Environmental Assessment

I-35W OVER THE MINNESOTA RIVER

DEPARTMENT OF TRANSPORTATION

Cities: Burnsville and Bloomington
Counties: Dakota and Hennepin

MnDOT proposes reconstruction of I-35W from Cliff Road to West 106th Street, including replacing the I-35W Minnesota River Bridge (Bridge No. 5983) and the I-35W bridges over West 106th Street (Bridge No. 9043 and Bridge No. 9044). This Environmental Assessment (including the Minnesota Environmental Assessment Worksheet form) documents the social, economic, and environmental impacts of the proposed project.

State Project 1981-124

December 2017

ENVIRONMENTAL ASSESSMENT

Interstate Highway 35W (I-35W)
State Project: 1981-124
Minnesota Project: not yet assigned

I-35W from Cliff Road (CSAH 32) to West 106th Street
(Highway Reference Point: 003+00.251 to 005+00.385)
Cities: Burnsville, Bloomington
Counties: Dakota, Hennepin
Section(s), Township(s), Range(s): Sections 21, 22, 27, 28, 33, 34, Township 27 N, Range 24 W

Submitted pursuant to 42 U.S.C. 4332 and M. S. 116D
By the
U.S. Department of Transportation
Federal Highway Administration and
Minnesota Department of Transportation
for

I-35W Over The Minnesota River

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This document is available in alternative formats upon request. Please call 651-366-4718 or email your request to ADArequest.dot@state.mn.us.

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Acronyms and Abbreviations

ACS	American Community Survey
ADA	Americans with Disabilities Act
ADT	Average Daily Traffic
BMP	Best Management Practice
BWSR	Board of Soil and Water Resources
CCP	Construction Contingency Plan
CR	County Road
CRU	Cultural Resources Unit
CSAH	County State Aid Highway
DNR	Minnesota Department of Natural Resources
EA	Environmental Assessment
EAW	Environmental Assessment Worksheet
EIS	Environmental Impact Statement
EIU	Environmental Investigations Unit
EJ	Environmental Justice
E.O.	Executive Order
ESA	Environmental Site Assessment
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FOFC	Findings of Fact and Conclusions
FONSI	Finding of No Significant Impact
HCAADT	Heavy Commercial Annual Average Daily Traffic
LAWCON	Land and Water Conservation Act
MEQB	Minnesota Environmental Quality Board

MnDOT	Minnesota Department of Transportation
MOT	Maintenance of Traffic
MPCA	Minnesota Pollution Control Agency
MPH	Miles Per Hour
M.S.	Minnesota Statute
MSAT	Mobile Source Air Toxics
NEPA	National Environmental Policy Act
OES	Office of Environmental Stewardship
RAP	Response Action Plan
RTMC	Regional Transportation Management Center
SHPO	State Historic Preservation Office
STIP	State Transportation Improvement Program
TAC	Technical Advisory Committee
TH	Trunk Highway
TMP	Transportation Management Plan
USACE	United States Army Corps of Engineers
USC	United States Code
USCG	United States Coast Guard
USFWS	United States Fish and Wildlife Service
vpd	Vehicles Per Day
VQAC	Visual Quality Advisory Committee
VQM	Visual Quality Manual
WCA	Wetland Conservation Act

Chapter 1 Project Summary

Chapter 1 of this Environmental Assessment (EA) summarizes of the I-35W Over the Minnesota River Bridge Project. This summary includes a high-level overview of the project need, alternatives, preferred alternative impacts, and mitigation measures. Detailed information regarding the project need, alternatives evaluation, description of the preferred alternative, preferred alternative impacts, and mitigation measures (including the Minnesota Environmental Assessment Worksheet form) can be found in later chapters of this EA.

1.1 I-35W Over the Minnesota River

The Minnesota Department of Transportation (MnDOT), in partnership with Dakota County, Hennepin County, the City of Burnsville, and the City of Bloomington are developing a project to replace the I-35W Minnesota River Bridge, reconstruct approximately two miles of I-35W adjacent to the Minnesota River Bridge, and replace the I-35W bridges over West 106th Street (I-35W Over the Minnesota River Project). The limits of the project extend from the I-35W/Cliff Road interchange in Burnsville to north of the I-35W/West 106th Street interchange in Bloomington. Figure A.1 and Figure A.2 in Appendix A illustrate the project location.

