

McHenry Avenue Widening Project - *NADR*



Noise Abatement Decision Report

McHenry Avenue Widening Project

County of Stanislaus

District 10-STA

STPL-5938(233)

September 2017



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List of Abbreviated Terms

Activity Category D	This activity category includes the interior impact criteria for certain land use facilities listed in Activity Category C (parks, campgrounds, golf courses, ect.) that may have interior uses
Caltrans	California Department of Transportation
Benefited Residence	A dwelling unit expected to receive a noise reduction of at least 5 dBA from the proposed abatement measure
Critical Design Receiver	The design receiver that is impacted and for which the absolute noise levels, build vs. existing noise levels, or achievable noise reduction will be at a maximum where noise abatement is considered
dB	A measure of sound pressure level on a logarithmic scale
dBA	A-weighted sound pressure level
ED	Environmental Document
FTIP	Federal Transportation Improvement Program
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
NSR	Noise Study Report
Planned, Designed, and Programmed	A noise-sensitive land use is considered planned, designed, and programmed when it has received final development approval (generally the issuance of a building permit) from the local agency with jurisdiction
Reasonable Allowance	A single dollar value - a reasonable allowance per benefited residence that embodies three reasonableness factors
ROW	Right-of-Way
Type I Project	Proposed Federal or Federal-aid highway project for the construction of a highway on a new location or the physical alteration of an existing highway where there is either a substantial horizontal or substantial vertical alteration. Refer to 23CFR772.5 for details on the types of projects that qualify as Type I.

Chapter 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 approved by a California licensed professional civil engineer. The project level noise study report (NSR) (April 2017) 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 determined by a survey that is normally conducted during the public review period for the project ED.

In addition to demonstrating noise reduction of at least 5 dBA to be considered feasible, 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 determined by calculating a cost allowance that is considered to be a reasonable amount of money to spend on abatement. This *reasonable 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. During final design, the exact placement and height of the barriers will be finalized to meet the noise abatement criteria.

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 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 (CEQA).

1.3 Project Description

The County of Stanislaus proposes to widen the existing two-lane McHenry Avenue to a total of five lanes (two north bound lanes, two south bound lanes, and one continuous left turn/median lane) from the intersection of Ladd/Patterson Road to 0.25 mile south of the intersection with East River Road. This project will not include widening or structural improvements to the McHenry Avenue Bridge over the Stanislaus River (Bridge No. 38C-0032). As part of the widening of McHenry Avenue, the McHenry Avenue Bridge over Dry Slough (Bridge No. 38C-0002) will be removed and replaced with a culvert topped with earthen fill from a disposal/borrow site located approximately 6 miles south west of the project area or with fill taken from other parts of the project area. The project will also include a drainage basin for stormwater runoff, as well as striping for four lanes and a center turn lane throughout the entirety of the project from the intersection of Ladd/Patterson Road and McHenry Avenue, to the intersection of East River Road and McHenry Avenue.

The total estimated cost to implement the widening project is \$13,025,000. This project is included in the Fiscal Years 2014/15 Federal Transportation Improvement Program (FTIP) and is funded through Caltrans Local Assistance.

Purpose

The purpose of the Project is to improve and accommodate the north to south interregional traffic between the cities of Modesto, Escalon, and to State Highway 108 by widening McHenry Avenue in its entirety from Ladd Road to East River Road. The project will also improve regional circulation, relieve existing traffic congestion, reduce traffic delay, accommodate future traffic, improve safety, promote non-motorized modes of transportation, and allow for good movement and job development for existing and future developments.

Need

The project is needed as Average Daily Traffic (ADT) (13,000 vehicles per day) counts are closely reaching capacity of the existing two-lane rural roadway.

Alternatives

The proposed project has two alternatives:

