

***North County Corridor New State Route 108 Project NSR***



# **Noise Study Report**

North County Corridor New State Route 108 Project

Stanislaus County, California

District 10 – STA – 108

(SR-108 [PM 27.5/44.5], SR-219 [PM 3.7/4.8], SR-120 [PM 6.9-11.6])

EA: 10-OS8000 & Project ID: 1000000263

**February 2017**



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EA: 10-0S8000 & Project ID: 1000000263

**February 2017**

Prepared By:



Date: 4/25/2015

Joza Burnam,  
Environmental Scientist

Entech Consulting Group  
43517 Ridge Park Drive, Temecula, CA  
92590  
(951) 506-0055 x302

Approved By:



Date: 4/25/2015

Michelle A. Jones,  
President/Principal Engineer

Entech Consulting Group  
43517 Ridge Park Drive, Temecula,  
CA 92590  
951-506-0055 x303

QA/QC By:



Date: 2/27/17

President/ Principal Engineer  
Entech Consulting Group  
43517 Ridge Park Drive, Temecula,  
CA 92590  
951-506-0055 x303

Concurred by:



Date: 3/15/17

Allam Alhabaly, Transportation Engineer

Environmental Engineering Branch  
Caltrans District 6 – Central Region  
559-445-6218

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## **Project Summary**

The North County Corridor Transportation Expressway Authority (NCCTEA), represented by the County of Stanislaus and the cities of Oakdale Riverbank and Modesto, in cooperation with Caltrans District 10 proposes to construct the North County Corridor New State Route 108 Project (hereafter referred to as the Project/Proposed Project). The Proposed Project is a new alignment between Tully Road at the western terminus to SR 120 (SR-120/108) at the eastern terminus to serve the the neighboring communities of Oakdale, Riverbank and Modesto. The proposed Project consists of four Build Alternatives (1A, 1B, 2A, and 2B) and the No-Build Alternative.

Segment 1 of all alternatives begins at the SR-219 (Kiernan Avenue)/Tully Road intersection. The alternatives proceed to the vicinity of the Claus Road/Claribel Road intersection, where Segment 2 begins and the alternatives separate into two different alignments (A and B). In Segment 2, Alternatives 1A and 1B veer northeast near the Claus Road/Claribel Road intersection and pass through the southern boundary of Oakdale, and Alternatives 2A and 2B continue easterly along Claribel Road and turn northeastward past the intersection of Claribel Road/Bentley Road. Each of the alternatives then breaks into two possible alignments to their eastern terminus in Segment 3, just past the Oakdale-Waterford Highway. The eastern terminus of Alternatives 1A and 2A end along SR-108/120 just east of the City of Oakdale boundary. Alternatives 1B and 2B end farther east of the Alternatives 1A and 2A terminus, along SR-108/120 in the vicinity of Lancaster Road.

The Proposed Project is a federally funded Type 1 project requiring a noise analysis following Federal Highway Administration (FHWA) and Caltrans guidelines. It was determined whether the proposed Project noise levels would approach or exceed the Noise Abatement Criteria (NAC) or would substantially exceed existing noise levels (23 CFR 772). If noise levels would exceed the NAC, noise abatement measures to reduce noise levels were evaluated. Noise abatement is considered where noise impacts are predicted in area of frequent human use that would benefit from a lowered noise level.

## **Existing Environment and Land Uses**

A variety of land uses including rural residential properties, single-family residences, farmland, commercial property and undeveloped farmland are dispersed throughout the entire project limits. Some of the residences located along SR-108 are located on large lots with formal and informal driveway access exists along the highway making

shielding, such as sound walls, difficult to place near these locations. The dominant noise sources in the project area are agricultural related and traffic traveling on local and main roadways. Areas that are located away from the main roadways tend to have non-traffic related noises as the dominant noise source and experience a serene noise environment. Frequent outdoor human use areas were identified at single-family residences within the proposed Project area. These land uses fall into the following NAC Activity Categories B.

## **Existing Noise Levels**

Long-term and short-term noise monitoring along with concurrent traffic counts was conducted at forty-two (42) locations during the time period of January 30, 2012 through February 2, 2012 to determine the existing noise environment. Due to limited access to areas of frequent human use during the time of measurement, acoustically equivalent measurement locations were selected for a majority of the short-term monitoring sites. Existing peak hour noise levels range from 41 dBA to 68 dBA  $L_{eq}(h)$ , as shown in the Appendix B. The majority of the receivers fall below their respective NAC Activity Category standard, with a few receivers exceeding the noise abatement standard of 67 dBA  $L_{eq}(h)$ .

## **No-Build Noise Levels**

Under No-Build conditions no improvements would be constructed, however traffic volumes increase over Existing conditions. The traffic noise modeling results for design year No-Build Alternative range from 41 dBA to 69 dBA  $L_{eq}(h)$ , as shown in the Appendix B. These noise levels result in an increase of up to 7 dBA over Existing conditions. Further, No Build noise levels at a few of the evaluated receivers approach or exceed 67 dBA for NAC Activity Category B.

## **Noise Impacts and Abatement**

The potential for noise impacts was investigated for each Build Alternative. Because the Build Alternatives are new alignments, future noise levels approach or exceed the NAC, as well as result in substantial noise increases over Existing conditions. It is not uncommon for an alternative to result in traffic noise increases of up to 35 dBA over Existing noise levels. These types of increases occur in areas where receivers under Existing conditions are not near roadways and are located in a serene noise environment. Each Build Alternative would result in areas where traffic noise impacts are expected due to the effect of new alignments bringing traffic closer to sensitive receivers. Sound walls were evaluated in areas where noise impacts occur on sensitive receivers.

## Preliminary Noise Abatement Analysis

Each sound wall has been evaluated for feasibility ranging from 6 to 16 feet based on achievable noise reduction. For sound walls found to be acoustically feasible, reasonable cost allowances were calculated. Based on 2014 construction costs, an allowance of \$71,000 is provided for each benefited receptor (i.e., receptors that receive at least 5 dB of noise reduction from a noise barrier). The total allowance for each barrier is calculated by multiplying the number of benefited receptors by \$71,000. If the estimated construction cost of a barrier is less than the total calculated allowance for the barrier, the barrier is considered reasonable from a cost perspective. Appendix B provides tables summarizing the sound wall analysis results at receiver locations for each Build Alternative.

The traffic noise modeling results are presented in Tables B-1 through Table B-4 in Appendix B for Build Alternatives 1A, 1B, 2A and 2B respectively. Alternative 1A contains the majority of the evaluated sound walls. There are negligible differences in noise levels and reductions between the Build Alternatives for common soundwalls; therefore, the costs tables were developed based of the results for Alternative 1A. Other alternatives may have triggered additional areas that would require a sound wall evaluation that were not impacted in Alternative 1A. In these instances, the results from the additional Build Alternatives were used to prepare the costs tables.

### Alternative 1A

The traffic noise modeling results in Table B-1 of Appendix B, indicate traffic noise levels are predicted to be in the range of 48 to 70 dBA  $L_{eq}(h)$  in the design year, with an increase over existing peak hour noise levels of up to 38 dBA. Some receivers located along Kiernan Avenue would experience increases in noise levels from the new alignment due to increases in traffic volumes under Build conditions and the new alignment moving closer to these receivers and other receivers becoming first row receivers as a result of right of way acquisitions. However, a few receivers experience a decrease in noise levels as the new alignment moves away from these receivers. As Alternative 1A continues east, it travels south of Claribel Road where new receivers that were not previously located near roadways would experience substantial increases over existing conditions. Similarly, receivers east of Claus Road to the Community of Oakdale near the end of Alternative 1A, are located in remote rural communities, where receivers would experience substantial increases over existing conditions. Some of the substantial increases at these receivers would also result in exceedances of the noise abatement standard (67 dBA  $L_{eq}[h]$ ). Because the predicted noise levels in the future design year would approach or exceed the noise abatement standard (67 dBA  $L_{eq}[h]$ ) and/or result in

a substantial increase in noise levels over existing conditions (over 12 dBA or more), abatement was considered for feasibility. A total of eight sound walls were analyzed for Alternative 1A. Seven of the eight sound walls were found to be feasible for Alternative 1A. Five sound walls meet the Caltrans design goal of 7 dBA.

### **Alternative 1B**

The traffic noise modeling results in Appendix B, Table B-2 indicate traffic noise levels are predicted to be in the range of 48 to 76 dBA  $L_{eq}(h)$  in the design year, with an increase over existing peak hour levels of up to 43 dBA. Alternative 1B is similar to Alternative 1A between the western project terminus near Kiernan Avenue to Claus Road. Similar noise levels occur at the same receiver locations as mentioned previously for Alternative 1A. However, under Alternative 1B, new receivers are affected within Segment 3 where Alternative 1B continues east of Stearns Road and traverses north near Fogarty Road, towards the community of Oakdale near Lancaster Road. Receivers in this area are located at single-family residences on large farmland and are currently not exposed to heavily travelled roadways. These receivers currently experience a serene existing noise environment. Under Build conditions, these receivers would experience substantial increases, which would result in exceedances of the noise abatement standard (67 dBA  $L_{eq}[h]$ ). Because the predicted noise levels in the future design year would approach or exceed noise abatement criterion (67 dBA  $L_{eq}[h]$ ) and result in a substantial increase in noise over existing conditions, abatement was considered for feasibility. A total of eight sound walls were analyzed for Alternative 1B. Five of the eight sound walls were found to be feasible. Three sound walls meet the Caltrans Design Goal of 7 dBA for Alternative 1B.

### **Alternative 2A**

The traffic noise modeling results in Appendix B, Table B-3, indicate traffic noise levels are predicted to be in the range of 45 to 68 dBA  $L_{eq}(h)$  in the future design year, with an increase over existing peak hour levels of up to 17 dBA. Similar to Alternatives 1A and 1B, Alternative 2A shares the same receiver locations in Segment 1 along Kiernan Avenue to Claus Road. Therefore, noise levels within this area for Alternative 2A are similar to the other Build Alternatives. However, Alternative 2A breaks east near Claribel Road and continues along Claribel Road within Segment 2 affecting new receivers in this Segment. These receivers are located at single-family residences on large farmlands and are currently not exposed to heavily travelled roadways. These receivers currently experience a serene existing noise environment. Under Build conditions, these receivers would experience substantial increases over existing noise levels, with some receivers experiencing exceedances of the noise abatement standard (67 dBA  $L_{eq}[h]$ ). Alternative

2A then continues to Alternative 1A near Stearns Road in Segment 3 and heads north to the community of Riverbank at SR108. Noise levels at these receivers would be similar to Alternative 1A. Because the predicted noise levels in the future design year would approach or exceed noise abatement criterion (67 dBA  $L_{eq}[h]$ ) and result in a substantial increase in noise over existing conditions, abatement was considered for feasibility. A total of six sound walls were analyzed for Alternative 2A. Four of the six sound walls were found to be feasible. Three sound walls meet the Caltrans Design Goal of 7 dBA for Alternative 2A.

### **Alternative 2B**

The traffic noise modeling results in Appendix B, Table B-4, indicate traffic noise levels are predicted to be in the range of 42 to 68 dBA  $L_{eq}(h)$  in the design year, with an increase over existing peak hour levels of up to 26 dBA. Similarly, Alternative 2B shares the same receiver locations in Segment 1 along Kiernan Avenue to Claus Road as all of the other Build alternatives. Therefore, noise levels within this area for Alternative 2B are similar to the other Build Alternatives. Similar to Alternative 2A, Alternative 2B breaks east near Claribel Road and continues along Claribel Road within Segment 2. Receivers affected within Segment 2 for Alternative 2B are similar to those in Alternative 1B. These receivers are located at single-family residences on large farmlands and are currently not exposed to heavily travelled roadways. These receivers currently experience a serene existing noise environment. Alternative 2B, correspondingly follows the same alignment as Alternative 1B and would affect similar receivers. Alternative 2B heads north of Fogarty Road to the community of Oakdale near Lancaster Road. Because the predicted noise levels in the future design year would approach or exceed noise abatement criterion (67 dBA  $L_{eq}[h]$ ) and result in a substantial increase over existing conditions, abatement was considered for feasibility. A total of seven sound walls were analyzed for Alternative 2B. Five of the seven sound walls were found to be feasible. Four sound walls were analyzed to meet the Caltrans Design Goal of 7 dBA for Alternative 2B.

### **Non Feasible Wall Locations**

There are several locations where noise impacts were predicted but an optimum location for soundwall placement was not identified. The following is a summary of these locations along with an explanation of the physical limitations that prevented soundwall placement.

Soundwall placement for Receivers 21.3, 21.4, 21.5, 28.1, 30.2, 30.3 and 30.13 which are adjacent to driveways, was limited due to gaps required for access to local roadways.

Soundwall effectiveness in shielding traffic noise to the receiver would be reduced due to these driveway openings.

Soundwall placement for Receivers 26.3, 30.6, 32.1 and 33.3 could not be placed close to the receiver to provide shielding for these receivers. These receivers are not located near the ROW of the new alignment where a soundwall would shield noise between the receiver and the noise source. Placing the soundwall at the ROW is midpoint between the receiver and the noise source, therefore rendering the soundwall not feasible.

### **Construction Noise Impacts**

No adverse noise impacts from construction are anticipated because construction would be conducted in accordance with the Caltrans' Standard Specifications 14-8.02 "Noise Control" and Standard Special Provision (SSP) 14-8.02. Construction noise would be short-term and intermittent within the project area.



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## List of Abbreviated Terms

BNSF	Burlington Northern Santa Fe Railroad
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CNEL	Community Noise Equivalent Level
dB	Decibels
dBA	A-weighted Decibels
FHWA	Federal Highway Administration
Hz	Hertz
kHz	Kilohertz
L <sub>dn</sub>	Day-Night Level
L <sub>eq</sub>	Equivalent Sound Level
L <sub>eq</sub> (h)	Equivalent Sound Level over one hour
L <sub>max</sub>	Maximum Sound Level
LOS	Level of Service
L <sub>n</sub>	Percentile-Exceeded Sound Level
LT	Long-term
μPa	Micro-Pascals
MID	Modesto Irrigation District
mph	Miles Per Hour
NAC	Noise Abatement Criteria
NADR	Noise Abatement Decision Report
NCCTEA	North County Corridor Transportation Expressway Authority
NEPA	National Environmental Policy Act
NSR	Noise Study Report
OID	Oakdale Irrigation District
Protocol	Caltrans Traffic Noise Analysis Protocol for New Highway Construction, Reconstruction, and Retrofit Sound walls Projects
SPL	Sound Pressure Level
SR	State Route
SSP	Standard Special Provision
ST	Short-term
TeNS	Caltrans' Technical Noise Supplement
TNM 2.5	FHWA Traffic Noise Model Version 2.5
UPRR	Union Pacific Railroad

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# **Chapter 1. Introduction**

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## **1.1. Purpose of the Noise Study Report**

The purpose of this Noise Study Report (NSR) is to evaluate noise impacts and abatement under the requirements of Title 23, Part 772 of the Code of Federal Regulations (23 CFR 772) “Procedures for Abatement of Highway Traffic Noise.” Title 23, Part 772 provides procedures for preparing operational and construction noise studies and evaluating noise abatement considered for federal and federal-aid highway projects. According to 23 CFR 772.3, all highway projects that are developed in conformance with this regulation are deemed to be in conformance with Federal Highway Administration (FHWA) noise standards.

The California Department of Transportation (Caltrans) Traffic Noise Analysis Protocol for New Highway Construction, Reconstruction, and Retrofit Sound walls Projects (Protocol) (Caltrans 2011) provides Caltrans policy for implementing 23 CFR 772 in California. The Protocol outlines the requirements for preparing NSRs. Noise impacts associated with this project under the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA) will be evaluated in accordance with this Protocol.

## **1.2. Project Purpose and Need**

### **1.2.1. Purpose**

The purpose of the project is to reduce existing and future traffic congestion in northern Stanislaus County, enhance traffic safety on existing SR 108 (SR-108), and support the efficient movement of goods as follows:

- Reduce average daily traffic volumes and current traffic congestion and accommodate anticipated future traffic on the existing SR-108 and the surrounding regional transportation network in Stanislaus County and the cities of Modesto, Riverbank, and Oakdale.
- Support the efficient movement of goods and services throughout the region for the benefit of the regional economy by providing a more direct and dependable truck route, increasing the average operating speeds of all vehicles, and reducing the number of areas of conflict between motorized traffic and non-motorized means of travel.

- Improve the efficiency of interregional travel by reducing travel times for long distance commuters, recreational traffic, and interregional goods movement

### **1.2.2. Need**

The current action is needed because:

- Travel conditions in the region, including traffic congestion on existing SR108, will continue to worsen due to regional population growth and projected traffic volume increases.
- Traffic congestion on existing truck routes (SR-108/SR-120) will continue to hinder the efficient movement of goods and services.
- Existing SR-108 is part of the interregional system, and interregional circulation will become increasingly constrained as travel times on existing SR-108 increase substantially with planned residential and employment growth.



## **Chapter 2. Project Description**

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The proposed project is located in Caltrans District 10 within portions of the Cities of Oakdale, Riverbank and Modesto. The NCC will connect SR-219, near Modesto, to SR-120, near Oakdale.

One no-build alternative and four build alternatives have been selected for this project. The western terminus of all alternatives is at the SR-219 (Kiernan Avenue)/Tully Road intersection. The eastern terminus of alternatives 1A and 2A end along SR-108/120 just east of the city of Oakdale. The eastern terminus of alternatives 2B and 2B end further east, along SR-108/120 in the vicinity of Lancaster Road.

The four alternatives consist of two to three 12-foot (ft) wide lanes with 5 to 10 ft wide shoulders in each direction. The proposed roadway would function as a freeway/expressway with controlled access, new and realigned local access roads are needed to provide continued access to existing properties. Elevated roadways, separated grade crossings, single point urban interchanges, signalized intersections, and roundabouts would be needed for each of the four alternatives.

The proposed project improvements include:

- At grade intersection improvements;
- Grade separation structures at major roadway and railway crossings;
- Structures at various waterway crossings, such as the Hetch Hetchy Aqueduct, Modesto Irrigation District and Oakdale Irrigation District canals; and,
- County roadway improvements at various intersections.

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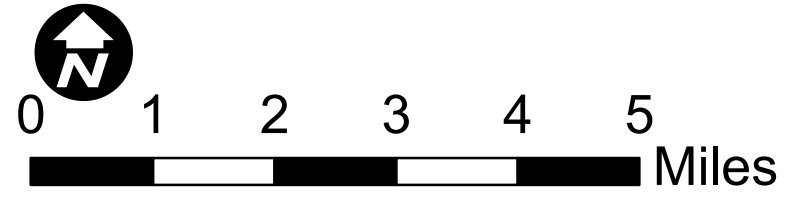
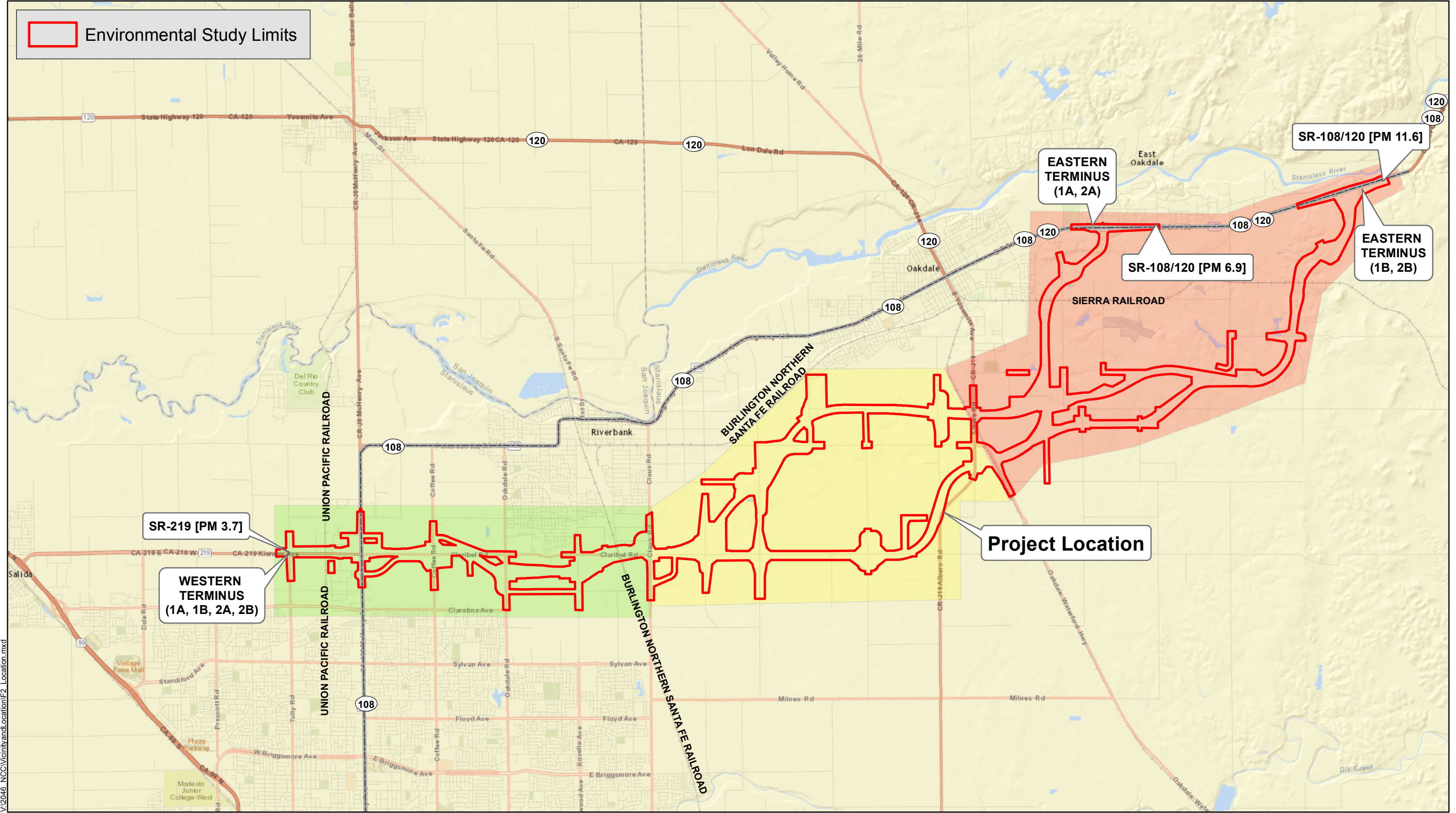


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**FIGURE 1**  
**Project Vicinity**  
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**FIGURE 2**  
**Project Location**  
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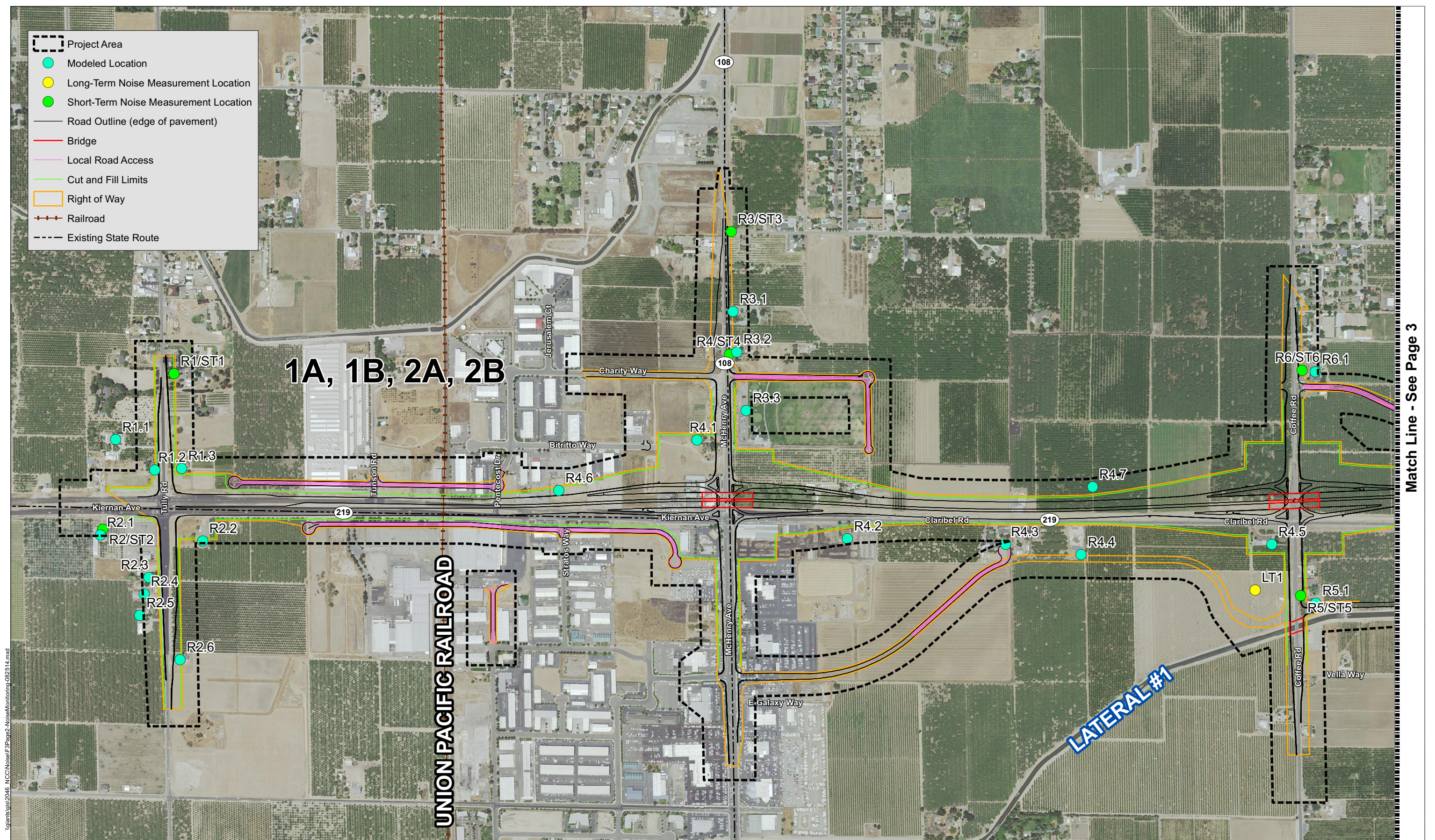






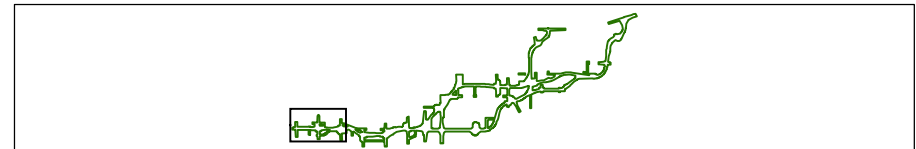
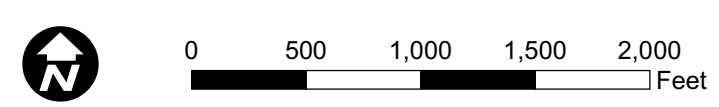






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**FIGURE 3**  
**Build Alternatives/Noise Receiver Locations**  
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 North County Corridor New State Route 108 Project  
 Stanislaus County, California



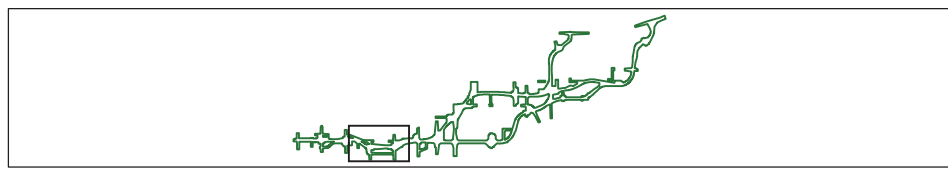
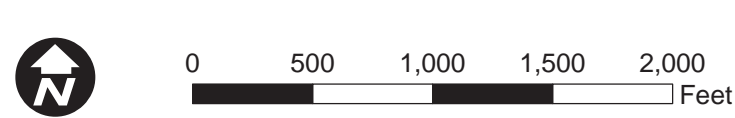






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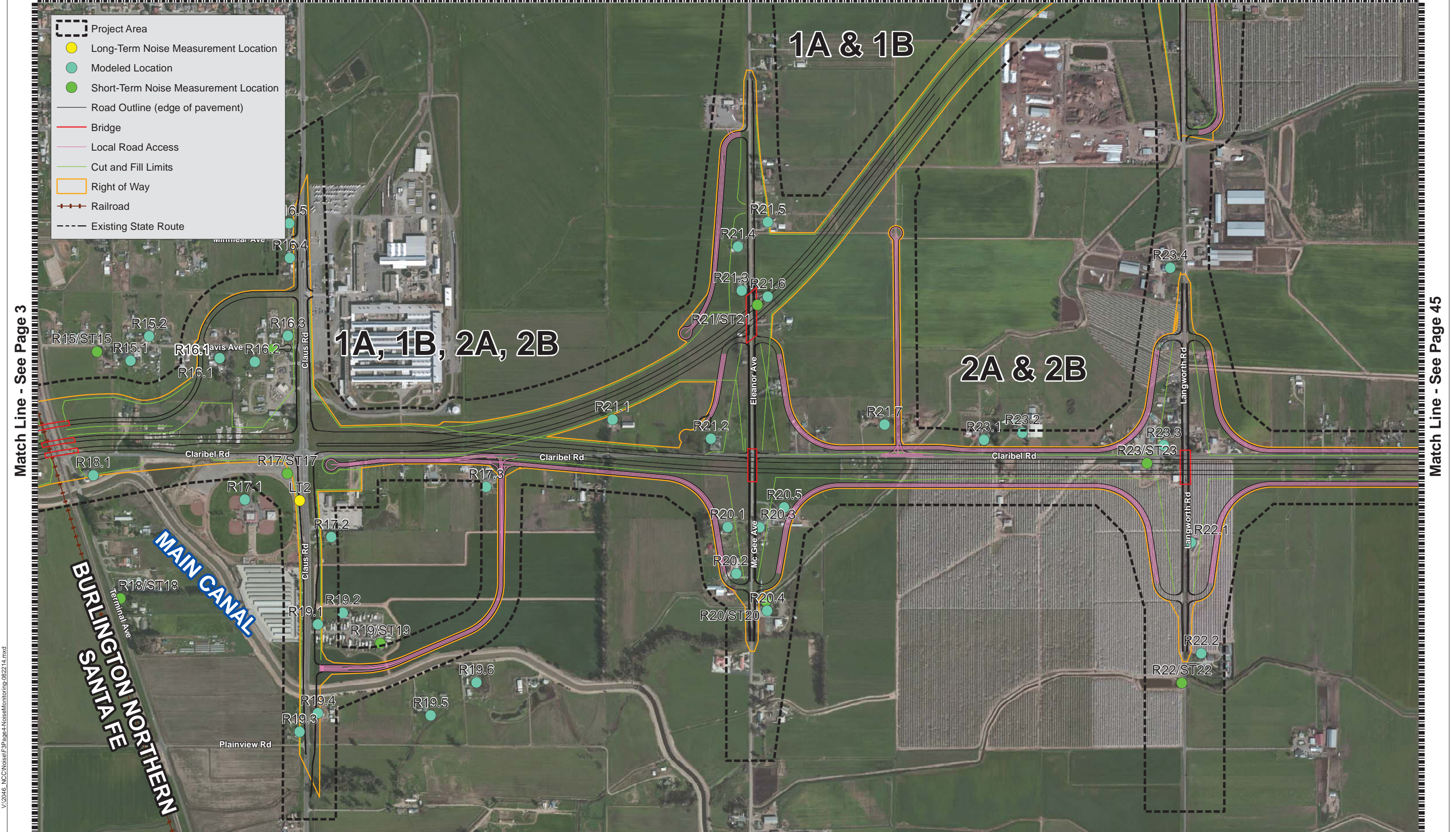
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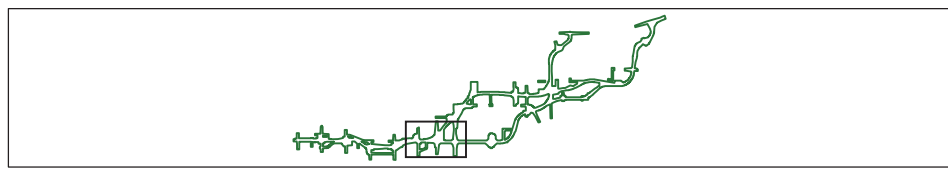
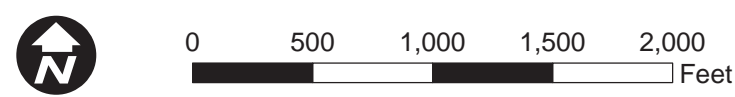






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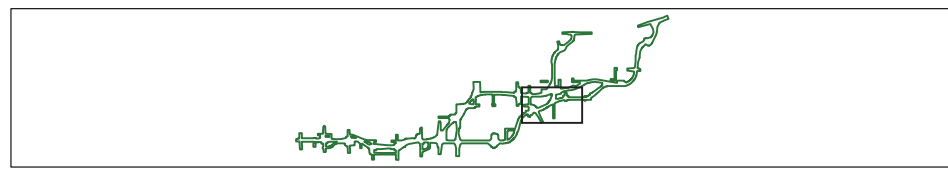




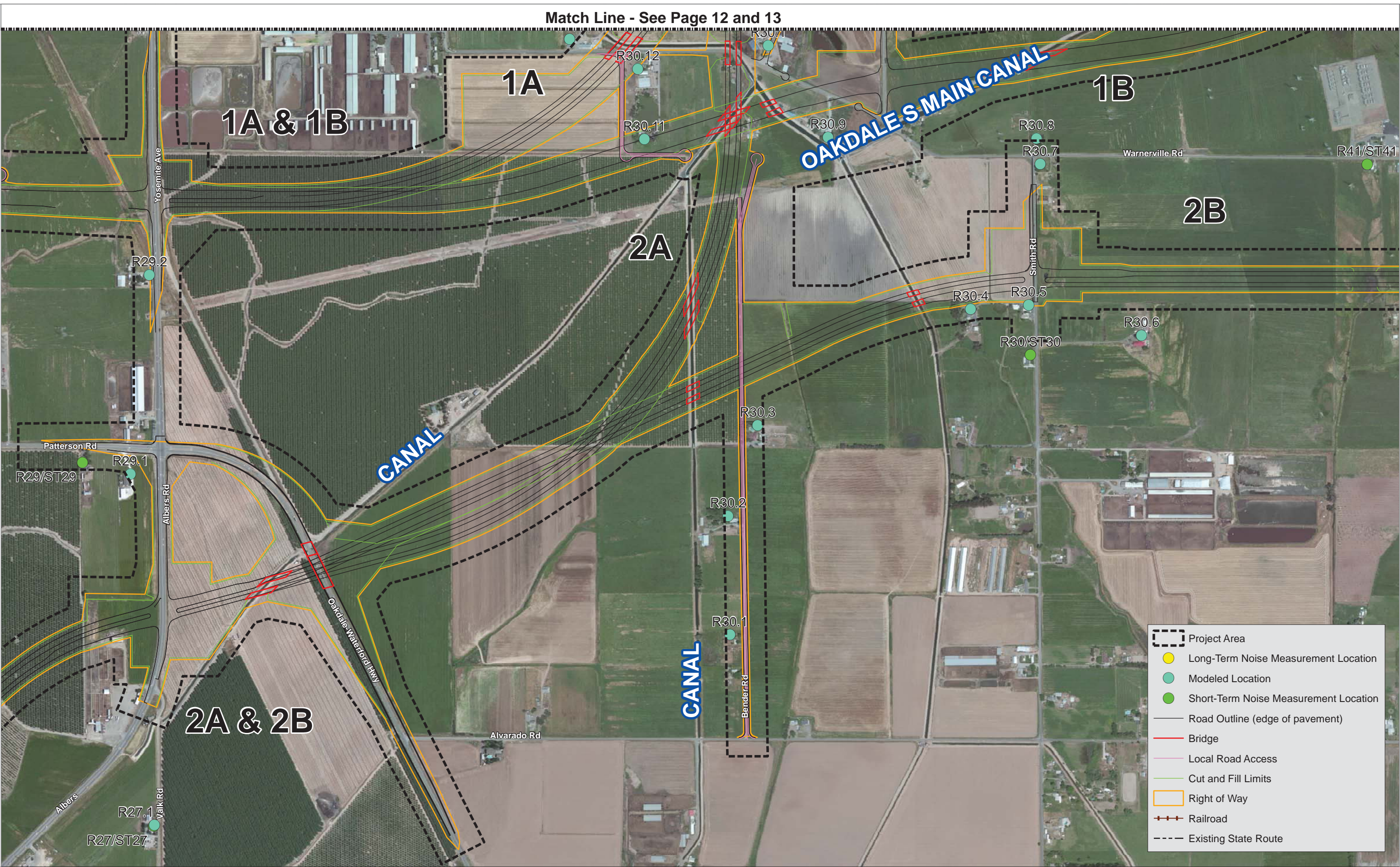


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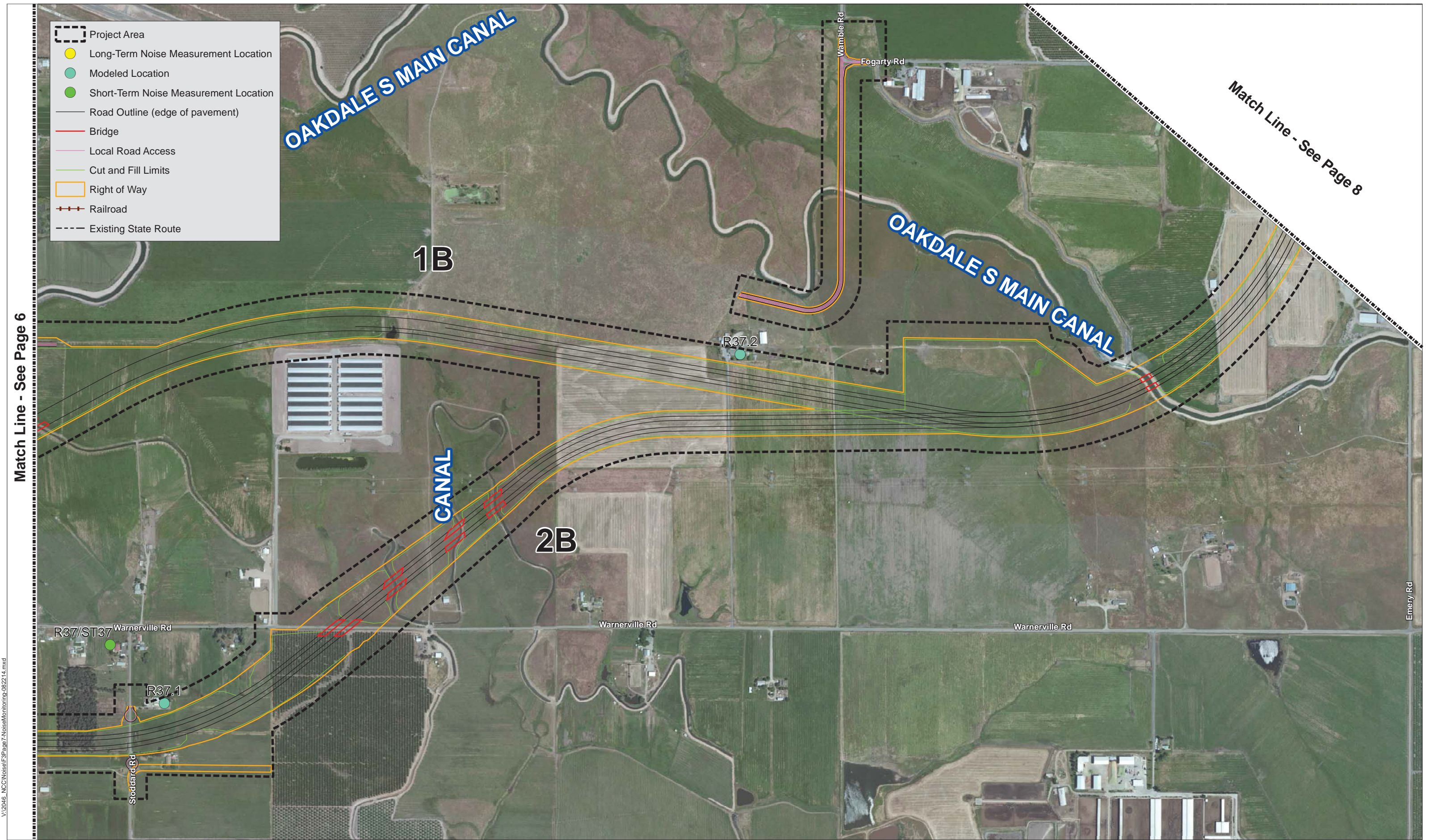
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- Project Area
- Long-Term Noise Measurement Location
- Modeled Location
- Short-Term Noise Measurement Location
- Road Outline (edge of pavement)
- Bridge
- Local Road Access
- Cut and Fill Limits
- Right of Way
- Railroad
- Existing State Route



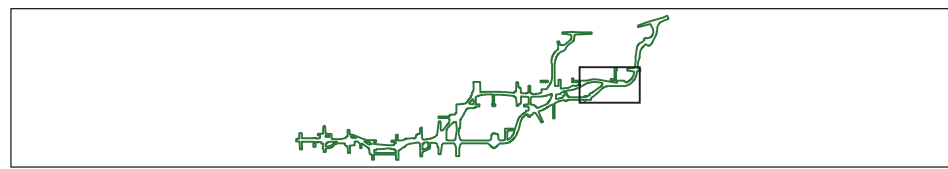
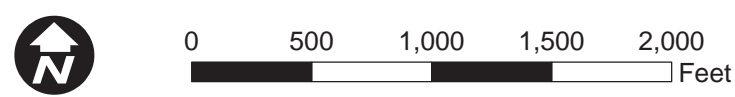






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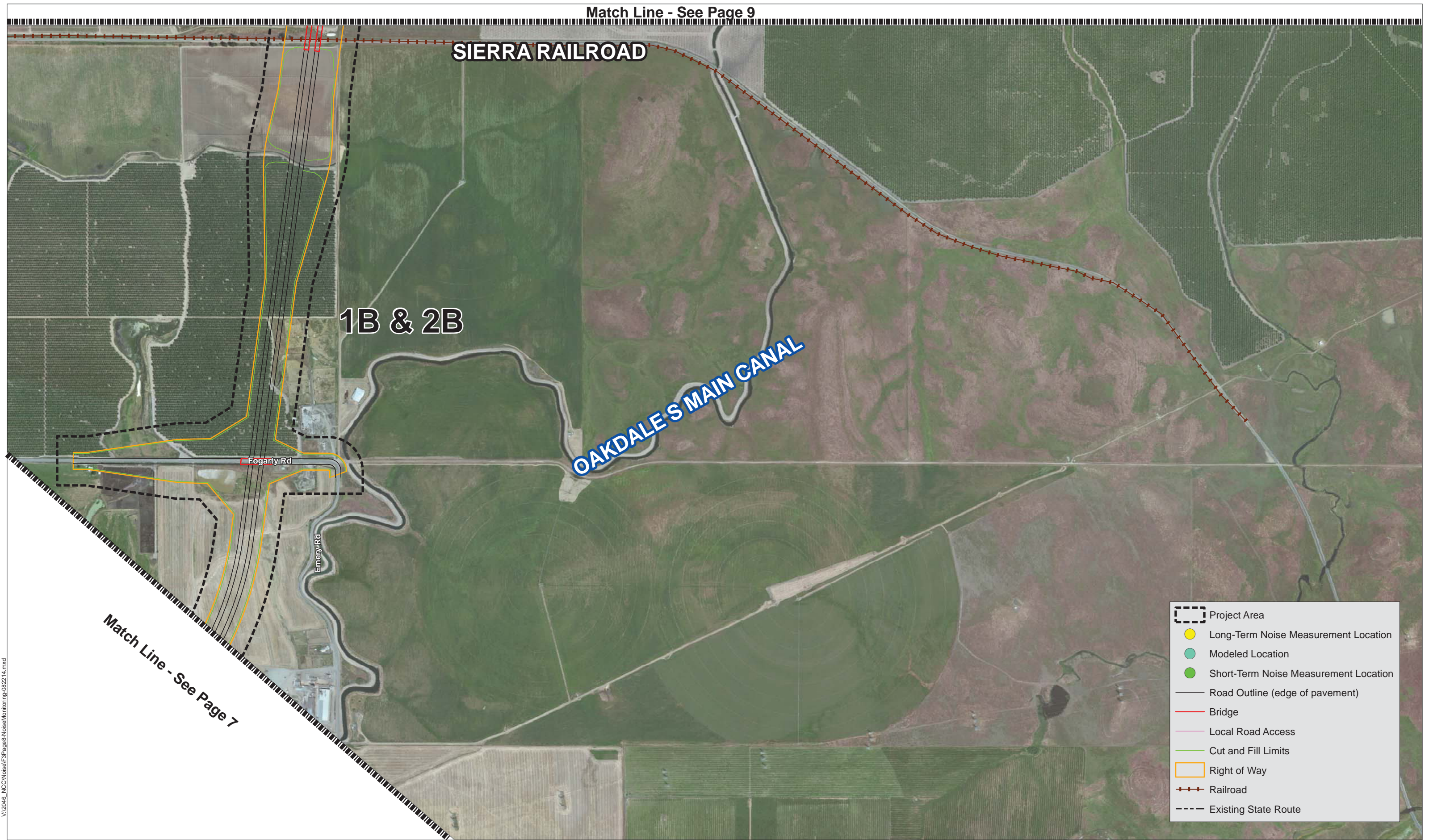


**FIGURE 3**  
**Build Alternatives/Noise Receiver Locations**  
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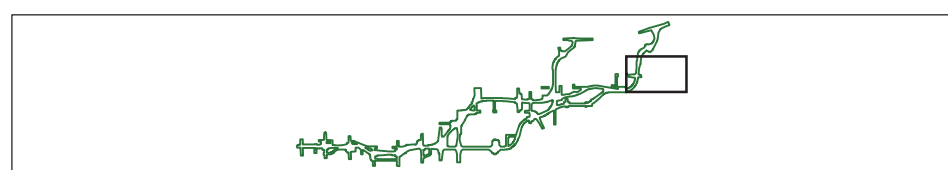
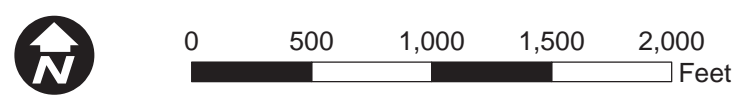






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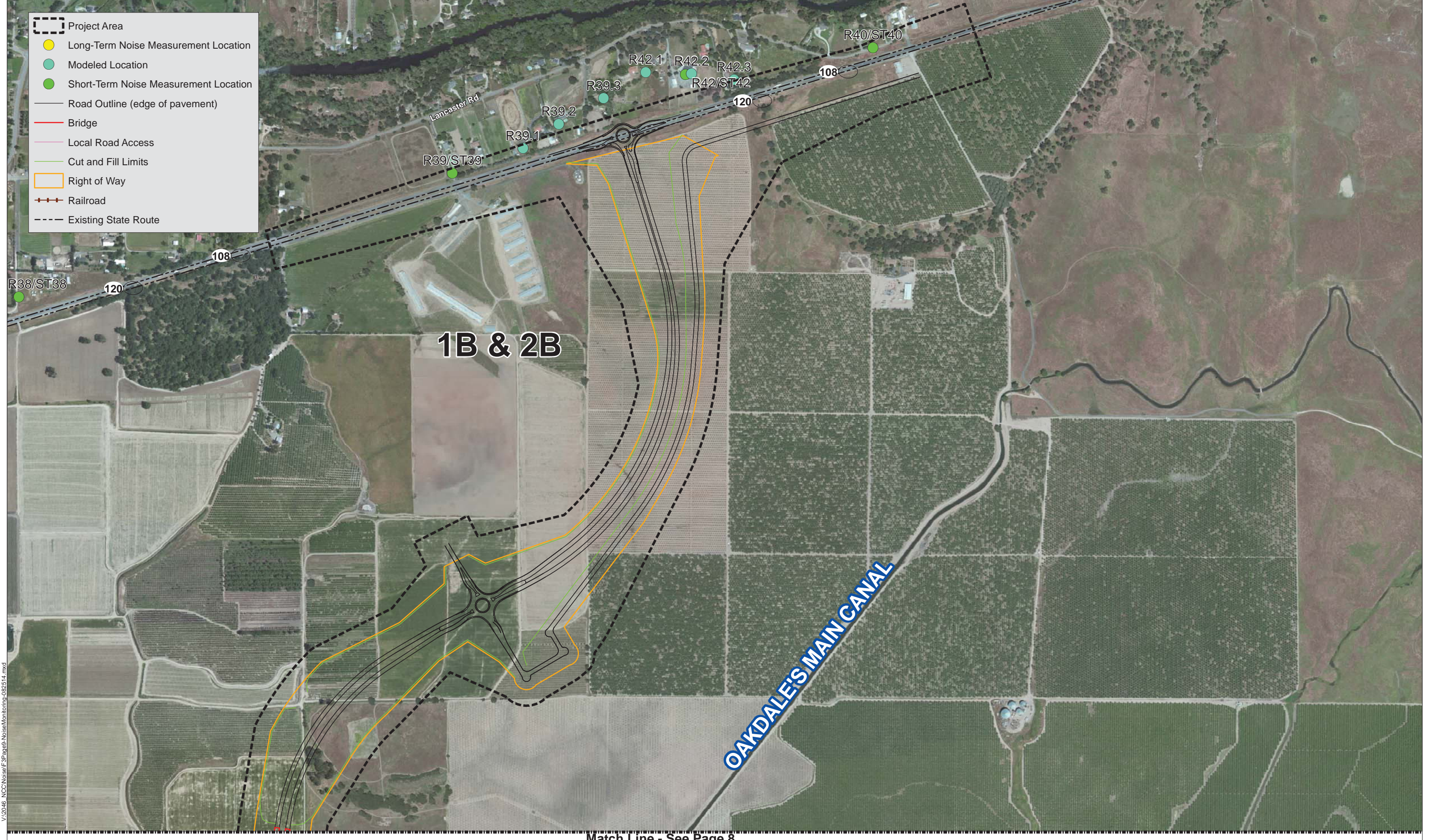


**FIGURE 3**  
**Build Alternatives/Noise Receiver Locations**  
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- Project Area
- Long-Term Noise Measurement Location
- Modeled Location
- Short-Term Noise Measurement Location
- Road Outline (edge of pavement)
- Bridge
- Local Road Access
- Cut and Fill Limits
- Right of Way
- Railroad
- Existing State Route

