State Route 99/120 Interchange Project ***NADR***

Noise Abatement Decision Report

Noise Study Report October 2018

State Route 120 – East of Main Street

State Route 99 – South of Yosemite Avenue and North of Palm Avenue

City of Manteca, San Joaquin County, CA

10-SJ-99 PM3.15-6.22, 120 PM5.13/T7.15

EA 10-1E740

October 2018

Caltrans

Noise Abatement Decision Report

State Route 99/120 Interchange Project

State Route 120 – East of Main Street

State Route 99 – South of Yosemite Avenue and North of Palm Avenue

City of Manteca, San Joaquin County, CA

10-SJ-99 PM3.15-6.22, 120 PM5.13/T7.15

EA 10-1E740

Approved By: _____ Date: 12/5/18

Richard Helgeson, Office Chief
Central Region Design IV
Project Development

List of Abbreviated Terms

Benefited receptor	A dwelling unit or other equivalent land use expected to receive a noise reduction of at least 5 dBA from the proposed abatement measure
CFR	Code of Federal Regulations
Date of public knowledge	The date of approval of the project's Finding of No Significant Impact
dBA	A-weighted sound pressure level
EB	Eastbound
ED	Environmental Document
FHWA	Federal Highway Administration
Leq	Equivalent sound level (energy averaged sound level)
Leq[h]	A-weighted, energy average sound level during a 1-hour period
NAC	Noise abatement criteria
NADR	Noise Abatement Decision Report
NB	Northbound
Noise reduction design goal	7 dB of noise reduction at one or more benefited receptors.
NSR	Noise Study Report
Protocol	Caltrans Traffic Noise Analysis Protocol
Reasonable allowance	A single dollar value—a reasonable allowance per benefited receptor
SB	Southbound
UPRR	Union Pacific Railroad
WB	Westbound

1. Introduction

The Noise Abatement Decision Report (NADR) presents the preliminary noise abatement decision as defined in the Caltrans Traffic Noise Analysis Protocol (Protocol). This report has been appoved by a Calfornia licensed professional civil engineer. The project level Noise Study Report (NSR) (October 2018) prepared for this project is hereby incorporated by reference.

1.1. Noise Abatement Assessment Requirements

Title 23, Code of Federal Regulations (CFR), Part 772 of the Federal Highway Administration (FHWA) standards (23 CFR 772) and the Caltrans Traffic Noise Analysis Protocol (Protocol) require that noise abatement be considered for projects that are predicted to result in traffic noise impacts. A traffic noise impact is considered to occur when future predicted design-year noise levels with the project "approach or exceed" Noise Abatement Criteria (NAC) defined in 23 CFR 772 or when the predicted design-year noise levels with the project substantially exceed existing noise levels. A predicted design-year noise level is considered to "approach" the NAC when it is within 1 dB of the NAC. A substantial increase is defined as being a 12-dB increase above existing conditions.

23 CFR 772 requires that noise abatement measures that are reasonable and feasible and are likely to be incorporated into the project be identified before adoption of the final environmental document (ED).

The Protocol establishes a process for assessing the reasonableness and feasibility of noise abatement. Before publication of the draft ED, a *preliminary noise abatement decision* is made. The preliminary noise abatement decision is based on the *feasibility* of evaluated abatement and the *preliminary reasonableness determination.* Noise abatement is considered to be acoustically feasible if it is predicted to provide noise reduction of at least 5 dBA at an impacted receptor. Other nonacoustical factors relating to geometric standards (e.g., sight distances), safety, maintenance, and security can also affect feasibility.

The overall reasonableness of noise abatement is determined by the following three factors:

- the viewpoints of benefited receptors,
- the cost of noise abatement, and
- the noise reduction design goal.

The preliminary reasonableness determination reported in this document is based on the noise reduction design goal and the cost of abatement. The viewpoints of benefited receptors are deterined by a survey that is normally conducted during the public review period for the project ED.

Caltrans' noise reduction design goal is that a barrier must be predicted to provide at least 7 dB of noise reduction at one or more benefited receptors. The cost reasonableness of abatement is deterined by calculating a cost allowance that is considered to be a reasonable amount of money to spend on abatement. This *reasonble allowance* is then compared to the engineer's cost estimate for the abatement. If the engineer's cost estimate is less than the allowance and the abatement will provide at least 7 dB of noise reduction at one or more benefited receptors, then the preliminary determination is that the abatement is reasonable. If the cost estimate is higher than the allowance or if the design goal cannot be achieved, the preliminary determination is that abatement is not reasonable.

The NADR presents the preliminary noise abatement decision based on acoustical and nonacoustical feasibility factors, the design goal, and the relationship between noise abatement allowances and the engineer's cost estimate. The NADR does not present the final decision regarding noise abatement; rather, it presents key information on abatement to be considered throughout the environmental review process, based on the best available information at the time the draft ED is published. The final overall reasonableness decision will take this information into account, along with the results of the survey of benefited receptors conducted during the environmental review process.

At the end of the public review process for the ED, the final noise abatement decision is made and is indicated in the final ED. The preliminary noise abatement decision will become the final noise abatement decision unless compelling information received during the environmental review process indicates that it should be changed.

1.2. Purpose of the Noise Abatement Decision Report

The purpose of the NADR is to:

- summarize the conclusions of the NSR relating to acoustical feasibility, the design goal, and the reasonable allowances for abatement evaluated,
- present the engineer's cost estimate for evaluated abatement,
- present the engineer's evaluation of nonacoustical feasibility issues,
- present the preliminary noise abatement decision, and
- present preliminary information on secondary effects of abatement (impacts on cultural resources, scenic views, hazardous materials, biology, etc.).

The NADR does not address noise barriers or other noise-reducing treatments required as mitigation for significant adverse environmental effects identified under the California Environmental Quality Act.