1.2 Project Purpose and Need

1.2.1 Need for the Project

The primary need for the project is to provide structurally sound bridge crossing over the Minnesota River within the I-35W corridor. The existing I-35W Minnesota River Bridge was constructed in 1957. At 60 years old, the I-35W Minnesota River Bridge is reaching the end of its useful life. Substantial maintenance needs are anticipated in the future, requiring extensive levels of investment. In addition to the I-35W Minnesota River crossing needs, MnDOT has identified several secondary needs for the project, including:

- Provide a structurally sound bridge crossing over West 106th Street within the I-35W corridor;
- Maximize maintenance of traffic during construction;
- Not preclude future river crossing capacity (beyond year 2040);

- Improve safety and traffic operations on northbound I-35W during the morning peak period;
- Improve non-motorized (pedestrian and bicycle) connectivity across the Minnesota River; and
- Address roadway flood hazard conditions.

Additional considerations that will help guide the alternatives development and evaluation include:

- Consistency with City of Burnsville development plans;
- Opportunities to improve existing geometric deficiencies on the I-35W Minnesota River Bridge, at the I-35W/Black Dog Road interchange, and at the I-35W/West 106th Street interchange; and
- Regulatory requirements regarding parklands (e.g., Section 4(f), Land and Water Conservation Act), river navigation, aquatic resources, and stormwater management.

1.2.2 Purpose of the Project

The primary purpose of the project is to provide a structurally sound bridge crossing of the Minnesota River in the I-35W corridor between the cities of Burnsville and Bloomington, Minnesota, In addition, the project needs to provide a structurally sound crossing of West 106th Street, maintain traffic to the maximum extent possible during construction, not preclude additional capacity on the I-35W Minnesota River Bridge in the future, address traffic operations and safety needs on northbound I-35W, and accommodate non-motorized connections across the Minnesota River.

1.3 Alternatives

1.3.1 Alternatives Studied in the EA

MnDOT evaluated nine different bridge types for the I-35W Minnesota River crossing, two different alignments for the I-35W Minnesota River Bridge (on existing alignment and an east shifted alignment), and numerous trail connection options to identify the best solution that addresses the needs for the project while minimizing impacts to the social, natural and cultural environment. The project development process consisted of four major decisions that ultimately led to the identification of a Preferred Alternative. Section 4.2 of this EA describes the project decision-making process in detail.

- Decision #1: Should the existing I-35W Minnesota River Bridge be rehabilitated or replaced (see Section 4.2.1)?
- Decision #2: If replaced, what potential structure types should replace the existing bridge (see Section 4.2.2)?
- Decision #3: If replaced, on what alignment should the replacement bridge be located? Interrelated with this step were additional decisions to address secondary needs and other goals and objectives identified for the project (see Section 4.2.3).
- Decision #4: If replaced, on what side of the replacement bridge should a trail be located, and how should trail connections be made to the bridge (see Section 4.2.4)?

This process was coordinated with the project's Technical Advisory Committee (TAC), a group that included representatives from Dakota County, Hennepin County, the City of Burnsville, the City of Bloomington, MnDOT, and Federal Highway Administration (FHWA).

1.3.2 Preferred Alternative

I-35W Minnesota River Bridge

The Preferred Alternative is the replacement of the I-35W Minnesota River Bridge with two new parallel bridges (one for northbound I-35W and one for southbound I-35W). The width of the existing I-35W Minnesota River Bridge is 103 feet. The combined width of the new bridges is 151.2 feet. The proposed southbound I-35W bridge will be 65 feet wide. The proposed northbound I-35W bridge will be 78.2 feet wide. The northbound and southbound bridges would be separated by approximately eight feet.

The Preferred Alternative proposes constructing the two new bridges on an alignment shifted to the east of the existing bridge. The east edge of the proposed northbound I-35W bridge would be located approximately 80 feet to the east of the existing bridge. The west edge of the proposed southbound I-35W bridge would be located approximately 40 feet to the east of the existing bridge. The Preferred Alternative proposes a trail along the east side of the northbound I-35W Bridge with connections to Black Dog Road and Lyndale Avenue South.

The Preferred Alternative bridge type will be identified by the design-build contractor as part of the design-build procurement process. The range of possible bridge types includes steel girder, PC spliced concrete beam, steel box girder, steel delta frame, and concrete segmental. Bridge types with

above-deck structural elements such as trusses, arches, towers, or cables will not be allowed.

