receiver	R44
Number of benefited Residences	19
New Hightway Construction	No
Pre 1978 residences	No
ExistingNoise Level	68
Future Noise Level	71
Change in Noise Level	3
Noise Level with Abatement	63
Barrier Insertion Loss	8