1.3. Project Description

The project would add an additional lane to each of the connectors and replace the Austin Road Overcrossing. To eliminate weaving, braiding the southbound (SB) State Route (SR) 99 and eastbound (EB) SR 120 to SB SR 99 connector ramps accessing the Austin Road interchange and extend the northbound (NB) SR 99/Austin Road on-ramp, connecting it to SR 99. Due to funding limitations, the project may be constructed in phases.

1.3.1. Construction Year 2023 (Phase 1A)

For Phase 1, the EB SR 120 to SB SR 99 traffic movement will be improved. This work, at a minimum, includes:

- widen the EB SR 120 to SB SR 99 connector ramp from one-lane to two-lanes;
- remove the Austin Road overcrossing and replace with a longer and wider structure spanning SR 99 and Union Pacific Railroad (UPRR). A two-lane structure may be initially constructed until Phase 3 requires a four-lane structure;
- add an auxiliary lane/ pavement widening on SR 99 from SR 120 to approximately one mile south by shifting the SR 99 median to the east;
- add a new connector road from Austin Road to Woodward Avenue to Moffat Boulevard and improve the existing UPRR gated crossing at Woodward Avenue;

- relocate a portion of the SR 99 Frontage Road and realign the existing NB SR 99 off-ramp to Austin Road;
- close the existing SB SR 99 off-ramp and the NB on ramp at Austin Road; and
- relocate conflicting utilities.

1.3.2. Design Year 2043 (Phase 1B)

For Phase 2, the NB SR 99 traffic to westbound (WB) SR 120 traffic movement will be improved. This phase may be constructed concurrently with Phase 1, however, Phase 2 requires that the Phase 1 be completed because Phase 2 cannot be completed without the removal of the Austin Road overcrossing. This work includes:

- widen the NB SR 99 to WB SR 120 connector ramp from one-lane to two-lanes;
- add an auxiliary lane in the median of WB SR 120 from Main Street to SR 99;
- restripe NB SR 99 median pavement widening constructed in Phase 1;
- construct a new structure over SR 99 to serve EB SR 120 to SB SR 99 traffic and modify the existing structure over SR 99 to serve WB traffic; and
- relocate conflicting utilities.

1.3.3. Design Year 2043 (Phase 1B)

For Phase 3, the SB SR 99 off-ramp and the NB on-ramp at Austin Road will be restored. This work includes:

- restore the NB on-ramp from Austin Road to NB SR 99 and to WB SR 120 to a loop ramp that will provide separate traffic lanes to SR 99 and SR 120;
- replace the SB exit ramp from SR 99 to Austin Road with a grade separated (braided) ramp to eliminate the weaving with SR 120 merging traffic;
- widen the SB SR 99 on-ramp from Austin Road to provide storage for two ramp metered lanes;
- relocate the SR 99 Frontage Road and the NB Austin Road off-ramp from SR 99; and
- relocate conflicting utilities.

1.4. Affected Land Uses

A field investigation was conducted to identify land uses that could be subject to traffic and construction noise impacts from the project. Existing land uses in the project area were categorized by land use type and Activity Category as defined by Caltrans, and the extent of frequent human use.

The following land uses were identified in the project area:

- Single-family and multi-family residences: Activity Category B
- Parks: Activity Category C (exterior)
- Places of worship: Activity Category C (exterior), Activity Category D (interior)
- Commercial retail uses, industrial uses, warehousing uses, and agricultural uses: Activity Category F

As stated in the Protocol, noise abatement is only considered where frequent human use occurs and where a lowered noise level would be of benefit. Although all land uses are evaluated in this analysis, the focus is on locations of frequent human use that would benefit from a lowered noise level.

2. Results of the Noise Study Report

The NSR for this project was prepared by Sam Silverman on October 1, 2018 and approved by Allam Alhabaly on October XX, 2018. The Federal Highway Administration (FHWA) Traffic Noise Prediction Model Version 2.5 was used in this analysis to evaluate traffic noise conditions for existing (2017), construction-year (2023) and design-year (2043). Modeling results indicate that predicted traffic noise levels under construction-year and design-year conditions would approach or exceed the noise abatement criterion (NAC) of 67 dBA-L_{eq}(h) (A-weighted equivalent sound level) for Activity Category B land uses and for Activity Category C land uses at parks and places of worship. Predicted noise levels in construction-year 2023 would range from 61 to 75 dBA-L_{eq}(h) and 62 to 72 dBA-L_{eq}(h) in the design-year 2043. No substantial increase of 12 dBA or more over existing levels would occur. Table 1 provides a summary of impacted receivers by noise assessment area. Figures 1 through 6 show the locations of noise assessment areas and impacted receivers. Detailed results can be found in Appendix B of the NSR.

Table 1. Noise Impacts

Area	Receivers Approaching or Exceeding NAC	
	Construction Year (2023)	Design Year (2043)
A	1	2
B	2	2
C	42	48
D	25	26
E	16	16
F	1	1
G	1	1
H	2	0
I	0	0
J	3	3
Total	93	99

Figure 1. Analysis Areas, Noise Monitoring Positions, and Location of Evaluated Noise Barrier (2023)

Figure 2. Analysis Areas, Noise Monitoring Positions, and Location of Evaluated Noise Barrier (2023)