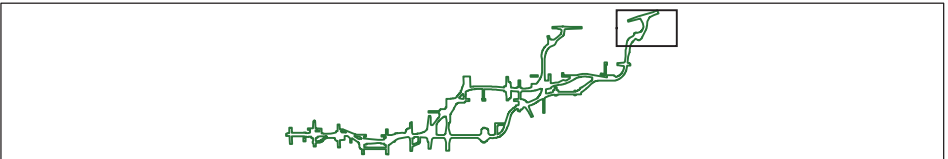
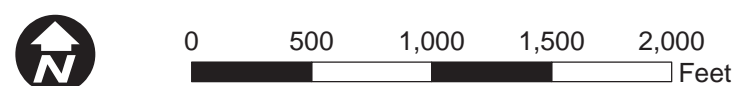
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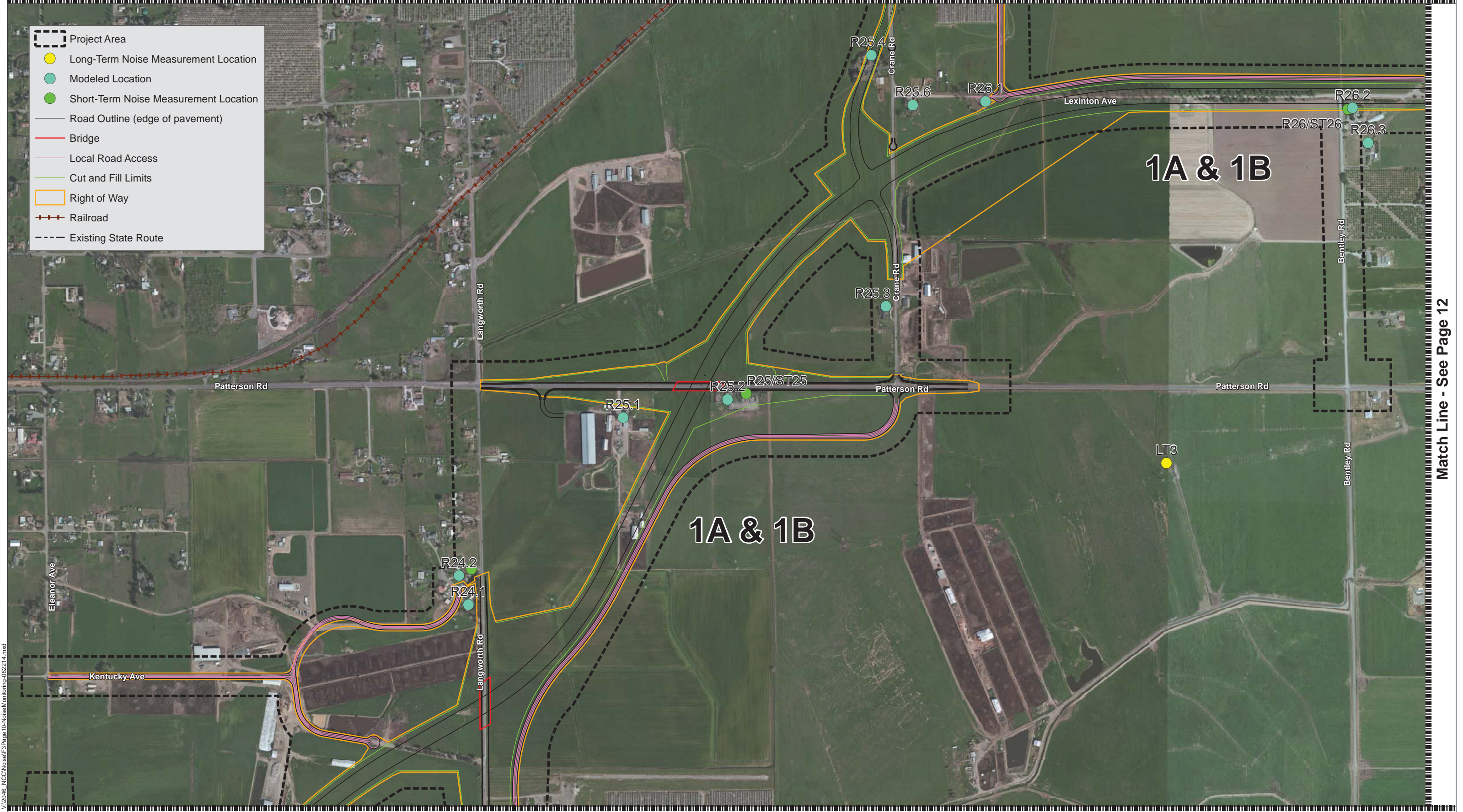






Match Line - See Page 11

- Project Area
- Long-Term Noise Measurement Location
- Modeled Location
- Short-Term Noise Measurement Location
- Road Outline (edge of pavement)
- Bridge
- Local Road Access
- Cut and Fill Limits
- Right of Way
- Railroad
- Existing State Route



Match Line - See Page 12

Match Line - See Page 4

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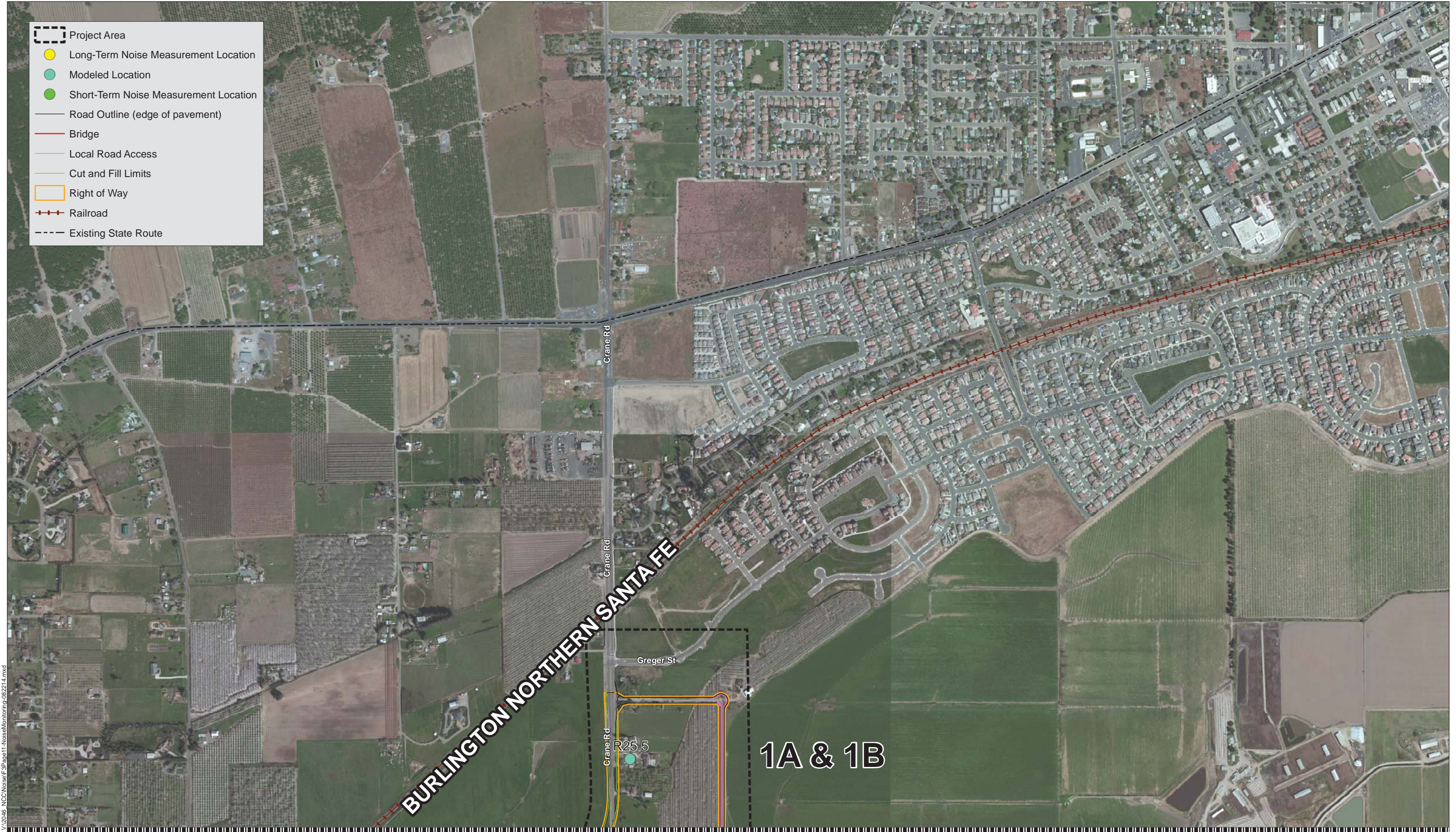


**FIGURE 3**  
**Build Alternatives/Noise Receiver Locations**  
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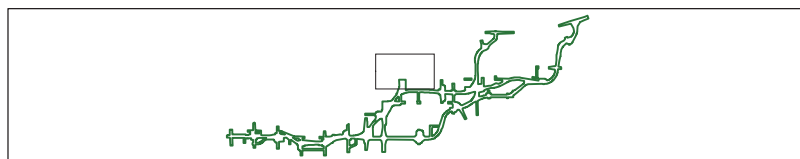
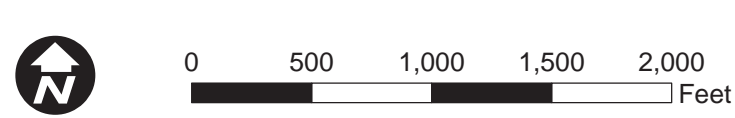




- Project Area
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- Short-Term Noise Measurement Location
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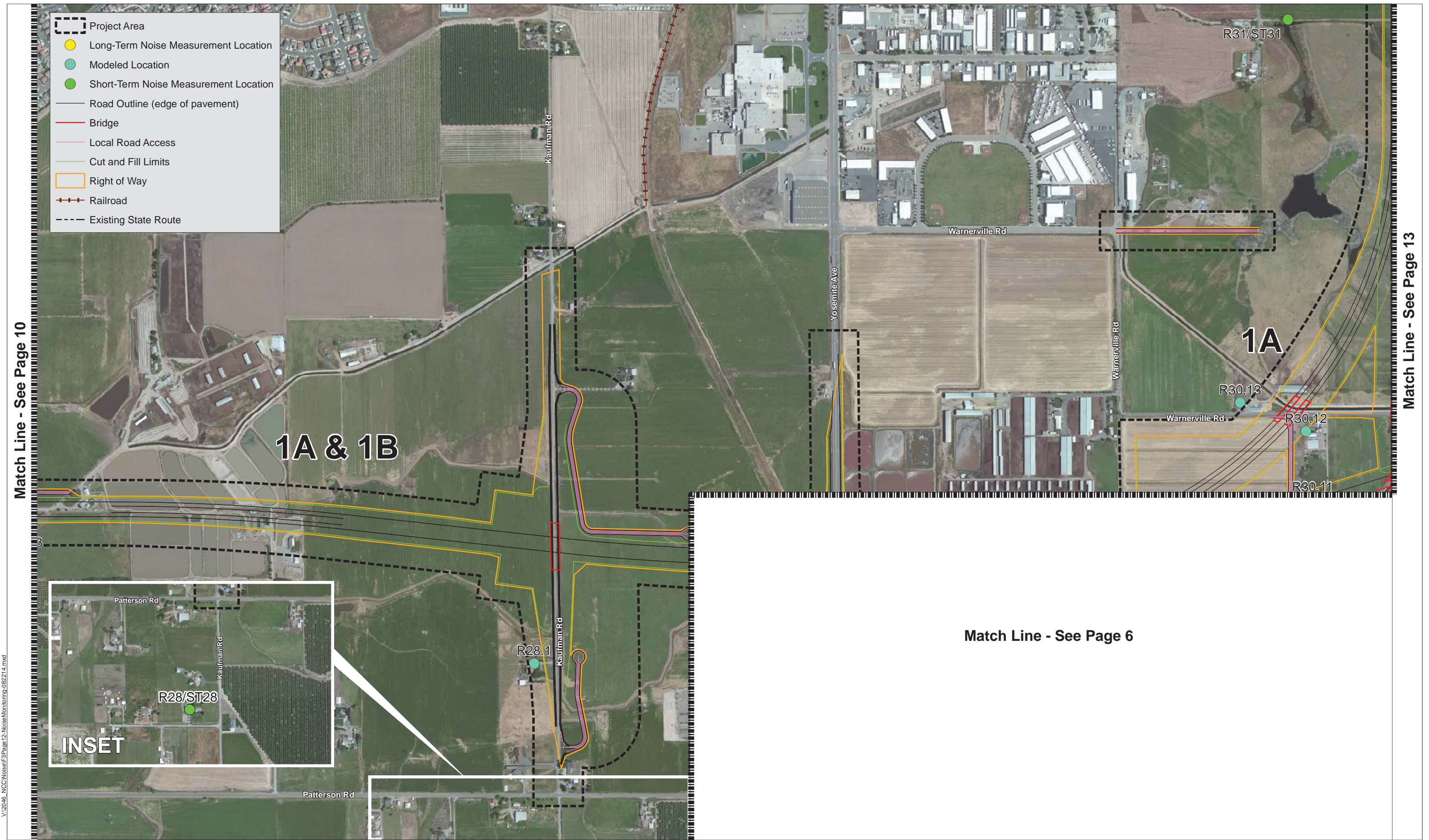


**FIGURE 3**  
**Build Alternatives/Noise Receiver Locations**  
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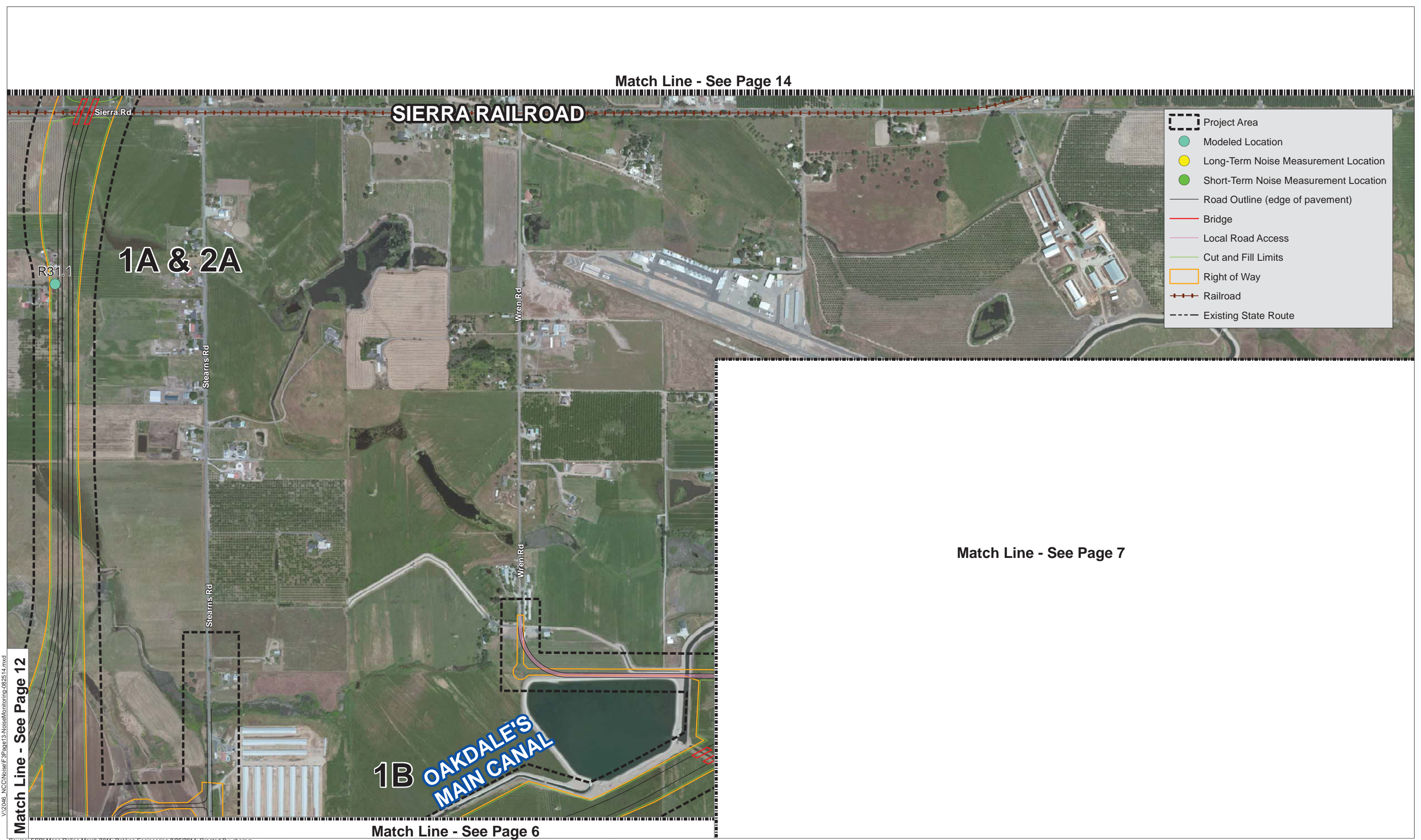


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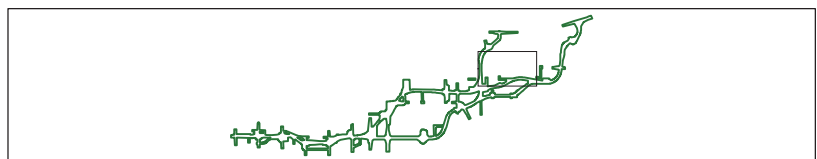
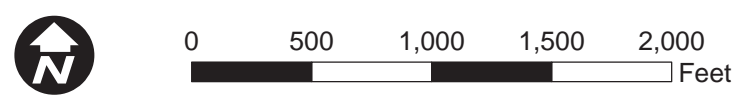






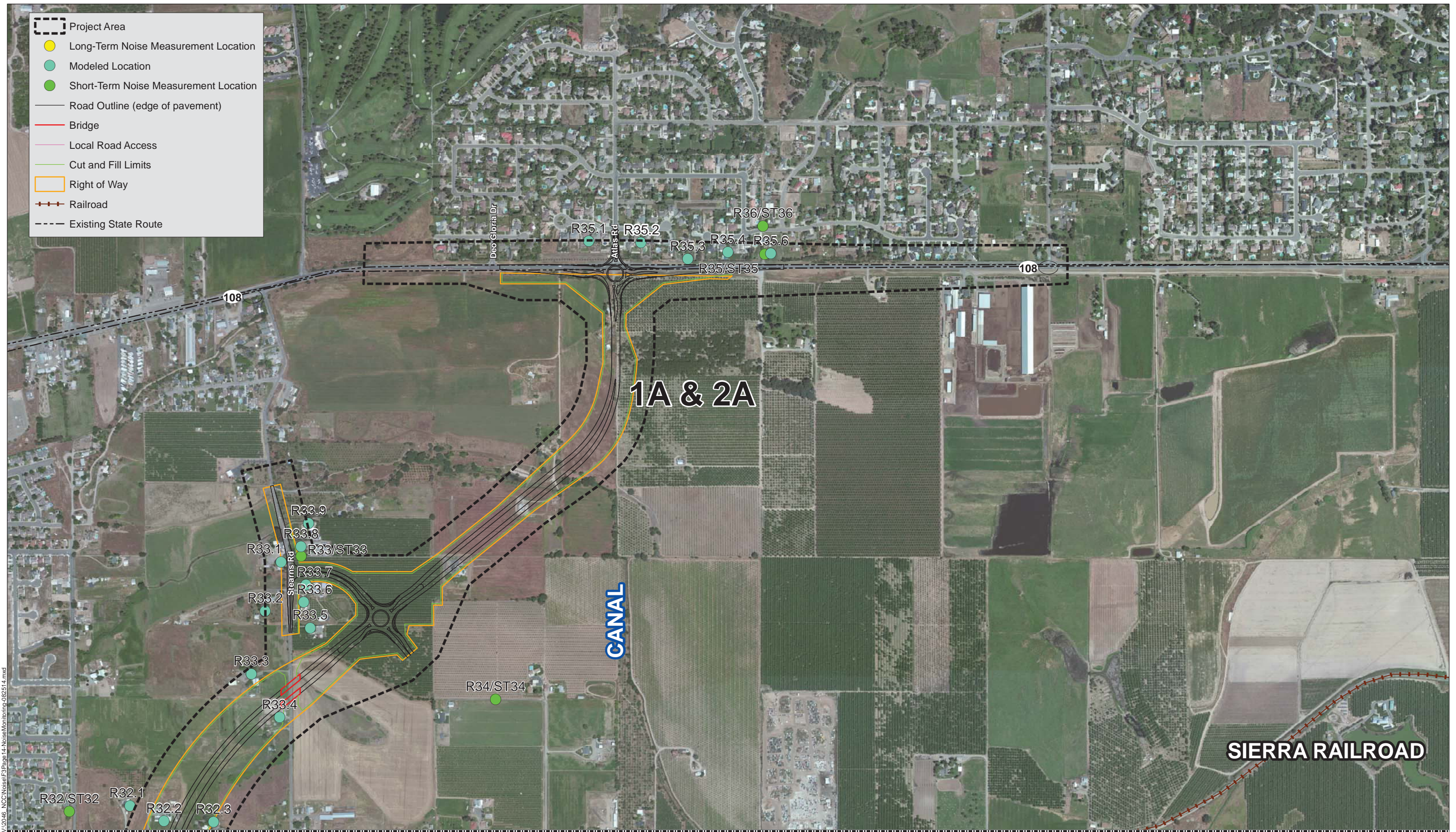
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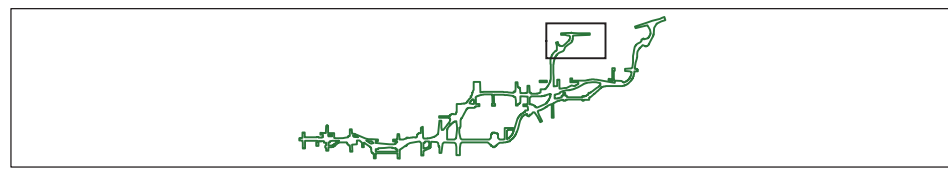




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Match Line - See Page 13

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**FIGURE 3**  
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## **Chapter 3. Fundamentals of Traffic Noise**

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The following is a brief discussion of fundamental traffic noise concepts. For a detailed discussion, please refer to Caltrans' Technical Noise Supplement (TeNS) (Caltrans 2013), a technical supplement to the Protocol that is available on the Caltrans Web site [[http://www.dot.ca.gov/hq/env/noise/pub/tens\\_complete.pdf](http://www.dot.ca.gov/hq/env/noise/pub/tens_complete.pdf)].

### **3.1. 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 defined as loud, unexpected, or annoying sound.

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

### **3.2. Frequency**

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.

### **3.3. 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 ( $\mu\text{Pa}$ ). One  $\mu\text{Pa}$  is approximately one hundred billionth (0.0000000001) of normal atmospheric pressure. Sound pressure amplitudes for different kinds of noise environments can range from less than 100 to 100,000,000  $\mu\text{Pa}$ . Because of this huge range of values, sound is rarely expressed in terms of  $\mu\text{Pa}$ . 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  $\mu\text{Pa}$ .

### 3.4. 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 approximately 3 dB higher than one source under the same conditions ( $10\log[2]$ ). 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 approximately 73 dB. Under the decibel scale, three sources of equal loudness together produce a sound level approximately 5 dB louder than one source ( $10\log[3]$ ).

### 3.5. 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 average human hearing when listening to most ordinary sounds. When we make judgments regarding the relative loudness or annoyance of a given sound, these judgments generally correlate well with A-weighted sound levels. Other weighting networks have been devised to address high noise levels or other special acoustical characteristics (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 3-1 describes typical A-weighted noise levels for various noise sources.

**Table 3-1. Typical A-Weighted Noise Levels**

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

Source: Caltrans 1998.

### 3.6. Human Response to Changes in Noise Levels

As discussed above, doubling sound energy results in a 3 dBA increase in sound level. However, given a sound level change measured with precise instrumentation, the subjective human perception of a doubling of loudness would usually be different than what is measured. Under controlled conditions in an acoustical laboratory, trained, healthy human hearing is able to discern 1 dBA changes in sound levels, when exposed to steady, single-frequency (“pure-tone”) signals in the mid-frequency (1,000 Hz–8,000 Hz) range. In typical noisy environments, changes in noise of 1 to 2 dBA are generally not perceptible. However, it is widely accepted that people are able to begin to detect sound level increases of 3 dBA 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 dBA increase in sound, would generally be perceived as barely detectable.

### 3.7. Noise Descriptors

Noise in our daily environment fluctuates over time. Some fluctuations are minor, but others are substantial. Some noise levels occur in regular patterns, but others are random.

Some noise levels fluctuate rapidly, but others slowly. Some noise levels vary widely, but others are relatively constant. Various noise descriptors have been developed to describe time-varying noise levels. The following are 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. In effect,  $L_{eq}$  is the steady-state sound level containing the same acoustical energy as the time-varying sound that actually occurs during the same period. The one-hour, A-weighted equivalent sound level ( $L_{eq}[h]$ ) is the energy-average of A-weighted sound levels occurring during a one-hour period, and is the basis for noise abatement criteria (NAC) used by Caltrans and FHWA.
- **Percentile-Exceeded Sound Level ( $L_n$ ):**  $L_n$  represents the sound level exceeded for a given percentage (n) of a specified period (e.g.,  $L_{10}$  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 (10 p.m.-7 a.m.).
- **Community Noise Equivalent Level (CNEL):** Similar to  $L_{dn}$ , CNEL is the energy-average of the A-weighted sound levels occurring over a 24-hour period, with a 10 dB penalty applied to A-weighted sound levels occurring during the nighttime hours between (10 p.m.-7 a.m.) and a 5 dB penalty applied to the A-weighted sound levels occurring during evening hours (7 p.m.-10 p.m.).

### 3.8. Sound Propagation

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

#### 3.8.1. 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 decibels for each doubling of distance from this 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 decibels for each doubling of distance from a line source.

### **3.8.2. Ground Absorption**

The propagation path of noise from a highway to a receiver is usually very close to the ground. Noise attenuation from ground absorption and reflective wave canceling increases 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 receiver, 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 receiver – such as soft dirt, grass, or scattered bushes and trees), an excess ground-attenuation value of 1.5 decibels 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 decibels per doubling of distance.

### **3.8.3. Atmospheric Effects**

Receivers located downwind from a source can be exposed to increased noise levels relative to calm conditions, whereas locations upwind can have reduced 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.

### **3.8.4. Shielding by Natural or Man-Made Features**

A large object or sound wall in the path between a noise source and a receiver can substantially attenuate noise levels at the receiver. The amount of attenuation provided by shielding depends on the size of the object and the frequency content of the noise. Natural terrain features (e.g., hills and dense woods) and man-made features (e.g., buildings and walls) can substantially reduce noise levels. Walls are often constructed between a source and a receiver specifically to reduce noise. A sound wall that breaks the line of sight between a source and a receiver would typically result in at least 5 dBA of noise reduction. Taller sound walls provide increased noise reduction. Vegetation between the highway and receiver is rarely effective in reducing noise unless it is sufficiently dense.



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# Chapter 4. Federal Regulations and State Policies

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This report focuses on the requirements of 23 CFR 772, as discussed below.

## 4.1. Federal Regulations

### 4.1.1. 23 CFR 772

Title 23, Part 772 of the Code of Federal Regulations provides procedures for preparing operational and construction noise studies and evaluating noise abatement considered for federal and federal-aid highway projects.

Under 23 CFR 772.7, projects are categorized as Type I, Type II, or Type III projects. FHWA defines a Type I project as a proposed Federal or Federal-aid highway project for the construction of a highway on a new location, the physical alteration of an existing highway where there is either a substantial horizontal or substantial vertical alteration, or other activities discussed below. 23 CFR 772 specifically defines a Type I project as a project that involves:

1. The construction of a highway on a new location; or
2. The physical alteration of an existing highway where there is either:
  - A. Substantial horizontal alteration. A project that halves the distance between the traffic noise source and the closest receiver between the existing condition to the future build condition, or
  - B. Substantial vertical alteration. A project that removes shielding, thereby causes a direct line-of-sight between the receiver and the traffic noise source. This is done by altering either the vertical alignment of the highway or the topography between the highway traffic noise source and the receiver; or
3. The addition of a through-traffic lane(s). This includes the addition of a through-traffic lane that functions as a high-occupancy vehicle (HOV) lane, high-occupancy toll (HOT) lane, bus lane, or truck climbing lane; or
4. The addition of an auxiliary lane, except for when the auxiliary lane is a turn lane; or



5. The addition or relocation of interchange lanes or ramps added to a quadrant to complete an existing partial interchange; or
6. Restriping existing pavement for the purpose of adding a through-traffic lane or an auxiliary lane; or
7. The new addition or substantial alteration of a weigh station, rest stop, ride-share lot, or toll plaza.

If a project is determined to be a Type I project under this definition, the entire project area as defined in the environmental document is a Type I project. This project proposes to a new alignment; therefore it is considered a Type I project.

A Type II project involves construction of noise abatement on an existing highway with no changes to highway capacity or alignment. This project is not a Type II project.

A Type III project is a project that does not meet the classifications of a Type I or Type II project. Type III projects do not require a noise analysis. This project is not a Type III project.

Under 23 CFR 772.13, noise abatement must be considered and evaluated for feasibility and reasonableness for Type I projects if the project is predicted to result in a traffic noise impact. In such cases, 23 CFR 772 requires that the project sponsor “consider” noise abatement before adopting the NEPA Categorical Exclusion (CE), Finding of No Significant Impact (FONSI), or Record of Decision (ROD). This process involves identification of noise abatement measures that are feasible, reasonable, and likely to be incorporated into the project, as well as noise impacts for which no noise abatement measures are feasible and reasonable.

Traffic noise impacts, as defined in 23 CFR 772.5, occur when the predicted noise level in the design year approaches or exceeds the NAC specified in 23 CFR 772 or when a predicted noise level substantially exceeds the existing noise level (a “substantial” noise increase). Noise levels are expressed in terms of A-weighted decibels (dBA) and the one-hour equivalent sound level (Leq[h]).

Table 4-1 summarizes NAC corresponding to various land use activity categories. Activity categories and related traffic noise impacts are determined based on the actual land use in a given area.

#### 4.1.2. Traffic Noise Analysis Protocol for New Highway Construction and Reconstruction Projects

The Protocol specifies the policies, procedures, and practices to be used by agencies that sponsor new construction or reconstruction of federal or Federal-aid highway projects. The Protocol defines a noise increase as substantial when the predicted noise levels with project implementation exceed existing noise levels by 12 dBA or more. The Protocol also states that a sound level is considered to approach an NAC level when the sound level is within 1 dB of the NAC identified in 23 CFR 772 (e.g., 66 dBA is considered to approach the NAC of 67 dBA, but 65 dBA is not).

The Technical Noise Supplement to the Protocol provides detailed technical guidance for the evaluation of highway traffic noise. This includes field measurement methods, noise modeling methods, and report preparation guidance.

**Table 4-1. Activity Categories and Noise Abatement Criteria**

Activity Category	Activity $L_{eq}$ [h] <sup>1</sup>	Evaluation Location	Description of Activities
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 <sup>2</sup>	67	Exterior	Residential.
C <sup>2</sup>	67	Exterior	Active sport areas, amphitheaters, 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, schools, and television studios.
E	72	Exterior	Hotels, motels, offices, restaurant/bars, and other developed lands, properties, or activities not included in A-D or F.
F <sup>3</sup>			Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G <sup>3</sup>			Undeveloped lands that are not permitted.
<sup>1</sup> The $L_{eq}$ (h) activity criteria values are for impact determination only and are not design standards for noise abatement measures. All values are A-weighted decibels (dBA). <sup>2</sup> Includes undeveloped lands permitted for this activity category. <sup>3</sup> No NAC (reporting use only)			



Predicted exterior traffic noise levels at land uses in Activity Categories listed in Table 4-1 are used to determine whether traffic noise impacts are predicted to occur. In determining traffic noise impacts for these Activity Categories, primary consideration is given to exterior areas where frequent human use occurs that would benefit from a lowered noise level. In general, an area of frequent human use is an area where people are exposed to traffic noise for an extended period of time on a regular basis.

As an example, the parking lot of a place of worship is not considered to be an area of frequent human use that would benefit from a lowered noise level because people only spend a few minutes there getting in and out of their cars, and there would be no benefit from a lowered noise level. However, if outdoor worship services are held at this location, this would be an area where people are exposed to noise for an extended period of time and where the ability to hear is important. This would then be considered an area of frequent human use that would benefit from a lowered noise level.

Other examples are outdoor seating areas at restaurants or outdoor use areas at hotels, if those are areas where people spend an extended period of time on a regular basis. One practical indicator for determining frequent human use is the presence of existing facilities that invite human use such as benches, barbeque facilities, covered group picnic areas, and uncovered picnic tables.

## **4.2. State Regulations and Policies**

### **4.2.1. California Environmental Quality Act (CEQA)**

Noise analysis under the California Environmental Quality Act (CEQA) may be required regardless of whether or not the project is a Type I project. The CEQA noise analysis is completely independent of the 23 CFR 772 analysis done for NEPA. Under CEQA, the baseline noise level is compared to the build noise level. The assessment entails looking at the setting of the noise impact and then how large or perceptible any noise increase would be in the given area. Key considerations include: the uniqueness of the setting, the sensitive nature of the noise receptors, the magnitude of the noise increase, the number of residences affected, and the absolute noise level

The significance of noise impacts under CEQA are addressed in the environmental document rather than the NSR. Even though the NSR (or noise technical memorandum) does not specifically evaluate the significance of noise impacts under CEQA, it must contain the technical information that is needed to make that determination in the environmental document.

#### **4.2.2. Section 216 of the California Streets and Highways Code**

Section 216 of the California Streets and Highways Code relates to the noise effects of a proposed freeway project on public and private elementary and secondary schools. Under this code, a noise impact occurs if as a result of a proposed freeway project, noise levels exceed 52 dBA  $L_{eq}(h)$  in the interior of public or private elementary or secondary classrooms, libraries, multipurpose rooms, or other noise-sensitive spaces. This requirement does not replace the “approach or exceed” NAC for FHWA Activity Category E for classroom interiors, but it is a requirement that must be addressed in addition to the requirements of 23 CFR 772.

If a project results in a noise impact under this code, noise abatement must be provided to reduce classroom noise to a level that is at or below 52 dBA  $L_{eq}(h)$ . If the classroom noise level generated from freeway and non-freeway sources exceed 52 dBA  $L_{eq}(h)$  prior to the construction of the proposed freeway project, then noise abatement must be provided to reduce the noise to the level that existed prior to construction of the project.

Because there are no public or private elementary or secondary schools located within the project area of potential effect, this section does not apply to this project.



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## **Chapter 5. Study Methods and Procedures**

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### **5.1. Methods for Identifying Land Uses and Selecting Noise Measurement and Modeling Receiver Locations**

A review of aerial photography and a detailed field investigation were conducted to identify land uses that could be subject to traffic and construction noise impacts from the proposed Project. Specifically, land uses in the project area were categorized by land use Activity Category as defined in Table 4-1 and outdoor activity areas were noted. As stated in the Protocol, noise abatement is only considered for areas of frequent human use that would benefit from a lowered noise level. Accordingly, this impact analysis primarily focuses on locations with defined outdoor activity areas, such as single-family residential backyards.

#### **5.1.1. Identified Land Uses within Project Study Area**

Developed and undeveloped land uses in the project vicinity were identified through inspection of aerial photography and a detailed field investigation. Within each land use category, sensitive receivers were then identified. Land uses in the project vicinity include primarily single-family residences on farmland and commercial properties. Additional single-family residences are located within master planned developments.

The generalized land use data and location of particular sensitive receivers were the basis for the selection of representative analysis sites. Receiver locations were modeled to represent the existing noise environment in the project vicinity. Existing noise levels within the project vicinity were generated by modeling existing peak hour traffic data from the Traffic Operations Report for North County Corridor (Fehr & Peers, 2014). Noise measurements taken at receivers identified near adjacent roadways were compared to Existing peak hour noise levels in order to validate the model. The location of short-term and long-term measurement locations and modeled receiver locations are shown on Figure 4.

#### **5.1.2. Extent of Frequent Human Use at Land Uses in Project Area**

As noted previously in this NSR, in determining traffic noise impacts, primary consideration is given to exterior areas where frequent human use occurs that would benefit from a lowered noise level. In general, an area of frequent human use is an area where people are exposed to traffic noise for an extended period of time on a regular basis.



For this project, exterior areas where frequent human use occurs that would benefit from a lowered noise level are limited primarily to outdoor activity areas of individual residences, such as back yards or patios. No such areas were identified for existing commercial uses located within the project study area.

### **5.1.3. Geometry of the Project Area Relative to Existing/Planned Land Use**

The geometry of the project relative to nearby existing and planned land uses was also identified. The geometry of the project will largely conform to the existing topography, which primarily consists of land uses single-family residences on farmland and commercial properties, as well as planned additional single-family residences. The project does include a number of elevated interchanges over local roadways, as well as elevated roadways which will cross over the new North County Corridor, which will cross over the aforementioned existing and planned land uses. Land uses located within the project area are similar in elevation to adjacent local roadways.

## **5.2. Field Measurement Equipment and Procedures**

Short-term noise measurements were taken at pertinent locations within the proposed Project area to help determine proper shielding and background noise levels. Measurements were taken in accordance with the procedures cited in the TeNS document (Caltrans, 2013). All short-term field measurements were 20 minutes in duration and noise levels are in terms of A-weighted decibel equivalent sound level. The following is a brief description of the measurement procedures utilized during field monitoring:

- Microphones were placed 5 feet above the ground elevation for all locations.
- Sound level meters were calibrated before and after each measurement.
- Following the calibration of equipment, a windscreen was placed over the microphone.
- Frequency weighting was set on “A” and slow response.
- Results of the noise measurements were recorded on field data sheets.
- During the noise measurements, any excessive noise contamination such as barking dogs, lawn mowers, and/or aircraft fly-overs were noted.
- Wind speed, temperature, humidity, and weather conditions were observed and documented using a Kestrel 3000 Weather Meter. Traffic speeds were measured and recorded using a Bushnell radar gun.
- The following instruments were used for field noise measurements:

- Sound Level Meter – A Larson Davis (LD) 812 (Serials 0239, 0430), 820 (Serials 1643, 0506) and 824 (Serial 824A3517) System Type 1 sound level meters were used to measure existing noise levels. This sound level meter and its microphone conform to the Institute of Electronic and Electric Engineers and the American National Standards Institute standards for Type 1 instruments.
- Microphone System – LD Model 2560 1.27-centimeter (0.5-inch) pressure microphone, Serial 377B02; LD Model 900 microphone preamplifier, Serial PRM902.
- Acoustic Field Calibrator – LD Model CAL200 (Serials 8534, 4593, 4594) and CAL250 Precision Acoustic Calibrator.
- Sony DSC-W50 Cybershot 6.0 Mega Pixel MPEG camera.

### **5.2.1. Short-Term Measurements**

Short-term measurements were conducted during the time period of January 30, 2012 through February 2, 2012 using a Larson Davis Model 812, 820 and 824 Type 1 sound level meters. Measurements were taken over a 20 minute period at each site. Short-term monitoring was conducted at sensitive land uses. The short-term measurement locations are identified on Figure 4.

Traffic on adjacent roadways were classified and counted during each short-term noise measurement. Vehicles were classified as automobiles, medium-duty trucks, or heavy-duty trucks. Automobiles are vehicles 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 included all cargo vehicles with two axles and six tires. Heavy-duty trucks include all vehicles with three or more axles. Measured speeds using a Bushnell radar gun on adjacent roadways were utilized for model validation purposes.

Field notes were taken at each noise measurement site, including wind speed, temperature, humidity, and weather conditions, which were documented using a Kestrel 3000 Weather Meter. Background noises that increase the measured noise level during the measurement were noted. If background noises increased the measured noise level, the short-term measurement was not used for model calibration. Due to the inability of the model to simulate non traffic related noise, only measurements where traffic was the dominant source was utilized to validate the model.

### **5.2.2. Long-Term Measurement**

Three (3) long-term measurements were conducted over a 24-hour period from January 30, 2012 to January, 31, 2012. The purpose of these measurements was to describe variations in sound levels throughout the day, rather than absolute sound levels at a specific receiver of concern. This measurement was used to determine when the peak hour occurs. If the peak hour occurs during both AM and PM time periods, the traffic data provided by the engineer was utilized to compare traffic volumes between the two time periods to determine the noisiest peak period. Comparing AM and PM traffic volumes under each alternative showed that the PM traffic hour produced higher volumes. Therefore, PM peak hour traffic was utilized.

### **5.3. Traffic Noise Level Prediction Methods**

Traffic noise levels were predicted using the FHWA Traffic Noise Model Version 2.5 (TNM 2.5). TNM 2.5 is a computer model based on two FHWA reports: FHWA-PD-96-009 and FHWA-PD-96-010 (FHWA 1998a, 1998b). Key inputs to the traffic noise model were the locations of roadways, shielding features (e.g., topography and buildings), existing and proposed privacy walls, ground type, and receivers. Three-dimensional representations of these inputs were developed using CAD drawings, aerials, and a topographic map.

Traffic noise was evaluated under existing conditions, design-year no-project conditions, and design-year conditions with the project alternatives. Loudest-hour traffic volumes, vehicle classification percentages, and traffic speeds under existing and design-year conditions were provided provided in the project's Travel Demand Forecast (Fehr & Peers, 2014) for input into the traffic noise model.

To validate the accuracy of the model calculations, TNM 2.5 was used to compare measured noise levels to modeled noise levels at field measurement locations to verify accuracy of the model results. For each location, traffic volumes counted for the 20 minute period during the short-term measurements were normalized to one hour volumes. These normalized volumes were assigned to the corresponding proposed Project area roadways to simulate the noise source strength during the actual measurement period. Modeled and measured noise levels were then compared to determine if calibration would be necessary.

TNM 2.5 is sensitive to the volume of trucks on the roadway because trucks contribute disproportionately to the traffic noise. Truck percentages on the adjacent roadways were obtained from the traffic counts collected during the short-term noise measurements. A



summary of traffic data used for the existing and design year conditions with and without the proposed Project are presented in Appendix A.

#### **5.4. Process for Evaluating Noise Abatement**

Traffic noise impacts are considered to occur at receiver locations where predicted design year noise levels are at least 12 dBA greater than existing noise levels, or where predicted design year noise levels approach or exceed the NAC for the applicable activity category. Where traffic noise impacts are identified, noise abatement must be considered for reasonableness and feasibility as required by 23 CFR 772 and the Protocol.

According to the Protocol, abatement measures are considered acoustically feasible if a minimum noise reduction of 5 dB at impacted receptor locations is predicted with implementation of the abatement measures. In addition, barriers should be designed to intercept the line-of-sight from the exhaust stack of a truck to the first tier of receptors, as required by the Highway Design Manual, Chapter 1100. Other factors that affect feasibility include topography, access requirements for driveways and ramps, presence of local cross streets, utility conflicts, other noise sources in the area, and safety considerations.

After a particular sound wall is found to meet the minimum noise reduction goal of 5 dBA at an impacted receiver, overall reasonableness of the noise abatement must be determined. The overall reasonableness of noise abatement is determined by considering factors such as the noise reduction design goal, the cost of noise abatement and the viewpoints of benefited receivers (including property owners and residents). Caltrans' acoustical design goal states that a sound wall must be predicted to provide at least 7 dBA of noise reduction at one or more benefited receivers. For a wall to be considered reasonable, the 7 dBA design goal must be achieved at one or more benefited receivers. This design goal applies to any receiver and is not limited to impacted receivers. The design goal only applies to sound wall design considerations and is not meant to be associated with the increase in noise from a project. Once the noise abatement criteria is triggered by a receiver approaching or exceeding its respective NAC, the design goal guides the noise abatement evaluation by permitting for the greatest noise reduction within allowable cost limits for all receivers near the proposed sound wall.

Cost considerations for determining noise abatement reasonableness are evaluated by comparing reasonableness allowances and projected abatement costs. The Protocol defines the procedure for assessing reasonableness of sound walls from a cost perspective. A cost-per-receiver allowance is calculated for each benefited receiver (i.e., residences that receive at least 5 dBA of noise reduction from a sound wall). As

established by the Traffic Analysis Protocol (Caltrans, 2013) the 2014 cost allowance is \$71,000 per benefited receiver. Total allowances are calculated by multiplying the cost-per-receivers by the number of benefited receivers. The engineer's cost estimate for a given proposed noise abatement measure is compared to the total reasonableness allowance for all benefited receivers. If the engineer's cost estimate is less than the total reasonable allowance, then the sound wall is considered to be reasonable from a cost perspective.

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## **Chapter 6. Existing Noise Environment**

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### **6.1. Existing Land Uses**

A general reconnaissance of the proposed Project area was performed within the project limits to identify noise-sensitive land uses. Aerial and Microstation mapping provided by the project Engineer, street views in Google Maps and field photographs of the project area were used to identify noise-sensitive land uses. Frequent outdoor human use areas were identified at single-family residences within the proposed Project area. This land use type falls into NAC Activity Category B. The FHWA and Caltrans NAC for Activity Categories B is 67 dBA  $L_{eq}(h)$ . There is a church within the project area which falls into NAC Activity Category D. The FHWA and Caltrans NAC for Activity Category D is interior 52 dBA  $L_{eq}(h)$ . There are commercial properties within the project area as well. This land use type falls into NAC Activity Category E. The FHWA and Caltrans NAC for Activity Categories E is 72 dBA  $L_{eq}(h)$ . Additionally, there are agricultural and undeveloped properties within the project area as well. These land use type falls into NAC Activity Category F and G, respectively. Neither FHWA nor Caltrans have a NAC for Activity Categories F or G. Further, the project area was reviewed to identify any planned and approved future residential developments in the area. However, no future planned and approved future residential developments were identified for evaluation. Local County ordinances and City municipal codes provide exemptions to local noise standards for vehicle noise. Traffic noise resulting from the operation of the proposed Project is categorized as an exemption to these local noise standards.

As required by the Protocol, all properties are evaluated in this analysis; however, noise abatement is only considered for areas of frequent human use that would benefit from a lowered noise level. Accordingly, this impact analysis focuses on locations with defined outdoor activity areas, such as residential backyards.

The section of SR-108 located between SR-219 (Kiernan Avenue)/Tully Road intersection and along the alignment of SR-120/108 east of the City of Oakdale encompasses a variety of land uses including single-family residences on farmland, commercial properties and undeveloped farmland. The single-family residences on farmland, are dispersed throughout the entire project area, with great gaps between each grouping of residences. Clusters of single-family residences in master planned developments are also scattered throughout the proposed Project area. Currently, a large portion of SR-108 operates as a “main street” with several signalized intersections and many commercial and residential driveways. These commercial and residential uses



hinder the flow of traffic, which results in poor traffic circulation patterns and reduces the level of service on the roadway.

Some of the residences located along SR-108 are located on large lots with formal and informal driveway access along the highway making shielding, such as sound walls, difficult to place near these locations. To describe the existing land uses in the project area in further detail, land uses within the project area have been divided into three segments as discussed below. Receiver locations are shown in Figure 4.

**Segment 1: Tully Road to Claus Road:** Single-family residences at the western terminus of the project limits surround the utility substation, located at the northwest corner of Tully Road and Kiernan Avenue. These single-family residences represented by receivers 1.1 to 2.6 have driveway access to Kiernan Avenue and Tully Road. Under the Build conditions, residential right of way acquisition would occur along Kiernan Avenue to accommodate the new alignment, which would bring the roadway closer to receivers in this area. The dominant noise source in the area is traffic travelling on Kiernan Avenue. A church is located along Tully Road and Kiernan Avenue, the Seed of Joy Church. This church does not have any outdoor areas of frequent human use; however there are windows that face the proposed alignment. This church is considered an Activity Category D property, and does have an interior NAC of 52 dBA; however, the predicted noise level at this location is predicted to be 47 dBA.<sup>1</sup>

The concentration of commercial properties for this segment occurs between Tunson Road and McHenry Ave. These commercial properties include a variety of retail businesses such as fitness studios, car maintenance facilities and fast food restaurants. The new project alignment for all Build Alternatives would require right of way acquisition along Kiernan Avenue, including the Empire Sportsmen Association building. Single-family residences represented by 3.1 to 4.1 are located to the north of Kiernan Avenue along McHenry Avenue would become front row receivers to the realigned roadway. In addition, right of way acquisition would occur on McHenry Avenue bringing the roadway closer to these receivers.

The land uses east of McHenry Road to Rosselle Avenue consists mainly of single-family residences on farmlands, represented by receivers 4.2 to 19.6 located adjacent to Claribel Road or their respective local cross streets of Coffee Road, Oakdale Road, Rosselle

<sup>1</sup> A receiver was placed at the corner of the Seeds of Joy Church to determine the exterior noise level. The exterior noise level was predicted to be 67 dbA  $L_{eq}(h)$  for all Build alternatives. Applying a 20 dBA attenuation for building insulation per Table 7-1 within the FHWA Technical Noise Supplement to the Traffic Noise Analysis Protocol (FHWA 2013) provides an interior noise level of 47 dBA  $L_{eq}(h)$  which is below the interior standard 52 dBA  $L_{eq}(h)$ . Therefore, no interior impacts are predicted.

Avenue and Claus Road. Receivers 7.1 through 8.1 represent the Morningside Mobile Home Park, located adjacent to Claribel Road. Receivers 10.1 to 10.5 south of Claribel Road between Oakdale and Rosselle Road would reside adjacent to the new alignment for all Build Alternatives. As the new alignment continues north from Rosselle Road to Terminal Avenue, additional residential right of way acquisition would occur north of Claribel Road. Local roadway improvements would occur along Rosselle Avenue near single-family residences represented by receivers 11.1 to 14.2 that reside along Rosselle Avenue and those located near Black sand Creek Way within a master plan community of the City of Riverbank.

The new alignment would also reside adjacent to the Rainbow Fields Sports Park represented by receiver 17.1 along Claribel Road.

Local roads such as Tully Road, McHenry, Coffee Avenue, Oakdale Road and Rosselle Avenue are the dominant noise sources to residences adjacent to these roadways, while Kiernan Avenue and Claribel are main roadways that are the dominant noise sources for receivers with driveway access directly to these main roads. The terrain in this area is relatively flat and similar to the elevation of nearby local or main roadways. Although some properties have fences along their property line, no existing sound walls in this segment shield receivers from traffic noise.

**Segment 2: Claus Road to Albers Road:** The majority of the receivers within this segment consists of single-family residences located on farmlands, is sparsely located throughout the area and experience a serene existing noise environment. The only concentrated single-family area in this segment is the Olive Lane Mobile Home Park located along Claus Road, represented by Receivers 19.1 and 19.2. Receivers 19.3 to 19.5 represent single-family residences on farmlands near Plainview Road. The widening of Claus Road in this area would bring these receivers closer to the realigned roadway.

Local roads in this zone include Terminal Avenue, Claus Road, McGee Avenue and Langsworth Road, while Claribel is the main road. Traffic traveling on Claribel Road is the dominant noise source in the area. The terrain in this segment is relatively flat and similar to the elevation of nearby local or main roadways. There are no existing sound walls in this segment that shield receivers from traffic noise. Receivers 21.1 to 23.9 represent the single-family residences on farmland. These receivers experience a serene existing noise environment.

**Segment 3: Albers Road to SR-120/108:** The sizes of the agricultural parcels with single-family residences in this segment are larger than the parcels in Segments 1 and 2. Receivers 24.1 to 33.9 and 37.1 and 38 represent the single-family residences on

farmland. These receivers experience a serene existing noise environment. Access to the properties within this segment is limited to travel on local roadways. No main roadways lead to the agricultural parcels in this segment. Single-family residences, represented by 35.1 to 35.6 reside in the City of Oakdale located near Sierra Road and Orsi Road and along Orange Blossom Road. The Oakdale community consists of several single-family homes in the Oakdale Golf and Country Club master plan community. Existing sound walls ESW-1, ESW-2 and ESW-3 shield these receivers from traffic noise on local roadways. SR-120/108 provides the main access to local roadways within this community. Beyond the City of Oakdale, single-family residences represented by 39.1 to 42.3 are sparsely located along Lancaster Road with backyards facing SR-120/SR-108. Similar to the other segments, the terrain continues to be relatively flat and similar in elevation to local roadways. There are no existing sound walls that shield these receivers from traffic noise on local roadways.

## **6.2. Noise Measurement Results**

The existing noise environment of the project area was characterized by conducting three (3) long-term and forty-two (42) short-term noise measurements at representative noise-sensitive receiver locations. The initial field measurements include a greater number of monitoring sites to capture general background noise levels as well as dominant noise by traffic. Further, as the majority of the project area is within agricultural land uses, field measurements were also used to assist in determining whether non-traffic sources contributed to existing noise levels. A subset of the forty-two (42) short-term noise measurements where the dominant noise source is traffic was utilized for model calibration.

### **6.2.1. Short-Term Noise Level Measurement Results**

Short-term monitoring was conducted at forty-two (42) locations. Measurements were taken for a duration of 20 minutes at each site. Short-term monitoring was conducted at or adjacent to Activity Category B land uses. The short-term measurement locations are identified on Figure 3.

During the short-term measurements, field staff attended each meter, checked calibration before and after the measurement and took field notes. Field conditions such as traffic counts, humidity, wind speed, weather conditions and dominant noise sources were also identified and logged. Due to limited access to areas of frequent human use during the time of measurement, acoustically equivalent measurement locations were selected for a majority of the short-term monitoring sites. Specific locations of the measurement positions for each short-term measurement site are illustrated on the noise monitoring forms. Field staff conducted measurements at sites that were free from background



contamination. However, background contamination resulting from farm animals and equipment was unavoidable at a few field measurements sites taken near residences which cannot be simulated in the TNM model. Therefore, these sites were not utilized for model calibration. Noise measurement field monitoring forms are located in Appendix C.