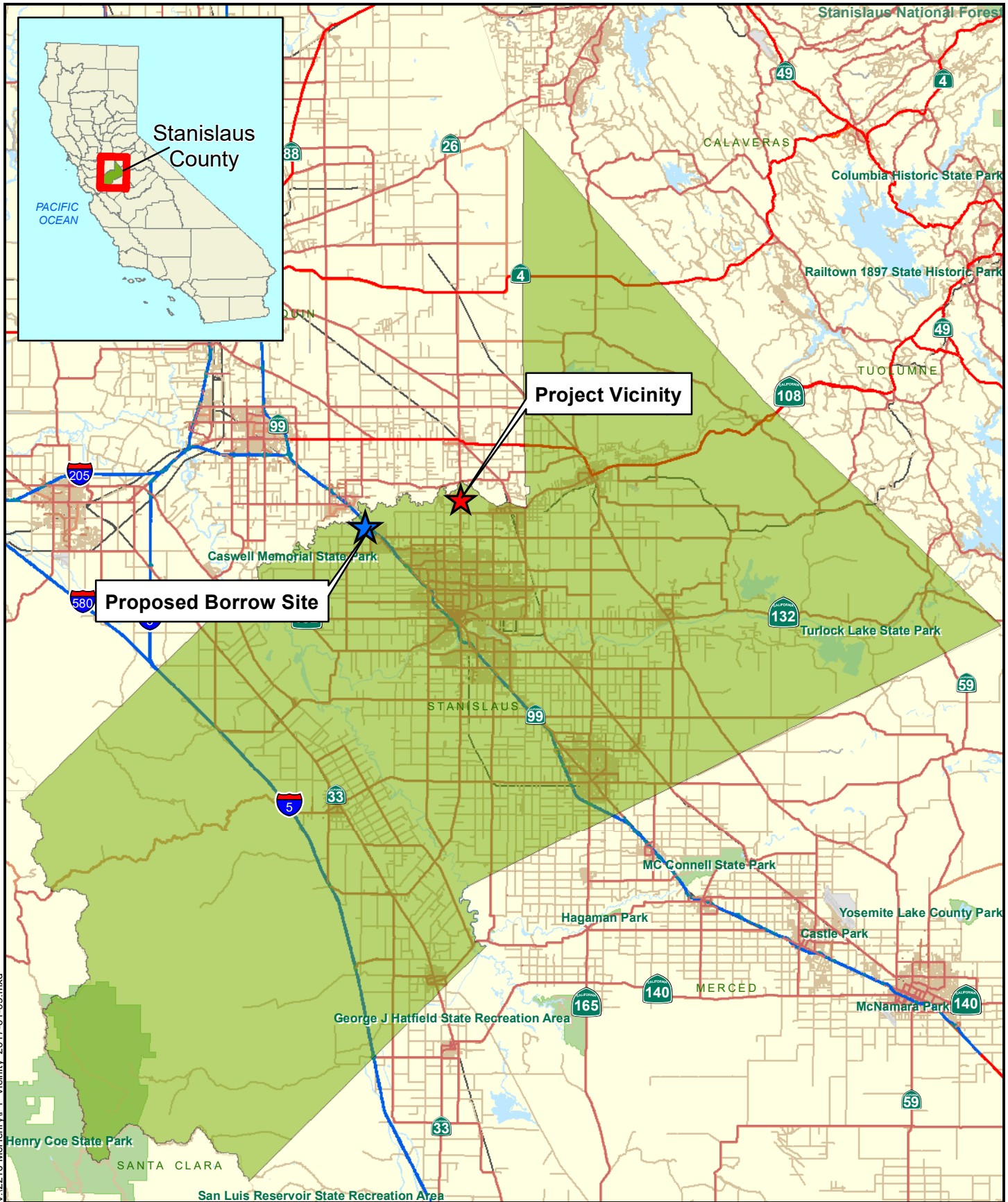
- Build Alternative
- No-Project Alternative

Specifics of each alternative are discussed below;

Build Alternative

The County of Stanislaus proposes to widen the existing two-lane McHenry Avenue to a total of five lanes (two north bound lanes, two south bound lanes, and one continuous left turn/median lane) from the intersection of Ladd/Patterson Road to 0.25 mile south of the intersection with East River Road. This project will not include widening or structural improvements to the McHenry Avenue Bridge over the Stanislaus River (Bridge No. 38C-0032). As part of the widening of McHenry Avenue, the McHenry Avenue Bridge over Dry Slough (Bridge No. 38C-0002) will be removed and replaced with a culvert topped with earthen fill from a disposal/borrow site located approximately 6 miles south west of the project area or with fill taken from other parts of the project area. The project will also include a drainage basin for stormwater runoff, as well as striping for four lanes and a center turn lane throughout the entirety of the project from the intersection of Ladd/Patterson Road and McHenry Avenue, to the intersection of East River Road and McHenry Avenue (See Figures 1 – 3).

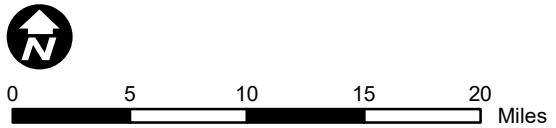
The project begins approximately 4.3 miles south of the City of Escalon and State Route 120, at the intersection of McHenry Avenue and Ladd Road/Patterson Road and runs north to the south abutment of the McHenry Avenue Bridge over the Stanislaus River. The widening project from Ladd Road to the south abutment of McHenry Avenue Bridge is approximately 1.9 miles in length. Stanislaus County's plan is to improve and accommodate the north to south interregional traffic between the cities of Modesto, Escalon, and to State Highway 108 by widening McHenry Avenue in its entirety from Ladd Road to East River Road. The project will also improve regional circulation, relieve existing traffic congestion, reduce traffic delay, accommodate future traffic, improve safety, promote non-motorized modes of