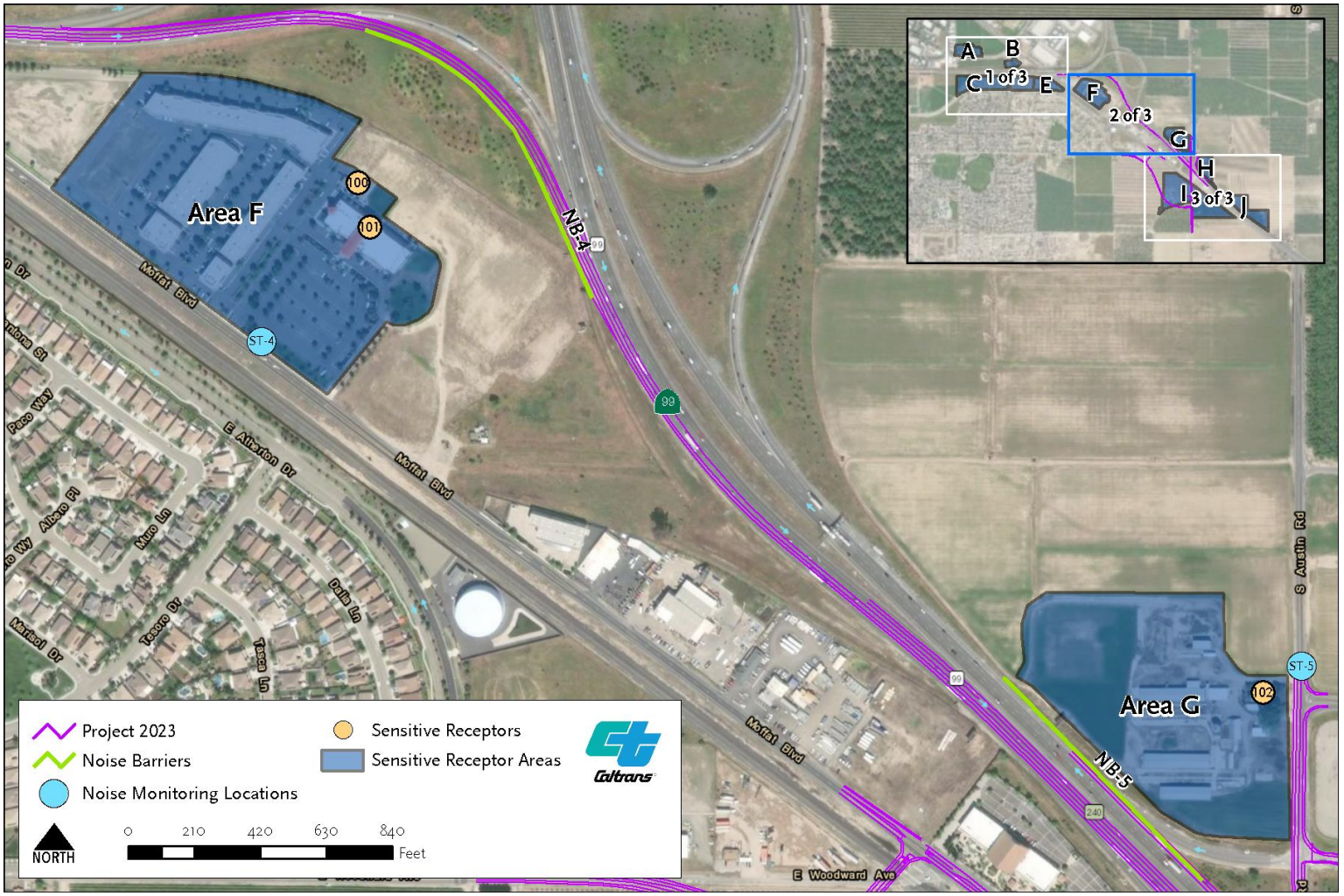


Figure 3. Analysis Areas, Noise Monitoring Positions, and Location of Evaluated Noise Barrier (2023)