Table 6-1 summarizes the results of the short-term noise monitoring conducted in the project area. Table 6-2 describes the physical locations of the noise monitoring sites. These short-term noise measurements were used to calibrate the noise model. Additional model receivers were placed at areas of frequent human use to calculate the noise levels at sensitive land uses in the project area. Areas of frequent human use were identified at areas where the presence of existing facilities would invite human use such as lawn chairs, benches, barbeques, covered porches, and other outdoor recreational equipment. Due to the size of the parcels in the project the area, several areas of frequent human use areas could be identified on one parcel. These areas often were not located in the backyards of residences, but on side yards and front porches. For purposes of these study, frequent human use areas that were most exposed to traffic noise was selected.

**Table 6-1. Summary of Short-Term Measurements**

Receiver	Address	Land Uses	Date and Start Time	Duration (minutes)	Measured dBA L <sub>eq</sub>
<b>Segment 1: Tully Road to Claus Road</b>					
R1/ST1	5236 Tully Rd, Modesto	SFR	1/30/12 11:22AM	20	52
R2/ST2	1348 Kiernan Ave, Modesto	SFR	1/31/2012 10:20 AM	20	59
R3/ST3	201 Crawford Rd, Modesto	SFR	1/30/2012 3:40 PM	20	65
R4/ST4	5150 McHenry Ave, Modesto	SFR	1/30/2012 3:10 PM	20	71
R5/ST5	4824 Coffee Rd, Modesto	SFR	1/31/2012 11:00 AM	20	63
R6/ST6	5242 Coffee Rd, Modesto	SFR	1/30/2012 12:21 PM	20	59
R7/ST7	1512 Cabo Dr, Modesto	SFR	1/31/2012 4:43 PM	20	58
R8/ST8	1529 Sailfish Dr, Modesto	SFR	1/31/2012 4:43 PM	20	54
R9/ST9	1526 Vella Way, Modesto	SFR	2/2/2013 11:06 AM	20	57
R10/ST10	4736 Oakdale Avenue, Modesto	SFR	2/1/2012 12:02 AM	20	65
R11/ST11	5010 Winding River Ct., Riverbank	SFR	1/31/2012 10:45 AM	20	48

**Table 6-1. Summary of Short-Term Measurements**

Receiver	Address	Land Uses	Date and Start Time	Duration (minutes)	Measured dBA L <sub>eq</sub>
R12/ST12	5033 Coolwater Ct., Riverbank	SFR	1/30/2012 1:15 PM	20	56
R13/ST13	4217 Rosselle Avenue, Riverbank	AG	1/30/2012 3:10 PM	20	66
R14/ST14	5118 Rosselle Avenue, Riverbank	SFR	1/31/2012 12:40 PM	20	58
R15/ST15	3701 Davis Avenue, Modesto	SFR	1/31/2012 3:25 PM	20	54
R16/ST16	3961 Davis Avenue, Modesto	SFR	1/31/2012 2:30 PM	20	54
R17/ST17	3800 Claribel Road, Modesto	SFR	1/30/2012 4:30 PM	20	61
R18/ST18	4712 Terminal Avenue, Modesto	SFR	2/2/2012 11:55 AM	20	60
R19/ST19	4628 Claus Road, Modesto #22	SFR	2/2/2012 10:51 AM	20	43
R20/ST20	4718 McGee Ave, Modesto	SFR	2/2/2012 10:54 AM	20	45
<b>Segment 2: Claus Road to Albers Road</b>					
R21/ST21	5236 Eleanor Rd, Modesto	SFR	2/2/2012 11:33 AM	20	49
R22/ST22	4608 Langworth Rd, Modesto	SFR	1/31/2012 12:17 PM	20	64
R23/ST23	4943 Claribel Road, Modesto	SFR	1/30/2012 4:39 PM	20	63
R24/ST24	5405 Epperson Ct, Oakdale	SFR	1/30/2012 4:02 PM	20	57
R25/ST25	6201 Patterson Rd, Oakdale	SFR	1/30/2012 3:28 PM	20	65
R26/ST26	7051 Bentley Rd, Oakdale	SFR	2/2/2012 12:53 PM	20	47
R27/ST27	5837 Volk Rd, Oakdale	SFR	2/2/2012 1:06 PM	20	43
R28/ST28	6224 Kaufman Rd, Oakdale	SFR	2/2/2012 2:49 PM	20	49
<b>Segment 3: Albers Road to SR-120/108</b>					
R29/ST29	8406 Patterson Road, Oakdale	SFR	2/1/2012 2:45 PM	20	61
R30/ST30	6613 Smith Rd, Oakdale	SFR	2/1/2012 3:42 PM	20	58
R31/ST31	1330 Town Hill Ave, Oakdale	SFR	2/1/2012 3:05 PM	20	45
R32/ST32	565 Edgetown Ave, Oakdale	SFR	2/2/2012 3:03 PM	20	52

**Table 6-1. Summary of Short-Term Measurements**

<b>Receiver</b>	<b>Address</b>	<b>Land Uses</b>	<b>Date and Start Time</b>	<b>Duration (minutes)</b>	<b>Measured dBA L<sub>eq</sub></b>
R33/ST33	279 S Stearns Rd, Oakdale	SFR	2/1/2012 3:37 PM	20	56
R34/ST34	8667 Tulloch Rd, Oakdale	SFR	2/1/2012 3:07 PM	20	45
R35/ST35	10330 Rio Sombra Ct., Oakdale	SFR	2/1/2012 4:30 PM	20	66
R36/ST36	10520 St. Andrew Ct., Oakdale	SFR	2/1/2012 4:58 PM	20	54
R37/ST37	6913 Stoddard Rd, Oakdale	SFR	2/1/2012 4:34 PM	20	50
R38/ST38	12424 Lancaster Rd., Oakdale	SFR	2/1/2012 10:53 AM	20	56
R39/ST39	13230 Lancaster Rd, Oakdale	SFR	2/1/2012 12:32 PM	20	60
R40/ST40	13949 Lancaster Rd, Oakdale	SFR	2/1/2012 11:44 AM	20	61
R41/ST41	10536 Warnerville Rd, Oakdale	SFR	3/24/2014 10:17 AM	20	57
R42/ST42	13712 Lancaster Rd, Oakdale	SFR	3/24/2014 11:35 AM	20	45

*Note:*

*SRF = Single Family Residence*

*COM = Commercial*

*AG = Agriculture*

*dBA – decibels or A-weighted sound level*

*L<sub>eq</sub>(h) - Equivalent Sound Level*



**Table 6-2. Physical Location of Noise Level Measurements**

Receiver ID	Location Description	Noise Sources	Comments
<b>Segment 1: Tully Road to Claus Road</b>			
1/ST1	Single family residence located north of Kiernan Avenue and east of Tully Road. The elevation at this location is approximately the same as the nearby roadways. There is no existing barrier at this measurement location.	Traffic traveling on Tully Road.	The SLM was placed in an orchard located south of the single family residence. The SLM was approximately 100 feet east of the Tully Road edge of shoulder.
2/ST2	Single family residence located south of Kiernan Avenue and west of Tully Road. The elevation at this location is approximately the same as the nearby roadways. There is no existing barrier at this measurement location.	Traffic traveling on Tully Road and Kiernan Avenue.	The SLM was placed in the front yard of the property, approximately 190 feet south of Kiernan Avenue.
3/ST3	Single family residence located east of McHenry Road and north of Crawford Road. The elevation at this location is approximately the same as the nearby roadways. There are no existing barriers shielding this residential property.	Traffic traveling on McHenry Road and Kiernan Avenue.	The SLM was placed in an orchard east of the residence, located between the home and McHenry Road. The meter was placed approximately 40 feet east of McHenry Road and just north of Crawford Road.
4/ST4	Short-term noise measurement taken in front of a restaurant located north of Claribel Road and east of McHenry Road. The elevation at this location is approximately the same as the nearby roadways. There are no existing barriers shielding this location.	Traffic traveling on McHenry Road and slightly from Claribel Road.	The SLM was placed just south of the restaurant building, approximately 20 feet east of McHenry Road.
5/ST5	Single family residence located south of Claribel Road and east of Coffee Road. The elevation at this location is relatively and approximately the same as the nearby roadways. There are no existing barriers shielding this location.	Traffic traveling on Coffee Road.	The SLM was placed in the driveway of the residential property, approximately 30 feet east of Coffee Road.
6/ST6	Single family residence located north of Claribel Road and east of Coffee Road. The elevation at this location is relatively flat and approximately the same as the nearby roadways. There is no existing barrier shielding this location.	Traffic traveling on Coffee Road.	The SLM was placed in an orchard directly adjacent to the residence. The meter was located approximately 100 feet east of Coffee Road.
7/ST7	Mobile home residence located in the Morningside Mobile Home Park. This community of mobile homes is located just south of Claribel Road and east of Coffee Road. The elevation at this location is similar to the nearby roadways. There is an existing fence on the private property line of the mobile home park.	Traffic traveling on Claribel Road and within the mobile home park.	The SLM was placed approximately 15 feet north of the residence on Cabo Street.
8/ST8	Mobile home residence located in the Morningside Mobile Home Park. This community of mobile homes is located just south of Claribel Road and east of Coffee Road. The elevation at this location is similar to the nearby roadways. There is an existing fence on the private property line of the mobile home park.	Traffic traveling on Claribel Road and within the mobile home park.	The SLM was placed at the intersection of Sailfish Drive and White Wing Drive, approximately 15 feet south of the residence.

**Table 6-2. Physical Location of Noise Level Measurements**

Receiver ID	Location Description	Noise Sources	Comments
9/ST9	Single family residence located south of Vella Way and east of Coffee Road. The elevation at this location is relatively the same as the nearby roadways. There is no existing barrier shielding this receiver from traffic noise.	Traffic traveling on Vella Way.	The SLM was placed in front of the residence, approximately 15 feet south of the edge of Vella Way.
10/ST10	Single family residence located south of Claribel Road and east of Oakdale Road. The elevation at this location is relatively similar to the nearby roadways. There is no existing barrier shielding this short-term measurement location.	Traffic traveling on Oakdale Road and Claribel Road.	The SLM was placed in an orchard that is directly adjacent to the residence, approximately 50 feet east from the edge of Oakdale Road.
11/ST11	Single family residence located north of Claribel Road and west of Rosselle Avenue. This residence is located in a community of single family residences. The elevation at this location is relatively flat and approximately the same as the nearby roadways. There are existing wood fences along each residence private property line. The fences are approximately 6 feet in height. However, there are gaps in these fences that allow access to a bike path adjacent to the community.	Traffic traveling on roads with the community and Claribel Road.	The SLM was placed in the cul-de-sac of Winding River Court approximately 300 feet north of Claribel Road. The meter was placed in front of the gap in the wood fence surrounding the private property line of the community.
12/ST12	Single family residence located north of Claribel Road and west of Rosselle Avenue. This residence is located in a community of single family residences. The elevation at this location is relatively flat and approximately the same as the nearby roadways. There are existing wood fences along each residence private property line. The fences are approximately 6 feet in height. However, there are gaps in these fences that allow access to a bike path adjacent to the community.	Traffic traveling on roads with the community and Claribel Road.	The SLM was placed in the cul-de-sac of Coowater Court approximately 300 feet north of Claribel Road. The meter was placed in front of the gap in the wood fence surrounding the private property line of the community.
13/ST13	This short-term noise measurement was taken in an open field at the southwest quadrant of the intersection of Rosselle Avenue and Plainview Road. The elevation at this location is relatively flat and similar to the adjacent roadways. There is no existing barrier shielding this location.	Traffic traveling on Rosselle Avenue and Plainview Road.	The SLM was placed in the southwest quadrant of the intersection approximately 40 feet west of the edge of Rosselle Avenue.
14/ST14	Single family residence located north of Claribel Road and east of Rosselle Avenue. The elevation at this location is relatively flat and similar to the nearby roadways. There is no existing barrier shielding this receiver location.	Traffic traveling on Rosselle Avenue and Claribel Road.	The SLM was placed approximately 80 feet south of the residence and approximately 40 feet east of Rosselle Avenue.
15/ST15	Single family residence located south of Davis Avenue and east of Terminal Avenue. The elevation at this location is relatively flat and similar to the adjacent roadways. There is an existing wire fence surrounding the property; however, there is no existing barrier shielding this residence.	Traffic traveling on Terminal Avenue and Davis Avenue.	The SLM was placed in a field directly adjacent to the residence, between the house and Terminal Avenue.
16/ST16	Single family residence located north of Claribel Road and west of Claus Road. The elevation at this location is relatively flat and similar to the adjacent roadways. There is no existing barrier shielding this residential property.	Traffic traveling on Claus Road and Davis Avenue.	The SLM was placed in front of the residence on Davis Avenue, approximately 250 feet east of Claus Road.

**Table 6-2. Physical Location of Noise Level Measurements**

<b>Receiver ID</b>	<b>Location Description</b>	<b>Noise Sources</b>	<b>Comments</b>
17/ST17	This short-term noise measurement was taken at a six field baseball diamond sports complex located north of Claribel Road and east of Claus Road. The elevation at this location is relatively flat and similarly to the adjacent roadways. There is an existing chain link fence surrounding the sports complex property. There is no existing barrier shielding traffic noise.	Traffic traveling on Claribel Road, Claus Road and noises associated with the complex.	The SLM was placed south of the parking lot located on the property, approximately 100 feet east of Claus Road.
18/ST18	Single family residence located south of Claribel Road and east of Terminal Avenue. The elevation at this location is relatively flat and similar to the adjacent roadways. There is no existing barrier shielding this residential property.	Traffic traveling on Claribel Road and Terminal Avenue.	The SLM was placed in the front yard of the residence, approximately 100 feet east of Terminal Avenue.
19/ST19	This measurement was taken at the Olive Lane Trailer Park, located south of Claribel Road and east of Claus Road. The elevation at this location is relatively flat and is similar to the adjacent roadways. There is no existing barrier shielding this property.	Traffic traveling on Claus Road, Claribel Road, and roadways within the community.	The SLM was placed between Units 20 and 22, approximately 600 feet east of the edge of Claus Road.
20/ST20	This measurement was taken the single family residence located south of Claribel Road and east of McGee Avenue. The elevation at this location is relatively flat and is similar to the adjacent roadways. There is no existing barrier shielding this property.	Traffic traveling along McGee and slightly traffic traveling on Claribel Road.	The SLM was placed approximately 15 feet north of the residence and approximately 120 feet east of McGee Road.
<b>Segment 2: Claus Road to Albers Road</b>			
21/ST21	Single family residence located north of Claribel Road and east of Eleanor Avenue. The elevation at this location is relatively flat and is similar to the adjacent roadways. There is no existing barrier shielding this location from traffic noise.	Traffic traveling on Eleanor Avenue and Claribel Road.	The SLM was placed approximately 54 feet east of Eleanor Avenue and 10 feet north of the residence.
22/ST22	This noise measurement was taken in an orchard across from a single family residence located south of Claribel Road and east of Langworth Road. The elevation at this location is relatively flat and is similar to the nearby roadways. There is no existing barrier shielding this residence from traffic noise.	Traffic traveling on Langworth Road.	The SLM was placed approximately 33 west of Langworth Road, adjacent to a pond that is located on the property.
23/ST23	Single family residence located south of Claribel Road and west of Langworth Road. The elevation at this location is relatively flat and is similar to the adjacent roadways. There is no existing barrier in this location to shield receivers from traffic noise.	Traffic traveling on Claribel Road and Langworth Road.	The SLM was placed approximately 50 feet south of Claribel Road and approximately 200 feet west of Langworth Road.
<b>Segment 3: Albers Road to SR-120/108</b>			
24/ST24	The noise measurement was taken in front of the Sisk Tallow Recycling facility located west of Crane Road and South of Patterson Road. The terrain is relatively flat in this area and the elevation for this location is similar to the adjacent roadways. There is no existing barrier shielding this location.	Traffic traveling on Patterson Road and Crane Road.	The SLM was placed in front of the Sisk Tallow Recycling company, approximately 54 feet south of Patterson Road.



**Table 6-2. Physical Location of Noise Level Measurements**

Receiver ID	Location Description	Noise Sources	Comments
25/ST25	The noise measurement was taken in front of the Sisk Tallow Recycling facility located west of Crane Road and South of Patterson Road. The terrain is relatively flat in this area and the elevation for this location is similar to the adjacent roadways. There is no existing barrier shielding this location.	Traffic traveling on Patterson Road and Crane Road.	The SLM was placed in front of the Sisk Tallow Recycling company, approximately 54 feet south of Patterson Road.
26/ST26	Single family residence located south of Lexington Avenue and east of Bentley Road. The terrain at this location is relatively flat and is similar in elevation to the adjacent roadways. There is no existing barrier shielding this location from traffic noise.	Traffic traveling on Lexington Avenue and Bentley Road.	The SLM was placed in front of the residence approximately 100 feet east of Bentley Road and 3 feet north of the walkway to the front door of the residence.
27/ST27	Single family residence located north of Claribel Road and west of Valk Road. The terrain at this location is relatively flat and is similarly to the adjacent roadways. There is no existing barrier shielding this location from traffic noise.	Traffic traveling on Albers Road and Valk Road.	The Sound level meter was placed on the east side of the residential property along Valk Road.
28/ST28	Single family residence located south of Patterson Road and west of Kaufman Road. The terrain at this location is relatively flat and the elevation is similar to the nearby roadways. There is no existing barrier shielding this location from traffic noise.	Traffic traveling on Patterson Road and Kaufman Road.	The SLM was placed south of the residential property and west of Kaufman Road.
29/ST29	Single family residence located south of Patterson Road and west of Albers Road. The terrain at this location is relatively flat and the elevation is similar to the nearby roadways. There is no existing barrier shielding this location from traffic noise.	Traffic traveling on Patterson Road and Albers Road.	The SLM was placed approximately 140 feet south of Patterson Road, adjacent to a cow pasture.
30/ST30	Single family residence located south of Warnerville Road and west of Smith Road. The terrain at this location is relatively flat and the elevation is similar to the nearby roadways. There is no existing barrier shielding this location from traffic noise.	Traffic traveling on Smith Road.	The SLM was placed in front of the residence approximately 50 feet west of Smith Road and 10 feet east from the residential building.
31/ST31	Single family residence located south of Sierra Road and east of Town Hill Road. The terrain at this location is relatively flat and the elevation is similar to the nearby roadways. There is a wire fence surrounding the property; however, there is no existing barrier shielding this location from traffic noise.	Traffic traveling on Town Hill Road.	The SLM was placed just outside the fence line of the property approximately 30 feet east of Town Hill Road.
32/ST32	Single family residence located north of Sierra Road and west of Orsi Road. This residence is located in a community of single family residences. The elevation of the residence is slightly lower in elevation than the adjacent roadways. There is an existing barrier, approximately 6 feet in height, shielding the residences in this community from traffic noise.	Traffic traveling on Sierra Road and Orsi Road.	The SLM was placed just outside the existing barrier on the private property line of the residence.
33/ST33	Single family residence located north of Sierra Road and east of S. Stearns Road. The terrain at this location is relatively flat and has a similar elevation of the adjacent roadways. There is no existing barrier shielding this residence from traffic noise.	Traffic traveling on S. Stearns Road.	The SLM was placed south of the residence, between the property fence and orchards. The meter was placed 100 feet east of S. Stearns Road.

**Table 6-2. Physical Location of Noise Level Measurements**

Receiver ID	Location Description	Noise Sources	Comments
34/ST34	Single family residence located north of Sierra Road and west of Tullock Road. The terrain at this location is relatively flat and has a similar elevation of the adjacent roadways. There is no existing barrier shielding this residence from traffic noise.	Traffic traveling on S. Stearns Road.	The SLM was placed north of a cow pasture located on the property, approximately 500 feet west of Tullock Road.
35/ST35	Single family residence located north of SR 108 and east of Atlas Road in a community of other single family residences. The terrain at this location is relatively flat and has a similar elevation of the adjacent roadways. There is an existing barrier approximately 6 feet in height shielding the residence of this community from traffic noise.	Traffic traveling on SR 108 and on roadways within the community.	The SLM was placed on the residential property approximately 100 feet north of the existing barrier and 30 feet east of the wooden fence along the western property line.
36/ST36	Single family residence located north of SR 108 and east of Rio Casa Drive in a community of other single family residences. The terrain at this location is relatively flat and has a similar elevation of the adjacent roadways. There is an existing barrier approximately 6 feet in height shielding the residence of this community from traffic noise.	Traffic traveling on SR 108 and on roadways within the community.	The SLM was placed on an empty lot located within the community. The SLM was approximately 300 feet north of SR 108 and 20 feet east of Rio Casa Drive.
37/ST37	Single family residence located south of Warnerville Road and west of Stoddard Road. The terrain at this location is relatively flat and has a similar elevation of the adjacent roadways. There is no existing barrier shielding this residence from traffic noise. There is a gate located on the residences private property line that does not provide any abatement.	Traffic traveling on Warnerville Road and Stoddard Road.	The SLM was placed on the residential property approximately 50 feet south of Warnerville Road, 21 feet east of the western property line and 42 feet west of the residential building.
38/ST38	Single family residence located north of SR 108, south of Lancaster Road and east of Wamble Road. The terrain in this area is uneven and the residences are slightly lower in elevation than the adjacent roadways. There is no existing barrier shielding this residence from traffic noise.	Traffic traveling on SR 108.	The SLM was placed just outside the fence on the private property line of the residence. The meter was approximately 200 feet north of SR 108.
39/ST39	Single family residence located north of SR 108, south of Lancaster Road and east of Wamble Road. The terrain in this area is uneven and the residences are slightly lower in elevation than the adjacent roadways. There is no existing barrier shielding this residence from traffic noise.	Traffic traveling on SR 108.	The SLM was placed on the residential property approximately 100 feet north of SR 108 and 15 feet west of the tennis court located on the property.
40/ST40	Single family residence located north of SR 108, south of Lancaster Road and east of Wamble Road. The terrain in this area is uneven and the residences are slightly lower in elevation than the adjacent roadways. There is no existing barrier shielding this residence from traffic noise.	Traffic traveling on SR 108.	The SLM was placed just outside the southern property line of the residence. Approximately 100 feet north of SR 108 and 15 feet east of the western terminus of the wire fence located along the property line.
41/ST41	Single family residence located south of Warnerville Road and west of Stoddard Road. The terrain at this location is relatively flat and has a similar elevation of the adjacent roadways. There is no existing barrier shielding this residence from traffic	Traffic traveling on Warnerville Road.	The SLM was placed in front of the house facing Warnerville Road, next to chairs located in front of the house. The meter was placed approximately 25 feet south of Warnerville Road and 10 feet east of the western end of the residence building.

**Table 6-2. Physical Location of Noise Level Measurements**

Receiver ID	Location Description	Noise Sources	Comments
42/ST42	Single family residence located north of SR 108, south of Lancaster Road and east of Wamble Road. The terrain in this area is uneven and the residences are higher in elevation than SR 108. A large berm between the residence and the roadway provides abatement for this area. There is no existing barrier surrounding the area.	Traffic traveling on SR 108.	The SLM was placed on the back patio of the residence. Approximately 30 feet from the back door of the residence.

Source: Entech Consulting Group, March 2014  
ST-Short-term measurement identifier  
SLM – sound level meter

### 6.2.2. Long-Term Noise Level Measurement Results

The purpose of long-term monitoring is to gather sound level data over a 24-hour period to find the noisiest hour for traffic and describe sound levels throughout the day rather than absolute levels at a specific receiver location. Three (3) long term measurements were conducted using a Larson-Davis Model 824 Type 1 sound level meter. The long-term noise level measurements were performed over a 24 hour period from, January 30, 2012 to January, 31, 2012. The locations of each long term measurement are shown on Figure 4.

Table 6-3 and Figure 5 shows that traffic noise peaks for long-term monitoring site LT-1 occur during the hours 5:00 pm – 6:00 pm. It should be noted that during the noisiest hour, existing noise levels exceeded the NAC standard of 67 dBA  $L_{eq}(h)$  for Activity Category B.

The monitoring site for LT-1 is located at approximately 14821 Coffee Rd, Modesto CA. This is an agricultural field and was recorded approximately 500 feet south of Claribel Rd and 350 feet west of Coffee Rd.



**Table 6-3. Long Term Measurement LT-1**

Hour Beginning	dBA L <sub>eq</sub> [h]	Difference from Loudest Hour (dBA)
9:00 AM	72	3
10:00 AM	73	2
11:00 AM	73	2
12:00 PM	73	2
1:00 PM	73	2
2:00 PM	73	2
3:00 PM	74	1
4:00 PM	74	1
5:00 PM	<b>75</b>	0
6:00 PM	73	2
7:00 PM	72	3
8:00 PM	71	4
9:00 PM	71	4
10:00 PM	68	7
11:00 PM	67	8
12:00 AM	65	10
1:00 AM	63	12
2:00 AM	63	12
3:00 AM	65	10
4:00 AM	67	8
5:00 AM	69	6
6:00 AM	72	3
7:00 AM	73	2
8:00 AM	73	2

Note:

Source: Entech Consulting Group, January/February 2012

Worst noise hour noise level is in bold.

dBA – decibels or A-weighted sound level

L<sub>eq</sub>(h) - Equivalent Sound Level

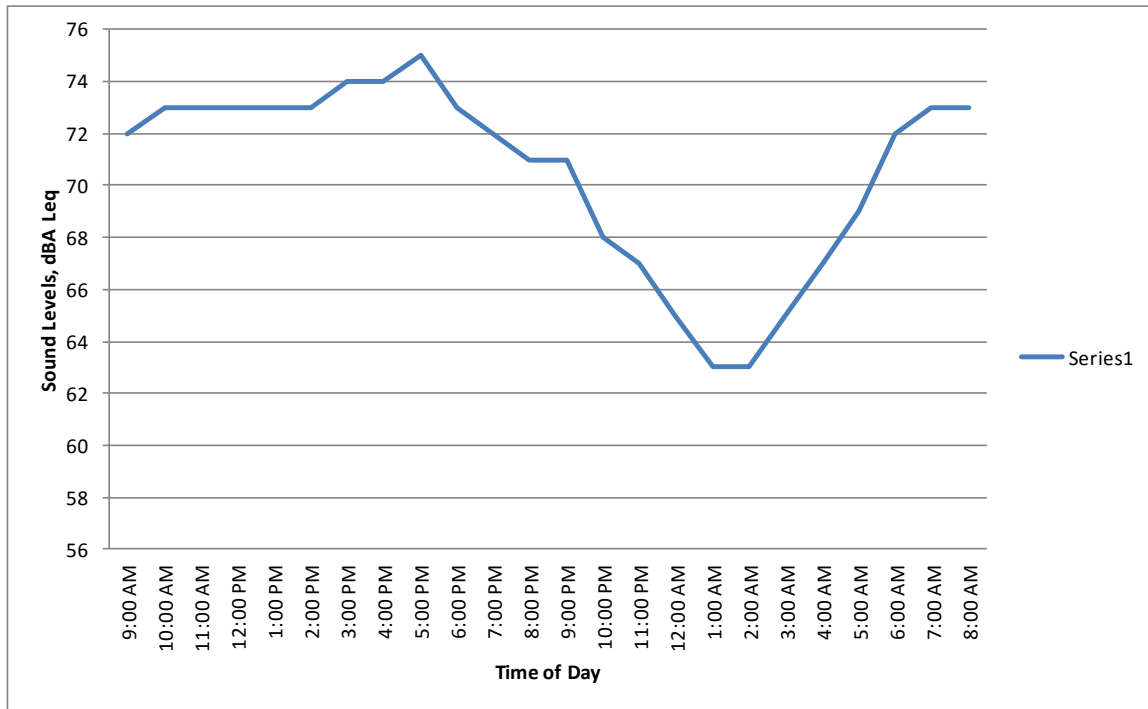
**Figure 4. Long-Term Noise Levels LT-1**

Table 6-4 and Figure 5 shows that traffic noise peaks for long-term monitoring site LT-2 occur during the hours of 7:00 am – 10:00 am and 3:00 pm and 6:00 pm. It should be noted that during the noisiest hour, existing noise levels exceeded the NAC standard of 67 dBA  $L_{eq}(h)$  for Activity Category B.

The monitoring site for LT-2 is located at approximately 3800 Claribel Road, Modesto, CA. This is a six field baseball diamond sports complex and was recorded approximately 400 feet south of Claribel Rd and 50 feet west of Claus Rd in the southeast corner of the complex's parking lot.

**Table 6-4. Long Term Measurement LT-2**

Hour Beginning	dBA $L_{eq}[h]$	Difference from Loudest Hour (dBA)
12:00 AM	59	10
1:00 AM	60	9
2:00 AM	59	10
3:00 AM	60	9
4:00 AM	62	7
5:00 AM	65	4
6:00 AM	68	1
7:00 AM	<b>69</b>	0
8:00 AM	<b>69</b>	0
9:00 AM	<b>69</b>	0
10:00 AM	68	1
11:00 AM	67	2
12:00 PM	67	2
1:00 PM	68	1
2:00 PM	68	1
3:00 PM	<b>69</b>	0
4:00 PM	68	1
5:00 PM	<b>69</b>	0
6:00 PM	66	3
7:00 PM	65	4
8:00 PM	66	3
9:00 PM	64	5
10:00 PM	64	5
11:00 PM	61	8

Note:

Source: Entech Consulting Group, March 2014

Worst noise hour noise level is in bold.

dBA – decibels or A-weighted sound level

$L_{eq}(h)$  - Equivalent Sound Level



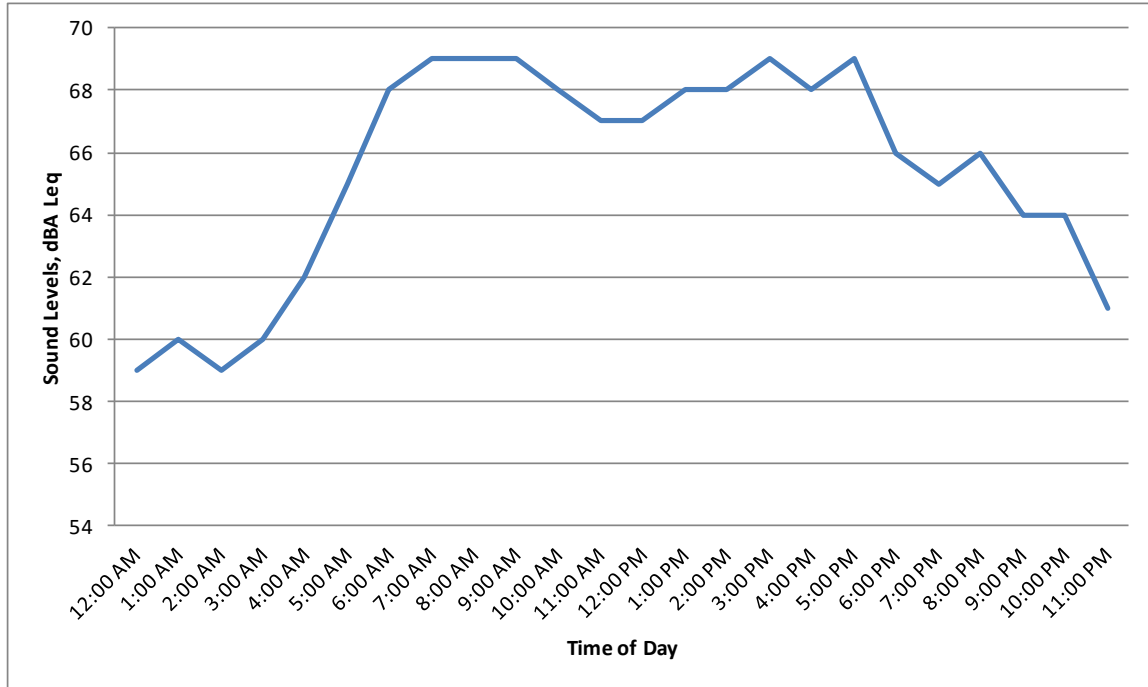
**Figure 5. Long-Term Noise Levels LT-2**

Table 6-5 and Figure 6 shows that traffic noise peaks for long-term monitoring site LT-3 occur during the hours of 7:00 am – 8:00 am and 5:00 pm and 6:00 pm. It should be noted that during the noisiest hour, existing noise levels approaches the NAC standard of 67 dBA  $L_{eq}(h)$  for Activity Category B.

The monitoring site for LT-3 is located at approximately 6666 Patterson Rd, Oakdale, CA. This is a an open agricultural field and was recorded approximately 700 feet south of Patterson Rd and 1500 feet west of Bentley Rd, adjacent to the Hetch Hetchy transformers.

**Table 6-5. Long Term Measurement LT-3**

Hour Beginning	dBA $L_{eq}[h]$	Difference from Loudest Hour (dBA)
10:00 AM	62	5
11:00 AM	61	6
12:00 PM	64	3
1:00 PM	60	7
2:00 PM	63	4
3:00 PM	64	3
4:00 PM	63	4
5:00 PM	<b>66</b>	1
6:00 PM	64	3
7:00 PM	59	8
8:00 PM	62	5
9:00 PM	59	8
10:00 PM	59	8
11:00 PM	58	9
12:00 AM	55	12
1:00 AM	44	23
2:00 AM	46	21
3:00 AM	46	21
4:00 AM	52	15
5:00 AM	58	9
6:00 AM	65	2
7:00 AM	<b>67</b>	0
8:00 AM	64	2
9:00 AM	64	2

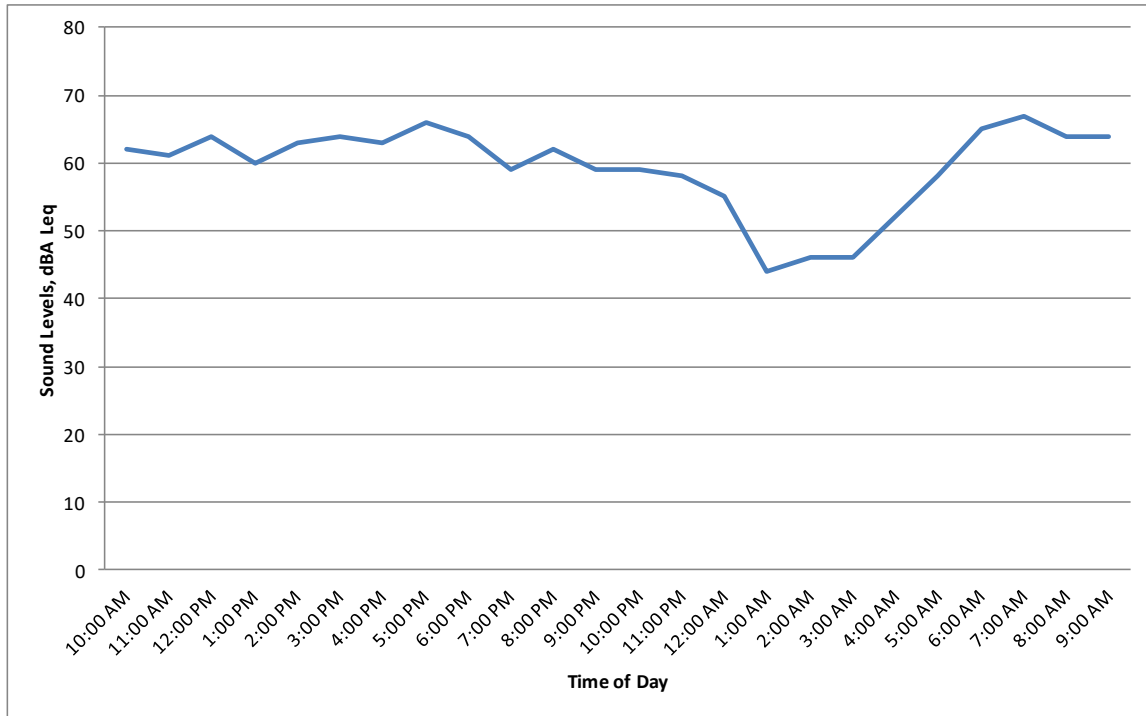
Note:

Source: Entech Consulting Group, March 2014

Worst noise hour noise level is in bold.

dBA – decibels or A-weighted sound level

$L_{eq}(h)$  - Equivalent Sound Level

**Figure 6. Long-Term Noise Levels LT-3**

### 6.3. Model Calibration

A total of thirty (30) short-term measurements would be utilized to calibrate the TNM2.5 model. During the field measurements, traffic counts and posted speeds were noted for model calibration. The traffic counts were tabulated according to three vehicle types, including automobiles, medium-duty trucks (2-axle with 6-wheels but not including pick-up trucks) and heavy-duty trucks (3 or more axles). As a general rule, the noise model is considered to be calibrated if the field measured noise levels versus the modeled noise levels (using field collected traffic data) agree within 3 dBA of each other. If differences are more than 3 dBA, refinement of the noise model is performed until there is agreement between the two values. If after thorough re-evaluation calibration still cannot be achieved due to complex topography or other unusual circumstances, then a K-factor is added such that the measured versus modeled values agree before any predictions can be made with the model.

Table 6-6 shows the representative modeled receiver locations, measured ambient noise level, the modeled noise levels using traffic counts and measured vehicle speeds during noise monitoring. The traffic volumes that were used in the calibration process are



located in Appendix A. TNM 2.5 was used to compare measured traffic noise levels to modeled noise levels at field measurement locations. Table 6-6 compares measured and modeled noise levels at each measurement location. The predicted sound levels are within 3 dBA of the measured sound levels and are thus considered to be in reasonable agreement with the measured sound levels. Therefore, no calibration of the model was necessary.

**Table 6-6. Comparison of Measured to Predicted Sound Levels**

Measurement Position	Measured Sound Level (dBA)	Predicted Sound Level (dBA)	Measured minus Predicted (dBA)
R1/ST1	52.3	52.5	-0.2
R2/ST2	58.8	57.5	1.3
R3/ST3	64.7	65.5	-0.8
R4/ST4	70.7	68.9	1.8
R5/ST5	63.4	62.8	0.6
R6/ST6	58.5	56.9	1.6
R7/ST7	58.3	57.6	0.7
R8/ST8	55	55.5	-0.5
R10/ST10	65	64.1	0.9
R11/ST11	48.1	51	-2.9
R12/ST12	47.5	47.8	-0.3
R13/ST13	65.9	65.3	0.6
R14/ST14	58.1	59.1	-1
R16/ST16	53.7	52.5	1.2
R17/ST17	61.2	60.5	0.7
R18/ST18	59.7	60.4	-0.7
R22/ST22	63.6	60.7	2.9
R23/ST23	62.6	62.8	-0.2
R24/ST24	57.2	56.6	0.6
R25/ST25	65.3	65.2	0.1
R30/ST30	58.4	57.6	0.8
R32/ST32	51.6	51.4	0.2
R33/ST33	55.3	53.1	2.2
R35/ST35	65.7	62.7	3
R36/ST36	54.4	53.1	1.3
R38/ST38	55.9	56.9	-1
R39/ST39	60.2	60.3	-0.1
R40/ST40	60.9	62.1	-1.2
R42/ST42	56.7	55.4	1.3

## **6.4. Existing Noise Levels**

A number of land uses existing within the project area, including single-family residences, exterior FHWA NAC Activity Category B, churches, interior FHWA NAC Activity Category D, business offices, exterior FHWA NAC Activity Category E, agricultural farm lands, exterior FHWA NAC Activity Category F, and unpermitted undeveloped farms, exterior FHWA NAC Activity Category G. The associated NAC Activity Category for each identified land use is listed in Table B-1 of Appendix B.

Existing noise levels were estimated using existing peak hour traffic data from the project's Travel Demand Forecast (Fehr & Peers, 2014). Existing peak hour traffic was entered into TNM 2.5 with existing roadway coordinates to estimate existing peak hour traffic noise levels. The results of the existing traffic noise modeling are shown in Table 6-7.

**Table 6-7. Summary of Existing Peak Hour Noise Levels**

Receiver ID	Location	Type of Land Use	Number of Dwelling Units	Noise Abatement Category	Measured Noise Level, dBA $L_{eq}(h)$	Modeled Existing Peak Noise Level, dBA $L_{eq}(h)$ <sup>a</sup>
R1/ST1	5236 Tully Rd, Modesto	SFR	--	B (67)	52	56
R1.1	5211 Tully Rd, Modesto	SFR	1	B (67)	--	49
R1.2	5089 Tully Rd, Modesto	SFR	1	B (67)	--	60
R1.3	5080 Tully Rd, Modesto	SFR	1	B (67)	--	56
R2/ST2	1348 Kiernan Ave, Modesto	SFR	--	B (67)	59	62
R2.1	1394 Kiernan Ave, Modesto	SFR	1	B (67)	--	59
R2.2	1248 Kiernan Ave, Modesto	SFR	1	B (67)	--	57
R2.3	4885 Tully Rd, Modesto	SFR	1	B (67)	--	56
R2.4	4767 Tully Rd, Modesto	SFR	1	B (67)	--	53
R2.5	4823 Tully Rd, Modesto	SFR	1	B (67)	--	52
R2.6	4744 Tully Rd, Modesto	SFR	1	B (67)	--	59
R3/ST3	201 Crawford Rd, Modesto	SFR	--	B (67)	65	68
R3.1	177 Chow Chow Ln, Modesto	SFR	1	B (67)	--	68
R3.2	5298 McHenry Ave, Modesto, CA	COM	--	E (72)	--	64
R3.3	5150 McHenry Ave, Modesto, CA	COM	--	C (67)	--	60
R4/ST4	5150 McHenry Ave, Modesto	COM	--	C (67)	71	73
R4.1	5045 McHenry Ave, Modesto	SFR	1	B (67)	--	56
R4.2	254 Claribel Road, Modesto	SFR	1	B (67)	--	59
R4.3	630 Claribel Road, Modesto	SFR	1	B (67)	--	57
R4.4	830 Claribel Road, Modesto	SFR	1	B (67)	--	55
R4.5	4929 Coffee Road, Modesto	SFR	1	B (67)	--	60
R4.6	501 Kiernan Avenue, Modesto, CA	UND	--	G (N/A)	--	58
R4.7	801 Claribel Rd, Modesto, CA	AG	--	F (N/A)	--	53
R5/ST5	4824 Coffee Rd, Modesto	SFR	1	B (67)	63	68
R5.1	4854 Coffee Rd, Modesto	SFR	1	B (67)	--	56
R6/ST6	5242 Coffee Rd, Modesto	SFR	1	B (67)	59	61
R6.1	5330 Coffee Rd, Modesto	SFR	1	B (67)	--	53
R7/ST7	1512 Cabo Dr, Modesto	SFR	1	B (67)	58	59
R7.1	1509 Cabo Dr, Modesto	SFR	4	B (67)	--	62
R7.2	1532 Cabo Dr, Modesto	SFR	1	B (67)	--	59



**Table 6-7. Summary of Existing Peak Hour Noise Levels**

Receiver ID	Location	Type of Land Use	Number of Dwelling Units	Noise Abatement Category	Measured Noise Level, dBA $L_{eq}(h)$	Modeled Existing Peak Noise Level, dBA $L_{eq}(h)$ <sup>a</sup>
R8/ST8	1529 Sailfish Dr, Modesto	SFR	6	B (67)	55	57
R8.1	1609 Cabo Dr, Modesto	SFR	5	B (67)	--	62
R10/ST10	4736 Oakdale Rd, Modesto	SFR	1	B (67)	65	67
R10.1	2030 Claribel Rd, Modesto	SFR	1	B (67)	--	51
R10.2	5036 Oakdale Rd, Modesto	SFR	1	B (67)	--	59
R10.3	4712 Oakdale Rd, Modesto	SFR	1	B (67)	--	48
R10.4	4780 Oakdale Rd, Modesto	SFR	1	B (67)	--	60
R10.5	4500 Oakdale Rd, Modesto	SFR	1	B (67)	--	64
R11/ST11	5010 Winding River Ct, Riverbank	SFR	1	B (67)	48	55
R11.1	5007 Gold River Ct, Riverbank	SFR	4	B (67)	--	55
R12/ST12	5033 Coolwater Ct, Riverbank	SFR	1	B (67)	48	52
R12.1	5008 Riverbed Ct, Riverbank	SFR	4	B (67)	--	53
R12.2	5015 Prospectors Pkwy, Riverbank	SFR	4	B (67)	--	51
R12.3	2966 Blacksand Creek Wy, Riverbank	SFR	5	B (67)	--	50
R13/ST13	4217 Roselle Ave, Riverbank	AG	1	F (N/A)	66	67
R13.1	4881 Rosselle Ave, Modesto	SFR	1	B (67)	--	61
R13.2	4955 Rosselle Ave, Modesto	SFR	1	B (67)	--	60
R14/ST14	5118 Roselle Ave, Riverbank	SFR	1	B (67)	58	66
R14.1	5230 Roselle Ave, Riverbank	SFR	1	B (67)	--	57
R14.2	3212 Claribel Rd, Modesto	SFR	1	B (67)	--	61
R15.1	3728 Davis Ave, Modesto	SFR	1	B (67)	--	45
R15.2	3761 Davis Ave, Modesto	SFR	1	B (67)	--	45
R16/ST16	3961 Davis Ave, Modesto	SFR	1	B (67)	54	53
R16.1	3874 Davis Ave, Modesto	SFR	1	B (67)	--	47
R16.2	3932 Davis Ave, Modesto	SFR	1	B (67)	--	50
R16.3	3973 Davis Ave, Modesto	SFR	1	B (67)	--	58
R16.4	5361 Claus Rd, Modesto	SFR	1	B (67)	--	60
R16.5	3973 Minniear Ave, Modesto	SFR	1	B (67)	--	60
R17/ST17	3800 Claribel Rd, Modesto	REC	1	C (67)	61	64
R17.1	3800 Claribel Rd, Modesto	REC	1	C (67)	--	55

**Table 6-7. Summary of Existing Peak Hour Noise Levels**

Receiver ID	Location	Type of Land Use	Number of Dwelling Units	Noise Abatement Category	Measured Noise Level, dBA $L_{eq}(h)$	Modeled Existing Peak Noise Level, dBA $L_{eq}(h)$ <sup>#</sup>
R17.2	4824 Claus Rd, Modesto	SFR	1	B (67)	--	56
R17.3	4380 Claribel Rd, Modesto	SFR	1	B (67)	--	53
R18/ST18	4712 Terminal, Modesto	SFR	1	B (67)	60	61
R18.1	4936 Terminal Ave, Modesto	SFR	1	B (67)		57
R19.1	4650 Claus Rd, Modesto	SFR	5	B (67)	--	63
R19.2	4672 Claus Rd, Modesto	SFR	1	B (67)	--	52
R19.3	4527 Claus Rd, Modesto	SFR	1	B (67)	--	62
R19.4	4548 Claus Rd, Modesto	SFR	1	B (67)	--	63
R19.5	4510 Claus Rd, Modesto	SFR	1	B (67)	--	42
R19.6	4500 Claus Rd, Modesto	SFR	1	B (67)	--	41
R20.1	4877 McGee Ave, Modesto	SFR	1	B (67)	--	47
R20.2	4663 McGee Ave, Modesto	SFR	1	B (67)	--	43
R20.3	4896 McGee Ave, Modesto	SFR	1	B (67)	--	47
R20.4	4642 McGee Ave, Modesto	SFR	1	B (67)	--	42
R20.5	4906 McGee Ave, Modesto	SFR	1	B (67)	--	49
R21.1	4601 Claribel Rd, Modesto	SFR	1	B (67)	--	52
R21.2	4737 Claribel Rd, Modesto	SFR	1	B (67)	--	60
R21.3	5303 Eleanor Ave, Oakdale	SFR	1	B (67)	--	49
R21.4	5307 Eleanor Ave, Oakdale	SFR	1	B (67)	--	44
R21.5	5354 Eleanor Ave, Oakdale	SFR	1	B (67)	--	40
R21.6	5274 Eleanor Ave, Oakdale	SFR	1	B (67)	--	46
R21.7	5023 Claribel Rd, Oakdale	SFR	1	B (67)	--	53
R22/ST22	4608 Langworth Rd, Oakdale	SFR	1	B (67)	64	
R22.1	4854 Langworth Rd, Oakdale	SFR	1	B (67)	--	59
R22.2	4660 Langworth Rd, Oakdale	SFR	1	B (67)	--	49
R23/ST23	4943 Claribel Rd, Oakdale	SFR	1	B (67)	63	67
R23.1	5233 Claribel Rd, Oakdale	SFR	1	B (67)	--	59
R23.2	5315 Claribel Rd, Oakdale	SFR	1	B (67)	--	57
R23.3	5553 Claribel Rd, Oakdale	SFR	1	B (67)	--	63
R23.4	5125 Langworth Rd, Oakdale	SFR	1	B (67)	--	40
R23.5	5931 Claribel Rd, Oakdale	SFR	1	B (67)	--	51

**Table 6-7. Summary of Existing Peak Hour Noise Levels**

Receiver ID	Location	Type of Land Use	Number of Dwelling Units	Noise Abatement Category	Measured Noise Level, dBA $L_{eq}(h)$	Modeled Existing Peak Noise Level, dBA $L_{eq}(h)$ <sup>a</sup>
R23.6	500 Bentley Rd, Oakdale	SFR	1	B (67)	--	55
R23.7	7131 Claribel Rd, Oakdale	SFR	1	B (67)	--	39
R23.8	7321 Claribel Rd, Oakdale	SFR	1	B (67)	--	55
R23.9	7319 Claribel Rd, Oakdale	SFR	1	B (67)	--	54
R24/ST24	5405 Epperson Ct, Oakdale	SFR	1	B (67)	57	57
R24.1	6153 Langworth Rd, Oakdale	SFR	1	B (67)	--	53
R24.2	5459 Langworth Rd, Oakdale	SFR	1	B (67)	--	49
R25/ST25	6201 Patterson Rd, Oakdale	SFR	1	B (67)	65	65
R25.1	5732 Langworth Rd, Oakdale	SFR	1	B (67)	--	52
R25.2	5918 Patterson Rd, Oakdale	SFR	1	B (67)	--	61
R25.3	6399 Crane Rd, Oakdale	SFR	1	B (67)	--	57
R25.4	7065 Crane Rd, Oakdale	SFR	1	B (67)	--	50
R25.5	6236 Crane Rd, Oakdale	SFR	1	B (67)	--	53
R25.6	1750 Lexington Ave, Oakdale	SFR	1	B (67)	--	51
R26.1	1952 Lexington Ave, Oakdale	SFR	1	B (67)	--	38
R26.2	7051 Patterson Rd, Oakdale	SFR	1	B (67)	--	33
R26.3	7041 Patterson Rd, Oakdale	SFR	2	B (67)	--	33
R27.1	5773 Valk Rd, Oakdale	SFR	1	B (67)	--	47
R27.2	8500 Valk Rd, Oakdale	SFR	1	B (67)	--	38
R28.1	3160 Kaufman Rd, Oakdale	SFR	1	B (67)	--	37
R29.1	6085 Albers Rd, Oakdale	SFR	1	B (67)	--	56
R29.2	6751 Albers Rd, Oakdale	SFR	1	B (67)	--	67
R30/ST30	6613 Smith Rd, Oakdale	SFR	1	B (67)	58	58
R30.1	6107 Bender Rd, Oakdale	SFR	1	B (67)	--	32
R30.2	6355 Bender Rd, Oakdale	SFR	1	B (67)	--	33
R30.3	6466 Bender Rd, Oakdale	SFR	1	B (67)	--	32
R30.4	6729 Smith Rd, Oakdale	SFR	1	B (67)	--	36
R30.5	6739 Smith Rd, Oakdale	SFR	1	B (67)	--	56
R30.6	6680 Smith Rd, Oakdale	SFR	1	B (67)	--	33
R30.7	10022 Warnerville Rd, Oakdale	SFR	1	B (67)	--	56
R30.8	9979 Warnerville Rd,	SFR	1	B (67)	--	44

**Table 6-7. Summary of Existing Peak Hour Noise Levels**

Receiver ID	Location	Type of Land Use	Number of Dwelling Units	Noise Abatement Category	Measured Noise Level, dBA $L_{eq}(h)$	Modeled Existing Peak Noise Level, dBA $L_{eq}(h)$ <sup>#</sup>
	Oakdale					
R30.9	9684 Warnerville Rd, Oakdale	SFR	1	B (67)	--	32
R30.10	9347 Warnerville Rd, Oakdale	SFR	1	B (67)	--	32
R30.11	9600 Warnerville Rd, Oakdale	SFR	1	B (67)	--	33
R30.12	9625 Warnerville Rd, Oakdale	SFR	1	B (67)	--	33
R30.13	8877 Warnerville Rd, Oakdale	SFR	1	B (67)	--	33
R31.1	925 Townhill Rd, Oakdale	SFR	1	B (67)	--	33
R32/ST32	565 Edgetown Ave, Oakdale	SFR	1	B (67)	52	
R32.1	1918 Sierra Rd, Oakdale	SFR	1	B (67)	--	42
R32.2	2130 Sierra Rd, Oakdale	SFR	1	B (67)	--	46
R32.3	2318 Sierra Rd, Oakdale	SFR	1	B (67)	--	47
R33/ST33	279 S Stearns Rd, Oakdale	SFR	1	B (67)	55	
R33.1	308 S Stearns Rd, Oakdale	SFR	1	B (67)	--	53
R33.2	336 S Stearns Rd, Oakdale	SFR	1	B (67)	--	57
R33.3	448 S Stearns Rd, Oakdale	SFR	1	B (67)	--	46
R33.4	524 S Stearns Rd, Oakdale	SFR	1	B (67)	--	42
R33.5	337 S Stearns Rd, Oakdale	SFR	1	B (67)	--	54
R33.6	401 S Stearns Rd, Oakdale	SFR	1	B (67)	--	49
R33.7	279 S Stearns Rd, Oakdale	SFR	1	B (67)	--	52
R33.8	249 S Stearns Rd, Oakdale	SFR	1	B (67)	--	51
R33.9	211 S Stearns Rd, Oakdale	SFR	1	B (67)	--	52
R35/ST35	7051 Bentley Rd, Oakdale	SFR	1	B (67)	66	
R35.1	10008 Plaza De Oro Dr, Oakdale	SFR	5	B (67)	--	56
R35.2	10306 Rio Sombra Ct, Oakdale	SFR	5	B (67)	--	58
R35.3	10318 Rio Sombra Ct, Oakdale	SFR	2	B (67)	--	65
R35.4	10468 St Andrews Ct, Oakdale	SFR	4	B (67)	--	61
R35.6	10529 California 108, Oakdale	SFR	3	B (67)	--	64
R36/ST36	10520 St. Andrew Ct., Oakdale	SFR	1	B (67)	54	55
R37.1	6954 Stoddard Rd, Oakdale	SFR	1	B (67)	--	31



**Table 6-7. Summary of Existing Peak Hour Noise Levels**

Receiver ID	Location	Type of Land Use	Number of Dwelling Units	Noise Abatement Category	Measured Noise Level, dBA $L_{eq}(h)$	Modeled Existing Peak Noise Level, dBA $L_{eq}(h)$ <sup>*</sup>
R37.2	11955 Warnerville Rd, Oakdale	SFR	1	B (67)	--	29
R38/ST38	8406 Patterson Rd, Oakdale	SFR	1	B (67)	56	55
R39/ST39	6613 Smith Rd, Oakdale	SFR	1	B (67)	60	58
R39.1	13949 California 108, Oakdale	SFR	1	B (67)	--	58
R39.2	13460 Lancaster Rd, Oakdale	SFR	2	B (67)	--	54
R39.3	13542 Lancaster Rd, Oakdale	SFR	1	B (67)	--	52
R40/ST40	13949 Lancaster Rd, Oakdale	SFR	1	B (67)	61	64
R42/ST42	13712 Lancaster Rd, Oakdale	SFR	1	B (67)	57	57
R42.1	13614 Lancaster Rd, Oakdale	SFR	2	B (67)	--	52
R42.2	13712 Lancaster Rd, Oakdale	SFR	2	B (67)	--	57
R42.3	13760 Lancaster Rd, Oakdale	SFR	1	B (67)	--	59

Source: Entech Consulting Group, March 2014

<sup>\*</sup> Shaded areas indicate that peak hour traffic data not available for local roadways. Other background noise contributed to the dominant noise source.