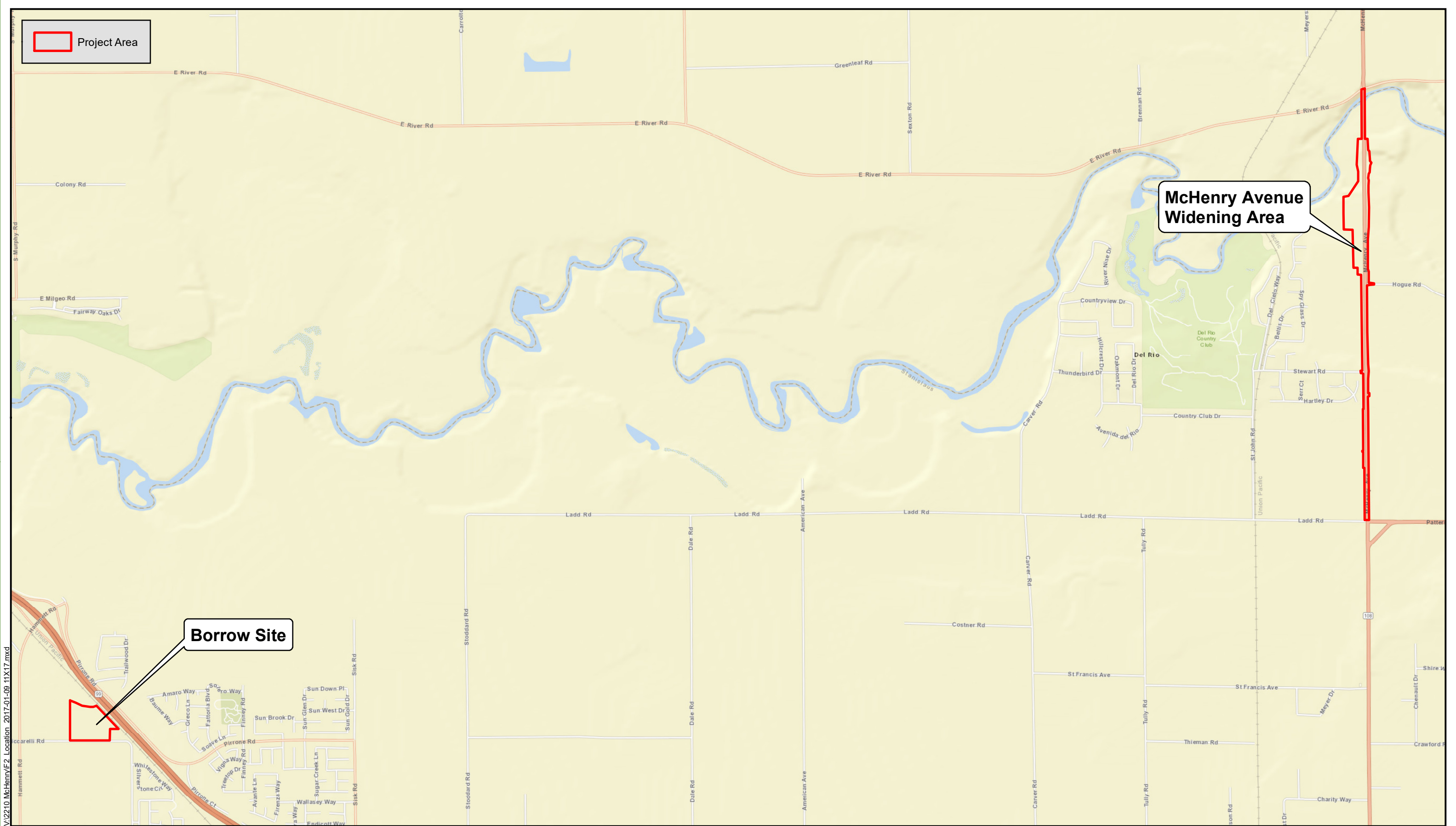
V:\2210 McHenry\F1_Vicinity_2017-01-09.mxd

Source: ESRI 2008; Dokken Engineering 1/9/2017; Created By: adellas

FIGURE 1
Project Vicinity
 STPL 5938(233)
 McHenry Avenue Widening Project
 Stanislaus County, California



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Project Area

McHenry Avenue Widening Area





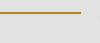


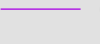


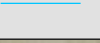
Borrow Site

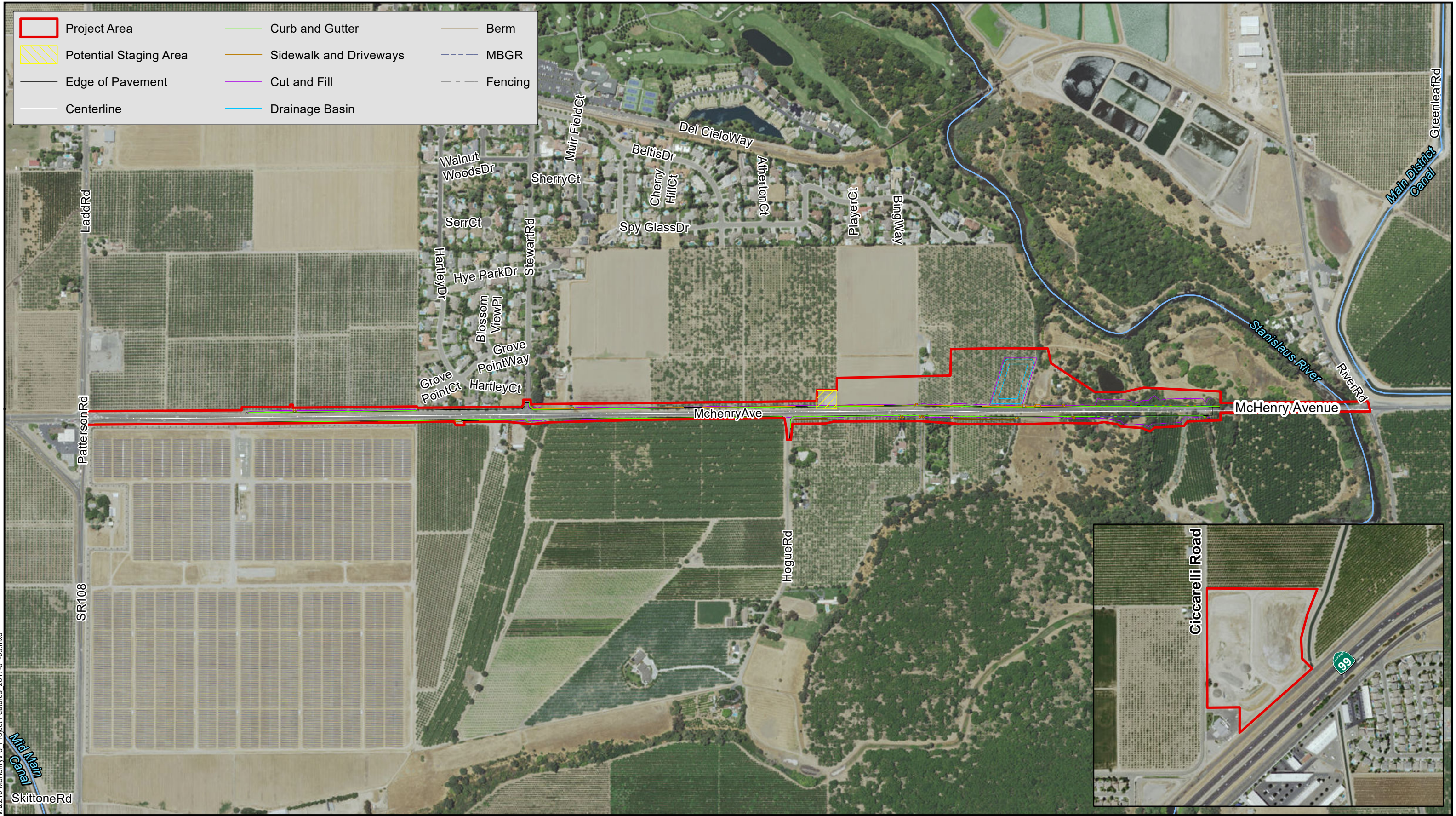
V:\210 McHenry\F2_Location_2017-01-09_11X17.mxd