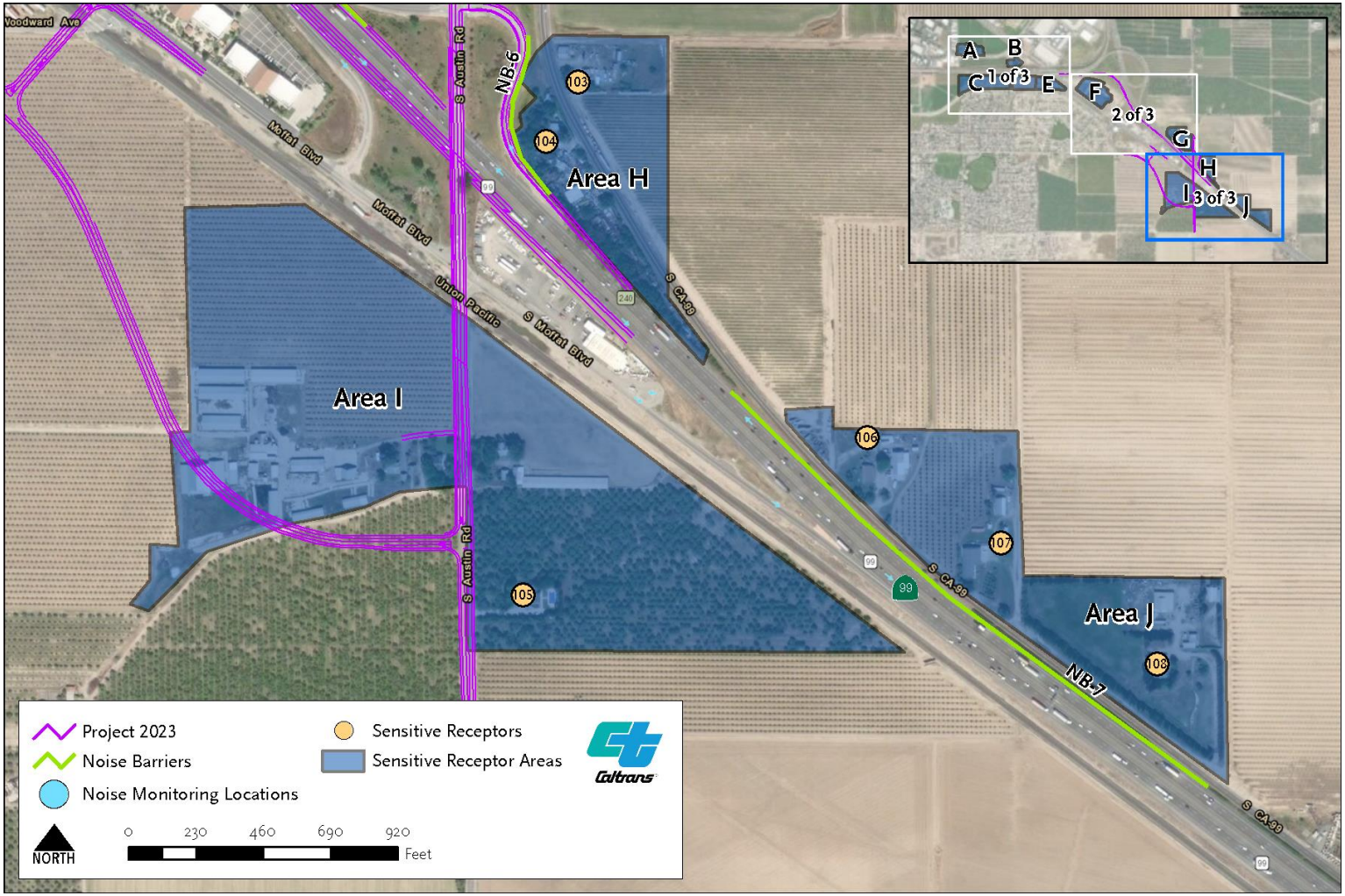


Figure 4. Analysis Areas, Noise Monitoring Positions, and Location of Evaluated Noise Barrier (2043)

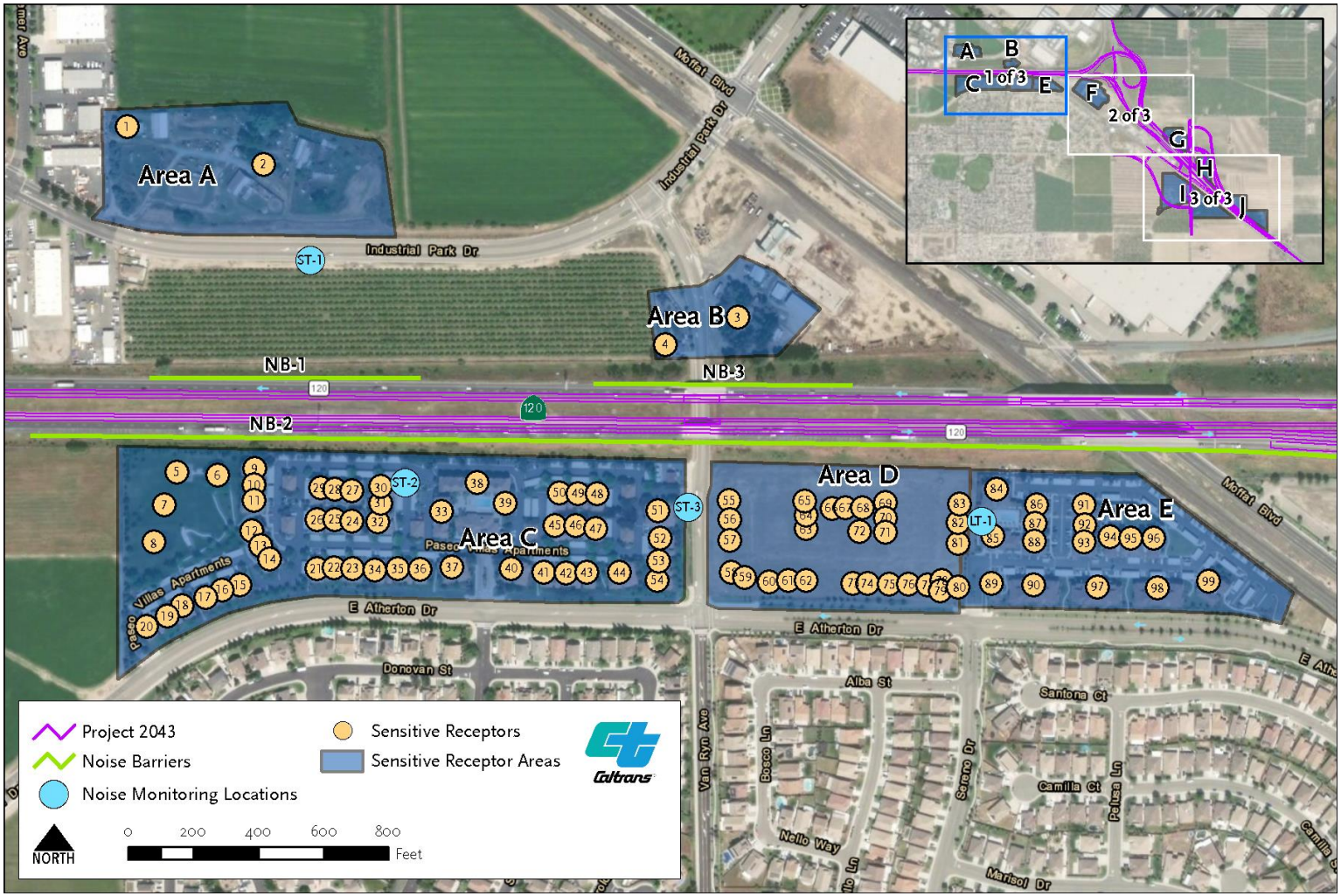


Figure 5. Analysis Areas, Noise Monitoring Positions, and Location of Evaluated Noise Barrier (2043)