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## **Chapter 7. Future Noise Environment, Impacts, and Considered Abatement**

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### **7.1. Future Noise Environment and Impacts**

The noise study was conducted to determine the future traffic noise impacts at sensitive receivers along the new project alignments. Potential long-term noise impacts associated with project operations arise solely from traffic noise. Traffic noise was evaluated for future scenarios (Future 2042 No-Build and Build) as worst-case conditions, using coordinates obtained from the topographic maps for receiver locations with frequently used outdoor use areas associated with existing single-family residences. These land uses fall into the NAC Activity Category B. The FHWA and Caltrans NAC both Activity Category B land uses is 67 dBA  $L_{eq}(h)$ .

The predicted future worst-case traffic noise levels for the Build Alternatives were determined using traffic volumes and truck percentages provided in the project's Traffic Operations Report for North County Corridor (Fehr & Peers, 2014). A summary of traffic data used for the existing and future design year conditions with and without the proposed Project are presented in Appendix A.

Table B-1 in Appendix B summarizes the traffic noise modeling results for the four Build Alternatives under future design year conditions with and without the proposed Project Build Alternatives. Predicted design year traffic noise levels for each proposed Project Build Alternative are compared to Existing conditions and to future design year No-Build conditions. The modeled future noise levels with the project were compared to the modeled existing peak hour noise levels (after calibration) from TNM 2.5 to determine whether a substantial noise increase would occur. The modeled future noise levels for each Build Alternative were also compared to the respective NAC land use Activity Category to determine whether a traffic noise impact would occur.

Traffic noise impacts occur when either of the following occurs: (1) if the traffic noise level at a sensitive receiver location is predicted to “approach or exceed” the NAC, or (2) if the predicted traffic noise level is 12 dBA or more over the corresponding modeled existing peak noise level at the sensitive receiver locations analyzed. When traffic noise impacts occur, noise abatement measures must be considered.

As stated in the TeNS, modeling results are rounded to the nearest decibel before comparisons are made. In some cases, this can result in relative changes that may not

appear intuitive. An example would be a comparison between sound levels of 64.4 and 64.5 dBA  $L_{eq}$ . The difference between these two values is 0.1 dBA. However, after rounding, the difference is reported as 1 dBA.

Modeling results in Tables B-1 through B-4 indicate that predicted traffic noise levels for the design year with-project conditions would approach or exceed the respective NAC land use Activity Category within the project area; therefore, noise abatement measures were evaluated.

## **7.2. Future Noise Environment**

Under No-Build conditions, no improvements would be constructed, however traffic volumes increase over existing conditions. The traffic noise modeling results for the design year No-Build Alternative range from 41 to 68 dBA  $L_{eq}(h)$ , as shown in Table B-1 of Appendix B. The existing noise levels increase up to 7 dBA under No-Build conditions. Furthermore, No-Build noise levels at few of the evaluated receivers approach 67 dBA for NAC Activity Category B.

The design year traffic noise modeling results for the four Build Alternatives are presented below.

Noise levels range from 46 to 76 dBA  $L_{eq}(h)$ , as shown in Tables B-1 through B-4 of Appendix B. Noise levels for the design year under the Build Alternatives are expected to be up to 35 dBA higher than existing noise levels at some locations. This substantial increase is due to sensitive receivers being adjacent to the new alignment and increased traffic volumes under Build conditions compared to the existing conditions. A description of the changes in noise levels at sensitive receivers is presented for each segment below.

### ***Segment 1-Tully Road to Claus Road.***

Noise levels within this segment are identical for each Build Alternative so changes in noise levels are considered to be similar for each Build Alternative.

*Tully Road and Kiernan Avenue.* Except for Receiver 2.1, receivers located near Tully Road and Kiernan Avenue, represented by 1.1 through 2.6, experience an increase in noise levels due to the widening of Tully Road and Kiernan Avenue and an increase in traffic volumes under Build conditions. Receiver 2.1 experiences a decrease because the new alignment is shifted away from this receiver. Noise levels for these receivers remain below 67 dBA for NAC Activity Category B.



At this location, the difference in noise levels between existing vs Build is between 3 and 7 dBA. As these noise level differences do not exceed 12 DBA, no substantial increase from existing noise levels to build noise levels is anticipated at this location.

*Kiernan Avenue and McHenry Avenue.* Single-family residence represented by Receiver 3.1 experience a slight decrease in noise levels under future Build conditions due to the right of way acquisition from the realigning and widening of McHenry Avenue. Traffic is shifted away from this receiver. Noise levels for these receivers would exceed 67 dBA for NAC Activity Category B. At this location, the difference in noise levels between existing vs Build is 1 dBA. As this noise level difference does not exceed 12 DBA, no substantial increase from existing noise levels to build noise levels is anticipated at this location.

Receiver 3.2 represents the McHentry Golf Center, an outdoor golf driving range,, and is classified as a NAC Activity Category E. At this location, the difference in noise levels between existing vs Build is 0 dBA. As this noise level difference does not exceed 12 DBA, no substantial increase from existing noise levels to build noise levels is anticipated at this location. Further, noise levels for this receiver would not exceed 72 dBA for NAC Activity Category E.

Receiver 3.3 represents a commercial businesses, Bar El Atrancon, and is classified as a NAC Activity Category C. At this location, the difference in noise levels between existing vs Build is 1 dBA. As this noise level difference does not exceed 12 DBA, no substantial increase from existing noise levels to build noise levels is anticipated at this location. Additionally, noise levels for this receiver would not exceed 67 dBA for NAC Activity Category C.

*Between McHenry Avenue and Coffee Road.* Receiver 4.1 represents a single-family residence that would become a first row receiver under future Build conditions due to right of way acquisition for the realignment of Kiernan Avenue. Receivers 4.2 through 4.5 move farther away from the realigned roadway; therefore, noise levels do not approach or exceed 67 dBA for NAC Activity Category B. Receiver 4.5 is located adjacent to the new alignment near Coffee Road and experiences an increase over existing noise levels, yet noise levels remain below 67 dBA for NAC Activity Category B.

At this location, the difference in noise levels between existing vs Build is between 2 and 7 dBA. As these noise level differences do not exceed 12 DBA, no substantial increase from existing noise levels to build noise levels is anticipated at this location.

Receiver 4.6 represents undeveloped land, and is classified as a NAC Activity Category G, and Receiver 4.7 represents an agricultural field, and is classified as a NAC Activity Category F. Neither NAC Activity Category G nor F have noise thresholds. While the NAC Activity Category G and F difference between existing and build noise levels is 12 dBA and 14 dBA respectively, no substantial increase thresholds exist for these NAC Activity Categories. No substantial increase in noise is identified at these locations.

*South of Claribel Road along Coffee Road.* Receiver 5.1 represents the single-family residences on Coffee Road, south of Claribel Road. This receiver does not experience a change in noise levels over No-Build noise levels. Build condition noise levels do not exceed 67 dBA for NAC Activity Category B.

At this location, the difference in noise levels between existing vs Build is 4 dBA. As this noise level difference does not exceed 12 DBA, no substantial increase from existing noise levels to build noise levels is anticipated at this location.

*North of Claribel Road along Coffee Road.* Receiver 6.1 represents single-family residences along Coffee Road, north of Claribel Road. This receiver also does not experience a change in noise levels over No-Build noise levels. Build condition noise levels do not exceed 67 dBA for NAC Activity Category B.

At this location, the difference in noise levels between existing vs Build is 6 dBA. As this noise level difference does not exceed 12 DBA, no substantial increase from existing noise levels to build noise levels is anticipated at this location.

*Morningside Mobile Home Park adjacent to Claribel Road.* Receivers 7 through 8.1 represent receivers located within the Morningside Mobile Home Park. These receivers experience a decrease over No-Build noise levels resulting from the realigned roadway moving farther away from these receivers. Noise levels for these receivers are below 67 dBA for NAC Activity Category B.

At this location, the difference in noise levels between existing vs Build is between -2 and 0 dBA. As these noise level differences do not exceed 12 DBA, no substantial increase from existing noise levels to build noise levels is anticipated at this location.

*South of Claribel Road along Oakdale Road.* The new alignment brings traffic noise closer to sensitive receivers 10.1 through 10.5. These receivers were not previously near major roadways. Under Build conditions, increases in noise levels over No-Build conditions are attributed to the proposed Project shifting traffic closer to these sensitive

receivers. The traffic volumes on the new alignment and the close proximity to these sensitive receivers increases noise levels above No-Build noise levels. Receiver 10.3 experiences a substantial increase.

At this location, the difference in noise levels between existing vs Build is between 1 and 10 dBA. As these noise level differences do not exceed 12 DBA, no substantial increase from existing noise levels to build noise levels is anticipated at this location.

*Claribel Road and Roselle Avenue.* Receivers 11.1, 12.1 through 12.3, 13.1, 13.2, 14.1 and 14.2 are adjacent to widening occurring on Roselle Avenue and the new alignment. The receivers that have the greatest increase in noise levels are receivers 13.1 and 13.2 due to traffic under the Build Alternative conditions increases on Roselle Avenue. However, traffic decreases on Claribel Road near receiver 14.2 therefore, this receiver experiences a decrease in noise levels. Noise levels for this area remain below 67 dBA for NAC Activity Category B.

At this location, the difference in noise levels between existing vs Build is between -6 and 4 dBA. As these noise level differences do not exceed 12 DBA, no substantial increase from existing noise levels to build noise levels is anticipated at this location.

*Terminal Avenue to Claus Road.* Receivers 15.1, 15.2, 16.1, 17.3 and 18.1 experience increases in noise levels from future No-Build to Build conditions due to increases in traffic volumes and the new realignment; however, noise levels remain below 67 dBA for NAC Activity Category B. However, Receivers 16.2 through 16.5 and 17.2, represent residences along Claus Road, do not experience increases in noise levels over Build conditions. The greatest increase in noise levels occurs at receivers 19.1, 19.3 and 19.4. Receivers 19.1 and 19.2 represent the single-family residences in the Olive Lane Trailer Park. Receivers 19.3 through 19.6 represent individual single-family residences near Plainview Road. Under Build conditions, Claus Road south of the proposed alignment would widen causing an increase for receivers along Claus Road that exceed 67 dBA for NAC Activity Category B.

At this location, the difference in noise levels between existing vs Build is between 3 and 11 dBA. As these noise level differences do not exceed 12 DBA, no substantial increase from existing noise levels to build noise levels is anticipated at this location.

Receiver 17.1, the Rainbow Sports Park, classified as a NAC Activity Category C, does not experience increases in No-Build noise levels over Build conditions, and noise levels for this area remain below 67 dBA for NAC Activity Category C. This location does

experience an increase of 4 dBA from existing condition to Build conditions; however, as this noise level difference does not exceed 12 DBA, no substantial increase from existing noise levels to build noise levels is anticipated at this location.

### **Segment 2 Claus Road to Albers Road**

The Build Alternatives diverge near Claus Road. Alternatives 1A and 1B veer north, while Alternatives 2A and 2B follow Claribel Road heading east. Different receivers are affected by Alternatives 1 and 2. Therefore, noise levels would be discussed for each receiver by alternative within this segment.

*Alternative 1A and 1B.* A majority of these receivers are individual single-family residences on farmland not located near heavily travelled roadways. Under the Existing and No-Build conditions, these receivers experience a serene noise environment. However, under Build conditions, Receivers 21.1 through 21.6 and Receivers 25.3 through 26.2 experience the greatest substantial noise increases in noise levels due to the new alignment shifting traffic closer to these receivers, causing some of these receivers to experience noise levels that exceed 67 dBA for NAC Activity Category B.

At this location, the difference in noise levels between existing vs Build is between 1 and 16 dBA. As these noise level differences do exceed 12 DBA, a substantial increase from existing noise levels to build noise levels is anticipated at this location.

*Alternative 2A and 2B-*A majority of these receivers are individual single-family residences on farmland not located near roadways. Under the existing conditions, Receivers 21.1 through 23.9 experience a serene noise environment, but traffic under No-Build conditions increases noise levels in the area resulting in higher noise levels. Under Build conditions, traffic volumes increase however the new alignment moves traffic away from some of the receivers in the area causing decreases in noise levels. Noise levels for this area remain below 67 dBA for NAC Activity Category B.

At this location, the difference in noise levels between existing vs Build is between 1 and 7 dBA. As these noise level differences do not exceed 12 DBA, no substantial increase from existing noise levels to build noise levels is anticipated at this location.

### **Segment 3 Albers Road to SR-120/108**

*Alternative 1A and 2A.* A majority of these receivers are individual single-family residences on farmland not located near heavily travelled roadways. Under the Existing and No-Build conditions, these receivers experience a serene noise environment.



However, under Build conditions, Receivers 30.12 through 33.9 experience noise level increases due to increases in traffic volumes and the new alignment shifting traffic closer to these receivers. The greatest increases occur at receivers 30.12, 32.1, and 33.3 where noise levels substantially increase, and/or approach or exceed 67 dBA for NAC Activity Category B. However, Receivers 35.1 through 35.6, which represent single-family residences near the end of this alignment, experience decreases in noise levels over No-Build condition and Existing conditions due to decreased traffic volumes and the alignment moves traffic away from receivers in this area.

At this location, the difference in noise levels between existing vs Build is between -2 and 21 dBA. As these noise level differences do exceed 12 DBA, a substantial increase from existing noise levels to build noise levels is anticipated at this location.

*Alternative 1B and 2B-* A majority of the receivers in this area are individual single-family residences on farmland not located near roadways. Receivers 27.1 through 42.3 experience noise level increases due to increases in traffic volumes and the new alignment shifting traffic closer to these receivers. Under the existing and No-Build conditions, these receivers experience a serene noise environment. However, under Build conditions, noise levels at some receivers within this area have substantial increases, approach and or exceed 67 dBA for NAC Activity Category B.

At this location, the difference in noise levels between existing vs Build is between 0 and 35 dBA. As these noise level differences do exceed 12 DBA, a substantial increase from existing noise levels to build noise levels is anticipated at this location.

### **Property Acquisitions**

The following properties will be acquired under the Build Alternatives: R5, R10/ST10, R21/ST21, R21.6, R23, R30.11, R25.4, ST26/ST26, and R26.2. Therefore, these properties are not included in the noise abatement evaluation.

## **7.3 Preliminary Noise Abatement Analysis**

In accordance with 23 CFR 772, noise abatement is considered where noise impacts are predicted in areas of frequent human use that would benefit from a lowered noise level. Potential noise abatement measures identified in the Protocol include the following:

- Avoiding the impact by using design alternatives, such as altering the horizontal and vertical alignment of the project;

- Constructing noise sound walls;
- Acquiring property to serve as a buffer zone;
- Using traffic management measures to regulate types of vehicles and speeds; and
- Acoustically insulating public-use or nonprofit institutional structures.

All of these abatement options have been considered. However, because of the configuration and location of the project, abatement in the form of noise sound walls is the only abatement that is considered to be feasible. Analysis of the various alignments is inherent in this study and is hereby taken into account. Applying traffic management measures, such as restricting truck traffic, would be fundamentally counter to the Project purpose and need. Acquisition of land for creating buffer zones would not be practical, as much of the areas where such measures would be most effective are already used by homes and businesses.

Each noise sound wall has been evaluated for feasibility based on achievable noise reduction. For each of the noise sound walls found to be acoustically feasible, reasonable cost allowances were calculated. Table B-1 through B-4 in Appendix B summarizes sound wall analysis results at receiver locations.

The analysis was conducted with sound walls heights ranging from 6 to 16 feet at two foot increments. The sound walls heights and locations were evaluated to determine if a minimum 5 dBA attenuation at the outdoor frequent use areas of the representative receivers could be achieved. The reason for limiting the maximum sound wall height to 16 feet above the ground line is to comply with the suggestions set forth by Highway Design Manual (Caltrans, 2007). The minimum sound walls height required to cut the line-of-sight from each receiver to the exhaust stacks of heavy trucks has been calculated for all feasible sound walls. These heights were evaluated through calculations performed by TNM 2.5.

For any noise sound walls to be considered reasonable from a cost perspective the estimated cost of the noise sound walls should be equal to or less than the total cost allowance calculated for the sound walls. Furthermore, 23 CFR 772 requires that an acoustical design goal be applied to all noise abatement. Caltrans' acoustical design goal is that a sound walls must be predicted to provide at least 7 dBA of noise reduction at one or more benefited receivers. For a wall to be considered reasonable, the 7 dBA design goal must be achieved at one or more benefited receivers. This design goal applies to any

receiver and is not limited to impacted receivers. The cost calculations of the noise sound walls should include all items appropriate and necessary for construction of the sound walls, such as traffic control, drainage modification, and retaining walls. Construction cost estimates are not provided in this NSR, but are presented in the Noise Abatement Decision Report (NADR). The NADR is a design responsibility and is prepared to compile information from the NSR, other relevant environmental studies, and design considerations into a single, comprehensive document before public review of the proposed Project. The NADR is prepared by the proposed Project Engineer after completion of the NSR and prior to publication of the draft environmental document. The NADR includes noise abatement construction cost estimates that have been prepared and signed by the Project Engineer based on site-specific conditions. Construction cost estimates are compared to reasonableness allowances in the NADR to identify which sound walls configurations are reasonable from a cost perspective.

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

Receiver locations under the Build Alternatives show design-year noise levels would approach or exceed 67 dBA  $L_{eq}$  NAC. Therefore, a noise abatement evaluation was required. Sound wall heights were evaluated in 2 foot increments ranging in height from 6 feet to 16 feet. Results of the noise abatement evaluation are presented in Tables B-1 through Table B-4 in Appendix B for the each Build Alternative. Alternative 1A contains the majority of the evaluated sound walls because it is the alignment that is closest to more densely populated areas. There are negligible differences in noise levels between the Build Alternatives due to variations in the design of local roadways and alignment locations which would not significant effect cost allowances for sound walls. Therefore, the costs tables were developed based of the results for Alternative 1A. Other alternatives may have triggered additional areas that would require a sound wall evaluation that were not impacted in Alternative 1A. In these instances, the results from the additional Alternatives were used to prepare the costs tables. A matrix of which Alternatives share sound wall locations is listed in Table 7.1. Sound walls are presented

for impacted receiver locations in Figure 7. The following discussion summarizes sound wall locations.

**Table 7.1 Sound Walls Common to Build Alternatives**

SW ID	Critical Receiver	1A	1B	2A	2B
SW-1	2.6	X	x	x	x
SW-2	3.1	X	x	x	x
SW-3	19.1	x	x	x	x
SW-4	19.3	x	x	x	x
SW-5	19.4	x	x	x	x
SW-6	21.1	x	x		
SW-7	30.4				x
SW-8	30.9		x		
SW-9	30.12	x			
SW-10	33.3	x		x	
SW-11	37.1				x
SW-12	37.2		x		

### Evaluated Sound Wall Locations

**SW-1: Kiernan Avenue and Tully Road.** The single-family residence represented by Receiver 2.6 approaches the NAC Activity Category B of 67 dBA. The widening of Tully Road brings traffic closer to this receiver increasing noise levels. SW-1 was placed on the Edge of Pavement (EOP) of Tully Road as shown in Figure 7 for all Build Alternatives. SW-1 was found not feasible at any evaluated height because the length of the soundwall was limited by driveway openings.

**SW-2: Kiernan Avenue and McHenry Avenue.** The single-family residence represented by Receiver 3.1 exceeds the NAC Activity Category B. The widening of McHenry Avenue decreases noise levels for this receiver however, noise levels remain above 67 dBA. SW-2 was placed on the EOP of McHenry Road as shown in Figure 7 for all Build Alternatives. SW-2 was not found to be feasible at any evaluated height because the length of the soundwall was limited by driveway openings.

**SW-3: Olive Lane Trailer Park along Claus Road.** Single-family residences in the Olive Lane Trailer Park, represented by receiver 19.1, experience a substantial increase and



exceed the NAC due to the widening of Claus Road and the increase in traffic on Claus Road under Build conditions. Sound wall SW-3 was placed on the EOP of Claus Road as shown in Figure 8 for all Build Alternatives. Sound wall SW-3 was found to be feasible at a height of 6 feet . SW-3 meets the Caltrans acoustical design goal of a 7 dBA reduction at 10 feet and breaks the truck line of sight at 12 feet. Table 7-2 summarizes the calculated noise reductions and reasonable allowances for each sound wall height.

**Table 7-2. Summary of Reasonableness Determination-Sound Wall 3**

Sound walls ID: SW-3						
Design-Year With Sound walls	6- foot <sup>1</sup>	8-foot	10-foot <sup>2</sup>	12-foot	14-foot	16-foot
Sound walls Noise Reduction, dBA	5	6	8	9	10	10
Number of Benefited Residences	5	5	5	5	5	5
Reasonable Allowance Per Benefited Residence	\$71,000	\$71,000	\$71,000	\$71,000	\$71,000	\$71,000
Total Reasonable Allowance	\$355,000	\$355,000	\$355,000	\$355,000	\$355,000	\$355,000

1. A 6-foot wall is feasible.

2. Caltrans design goal is met at this height.

**SW-4:** *Claus Road near Plainview Road.* The single-family residence represented by receiver 19.3 experiences a substantial increase in noise levels and exceeds the NAC due to the widening of Claus Road and the increase in traffic on Claus Road under Build conditions. Sound wall SW-4 was placed on the EOP of Claus Road adjacent to this receiver. Sound wall SW-4 was found to be feasible at a height of 8 feet for all Build Alternatives. In order to meet the Caltrans acoustical design goal of a 7 dBA reduction, SW-4 should be at a minimum height of 10 feet. The sound wall at 12 feet would break the line of sight of an 11.5 foot truck stack. Table 7-3 summarizes the calculated noise reductions and reasonable allowances for each sound wall height.

**Table 7-3. Summary of Reasonableness Determination-Sound Wall 4**

Sound walls ID: SW-4						
Design-Year With Sound walls	6- foot	8-foot <sup>1</sup>	10-foot <sup>2</sup>	12-foot	14-foot	16-foot
Sound walls Noise Reduction, dBA		6	8	9	10	10
Number of Benefited Residences		1	1	1	1	1
Reasonable Allowance Per Benefited Residence		\$71,000	\$71,000	\$71,000	\$71,000	\$71,000
Total Reasonable Allowance		\$71,000	\$71,000	\$71,000	\$71,000	\$71,000

1. A 8-foot wall is feasible.

2. Caltrans design goal is met at this height.

3. Shaded areas indicate not feasible at this height.

**SW-5: Claus Road near Plainview Road.** The single-family residence represented by receiver 19.4, experience a substantial increase and an exceedance of the NAC due to the widening of Claus Road and the increase in traffic on Claus Road under Build conditions. Sound wall SW-5 was placed on the EOP of the Claus Road adjacent to this receiver. SW-5 was found to be feasible at a height of 8 feet for all Build Alternatives. In order to meet the Caltrans acoustical design goal of a 7 dBA reduction, SW-5 should be at a minimum height of 10 feet. The sound wall at 12 feet would break the line of sight of an 11.5 foot truck stack. Table 7-4 summarizes the calculated noise reductions and reasonable allowances for each sound wall height.

**Table 7-4. Summary of Reasonableness Determination-Sound Wall 5**

Sound walls ID: SW-5						
Design-Year With Sound walls	6- foot	8-foot <sup>1</sup>	10-foot <sup>2</sup>	12-foot	14-foot	16-foot
Sound walls Noise Reduction, dBA		6	7	8	8	8
Number of Benefited Residences		1	1	1	1	1
Reasonable Allowance Per Benefited Residence		\$71,000	\$71,000	\$71,000	\$71,000	\$71,000
Total Reasonable Allowance		\$71,000	\$71,000	\$71,000	\$71,000	\$71,000

1. A 8--foot wall is feasible.

2. Caltrans design goal is met at this height.

3. Shaded areas indicate not feasible at this height.

**SW-6: North of Claribel Road.** The single-family residence represented by receiver 21.1 experiences a substantial increase and an exceedance of the NAC due its close proximity to new alignment. Sound wall, SW-6, was placed on the ROW of the new alignment. Sound wall heights were evaluated in 2 foot increments for this location ranging in height from 6 feet to 16 feet for Build Alternatives 1A and 1B. Tables B-1 and B-2 in Appendix B summarizes the results of the sound wall analysis for this location for Build Alternatives 1A and 1B respectively. SW-6 was found to be feasible at a height of 8 feet. The Caltrans acoustical design goal of a 7 dBA reduction is met at a height of 10 feet. The sound wall at 12 feet would break the line of sight of an 11.5 foot truck stack. Table 7-5 summarizes the calculated noise reductions and reasonable allowances for each sound wall height.

**Table 7-5. Summary of Reasonableness Determination-Sound Wall 6**

Sound walls ID: SW-6						
Design-Year With Sound walls	6- foot	8-foot <sup>1</sup>	10-foot <sup>2</sup>	12-foot	14-foot	16-foot
Sound walls Noise Reduction, dBA		6	8	9	10	11
Number of Benefited Residences		1	1	1	1	1
Reasonable Allowance Per Benefited Residence		\$71,000	\$71,000	\$71,000	\$71,000	\$71,000
Total Reasonable Allowance		\$71,000	\$71,000	\$71,000	\$71,000	\$71,000

1. A 8-foot wall is feasible.

2. Caltrans design goal is met at this height.

3. Shaded areas indicate not feasible at this height.

**SW-7: Near Smith Road.** The single-family residence represented by receiver 30.4 experiences a substantial increase in noise levels due its close proximity to the new alignment. Sound wall SW-7 was placed on the ROW of the new alignment for Alternative 2B. Tables B-4 in Appendix B summarizes the results of the sound wall analysis for this location for Build Alternative 2B. SW-7 was found to be feasible at a height of 8 feet. The Caltrans acoustical design goal of a 7 dBA reduction is met at a height of 12 feet and breaks the truck line of sight at this a height . Table 7-6 summarizes the calculated noise reductions and reasonable allowances for each sound wall height.

**Table 7-6. Summary of Reasonableness Determination-Sound Wall 7**

Sound walls ID: SW-7						
Design-Year With Sound walls	6- foot	8-foot <sup>1</sup>	10-foot <sup>2</sup>	12-foot	14-foot	16-foot
Sound walls Noise Reduction, dBA		5	6	7	7	8
Number of Benefited Residences		1	1	1	1	1
Reasonable Allowance Per Benefited Residence		\$71,000	\$71,000	\$71,000	\$71,000	\$71,000
Total Reasonable Allowance		\$71,000	\$71,000	\$71,000	\$71,000	\$71,000

1. A 8-foot wall is feasible.

2. Caltrans design goal is met at this height.

3. Shaded areas indicate not feasible at this height.

**SW-8: Near Warnerville Road and Oakdale S. Main Canal.** The single-family residence, represented by Receiver 30.9, experiences a substantial increase in noise levels due its close proximity to the new alignment. Sound wall SW-8 was placed on the EOP of the new alignment for Alternative 1B. Tables B-1 in Appendix B summarizes the results of the sound wall analysis for this location for Build Alternative 1B. SW-8 was found to be feasible at a height of 14 feet. However, this soundwall does not meet the Caltrans acoustical design goal of a 7 dBA reduction.

**SW-9:** *Near Warnerville Road and Oakdale S. Main Canal.* The single-family residence, represented by Receiver 30.12, experiences a substantial increase in noise levels due its close proximity to the new alignment. Sound wall SW-9 was placed on the ROW of the new alignment for Alternative 1A. Tables B-1 in Appendix B summarizes the results of the sound wall analysis for this location for Build Alternative 1A. SW-9 was not found to be feasible at any evaluated a height due to the length of the wall being limited by the surrounding local roadways. Therefore, the receiver was only partially shielded from traffic noise from the proposed alignment.

**SW-10:** *Adjacent to Stearns Road.* The single-family residence, represented by receiver 33.3, experiences a substantial increase in noise levels due to its close proximity to new alignment. Sound wall SW-10 was placed on the EOP of the new alignment for Alternatives 1A and 2A. Tables B-1 and B-3 in Appendix B summarizes the results of the sound wall analysis for this location for Build Alternatives 1A and 2A respectively. SW-10 was not found to be feasible at any height.

**SW-11:** *Adjacent to Stoddard Road.* The single-family residence represented by receiver 37.1 experiences a substantial increase in noise levels due to its close proximity to new alignment. Sound wall SW-11 was placed on the EOP of the new alignment for Alternative 2B. Placing the soundwall on the ROW does not block the noise source from the receiver. Table B-4 in Appendix B summarizes the results of the sound wall analysis for SW-11 at the EOP. SW-11 was found to be feasible at a height of 12 feet. However, this soundwall does not meet the Caltrans acoustical design goal of a 7 dBA reduction.

**SW-12:** *Near Oakdale S Main Canal.* The single-family residence represented by receiver 37.2 experiences a substantial increase in noise levels due to its close proximity to new alignment. Sound wall SW-12 was placed on the ROW of the new alignment for Alternative 2B. Table B-4 in Appendix B summarizes the results of the sound wall analysis for this location. SW-12 was found to be feasible at a height of 10 feet. However, this soundwall does not meet the Caltrans acoustical design goal of a 7 dBA reduction.

### **Non Feasible Wall Locations**

There are several locations where noise impacts were predicted but an optimum location for soundwall placement was not identified. The following is a summary of these locations along with an explanation of the physical limitations that prevented soundwall placement.

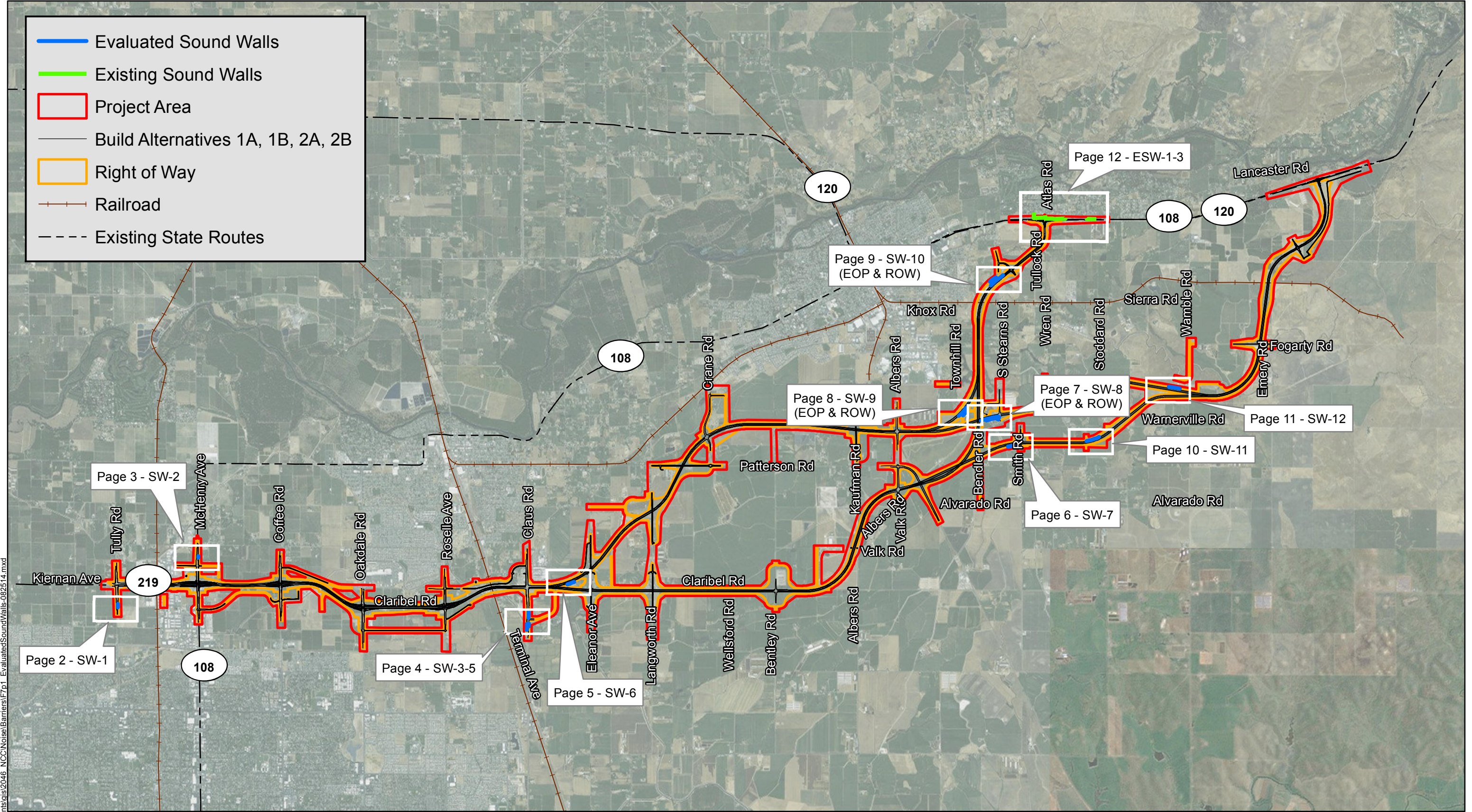


Soundwall placement for Receivers 21.3, 21.4, 21.5, 28.1, 30.2, 30.3 and 30.13 which are adjacent to driveways, was limited due to gaps required for access to local roadways. Soundwall effectiveness in blocking the line of sight from the noise source to the receiver would be reduced due to these driveway openings.

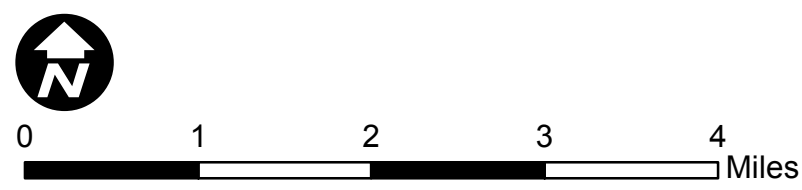
Soundwall placement for Receivers 26.3, 30.6, 32.1 and 33.3 could not be placed close to the receiver to provide shielding for these receivers. These receivers are not located near the ROW of the new alignment where a soundwall would block the line of sight between the receiver and the noise source. Placing of the soundwall at the ROW is at the midpoint between the receiver and the noise source, therefore rendering the soundwall not feasible.

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Source: ESRI 2011 Online; Dokken Engineering 11/3/2014; Created By: zachl



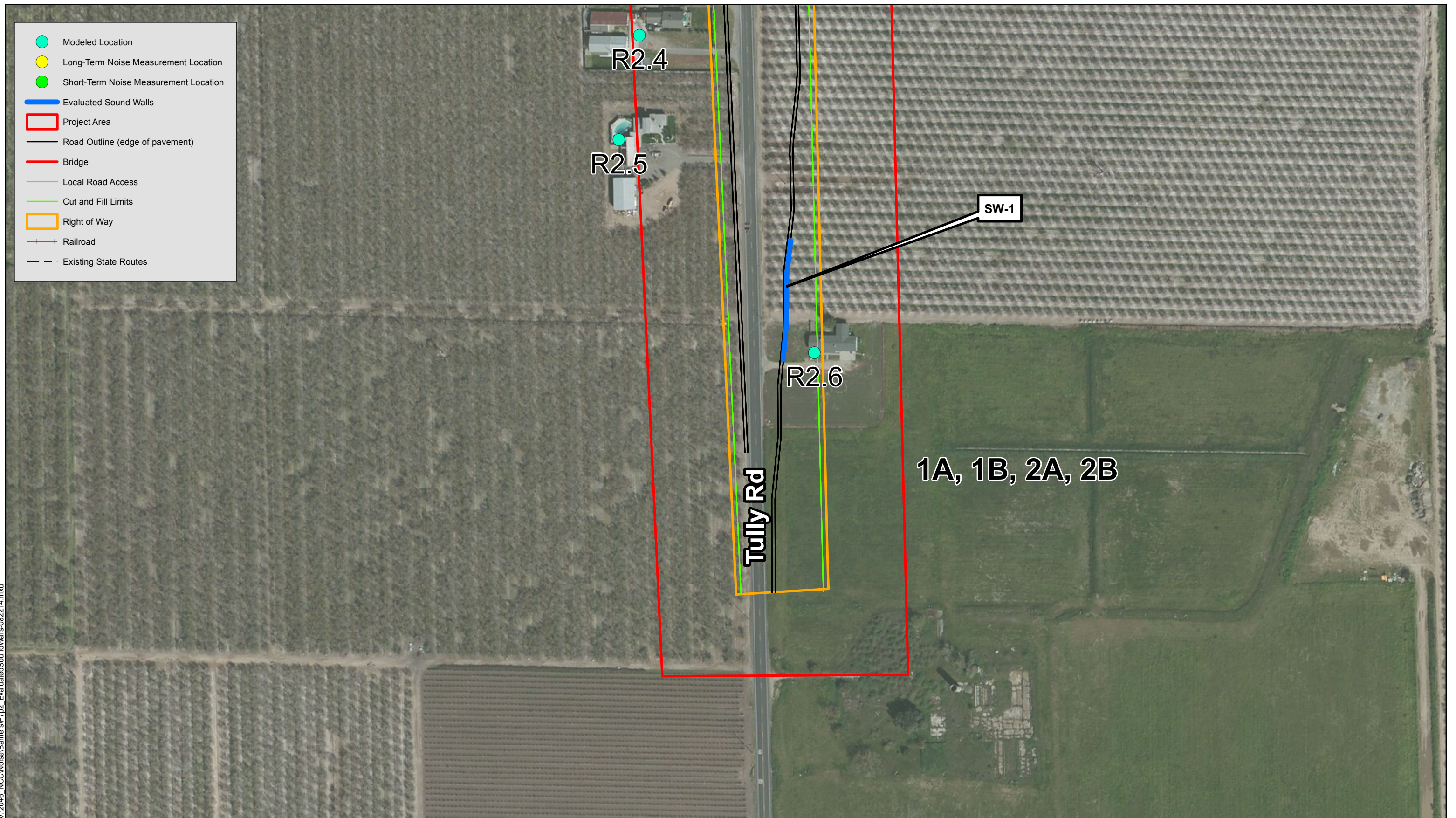
**Figure 7**  
**Evaluated Sound Wall Locations**  
**Page 1 of 12**  
EA: 10-0S8000, Project ID # 1000000263  
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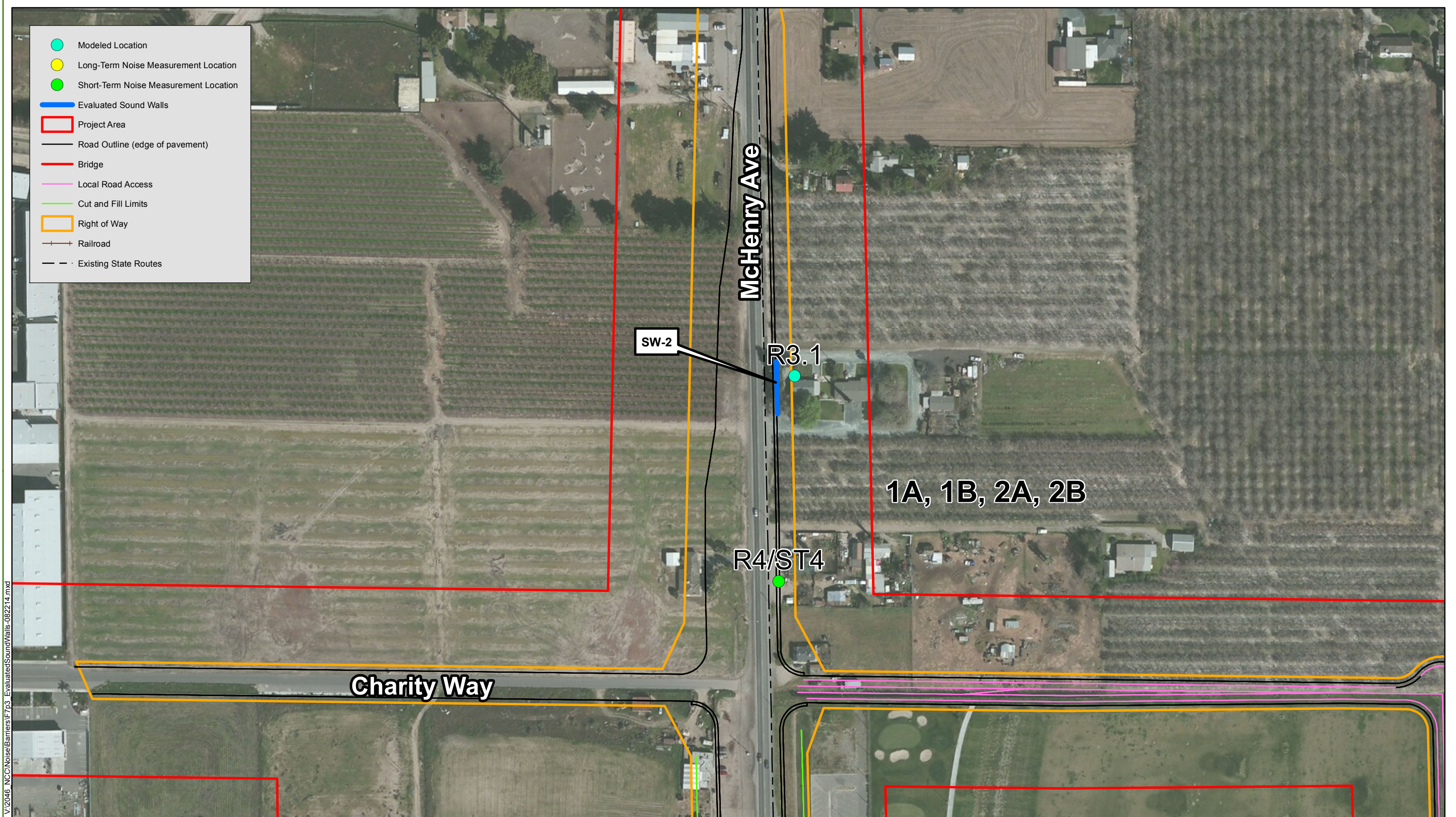
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**Figure 7**  
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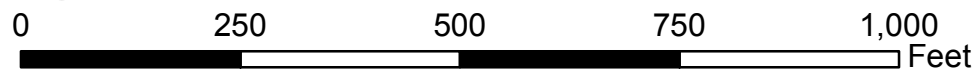








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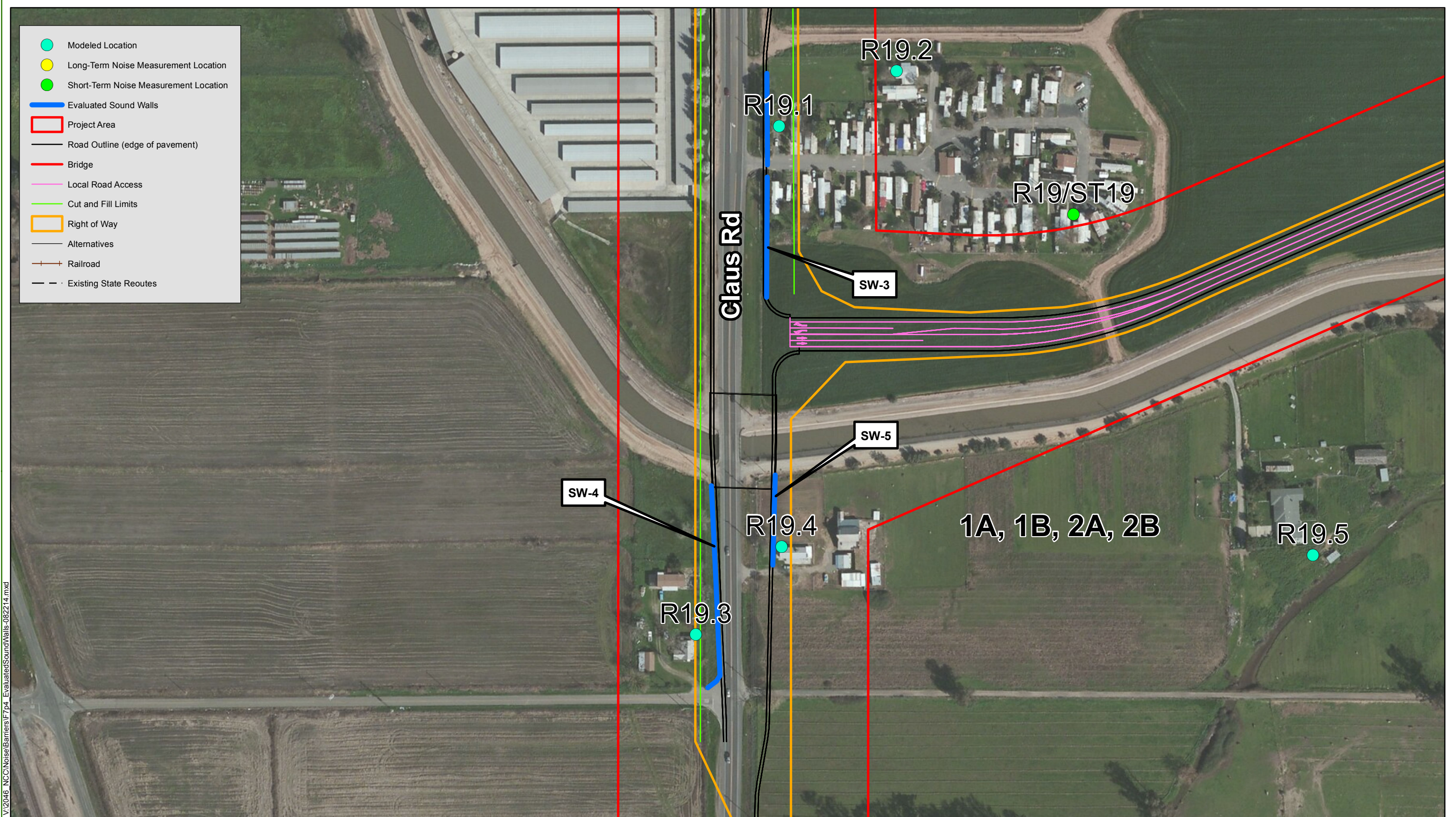
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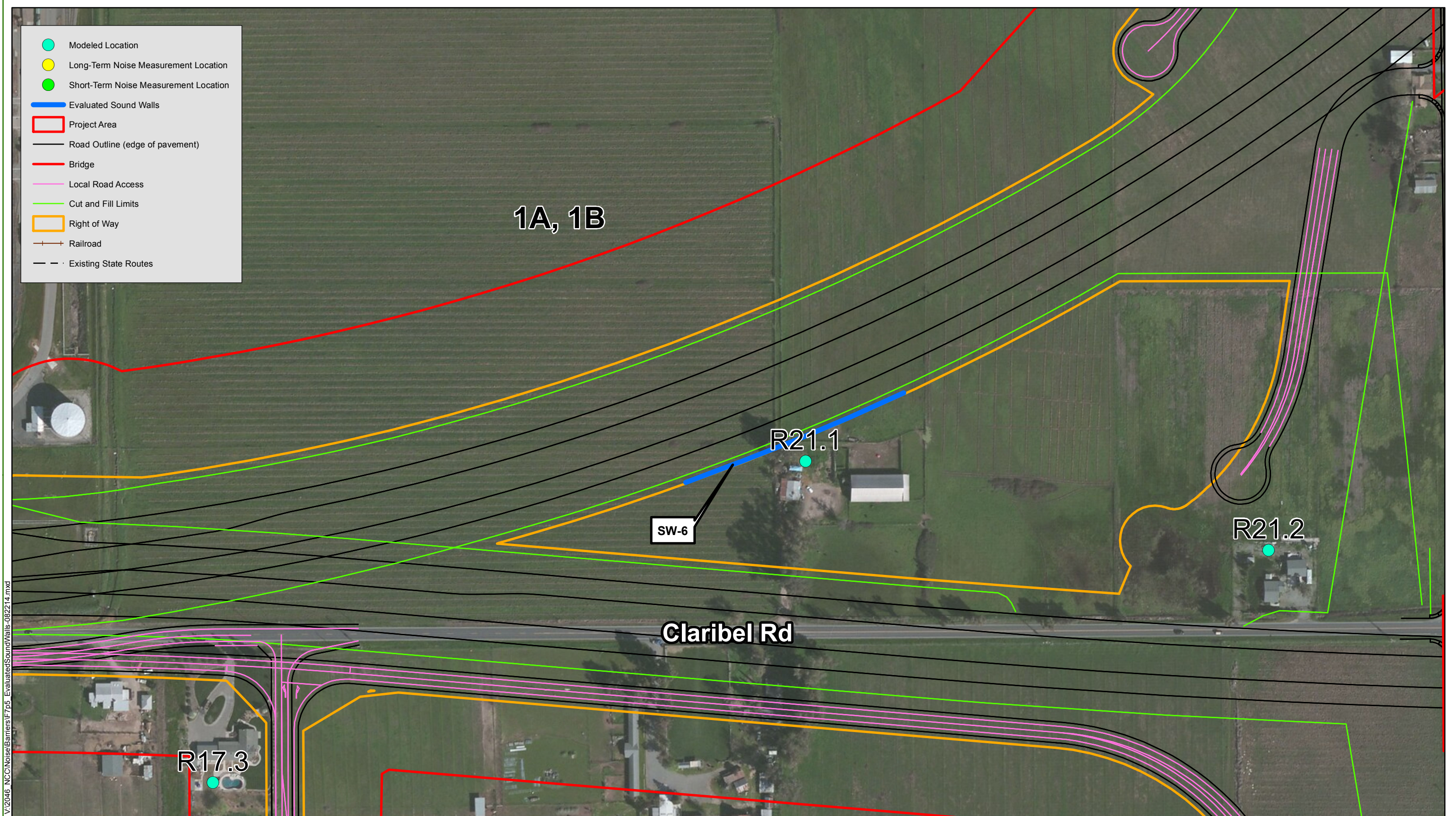
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**Figure 7**  
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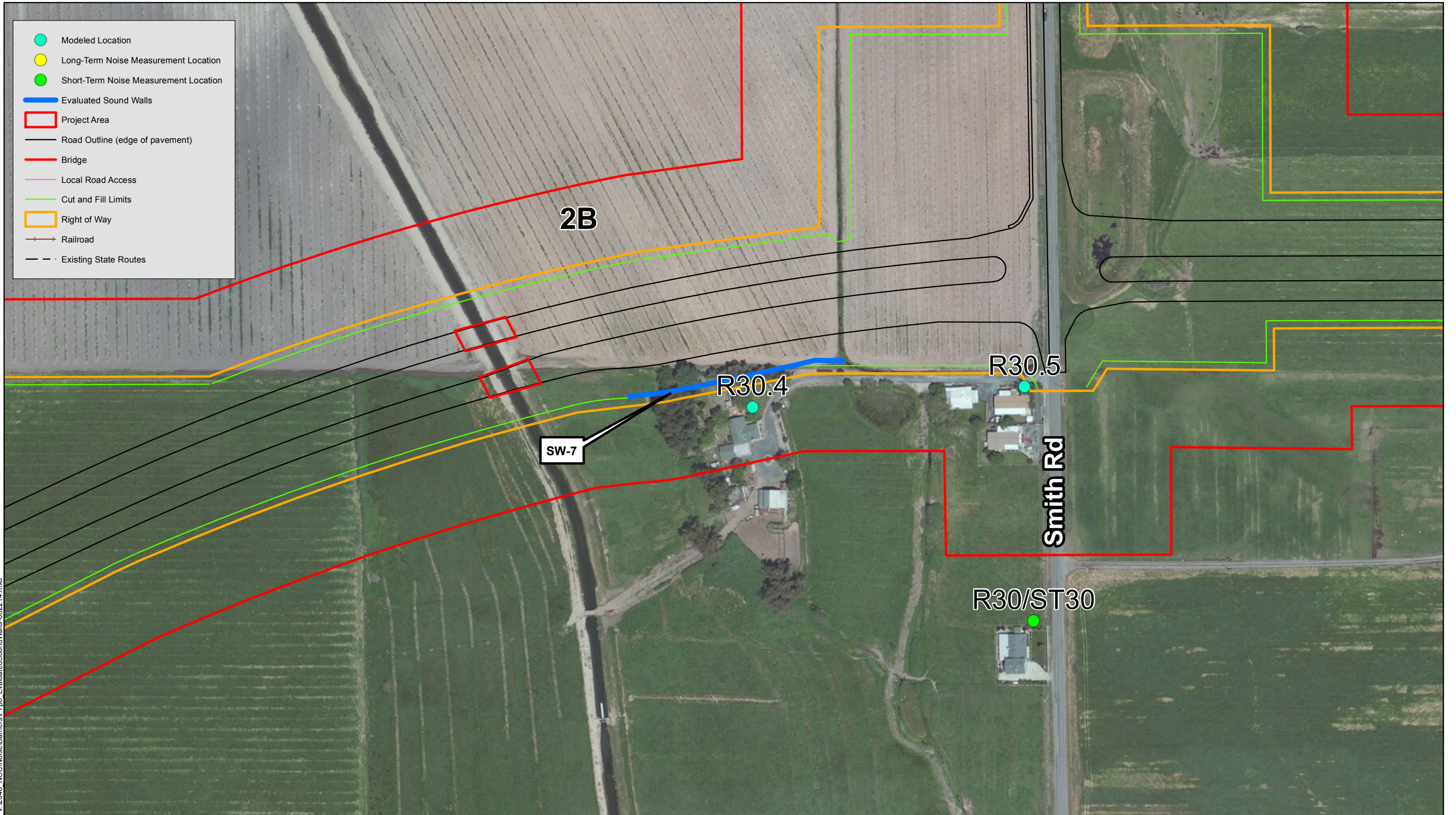