Source: ESRI Street Map Online; Dokken Engineering 1/9/2017; Created By: briann



FIGURE 2
Project Location
 STPL 5938(233)
 McHenry Avenue Widening Project
 Stanislaus County, California

- | | | |
|---|--|--|
|  Project Area |  Curb and Gutter |  Berm |
|  Potential Staging Area |  Sidewalk and Driveways |  MBGR |
|  Edge of Pavement |  Cut and Fill |  Fencing |
|  Centerline |  Drainage Basin | |



V:\2210 McHenry\F3 Project Features_2017-01-09.mxd

Source: USA Topo Maps Online; Dokken Engineering 1/10/2017; Created By: adellas

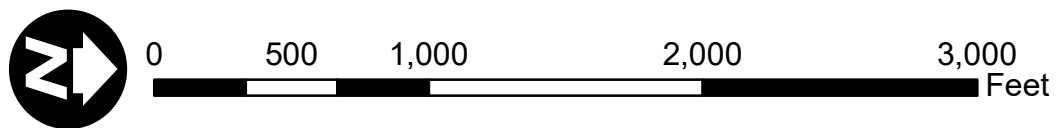


FIGURE 3
Project Features
 STPL 5938(233)
 McHenry Avenue Widening Project
 Stanislaus County, California

transportation, and allow for good movement and job development for existing and future developments. The project is needed as Average Daily Traffic (ADT) (13,000 vehicles per day) counts are closely reaching capacity of the existing two-lane rural roadway.

There are existing overhead electric and communications utility lines along McHenry Avenue that will need to be relocated. Close coordination with the local utility companies will be carried out in order to coordinate the permanent relocation of these utilities.

Temporary construction easements are also needed throughout the project area as construction staging would take place within County right-of-way and adjacent privately owned parcels. Permanent right-of-way acquisitions are also anticipated to accommodate the proposed roadway improvements.

The total estimated cost to implement the widening project is \$13,025,000. This project is included in the Fiscal Years 2014/15 Federal Transportation Improvement Program (FTIP) and is funded through Caltrans Local Assistance.

No-Project Alternative

Under the No-Build, or “Do Nothing” Alternative, McHenry Avenue will not be extended. The ultimate width of the roadway would not be completed and as a result congestion would increase along this segment of roadway.

1.4 Affected Land Uses

A general reconnaissance of the proposed project area was performed within the project limits to identify noise-sensitive land uses. Field visits, 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. The land use within the project corridor is primarily rural-residential-agricultural. Single-family sensitive receivers were identified in those areas where outdoor frequent human use would occur. These land uses fall into the NAC Activity Category B.

Although all developed land uses are evaluated in this analysis, as required by the Protocol, noise abatement was considered only 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 recreation areas.

Chapter 2. Results of the Noise Study Report

The NSR for this project was prepared by Ken Chen and approved by Zachary Liptak of Dokken Engineering on April 13, 2017; it was subsequently concurred by Parminder Singh of Caltrans, on September 6, 2017.