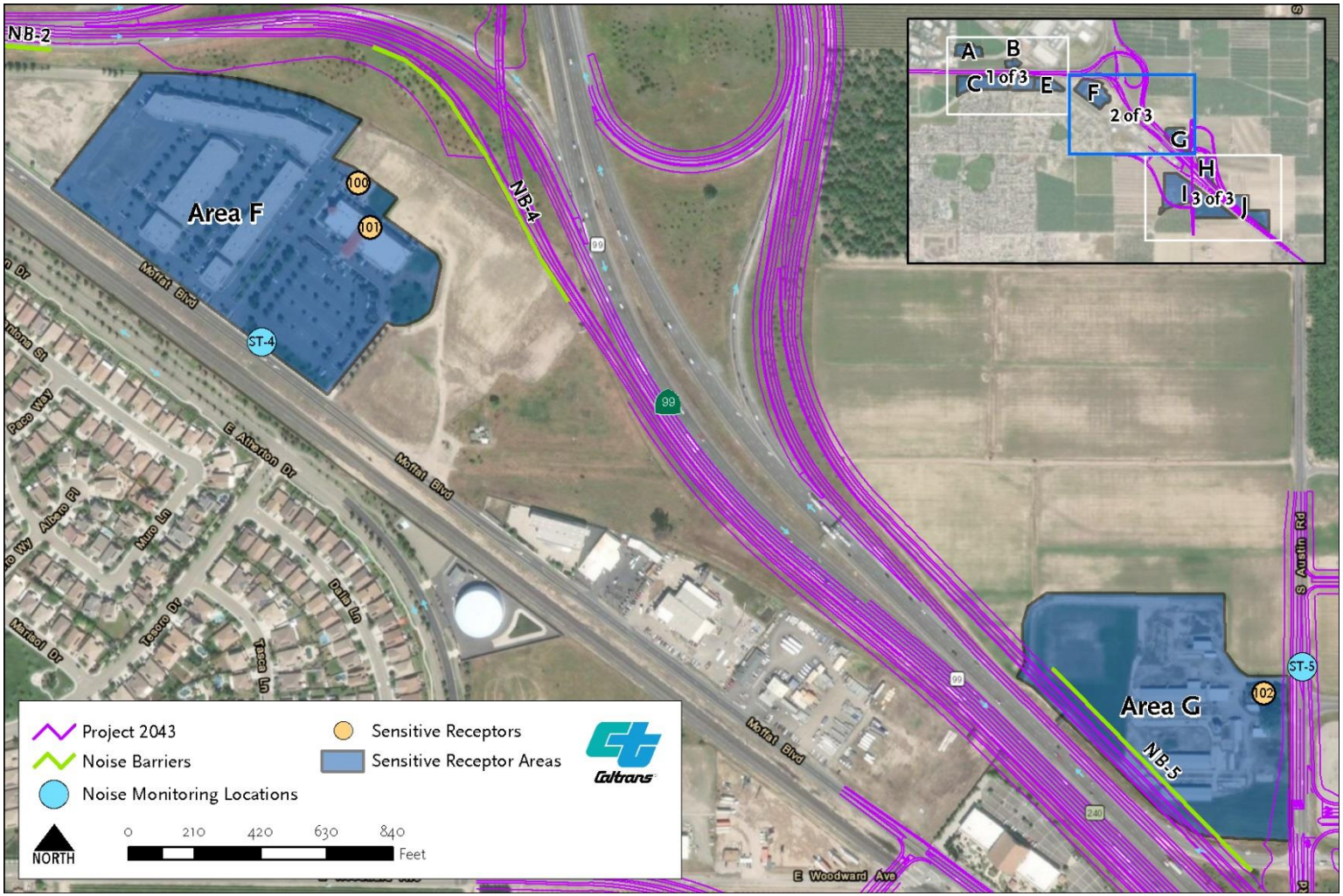
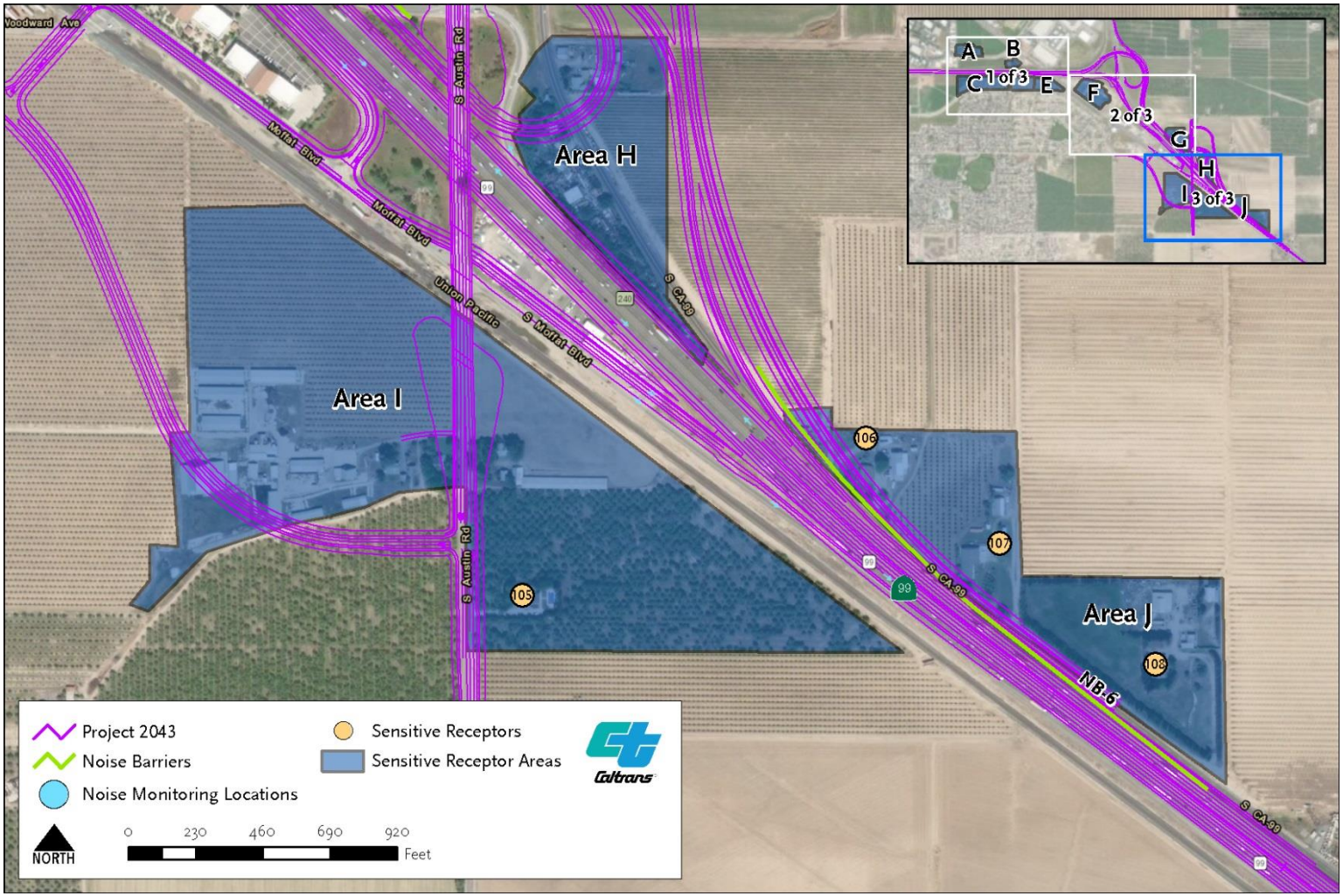