**Figure 7**  
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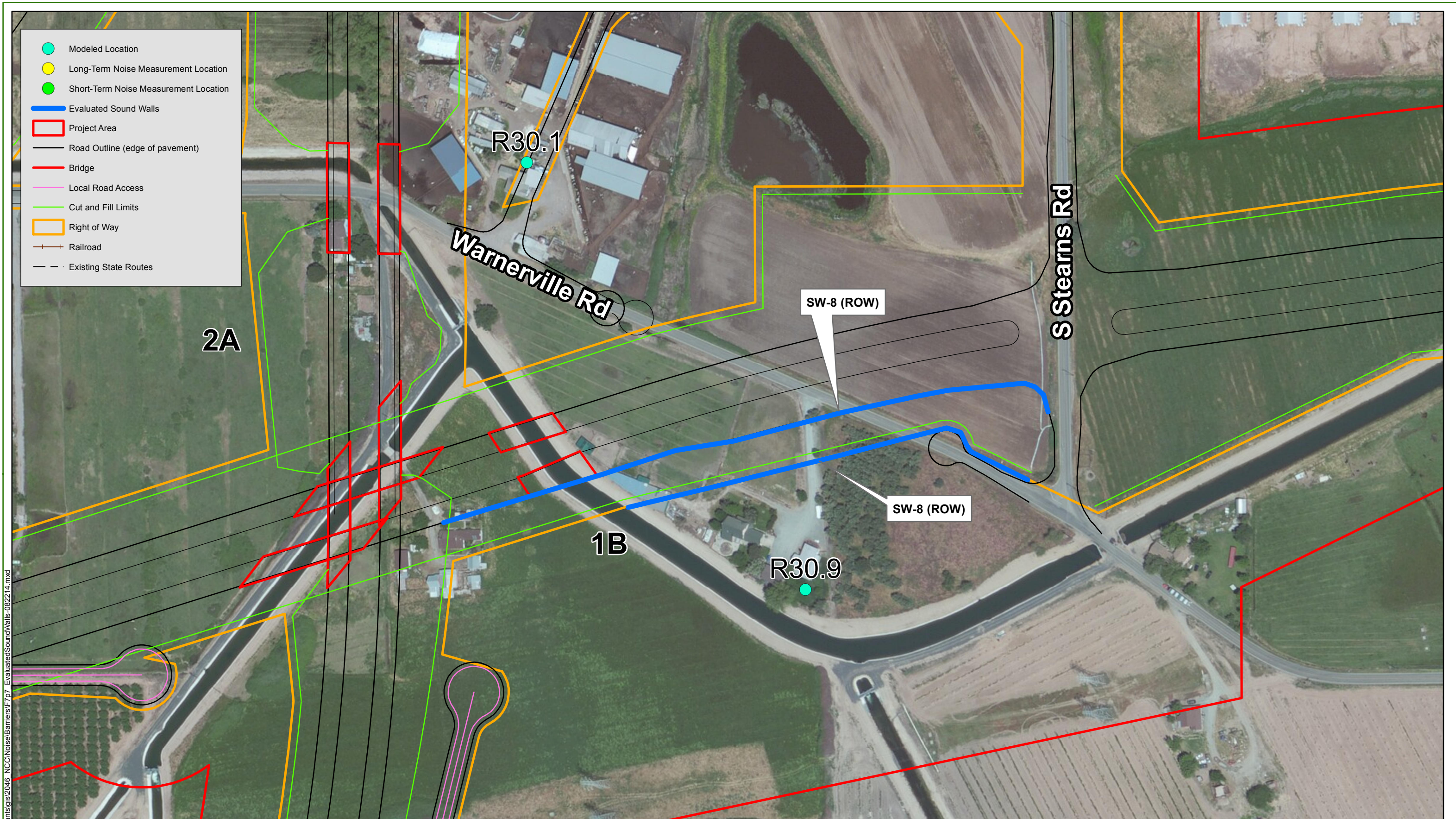
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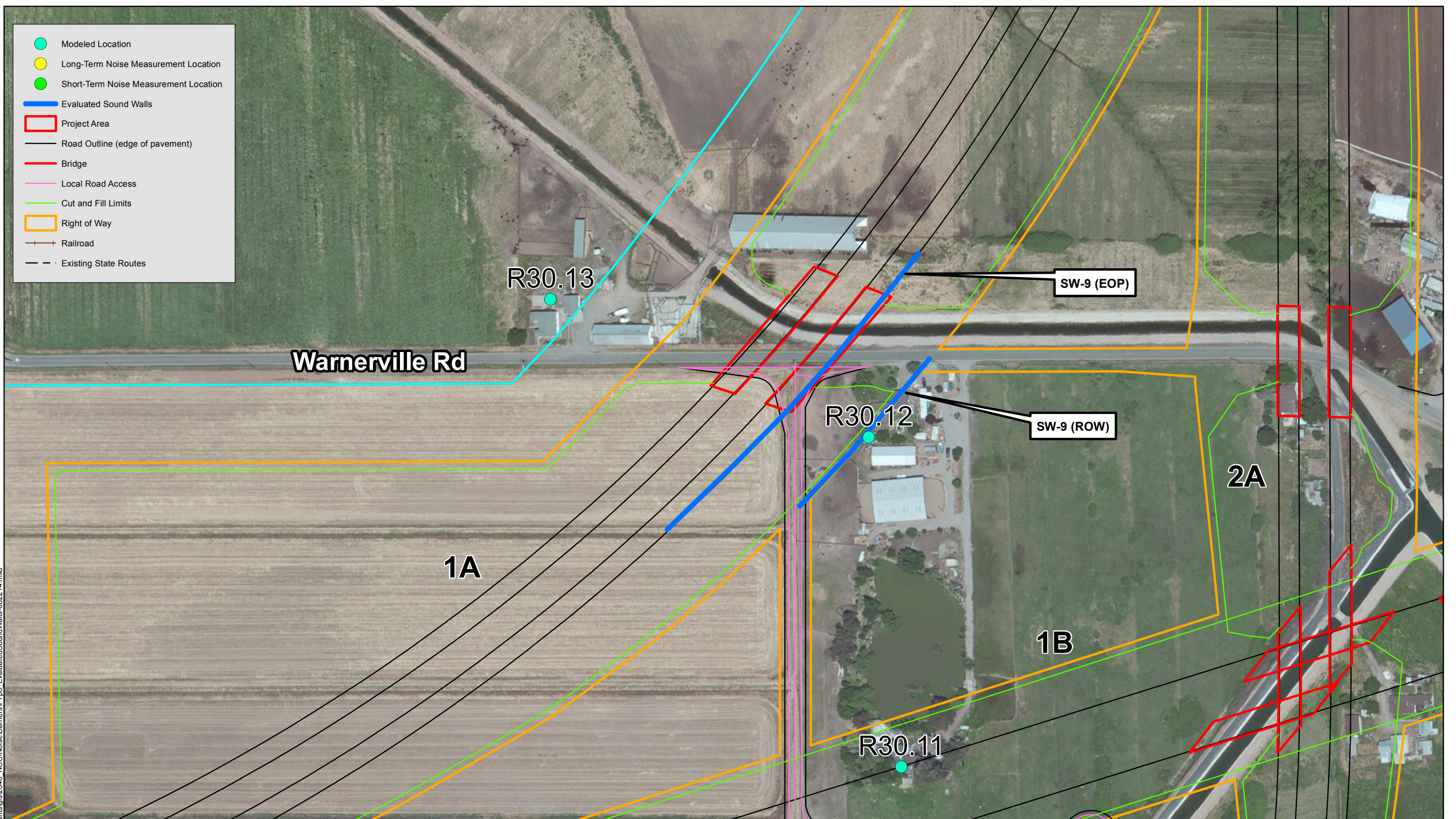


**Figure 7**  
**Evaluated Sound Wall Locations**  
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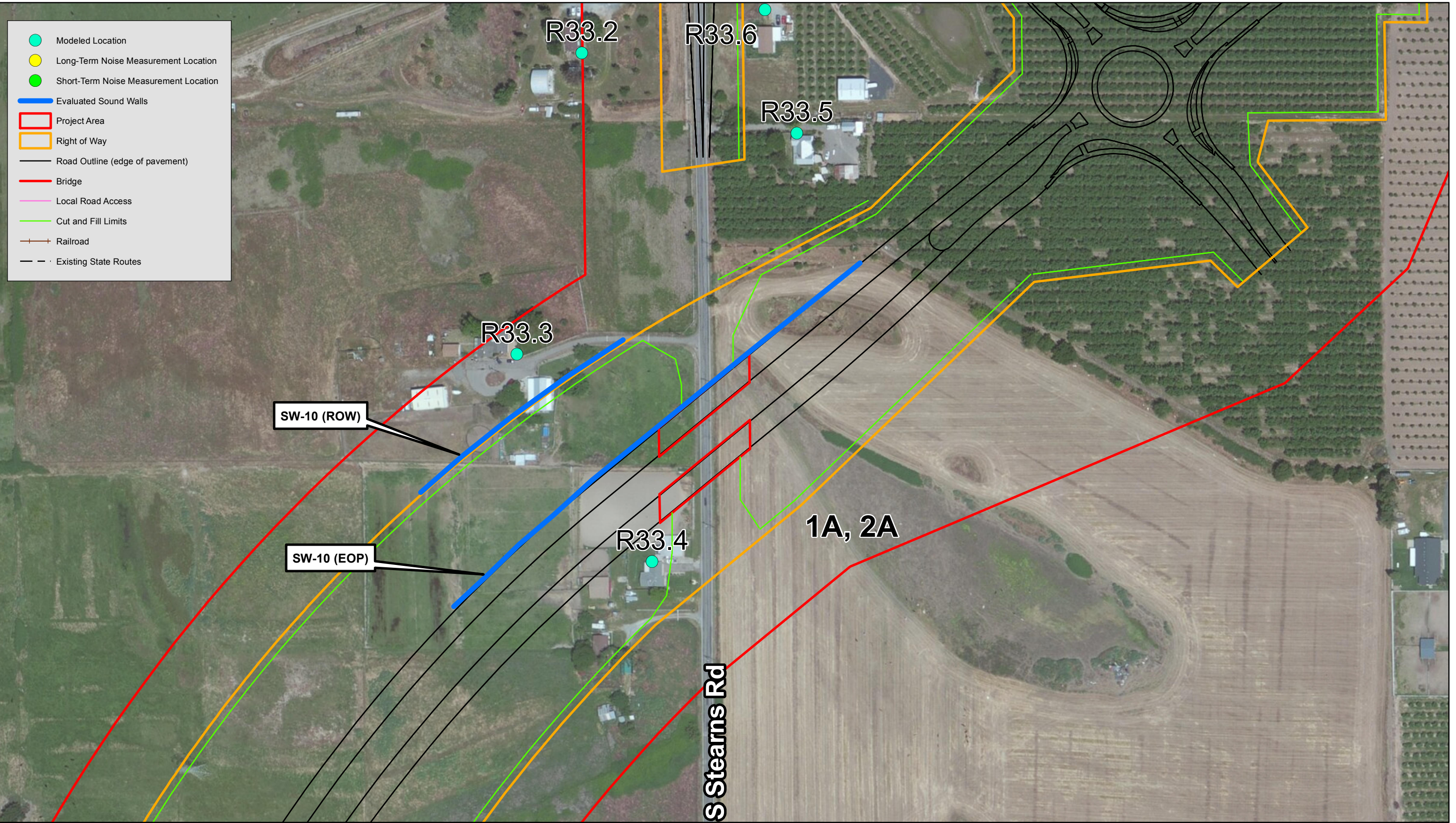
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**Figure 7**  
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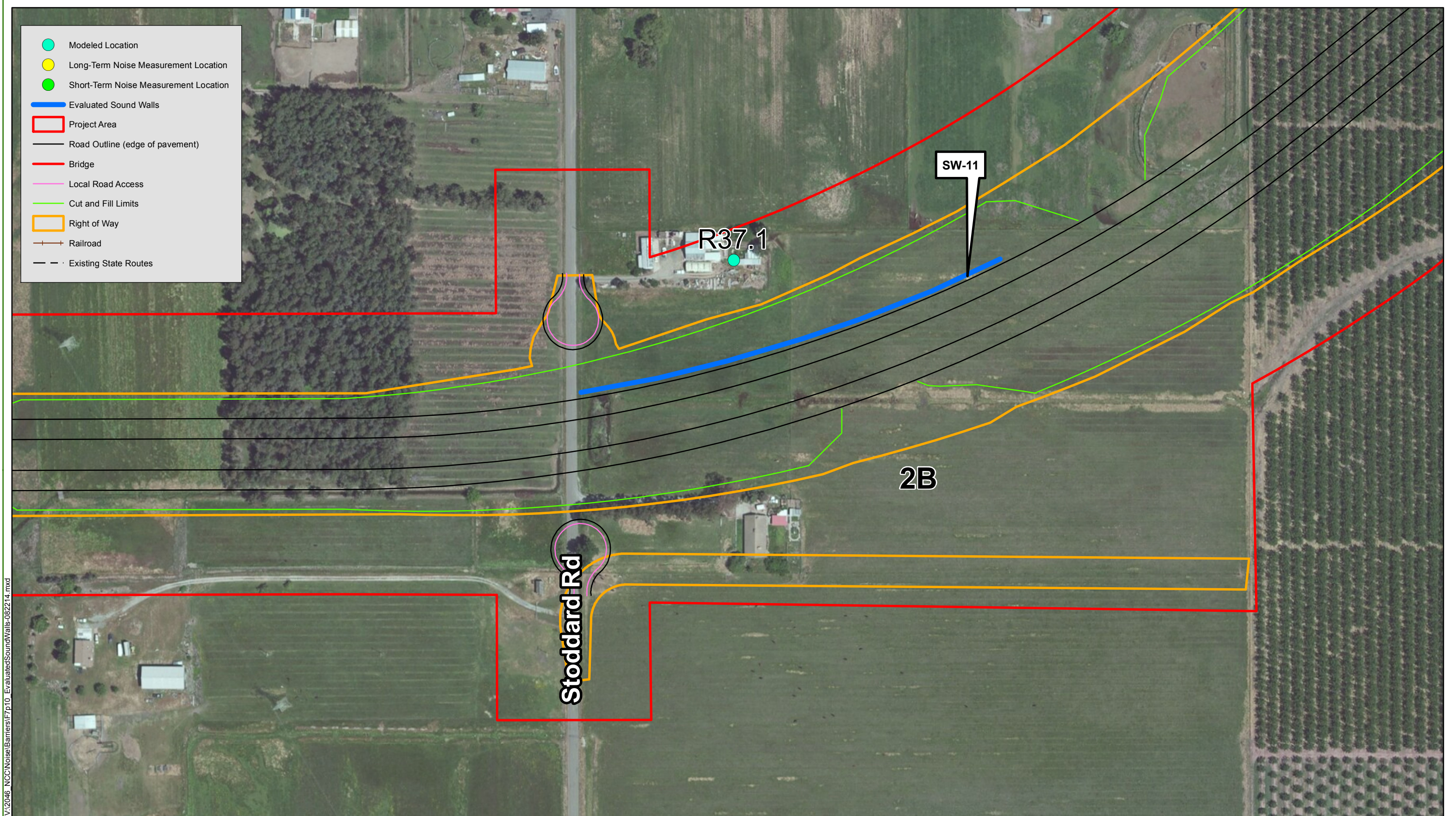
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**Figure 7**  
**Evaluated Sound Wall Locations**  
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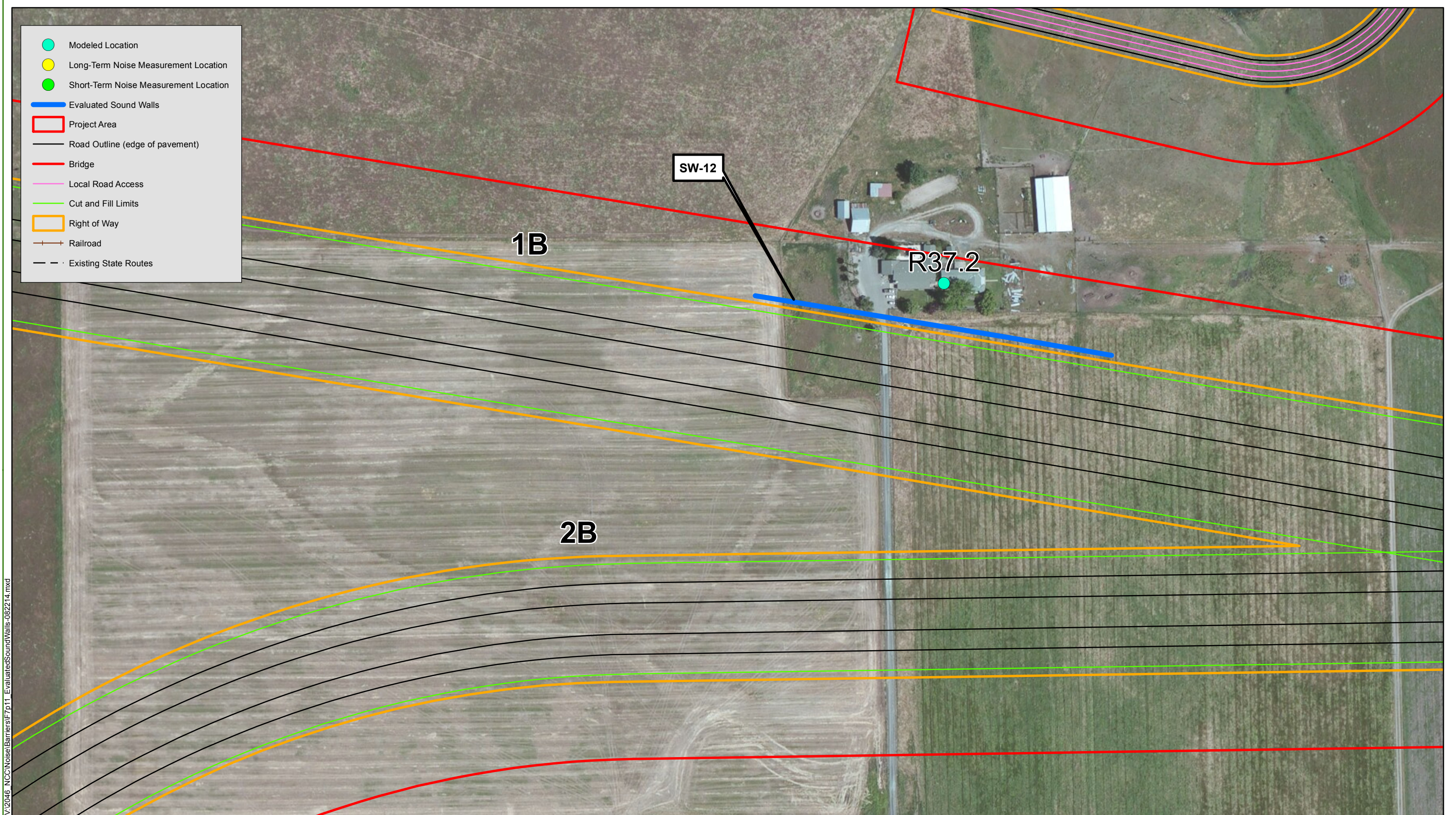
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**Figure 7**  
**Evaluated Sound Wall Locations**  
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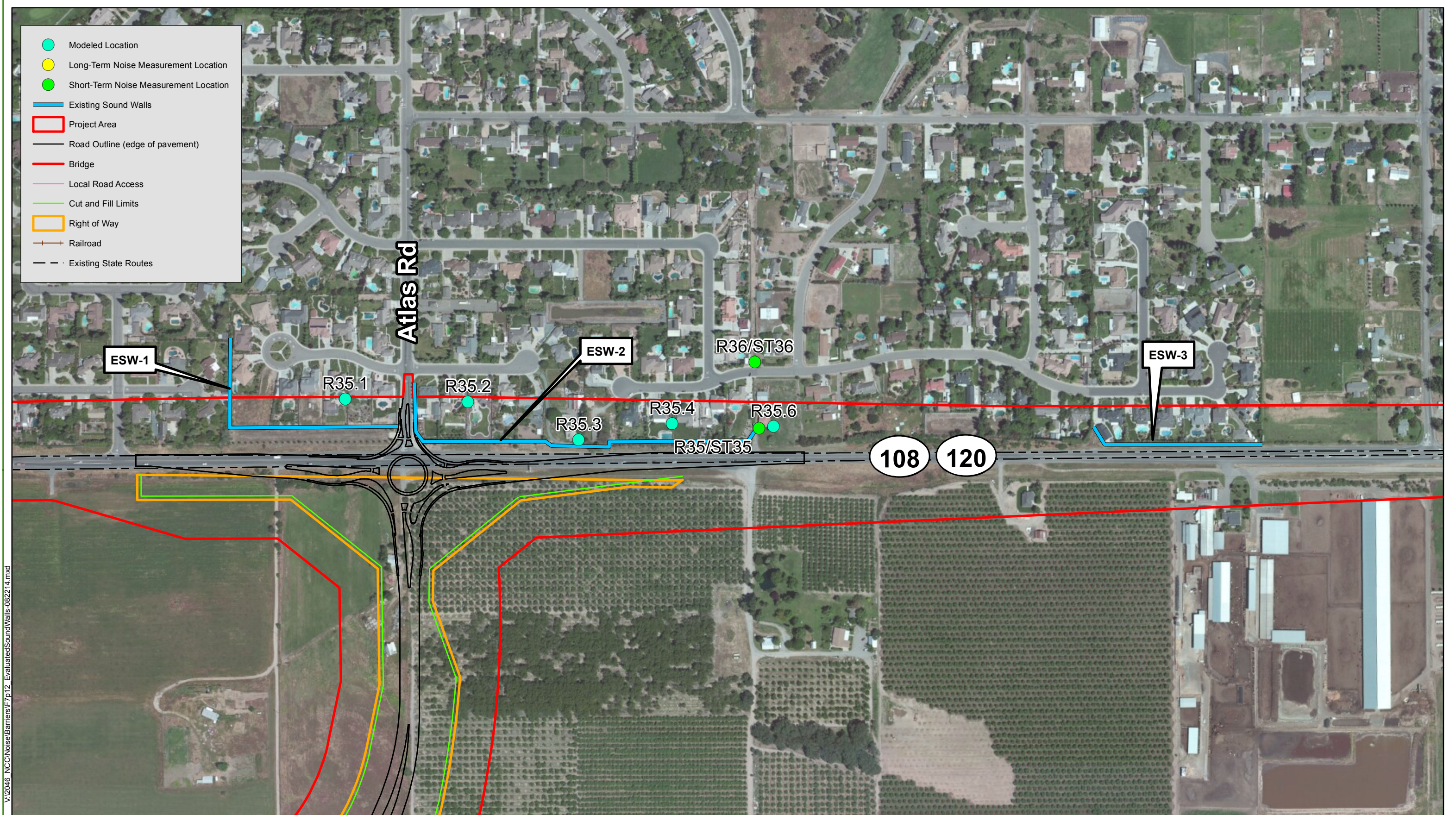
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**Figure 7**  
**Evaluated Sound Wall Locations**  
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**Figure 7**  
**Evaluated Sound Wall Locations**  
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## Chapter 8. Construction Noise

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During construction of the project, noise from construction activities may intermittently dominant the noise environment in the immediate area of construction. Table 8-1 summarizes noise levels produced by construction equipment that is commonly used on roadway construction projects. Construction equipment is expected to generate noise levels ranging from 70 to 90 dBA at a distance of 50 feet, and noise produced by construction equipment would be reduced over distance at a rate of about 6 dBA per doubling of distance. To minimize the construction-generated noise, abatement measures from Standard Specification 14-8.02 “Noise Control” and SSP 14-8.02 must be followed:

- Do not exceed 86 dBA at 50 feet from the job site activities from 9 p.m. to 6 a.m.
- Equip an internal combustion engine with the manufacturer recommended muffler.
- Do not operate an internal combustion engine on the job site without the appropriate muffler.

**Table 8-1. Construction Equipment Noise**

Equipment	Maximum Noise Level (dBA at 50 feet)
Scrapers	89
Bulldozers	85
Heavy Trucks	88
Backhoe	80
Pneumatic Tools	85
Concrete Pump	82

*Source: Federal Transit Administration 1995.*

No adverse noise impacts from construction are anticipated because construction would be conducted in accordance with Standard Specification 14-8.02, SSP14-8.02 and applicable local noise standards. Construction noise would be short-term, intermittent, and overshadowed by local traffic noise. The following local city ordinances provide the following restrictions on construction activity. No specific construction noise limits are provided for the City of Riverbank, therefore Stanislaus County construction noise limits apply.

## **Stanislaus County**

Construction Equipment. No person shall operate any construction equipment so as to cause at or beyond the property line of any property upon which a dwelling unit is located an average sound level greater than 75 decibels between the hours of 7p.m. and 7a.m.

## **City of Oakdale**

Section 19-4 (e) of the City of Oakdale Noise Ordinance states that “No person shall engage in or permit construction activities involving the use of any kind of electric, diesel or gas-powered machine or other power equipment except between the hours of 7 a.m. and 7 p.m., Monday through Friday, and between the hours of 9 a.m. and 5 p.m. on Saturdays. No person shall engage in or permit commercial construction activity on Sundays or holidays.

## **City of Modesto**

Under section 4-9.103 of the City of Modesto Noise Ordinance, construction noise is specially regulated and prohibited before 7:00am or after 9:00pm daily (except Saturday and Sunday and state or federal holidays when the prohibited times are before 9:00am

Standard Special Provision (SSP 14-8.02) would be edited specifically for this project during the PS&E phase.



## Chapter 9. References

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Caltrans, 2013. Technical Noise Supplement. November. Sacramento, CA: Division of Environmental Analysis. Sacramento, CA. Available:  
([http://www.dot.ca.gov/hq/env/noise/pub/tens\\_complete.pdf](http://www.dot.ca.gov/hq/env/noise/pub/tens_complete.pdf)).

Caltrans, 2011. Traffic Noise Analysis Protocol for New Highway Construction, Reconstruction, and Retrofit Sound walls Projects. May. Sacramento, CA: Division of Environmental Analysis. Sacramento, CA.

Federal Highway Administration, 2004. FHWA Traffic Noise Model, Version 2.5

Fehr & Peers, 2014. Traffic Operations Report for the North County Corridor.  
February 2014

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## **Appendix A**      Traffic Data

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**Table A.1 Traffic Used in Calibration Models**

Measurement Site	Roadway	20-minute counts			1-hour traffic			1-hour traffic used in model			Speed (A/MT/HT) mph
		Auto	MT	HT	Auto	MT	HT	Auto	MT	HT	
1/ST10	Tully Rd SB	43	2	0	129	6	0	64	3	0	50/50/0
	Tully Rd NB							64	3	0	50/50/0
2/ST11	Kiernan Ave EB	177	9	13	530	26	38	265	13	19	45/45/45
	Kiernan Ave WB							265	13	19	45/45/45
	Tully Rd SB	43	2	0	129	6	0	64	3	0	50/50/0
	Tully Rd NB							64	3	0	50/50/0
3/ST12	McHenry Ave SB	296	4	2	888	12	6	444	6	3	50/50/50
	McHenry Ave NB							444	6	3	50/50/50
	Crawford Rd WB	15	2	0	44	6	0	22	3	0	35/35/0
	Crawford Rd EB							22	3	0	35/35/0
4/ST13	Crawford Rd WB	360	2	6	1080	6	18	540	3	9	40/40/40
	Crawford Rd EB							540	3	9	40/40/40
5/ST14	Coffee Rd SB	155	3	0	464	8	0	232	4	0	40/40/0
	Coffee Rd NB							232	4	0	40/40/0
	Claribel Rd WB	345	7	4	1035	21	12	396	9	6	55/55/55
	Claribel Rd EB							639	12	6	55/55/55
6/ST15	Coffee Rd SB	116	0	0	348	0	0	174	0	0	45/0/0
	Coffee Rd NB							174	0	0	45/0/0
7/ST16	Claribel Rd WB	345	7	4	1035	21	12	396	9	6	55/55/55
	Claribel Rd EB							639	12	6	55/55/55
8/ST17	Claribel Rd WB	345	7	4	1035	21	12	396	9	6	55/55/55
	Claribel Rd EB							639	12	6	55/55/55
10/ST19	Oakdale Rd SB	357	9	2	1070	26	6	535	13	3	45/45/45
	Oakdale Rd NB							535	13	3	45/45/45
11/ST20	Claribel Rd WB	250	6	4	750	18	12	375	9	6	50/50/50
	Claribel Rd EB							375	9	6	50/50/50
12/ST21	Claribel Rd WB	250	6	4	750	18	12	375	9	6	50/50/50
	Claribel Rd EB							375	9	6	50/50/50
	Roselle Ave SB	117	3	2	350	8	6	175	4	3	35/35/35
	Roselle Ave NB							175	4	3	35/35/35
13/ST22	Roselle Ave SB	127	6	6	380	18	18	190	9	9	50/50/50
	Roselle Ave NB							190	9	9	50/50/50
14/ST23	Claribel Rd WB	250	6	4	750	18	12	375	9	6	50/50/50
	Claribel Rd EB							375	9	6	50/50/50
	Roselle Ave SB	117	3	2	350	8	6	175	4	3	35/35/35
	Roselle Ave NB							175	4	3	35/35/35
16/ST25	Davis Ave EB	6	0	0	18	0	0	9	0	0	15/15/15
	Claus Rd SB	194	10	2	582	30	6	291	15	3	40/40/40
	Claus Rd NB							291	15	3	40/40/40

**Table A.1 Traffic Used in Calibration Models**

17/ST26	Claribel Rd WB	134	7	1	402	20	2	201	10	1	40/40/40
	Claribel Rd EB							201	10	1	40/40/40
	Claus Rd SB	294	9	3	882	26	8	441	13	4	40/40/40
	Claus Rd NB							441	13	4	40/40/40
18/ST27	Terminal Ave SB	50	2	0	150	6	0	75	3	0	45/45/0
	Terminal Ave NB							75	3	0	45/45/0
22/ST31	Langworth Rd SB	34	0	0	102	0	0	51	0	0	54/0/0
	Langworth Rd NB							51	0	0	54/0/0
23/ST32	Claribel Rd WB	197	7	1	590	20	2	295	10	1	45/45/45
	Claribel Rd EB							295	10	1	45/45/45
	Langworth Rd SB	34	0	0	102	0	0	51	0	0	54/0/0
	Langworth Rd NB							51	0	0	54/0/0
24/ST33	Langworth Rd SB	91	0	0	272	0	0	136	0	0	55/0/0
	Langworth Rd NB							136	0	0	55/0/0
25/ST34	Patterson Rd WB	142	6	1	426	18	2	213	9	1	60/60/60
	Patterson Rd EB							213	9	1	60/60/60
29/ST38	Patterson Rd WB	10	3	10	30	8	30	15	4	15	55/55/55
	Patterson Rd EB							15	4	15	55/55/55
	Albers Rd SB	216	10	16	648	30	48	324	15	24	55/55/55
	Albers Rd NB							324	15	24	55/55/55
30/ST39	Smith Rd SB	32	2	0	96	6	0	48	3	0	47/47/0
	Smith Rd NB							48	3	0	47/47/0
32/ST41	Orsi Rd SB	2	3	0	6	8	0	3	4	0	35/35/0
	Orsi Rd NB							3	4	0	35/35/0
	Sierra Rd WB	41	1	0	122	2	0	61	1	0	45/45/0
	Sierra Rd EB							61	1	0	45/45/0
33/ST42	Stearns Rd SB	53	0	0	158	0	0	79	0	0	55/0/0
	Stearns Rd NB							79	0	0	55/0/0
35/ST44	Highway 108 WB	334	4	11	1002	12	32	501	6	16	55/55/55
	Highway 108 EB							501	6	16	55/55/55
36/ST45	Highway 108 WB	334	4	11	1002	12	32	501	6	16	55/55/55
	Highway 108 EB							501	6	16	55/55/55
	St. Andrew EB	14	0	0	42	0	0	21	0	0	25/0/0
38/ST47	Highway 120 WB	145	7	13	434	20	38	217	10	19	55/55/55
	Highway 120 EB							217	10	19	55/55/55
39/ST48	Highway 120 WB	173	2	15	518	6	44	259	3	22	55/55/55
	Highway 120 EB							259	3	22	55/55/55
40/ST49	Highway 120 WB	127	4	16	380	12	48	190	6	24	55/55/55
	Highway 120 EB							190	6	24	55/55/55
42/ST51	Highway 120 WB	127	4	16	380	12	48	190	6	24	55/55/55
	Highway 120 EB							190	6	24	55/55/55



**Table A.2 PM Peak Traffic Used in Existing TNM Model**

Roadway	Number of Lanes	Total PM Peak Hour Traffic	Auto %	Total Auto	MT %	Total MT	HT %	Total HT	Speed (A/MT/HT)
10-NB - Tully Rd	1	186	92%	171	5%	9	3%	6	45/45/45
10-SB - Tully Rd	1	132	92%	122	5%	6	3%	4	45/45/45
11-EB - Kiernan Ave	1	576	92%	530	5%	28	3%	18	55/55/55
11-WB - Kiernan Ave	1	578	92%	532	5%	28	3%	18	55/55/55
12-SB - McHenry Ave	1	888	92%	817	5%	43	3%	28	45/45/45
12-NB - McHenry Ave	1	568	92%	523	5%	27	3%	18	45/45/45
12-EB - Crawford Rd	1	25	88%	22	12%	3	0%	0	35/35/0
12-WB - Crawford Rd	1	25	88%	22	12%	3	0%	0	35/35/0
13-NB - McHenry Ave	1	888	92%	817	5%	43	3%	28	45/45/45
13-SB - McHenry Ave	1	568	92%	523	5%	27	3%	18	45/45/45
14-NB - Coffee Rd	1	523	92%	481	5%	25	3%	17	45/45/45
14-SB - Coffee Rd	1	274	92%	252	5%	13	3%	9	45/45/45
15-NB - Coffee Rd	1	310	92%	285	5%	15	3%	10	45/45/45
15-SB - Coffee Rd	1	218	92%	201	5%	10	3%	7	45/45/45
16-EB - Clairbel Rd	1	588	92%	541	5%	28	3%	19	55/55/55
16-WB - Clairbel Rd	1	395	92%	363	5%	19	3%	13	55/55/55
19-NB - Oakdale Rd	1	765	92%	704	5%	37	3%	24	45/45/45
19-SB - Oakdale Rd	1	646	92%	594	5%	31	3%	21	45/45/45
20-EB - Clairbel Rd	1	674	92%	620	5%	32	3%	22	55/55/55
20-WB - Clairbel Rd	1	525	92%	483	5%	25	3%	17	55/55/55
22-NB - Roselle Ave	1	446	92%	411	5%	21	3%	14	45/45/45
22-SB - Roselle Ave	1	373	92%	343	5%	18	3%	12	45/45/45
23-NB - Roselle Ave	1	405	92%	373	5%	19	3%	13	45/45/45
23-SB - Roselle Ave	1	300	92%	276	5%	14	3%	10	45/45/45
24-NB - Terminal Ave	1	144	100%	144	0%	0	0%	0	40/0/0
24-SB - Terminal Ave	1	144	100%	144	0%	0	0%	0	40/0/0
24-EB - Davis Ave	1	9	100%	9	0%	0	0%	0	15/0/0
25-NB - Claus Rd	1	354	92%	326	5%	17	3%	11	45/45/45
25-SB - Claus Rd	1	368	92%	338	5%	18	3%	12	45/45/45
26-EB - Claribel Rd	1	376	92%	346	5%	18	3%	12	55/55/55
26-WB - Claribel Rd	1	283	92%	260	5%	14	3%	9	55/55/55
26-NB - Claus Rd	1	453	92%	417	5%	22	3%	14	45/45/45
26-SB - Claus Rd	1	408	92%	375	5%	20	3%	13	45/45/45
27-NB - Terminal Ave	1	78	96%	75	4%	3	0%	0	45/45/0
27-SB - Terminal Ave	1	78	96%	75	4%	3	0%	0	45/45/0
28-NB - Claus Rd	1	453	92%	417	5%	22	3%	14	45/45/45
28-SB - Claus Rd	1	408	92%	375	5%	20	3%	13	45/45/45
29-NB - McGee Ave	1	3	100%	3	0%	0	0%	0	45/0/0

**Table A.2 PM Peak Traffic Used in Existing TNM Model**

30-NB - Eleanor Ave	1	13	92%	12	0%	0	8%	1	45/0/45
30-SB - Eleanor Ave	1	13	92%	12	0%	0	8%	1	45/0/45
31-NB - Langworth Rd	1	51	100%	51	0%	0	0%	0	54/0/0
31-SB - Langworth Rd	1	51	100%	51	0%	0	0%	0	54/0/0
32-EB - Claribel Rd	1	347	92%	319	5%	17	3%	11	55/55/55
32-WB - Claribel Rd	1	283	92%	260	5%	14	3%	9	55/55/55
33-NB - Langworth Ave	1	136	100%	136	0%	0	0%	0	55/0/0
33-SB - Langworth Ave	1	136	100%	136	0%	0	0%	0	55/0/0
34-EB - Patterson Rd	1	223	96%	213	4%	9	0%	1	60/60/60
34-WB - Patterson Rd	1	223	96%	213	4%	9	0%	1	60/60/60
36-NB - Albers Rd	1	363	89%	324	4%	15	7%	24	55/55/55
36-SB - Albers Rd	1	363	89%	324	4%	15	7%	24	55/55/55
38-EB - Patterson Rd	1	123	91%	112	6%	7	3%	4	45/45/45
38-WB - Patterson Rd	1	170	91%	155	5%	9	4%	6	45/45/45
39-NB - Smith Rd	1	51	94%	48	6%	3	0%	0	47/47/0
39-SB - Smith Rd	1	51	94%	48	6%	3	0%	0	47/47/0
41-NB - Orsi Rd	1	7	43%	3	57%	4	0%	0	35/35/0
41-SB - Orsi Rd	1	7	43%	3	57%	4	0%	0	35/35/0
41-EB - Sierra Rd	1	62	98%	61	2%	1	0%	0	45/45/0
41-WB - Sierra Rd	1	62	98%	61	2%	1	0%	0	45/45/0
41-EB - Knox Rd	1	76	92%	70	8%	6	0%	0	45/45/0
41-WB - Knox Rd	1	76	92%	70	8%	6	0%	0	45/45/0
42-NB - Stearns Rd	1	79	100%	79	0%	0	0%	0	55/0/0
42-SB - Stearns Rd	1	79	100%	79	0%	0	0%	0	55/0/0
44-EB - Hwy 108	1	764	91%	695	5%	41	4%	28	55/55/55
44-WB - Hwy 108	1	764	91%	695	5%	41	4%	28	55/55/55
45-EB - St Andrew	1	21	100%	21	0%	0	0%	0	25/0/0
46-EB - Warnerville Rd	1	39	100%	39	0%	0	0%	0	25/0/0
46-NB - Stoddard Rd	1	25	96%	24	4%	1	0%	0	25/25/25
47-EB - Hwy 120	1	795	91%	723	5%	43	4%	29	55/55/55
47-WB - Hwy 120	1	783	91%	713	5%	42	4%	28	55/55/55
48-EB - Hwy 120	1	424	91%	386	5%	23	4%	15	55/55/55
48-WB - Hwy 120	1	424	91%	386	5%	23	4%	15	55/55/55
49-B - Hwy 120	1	324	88%	286	7%	23	5%	15	55/55/55
38 - Albers SB	1	709	91%	645	5%	38	4%	26	45/45/45
51 - SR 120 - SB	1	424	91%	386	5%	23	4%	15	55/55/55
51 - SR 120 NB	1	424	91%	386	5%	23	4%	15	55/55/55
11-NB - Tully Road South	1	277	92%	255	5%	13	3%	9	45/45/45
11-SB - Tully Road South	1	293	92%	270	5%	14	3%	9	45/45/45
49-EB - Hwy 120	1	424	91%	386	5%	23	4%	15	55/55/55
11-EB - Kiernan Ave	1	582	92%	535	5%	28	3%	19	55/55/55

**Table A.2 PM Peak Traffic Used in Existing TNM Model**

11-WB - Kiernan Ave	1	497	92%	457	5%	24	3%	16	55/55/55
26-EB - Claribel Rd	1	347	92%	319	5%	17	3%	11	55/55/55
26-WB - Claribel Rd	1	361	92%	332	5%	17	3%	12	55/55/55
38 - Albers NB-2	1	639	91%	581	5%	35	4%	23	45/45/45
38 - Albers SB-2	1	488	91%	444	5%	26	4%	18	45/45/45
38 - Albers NB-2-2	1	833	91%	758	5%	45	4%	30	45/45/45
Claribel EB 4	1	588	92%	541	5%	28	3%	19	55/55/55
Roadway96	1	395	92%	363	5%	19	3%	13	55/55/55
Crane NB	1	163	100%	163	0%	0	0%	0	55/0/0
Crane SB	1	77	100%	77	0%	0	0%	0	55/0/0



**Table A.3 PM Peak Hour Traffic Used In No Build TNM Model**

Roadway	Number of Lanes	Total PM Peak Hour Traffic	Auto %	Total Auto	MT %	Total MT	HT %	Total HT	Speed (A/MT/HT)
10-NB - Tully Rd	1	350	92%	322	5%	17	3%	11	45/45/45
10-SB - Tully Rd	1	380	92%	350	5%	18	3%	12	45/45/45
11-EB - Kiernan Ave	1	1780	92%	1638	5%	85	3%	57	55/55/55
11-WB - Kiernan Ave	1	1520	92%	1398	5%	73	3%	49	55/55/55
12-SB - McHenry Ave	1	1090	92%	1003	5%	52	3%	35	45/45/45
12-NB - McHenry Ave	1	880	92%	810	5%	42	3%	28	45/45/45
12-EB - Crawford Rd	1	25	88%	22	12%	3	0%	0	35/35/0
12-WB - Crawford Rd	1	25	88%	22	12%	3	0%	0	35/35/0
13-NB - McHenry Ave	1	1090	92%	1003	5%	52	3%	35	45/45/45
13-SB - McHenry Ave	1	880	92%	810	5%	42	3%	28	45/45/45
14-NB - Coffee Rd	1	890	92%	819	5%	43	3%	28	45/45/45
14-SB - Coffee Rd	1	770	92%	708	5%	37	3%	25	45/45/45
15-NB - Coffee Rd	1	681	92%	626	5%	33	3%	22	45/45/45
15-SB - Coffee Rd	1	491	92%	451	5%	24	3%	16	45/45/45
16-EB - Clairbel Rd	1	1280	92%	1178	5%	61	3%	41	55/55/55
16-WB - Clairbel Rd	1	1100	92%	1012	5%	53	3%	35	55/55/55
19-NB - Oakdale Rd	1	931	92%	856	5%	45	3%	30	45/45/45
19-SB - Oakdale Rd	1	919	92%	846	5%	44	3%	29	45/45/45
20-EB - Clairbel Rd	1	991	92%	911	5%	48	3%	32	55/55/55
20-WB - Clairbel Rd	1	980	92%	902	5%	47	3%	31	55/55/55
22-NB - Roselle Ave	1	1181	92%	1086	5%	57	3%	38	45/45/45
22-SB - Roselle Ave	1	890	92%	819	5%	43	3%	28	45/45/45
23-NB - Roselle Ave	1	690	92%	635	5%	33	3%	22	45/45/45
23-SB - Roselle Ave	1	500	92%	460	5%	24	3%	16	45/45/45
24-NB - Terminal Ave	1	144	100%	144	0%	0	0%	0	40/0/0
24-SB - Terminal Ave	1	144	100%	144	0%	0	0%	0	40/0/0
24-EB - Davis Ave	1	9	100%	9	0%	0	0%	0	15/0/0
25-NB - Claus Rd	1	900	92%	828	5%	43	3%	29	45/45/45
25-SB - Claus Rd	1	919	92%	846	5%	44	3%	29	45/45/45
26-EB - Claribel Rd	1	900	92%	828	5%	43	3%	29	55/55/55
26-WB - Claribel Rd	1	890	92%	819	5%	43	3%	28	55/55/55
26-NB - Claus Rd	1	1220	92%	1122	5%	59	3%	39	45/45/45
26-SB - Claus Rd	1	1270	92%	1168	5%	61	3%	41	45/45/45
27-NB - Terminal Ave	1	78	96%	75	4%	3	0%	0	45/45/0
27-SB - Terminal Ave	1	78	96%	75	4%	3	0%	0	45/45/0
28-NB - Claus Rd	1	1220	92%	1122	5%	59	3%	39	45/45/45
29-NB - McGee Ave	1	3	100%	3	0%	0	0%	0	45/0/0
30-NB - Eleanor Ave	1	12	100%	12	0%	0	0%	0	45/0/45

**Table A.3 PM Peak Hour Traffic Used In No Build TNM Model**

Roadway	Number of Lanes	Total PM Peak Hour Traffic	Auto %	Total Auto	MT %	Total MT	HT %	Total HT	Speed (A/MT/HT)
30-SB - Eleanor Ave	1	12	100%	12	0%	0	0%	0	45/0/45
31-NB - Langworth Rd	1	51	100%	51	0%	0	0%	0	54/0/0
31-SB - Langworth Rd	1	51	100%	51	0%	0	0%	0	54/0/0
32-EB - Claribel Rd	1	880	92%	810	5%	42	3%	28	55/55/55
32-WB - Claribel Rd	1	890	92%	819	5%	43	3%	28	55/55/55
33-NB - Langworth Ave	1	136	100%	136	0%	0	0%	0	55/0/0
33-SB - Langworth Ave	1	136	100%	136	0%	0	0%	0	55/0/0
34-EB - Patterson Rd	1	223	96%	213	4%	9	0%	1	60/60/60
34-WB - Patterson Rd	1	223	96%	213	4%	9	0%	1	60/60/60
36-NB - Albers Rd	1	363	89%	324	4%	15	7%	24	55/55/55
36-SB - Albers Rd	1	363	89%	324	4%	15	7%	24	55/55/55
38-EB - Patterson Rd	1	690	91%	628	5%	37	4%	25	45/45/45
38-WB - Patterson Rd	1	310	91%	282	5%	17	4%	11	45/45/45
39-NB - Smith Rd	1	51	94%	48	6%	3	0%	0	47/47/0
39-SB - Smith Rd	1	51	94%	48	6%	3	0%	0	47/47/0
41-NB - Orsi Rd	1	7	43%	3	57%	4	0%	0	35/35/0
41-SB - Orsi Rd	1	7	43%	3	57%	4	0%	0	35/35/0
41-EB - Sierra Rd	1	62	98%	61	2%	1	0%	0	45/45/0
41-WB - Sierra Rd	1	62	98%	61	2%	1	0%	0	45/45/0
41-EB - Knox Rd	1	76	92%	70	8%	6	0%	0	45/45/0
41-WB - Knox Rd	1	76	92%	70	8%	6	0%	0	45/45/0
42-NB - Stearns Rd	1	79	100%	79	0%	0	0%	0	55/0/0
42-SB - Stearns Rd	1	79	100%	79	0%	0	0%	0	55/0/0
44-EB - Hwy 108	1	1165	91%	1060	5%	63	4%	42	55/55/55
44-WB - Hwy 108	1	1165	91%	1060	5%	63	4%	42	55/55/55
45-EB - St Andrew	1	21	100%	21	0%	0	0%	0	25/0/0
46-EB - Warnerville Rd	1	39	100%	39	0%	0	0%	0	25/0/0
46-NB - Stoddard Rd	1	25	96%	24	4%	1	0%	0	25/25/0
47-EB - Hwy 120	1	1161	91%	1056	5%	63	4%	42	55/55/55
47-WB - Hwy 120	1	1170	91%	1065	5%	63	4%	42	55/55/55
48-EB - Hwy 120	1	435	91%	396	5%	23	4%	16	55/55/55
48-WB - Hwy 120	1	435	91%	396	5%	23	4%	16	55/55/55
49-B - Hwy 120	1	435	91%	396	5%	23	4%	16	55/55/55
38 - Albers NB	1	900	91%	819	5%	49	4%	32	45/45/45
38 - Albers SB	1	961	91%	874	5%	52	4%	35	45/45/45
51 - SR 120 - SB	1	435	91%	396	5%	23	4%	16	55/55/55
51 - SR 120 NB	1	435	91%	396	5%	23	4%	16	55/55/55
11-NB - Tully Road South	1	1169	92%	1076	5%	56	3%	37	45/45/45