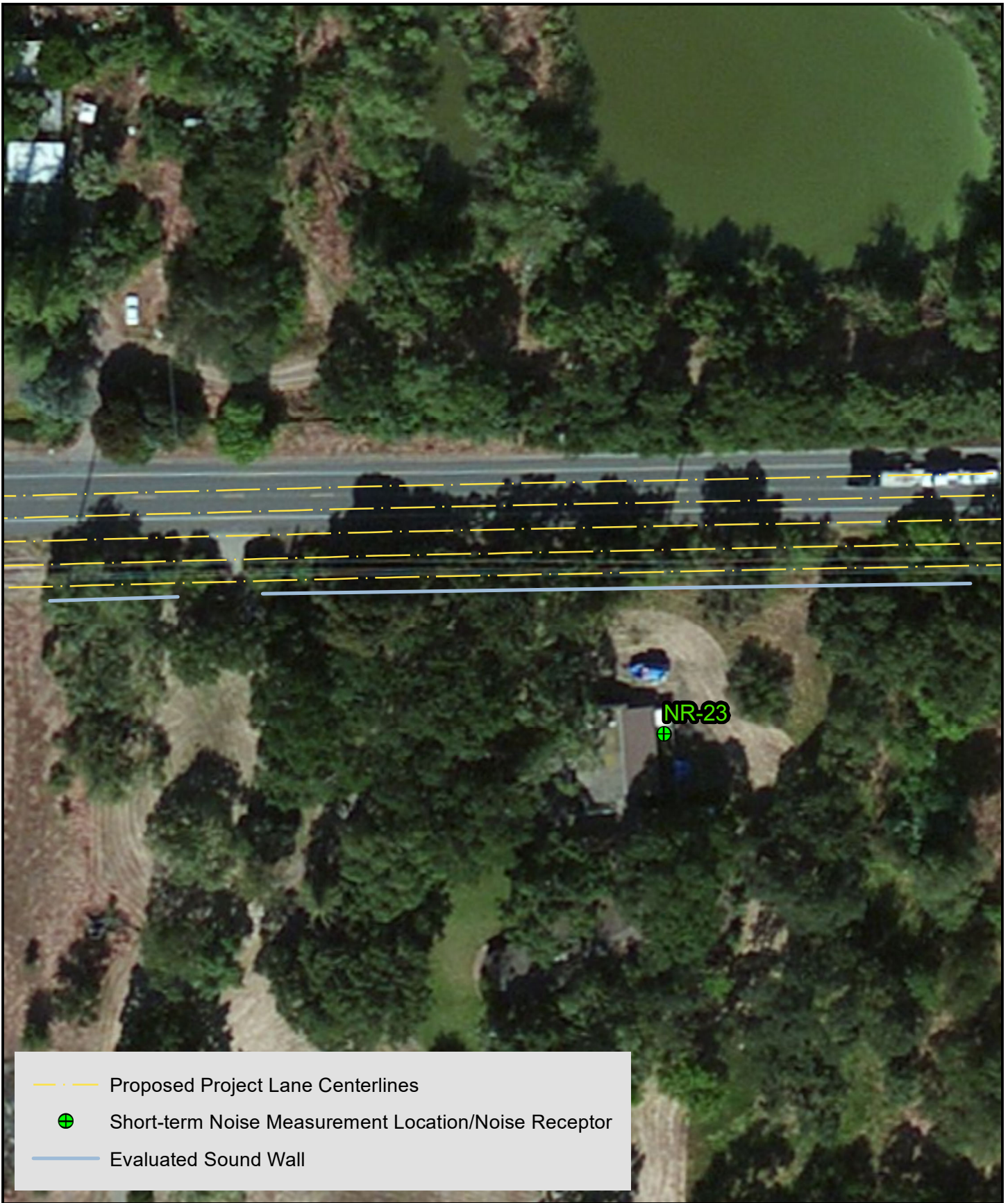
According to 23 CFR 772(13)(c), federal funding may be used for the following abatement measures:

- Construction of noise barriers, including acquisition of property rights, either within or outside the highway right-of-way. Landscaping is not a viable noise abatement measure.
- Traffic management measures including, but not limited to, traffic control devices and signage for prohibition of certain vehicle types, time-use restrictions for certain vehicle types, modified speed limits, and exclusive lane designations.
- Alteration of horizontal and vertical alignments.
- Acquisition of real property or interests therein (predominantly unimproved property) to serve as a buffer zone to preempt development which would be adversely impacted by traffic noise. This measure may be included in Type I projects only.
- Noise insulation of Activity Category D land use facilities. Post- installation maintenance and operational costs for noise insulation are not eligible for Federal- aid funding.

The design year traffic noise modeling results for the Build Alternative range from 52 to 74 dBA $L_{eq}(h)$, as shown in Table B-1 of Appendix B. Noise levels from Existing to No-Build conditions are expected to increase by 1.5 to 1.6 dB. The increase in noise levels is due to the slight increases in traffic volumes from Existing to No-Build conditions. Noise levels for the design year under the Build Alternative are expected to increase by 1 to 4 dB compared to design year No-Build noise levels. Proposed improvements at McHenry Avenue would bring traffic closer to nearby receivers which results in increased noise levels.

Under the Build Alternative, design-year noise levels would approach or exceed their respective NAC Activity criteria (67 dBA $L_{eq}(h)$) at one residence (NR-23, see Figure 4). Therefore, a noise abatement evaluation was required.

The noise abatement evaluation was conducted to determine if construction of a soundwall would provide at least a 5 dB reduction for the residence that is anticipated to approach or



Source: USA Topo Maps Online; Dokken Engineering 4/19/2017; Created By: kchen



0 50 100 150
Feet

FIGURE 4
Evaluated Sound Walls and Receiver Locations

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exceed its respective NAC Activity criteria. The soundwall would be constructed on the edge of the shoulder along northbound McHenry Avenue. In addition to the 5 dB reduction, the abatement must achieve, per the 23CFR772 Caltrans acoustical design goal, at least 7 dB of noise reduction at one or more benefited receptors to be considered for further evaluation.

The Noise Study Report evaluated Barrier SW-W1 for feasibility. SW-W1 was evaluated on the edge of the shoulder along northbound McHenry Avenue to shield receiver NR-23. SW-W1 was found to be feasible at a minimum height of 8 feet where SW-W1 was raised in 2 foot increments from 6 feet to 14 feet in height. In order to meet the Caltrans acoustical design goal of a 7 dB reduction, a 14 foot sound wall must be erected. A 12 foot sound wall is able to provide a 6.7 dB reduction and break the line of sight of an 11.5 foot truck stack. 14 feet is the maximum height allowable under Caltrans design criteria for sound barriers when the sound barrier is located 15 feet or less from the edge of the roadway. Table B-1 in Appendix C summarizes the results of the barrier analysis at all effective design heights for each impacted receptor location along the project.