Figure 6. Analysis Areas, Noise Monitoring Positions, and Location of Evaluated Noise Barrier (2043)



Noise barriers were evaluated for areas where noise impacts were identified. All areas except for Area I were evaluated for a noise barrier. Area H was not evaluated in the design year 2043, as the Area H receptors would be removed. Noise barriers were the only form of noise abatement considered for this project. For each barrier found to be acoustically feasible, reasonable cost allowances were calculated. A description of each noise barrier for construction year 2023 and design year 2043 can be found in Table 2 and Table 3 below.

Table 2. Summary of Barrier Evaluation from Noise Study Report (Construction Year 2023)

Barrier	Location	Length (feet)	Height (feet)	Acoustically Feasible?	Number of Benefited Residences	Design Goal Achieved?	Reasonable Allowance per Residence	Total Reasonable Allowance
NB1	Area A	832	16	No	0	No	$95,000	$0
NB2	Areas C, D, E	4,043	6	Yes	105	No	$95,000	$9,975,000
			8	Yes	261	Yes	$95,000	$24,795,000
			10	Yes	405	Yes	$95,000	$38,475,000
			12	Yes	528	Yes	$95,000	$50,160,000
			14	Yes	581	Yes	$95,000	$55,195,000
			16	Yes	587	Yes	$95,000	$55,765,000
NB3	Area B	797	8	Yes	1	No	$95,000	$95,000
			10	Yes	2	Yes	$95,000	$190,000
			12	Yes	2	Yes	$95,000	$190,000
			14	Yes	2	Yes	$95,000	$190,000
			16	Yes	2	Yes	$95,000	$190,000
NB4	Area F	1,176	16	No	0	No	$95,000	$0
NB5	Area G	904	16	No	0	No	$95,000	$0
NB6	Area H	593	10	Yes	1	No	$95,000	$95,000
			12	Yes	1	No	$95,000	$95,000
			14	Yes	1	Yes	$95,000	$95,000
			16	Yes	2	Yes	$95,000	$190,000
NB7	Area J	2,125	6	Yes	1	No	$95,000	$95,000
			8	Yes	2	No	$95,000	$190,000
			10	Yes	2	No	$95,000	$190,000
			12	Yes	3	Yes	$95,000	$285,000
			14	Yes	3	Yes	$95,000	$285,000
			16	Yes	3	Yes	$95,000	$285,000

Table 3. Summary of Barrier Evaluation from Noise Study Report (Design Year 2043)

Barrier	Location	Length (feet)	Height (feet)	Acoustically Feasible?	Number of Benefited Residences	Design Goal Achieved?	Reasonable Allowance per Residence	Total Reasonable Allowance
NB1	Area A	832	16	No	0	No	$95,000	$0
NB2	Areas C, D, E	4,218	6	Yes	76	No	$95,000	$7,220,000
			8	Yes	257	Yes	$95,000	$24,415,000
			10	Yes	374	Yes	$95,000	$35,530,000
			12	Yes	515	Yes	$95,000	$48,925,000
			14	Yes	545	Yes	$95,000	$51,775,000
			16	Yes	555	Yes	$95,000	$52,725,000
NB3	Area B	797	8	Yes	1	No	$95,000	$95,000
			10	Yes	2	Yes	$95,000	$190,000
			12	Yes	2	Yes	$95,000	$190,000
			14	Yes	2	Yes	$95,000	$190,000
			16	Yes	2	Yes	$95,000	$190,000
NB4	Area F	1,051	16	No	0	No	$95,000	$0
NB5	Area G	904	16	No	0	No	$95,000	$0
N/A	Area H	N/A	N/A	N/A	N/A	N/A	N/A	N/A
NB6	Area J	2,131	12	Yes	3	No	$95,000	$285,000
			14	Yes	3	Yes	$95,000	$285,000
			16	Yes	3	Yes	$95,000	$285,000

3. Preliminary Noise Abatement Decision

3.1. Summary of Key Information

Noise abatement must be considered for reasonablesness and feasibility as required by 23 CFR 772 if predicted noise levels with project implementation exceed existing noise levels by 12 dBA or more or when the predicted sound levels approach or exceed the NAC level of the applicable activity category.

Feasibility Criteria

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.

Reasonableness Criteria

The Protocol defines the procedure for assessing reasonableness of noise barriers from a cost perspective. Based on 2018 construction costs an allowance of $95,000 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 $95,000. 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.

3.2. Nonacoustical Factors Relating to Feasibility

Nonacoustical factors include geometric standards, safety, maintenance, security, geotechnical considerations, and utility relocations. The proposed noise barriers would be located along the edge-of-the pavement of SR 99 and SR 120 and would not pose a concern for any of these areas of consideration.