**Table A.3 PM Peak Hour Traffic Used In No Build TNM Model**

Roadway	Number of Lanes	Total PM Peak Hour Traffic	Auto %	Total Auto	MT %	Total MT	HT %	Total HT	Speed (A/MT/HT)
11-SB - Tully Road South	1	1020	92%	938	5%	49	3%	33	45/45/45
49-EB - Hwy 120	1	435	91%	396	5%	23	4%	16	55/55/55
11-EB - Kiernan Ave	1	1720	92%	1582	5%	83	3%	55	55/55/55
11-WB - Kiernan Ave	1	1759	92%	1619	5%	84	3%	56	55/55/55
26-EB - Claribel Rd	1	880	92%	810	5%	42	3%	28	55/55/55
26-WB - Claribel Rd	1	900	92%	828	5%	43	3%	29	55/55/55
38 - Albers NB-2	1	900	91%	819	5%	49	4%	32	45/45/45
38 - Albers SB-2	1	760	91%	692	5%	41	4%	27	45/45/45
38 - Albers NB-2-2	1	1119	91%	1019	5%	60	4%	40	45/45/45
Claribel EB 4	1	1280	92%	1178	5%	61	3%	41	55/55/55
Claribel WB - 4	1	1100	92%	1012	5%	53	3%	35	55/55/55
Crane NB	1	780	100%	780	0%	0	0%	0	45/0/0
Crane SB	1	690	100%	690	0%	0	0%	0	45/0/0



**Table A.4 PM Peak Hour Traffic Used in Alternative 1A**

Roadway	Number of Lanes	Total PM Peak Hour Traffic	Auto %	Total Auto	MT %	Total MT	HT %	Total HT	Speed (A/MT/HT)
n tully nb	1	340	92%	313	5%	16	3%	11	45/45/45
n tully sb	1	380	92%	350	5%	18	3%	12	45/45/45
s tully sb	1	1169	92%	1076	5%	56	3%	37	45/45/45
s tully nb	1	1640	92%	1509	5%	79	3%	52	45/45/45
n mchenry nb	1	569	92%	524	5%	27	3%	18	45/45/45
n mchenry sb	1	919	92%	846	5%	44	3%	29	45/45/45
s mchenry sb	1	1230	92%	1132	5%	59	3%	39	45/45/45
s mchenry nb	1	1770	92%	1628	5%	85	3%	57	45/45/45
n coffee nb	1	1020	92%	938	5%	49	3%	33	45/45/45
n coffee sb	1	540	92%	497	5%	26	3%	17	45/45/45
s coffee sb	1	960	92%	883	5%	46	3%	31	45/45/45
s coffee nb	1	1009	92%	929	5%	48	3%	32	45/45/45
n oakdale nb	1	1350	92%	1242	5%	65	3%	43	45/45/45
n oakdale sb	1	1160	92%	1067	5%	56	3%	37	45/45/45
s oakdale sb	1	1060	92%	975	5%	51	3%	34	45/45/45
s oakdale nb	1	450	92%	414	5%	22	3%	14	45/45/45
n roselle nb	1	800	92%	736	5%	38	3%	26	45/45/45
n roselle sb	1	690	92%	635	5%	33	3%	22	45/45/45
s roselle sb	1	1030	92%	948	5%	49	3%	33	45/45/45
s roselle nb	1	1020	92%	938	5%	49	3%	33	45/45/45
ncc wb - carver to tully	1	669	92%	616	5%	32	3%	21	55/55/55
ncc wb - carver to tully-2	1	669	92%	616	5%	32	3%	21	55/55/55
ncc wb - carver to tully-3	1	669	92%	616	5%	32	3%	21	55/55/55
ncc wb - tully to mchenry 1	1	643	92%	591	5%	31	3%	21	55/55/55
ncc wb - tully to mchenry 2	1	643	92%	591	5%	31	3%	21	55/55/55
ncc wb - tully to mchenry 3	1	643	92%	591	5%	31	3%	21	55/55/55
ncc wb - tully to mchenry 4	1	643	92%	591	5%	31	3%	21	55/55/55
ncc wb - mchenry to coffee 1	1	757	92%	697	5%	36	3%	24	55/55/55
ncc wb - mchenry to coffee 2	1	757	92%	697	5%	36	3%	24	55/55/55
ncc wb - mchenry to coffee 3	1	757	92%	697	5%	36	3%	24	55/55/55
ncc wb - mchenry to coffee 4	1	757	92%	697	5%	36	3%	24	55/55/55
ncc wb - coffee to oakdale 1	1	827	92%	761	5%	40	3%	26	55/55/55
ncc wb - coffee to oakdale 2	1	827	92%	761	5%	40	3%	26	55/55/55
ncc wb - coffee to oakdale 3	1	827	92%	761	5%	40	3%	26	55/55/55
ncc wb - oakdale to roselle 1	1	1095	92%	1007	5%	53	3%	35	55/55/55
ncc wb - oakdale to roselle 2	1	1095	92%	1007	5%	53	3%	35	55/55/55
ncc wb - roselle to claus 1	1	1065	92%	980	5%	51	3%	34	55/55/55
ncc wb - roselle to claus 2	1	1065	92%	980	5%	51	3%	34	55/55/55

**Table A.4 PM Peak Hour Traffic Used in Alternative 1A**

Roadway	Number of Lanes	Total PM Peak Hour Traffic	Auto %	Total Auto	MT %	Total MT	HT %	Total HT	Speed (A/MT/HT)
ncc eb - claus to roselle 1	1	1125	92%	1035	5%	54	3%	36	55/55/55
ncc eb - claus to roselle 2	1	1125	92%	1035	5%	54	3%	36	55/55/55
ncc eb - roselle to oakdale 1	1	1095	92%	1007	5%	53	3%	35	55/55/55
ncc eb - roselle to oakdale 2	1	1095	92%	1007	5%	53	3%	35	55/55/55
ncc eb - oakdale to coffee 1	1	710	92%	653	5%	34	3%	23	55/55/55
ncc eb - oakdale to coffee 2	1	710	92%	653	5%	34	3%	23	55/55/55
ncc eb - oakdale to coffee 3	1	710	92%	653	5%	34	3%	23	55/55/55
ncc eb - coffee to mchenry 1	1	563	92%	518	5%	27	3%	18	55/55/55
ncc eb - coffee to mchenry 2	1	563	92%	518	5%	27	3%	18	55/55/55
ncc eb - coffee to mchenry 3	1	563	92%	518	5%	27	3%	18	55/55/55
ncc eb - coffee to mchenry 4	1	563	92%	518	5%	27	3%	18	55/55/55
ncc eb - mchenry to tully 1	1	704	92%	647	5%	34	3%	23	55/55/55
ncc eb - mchenry to tully 2	1	704	92%	647	5%	34	3%	23	55/55/55
ncc eb - mchenry to tully 3	1	704	92%	647	5%	34	3%	23	55/55/55
ncc eb - tully to carver 1	1	687	92%	632	5%	33	3%	22	55/55/55
ncc eb - tully to carver 2	1	687	92%	632	5%	33	3%	22	55/55/55
ncc eb - tully to carver 3	1	687	92%	632	5%	33	3%	22	55/55/55
terminal nb 1	1	78	96%	75	4%	3	0%	0	45/45/0
terminal sb 1	1	78	96%	75	4%	3	0%	0	45/45/0
n claus nb 1	1	730	92%	672	5%	35	3%	23	45/45/45
n claus sb 1	1	800	92%	736	5%	38	3%	26	45/45/45
s claus sb 1	1	1581	92%	1454	5%	76	3%	51	45/45/45
s claus nb 1	1	1310	92%	1205	5%	63	3%	42	45/45/45
n eleanor nb 1	1	13	92%	12	0%	0	8%	1	45/0/45
n eleanor sb 1	1	13	92%	12	0%	0	8%	1	45/0/45
s eleanor sb 1	1	13	92%	12	0%	0	8%	1	45/0/45
s eleanor nb 1	1	13	92%	12	0%	0	8%	1	45/0/45
s albers nb	1	870	92%	800	5%	42	3%	28	45/45/45
s albers sb 1	1	1090	92%	1003	5%	52	3%	35	45/45/45
n albers nb 1	1	1200	92%	1104	5%	58	3%	38	45/45/45
n albers sb 1	1	1980	92%	1822	5%	95	3%	63	45/45/45
n round to stearns nb 1	1	460	92%	423	5%	22	3%	15	45/45/45
n stearns to round sb 1	1	419	92%	386	5%	20	3%	13	45/45/45
s langworth nb 1	1	136	100%	136	0%	0	0%	0	55/0/0
s langworth sb 1	1	136	100%	136	0%	0	0%	0	55/0/0
n langworth nb 1	1	136	100%	136	0%	0	0%	0	55/0/0
n langworth sb 1	1	136	100%	136	0%	0	0%	0	55/0/0
w patterson eb	1	431	92%	396	5%	21	3%	14	45/45/45

**Table A.4 PM Peak Hour Traffic Used in Alternative 1A**

Roadway	Number of Lanes	Total PM Peak Hour Traffic	Auto %	Total Auto	MT %	Total MT	HT %	Total HT	Speed (A/MT/HT)
w patterson wb	1	550	92%	506	5%	26	3%	18	45/45/45
e patterson eb 1	1	431	92%	396	5%	21	3%	14	45/45/45
e patterson wb 1	1	550	92%	506	5%	26	3%	18	45/45/45
s crane sb 1	1	380	92%	350	5%	18	3%	12	45/45/45
s crane nb 1	1	310	92%	285	5%	15	3%	10	45/45/45
n crane nb 1	1	931	92%	856	5%	45	3%	30	45/45/45
n crane sb 1	1	970	92%	892	5%	47	3%	31	45/45/45
w knox eb 1	1	76	92%	70	8%	6	0%	0	45/45/0
w knox wb 1	1	76	92%	70	8%	6	0%	0	45/45/0
w sierra eb 1	1	62	98%	61	2%	1	0%	0	45/45/0
w sierra wb	1	62	98%	61	2%	1	0%	0	45/45/0
e sierra wb 1	1	62	98%	61	2%	1	0%	0	45/45/0
e sierra eb 1	1	62	98%	61	2%	1	0%	0	45/45/0
n orsi nb 1	1	7	43%	3	57%	4	0%	0	35/35/0
n orsi sb 1	1	7	43%	3	57%	4	0%	0	35/35/0
w sr108 eb 1	1	460	92%	423	5%	22	3%	15	55/55/55
w sr108 wb	1	640	92%	589	5%	31	3%	20	55/55/55
e sr108 eb 1	1	831	92%	764	5%	40	3%	27	55/55/55
e sr108 wb 1	1	1050	92%	966	5%	50	3%	34	55/55/55
ncc eb - claus to eleanor 1	1	925	92%	851	5%	44	3%	30	55/55/55
ncc eb - claus to eleanor 2	1	925	92%	851	5%	44	3%	30	55/55/55
ncc eb - eleanor to langworth 1	1	925	92%	851	5%	44	3%	30	55/55/55
ncc eb - eleanor to langworth 2	1	925	92%	851	5%	44	3%	30	55/55/55
ncc eb - langworth to patterson 1	1	925	92%	851	5%	44	3%	30	55/55/55
ncc eb - langworth to patterson 2	1	925	92%	851	5%	44	3%	30	55/55/55
ncc eb - patterson to crane 1	1	925	92%	851	5%	44	3%	30	55/55/55
ncc eb - patterson to crane 2	1	925	92%	851	5%	44	3%	30	55/55/55
ncc eb - crane to kaufman 1	1	650	92%	598	5%	31	3%	21	55/55/55
ncc eb - crane to kaufman 2	1	650	92%	598	5%	31	3%	21	55/55/55
ncc eb - kaufman to albers 1	1	650	92%	598	5%	31	3%	21	55/55/55
ncc eb - kaufman to albers 2	1	650	92%	598	5%	31	3%	21	55/55/55
ncc eb - albers to sierra 1	1	525	92%	483	5%	25	3%	17	55/55/55
ncc eb - albers to sierra 2	1	525	92%	483	5%	25	3%	17	55/55/55
ncc eb - sierra to round 1	1	525	92%	483	5%	25	3%	17	55/55/55
ncc eb - sierra to round 2	1	525	92%	483	5%	25	3%	17	55/55/55
ncc eb - round to sr108 1	1	319	92%	294	5%	15	3%	10	55/55/55
ncc eb - round to sr108 2	1	319	92%	294	5%	15	3%	10	55/55/55
ncc wb - sr108 to round 1	1	230	92%	212	5%	11	3%	7	55/55/55



**Table A.4 PM Peak Hour Traffic Used in Alternative 1A**

Roadway	Number of Lanes	Total PM Peak Hour Traffic	Auto %	Total Auto	MT %	Total MT	HT %	Total HT	Speed (A/MT/HT)
ncc wb - sr108 to round 2	1	230	92%	212	5%	11	3%	7	55/55/55
ncc wb - round to sierra 1	1	415	92%	382	5%	20	3%	13	55/55/55
ncc wb - round to sierra 2	1	415	92%	382	5%	20	3%	13	55/55/55
ncc wb - sierra to albers 1	1	415	92%	382	5%	20	3%	13	55/55/55
ncc wb - sierra to albers 2	1	415	92%	382	5%	20	3%	13	55/55/55
ncc wb - albers to kaufman 1	1	819	92%	754	5%	39	3%	26	55/55/55
ncc wb - albers to kaufman 2	1	819	92%	754	5%	39	3%	26	55/55/55
ncc wb - kaufman to crane 1	1	819	92%	754	5%	39	3%	26	55/55/55
ncc wb - kaufman to crane 2	1	819	92%	754	5%	39	3%	26	55/55/55
ncc wb - kaufman to crane 2	1	819	92%	754	5%	39	3%	26	55/55/55
ncc wb - crane to patterson 1	1	1081	92%	994	5%	52	3%	35	55/55/55
ncc wb - crane to patterson 2	1	1081	92%	994	5%	52	3%	35	55/55/55
ncc wb - patterson to langworth 1	1	1081	92%	994	5%	52	3%	35	55/55/55
ncc wb - patterson to langworth 2	1	1081	92%	994	5%	52	3%	35	55/55/55
ncc wb - langworth to eleanor 1	1	1081	92%	994	5%	52	3%	35	55/55/55
ncc wb - langworth to eleanor 2	1	1081	92%	994	5%	52	3%	35	55/55/55
ncc wb - eleanor to claus 1	1	1081	92%	994	5%	52	3%	35	55/55/55
ncc wb - eleanor to claus 2	1	1081	92%	994	5%	52	3%	35	55/55/55
n mchenry nb 2	1	569	92%	524	5%	27	3%	18	45/45/45
s oakdale nb 2	1	450	92%	414	5%	22	3%	14	45/45/45
n stearns nb 1	1	81	91%	74	5%	4	4%	3	45/45/45
n stearns sb 1	1	400	92%	368	5%	19	3%	13	45/45/45
s stearns sb 1	1	90	92%	83	4%	4	3%	3	45/45/45
s stearns nb 1	1	81	91%	74	5%	4	4%	3	45/45/45
n stearns nb 2	1	431	92%	396	5%	21	3%	14	45/45/45
n stearns sb 2	1	90	92%	83	4%	4	3%	3	45/45/45
24-EB - Davis Ave	1	9	100%	9	0%	0	0%	0	15/0/0

**Table A.5 PM Peak Hour Traffic for Build Alternative 1B**

Roadway	Number of Lanes	Total PM Peak Hour Traffic	Auto %	Total Auto	MT %	Total MT	HT %	Total HT	Speed (A/MT/HT)
n tully nb	1	340	92%	313	5%	16	3%	11	45/45/45
n tully sb	1	380	92%	350	5%	18	3%	12	45/45/45
s tully sb	1	1169	92%	1076	5%	56	3%	37	45/45/45
s tully nb	1	1640	92%	1509	5%	79	3%	52	45/45/45
n mchenry nb	1	575	92%	529	5%	28	3%	18	45/45/45
n mchenry sb	1	940	92%	865	5%	45	3%	30	45/45/45
s mchenry sb	1	1230	92%	1132	5%	59	3%	39	45/45/45
s mchenry nb	1	1770	92%	1628	5%	85	3%	57	45/45/45
n coffee nb	1	1030	92%	948	5%	49	3%	33	45/45/45
n coffee sb	1	540	92%	497	5%	26	3%	17	45/45/45
s coffee sb	1	960	92%	883	5%	46	3%	31	45/45/45
s coffee nb	1	1009	92%	929	5%	48	3%	32	45/45/45
n oakdale nb	1	1290	92%	1187	5%	62	3%	41	45/45/45
n oakdale sb	1	1160	92%	1067	5%	56	3%	37	45/45/45
s oakdale sb	1	1060	92%	975	5%	51	3%	34	45/45/45
s oakdale nb	1	410	92%	377	5%	20	3%	13	45/45/45
n roselle nb	1	800	92%	736	5%	38	3%	26	45/45/45
n roselle sb	1	690	92%	635	5%	33	3%	22	45/45/45
s roselle sb	1	1030	92%	948	5%	49	3%	33	45/45/45
s roselle nb	1	1020	92%	938	5%	49	3%	33	45/45/45
ncc wb - carver to tully 1	1	669	92%	616	5%	32	3%	21	55/55/55
ncc wb - carver to tully 2	1	669	92%	616	5%	32	3%	21	55/55/55
ncc wb - carver to tully 3	1	669	92%	616	5%	32	3%	21	55/55/55
ncc wb - tully to mchenry 1	1	643	92%	591	5%	31	3%	21	55/55/55
ncc wb - tully to mchenry 2	1	643	92%	591	5%	31	3%	21	55/55/55
ncc wb - tully to mchenry 3	1	643	92%	591	5%	31	3%	21	55/55/55
ncc wb - tully to mchenry 4	1	643	92%	591	5%	31	3%	21	55/55/55
ncc wb - mchenry to coffee 1	1	755	92%	695	5%	36	3%	24	55/55/55
ncc wb - mchenry to coffee 2	1	755	92%	695	5%	36	3%	24	55/55/55
ncc wb - mchenry to coffee 3	1	755	92%	695	5%	36	3%	24	55/55/55
ncc wb - mchenry to coffee 4	1	755	92%	695	5%	36	3%	24	55/55/55
ncc wb - coffee to oakdale 1	1	819	92%	754	5%	39	3%	26	55/55/55
ncc wb - coffee to oakdale 2	1	819	92%	754	5%	39	3%	26	55/55/55
ncc wb - coffee to oakdale 3	1	819	92%	754	5%	39	3%	26	55/55/55
ncc wb - oakdale to roselle 1	1	1075	92%	989	5%	52	3%	34	55/55/55
ncc wb - oakdale to roselle 2	1	1075	92%	989	5%	52	3%	34	55/55/55
ncc wb - roselle to claus 1	1	1044	92%	961	5%	50	3%	33	55/55/55
ncc wb - roselle to claus 2	1	1044	92%	961	5%	50	3%	33	55/55/55

**Table A.5 PM Peak Hour Traffic for Build Alternative 1B**

Roadway	Number of Lanes	Total PM Peak Hour Traffic	Auto %	Total Auto	MT %	Total MT	HT %	Total HT	Speed (A/MT/HT)
ncc eb - claus to roselle 1	1	1116	92%	1026	5%	54	3%	36	55/55/55
ncc eb - claus to roselle 2	1	1116	92%	1026	5%	54	3%	36	55/55/55
ncc eb - roselle to oakdale 1	1	1085	92%	998	5%	52	3%	35	55/55/55
ncc eb - roselle to oakdale 2	1	1085	92%	998	5%	52	3%	35	55/55/55
ncc eb - oakdale to coffee 1	1	704	92%	647	5%	34	3%	23	55/55/55
ncc eb - oakdale to coffee 2	1	704	92%	647	5%	34	3%	23	55/55/55
ncc eb - oakdale to coffee 3	1	704	92%	647	5%	34	3%	23	55/55/55
ncc eb - coffee to mchenry 1	1	558	92%	513	5%	27	3%	18	55/55/55
ncc eb - coffee to mchenry 2	1	558	92%	513	5%	27	3%	18	55/55/55
ncc eb - coffee to mchenry 3	1	558	92%	513	5%	27	3%	18	55/55/55
ncc eb - coffee to mchenry 4	1	558	92%	513	5%	27	3%	18	55/55/55
ncc eb - mchenry to tully 1	1	704	92%	647	5%	34	3%	23	55/55/55
ncc eb - mchenry to tully 2	1	704	92%	647	5%	34	3%	23	55/55/55
ncc eb - mchenry to tully 3	1	704	92%	647	5%	34	3%	23	55/55/55
ncc eb - tully to carver 1	1	687	92%	632	5%	33	3%	22	55/55/55
ncc eb - tully to carver 2	1	687	92%	632	5%	33	3%	22	55/55/55
ncc eb - tully to carver 3	1	687	92%	632	5%	33	3%	22	55/55/55
claribel eb 1	1	300	92%	276	5%	14	3%	10	45/45/45
claribel wb 1	1	160	92%	147	5%	8	3%	5	45/45/45
terminal nb 1	1	78	96%	75	4%	3	0%	0	45/45/0
terminal sb 1	1	78	96%	75	4%	3	0%	0	45/45/0
n claus nb 1	1	750	92%	690	5%	36	3%	24	45/45/45
n claus sb 1	1	819	92%	754	5%	39	3%	26	45/45/45
s claus sb 1	1	1581	92%	1454	5%	76	3%	51	45/45/45
s claus nb 1	1	1130	92%	1040	5%	54	3%	36	45/45/45
n mchenry nb 2	1	575	92%	529	5%	28	3%	18	45/45/45
s oakdale nb 2	1	410	92%	377	5%	20	3%	13	45/45/45
w claribel eb 1	1	400	92%	368	5%	19	3%	13	45/45/45
w claribel wb 1	1	310	92%	285	5%	15	3%	10	45/45/45
24-EB - Davis Ave	1	9	100%	9	0%	0	0%	0	15/0/0
n eleanor nb 1	1	13	92%	12	0%	0	8%	1	45/0/45
n eleanor sb 1	1	13	92%	12	0%	0	8%	1	45/0/45
s eleanor sb 1	1	13	92%	12	0%	0	8%	1	45/0/45
s eleanor nb 1	1	13	92%	12	0%	0	8%	1	45/0/45
s albers nb 1	1	870	91%	792	5%	47	4%	31	45/45/45
s albers sb 1	1	1090	91%	992	5%	59	4%	39	45/45/45
n albers nb 1	1	1290	91%	1174	5%	70	4%	46	45/45/45
n albers sb 1	1	2060	91%	1875	5%	111	4%	74	45/45/45



**Table A.5 PM Peak Hour Traffic for Build Alternative 1B**

Roadway	Number of Lanes	Total PM Peak Hour Traffic	Auto %	Total Auto	MT %	Total MT	HT %	Total HT	Speed (A/MT/HT)
s langworth nb 1	1	136	100%	136	0%	0	0%	0	55/0/0
s langworth sb 1	1	136	100%	136	0%	0	0%	0	55/0/0
n langworth nb 1	1	136	100%	136	0%	0	0%	0	55/0/0
n langworth sb 1	1	136	100%	136	0%	0	0%	0	55/0/0
w patterson eb 2	1	429	91%	391	5%	23	3%	15	45/45/45
w patterson wb 2	1	551	91%	501	5%	30	4%	20	45/45/45
e patterson eb 1	1	429	91%	391	5%	23	3%	15	45/45/45
e patterson wb 1	1	551	91%	501	5%	30	4%	20	45/45/45
s crane sb 1	1	381	91%	346	6%	21	4%	14	45/45/45
s crane nb 1	1	310	91%	282	5%	17	4%	11	45/45/45
n crane nb 1	1	940	91%	855	5%	51	4%	34	45/45/45
n crane sb 1	1	970	91%	883	5%	52	4%	35	45/45/45
e 108 eb 1	1	661	91%	601	5%	36	4%	24	45/45/45
e 108 wb 1	1	580	91%	528	5%	31	4%	21	45/45/45
w 108 wb 1	1	310	91%	282	5%	17	4%	11	45/45/45
w 108 eb 1	1	260	91%	237	5%	14	3%	9	45/45/45
n stearns nb 1	1	300	91%	273	5%	16	4%	11	45/45/45
n stearns sb 1	1	271	91%	246	6%	15	4%	10	45/45/45
ncc eb - claus to eleanor 1	1	884	92%	814	5%	42	3%	28	55/55/55
ncc eb - claus to eleanor 2	1	884	92%	814	5%	42	3%	28	55/55/55
ncc eb - eleanor to langworth 1	1	884	92%	814	5%	42	3%	28	55/55/55
ncc eb - eleanor to langworth 2	1	884	92%	814	5%	42	3%	28	55/55/55
ncc eb - langworth to patterson 1	1	884	92%	814	5%	42	3%	28	55/55/55
ncc eb - langworth to patterson 2	1	884	92%	814	5%	42	3%	28	55/55/55
ncc eb - patterson to crane 1	1	884	92%	814	5%	42	3%	28	55/55/55
ncc eb - patterson to crane 2	1	884	92%	814	5%	42	3%	28	55/55/55
ncc eb - crane to kaufman 1	1	600	91%	546	5%	32	4%	22	55/55/55
ncc eb - crane to kaufman 2	1	600	91%	546	5%	32	4%	22	55/55/55
ncc eb - kaufman to albers 1	1	600	91%	546	5%	32	4%	22	55/55/55
ncc eb - kaufman to albers 2	1	600	91%	546	5%	32	4%	22	55/55/55
ncc wb - albers to kaufman 1	1	790	91%	719	5%	43	4%	28	55/55/55
ncc wb - albers to kaufman 2	1	790	91%	719	5%	43	4%	28	55/55/55
ncc wb - kaufman to crane 1	1	790	91%	719	5%	43	4%	28	55/55/55
ncc wb - kaufman to crane 2	1	790	91%	719	5%	43	4%	28	55/55/55
ncc wb - crane to patterson 1	1	1056	92%	971	5%	51	3%	34	55/55/55
ncc wb - crane to patterson 2	1	1056	92%	971	5%	51	3%	34	55/55/55
ncc wb - patterson to langworth 1	1	1056	92%	971	5%	51	3%	34	55/55/55
ncc wb - patterson to langworth 2	1	1056	92%	971	5%	51	3%	34	55/55/55

**Table A.5 PM Peak Hour Traffic for Build Alternative 1B**

Roadway	Number of Lanes	Total PM Peak Hour Traffic	Auto %	Total Auto	MT %	Total MT	HT %	Total HT	Speed (A/MT/HT)
ncc wb - langworth to eleanor 1	1	1056	92%	971	5%	51	3%	34	55/55/55
ncc wb - langworth to eleanor 2	1	1056	92%	971	5%	51	3%	34	55/55/55
ncc wb - eleanor to claus 1	1	1056	92%	971	5%	51	3%	34	55/55/55
ncc wb - eleanor to claus 2	1	1056	92%	971	5%	51	3%	34	55/55/55
ncc eb - wamble to new road 1	1	265	91%	241	5%	14	4%	10	55/55/55
ncc eb - wamble to new road 2	1	265	91%	241	5%	14	4%	10	55/55/55
ncc eb - new road to terminus 1	1	265	91%	241	5%	14	4%	10	55/55/55
ncc eb - new road to terminus 2	1	265	91%	241	5%	14	4%	10	55/55/55
ncc wb - terminus to new road 1	1	200	91%	182	6%	11	4%	7	55/55/55
ncc wb - terminus to new road 2	1	200	91%	182	6%	11	4%	7	55/55/55
ncc wb - new road to wamble 1	1	200	91%	182	6%	11	4%	7	55/55/55
ncc wb - new road to wamble 2	1	200	91%	182	6%	11	4%	7	55/55/55
ncc eb - albers to stearns 1	1	394	91%	359	5%	21	4%	14	55/55/55
ncc eb - albers to stearns 2	1	394	91%	359	5%	21	4%	14	55/55/55
ncc eb - stearns to wamble 1	1	265	91%	241	5%	14	4%	10	55/55/55
ncc eb - stearns to wamble 2	1	265	91%	241	5%	14	4%	10	55/55/55
ncc wb - wamble to stearns 1	1	200	91%	182	6%	11	4%	7	55/55/55
ncc wb - wamble to stearns 2	1	200	91%	182	6%	11	4%	7	55/55/55
ncc wb - stearns to albers 1	1	310	91%	282	5%	17	4%	11	55/55/55
ncc wb - stearns to albers 2	1	310	91%	282	5%	17	4%	11	55/55/55

**Table A.6 PM Peak Hour Traffic for Build Alternative 2A**

Roadway	Number of Lanes	Total PM Peak Hour Traffic	Auto %	Total Auto	MT %	Total MT	HT %	Total HT	Speed (A/MT/HT)
n tully nb	1	310	92%	285	5%	15	3%	10	45/45/45
n tully sb	1	410	92%	377	5%	20	3%	13	45/45/45
s tully sb	1	1060	92%	975	5%	51	3%	34	45/45/45
s tully nb	1	1660	92%	1527	5%	80	3%	53	45/45/45
n mchenry nb	1	550	92%	506	5%	26	3%	18	45/45/45
n mchenry sb	1	900	92%	828	5%	43	3%	29	45/45/45
s mchenry sb	1	1150	92%	1058	5%	55	3%	37	45/45/45
s mchenry nb	1	1560	92%	1435	5%	75	3%	50	45/45/45
n coffee nb	1	991	92%	911	5%	48	3%	32	45/45/45
n coffee sb	1	590	92%	543	5%	28	3%	19	45/45/45
s coffee sb	1	919	92%	846	5%	44	3%	29	45/45/45
s coffee nb	1	980	92%	902	5%	47	3%	31	45/45/45
n oakdale nb	1	1480	92%	1362	5%	71	3%	47	45/45/45
n oakdale sb	1	1259	92%	1159	5%	60	3%	40	45/45/45
s oakdale sb	1	1100	92%	1012	5%	53	3%	35	45/45/45
s oakdale nb	1	450	92%	414	5%	22	3%	14	45/45/45
n roselle nb	1	810	92%	745	5%	39	3%	26	45/45/45
n roselle sb	1	730	92%	672	5%	35	3%	23	45/45/45
s roselle sb	1	1050	92%	966	5%	50	3%	34	45/45/45
s roselle nb	1	1030	92%	948	5%	49	3%	33	45/45/45
ncc wb - carver to tully 1	1	640	92%	589	5%	31	3%	20	55/55/55
ncc wb - carver to tully 2	1	640	92%	589	5%	31	3%	20	55/55/55
ncc wb - carver to tully 3	1	640	92%	589	5%	31	3%	20	55/55/55
ncc wb - tully to mchenry 1	1	648	92%	596	5%	31	3%	21	55/55/55
ncc wb - tully to mchenry 2	1	648	92%	596	5%	31	3%	21	55/55/55
ncc wb - tully to mchenry 3	1	648	92%	596	5%	31	3%	21	55/55/55
ncc wb - tully to mchenry 4	1	648	92%	596	5%	31	3%	21	55/55/55
ncc wb - mchenry to coffee 1	1	720	92%	662	5%	35	3%	23	55/55/55
ncc wb - mchenry to coffee 2	1	720	92%	662	5%	35	3%	23	55/55/55
ncc wb - mchenry to coffee 3	1	720	92%	662	5%	35	3%	23	55/55/55
ncc wb - mchenry to coffee 4	1	720	92%	662	5%	35	3%	23	55/55/55
ncc wb - coffee to oakdale 1	1	790	92%	727	5%	38	3%	25	55/55/55
ncc wb - coffee to oakdale 2	1	790	92%	727	5%	38	3%	25	55/55/55
ncc wb - coffee to oakdale 3	1	790	92%	727	5%	38	3%	25	55/55/55
ncc wb - oakdale to roselle 1	1	950	92%	874	5%	46	3%	30	55/55/55
ncc wb - oakdale to roselle 2	1	950	92%	874	5%	46	3%	30	55/55/55
ncc wb - roselle to claus 1	1	919	92%	846	5%	44	3%	29	55/55/55
ncc wb - roselle to claus 2	1	919	92%	846	5%	44	3%	29	55/55/55
ncc eb - claus to roselle 1	1	919	92%	846	5%	44	3%	29	55/55/55
ncc eb - claus to roselle 2	1	919	92%	846	5%	44	3%	29	55/55/55



**Table A.6 PM Peak Hour Traffic for Build Alternative 2A**

Roadway	Number of Lanes	Total PM Peak Hour Traffic	Auto %	Total Auto	MT %	Total MT	HT %	Total HT	Speed (A/MT/HT)
ncc eb - roselle to oakdale 1	1	900	92%	828	5%	43	3%	29	55/55/55
ncc eb - roselle to oakdale 2	1	900	92%	828	5%	43	3%	29	55/55/55
ncc eb - oakdale to coffee 1	1	617	92%	567	5%	30	3%	20	55/55/55
ncc eb - oakdale to coffee 2	1	617	92%	567	5%	30	3%	20	55/55/55
ncc eb - oakdale to coffee 3	1	617	92%	567	5%	30	3%	20	55/55/55
ncc eb - coffee to mchenry 1	1	505	92%	465	5%	24	3%	16	55/55/55
ncc eb - coffee to mchenry 2	1	505	92%	465	5%	24	3%	16	55/55/55
ncc eb - coffee to mchenry 3	1	505	92%	465	5%	24	3%	16	55/55/55
ncc eb - coffee to mchenry 4	1	505	92%	465	5%	24	3%	16	55/55/55
ncc eb - mchenry to tully 1	1	647	92%	595	5%	31	3%	21	55/55/55
ncc eb - mchenry to tully 2	1	647	92%	595	5%	31	3%	21	55/55/55
ncc eb - mchenry to tully 3	1	647	92%	595	5%	31	3%	21	55/55/55
ncc eb - tully to carver 1	1	657	92%	604	5%	32	3%	21	55/55/55
ncc eb - tully to carver 2	1	657	92%	604	5%	32	3%	21	55/55/55
ncc eb - tully to carver 3	1	657	92%	604	5%	32	3%	21	55/55/55
claribel eb 1	1	310	92%	285	5%	15	3%	10	45/45/45
claribel wb 1	1	160	92%	147	5%	8	3%	5	45/45/45
terminal nb 1	1	78	96%	75	4%	3	0%	0	45/45/0
terminal sb 1	1	78	96%	75	4%	3	0%	0	45/45/0
n claus nb 1	1	78	96%	75	4%	3	0%	0	45/45/0
n claus sb 1	1	900	92%	828	5%	43	3%	29	45/45/45
s claus sb 1	1	1090	92%	1003	5%	52	3%	35	45/45/45
s claus nb 1	1	910	92%	837	5%	44	3%	29	45/45/45
n mchenry nb 2	1	550	92%	506	5%	26	3%	18	45/45/45
s oakdale nb 2	1	450	92%	414	5%	22	3%	14	45/45/45
s albers sb 1	1	640	91%	582	5%	35	4%	23	45/45/45
s albers nb 1	1	670	91%	610	5%	36	4%	24	45/45/45
n albers sb 1	1	1039	91%	946	5%	56	4%	37	45/45/45
n albers nb 1	1	1060	91%	965	5%	57	4%	38	45/45/45
s bentley nb 1	1	280	92%	258	5%	13	3%	9	45/45/45
s bentley sb 1	1	400	92%	368	5%	19	3%	13	45/45/45
n bentley sb 1	1	509	92%	469	5%	24	3%	16	45/45/45
n bentley nb 1	1	220	92%	202	5%	11	3%	7	45/45/45
s langworth nb 1	1	51	100%	51	0%	0	0%	0	54/0/0
s langworth sb 1	1	51	100%	51	0%	0	0%	0	54/0/0
s eleanor sb 1	1	13	92%	12	0%	0	8%	1	45/0/45
s eleanor nb 1	1	13	92%	12	0%	0	8%	1	45/0/45
n eleanor nb 1	1	13	92%	12	0%	0	8%	1	45/0/45
n eleanor sb 1	1	13	92%	12	0%	0	8%	1	45/0/45
w patterson eb 1	1	650	91%	592	5%	35	4%	23	45/45/45

**Table A.6 PM Peak Hour Traffic for Build Alternative 2A**

Roadway	Number of Lanes	Total PM Peak Hour Traffic	Auto %	Total Auto	MT %	Total MT	HT %	Total HT	Speed (A/MT/HT)
w patterson wb 1	1	280	91%	255	5%	15	4%	10	45/45/45
w knox eb 1	1	76	92%	70	8%	6	0%	0	45/45/0
w knox wb 1	1	76	92%	70	8%	6	0%	0	45/45/0
w sierra eb 1	1	62	98%	61	2%	1	0%	0	45/45/0
w sierra wb	1	62	98%	61	2%	1	0%	0	45/45/0
e sierra wb	1	62	98%	61	2%	1	0%	0	45/45/0
e sierra eb	1	62	98%	61	2%	1	0%	0	45/45/0
n orsi nb 1	1	7	43%	3	57%	4	0%	0	35/35/0
n orsi sb 1	1	7	43%	3	57%	4	0%	0	35/35/0
w sr108 eb 1	1	810	91%	737	5%	44	4%	29	55/55/55
w sr108 wb 1	1	470	91%	428	5%	25	4%	17	55/55/55
e sr108 eb 1	1	1000	91%	910	5%	54	4%	36	55/55/55
e sr108 wb 1	1	571	91%	519	5%	31	4%	21	55/55/55
n stearns nb 1	1	90	91%	82	6%	5	3%	3	45/45/45
n stearns sb 1	1	480	91%	437	5%	26	4%	17	45/45/45
s stearns sb 1	1	71	90%	64	6%	4	4%	3	45/45/45
s stearns nb 1	1	90	91%	82	6%	5	3%	3	45/45/45
ncc eb - claus to mcgee 1	1	560	92%	515	5%	27	3%	18	55/55/55
ncc eb - claus to mcgee 2	1	535	96%	515	0%	2	3%	18	55/55/55
ncc eb - mcgee to langworth 1	1	560	92%	515	5%	27	3%	18	55/55/55
ncc eb - mcgee to langworth 2	1	560	92%	515	5%	27	3%	18	55/55/55
ncc eb - langworth to bentley 1	1	560	92%	515	5%	27	3%	18	55/55/55
ncc eb - langworth to bentley 2	1	560	92%	515	5%	27	3%	18	55/55/55
ncc eb - bentley to albers 1	1	650	91%	592	5%	35	4%	23	55/55/55
ncc eb - bentley to albers 2	1	650	91%	592	5%	35	4%	23	55/55/55
ncc wb - albers to bentley 1	1	606	91%	551	5%	33	4%	22	55/55/55
ncc wb - albers to bentley 2	1	606	91%	551	5%	33	4%	22	55/55/55
ncc wb - bentley to langworth 1	1	770	92%	708	5%	37	3%	25	55/55/55
ncc wb - bentley to langworth 2	1	770	92%	708	5%	37	3%	25	55/55/55
ncc wb - langworth to mcgee 1	1	770	92%	708	5%	37	3%	25	55/55/55
ncc wb - langworth to mcgee 2	1	770	92%	708	5%	37	3%	25	55/55/55
ncc wb - mcgee to claus-1	1	770	92%	708	5%	37	3%	25	55/55/55
ncc wb - mcgee to claus 2	1	770	92%	708	5%	37	3%	25	55/55/55
ncc eb - sierra to round 1	1	490	91%	446	5%	26	4%	18	55/55/55
ncc eb - sierra to round 2	1	490	91%	446	5%	26	4%	18	55/55/55
ncc eb - round to sr108 1	1	305	91%	278	5%	16	4%	11	55/55/55
ncc eb - round to sr108 2	1	305	91%	278	5%	16	4%	11	55/55/55
ncc wb - sr108 to round 1	1	216	91%	196	6%	12	4%	8	55/55/55
ncc wb - sr108 to round 2	1	216	91%	196	6%	12	4%	8	55/55/55
ncc wb - round to sierra 1	1	440	91%	400	5%	24	4%	16	55/55/55

**Table A.6 PM Peak Hour Traffic for Build Alternative 2A**

Roadway	Number of Lanes	Total PM Peak Hour Traffic	Auto %	Total Auto	MT %	Total MT	HT %	Total HT	Speed (A/MT/HT)
ncc wb - round to sierra 2	1	440	91%	400	5%	24	4%	16	55/55/55
ncc eb - albers to sierra 1	1	490	91%	446	5%	26	4%	18	55/55/55
ncc eb - albers to sierra 2	1	490	91%	446	5%	26	4%	18	55/55/55
ncc wb - sierra to albers 1	1	440	91%	400	5%	24	4%	16	55/55/55
ncc wb - sierra to albers 2	1	440	91%	400	5%	24	4%	16	55/55/55
n stearns nb 2	1	420	91%	382	5%	23	4%	15	45/45/45
n stearns sb 2	1	71	90%	64	6%	4	4%	3	45/45/45



**Table A.7 PM Peak Hour Traffic for Build Alternative 2B**

Roadway	Number of Lanes	Total PM Peak Hour Traffic	Auto %	Total Auto	MT %	Total MT	HT %	Total HT	Speed (A/MT/HT)
n tully nb 1	1	310	92%	285	5%	15	3%	10	45/45/45
n tully sb 1	1	410	92%	377	5%	20	3%	13	45/45/45
s tully sb 1	1	1060	92%	975	5%	51	3%	34	45/45/45
s tully nb 1	1	1660	92%	1527	5%	80	3%	53	45/45/45
n mchenry nb 1	1	550	92%	506	5%	26	3%	18	45/45/45
n mchenry sb 1	1	900	92%	828	5%	43	3%	29	45/45/45
s mchenry sb 1	1	1150	92%	1058	5%	55	3%	37	45/45/45
s mchenry nb 1	1	1560	92%	1435	5%	75	3%	50	45/45/45
n coffee nb 1	1	1000	92%	920	5%	48	3%	32	45/45/45
n coffee sb 1	1	600	92%	552	5%	29	3%	19	45/45/45
s coffee sb 1	1	919	92%	846	5%	44	3%	29	45/45/45
s coffee nb 1	1	980	92%	902	5%	47	3%	31	45/45/45
n oakdale nb 1	1	1509	92%	1389	5%	72	3%	48	45/45/45
n oakdale sb 1	1	1270	92%	1168	5%	61	3%	41	45/45/45
s oakdale sb 1	1	1100	92%	1012	5%	53	3%	35	45/45/45
s oakdale nb 1-1	1	450	92%	414	5%	22	3%	14	45/45/45
n roselle nb 1	1	780	92%	718	5%	37	3%	25	45/45/45
n roselle sb 1	1	810	92%	745	5%	39	3%	26	45/45/45
s roselle sb 1	1	1130	92%	1040	5%	54	3%	36	45/45/45
s roselle nb 1	1	1000	92%	920	5%	48	3%	32	45/45/45
ncc wb - carver to tully 1	1	640	92%	589	5%	31	3%	20	55/55/55
ncc wb - carver to tully 2	1	640	92%	589	5%	31	3%	20	55/55/55
ncc wb - carver to tully 3	1	640	92%	589	5%	31	3%	20	55/55/55
ncc wb - tully to mchenry 1	1	648	92%	596	5%	31	3%	21	55/55/55
ncc wb - tully to mchenry 2	1	648	92%	596	5%	31	3%	21	55/55/55
ncc wb - tully to mchenry 3	1	648	92%	596	5%	31	3%	21	55/55/55
ncc wb - tully to mchenry 4	1	648	92%	596	5%	31	3%	21	55/55/55
ncc wb - mchenry to coffee 1	1	720	92%	662	5%	35	3%	23	55/55/55
ncc wb - mchenry to coffee 2	1	720	92%	662	5%	35	3%	23	55/55/55
ncc wb - mchenry to coffee 3	1	720	92%	662	5%	35	3%	23	55/55/55
ncc wb - mchenry to coffee 4	1	720	92%	662	5%	35	3%	23	55/55/55
ncc wb - coffee to oakdale 1	1	787	92%	724	5%	38	3%	25	55/55/55
ncc wb - coffee to oakdale 2	1	787	92%	724	5%	38	3%	25	55/55/55
ncc wb - coffee to oakdale 3	1	787	92%	724	5%	38	3%	25	55/55/55
ncc wb - oakdale to roselle 1	1	919	92%	846	5%	44	3%	29	55/55/55
ncc wb - oakdale to roselle 2	1	919	92%	846	5%	44	3%	29	55/55/55
ncc wb - roselle to claus 1	1	890	92%	819	5%	43	3%	28	55/55/55
ncc wb - roselle to claus 2	1	890	92%	819	5%	43	3%	28	55/55/55

**Table A.7 PM Peak Hour Traffic for Build Alternative 2B**

Roadway	Number of Lanes	Total PM Peak Hour Traffic	Auto %	Total Auto	MT %	Total MT	HT %	Total HT	Speed (A/MT/HT)
ncc eb - claus to roselle 1	1	900	92%	828	5%	43	3%	29	55/55/55
ncc eb - claus to roselle 2	1	900	92%	828	5%	43	3%	29	55/55/55
ncc eb - roselle to oakdale 1	1	880	92%	810	5%	42	3%	28	55/55/55
ncc eb - roselle to oakdale 2	1	880	92%	810	5%	42	3%	28	55/55/55
ncc eb - oakdale to coffee 1	1	613	92%	564	5%	29	3%	20	55/55/55
ncc eb - oakdale to coffee 2	1	613	92%	564	5%	29	3%	20	55/55/55
ncc eb - oakdale to coffee 3	1	613	92%	564	5%	29	3%	20	55/55/55
ncc eb - coffee to mchenry 1	1	620	92%	570	5%	30	3%	20	55/55/55
ncc eb - coffee to mchenry 2	1	620	92%	570	5%	30	3%	20	55/55/55
ncc eb - coffee to mchenry 3	1	620	92%	570	5%	30	3%	20	55/55/55
ncc eb - coffee to mchenry 4	1	620	92%	570	5%	30	3%	20	55/55/55
ncc eb - mchenry to tully 1	1	647	92%	595	5%	31	3%	21	55/55/55
ncc eb - mchenry to tully 2	1	647	92%	595	5%	31	3%	21	55/55/55
ncc eb - mchenry to tully 3	1	647	92%	595	5%	31	3%	21	55/55/55
ncc eb - tully to carver 1	1	657	92%	604	5%	32	3%	21	55/55/55
ncc eb - tully to carver 2	1	657	92%	604	5%	32	3%	21	55/55/55
ncc eb - tully to carver 3	1	657	92%	604	5%	32	3%	21	55/55/55
ncc eb - claus to mcgee 1	1	665	92%	612	5%	32	3%	21	55/55/55
ncc eb - claus to mcgee 2	1	665	92%	612	5%	32	3%	21	55/55/55
ncc eb - mcgee to langworth 1	1	665	92%	612	5%	32	3%	21	55/55/55
ncc eb - mcgee to langworth 2	1	665	92%	612	5%	32	3%	21	55/55/55
ncc eb - langworth to bentley 1	1	665	92%	612	5%	32	3%	21	55/55/55
ncc eb - langworth to bentley 2	1	665	92%	612	5%	32	3%	21	55/55/55
ncc eb - bentley to albers 1	1	571	91%	519	5%	31	4%	21	55/55/55
ncc eb - bentley to albers 2	1	571	91%	519	5%	31	4%	21	55/55/55
ncc eb - albers to smith 1	1	315	91%	287	5%	17	3%	11	55/55/55
ncc eb - albers to smith 2	1	315	91%	287	5%	17	3%	11	55/55/55
ncc eb - smith to wamble	1	235	91%	214	6%	13	3%	8	55/55/55
ncc eb - smith to wamble 2	1	235	91%	214	6%	13	3%	8	55/55/55
ncc eb - wamble to new road 1	1	235	91%	214	6%	13	3%	8	55/55/55
ncc eb - wamble to new road 2	1	235	91%	214	6%	13	3%	8	55/55/55
ncc eb - new road to terminus 1	1	235	91%	214	6%	13	3%	8	55/55/55
ncc eb - new road to terminus 2	1	235	91%	214	6%	13	3%	8	55/55/55
ncc wb - terminus to new road 1	1	185	91%	168	5%	10	4%	7	55/55/55
ncc wb - terminus to new road 2	1	185	91%	168	5%	10	4%	7	55/55/55
ncc wb - new road to wamble 1	1	185	91%	168	5%	10	4%	7	55/55/55
ncc wb - new road to wamble 2	1	185	91%	168	5%	10	4%	7	55/55/55
ncc wb - wamble to smith 1	1	185	91%	168	5%	10	4%	7	55/55/55

**Table A.7 PM Peak Hour Traffic for Build Alternative 2B**

Roadway	Number of Lanes	Total PM Peak Hour Traffic	Auto %	Total Auto	MT %	Total MT	HT %	Total HT	Speed (A/MT/HT)
ncc wb - wamble to smith 2	1	185	91%	168	5%	10	4%	7	55/55/55
ncc wb - smith to albers 1	1	271	91%	246	6%	15	4%	10	55/55/55
ncc wb - smith to albers 2	1	271	91%	246	6%	15	4%	10	55/55/55
ncc wb - albers to bentley 1	1	565	91%	514	5%	31	4%	20	55/55/55
ncc wb - albers to bentley 2	1	565	91%	514	5%	31	4%	20	55/55/55
ncc wb - bentley to langworth 1	1	730	92%	672	5%	35	3%	23	55/55/55
ncc wb - bentley to langworth 2	1	730	92%	672	5%	35	3%	23	55/55/55
ncc wb - langworth to mcgee 1	1	730	92%	672	5%	35	3%	23	55/55/55
ncc wb - langworth to mcgee 2	1	730	92%	672	5%	35	3%	23	55/55/55
ncc wb - mcgee to claus	1	730	92%	672	5%	35	3%	23	55/55/55
ncc wb - mcgee to claus 2	1	730	92%	672	5%	35	3%	23	55/55/55
n langworth nb 1	1	51	100%	51	0%	0	0%	0	54/0/0
n langworth sb 1	1	51	100%	51	0%	0	0%	0	54/0/0
s langworth sb 1	1	51	100%	51	0%	0	0%	0	54/0/0
s langworth nb 1	1	51	100%	51	0%	0	0%	0	54/0/0
n bentley nb 1	1	251	91%	228	6%	14	4%	9	45/45/45
n bentley sb 1	1	510	91%	464	5%	28	4%	18	45/45/45
s bentley sb 1	1	400	91%	364	6%	22	4%	14	45/45/45
s bentley nb 1	1	280	91%	255	5%	15	4%	10	45/45/45
n albers nb 1	1	1180	91%	1074	5%	64	4%	42	45/45/45
n albers sb 1	1	1140	91%	1037	5%	62	4%	41	45/45/45
s albers sb 1	1	551	91%	501	5%	30	4%	20	45/45/45
s albers nb 1	1	670	91%	610	5%	36	4%	24	45/45/45
n smith nb 1	1	229	91%	209	5%	12	3%	8	45/45/45
n smith sb 1	1	271	91%	246	6%	15	4%	10	45/45/45
s smith sb 1	1	100	91%	91	5%	5	4%	4	45/45/45
s smith nb 1	1	71	90%	64	6%	4	4%	3	45/45/45
e 108 eb 1	1	661	91%	601	5%	36	4%	24	55/55/55
e 108 wb 1	1	580	91%	528	5%	31	4%	21	55/55/55
w 108 wb 1	1	339	91%	309	5%	18	4%	12	55/55/55
w 108 eb 1	1	320	91%	291	5%	17	4%	12	55/55/55
claribel eb 1	1	280	92%	258	5%	13	3%	9	45/45/45
claribel wb 1	1	241	92%	221	5%	12	3%	8	45/45/45
terminal nb 1	1	78	96%	75	4%	3	0%	0	45/45/0
terminal sb 1	1	78	96%	75	4%	3	0%	0	45/45/0
n claus nb 1	1	850	92%	782	5%	41	3%	27	45/45/45
n claus sb 1	1	919	92%	846	5%	44	3%	29	45/45/45
s claus sb 1	1	1090	92%	1003	5%	52	3%	35	45/45/45