For each noise barrier found to be acoustically feasible, reasonable cost allowances were calculated. The total reasonable allowance for the cost of construction of the wall is calculated by multiplying the number of benefited receivers by the reasonable allowance per benefited receiver, which is currently \$80,000. Since only one receiver is benefited by the SW-W1, the total reasonable allowance is \$80,000.

Table 2-1 below lists the acoustically feasible heights for SW-W1 walls, the number of benefited receivers, and the reasonable allowances per benefited receiver, and the total reasonable allowance for each height of the wall (in this case, barriers ranging from 8 feet to 14 feet in height were determined to be feasible for Barrier SW-W1. These heights were considered feasible as they achieved a reduction of 5 dB; however, SW-W1 also achieved the 7 dB reduction goal at a height of 14 feet.

For any noise barrier to be considered reasonable from a cost perspective, the estimated cost of the noise barrier should be within 10% or less than the total reasonable cost allowance calculated for the barrier. The cost calculations of the noise barrier should include all items appropriate and necessary for construction of the barrier, such as traffic control, drainage modification, and retaining walls.

Table 2-1. Summary of Reasonableness Determination Data—SW-W1

Barrier I.D.:	EX-W1	6-Foot	8-Foot	10-Foot	12-Foot	14-Foot
Number of Benefited Receivers	N/A	1	1	1	1	1
Reasonable Allowance Per Benefited Receiver	N/A	\$80,000	\$80,000	\$80,000	\$80,000	\$80,000
Total Reasonable Allowance	N/A	\$80,000	\$80,000	\$80,000	\$80,000	\$80,000
At least 7dB reduction for one or more residences?	N/A	No	No	No	No	Yes

Note: N/A-Not applicable. Barrier does not provide 5 dB of noise reduction.

The design of the noise barrier presented in this report is preliminary and has been conducted at a level appropriate for environmental review and not for final design of the project. Preliminary information on the physical location, length, and height of noise barrier is provided in this report. During final design, the exact placement and height of the barriers will be finalized to meet the noise abatement criteria.

Chapter 3. Preliminary Noise Abatement Decision

The Preliminary Noise Abatement Decision is made by comparing total reasonable allowance, as determined by the number of benefitted receivers for each acoustically feasible wall height, to the estimated construction cost. Appendix C shows evaluated barrier heights which must achieve at least a 7 dB reduction for at least one residence to be considered acoustically feasible. Appendix D includes engineering estimates for the construction costs of SW-W1. If these cost estimates are within 10% of the total reasonable allowance, the wall is considered feasible and reasonable and is recommended to be included as part of the project's features. These recommendations will be found under Section 3.3 of the NADR.

3.1 Summary of Key Information

As shown in Appendix C and Table 3-1 below, Barrier SW-W1 is acoustically feasible at a height of 14 feet. The total length of the proposed Barrier SW-W1 is 480 feet. From this length, the number of benefitted residences (1) yields a total reasonable allowance of \$80,000 for each soundwall height. Based on the engineer's cost estimate including costs required to construct the abatement - cost of the wall, footings, traffic control, drainage, modified or additional plantings, and miscellaneous items, the 14-foot soundwall is estimated to cost \$490,000 (\$72.92 per square foot, respectively). Comparing the total reasonable allowances to the estimated construction costs, the soundwall SW-W1 is determined to be fiscally unreasonable as it would not be within 10% of the total reasonable allowance.

Barrier	Height (meters [feet])	Breaks Line of Sight?*	Acoustically Feasible?	Number of Benefitted Residences	Total Reasonable Allowance	Estimated Construction Cost	Cost within 10% of Allowance?
SW-W1	4.3 (14)	YES	YES	1	\$80,000	\$490,000	NO

3.2 Nonacoustical Factors Relating to Feasibility

Several nonacoustical factors were considered relating to the feasibility of the proposed soundwall such as geometric standards, safety, maintenance, security, geotechnical considerations, and utility relocations. The soundwall meets geometric standards for sight distance and placement along the travel way. There are no unusual utility or geotechnical considerations, and as such, no nonacoustical items affect feasibility.

3.3 Preliminary Recommendation and Decision

The evaluation of Barrier SW-W1 indicates that the barrier height determined by the Noise Study Report to mitigate the noise impact is feasible at a height of 14 feet but is not fiscally reasonable at a cost of \$490,000. Based on these findings, no soundwall is recommended for inclusion as a design feature of this project.

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

Chapter 4. Secondary Effects of Abatement

Potential secondary effects from the placement of a sound wall at the evaluated location were considered. Based on analyses found in the draft Historic Property Survey Report, historic properties were identified in the project area but none occur at the sound wall location. Based on the Natural Environment Study, no sensitive natural communities or habitats are located at the sound wall location. Further, the Visual Impact Assessment describes negligible visual impacts as a result of the proposed project. Effects on cultural resources, biological resources, visual resources, or other resource areas are not anticipated.

Chapter 5. References

Dokken Engineering. 2017. *McHenry Avenue Widening Project Noise Study Report*. Stanislaus County, CA. April 2017.