3.3. Preliminary Recommendation and Decision

The preliminary noise abatement decision presented in this report is based on preliminary project alignments and profiles, which may be subject to change. As such, the physical characteristics of noise abatement described herein also may be subject to change. If pertinent parameters change substantially during the final project design, the preliminary noise abatement decision may be changed or eliminated from the final project design. A final decision to construct noise abatement will be made upon completion of the project design.

The preliminary noise abatement decision presented here will be included in the draft ED, which will be circulated for public review.

Table 4 and Table 5 show the key information for noise abatement decision including number of beneifted receptors, total reasonable allowance, and estimated constructtion cost of each barrier. The NSR analyzed barriers of heights 6 feet to 16 feet for each location, howver, only those that would meet requirements were included in this report.

The engineer's cost estimate includes costs required to construct the abatement, including the materials for the wall as well as the barriers or piles on which the noise walls would be constructed. Wall construction cost were based on masonry construction, in accordance with Caltrans' standard specifications.

Table 4. Summary of Abatement Key Information (Construction Year 2023)

Barrier	Location	Length (feet)	Height (feet)	Acoustically Feasible?	Number of Benefited Residences	Design Goal Achieved?	Reasonable Allowance per Residence	Total Reasonable Allowance	Estimated Construction Cost	Cost Less than Allowance?
NB1	Area A	832	16	No	0	No	$95,000	$0	N/A	N/A
NB2	Areas C, D, E	4,043	6	Yes	105	No	$95,000	$9,975,000	$1,836,700	Yes
			8	Yes	261	Yes	$95,000	$24,795,000	$2,038,900	Yes
			10	Yes	405	Yes	$95,000	$38,475,000	$2,373,100	Yes
			12	Yes	528	Yes	$95,000	$50,160,000	$2,831,900	Yes
			14	Yes	581	Yes	$95,000	$55,195,000	$3,183,500	Yes
			16	Yes	587	Yes	$95,000	$55,765,000	$3,763,500	Yes
NB3	Area B	797	8	Yes	1	No	$95,000	$95,000	$403,600	No
			10	Yes	2	Yes	$95,000	$190,000	$468,400	No
			12	Yes	2	Yes	$95,000	$190,000	$565,000	No
			14	Yes	2	Yes	$95,000	$190,000	$633,100	No
			16	Yes	2	Yes	$95,000	$190,000	$760,700	No
NB4	Area F	1,176	16	No	0	No	$95,000	$0	N/A	N/A
NB5	Area G	904	16	No	0	No	$95,000	$0	N/A	N/A
NB6	Area H	593	10	Yes	1	No	$95,000	$95,000	$346,400	No
			12	Yes	1	No	$95,000	$95,000	$395,600	No
			14	Yes	1	Yes	$95,000	$95,000	$450,700	No
			16	Yes	2	Yes	$95,000	$190,000	$496,400	No
NB7	Area J	2,125	6	Yes	1	No	$95,000	$95,000	$947,800	No
			8	Yes	2	No	$95,000	$190,000	$1,054,000	No
			10	Yes	2	No	$95,000	$190,000	$1,241,000	No
			12	Yes	3	Yes	$95,000	$285,000	$1,417,400	No
			14	Yes	3	Yes	$95,000	$285,000	$1,615,000	No
			16	Yes	3	Yes	$95,000	$285,000	$1,778,700	No

Table 5. Summary of Abatement Key Information (Design Year 2043)

Barrier	Location	Length (feet)	Height (feet)	Acoustically Feasible?	Number of Benefited Residences	Design Goal Achieved?	Reasonable Allowance per Residence	Total Reasonable Allowance	Estimated Construction Cost	Cost Less than Allowance?
NB1	Area A	832	16	No	0	No	$95,000	$0	N/A	N/A
NB2	Areas C, D, E	4,218	6	Yes	76	No	$95,000	$7,220,000	$1,914,800	Yes
			8	Yes	257	Yes	$95,000	$24,415,000	$2,125,700	Yes
			10	Yes	374	Yes	$95,000	$35,530,000	$2,475,300	Yes
			12	Yes	515	Yes	$95,000	$48,925,000	$2,948,600	Yes
			14	Yes	545	Yes	$95,000	$51,775,000	$3,316,500	Yes
			16	Yes	555	Yes	$95,000	$52,725,000	$3,909,900	Yes
NB3	Area B	797	8	Yes	1	No	$95,000	$95,000	$403,600	No
			10	Yes	2	Yes	$95,000	$190,000	$468,400	No
			12	Yes	2	Yes	$95,000	$190,000	$565,000	No
			14	Yes	2	Yes	$95,000	$190,000	$633,100	No
			16	Yes	2	Yes	$95,000	$190,000	$760,700	No
NB4	Area F	1,051	16	No	0	No	$95,000	$0	N/A	N/A
NB5	Area G	904	16	No	0	No	$95,000	$0	N/A	N/A
N/A	Area H	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
NB6	Area J	2,131	12	Yes	3	No	$95,000	$285,000	$1,421,400	No
			14	Yes	3	Yes	$95,000	$285,000	$1,619,600	No
			16	Yes	3	Yes	$95,000	$285,000	$1,783,700	No

3.3.1. Construction Year 2023 Noise Abatement Reccomendation

Noise Barrier NB1

Noise barrier NB1 in Area A would not be acoustically feasible because the barrier does not provide a 5 dBA reduction or more for any impacted receptors. Therefore, noise barrier NB1 is not recommended for further analysis.

Noise Barrier NB2

Noise barrier NB2 in Areas C, D, and E would be acoustically feasible at all barrier heights and would provide at least a 5 dBA or greater reduction. A 12-foot barrier would be the least expensive wall that would meet both the reasonable and feasibile criteriea. However, the line-of-sight of truck exhaust stacks would not be blocked for all receptors in Area C. A 12-foot barrier would benefit 528 receptors with a reasonable allowance of $50,160,000 and a estimated construction cost of $2,831,900, which is less than the reasonable cost allowance. Therefore, noise barrier NB2 is recommened at a height of 12 feet.