**Table A.7 PM Peak Hour Traffic for Build Alternative 2B**

Roadway	Number of Lanes	Total PM Peak Hour Traffic	Auto %	Total Auto	MT %	Total MT	HT %	Total HT	Speed (A/MT/HT)
s claus nb 1	1	910	92%	837	5%	44	3%	29	45/45/45
w patterson eb 1	1	650	91%	592	5%	35	4%	23	45/45/45
w patterson wb 1	1	810	91%	737	5%	44	4%	29	45/45/45
warnerville eb 1	1	39	100%	39	0%	0	0%	0	25/0/0
warnerville wb 1	1	39	100%	39	0%	0	0%	0	25/0/0
n mchenry nb 2	1	550	92%	506	5%	26	3%	18	45/45/45
s oakdale nb 2	1	450	92%	414	5%	22	3%	14	45/45/45
w claribel wb 1	1	450	92%	414	5%	22	3%	14	45/45/45
w claribel wb 2	1	300	92%	276	5%	14	3%	10	45/45/45

## **Appendix B**      Predicted Future Noise Levels

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**Table B-1. Predicted Future Noise and Sound Wall Analysis - Alternative 1A**

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**Table B-1. Predicted Future Noise and Sound Wall Analysis - Alternative 1A**

Receiver I.D.	Barrier I.D.	Barrier Location	Number of Dwelling Units	Land Use	Address	Existing Noise Level L <sub>eq</sub> (h), dBA <sup>1</sup>	North County Corridor New State Route 108 Project Future Worst Hour Noise Levels - L <sub>eq</sub> (h), dBA																																	
							Design Year Noise Level without Project	Design Year Noise Level with Project	Design Year Noise Level without Project minus Existing Conditions	Design Year Noise Level with Project minus Existing Conditions	Design Year Noise Level with Project minus No Project Conditions	Activity Category (NAC)	Impact Type <sup>2</sup>	Noise Prediction with Barrier, Barrier Insertion Loss (I.L.), and																										
														Number of Benefited Receivers (NBR)																										
														6 feet			8 feet			10 feet			12 feet			14 feet			16 feet											
														L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR									
12.3	No Barrier		1	SFR	2966 Blacksand Creek Wy, Riverbank	50	53	53	3	3	0	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--							
13.1	No Barrier		1	SFR	4881 Rosselle Ave, Modesto	61	65	65	4	4	0	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--							
13.2	No Barrier		1	SFR	4955 Rosselle Ave, Modesto	60	64	62	4	2	-2	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--							
14.1	No Barrier		1	SFR	5230 Roselle Ave, Riverbank	57	59	59	2	2	0	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--							
14.2	No Barrier		1	SFR	3212 Claribel Rd, Modesto	61	66	55	5	-6	-11	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--							
15.1	No Barrier		1	SFR	3728 Davis Ave, Modesto	45	51	54	6	9	3	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--							
15.2	No Barrier		1	SFR	3761 Davis Ave, Modesto	45	50	53	5	8	3	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--							
16.1	No Barrier		1	SFR	3874 Davis Ave, Modesto	47	54	58	7	11	4	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--							
16.2	No Barrier		1	SFR	3932 Davis Ave, Modesto	50	57	57	7	7	0	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--						
16.3	No Barrier		1	SFR	3973 Davis Ave, Modesto	58	62	62	4	4	0	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--						
16.4	No Barrier		1	SFR	5361 Claus Rd, Modesto	60	64	64	4	4	0	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--						
16.5	No Barrier		1	SFR	3973 Minniear Ave, Modesto	60	64	63	4	3	-1	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--						
17.1	No Barrier		1	REC	3800 Claribel Rd, Modesto	55	59	59	4	4	0	C (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--						
17.2	No Barrier		1	SFR	4824 Claus Rd, Modesto	56	61	61	5	5	0	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--						
17.3	No Barrier		1	SFR	4380 Claribel Rd, Modesto	53	58	59	5	6	1	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--						
18.1	No Barrier	1	SFR	4936 Terminal Ave, Modesto	57	61	63	4	6	2	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--							
19.1	SW-3	EOP	5	SFR	4650 Claus Rd, Modesto	63	68	70	5	7	2	B (67)	A/E	--	65	5	5	--	64	6	5	--	61	9	5	--	61	10	5	--	60	10	5							
19.2	No Barrier	--	1	SFR	4672 Claus Rd, Modesto	52	56	57	4	5	1	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--							
19.3	SW-4	EOP	1	SFR	4527 Claus Rd, Modesto	63	64	69	1	6	5	B (67)	A/E	--	65	4	1	--	63	6	1	--	60	9	1	--	59	10	1	--	59	10	1							
19.4	SW-5	EOP	1	SFR	4548 Claus Rd, Modesto	62	66	69	4	7	3	B (67)	A/E	--	65	4	1	--	63	6	1	--	61	8	1	--	61	8	1	--	61	8	1							
19.5	No Barrier	--	1	SFR	4510 Claus Rd, Modesto	42	46	49	4	7	3	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--							
19.6	No Barrier		1	SFR	4500 Claus Rd, Modesto	41	45	48	4	7	3	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--							
21.1	SW-6	ROW	1	SFR	4601 Claribel Rd, Modesto	52	56	68	4	16	12	B (67)	A/E/S	--	64	4	1	--	62	6	1	--	59	9	1	--	58	10	1	--	57	11	1							
24.1	No Barrier	--	1	SFR	6153 Langworth Rd, Oakdale	53	53	57	0	4	4	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--							
24.2	No Barrier		1	SFR	5459 Langworth Rd, Oakdale	49	49	54	0	5	5	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--							
25.1	No Barrier		1	SFR	5732 Langworth Rd, Oakdale	52	52	59	0	7	7	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--										



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Table B-1. Predicted Future Noise and Sound Wall Analysis - Alternative 1A

Receiver I.D.	Barrier I.D.	Barrier Location	Number of Dwelling Units	Land Use	Address	Existing Noise Level L <sub>eq</sub> (h), dBA <sup>1</sup>	North County Corridor New State Route 108 Project Future Worst Hour Noise Levels - L <sub>eq</sub> (h), dBA																														
							Design Year Noise Level without Project	Design Year Noise Level with Project	Design Year Noise Level without Project minus Existing Conditions	Design Year Noise Level with Project minus Existing Conditions	Design Year Noise Level with Project minus No Project Conditions	Activity Category (NAC)	Impact Type <sup>2</sup>	Noise Prediction with Barrier, Barrier Insertion Loss (I.L.), and																							
														Number of Benefited Receivers (NBR)																							
														6 feet			8 feet			10 feet			12 feet			14 feet			16 feet								
														L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR						
26.3	No Barrier <sup>4</sup>		2	SFR	7041 Patterson Rd, Oakdale	41	36	57	-5	16	21	B (67)	S	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--						
28	No Barrier		0	SFR	6224 Kaufman Rd, Oakdale	41	41	43	0	2	2	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--							
28.1	No Barrier <sup>4</sup>		1	SFR	3160 Kaufman Rd, Oakdale	41	39	51	-2	10	12	B (67)	S	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--						
29.2	No Barrier		1	SFR	6751 Albers Rd, Oakdale	67	68	68	1	1	0	B (67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--						
30.12	SW-9	ROW	1	SFR	9625 Warnerville Rd, Oakdale	41	35	62	-6	21	27	B (67)	S	--	57	5	1	--	54	8	1	--	51	11	1	--	50	12	1	--	49	13	1				
30.13	No Barrier <sup>4</sup>	--	1	SFR	8877 Warnerville Rd, Oakdale	41	35	56	-6	15	21	B (67)	S	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--					
32.1	No Barrier <sup>4</sup>		1	SFR	1918 Sierra Rd, Oakdale	42	42	56	0	14	14	B (67)	S	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--					
33.1	No Barrier		1	SFR	308 S Stearns Rd, Oakdale	57	57	64	0	7	7	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--					
33.2	No Barrier		1	SFR	336 S Stearns Rd, Oakdale	46	46	54	0	8	8	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--					
33.3	SW-10	EOP	1	SFR	448 S Stearns Rd, Oakdale	42	42	57	0	15	15	B (67)	S	--	54	3	1	--	54	3	1	--	53	4	1	--	53	5	1	--	52	5	1				
33.5	No Barrier	--	1	SFR	337 S Stearns Rd, Oakdale	49	49	59	0	10	10	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--					
33.6	No Barrier		1	SFR	401 S Stearns Rd, Oakdale	52	53	59	1	7	6	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--					
33.7	No Barrier		1	SFR	279 S Stearns Rd, Oakdale	51	51	62	0	11	11	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--					
33.8	No Barrier		1	SFR	249 S Stearns Rd, Oakdale	52	52	61	0	9	9	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--					
33.9	No Barrier		1	SFR	211 S Stearns Rd, Oakdale	45	46	56	1	11	10	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--					
35.1	No Barrier		1	SFR	10008 Plaza De Oro Dr, Oakdale	56	58	54	2	-2	-4	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--					
35.2	No Barrier		1	SFR	10306 Rio Sombra Ct, Oakdale	59	61	58	2	-1	-3	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--					
35.3	No Barrier		1	SFR	10318 Rio Sombra Ct, Oakdale	65	67	65	2	0	-2	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--					
35.4	No Barrier		1	SFR	10468 St Andrews Ct, Oakdale	61	62	62	1	1	0	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--					
35.6	No Barrier		1	SFR	10529 California 108, Oakdale	64	66	65	2	1	-1	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--					

Notes:EOP=Edge of Pavement, ROW=Right of Way

1. Short Term measurements were used for calibrating the TNM models and do not represent a frequently used outdoor area within the proposed project area.
2. Impact types: A/E - Future noise conditions approach (within 1 dBA) or exceed the Noise Abatement Criteria (NAC), S - Substantial Increase of 12 dBA or more, N/A - No abatement necessary based on land use.
3. I.L. = Insertion Loss
4. '-- A soundwall was not analyzed for this receiver. No feasible location to place a soundwall.
5. SFR = Single Family Residence, COM = Commercial, REC = Recreation, UND = Undeveloped Land, AG = Agriculture
6. Noise levels for Existing and No-Build for receivers 26.3, 28, 28.1, 30.12, 30.13 are representative of background noise sites. No traffic near receivers under Existing and No-Build conditions.

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**Table B-2. Predicted Future Noise and Sound Wall Analysis - Alternative 1B**

Receiver I.D.	Barrier I.D.	Barrier Location	Number of Dwelling Units	Land Use	Address	Existing Noise Level L <sub>eq</sub> (h), dBA <sup>1</sup>	North County Corridor New State Route 108 Project Future Worst Hour Noise Levels - L <sub>eq</sub> (h), dBA																																	
							Design Year Noise Level without Project	Design Year Noise Level with Project	Design Year Noise Level without Project minus Existing Conditions	Design Year Noise Level with Project minus Existing Conditions	Design Year Noise Level with Project minus No Project Conditions	Activity Category (NAC)	Impact Type <sup>2</sup>	Noise Prediction with Barrier, Barrier Insertion Loss (I.L.), and Number of Benefited Receivers (NBR)																										
														Number of Benefited Receivers (NBR)																										
														6 feet			8 feet			10 feet			12 feet			14 feet			16 feet											
														L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR			
1.1	No Barrier	-	1	SFR	5211 Tully Rd, Modesto	49	54	55	5	6	1	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--							
1.2	No Barrier		1	SFR	5089 Tully Rd, Modesto	60	64	65	4	5	1	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--							
1.3	No Barrier		1	SFR	5080 Tully Rd, Modesto	56	60	62	4	6	2	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--							
2.1	No Barrier		1	SFR	1394 Kiernan Ave, Modesto	59	63	62	4	3	-1	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--							
2.2	No Barrier		1	SFR	1248 Kiernan Ave, Modesto	57	62	63	5	6	1	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--							
2.3	No Barrier		1	SFR	4885 Tully Rd, Modesto	56	61	64	5	8	3	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--						
2.4	No Barrier		1	SFR	4767 Tully Rd, Modesto	53	59	61	6	8	2	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--						
2.5	No Barrier		1	SFR	4823 Tully Rd, Modesto	52	58	58	6	6	0	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--						
2.6	SW-1	EOP	1	SFR	4744 Tully Rd, Modesto	59	64	66	5	7	2	B (67)	A/E	--	65	1	1	--	64	2	1	--	64	3	1	--	63	3	1	--	63	3	1							
3.1	SW-2	EOP	1	SFR	177 Chow Chow Ln, Modesto	68	69	67	1	-1	-2	B (67)	A/E	--	64	3	1	--	64	3	1	--	63	4	1	--	63	4	1	--	63	4	1							
3.2	No Barrier	-	1	COM	5298 McHenry Ave, Modesto, CA	64	66	65	1	0	-1	E (72)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--						
3.3	No Barrier		1	COM	5150 McHenry Ave, Modesto, CA	60	62	61	2	2	0	C (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--							
4.1	No Barrier		1	SFR	5045 McHenry Ave, Modesto	56	57	60	1	4	3	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--							
4.2	No Barrier		1	SFR	254 Claribel Road, Modesto	59	63	64	4	5	1	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--						
4.3	No Barrier		1	SFR	630 Claribel Road, Modesto	57	61	64	4	7	3	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--						
4.4	No Barrier		1	SFR	830 Claribel Road, Modesto	55	59	61	4	6	2	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--						
4.5	No Barrier		1	SFR	4929 Coffee Road, Modesto	60	64	62	4	2	-2	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--						
4.6	No Barrier		1	UND	501 Kiernan Avenue, Modesto, CA	58	63	70	5	12	7	G (N/A)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--						
4.7	No Barrier		1	AG	801 Claribel Rd, Modesto, CA	53	57	67	4	14	10	F (N/A)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--						
5	No Barrier		4	SFR	4824 Coffee Rd, Modesto	68	71	73	3	5	2	B (67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--						
5.1	No Barrier		1	SFR	4854 Coffee Rd, Modesto	56	60	60	4	4	0	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--						
6.1	No Barrier		1	SFR	5330 Coffee Rd, Modesto	53	57	59	4	6	2	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--						
7.1	No Barrier		4	SFR	1509 Cabo Dr, Modesto	62	65	60	3	-2	-5	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--						
7.2	No Barrier		1	SFR	1532 Cabo Dr, Modesto	59	62	59	3	0	-3	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--						
8.1	No Barrier		5	SFR	1609 Cabo Dr, Modesto	62	66	60	4	-2	-6	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--						
10.1	No Barrier		1	SFR	2030 Claribel Rd, Modesto	51	55	61	4	10	6	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--						
10.2	No Barrier		1	SFR	5036 Oakdale Rd, Modesto	59	60	61	1	2	1	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--						
10.4	No Barrier		1	SFR	4780 Oakdale Rd, Modesto	60	61	62	1	2	1	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--						
10.5	No Barrier		1	SFR	4500 Oakdale Rd, Modesto	64	66	64	2	0	-2	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--						



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**Table B-2. Predicted Future Noise and Sound Wall Analysis - Alternative 1B**

Receiver I.D.	Barrier I.D.	Barrier Location	Number of Dwelling Units	Land Use	Address	Existing Noise Level $L_{eq}(h)$ , dBA <sup>1</sup>	North County Corridor New State Route 108 Project Future Worst Hour Noise Levels - $L_{eq}(h)$ , dBA																														
							Design Year Noise Level without Project	Design Year Noise Level with Project	Design Year Noise Level without Project minus Existing Conditions	Design Year Noise Level with Project minus Existing Conditions	Design Year Noise Level with Project minus No Project Conditions	Activity Category (NAC)	Impact Type <sup>2</sup>	Noise Prediction with Barrier, Barrier Insertion Loss (I.L.), and																							
														Number of Benefited Receivers (NBR)																							
														6 feet			8 feet			10 feet			12 feet			14 feet			16 feet								
														$L_{eq}(h)$	I.L. <sup>3</sup>	NBR	$L_{eq}(h)$	I.L. <sup>3</sup>	NBR	$L_{eq}(h)$	I.L. <sup>3</sup>	NBR	$L_{eq}(h)$	I.L. <sup>3</sup>	NBR	$L_{eq}(h)$	I.L. <sup>3</sup>	NBR	$L_{eq}(h)$	I.L. <sup>3</sup>	NBR	$L_{eq}(h)$	I.L. <sup>3</sup>	NBR	$L_{eq}(h)$	I.L. <sup>3</sup>	NBR
11.1	No Barrier		1	SFR	5007 Gold River Ct, Riverbank	55	57	51	2	-4	-6	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
12.1	No Barrier		1	SFR	5008 Riverbed Ct, Riverbank	53	55	51	2	-2	-4	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
12.2	No Barrier		1	SFR	5015 Prospectors Pkwy, Riverbank	51	53	52	2	1	-1	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
12.3	No Barrier		1	SFR	2966 Blacksand Creek Wy, Riverbank	50	53	53	3	3	0	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
13.1	No Barrier		1	SFR	4955 Rosselle Ave, Modesto	61	65	65	4	4	0	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
13.2	No Barrier		1	SFR	4955 Rosselle Ave, Modesto	60	64	62	4	2	-2	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
14.1	No Barrier		1	SFR	4881 Rosselle Ave, Modesto	57	59	59	2	2	0	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
14.2	No Barrier		1	SFR	3212 Claribel Rd, Modesto	61	66	60	5	-1	-6	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
15.1	No Barrier		1	SFR	3728 Davis Ave, Modesto	45	51	55	6	10	4	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
15.2	No Barrier		1	SFR	3761 Davis Ave, Modesto	45	50	54	5	9	4	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
16.1	No Barrier		1	SFR	3874 Davis Ave, Modesto	47	54	58	7	11	4	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
16.2	No Barrier		1	SFR	3932 Davis Ave, Modesto	50	57	57	7	7	0	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
16.3	No Barrier		1	SFR	3973 Davis Ave, Modesto	58	62	62	4	4	0	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
16.4	No Barrier		1	SFR	5361 Claus Rd, Modesto	60	64	64	4	4	0	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
16.5	No Barrier		1	SFR	3973 Minniear Ave, Modesto	60	64	63	4	3	-1	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
17.1	No Barrier	--	1	REC	3800 Claribel Rd, Modesto	55	59	59	4	4	0	C (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--					
17.2	No Barrier		1	SFR	4824 Claus Rd, Modesto	56	61	60	5	4	-1	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--					
17.3	No Barrier		1	SFR	4380 Claribel Rd, Modesto	53	58	58	5	5	0	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--					
18.1	No Barrier		1	SFR	4936 Terminal Ave, Modesto	57	61	63	4	6	2	B (67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--					
19.1	SW-3	EOP	5	SFR	4650 Claus Rd, Modesto	63	68	70	5	7	2	B (67)	A/E	--	64	6	5	--	62	9	5	--	60	10	5	--	59	11	5	--	58	12	5	--	57	13	5
19.2	No Barrier	--	1	SFR	4672 Claus Rd, Modesto	52	56	57	4	5	1	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
19.3	SW-4	EOP	1	SFR	4527 Claus Rd, Modesto	63	64	69	1	6	5	B (67)	A/E	--	64	5	1	--	63	6	1	--	61	8	1	--	60	9	1	--	59	10	1	--	59	10	1
19.4	SW-5	EOP	1	SFR	4548 Claus Rd, Modesto	62	66	69	4	7	3	B (67)	A/E	--	65	4	1	--	63	6	1	--	62	7	1	--	61	8	1	--	60	9	1	--	60	9	1
19.5	No Barrier		1	SFR	4510 Claus Rd, Modesto	42	46	49	4	7	3	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
19.6	No Barrier		1	SFR	4500 Claus Rd, Modesto	41	45	48	4	7	3	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
21.1	SW-6		1	SFR	4601 Claribel Rd, Modesto	52	56	68	4	16	12	B (67)	A/E/S	--	64	4	1	--	64	5	1	--	63	5	1	--	62	7	1	--	61	6	1	--	61	7	1
21.3	No Barrier		1	SFR	5303 Eleanor Ave, Oakdale	49	50	65	1	16	15	B (67)	S	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
21.4	No Barrier		1	SFR	5307 Eleanor Ave, Oakdale	44	46	56	2	12	10	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
21.5	No Barrier		1	REC	5354 Eleanor Ave, Oakdale	40	44	57	4	17	13	B (67)	S	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			

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Table B-2. Predicted Future Noise and Sound Wall Analysis - Alternative 1B

Receiver I.D.	Barrier I.D.	Barrier Location	Number of Dwelling Units	Land Use	Address	Existing Noise Level L <sub>eq</sub> (h), dBA <sup>1</sup>	North County Corridor New State Route 108 Project Future Worst Hour Noise Levels - L <sub>eq</sub> (h), dBA																														
							Design Year Noise Level without Project	Design Year Noise Level with Project	Design Year Noise Level without Project minus Existing Conditions	Design Year Noise Level with Project minus Existing Conditions	Design Year Noise Level with Project minus No Project Conditions	Activity Category (NAC)	Impact Type <sup>2</sup>	Noise Prediction with Barrier, Barrier Insertion Loss (I.L.), and																							
														Number of Benefited Receivers (NBR)																							
														6 feet			8 feet			10 feet			12 feet			14 feet			16 feet								
														L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR
24.1	No Barrier	-	1	SFR	6153 Langworth Rd, Oakdale	53	53	57	0	4	4	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--						
24.2	No Barrier		1	SFR	5459 Langworth Rd, Oakdale	49	49	54	0	5	5	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--						
25.1	No Barrier		1	SFR	5732 Langworth Rd, Oakdale	52	52	59	0	7	7	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--						
25.2	No Barrier		1	SFR	5918 Patterson Rd, Oakdale	61	61	64	0	3	3	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--						
25.3	No Barrier		1	SFR	6399 Crane Rd, Oakdale	57	62	62	5	5	0	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--						
25.5	No Barrier		1	SFR	6236 Crane Rd, Oakdale	53	58	61	5	8	3	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--						
25.6	No Barrier		1	SFR	1750 Lexington Ave, Oakdale	51	56	59	5	8	3	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--						
28.1	No Barrier		1	SFR	3160 Kaufman Rd, Oakdale	37	39	50	2	13	11	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--						
29.2	No Barrier		1	SFR	6751 Albers Rd, Oakdale	67	68	68	1	1	0	B (67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--						
30.9	SW-8	EOP	1	SFR	9684 Warnerville Rd, Oakdale	41	41	55	0	14	14	B (67)	S	--	54	2	1	--	53	2	1	--	51	4	1	--	50	5	1	--	49	6	1				
30.11	No Barrier		1	SFR	9600 Warnerville Rd, Oakdale	41	41	76	0	35	35	B (67)	A/E/S	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--						
37.2	SW-12	ROW	1	SFR	11955 Warnerville Rd, Oakdale	41	41	57	0	16	16	B (67)	S	--	55	2	1	--	53	4	1	--	52	5	1	--	51	6	1	--	51	6	1				
39.1	No Barrier	--	1	SFR	13949 California 108, Oakdale	58	59	58	1	0	-1	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--						
39.2	No Barrier		1	SFR	13460 Lancaster Rd, Oakdale	54	55	55	1	1	0	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--						
39.3	No Barrier		1	SFR	13542 Lancaster Rd, Oakdale	52	52	56	0	4	4	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--						
42	No Barrier		0	SFR	13712 Lancaster Rd, Oakdale	57	57	58	0	1	1	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--						
42.1	No Barrier		1	SFR	13614 Lancaster Rd, Oakdale	52	52	54	0	2	2	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--						
42.2	No Barrier		1	SFR	13712 Lancaster Rd, Oakdale	57	57	59	0	2	2	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--						
42.3	No Barrier	--	1	SFR	13760 Lancaster Rd, Oakdale	59	59	60	0	1	1	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--							

Notes:EOP=Edge of Pavement, ROW=Right of Way

1. Short Term measurements were used for calibrating the TNM models and do not represent a frequently used outdoor area within the proposed project area.
2. Impact types: A/E - Future noise conditions approach (within 1 dBA) or exceed the Noise Abatement Criteria (NAC), S - Substantial Increase of 12 dBA or more, N/A - No abatement necessary based on land use.
3. I.L. = Insertion Loss
4. '-- A soundwall was not analyzed for this receiver. No feasible location to place a soundwall.
5. SFR = Single Family Residence, COM = Commercial, REC = Recreation, UND = Undeveloped Land, AG = Agriculture
6. Existing and No-Build noise levels for Receivers 30.9, 30.11, 37.2 are representative of background field measurement. No traffic near receivers under Existing and No-Build conditions.



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**Table B-3. Predicted Future Noise and Sound Wall Analysis - Alternative 2A**

Receiver I.D.	Barrier I.D.	Barrier Location	Number of Dwelling Units	Land Use	Address	Existing Noise Level L <sub>eq</sub> (h), dBA <sup>1</sup>	North County Corridor New State Route 108 Project Future Worst Hour Noise Levels - L <sub>eq</sub> (h), dBA																																	
							Design Year Noise Level without Project	Design Year Noise Level with Project	Design Year Noise Level without Project minus Existing Conditions	Design Year Noise Level with Project minus Existing Conditions	Design Year Noise Level with Project minus No Project Conditions	Activity Category (NAC)	Impact Type <sup>2</sup>	Noise Prediction with Barrier, Barrier Insertion Loss (I.L.), and																										
														Number of Benefited Receivers (NBR)																										
														6 feet			8 feet			10 feet			12 feet			14 feet			16 feet											
														L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR									
1.1	No Barrier	-	1	SFR	5211 Tully Rd, Modesto	49	54	55	5	6	1	B (67)	N/A	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--					
1.2	No Barrier		1	SFR	5089 Tully Rd, Modesto	60	64	65	4	5	1	B (67)	N/A	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--					
1.3	No Barrier		1	SFR	5080 Tully Rd, Modesto	56	60	62	4	6	2	B (67)	N/A	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--					
2.1	No Barrier		1	SFR	1394 Kiernan Ave, Modesto	59	63	62	4	3	-1	B (67)	N/A	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--					
2.2	No Barrier		1	SFR	1248 Kiernan Ave, Modesto	57	62	63	5	6	1	B (67)	N/A	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--					
2.3	No Barrier		1	SFR	4885 Tully Rd, Modesto	56	61	62	5	6	1	B (67)	N/A	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--					
2.4	No Barrier		1	SFR	4767 Tully Rd, Modesto	53	59	60	6	7	1	B (67)	N/A	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--					
2.5	No Barrier		1	SFR	4823 Tully Rd, Modesto	52	58	58	6	6	0	B (67)	N/A	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--					
2.6	SW-1	EOP	1	SFR	4744 Tully Rd, Modesto	59	64	66	5	7	2	B (67)	A/E	--	65	1	1	--	64	2	1	--	64	2	1	--	64	2	1	--	63	3	1	--	63	3	1			
3.1	SW-2	EOP	1	SFR	177 Chow Chow Ln, Modesto	68	69	67	1	-1	-2	B (67)	A/E	--	64	3	1	--	64	3	1	--	64	3	1	--	63	4	1	--	63	4	1	--	63	4	1			
3.2	No Barrier	-	1	COM	5298 McHenry Ave, Modesto, CA	64	66	65	1	0	-1	E (72)	N/A	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--					
3.3	No Barrier		1	COM	5150 McHenry Ave, Modesto, CA	60	62	61	2	1	0	C (67)	N/A	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--					
4.1	No Barrier		1	SFR	5045 McHenry Ave, Modesto	56	57	60	1	4	3	B (67)	N/A	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--					
4.2	No Barrier		1	SFR	254 Claribel Road, Modesto	59	63	63	4	4	0	B (67)	N/A	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--					
4.3	No Barrier		1	SFR	630 Claribel Road, Modesto	57	61	64	4	7	3	B (67)	N/A	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--					
4.4	No Barrier		1	SFR	830 Claribel Road, Modesto	55	59	61	4	6	2	B (67)	N/A	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--					
4.5	No Barrier		1	SFR	4929 Coffee Road, Modesto	60	64	62	4	2	-2	B (67)	N/A	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--					
4.6	No Barrier		1	UND	501 Kiernan Avenue, Modesto, CA	58	63	70	5	11	6	G (N/A)	N/A	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--					
4.7	No Barrier		1	AG	801 Claribel Rd, Modesto, CA	53	57	67	4	14	10	F (N/A)	N/A	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--					
5.1	No Barrier		1	SFR	4854 Coffee Rd, Modesto	56	60	60	4	4	0	B (67)	N/A	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--					
6.1	No Barrier		1	SFR	5330 Coffee Rd, Modesto	53	57	59	4	6	2	B (67)	N/A	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--					
7.1	No Barrier		4	CH	1509 Cabo Dr, Modesto	62	65	60	3	-2	-5	B (67)	N/A	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--					
7.2	No Barrier		1	SFR	1532 Cabo Dr, Modesto	59	62	59	3	0	-3	B (67)	N/A	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--					
8.1	No Barrier		5	SFR	1609 Cabo Dr, Modesto	62	66	60	4	-2	-6	B (67)	N/A	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--					
10.1	No Barrier		1	SFR	2030 Claribel Rd, Modesto	51	55	60	4	9	5	B (67)	N/A	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--					
10.2	No Barrier		1	SFR	5036 Oakdale Rd, Modesto	59	60	61	1	2	1	B (67)	N/A	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--					
10.4	No Barrier		1	SFR	4780 Oakdale Rd, Modesto	60	61	62	1	2	1	B (67)	N/A	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--					
10.5	No Barrier		1	SFR	4500 Oakdale Rd, Modesto	64	66	65	2	1	-1	B (67)	N/A	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--					
11.1	No Barrier		1	SFR	5007 Gold River Ct, Riverbank	55	57	50	2	-5	-7	B (67)	N/A	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--					
12.1	No Barrier		1	SFR	5008 Riverbed Ct, Riverbank	53	55	49	2	-4	-6	B (67)	N/A	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--					
12.2	No Barrier		1	SFR	5015 Prospectors Pkwy, Riverbank	51	53	50	2	-1	-3	B (67)	N/A	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--					
12.3	No Barrier		1	SFR	2966 Blacksand Creek Wy, Riverbank	50	53	52	3	2	-1	B (67)	N/A	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--					
13.1	No Barrier		1	SFR	4881 Rosselle Ave, Modesto	61	65	65	4	4	0	B (67)	N/A	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--	-	-	--	--					

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**Table B-3. Predicted Future Noise and Sound Wall Analysis - Alternative 2A**

Receiver I.D.	Barrier I.D.	Barrier Location	Number of Dwelling Units	Land Use	Address	Existing Noise Level L <sub>eq</sub> (h), dBA <sup>1</sup>	North County Corridor New State Route 108 Project Future Worst Hour Noise Levels - L <sub>eq</sub> (h), dBA																														
							Design Year Noise Level without Project	Design Year Noise Level with Project	Design Year Noise Level without Project minus Existing Conditions	Design Year Noise Level with Project minus Existing Conditions	Design Year Noise Level with Project minus No Project Conditions	Activity Category (NAC)	Impact Type <sup>2</sup>	Noise Prediction with Barrier, Barrier Insertion Loss (I.L.), and																							
														Number of Benefited Receivers (NBR)																							
														6 feet			8 feet			10 feet			12 feet			14 feet			16 feet								
														L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR
13.2	No Barrier		1	SFR	4955 Rosselle Ave, Modesto	60	64	62	4	2	-2	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--					
14.1	No Barrier		1	SFR	5230 Roselle Ave, Riverbank	57	59	59	2	2	0	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--					
14.2	No Barrier		1	SFR	3212 Claribel Rd, Modesto	61	66	55	5	-6	-11	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--					
15.1	No Barrier		1	SFR	3728 Davis Ave, Modesto	45	51	54	6	9	3	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--					
15.2	No Barrier		1	SFR	3761 Davis Ave, Modesto	45	50	52	5	7	2	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--					
16.1	No Barrier		1	SFR	3874 Davis Ave, Modesto	47	54	57	7	10	3	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
16.2	No Barrier		1	SFR	3932 Davis Ave, Modesto	50	57	56	7	6	-1	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
16.3	No Barrier		1	SFR	3973 Davis Ave, Modesto	58	62	62	4	4	0	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
16.4	No Barrier		1	SFR	5361 Claus Rd, Modesto	60	64	64	4	4	0	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
16.5	No Barrier		1	SFR	3973 Minniear Ave, Modesto	60	64	64	4	4	0	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
17.1	No Barrier		1	REC	3800 Claribel Rd, Modesto	55	59	58	4	3	-1	C (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
17.2	No Barrier		1	SFR	4824 Claus Rd, Modesto	56	61	59	5	3	-2	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
17.3	No Barrier		1	SFR	4380 Claribel Rd, Modesto	53	58	59	5	6	1	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
18.1	No Barrier		1	SFR	4936 Terminal Ave, Modesto	57	61	62	4	5	1	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
19.1	SW-3	EOP	5	SFR	4650 Claus Rd, Modesto	63	68	69	5	6	1	B (67)	A/E	--	64	5	5	--	62	7	5	--	62	7	5	--	60	9	5	--	60	9	5	--	59	10	5
19.2	No Barrier	--	1	SFR	4672 Claus Rd, Modesto	52	56	56	4	4	0	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
19.3	SW-4	EOP	1	SFR	4527 Claus Rd, Modesto	63	64	67	1	4	3	B (67)	A/E	--	63	4	1	--	62	5	1	--	62	5	1	--	60	7	1	--	59	8	1	--	58	9	1
19.4	SW-5	EOP	1	SFR	4548 Claus Rd, Modesto	62	66	68	4	6	2	B (67)	A/E	--	64	4	1	--	62	7	1	--	62	7	1	--	60	8	1	--	60	8	1	--	59	9	1
19.5	No Barrier		1	SFR	4510 Claus Rd, Modesto	42	46	48	4	6	2	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
19.6	No Barrier		1	SFR	4500 Claus Rd, Modesto	41	45	47	4	6	2	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
20	No Barrier		1	SFR	4718 McGee Ave, Modesto	42	46	48	4	6	2	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
20.1	No Barrier		1	SFR	4877 McGee Ave, Modesto	47	51	53	4	6	2	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
20.2	No Barrier		1	SFR	4663 McGee Ave, Modesto	43	47	50	4	7	3	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
20.3	No Barrier		1	SFR	4896 McGee Ave, Modesto	47	51	54	4	7	3	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
20.4	No Barrier		1	SFR	4642 McGee Ave, Modesto	42	46	48	4	6	2	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
20.5	No Barrier		1	REC	4906 McGee Ave, Modesto	49	53	57	4	8	4	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
21.1	No Barrier		1	SFR	4601 Claribel Rd, Modesto	52	56	59	4	7	3	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
21.2	No Barrier		1	SFR	4737 Claribel Rd, Modesto	60	65	64	5	4	-1	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
21.7	No Barrier		1	SFR	5023 Claribel Rd, Modesto	53	58	57	5	4	-1	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
22.1	No Barrier		1	SFR	4854 Langworth Rd, Modesto	59	60	60	1	1	0	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
22.2	No Barrier		1	SFR	4660 Langworth Rd, Modesto	49	50	53	1	4	3	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
23.1	No Barrier		1	SFR	5233 Claribel Rd, Modesto	59	63	61	4	2	-2	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
23.2	No Barrier		1	SFR	5315 Claribel Rd, Modesto	57	61	59	4	2	-2	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				



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Table B-3. Predicted Future Noise and Sound Wall Analysis - Alternative 2A

Receiver I.D.	Barrier I.D.	Barrier Location	Number of Dwelling Units	Land Use	Address	Existing Noise Level L <sub>eq</sub> (h), dBA <sup>1</sup>	North County Corridor New State Route 108 Project Future Worst Hour Noise Levels - L <sub>eq</sub> (h), dBA																										
							Design Year Noise Level without Project	Design Year Noise Level with Project	Design Year Noise Level without Project minus Existing Conditions	Design Year Noise Level with Project minus Existing Conditions	Design Year Noise Level with Project minus No Project Conditions	Activity Category (NAC)	Impact Type <sup>2</sup>	Noise Prediction with Barrier, Barrier Insertion Loss (I.L.), and																			
														Number of Benefited Receivers (NBR)																			
														6 feet			8 feet			10 feet			12 feet			14 feet			16 feet				
														L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR		
23.3	No Barrier		1	SFR	5553 Claribel Rd, Modesto	63	68	64	5	1	-4	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
23.4	No Barrier		1	SFR	5125 Langworth Rd, Oakdale	40	44	45	5	6	1	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
23.5	No Barrier		1	SFR	5931 Claribel Rd, Oakdale	51	56	57	5	6	1	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
23.6	No Barrier		1	SFR	500 Bentley Rd, Oakdale	55	60	60	5	5	0	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
23.7	No Barrier		1	SFR	7131 Claribel Rd, Oakdale	41	43	47	2	6	4	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
23.8	No Barrier		1	SFR	7321 Claribel Rd, Oakdale	55	59	59	4	4	0	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
23.9	No Barrier		1	SFR	7319 Claribel Rd, Oakdale	54	59	60	5	6	1	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
27.1	No Barrier		1	SFR	5773 Valk Rd, Oakdale	47	47	49	0	2	2	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
27.2	No Barrier <sup>4</sup>		1	SFR	8500 Valk Rd, Oakdale	41	41	50	0	9	9	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
29.1	No Barrier		1	SFR	6085 Albers Rd, Oakdale	56	58	59	2	3	1	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
30.1	No Barrier		1	SFR	6107 Bender Rd, Oakdale	41	41	44	0	3	3	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
30.12	No Barrier <sup>4</sup>		0	SFR	9625 Warnerville Rd, Oakdale	41	41	50	0	9	9	B (67)	S	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
32.1	No Barrier <sup>4</sup>		2	SFR	1918 Sierra Rd, Oakdale	42	42	56	0	14	14	B (67)	S	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
33.1	No Barrier		1	SFR	308 S Stearns Rd, Oakdale	57	57	64	0	7	7	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
33.2	No Barrier		1	SFR	336 S Stearns Rd, Oakdale	46	46	54	0	8	8	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
33.3	SW-10	EOP	1	SFR	448 S Stearns Rd, Oakdale	42	42	57	0	15	15	B (67)	S	--	55	2	1	--	55	3	1	--	54	3	1	--	52	5	1	--	52	5	1
33.5	No Barrier	--	1	SFR	337 S Stearns Rd, Oakdale	49	49	59	0	10	10	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
33.6	No Barrier		1	SFR	401 S Stearns Rd, Oakdale	52	53	58	1	6	5	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
35.1	No Barrier		1	SFR	10008 Plaza De Oro Dr, Oakdale	56	58	54	2	-2	-4	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
35.2	No Barrier		1	SFR	10306 Rio Sombra Ct, Oakdale	59	61	57	2	-2	-4	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
35.3	No Barrier		1	SFR	10318 Rio Sombra Ct, Oakdale	65	67	64	2	-1	-3	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
35.4	No Barrier		1	SFR	10468 St Andrews Ct, Oakdale	61	62	61	1	0	-1	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
35.6	No Barrier		1	SFR	10529 California 108, Oakdale	64	66	65	2	1	-1	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		

Notes:EOP=Edge of Pavement, ROW=Right of Way

1. Short Term measurements were used for calibrating the TNM models and do not represent a frequently used outdoor area within the proposed project area.

2. Impact types: A/E - Future noise conditions approach (within 1 dBA) or exceed the Noise Abatement Criteria (NAC), S - Substantial Increase of 12 dBA or more, , N/A - No abatement necessary based on land use.

3. I.L. = Insertion Loss

4. '-- A soundwall was not analyzed for this receiver. No feasible location to place a soundwall.

5. SFR = Single Family Residence, COM = Commercial, REC = Recreation, UND = Undeveloped Land, AG = Agriculture

6. Existing and No-Build noise levels for receivers 27.2, 30.1, 30.12 are representative of background noise sites. No traffic near receivers under Existing and No-Build conditions.

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**Table B-4. Predicted Future Noise and Sound Wall Analysis - Alternative 2B**

Receiver I.D.	Barrier I.D.	Barrier I.D.	Number of Dwelling Units	Land Use	Address	Existing Noise Level L <sub>eq</sub> (h), dBA <sup>1</sup>	North County Corridor New State Route 108 Project Future Worst Hour Noise Levels - L <sub>eq</sub> (h), dBA																																	
							Design Year Noise Level without Project	Design Year Noise Level with Project	Design Year Noise Level without Project minus Existing Conditions	Design Year Noise Level with Project minus Existing Conditions	Design Year Noise Level with Project minus No Project Conditions	Activity Category (NAC)	Impact Type <sup>2</sup>	Noise Prediction with Barrier, Barrier Insertion Loss (I.L.), and																										
														Number of Benefited Receivers (NBR)																										
														6 feet			8 feet			10 feet			12 feet			14 feet			16 feet											
														L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR
1.1	No Barrier	-	1	SFR	5211 Tully Rd, Modesto	49	54	55	5	6	1	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--							
1.2	No Barrier		1	SFR	5089 Tully Rd, Modesto	60	64	65	4	5	1	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--							
1.3	No Barrier		1	SFR	5080 Tully Rd, Modesto	56	60	62	4	6	2	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--							
2.1	No Barrier		1	SFR	1394 Kiernan Ave, Modesto	59	63	62	4	3	-1	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--							
2.2	No Barrier		1	SFR	1248 Kiernan Ave, Modesto	57	62	63	5	6	1	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--							
2.3	No Barrier		1	SFR	4885 Tully Rd, Modesto	56	61	62	5	6	1	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--							
2.4	No Barrier		1	SFR	4767 Tully Rd, Modesto	53	59	60	6	7	1	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--							
2.5	No Barrier		1	SFR	4823 Tully Rd, Modesto	52	58	58	6	6	0	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--							
2.6	SW-1	EOP	1	SFR	4744 Tully Rd, Modesto	59	64	66	5	7	2	B (67)	A/E	--	65	1	1	--	64	2	1	--	64	2	1	--	63	3	1	--	63	3	1							
3	No Barrier		1	SFR	201 Crawford Rd, Modesto	68	69	67	1	-1	-2	B (67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--							
3.1	SW-2	EOP	1	SFR	177 Chow Chow Ln, Modesto	68	69	67	1	-1	-2	B (67)	A/E	--	64	3	1	--	64	3	1	--	63	4	1	--	63	4	1	--	63	4	1							
3.2	No Barrier	-	1	COM	5298 McHenry Ave, Modesto, CA	64	66	65	1	0	-1	E (72)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--							
3.3	No Barrier		1	COM	5150 McHenry Ave, Modesto, CA	60	62	61	2	1	0	C (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--							
4	No Barrier		1	COM	5150 McHenry Ave, Modesto	73	74	73	1	0	-1	C (67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--							
4.1	No Barrier		1	SFR	5045 McHenry Ave, Modesto	56	57	60	1	4	3	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--							
4.2	No Barrier		1	SFR	254 Claribel Road, Modesto	59	63	64	4	5	1	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--							
4.3	No Barrier		1	SFR	630 Claribel Road, Modesto	57	61	64	4	7	3	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--							
4.4	No Barrier		1	SFR	830 Claribel Road, Modesto	55	59	61	4	6	2	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--							
4.5	No Barrier		1	SFR	4929 Coffee Road, Modesto	60	64	62	4	2	-2	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--							
4.6	No Barrier		1	UND	501 Kiernan Avenue, Modesto, CA	58	63	70	5	11	6	G (N/A)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--							
4.7	No Barrier		1	AG	801 Claribel Rd, Modesto, CA	53	57	68	4	14	11	F (N/A)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--							
5	No Barrier			4	SFR	4824 Coffee Rd, Modesto	68	71	73	3	5	2	B (67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--							
5.1	No Barrier		-	1	SFR	4854 Coffee Rd, Modesto	56	60	60	4	4	0	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--						
6.1	No Barrier			1	SFR	5330 Coffee Rd, Modesto	53	57	59	4	6	2	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--						
7.1	No Barrier			4	SFR	1509 Cabo Dr, Modesto	62	65	60	3	-2	-5	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--										



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**Table B-4. Predicted Future Noise and Sound Wall Analysis - Alternative 2B**

Receiver I.D.	Barrier I.D.	Barrier I.D.	Number of Dwelling Units	Land Use	Address	Existing Noise Level L <sub>eq</sub> (h), dBA <sup>1</sup>	North County Corridor New State Route 108 Project Future Worst Hour Noise Levels - L <sub>eq</sub> (h), dBA																														
							Design Year Noise Level without Project	Design Year Noise Level with Project	Design Year Noise Level without Project minus Existing Conditions	Design Year Noise Level with Project minus Existing Conditions	Design Year Noise Level with Project minus No Project Conditions	Activity Category (NAC)	Impact Type <sup>2</sup>	Noise Prediction with Barrier, Barrier Insertion Loss (I.L.), and																							
														Number of Benefited Receivers (NBR)																							
														6 feet			8 feet			10 feet			12 feet			14 feet			16 feet								
														L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR
12.2	No Barrier		1	SFR	5015 Prospectors Pkwy, Riverbank	51	53	51	2	0	-2	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
12.3	No Barrier		1	SFR	2966 Blacksand Creek Wy, Riverbank	50	53	53	3	3	0	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
13.1	No Barrier		1	SFR	4881 Rosselle Ave, Modesto	61	65	65	4	4	0	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
13.2	No Barrier		1	SFR	4955 Rosselle Ave, Modesto	60	64	62	4	2	-2	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
14.1	No Barrier		1	SFR	5230 Roselle Ave, Riverbank	57	59	60	2	3	1	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
14.2	No Barrier		1	SFR	3212 Claribel Rd, Modesto	61	66	61	5	0	-5	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
15.1	No Barrier		1	SFR	3728 Davis Ave, Modesto	45	51	54	6	9	3	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
15.2	No Barrier		1	SFR	3761 Davis Ave, Modesto	45	50	53	5	8	3	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
16.1	No Barrier		1	SFR	3874 Davis Ave, Modesto	47	54	58	7	11	4	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
16.2	No Barrier		1	SFR	3932 Davis Ave, Modesto	50	57	56	7	6	-1	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
16.3	No Barrier		1	SFR	3973 Davis Ave, Modesto	58	62	63	4	5	1	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
16.4	No Barrier		1	SFR	5361 Claus Rd, Modesto	60	64	64	4	4	0	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
16.5	No Barrier		1	SFR	3973 Minniear Ave, Modesto	60	64	64	4	4	0	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
17.1	No Barrier		1	REC	3800 Claribel Rd, Modesto	55	59	57	4	2	-2	C (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
17.2	No Barrier		1	SFR	4824 Claus Rd, Modesto	56	61	59	5	3	-2	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
17.3	No Barrier		1	SFR	4380 Claribel Rd, Modesto	53	58	59	5	6	1	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
18.1	No Barrier	1	SFR	4936 Terminal Ave, Modesto	57	61	62	4	5	1	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
19.1	SW-3	EOP	5	SFR	4650 Claus Rd, Modesto	63	68	69	5	6	1	B (67)	A/E	--	64	5	5	--	62	7	5	--	60	9	5	--	60	9	5	--	59	10	5	--	59	11	5
19.2	No Barrier	--	1	SFR	4672 Claus Rd, Modesto	52	56	56	4	4	0	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
19.3	SW-4	EOP	1	SFR	4527 Claus Rd, Modesto	63	64	67	1	4	3	B (67)	A/E	--	63	4	1	--	62	5	1	--	62	5	1	--	59	8	1	--	58	9	1	--	57	10	1
19.4	SW-5	EOP	1	SFR	4548 Claus Rd, Modesto	62	66	68	4	6	2	B (67)	A/E	--	64	4	1	--	62	6	1	--	62	6	1	--	60	8	1	--	59	9	1	--	59	9	1
19.5	No Barrier		1	SFR	4510 Claus Rd, Modesto	42	46	48	4	6	2	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
19.6	No Barrier		1	SFR	4500 Claus Rd, Modesto	41	45	47	4	6	2	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
20	No Barrier		1	SFR	4718 McGee Ave, Modesto	42	46	48	4	6	2	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
20.1	No Barrier		1	SFR	4877 McGee Ave, Modesto	47	51	54	4	7	3	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
20.2	No Barrier		1	SFR	4663 McGee Ave, Modesto	43	47	50	4	7	3	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
20.3	No Barrier		1	SFR	4896 McGee Ave, Modesto	47	51	54	4	7	3	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
20.4	No Barrier		1	SFR	4642 McGee Ave, Modesto	42	46	48	4	6	2	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
20.5	No Barrier		1	SFR	4906 McGee Ave, Modesto	49	53	58	4	9	5	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
21.1	No Barrier		1	SFR	4601 Claribel Rd, Modesto	52	56	59	4	7	3	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
21.2	No Barrier		1	SFR	4737 Claribel Rd, Modesto	60	65	64	5	4	-1	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
21.7	No Barrier		1	SFR	5023 Claribel Rd, Modesto	53	58	57	5	4	-1	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
22.1	No Barrier		1	SFR	4854 Langworth Rd, Modesto	59	60	60	1	1	0	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		

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Table B-4. Predicted Future Noise and Sound Wall Analysis - Alternative 2B

Receiver I.D.	Barrier I.D.	Barrier I.D.	Number of Dwelling Units	Land Use	Address	Existing Noise Level L <sub>eq</sub> (h), dBA <sup>1</sup>	North County Corridor New State Route 108 Project Future Worst Hour Noise Levels - L <sub>eq</sub> (h), dBA																														
							Design Year Noise Level without Project	Design Year Noise Level with Project	Design Year Noise Level without Project minus Existing Conditions	Design Year Noise Level with Project minus Existing Conditions	Design Year Noise Level with Project minus No Project Conditions	Activity Category (NAC)	Impact Type <sup>2</sup>	Noise Prediction with Barrier, Barrier Insertion Loss (I.L.), and																							
														Number of Benefited Receivers (NBR)																							
														6 feet			8 feet			10 feet			12 feet			14 feet			16 feet								
														L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR	L <sub>eq</sub> (h)	I.L. <sup>3</sup>	NBR						
22.2	No Barrier	-	1	SFR	4660 Langworth Rd, Modesto	49	50	53	1	4	3	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--					
23.1	No Barrier		1	SFR	5233 Claribel Rd, Modesto	59	63	61	4	2	-2	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--					
23.2	No Barrier		1	SFR	5315 Claribel Rd, Modesto	57	61	59	4	2	-2	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--					
23.3	No Barrier		1	SFR	5553 Claribel Rd, Modesto	63	68	64	5	1	-4	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--					
23.4	No Barrier		1	SFR	5125 Langworth Rd, Oakdale	40	44	51	5	12	7	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--					
23.5	No Barrier		1	SFR	5931 Claribel Rd, Oakdale	51	56	57	5	6	1	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
23.6	No Barrier		1	SFR	500 Bentley Rd, Oakdale	55	60	61	5	6	1	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
23.7	No Barrier		1	SFR	7131 Claribel Rd, Oakdale	41	43	47	3	6	4	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
23.8	No Barrier		1	SFR	7321 Claribel Rd, Oakdale	55	59	59	4	4	0	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
23.9	No Barrier		1	SFR	7319 Claribel Rd, Oakdale	54	59	60	5	6	1	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
27.1	No Barrier		1	SFR	5773 Valk Rd, Oakdale	47	47	49	0	2	2	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
27.2	No Barrier		1	SFR	8500 Valk Rd, Oakdale	41	41	49	0	8	8	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
29.1	No Barrier		1	SFR	6085 Albers Rd, Oakdale	56	58	60	2	4	2	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
30.1	No Barrier		1	SFR	6107 Bender Rd, Oakdale	41	41	42	0	1	1	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
30.2	No Barrier <sup>4</sup>		1	SFR	6355 Bender Rd, Oakdale	41	41	45	0	4	4	B (67)	S	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
30.3	No Barrier <sup>4</sup>		1	SFR	6466 Bender Rd, Oakdale	41	41	52	0	11	11	B (67)	S	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
30.4	SW-7	ROW	1	SFR	6729 Smith Rd, Oakdale	41	41	61	0	20	20	B (67)	S	--	58	3	1	--	56	5	1	--	55	6	1	--	54	7	1	--	53	8	1				
30.5	No Barrier	--	1	SFR	6739 Smith Rd, Oakdale	55	55	62	0	7	7	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
30.6	No Barrier <sup>4</sup>		1	SFR	6680 Smith Rd, Oakdale	41	41	51	0	10	10	B (67)	S	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
30.7	No Barrier		1	SFR	10022 Warnerville Rd, Oakdale	56	56	62	0	6	6	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
30.8	No Barrier		1	SFR	9979 Warnerville Rd, Oakdale	44	45	54	1	10	9	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
30.12	No Barrier		1	SFR	9625 Warnerville Rd, Oakdale	41	41	40	0	-1	-1	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
37.1	SW-11	EOP	1	SFR	6954 Stoddard Rd, Oakdale	41	41	57	0	16	16	B (67)	S	--	55	2	1	--	55	2	1	--	54	3	1	--	52	5	1	--	52	5	1				
39.1	No Barrier	--	1	SFR	13949 California 108, Oakdale	58	59	58	1	0	-1	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
39.2	No Barrier		1	SFR	13460 Lancaster Rd, Oakdale	54	55	54	1	0	-1	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
39.3	No Barrier		1	SFR	13542 Lancaster Rd, Oakdale	52	52	53	0	1	1	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
42	No Barrier		1	SFR	13712 Lancaster Rd, Oakdale	57	57	58	0	1	1	B (67)	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				

Notes:EOP=Edge of Pavement, ROW=Right of Way

1. Short Term measurements were used for calibrating the TNM models and do not represent a frequently used outdoor area within the proposed project area.
2. Impact types: A/E - Future noise conditions approach (within 1 dBA) or exceed the Noise Abatement Criteria (NAC), S - Substantial Increase of 12 dBA or more, N/A - No abatement necessary based on land use.
3. I.L. = Insertion Loss
4. '-- A soundwall was not analyzed for this receiver. No feasible location to place a soundwall.
5. SFR = Single Family Residence, COM = Commercial, REC = Recreation, UND = Undeveloped Land, AG = Agriculture
6. Existing and No-Build noise levels for receivers 23.7,27.2,30.1,30.2,30.3,30.4,30.6, 30.12, 37.1 are representative of background noise sites. No traffic near receivers under Existing and No Build conditions.