Appendix A. Traffic Data

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Table A-1. Existing PM Peak Hour Traffic Volumes Used in TNM

	Segment	Number of Lanes	Total PM Peak Hour Traffic	Auto %	Total Auto	MT %	Total MT	HT %	Total HT	Speed (A/MT/HT)
McHenry Avenue	Northbound South of Stewart Road	1	750	95%	713	3%	23	2%	15	50/50/45
McHenry Avenue	Northbound North of Stewart Road	1	679	95%	645	3%	20	2%	14	50/50/45
McHenry Avenue	Southbound South of Stewart Road	1	929	95%	883	3%	28	2%	19	50/50/45
McHenry Avenue	Southbound North of Stewart Road	1	901	95%	856	3%	27	2%	18	50/50/45

Source: Dokken Engineering 2016
A = Auto, MT = medium truck, HT = heavy truck

Table A-2. 2018 No Build PM Peak Hour Traffic Volumes Used in TNM

	Segment	Number of Lanes	Total PM Peak Hour Traffic	Auto %	Total Auto	MT %	Total MT	HT %	Total HT	Speed (A/MT/HT)
McHenry Avenue	Northbound South of Stewart Road	1	760	95%	722	3%	23	2%	15	50/50/45
McHenry Avenue	Northbound North of Stewart Road	1	706	95%	671	3%	21	2%	14	50/50/45
McHenry Avenue	Southbound South of Stewart Road	1	966	95%	918	3%	29	2%	19	50/50/45
McHenry Avenue	Southbound North of Stewart Road	1	937	95%	890	3%	28	2%	19	50/50/45

Source: Dokken Engineering 2016
A = Auto, MT = medium truck, HT = heavy truck

Table A-3. 2018 Build PM Peak Hour Traffic Volumes Used in TNM

	Segment	Number of Lanes	Total PM Peak Hour Traffic	Auto %	Total Auto	MT %	Total MT	HT %	Total HT	Speed (A/MT/HT)
McHenry Avenue	Northbound South of Stewart Road	2	760	95%	722	3%	23	2%	15	50/50/45
McHenry Avenue	Northbound North of Stewart Road	2	706	95%	671	3%	21	2%	14	50/50/45
McHenry Avenue	Southbound South of Stewart Road	2	966	95%	918	3%	29	2%	19	50/50/45
McHenry Avenue	Southbound North of Stewart Road	2	937	95%	890	3%	28	2%	19	50/50/45

Source: Dokken Engineering 2016
A = Auto, MT = medium truck, HT = heavy truck

Table A-4. 2040 No Build PM Peak Hour Traffic Volumes Used in TNM

	Segment	Number of Lanes	Total PM Peak Hour Traffic	Auto %	Total Auto	MT %	Total MT	HT %	Total HT	Speed (A/MT/HT)
McHenry Avenue	Northbound South of Stewart Road	2	1052	95%	999	3%	32	2%	21	50/50/45
McHenry Avenue	Northbound North of Stewart Road	2	977	95%	928	3%	29	2%	20	50/50/45
McHenry Avenue	Southbound South of Stewart Road	2	1337	95%	1270	3%	40	2%	27	50/50/45
McHenry Avenue	Southbound North of Stewart Road	2	1297	95%	1297	3%	39	2%	26	50/50/45

Source: Dokken Engineering 2016
A = Auto, MT = medium truck, HT = heavy truck

Table A-5. 2040 Build PM Peak Hour Traffic Volumes Used in TNM

	Segment	Number of Lanes	Total PM Peak Hour Traffic	Auto %	Total Auto	MT %	Total MT	HT %	Total HT	Speed (A/MT/HT)
McHenry Avenue	Northbound South of Stewart Road	2	1052	95%	999	3%	32	2%	21	50/50/45
McHenry Avenue	Northbound North of Stewart Road	2	977	95%	928	3%	29	2%	20	50/50/45
McHenry Avenue	Southbound South of Stewart Road	2	1337	95%	1270	3%	40	2%	27	50/50/45
McHenry Avenue	Southbound North of Stewart Road	2	1297	95%	1297	3%	39	2%	26	50/50/45

Source: Dokken Engineering 2016
A = Auto, MT = medium truck, HT = heavy truck

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Appendix B. Predicted Future Noise Levels and Noise Barrier Analysis

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Table B-1. Predicted Future Noise