Noise Barrier NB3

Noise barrier NB3 in Area B would be acoustically feasible at barrier heights of 8 feet to 16 feet and would provide a 5 dBA or greater reduction. A barrier height a 10 feet would be the least expensive wall that would meet both the reasonable and feasibile criteriea. A total of two receptors would be benefited by this barrier with a resonable cost allowance of $190,000. The estiamted construction cost for a 10-foot barrier is $403,600, which is greater than the reasonable cost allowance. Therefore, noise barrier NB3 is not recommended for further analysis.

Noise Barrier NB4

Noise barrier NB4 in Area F would not be acoustically feasible because the barrier does not provide a 5 dBA reduction or more for any impacted receptors. Therefore, noise barrier NB4 is not recommended for further analysis.

Noise Barrier NB5

Noise barrier NB5 in Area G would not be acoustically feasible because the barrier does not provide a 5 dBA reduction or more for any impacted receptors. Therefore, noise barrier NB5 is not recommended for further analysis.

Noise Barrier NB6

Noise barrier NB6 in Area H would be acoustically feasibe at heights of 10 feet to 16 feet. The design goal of a 7 dBA reduction would be achieved starting at 14 feet which would also result in a line-of-sight break between receptors and a 11.5-foot tall truck exhaust stack. A 14 foot wall would be the least expensive wall that would meet both the reasonable and feasibile criteriea. The 14-foot barrier would however only provide a 5 dBA or greater reduction to one receptor. The reasonable cost allowance for the 14-foot barrier would be $95,000. The estimated construction cost for a 10-foot barrier is $450,700, which is greater than the reasonable cost allowance. Therefore, NB6 is not recommened for further analysis.

Noise Barrier NB7

Noise barrier NB7 in Area J would be acoustically feasible at all barrier heights and would provide at least a 5 dBA or greater reduction. A 12-foot barrier would be the least expensive wall that would meet both the reasonable and feasibile criteriea. A 12-foot barrier would benefit three receptors with a reasonable allowance of $285,000 and a estimated construction cost of $1,417,400, which is greater than the reasonable cost allowance. Therefore, noise barrier NB7 is not recommened for further analysis.

3.3.2. Design Year 2043 Noise Abatement Reccomendation

Noise Barrier NB1

Noise barrier NB1 in Area A would not be acoustically feasible because the barrier does not provide a 5 dBA reduction or more for any impacted receptors. Therefore, noise barrier NB1 is not recommended for further analysis.

Noise Barrier NB2

Noise barrier NB2 in Areas C, D, and E would be acoustically feasible at all barrier heights would provide at least a 5 dBA or greater reduction. A 12-foot barrier would be the least expensive wall that would meet both the reasonable and feasibile criteriea. However, the line-of-sight of truck exhaust stacks would not be blocked for all receptors in Area C. A 12-foot barrier would benefit 515 receptors with a reasonable allowance of $48,925,000 and a estimated construction cost of $2,948,600, which is less than the reasonable cost allowance. Therefore, noise barrier NB2 is recommened at a height of 12 feet.

Noise Barrier NB3

Noise barrier NB3 in Area B would be acoustically feasible and barrier heights of 8 feet to 16 feet and would provide a 5 dBA or greater reduction. A barrier height a 10 feet would be the least expensive wall that would meet both the reasonable and feasibile criteriea. A total of two receptors would be benefited by this barrier with a resonable cost allowance of $190,000. The estiamted construction cost for a 10-foot barrier is $468,400, which is greater than the reasonable cost allowance. Therefore, noise barrier NB3 is not recommended for further analysis.

Noise Barrier NB4

Noise barrier NB4 in Area F would not be acoustically feasible because the barrier does not provide a 5 dBA reduction or more for any impacted receptors. Therefore, noise barrier NB4 is not recommended for further analysis.

Noise Barrier NB5

Noise barrier NB5 in Area G would not be acoustically feasible because the barrier does not provide a 5 dBA reduction or more for any impacted receptors. Therefore, noise barrier NB5 is not recommended for further analysis.

Noise Barrier NB6

Noise barrier NB6 in Area J would be acoustically feasible at heights of 12 feet to 16 feet, which would provide at least a 5 dBA or greater reduction. A 14-foot barrier would be the least expensive wall that would meet both the reasonable and feasibile criteriea. A 14-foot barrier would benefit three receptors with a reasonable allowance of $285,000 and a estimated construction cost of $1,619,600, which is greater than the reasonable cost allowance. Therefore, noise barrier NB6 is not recommened for further analysis.

4. Secondary Effects of Abatement

The noise abatement recommended in the preliminary noise abatement decision may have the potential to result in secondary effects to other resources, such as visual impacts or additional short-term noise or air quality impacts associated with construction of the noise barriers. Noise barrier NB2 is the only noise barrier recommended for further analysis and consideration. The proposed noise barrier would block views of SR 120 and not scenic views of nearby open agricultural land and would not result in a secondary visual impact.

5. References

Caltrans. 2013. Technical Noise Supplement. September. Sacramento, CA: Environmental Program, Noise, Air Quality, and Hazardous Waste Management Office. Sacramento, CA. Available: (http://www.dot.ca.gov/hq/env/noise/pub/TeNS_Sept_2013B.pdf).

———. 2011. Traffic Noise Analysis Protocol for New Highway Construction, Reconstruction, and Retrofit Barrier Projects. May. Sacramento, CA. Available: (http://www.dot.ca.gov/hq/env/noise/pub/ca_tnap_may2011.pdf).

Terry. A. Hayes Associates Inc. 2018. SR99/120 Interchange Project, Noise Study Report.

Garry Horton. October 1, 2018. Noise Barrier Costs. Mark Thomas. Ghorton@markthomas.com. 916-403-5759.