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## **Appendix C** Field Data Sheet

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## SITE PHOTOS



## Short-Term

**R1/ST1**  
Meas

### SITE INFORMATION

**Analysis Date:** 1/30/2012 11:50 AM  
**Noise Analyst:** B.Chang  
**Duration:** 20 minutes  
**Ambient Temperature:** 60° F  
**Humidity:** 61%  
**Wind Speed:** 2 mph  
**Sky:** Slightly Cloudy  
**Address:** 5236 Tully Road, Modesto  
**Existing Land Use:** Single-Family Residence

### NOISE RESULTS

**Sound Level ( $L_{eq}$ )** **52.3**  
**dBA**

Jones & Stokes SLM: Larson Davis Model 820 /  
Serial 0506  
Cal 200: Serial 4593

### FIELD COMMENTS

The SLM was placed in front yard of the single-family residence. The SLM was approximately 100 feet from Oakdale Road. The elevation at this location is approximately the same as the nearby roadways. There is no existing barrier at this measurement location. Traffic traveling on Oakdale Road is the dominant noise source.



# Noise Monitoring Field Report

## North County Corridor Project

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### SITE PHOTOS



### Short-Term

**R2/ST2**  
Meas

#### SITE INFORMATION

**Analysis Date:** 1/31/2012 10:20 AM  
**Noise Analyst:** C. Matsui and B. Chang  
**Duration:** 20 minutes  
**Ambient Temperature:** 49° F  
**Humidity:** 77%  
**Wind Speed:** 0.8 mph  
**Sky:** Foggy  
**Address:** 1348 Kiernan Avenue, Modesto  
**Existing Land Use:** Single-Family Residence

#### NOISE RESULTS

Sound Level **58.8**  
dBA

Jones & Stokes SLM: Larson Davis Model 820 /  
Serial 1643  
Cal 200: Serial 4593

#### FIELD COMMENTS

Single family residence located south of Kiernan Avenue and west of Tully Road. The elevation at this location is relatively the same as the nearby roadways. There is no existing barrier shielding this receiver from traffic noise. Traffic traveling on Tully Road and Kiernan is the dominant noise source for this location. The SLM was placed in front of the residence, approximately 190 feet south of the Kiernan Avenue.

# Noise Monitoring Field Report

## North County Corridor Project

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### SITE PHOTOS



### Short-Term

**R3/ST3**  
Meas

#### SITE INFORMATION

**Analysis Date:** 1/31/2012 3:40 PM  
**Noise Analyst:** C. Matsui and B. Chang  
**Duration:** 20 minutes  
**Ambient Temperature:** 59° F  
**Humidity:** 64%  
**Wind Speed:** 2 mph  
**Sky:** Cloudy  
**Address:** 201 Crawford Road, Modesto  
**Existing Land Use:** Single-Family Residence

#### NOISE RESULTS

Sound Level **64.7**  
dBA

Jones & Stokes SLM: Larson Davis Model 820 /  
Serial 1643  
Cal 200: Serial 4593

#### FIELD COMMENTS

Single family residence located east of McHenry Road and north of Crawford Road. The elevation at this location is relatively the same as the nearby roadways. There is no existing barrier shielding this receiver from traffic noise. Traffic traveling on McHenry Road and Kiernan Avenue is the dominant noise source for this location. The SLM was placed in front of the residence, approximately 40 feet east McHenry Road and just north of the Crawford Road.

## SITE PHOTOS



## Short-Term

**R4/ST4**  
Meas

### SITE INFORMATION

**Analysis Date:** 1/31/2012 3:10 PM

**Noise Analyst:** C. Matsui and B. Chang

**Duration:** 20 minutes

**Ambient Temperature:** 62° F

**Humidity:** 56%

**Wind Speed:** 1 mph

**Sky:** Cloudy

**Address:** 5150 McHenry Avenue, Modesto

**Existing Land Use:** Restaurant

### NOISE RESULTS

Sound Level **70.7**  
dBA

Jones & Stokes SLM: Larson Davis Model 820 /  
Serial 1643  
Cal 200: Serial 4593

### FIELD COMMENTS

Short-term noise measurement taken in front of a restaurant located north of Claribel Road and east of McHenry Road. The elevation at this location is approximately the same as the nearby roadways. There is no existing barrier shielding this receiver from traffic noise. Traffic traveling on McHenry Road and Claribel Road is the dominant noise source for this location. The SLM was placed in front of the residence, approximately 20 feet east McHenry Road.



Noise Monitoring Field Report  
North County Corridor Project

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**SITE PHOTOS**



**Short-Term**

**R5/ST5**  
Meas

**SITE INFORMATION**

**Analysis Date:** 1/31/2012 10:00 AM  
**Noise Analyst:** C. Matsui and B. Chang  
**Duration:** 20 minutes  
**Ambient Temperature:** 49° F  
**Humidity:** 77%  
**Wind Speed:** 0 mph  
**Sky:** Cloudy  
**Address:** 4824 Coffee Road, Modesto  
**Existing Land Use:** Single Family Residence

**NOISE RESULTS**

**Sound Level** **63.4**  
**dBA**

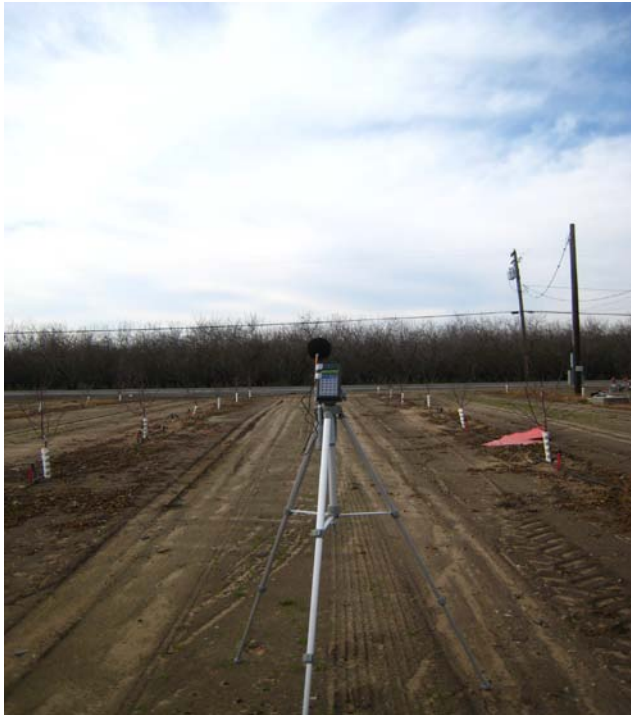
Jones & Stokes SLM: Larson Davis Model 820 /  
Serial 1643  
Cal 200: Serial 4593

**FIELD COMMENTS**

Single family residence located south of Claribel Road and east of Coffee Road. The elevation at this location is relatively the same as the nearby roadway. There are no existing barriers shielding this location. Traffic traveling on Coffee Road is the dominant noise source for this location. The SLM was placed in the driveway of the residential property, approximately 30 feet east of Coffee Road.



## SITE PHOTOS



## Short-Term

**R6/ST6**  
Meas

### SITE INFORMATION

**Analysis Date:** 1/31/2012 12:21 PM  
**Noise Analyst:** K. Kuo  
**Duration:** 20 minutes  
**Ambient Temperature:** 61° F  
**Humidity:** 64%  
**Wind Speed:** 3 mph  
**Sky:** Partly Cloud  
**Address:** 5242 Coffee Road, Modesto  
**Existing Land Use:** Single Family Residence

### NOISE RESULTS

Sound Level **58.5**  
dBA

Jones & Stokes SLM: Larson Davis Model 820 /  
Serial 1643  
Cal 200: Serial 4593

### FIELD COMMENTS

Single family residence located south of Claribel Road and east of Coffee Road. The elevation at this location is relatively the same as the nearby Roadway. There are no existing barriers shielding this location. Traffic traveling on Coffee Road is the dominant noise source for this location. The SLM was placed in the driveway of the residential property, approximately 100 feet east of Coffee Road.

## SITE PHOTOS



## Short-Term

**R7/ST7**  
Meas

### SITE INFORMATION

**Analysis Date:** 1/31/2012 4:43PM  
**Noise Analyst:** K. Kuo, J. Volk, B. Chang  
**Duration:** 20 minutes  
**Ambient Temperature:** 60° F  
**Humidity:** 72%  
**Wind Speed:** calm  
**Sky:** Partly Cloudy  
**Address:** 1512 Cabo Drive, Modesto  
**Existing Land Use:** Mobile Home Residence

### NOISE RESULTS

Sound Level **58.3**  
dBA



Jones & Stokes SLM: Larson Davis Model 812 /  
Serial 0239  
Cal 200: Serial 4593

### FIELD COMMENTS

Mobile home residence located in the Morningside Mobile Home Park. This community of mobile homes is located just south of Claribel Road and east of Coffee Road. The elevation at this location is similar to the nearby roadways. There is an existing fence on the private property line of the mobile home park. Traffic traveling on Claribel Road and within the mobile home park is the dominant noise source for this mobile home community. The SLM was placed at 15 feet north of the residence on Cabo Street.

Noise Monitoring Field Report  
North County Corridor Project

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**SITE PHOTOS**



**Short-Term**

**R8/ST8**  
Meas

**SITE INFORMATION**

**Analysis Date:** 1/31/2012 4:43 PM  
**Noise Analyst:** Kuo, Volk, Chang  
**Duration:** 20 minutes  
**Ambient Temperature:** 60° F  
**Humidity:** 72%  
**Wind Speed:** calm  
**Sky:** Cloudy  
**Address:** 1529 Sailfish Drive, Modesto  
**Existing Land Use:** Mobile Home Residence

**NOISE RESULTS**

**Sound Level** **55.0**  
**dBA**

Jones & Stokes SLM: Larson Davis Model 812 /  
Serial 0239  
Cal 200: Serial 4593

**FIELD COMMENTS**

Mobile home residence located in the Morningside Mobile Home Park. This community of mobile homes is located just south of Claribel Road and east of Coffee Road. The elevation at this location is similar to the nearby roadways. There is an existing fence on the private property line of the mobile home park. Traffic traveling on Claribel Road and within the mobile home park is the dominant noise source for this mobile home community. The SLM was placed at the intersection of Sailfish Drive and White Wing Drive, approximately 15 feet south of the residence.



## SITE PHOTOS



## Short-Term

**R9/ST9**  
Meas

### SITE INFORMATION

**Analysis Date:** 2/2/2012 11:06 AM

**Noise Analyst:** J. Volk

**Duration:** 20 minutes

**Ambient Temperature:** 70° F

**Humidity:** 51%

**Wind Speed:** 10 mph

**Sky:** Clear

**Address:** 1526 Vella Way, Modesto

**Existing Land Use:** Single-Family Residence

### NOISE RESULTS

Sound Level **57.3**  
dBA

Jones & Stokes SLM: Larson Davis Model 820 /  
Serial 1643  
Cal 200: Serial 4593

### FIELD COMMENTS

Single family residence located south of Vella Way and east of Coffee Road. The elevation at this location is relatively the same as the nearby roadways. There is no existing barrier shielding this receiver from traffic noise. Traffic traveling on Vella Way is the dominant noise source for this location. The SLM was placed in front of the residence, approximately 15 feet south of the edge of Vella Way.



## SITE PHOTOS



## Short-Term

**R10/ST10**  
Meas

### SITE INFORMATION

**Analysis Date:** 2/1/2012 12:02 PM

**Noise Analyst:** K. Kuo

**Duration:** 20 minutes

**Ambient Temperature:** 50° F

**Humidity:** 36%

**Wind Speed:** 10 mph

**Sky:** Cloudy

**Address:** 4736 Oakdale Avenue, Modesto

**Existing Land Use:** Single-Family Residence

### NOISE RESULTS

Sound Level **65.0**  
dBA

Jones & Stokes SLM: Larson Davis Model 820 /  
Serial 1643  
Cal 200: Serial 4593

### FIELD COMMENTS

Single family residence located south of Claribel Road and east of Oakdale Road. The elevation at this location is relatively similar to the nearby roadways. There is no existing barrier shielding this short-term measurement location. Traffic traveling on Oakdale Road and Claribel Road are the dominant noise source for this location. The SLM was placed in an orchard that is directly adjacent to the residence, approximately 50 feet east from the edge of Oakdale Road.

# Noise Monitoring Field Report

## North County Corridor Project

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### SITE PHOTOS



### Short-Term

**R11/ST11**  
Meas

#### SITE INFORMATION

**Analysis Date:** 1/31/2012 11:45 AM  
**Noise Analyst:** C. Matsui and B. Chang  
**Duration:** 20 minutes  
**Ambient Temperature:** 52° F  
**Humidity:** 76%  
**Wind Speed:** 4 mph  
**Sky:** Cloudy  
**Address:** 5010 Winding River Court, Riverbank  
**Existing Land Use:** Single-Family Residence

#### NOISE RESULTS

Sound Level **48.1**  
dBA

Jones & Stokes SLM: Larson Davis Model 812 /  
Serial 0239  
Cal 200: Serial 4593

#### FIELD COMMENTS

Single family residence located north of Claribel Road and west of Roselle Avenue. This residence is located in a community of single family residences. The elevation at this location is relatively flat and approximately the same as the nearby roadways. There are existing wood fences along each residence private property line. The fences are approximately 6 feet in height. However, there are gaps in these fences that allow access to a bike path adjacent to the community. Traffic traveling on roads with the community and Claribel Road are the dominant noise source at this location. The SLM was placed in the cul-de-sac of Winding River Court approximately 300 feet north of Claribel Road. The meter was placed in front of the gap in the wood fence surrounding the private property line of the community.



# Noise Monitoring Field Report

## North County Corridor Project

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### SITE PHOTOS



### Short-Term

**R12/ST12**  
Meas

#### SITE INFORMATION

**Analysis Date:** 1/31/2012 1:15 PM

**Noise Analyst:** B. Chang

**Duration:** 20 minutes

**Ambient Temperature:** 56° F

**Humidity:** 76%

**Wind Speed:** 1 mph

**Sky:** Cloudy

**Address:** 5033 Coolwater Court, Riverbank

**Existing Land Use:** Single-Family Residence

#### NOISE RESULTS

**Sound Level** **47.5**  
**dBA**

Jones & Stokes SLM: Larson Davis Model 812 /  
Serial 0239  
Cal 200: Serial 4593

#### FIELD COMMENTS

Single family residence located north of Claribel Road and west of Roselle Avenue. This residence is located in a community of single family residences. The elevation at this location is relatively flat and approximately the same as the nearby roadways. There are existing wood fences along each residence private property line. The fences are approximately 6 feet in height. However, there are gaps in these fences that allow access to a bike path adjacent to the community. Traffic traveling on roads with the community and Claribel Road are the dominant noise source for this location. The SLM was placed in the cul-de-sac of Coowater Court approximately 300 feet north of Claribel Road. The meter was placed in front of the gap in the wood fence surrounding the private property line of the community.

# Noise Monitoring Field Report

## North County Corridor Project

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### SITE PHOTOS



### Short-Term

**R13/ST13**  
Meas

#### SITE INFORMATION

**Analysis Date:** 1/31/2012 12:45 PM  
**Noise Analyst:** B. Chang  
**Duration:** 20 minutes  
**Ambient Temperature:** 61° F  
**Humidity:** 65%  
**Wind Speed:** 2 mph  
**Sky:** Cloudy  
**Address:** 4217 Roselle Avenue, Riverbank  
**Existing Land Use:** Single-Family Residence

#### NOISE RESULTS

Sound Level **65.9**  
dBA

Jones & Stokes SLM: Larson Davis Model 820 /  
Serial 0506  
Cal 200: Serial 4593

#### FIELD COMMENTS

This short-term noise measurement was taken in an open field at the southwest quadrant of the intersection of Roselle Avenue and Planview Road. The elevation at this location is relatively flat and similar to the adjacent roadways. There is no existing barrier shielding this location. Traffic traveling on Roselle Avenue and Planview Road are the dominant noise source for this location. The SLM was placed in the southwest quadrant of the intersection approximately 40 feet west of the edge of Roselle Avenue.



Noise Monitoring Field Report  
North County Corridor Project

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**SITE PHOTOS**



**Short-Term**

**R14/ST14**  
Meas

**SITE INFORMATION**

**Analysis Date:** 1/31/2012 12:40 PM

**Noise Analyst:** C. Matsui

**Duration:** 20 minutes

**Ambient Temperature:** 53° F

**Humidity:** 65%

**Wind Speed:** 1 mph

**Sky:** Foggy

**Address:** 5118 Roselle Avenue, Riverbank

**Existing Land Use:** Single-Family Residence

**NOISE RESULTS**

**Sound Level** **58.1**  
**dBA**

Jones & Stokes SLM: Larson Davis Model 812 /  
Serial 0239  
Cal 200: Serial 4593

**FIELD COMMENTS**

Single family residence located north of Claribel Road and east of Roselle Avenue. The elevation at this location is relatively flat and similar to the nearby roadways. There is no existing barrier shielding this receiver location. Traffic traveling on Roselle Avenue and Claribel Road are the dominant noise source for this location. The SLM was placed approximately 80 feet south of the residence and approximately 40 feet east of Roselle Avenue.

# Noise Monitoring Field Report

## North County Corridor Project

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### SITE PHOTOS



### Short-Term

**R15/ST15**  
Meas

#### SITE INFORMATION

**Analysis Date:** 1/31/2012 3:25 PM  
**Noise Analyst:** C. Matsui and B, Chang  
**Duration:** 20 minutes  
**Ambient Temperature:** 61° F  
**Humidity:** 73%  
**Wind Speed:** 1 mph  
**Sky:** Clear  
**Address:** 3701 Davis Avenue, Modesto  
**Existing Land Use:** Single-Family Residence

#### NOISE RESULTS

Sound Level **54.0**  
dBA

Jones & Stokes SLM: Larson Davis Model 812 /  
Serial 0430  
Cal 200: Serial 4593

#### FIELD COMMENTS

Single family residence located south of Davis Avenue and east of Terminal Avenue. The elevation at this location is relatively flat and similar to the adjacent roadways. There is an existing wire fence surrounding the property; however, there is no existing barrier shielding this residence. Traffic traveling on Terminal Avenue and Davis Avenue are the dominant noise source for this location. The SLM was placed in a field directly adjacent to the residence, between the house and Terminal Avenue.



Noise Monitoring Field Report  
North County Corridor Project

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**SITE PHOTOS**



**Short-Term**

**R16/ST16**  
Meas

**SITE INFORMATION**

**Analysis Date:** 1/31/2012 2:30 PM  
**Noise Analyst:** C. Matsui and B, Chang  
**Duration:** 20 minutes  
**Ambient Temperature:** 60° F  
**Humidity:** 72%  
**Wind Speed:** 1 mph  
**Sky:** Clear  
**Address:** 3961 Davis Avenue, Modesto  
**Existing Land Use:** Single-Family Residence

**NOISE RESULTS**

Sound Level **53.7**  
dBA

Jones & Stokes SLM: Larson Davis Model 812 /  
Serial 0430  
Cal 200: Serial 4593

**FIELD COMMENTS**

Single family residence located north of Claribel Road and west of Claus Road. The elevation at this location is relatively flat and similar to the adjacent roadways. There is no existing barrier shielding this residential property. Traffic traveling on Claus Road and Davis Avenue are the dominant noise source for this location. The SLM was placed in front of the residence on Davis Avenue, approximately 250 feet east of Claus Road.

# Noise Monitoring Field Report

## North County Corridor Project

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### SITE PHOTOS



### Short-Term

**R17/ST17**  
Meas

#### SITE INFORMATION

**Analysis Date:** 1/30/2012 4:30 PM  
**Noise Analyst:** C. Matsui and B, Chang  
**Duration:** 20 minutes  
**Ambient Temperature:** 59° F  
**Humidity:** 61%  
**Wind Speed:** 1 mph  
**Sky:** Cloudy  
**Address:** 3800 Claribel Road, Modesto  
**Existing Land Use:** Recreational

#### NOISE RESULTS

Sound Level **61.2**  
dBA

Jones & Stokes SLM: Larson Davis Model 812 /  
Serial 0239  
Cal 200: Serial 4593

#### FIELD COMMENTS

This short-term noise measurement was taken at a six field baseball diamond sports complex located north of Claribel Road and east of Claus Road. The elevation at this location is relatively flat and similarly to the adjacent roadways. There is an existing chain link fence surrounding the sports complex property. There is no existing barrier shielding traffic noise. Traffic traveling on Claribel Road, Claus Road and noises associated with the complex are the dominant noise sources for this location. The SLM was placed south of the parking lot located on the property, approximately 100 feet east of Claus Road.



# Noise Monitoring Field Report

## North County Corridor Project

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### SITE PHOTOS



### Short-Term

**R18/ST18**  
Meas

#### SITE INFORMATION

**Analysis Date:** 2/2/2012 11:55 AM

**Noise Analyst:** K. Kuo and J. Volk

**Duration:** 20 minutes

**Ambient Temperature:** 56° F

**Humidity:** 58%

**Wind Speed:** 2 mph

**Sky:** Clear

**Address:** 4712 Terminal Avenue, Modesto

**Existing Land Use:** Single-family Volk

#### NOISE RESULTS

Sound Level **59.7**  
dBA

Jones & Stokes SLM: Larson Davis Model 812 /  
Serial 0239  
Cal 200: Serial 4594

#### FIELD COMMENTS

Single family residence located south of Claribel Road and east of Terminal Avenue. The elevation at this location is relatively flat and similar to the adjacent roadways. There is no existing barrier shielding this residential property. Traffic traveling on Claribel Road and Terminal Avenue are the dominant noise source for this location. The SLM was placed in the front yard of the residence, approximately 100 feet east of Terminal Avenue.

## SITE PHOTOS



## Short-Term

**R19/ST19**  
Meas

### SITE INFORMATION

**Analysis Date:** 2/2/2012 10:51 AM

**Noise Analyst:** K. Kuo

**Duration:** 20 minutes

**Ambient Temperature:** 56° F

**Humidity:** 61%

**Wind Speed:** 5 mph

**Sky:** Clear

**Address:** 4628 Claus Road, Modesto #22

**Existing Land Use:** Mobile home residence

### NOISE RESULTS

Sound Level **43.1**  
dBA

Jones & Stokes SLM: Larson Davis Model 812 /  
Serial 0239  
Cal 200: Serial 4594

### FIELD COMMENTS

This measurement was taken at the Olive Lane Trailer Park, located south of Claribel Road and east of Claus Road. The elevation at this location is relatively flat and is similar to the adjacent roadways. There is no existing barrier shielding this property. Traffic traveling on Claus Road, Claribel Road, and roadways within the community are the dominant noise source for this location. The SLM was placed between Units 20 and 22, approximately 600 feet east of the edge of Claus Road.



## SITE PHOTOS



## Short-Term

**R20/ST20**  
Meas

### SITE INFORMATION

**Analysis Date:** 2/2/2012 10:54 AM

**Noise Analyst:** Peter Hardie

**Duration:** 20 minutes

**Ambient Temperature:** 54° F

**Humidity:** 52%

**Wind Speed:** 1 mph

**Sky:** Clear

**Address:** 4718 McGee Avenue, Modesto

**Existing Land Use:** Single-family residence

### NOISE RESULTS

Sound Level **45.2**  
dBA

Jones & Stokes SLM: Larson Davis Model 812 /  
Serial 0239  
Cal 200: Serial 4594

### FIELD COMMENTS

This measurement was taken the single family residence located south of Claribel Road and east of McGee Avenue. The elevation at this location is relatively flat and is similar to the adjacent roadways. There is no existing barrier shielding this property. Traffic traveling along McGee and slightly traffic traveling on Claribel Road are the dominant noise source for this location. The SLM was placed approximately 15 feet north of the residence and approximately 120 feet east of McGee Road.



# Noise Monitoring Field Report

## North County Corridor Project

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### SITE PHOTOS



### Short-Term

**R21/ST21**  
Meas

#### SITE INFORMATION

**Analysis Date:** 2/2/2012 11:33 AM

**Noise Analyst:** Peter Hardie

**Duration:** 20 minutes

**Ambient Temperature:** 57° F

**Humidity:** 47%

**Wind Speed:** 1 mph

**Sky:** Clear

**Address:** 5236 Eleanor Road, Modesto

**Existing Land Use:** Single-family residence

#### NOISE RESULTS

Sound Level **56.7**  
dBA

Jones & Stokes SLM: Larson Davis Model 812 /  
Serial 0239  
Cal 200: Serial 4594

#### FIELD COMMENTS

Single family residence located north of Claribel Road and east of Eleanor Avenue. The elevation at this location is relatively flat and is similar to the adjacent roadways. There is no existing barrier shielding this location from traffic noise. Traffic traveling on Eleanor Avenue and Claribel Road are the dominant noise sources at this location. The SLM was placed approximately 54 feet east of Eleanor Avenue and 10 feet north of the residence.



## SITE PHOTOS



## Short-Term

**R22/ST22**  
Meas

### SITE INFORMATION

**Analysis Date:** 1/31/2012 12:17 PM

**Noise Analyst:** K. Kuo and J. Volk

**Duration:** 20 minutes

**Ambient Temperature:** 52° F

**Humidity:** 67%

**Wind Speed:** calm

**Sky:** Cloudy

**Address:** 4608 Langworth Road, Modesto

**Existing Land Use:** Single-family residence

### NOISE RESULTS

Sound Level **63.6**  
dBA

Jones & Stokes SLM: Larson Davis Model 820 /  
Serial 1643  
Cal 200: Serial 8534

### FIELD COMMENTS

This noise measurement was taken in an orchard across from a single family residence located south of Claribel Road and east of Langworth Road. The elevation at this location is relatively flat and is similar to the nearby roadways. There is no existing barrier shielding this residence from traffic noise. Traffic traveling on Langworth Road is the dominant noise source for this location. The SLM was placed approximately 33 feet west of Langworth Road, adjacent to a pond that is located on the property.

# Noise Monitoring Field Report

## North County Corridor Project

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### SITE PHOTOS



### Short-Term

**R23/ST23**  
Meas

#### SITE INFORMATION

**Analysis Date:** 1/30/2012 4:39 PM

**Noise Analyst:** K. Kuo and Buehler

**Duration:** 20 minutes

**Ambient Temperature:** 64° F

**Humidity:** 68%

**Wind Speed:** calm

**Sky:** Partly Cloudy

**Address:** 4943 Claribel Road, Modesto

**Existing Land Use:** Single-family residence

#### NOISE RESULTS

Sound Level **62.6**  
dBA

Jones & Stokes SLM: Larson Davis Model 812 /  
Serial 0239  
Cal 200: Serial 4594

#### FIELD COMMENTS

Single family residence located south of Claribel Road and west of Langworth Road. The elevation at this location is relatively flat and is similar to the adjacent roadways. There is no existing barrier in this location to shield receivers from traffic noise. Traffic traveling on Claribel Road and Langworth Road are the dominant noise source for this location. The SLM was placed approximately 50 feet south of Claribel Road and approximately 200 feet west of Langworth Road.



# Noise Monitoring Field Report

## North County Corridor Project

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### SITE PHOTOS



### Short-Term

**R24/ST24**  
Meas

#### SITE INFORMATION

**Analysis Date:** 1/30/2012 4:02 PM

**Noise Analyst:** K. Kuo and Buehler

**Duration:** 20 minutes

**Ambient Temperature:** 62° F

**Humidity:** 66%

**Wind Speed:** calm

**Sky:** Partly Cloudy

**Address:** 5405 Epperson Court, Oakdale

**Existing Land Use:** Single-family residence

#### NOISE RESULTS

Sound Level **57.2**  
dBA

Jones & Stokes SLM: Larson Davis Model 812 /  
Serial 0239  
Cal 200: Serial 4593

#### FIELD COMMENTS

Single family residence located west of Langworth Road and north of Epperson Court. The location is slightly higher in elevation than Epperson Court. There is no existing barrier shielding the residence from traffic noise. Traffic traveling on Epperson Court and Langworth Road is the dominant noise source for this location. The SLM was placed directly north of Epperson Court, approximately 200 feet west of Langworth Road.

# Noise Monitoring Field Report

## North County Corridor Project

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### SITE PHOTOS



### Short-Term

**R25/ST25**  
Meas

#### SITE INFORMATION

**Analysis Date:** 1/30/2012 3:28 PM  
**Noise Analyst:** K. Kuo and Buehler  
**Duration:** 20 minutes  
**Ambient Temperature:** 63° F  
**Humidity:** 64%  
**Wind Speed:** 2 mph  
**Sky:** Partly Cloudy  
**Address:** 6201 Patterson Road, Oakdale  
**Existing Land Use:** Commerical land use

#### NOISE RESULTS

Sound Level **65.3**  
dBA

Jones & Stokes SLM: Larson Davis Model 812 /  
Serial 0239  
Cal 200: Serial 4593

#### FIELD COMMENTS

The noise measurement was taken in front of the Sisk Tallow Recycling facility located west of Crane Road and South of Patterson Road. The terrain is relatively flat in this area and the elevation for this location is similar to the adjacent roadways. There is no existing barrier shielding this location. Traffic traveling on Patterson Road and Crane Road are the dominant noise source for this location. The SLM was placed in front of the Sisk Tallow Recycling Company, approximately 54 feet south of Patterson Road.



# Noise Monitoring Field Report

## North County Corridor Project

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### SITE PHOTOS



### Short-Term

**R26/ST26**  
Meas

#### SITE INFORMATION

**Analysis Date:** 2/2/2012 12:53 PM

**Noise Analyst:** Peter Hardie

**Duration:** 20 minutes

**Ambient Temperature:** 62° F

**Humidity:** 57%

**Wind Speed:** 1 mph

**Sky:** Clear

**Address:** 7051 Bentley Road, Oakdale

**Existing Land Use:** Single-family residence

#### NOISE RESULTS

Sound Level **46.9**  
dBA



Jones & Stokes SLM: Larson Davis Model 820 /  
Serial 1643  
Cal 200: Serial 8534

#### FIELD COMMENTS

Single family residence located south of Lexington Avenue and east of Bentley Road. The terrain at this location is relatively flat and is similar in elevation to the adjacent roadways. There is no existing barrier shielding this location from traffic noise. Traffic traveling on Lexington Avenue and Bentley Road are the dominant noise source for this location. The SLM was placed in front of the residence approximately 100 feet east of Bentley Road and 3 feet north of the walkway to the front door of the residence.

## SITE PHOTOS



## Short-Term

**R27/ST27**  
Meas

### SITE INFORMATION

**Analysis Date:** 2/2/2012 1:06 PM  
**Noise Analyst:** K. Kuo and J. Volk  
**Duration:** 20 minutes  
**Ambient Temperature:** 62° F  
**Humidity:** 38%  
**Wind Speed:** 1 mph  
**Sky:** Clear  
**Address:** 5837 Volk Road, Oakdale  
**Existing Land Use:** Single-family residence

### NOISE RESULTS

Sound Level **42.8**  
dBA

Jones & Stokes SLM: Larson Davis Model 820 /  
Serial 1643  
Cal 200: Serial 8534

### FIELD COMMENTS

Single family residence located north of Claribel Road and west of Volk Road. The terrain at this locations relatively flat and is similarly to the adjacent roadways. There is no existing barrier shielding this location from traffic noise. Traffic traveling on Albers Road and Volk Road are the dominant noise sources for this location. The SLM was placed on the east side of the residential property along Volk Road.



## SITE PHOTOS



## Short-Term

**R28/ST28**  
Meas

### SITE INFORMATION

**Analysis Date:** 2/1/2012 2:49 PM

**Noise Analyst:** K. Kuo

**Duration:** 20 minutes

**Ambient Temperature:** 60° F

**Humidity:** 57%

**Wind Speed:** 1 mph

**Sky:** Clear

**Address:** 6224 Kaufman Road, Oakdale

**Existing Land Use:** Single-family residence

### NOISE RESULTS

Sound Level **49.3**  
dBA

Jones & Stokes SLM: Larson Davis Model 820 /  
Serial 1643  
Cal 200: Serial 8534

### FIELD COMMENTS

Single family residence located south of Patterson Road and west of Kaufman Road. The terrain at this location is relatively flat and the elevation is similar to the nearby roadways. There is no existing barrier shielding this location from traffic noise. Traffic traveling on Patterson Road and Kaufman Road are the dominant noise sources for this location.

# Noise Monitoring Field Report

## North County Corridor Project

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### SITE PHOTOS



### Short-Term

**R29/ST29**  
Meas

#### SITE INFORMATION

**Analysis Date:** 2/1/2012 2:45 PM

**Noise Analyst:** Peter Hardie

**Duration:** 20 minutes

**Ambient Temperature:** 56° F

**Humidity:** 34%

**Wind Speed:** 8 mph

**Sky:** Clear

**Address:** 8406 Patterson Road, Oakdale

**Existing Land Use:** Single-family residence

#### NOISE RESULTS

Sound Level **60.6**  
dBA

Jones & Stokes SLM: Larson Davis Model 812 /  
Serial 0430  
Cal 200: Serial 4593

#### FIELD COMMENTS

Single family residence located south of Patterson Road and west of Albers Road. The terrain at this location is relatively flat and the elevation is similar to the nearby roadways. There is no existing barrier shielding this location from traffic noise. Traffic traveling on Patterson Road and Albers Road are the dominant noise source for this location. The SLM was placed approximately 140 feet south of Patterson Road, adjacent to a cow pasture.

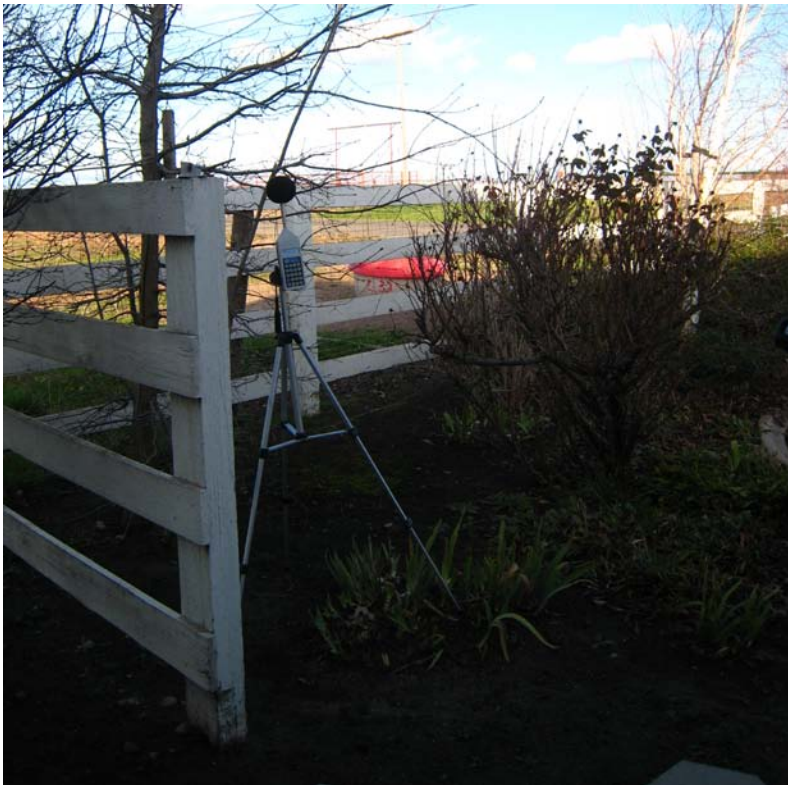


# Noise Monitoring Field Report

## North County Corridor Project

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### SITE PHOTOS



### Short-Term

**R30/ST30**  
Meas

#### SITE INFORMATION

**Analysis Date:** 2/1/2012 3:42 PM  
**Noise Analyst:** Peter Hardie and K. Kuo  
**Duration:** 20 minutes  
**Ambient Temperature:** 55° F  
**Humidity:** 31%  
**Wind Speed:** 6 mph  
**Sky:** Clear  
**Address:** 6613 Smith Road, Oakdale  
**Existing Land Use:** Single-family residence

#### NOISE RESULTS

Sound Level **58.4**  
dBA

Jones & Stokes SLM: Larson Davis Model 812 /  
Serial 0430  
Cal 200: Serial 4593

#### FIELD COMMENTS

Single family residence located south of Warnerville Road and west of Smith Road. The terrain at this location is relatively flat and the elevation is similar to the nearby roadways. There is no existing barrier shielding this location from traffic noise. Traffic traveling on Smith Road was the dominant noise source. The SLM was placed in front of the residence approximately 50 feet west of Smith Road and 10 feet east from the residential building.

# Noise Monitoring Field Report

## North County Corridor Project

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### SITE PHOTOS



### Short-Term

**R31/ST31**  
Meas

#### SITE INFORMATION

**Analysis Date:** 2/2/2012 3:05 PM

**Noise Analyst:** Peter Hardie

**Duration:** 20 minutes

**Ambient Temperature:** 62° F

**Humidity:** 45%

**Wind Speed:** 4 mph

**Sky:** Clear

**Address:** 1330 Town Hill Road, Oakdale

**Existing Land Use:** Single-family residence

#### NOISE RESULTS

Sound Level **44.5**  
dBA

Jones & Stokes SLM: Larson Davis Model 820 /  
Serial 1643  
Cal 200: Serial 8534

#### FIELD COMMENTS

Single family residence located south of Sierra Road and east of Town Hill Road. The terrain at this location is relatively flat and the elevation is similar to the nearby roadways. There is a wire fence surrounding the property; however, there is no existing barrier shielding this location from traffic noise. Traffic traveling on Town Hill Road was the dominant noise source at this location. The SLM was placed just outside the fence line of the property approximately 30 feet east of Town Hill Road.



# Noise Monitoring Field Report

## North County Corridor Project

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### SITE PHOTOS



## Short-Term

**R32/ST32**  
Meas

### SITE INFORMATION

**Analysis Date:** 2/2/2012 3:03 PM  
**Noise Analyst:** K. Kuo and J. Volk  
**Duration:** 20 minutes  
**Ambient Temperature:** 58° F  
**Humidity:** 39%  
**Wind Speed:** 2 mph  
**Sky:** Clear  
**Address:** 565 Edgetown Avenue, Oakdale  
**Existing Land Use:** Single-family residence

### NOISE RESULTS

Sound Level **51.6**  
dBA

Jones & Stokes SLM: Larson Davis Model 812 /  
Serial 0430  
Cal 200: Serial 4593

### FIELD COMMENTS

Single family residence located north of Sierra Road and west of Orsi Road. This residence is located in a community of single family residences. The elevation of the residence is slightly lower in elevation than the adjacent roadways. There is an existing barrier, approximately 6 feet in height, shielding the residences in this community from traffic noise. Traffic traveling on Sierra Road and Orsi Road were the dominant noise source for this location. The SLM was placed just outside the existing barrier on the private property line of the residence.

# Noise Monitoring Field Report

## North County Corridor Project

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### SITE PHOTOS



### Short-Term

**R33/ST33**  
Meas

#### SITE INFORMATION

**Analysis Date:** 2/1/2012 3:57 PM  
**Noise Analyst:** C. Matsui and B. Chang  
**Duration:** 20 minutes  
**Ambient Temperature:** 59° F  
**Humidity:** 63%  
**Wind Speed:** 3 mph  
**Sky:** Clear  
**Address:** 279 S Stearns Road, Oakdale  
**Existing Land Use:** Single-family residence

#### NOISE RESULTS

Sound Level **55.3**  
dBA

Jones & Stokes SLM: Larson Davis Model 812 /  
Serial 0430  
Cal 200: Serial 4593

#### FIELD COMMENTS

Single family residence located north of Sierra Road and east of S. Stearns Road. The terrain at this location is relatively flat and has a similar elevation of the adjacent roadways. There is no existing barrier shielding this residence from traffic noise. Traffic traveling on S. Stearns Road is the dominant noise source for this location. The SLM was placed south of the residence, between the property fence and orchards. The meter was placed 100 feet east of S. Stearns Road.



## SITE PHOTOS



## Short-Term

**R34/ST34**  
Meas

### SITE INFORMATION

**Analysis Date:** 2/1/2012 3:07 PM

**Noise Analyst:** C. Matsui and B. Chang

**Duration:** 20 minutes

**Ambient Temperature:** 58° F

**Humidity:** 67%

**Wind Speed:** 4 mph

**Sky:** Clear

**Address:** 8667 Tulloch Road, Oakdale

**Existing Land Use:** Single-family residence

### NOISE RESULTS

Sound Level **45.2**  
dBA

Jones & Stokes SLM: Larson Davis Model 812 /  
Serial 0430  
Cal 200: Serial 4593

### FIELD COMMENTS

Single family residence located north of Sierra Road and west of Tulloch Road. The terrain at this location is relatively flat and has a similar elevation of the adjacent roadways. There is no existing barrier shielding this residence from traffic noise. Traffic traveling on S. Stearns Road is the dominant noise source for this location. The SLM was placed north of a cow pasture located on the property, approximately 500 feet west of Tulloch Road.

# Noise Monitoring Field Report

## North County Corridor Project

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### SITE PHOTOS



### Short-Term

**R35/ST35**  
Meas

#### SITE INFORMATION

**Analysis Date:** 2/1/2012 4:30 PM

**Noise Analyst:** C. Matsui and B. Chang

**Duration:** 20 minutes

**Ambient Temperature:** 57° F

**Humidity:** 68%

**Wind Speed:** 2 mph

**Sky:** Clear

**Address:** 10330 Rio Sombra Court, Oakdale

**Existing Land Use:** Single-family residence

#### NOISE RESULTS

Sound Level **65.7**  
dBA

Jones & Stokes SLM: Larson Davis Model 812 /  
Serial 0430  
Cal 200: Serial 4593

#### FIELD COMMENTS

Single family residence located north of SR 108 and east of Atlas Road in a community of other single family residences. The terrain at this location is relatively flat and has a similar elevation of the adjacent roadways. There is an existing barrier approximately 6 feet in height shielding the residence of this community from traffic noise. Traffic traveling on SR 108 and on roadways within the community are the dominant noise source at this location. The SLM was placed on the residential property approximately 100 feet north of the existing barrier and 30 feet east of the wooden fence along the western property line.

# Noise Monitoring Field Report

## North County Corridor Project

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### SITE PHOTOS



### Short-Term

**R36/ST36**  
Meas

#### SITE INFORMATION

**Analysis Date:** 2/1/2012 4:58 PM

**Noise Analyst:** C. Matsui and B. Chang

**Duration:** 20 minutes

**Ambient Temperature:** 56° F

**Humidity:** 70%

**Wind Speed:** 1 mph

**Sky:** Clear

**Address:** 10520 St. Andrew Court, Oakdale

**Existing Land Use:** Single-family residence

#### NOISE RESULTS

Sound Level **54.4**  
dBA

Jones & Stokes SLM: Larson Davis Model 812 /  
Serial 0430  
Cal 200: Serial 4593

#### FIELD COMMENTS

Single family residence located north of SR 108 and east of Atlas Road in a community of other single family residences. The terrain at this location is relatively flat and has a similar elevation of the adjacent roadways. There is an existing barrier approximately 6 feet in height shielding the residence of this community from traffic noise. Traffic traveling on SR 108 and on roadways within the community are the dominant noise sources for this location. The SLM was placed on the residential property approximately 100 feet north of the existing barrier and 30 feet east of the wooden fence along the western property line.



## SITE PHOTOS



## Short-Term

R37/ST37

Meas

### SITE INFORMATION

**Analysis Date:** 2/1/2012 4:34 PM

**Noise Analyst:** K. Kuo and Peter Hardie

**Duration:** 20 minutes

**Ambient Temperature:** 58° F

**Humidity:** 67%

**Wind Speed:** 1 mph

**Sky:** Clear

**Address:** 6913 Stoddard Road, Oakdale

**Existing Land Use:** Single-family residence

### NOISE RESULTS

Sound Level **50.9**  
dBA

Jones & Stokes SLM: Larson Davis Model 812 /  
Serial 0430  
Cal 200: Serial 4593

### FIELD COMMENTS

Single family residence located south of Warnerville Road and west of Stoddard Road. The terrain at this location is relatively flat and has a similar elevation of the adjacent roadways. There is no existing barrier shielding this residence from traffic noise. There is a gate located on the residences private property line that does not provide any abatement. Traffic traveling on Warnerville Road and Stoddard Road are the dominant noise sources for this location. The SLM was placed on the residential property approximately 50 feet south of Warnerville Road, 21 feet east of the western property line and 42 feet west of the residential building.



# Noise Monitoring Field Report

## North County Corridor Project

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### SITE PHOTOS



### Short-Term

R38/ST38

Meas

### SITE INFORMATION

**Analysis Date:** 2/1/2012 10:53 AM

**Noise Analyst:** B. Chang and C. Matsui

**Duration:** 20 minutes

**Ambient Temperature:** 60° F

**Humidity:** 70%

**Wind Speed:** 1 mph

**Sky:** Clear

**Address:** 12424 Lancaster Rd, Oakdale

**Existing Land Use:** Single-family residence

### NOISE RESULTS

Sound Level **55.9**  
dBA

Jones & Stokes SLM: Larson Davis Model 812 /  
Serial 0430  
Cal 200: Serial 4593

### FIELD COMMENTS

Single family residence located north of SR 108, south of Lancaster Road and east of Wamble Road. The terrain in this area is uneven and the residences are slightly lower in elevation than the adjacent roadways. There is no existing barrier shielding this residence from traffic noise. Traffic traveling on SR 108 is the dominant noise source for this location. The SLM was placed just outside the fence on the private property line of the residence. The meter was approximately 200 feet north of SR 108.

# Noise Monitoring Field Report

## North County Corridor Project

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### SITE PHOTOS



## Short-Term

R39/ST39

Meas

### SITE INFORMATION

**Analysis Date:** 2/1/2012 12:32 PM

**Noise Analyst:** B. Chang and C. Matsui

**Duration:** 20 minutes

**Ambient Temperature:** 58° F

**Humidity:** 74%

**Wind Speed:** 3 mph

**Sky:** Cloudy

**Address:** 13230 Lancaster Road, Oakdale

**Existing Land Use:** Single-family residence

### NOISE RESULTS

Sound Level **60.2**  
dBA

Jones & Stokes SLM: Larson Davis Model 820 /  
Serial 1643  
Cal 200: Serial 8534

### FIELD COMMENTS

Single family residence located north of SR 108, south of Lancaster Road and east of Wamble Road. The terrain in this area is uneven and the residences are slightly lower in elevation than the adjacent roadways. There is no existing barrier shielding this residence from traffic noise. Traffic traveling on SR 108 is the dominant noise source for this location.

# Noise Monitoring Field Report

## North County Corridor Project

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### SITE PHOTOS



### Short-Term

R40/ST40

Meas

### SITE INFORMATION

**Analysis Date:** 2/1/2012 11:44 AM

**Noise Analyst:** B. Chang and C. Matsui

**Duration:** 20 minutes

**Ambient Temperature:** 57° F

**Humidity:** 78%

**Wind Speed:** 5 mph

**Sky:** Overcast

**Address:** 13949 Lancaster Road, Oakdale

**Existing Land Use:** Single-family residence

### NOISE RESULTS

Sound Level **60.9**  
dBA

Jones & Stokes SLM: Larson Davis Model 812 /  
Serial 0430  
Cal 200: Serial 4593

### FIELD COMMENTS

Single family residence located north of SR 108, south of Lancaster Road and east of Wamble Road. The terrain in this area is uneven and the residences are slightly lower in elevation than the adjacent roadways. There is no existing barrier shielding this residence from traffic noise. Traffic traveling on SR 108 is the dominant noise source for this location. The SLM was placed just outside the southern property line of the residence. Approximately 100 feet north of SR 108 and 15 feet east of the western terminus of the wire fence located along the property line.



# Noise Monitoring Field Report

## North County Corridor Project

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### SITE PHOTOS



### Short-Term

R41/ST41

Meas

#### SITE INFORMATION

**Analysis Date:** 3/24/2014 10:52 AM

**Noise Analyst:** J. Burnam

**Duration:** 15 minutes

**Ambient Temperature:** 69° F

**Humidity:** 39%

**Wind Speed:** 2 mph

**Sky:** Clear

**Address:** 10536 Warnerville Avenue, Oakdale

**Existing Land Use:** Single-family residence

#### NOISE RESULTS

Sound Level **56.7**  
dBA

ENTECH SLM 1: Larson Davis Model 824 / Serial 824A3517  
Microphone: 0.5" PCB Electronics 377B02 / Serial  
Preamp: Larson Davis PRM902 0.5" 7 pin/ Serial

#### FIELD COMMENTS

Single family residence located south of Warnerville Road and west of Stoddard Road. The terrain at this location is relatively flat and has a similar elevation of the adjacent roadways. There is no existing barrier shielding this residence from traffic. Traffic traveling on Warnerville Road is the dominant noise source for this location. The SLM was placed in front of the house facing Warnerville Road, next to chairs located in front of the house. The meter was placed approximately 25 feet south of Warnerville Road and 10 feet east of the western end of the residence building.



# Noise Monitoring Field Report

## North County Corridor Project

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### SITE PHOTOS



### Short-Term

R42/ST42

Meas

### SITE INFORMATION

**Analysis Date:** 3/24/2014 11:35 AM

**Noise Analyst:** J. Burnam

**Duration:** 15 minutes

**Ambient Temperature:** 71° F

**Humidity:** 31%

**Wind Speed:** 5 mph

**Sky:** Clear

**Address:** 13712 Lancaster Road, Oakdale

**Existing Land Use:** Single-family residence

### NOISE RESULTS

Sound Level **45.3**  
dBA

ENTECH SLM 1: Larson Davis Model 824 / Serial 824A3517  
Microphone: 0.5" PCB Electronics 377B02 / Serial  
Preamp: Larson Davis PRM902 0.5" 7 pin/ Serial

### FIELD COMMENTS

Single family residence located north of SR 108, south of Lancaster Road and east of Wamble Road. The terrain in this area is uneven and the residences are higher in elevation than SR 108. A large berm between the residence and the roadway provides abatement for this area. There is no existing barrier surrounding the area. Traffic traveling on SR 108 was the dominant noise source. The SLM was placed on the back patio of the residence. Approximately 30 feet from the back door of the residence.

## **Appendix D**   TNM

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TNM Files Provided Digitally