Receptor I.D.	Barrier I.D.	Number of Dwelling Units	Land Use	Address	McHenry Avenue Widening PM Peak Hour Noise Levels -Leq, dBA																			Barrier Feasible (5 dB I.L.)	Barrier meets Caltrans Acoustical Design Goal (7 dB I.L.)			
					Existing Exterior Noise Level Leq, dBA	2018 No Build PM Exterior Noise Level Leq, dBA	2018 Build PM Exterior Noise Level Leq, dBA	2040 No Build PM Exterior Noise Level Leq, dBA	2040 Build PM Exterior Noise Level Leq, dBA	Activity Category (NAC)	Impact Type ²	Noise Prediction with Barrier, Barrier Insertion Loss (I.L.), and Number of Benefited Receptors (NBR)																
												2040																
												6 feet			8 feet			10 feet			12 feet					14 feet		
Leq	I.L.	NBR	Leq	I.L.	NBR	Leq	I.L.	NBR	Leq	I.L.	NBR	Leq	I.L.	NBR														
NR-1	No Barrier	1	Residential	7099 Grove Point Court	57.2	57.3	56.8	58.7	58.5	B (67)	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NR-2	No Barrier	1	Residential	7001 Grove Point Court	62.8	63.0	62.5	64.4	64.4	B (67)	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NR-3	No Barrier	1	Residential	300 Hartley Drive	56.3	56.4	56.0	57.9	57.7	B (67)	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NR-4	No Barrier	1	Residential	7005 Grove Point Court	61.9	62.0	61.5	63.5	63.4	B (67)	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NR-5	No Barrier	1	Residential	7009 Grove Point Court	61.6	61.8	61.1	63.2	63.0	B (67)	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NR-6	No Barrier	1	Residential	7000 Hartley Court	61.9	62.0	61.0	63.4	62.8	B (67)	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NR-7	No Barrier	1	Residential	7004 Hartley Court	63.3	63.4	62.4	64.8	64.2	B (67)	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NR-8	No Barrier	1	Residential	7008 Hartley Court	63.3	63.4	62.4	64.8	64.1	B (67)	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NR-9	No Barrier	1	Residential	7011 Hartley Court	58.1	58.3	57.8	59.7	59.4	B (67)	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NR-10	No Barrier	1	Residential	7005 Hartley Court	57.4	57.5	57.1	58.9	58.7	B (67)	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NR-11	No Barrier	1	Residential	7008 Grove Pointe Way	55.4	55.5	55.1	57.0	56.7	B (67)	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NR-12	No Barrier	1	Residential	200 Blossom View Place	54.4	54.5	54.2	55.9	55.8	B (67)	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NR-13	No Barrier	1	Residential	7001 Hartley Court	56.4	56.5	56.2	57.9	57.8	B (67)	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NR-14	No Barrier	1	Residential	7017 Grove Pointe Way	57.2	57.3	57.1	58.7	58.5	B (67)	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NR-15	No Barrier	1	Residential	7021 Grove Pointe Way	58.1	58.2	58.1	59.6	59.4	B (67)	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NR-16	No Barrier	1	Residential	117 Stewart Road	61.7	61.9	62.4	63.3	63.6	B (67)	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NR-17	No Barrier	1	Residential	125 Hogue Road	60.3	60.5	61.2	61.9	62.3	B (67)	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NR-18	No Barrier	1	Residential	7600 McHenry Avenue	49.7	49.8	50.5	51.2	51.6	B (67)	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NR-19	No Barrier	1	Residential	7730 McHenry Avenue	57.7	57.9	58.7	59.3	59.8	B (67)	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NR-20	No Barrier	1	Residential	7706 McHenry Avenue	62.1	62.3	63.1	63.7	64.2	B (67)	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NR-21	No Barrier	1	Residential	7709 McHenry Avenue	61.5	61.7	61.7	63.1	62.8	B (67)	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NR-22	No Barrier	0 ⁶	Residential	8018 McHenry Avenue	69.4	69.6	72.7	71.0	73.6	B (67)	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NR-23	Soundwall 1	1	Residential	8018 McHenry Avenue	66.3	66.5	67.8	67.9	68.8	B (67)	A/E	63.8	4.8	1	63.2	5.4	1	62.6	6	1	61.9	6.7	1	61.6	7	1	Y	Y
NR-24	No Barrier	0	Agricultural	7785-7893 McHenry Avenue	70.3	70.5	70.8	71.9	72.0	G (N/A)	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NR-25	No Barrier	0	Planned Development ⁷	7785-7893 McHenry Avenue	66.6	66.7	66.9	68.2	68.1	G (N/A)	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Notes:
 1. Noise levels were adjusted to existing peak hour.
 2. Impact types: A/E - Future noise conditions approach (within 1 dBA) or exceed the Noise Abatement Criteria, S = substantial noise increase, when the project's predicted worst-hour design-year noise level exceeds the existing worst hour noise level by 12 dBA or more
 3. I.L. = Insertion Loss
 4. SFR = single-family residence, UND = Undeveloped, ASA = active sports area, MFR = multi-family residence
 5. N/A - Not Applicable
 6. NR-22 represents a noise measurement location a residential property that is not a sensitive outdoor use area.
 7. NR-25 is not currently permitted for future development

Appendix C. Noise Barrier Cost Estimates

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BRIDGE GENERAL PLAN ESTIMATE _____ **OR** **PLANNING ESTIMATE** **X**

DPD-DSD-DIS (Rev 8/92)

STRUCTURE McHenry Ave Widening Soundwall 1 (for Receptor NR-23)	BR. NO. TBD	RCVD BY	ESTIMATING GROUP	
TYPE 14' Masonry Block Soundwall on Type 736SV Barrier	DISTRICT 10	CO STA	RTE CR	KP
LENGTH <u>480.00'</u> x HEIGHT <u>14.00'</u> = AREA <u>6720</u> SF				

DESIGN SECTION DOKKEN QUANTITIES BY M. Maechler DATE 4/18/17 ESTIMATE NO _____
 _____ STRUCTURES QUANTITIES CHK BY _____ DATE _____ PRICED BY: MM
 AND _____ ROADWORK CHG UNIT AND EA _____ 2013 COST INDEX

	CONTRACT ITEMS	UNIT	QUANTITY	PRICE	AMOUNT
498016	16" CAST-IN-DRILLED-HOLE CONCRETE PILING (SOUND WA	LF	1,360	\$80.00	\$108,800
582001	SOUND WALL (MASONRY BLOCK)	SQFT	5,280	\$28.00	\$147,840
839734	CONCRETE BARRIER (TYPE 736SV)	LF	480	\$200.00	\$96,000

Standard pile type for soundwalls.
 Only includes area of block above the 3 ft tall barrier
 The unit price of the concrete barrier which would not be required if there was not a soundwall.

Notes:

SUB TOTAL	\$352,640
MOBILIZATION (10%)	\$39,182
SUB TOTAL BRIDGE ITEMS	\$391,822
CONTINGENCIES (25%)	\$97,956
BRIDGE TOTAL	\$489,778
FOR BUDGET PURPOSES ONLY - SAY	\$490,000

This is in an confined area where construction of the soundwall will be difficult and there may be some surprises. Given this, use 25%.

COMMENTS \$ 72.92 / SF