I-35W South of the Minnesota River

The Preferred Alternative includes reconstruction of I-35W south of the Minnesota River Bridge, raising the roadway grade and providing approximately two feet of freeboard above the 100-year flood elevation. Raising the roadway grade reduces the susceptibility of I-35W to Minnesota River flood events. An additional lane also would be constructed on northbound I-35W between Cliff Road and the existing truck climbing lane south of West 106th Street, improving A.M. peak period operations.

I-35W Bridges over West 106th Street

The Preferred Alternative includes replacement of the I-35W bridges over West 106th Street in Bloomington. The existing northbound and southbound bridges would be replaced with a new single structure that would span West 106th Street. Existing bridge piers on the north and south sides of West 106th Street would be removed. The west side of the proposed I-35W bridge over West 106th Street would include a wide outside shoulder. This is necessary to accommodate both directions of I-35W traffic during construction of the northbound side of the bridge.

1.4 Impacts and Mitigation

Table 1.1 summarizes the anticipated impacts, benefits, and proposed mitigation measures for the project.

Table 1.1 Summary of Impacts/Benefits and Mitigation Measures

Issue Area	Anticipated Impact/Benefits	Mitigation Measures
Land Use	None.	None.
Geology, Soils, and Topography/Land Forms	None.	• Prepare Stormwater Pollution Prevention Plan (SWPPP). • Implement erosion control best management practices (BMPs).
Stormwater	Increase in impervious surface (approximately 5.6 acres). Increase in rate and volume of runoff.	• Stormwater pond and filtration basin along I-35W north of Minnesota River. • Restore existing ponds to maximize their design capacity.

Issue Area	Anticipated Impact/Benefits	Mitigation Measures
Water Appropriation	May be required for roadway construction. Required for bridge construction (cofferdams, deck walls, pier construction).	• Prepare SWPPP and dewatering plan. • Obtain groundwater appropriations permit (if necessary for construction). • Treat water prior to discharge in accordance with permitting requirements.
Aquatic Resources	• Approximately 0.6 acres of aquatic resource impacts, including approximately 0.3 acres of permanent wetland impacts. • Temporary fill in Minnesota River during construction. • Removal of existing bridge piers from the Minnesota River.	Mitigation through the MnDOT and BWSR Cooperative Wetland Replacement Program.
Contamination/Hazardous Materials/Wastes	• Medium and high risk sites adjacent to I-35W (freeway dump, freeway sanitary landfill, freeway transfer station). • Regulated waste on existing I-35W Minnesota River Bridge.	• Phase II studies completed. • Prepare special provisions. • Handle and dispose of regulated wastes from existing bridge in accordance with MnDOT specifications and regulatory requirements. • Complete methane gas survey within one year of the beginning of construction.
Fish, Wildlife, Plant Communities, and Sensitive Ecological Resources (Rare Features)	• Wildlife passage along Minnesota River shoreline and bluff areas. • Blanding's turtle and Blanchard's cricket frog occurrences in project area. • Mussel survey completed in July 2017. Two state-listed mussel species identified. • In-water work impacts to fish in Minnesota River.	• Identify Areas of Environmental Sensitivity adjacent to I-35W corridor on project plans. • Excess materials will not be disposed of in Areas of Environmental Sensitivity. • Prevent stormwater runoff from reaching Areas of Environmental Sensitivity. • Blanding's turtle fact sheet provided to all contractors. • Staging equipment and materials along west side of I-35W Minnesota River Bridge will be limited. • Coordinate dewatering plans with DNR nongame wildlife staff. Dewatering restriction dates incorporated into project schedule. • Fish spawning restriction

Issue Area	Anticipated Impact/Benefits	Mitigation Measures
		dates incorporated into project schedule. • Re-establish vegetation in disturbed areas to native vegetation suitable to local habitat. • Compensatory mitigation for impacts to state-listed mussels (part of mussel takings permit). • Implement standard MnDOT practices to prevent birds from nesting on bridges prior to start of construction. • Complete bald eagle nest surveys prior to the start of construction. • Use of bio-netting, natural-netting (category 3N or 4N), or woven-type erosion control products. • Install passage benches under I-35W Minnesota River Bridge. • Lighting will be directed downward towards the road and bridge deck. Use full cutoff luminaire lighting heads.
Visual	None.	Implement measures identified in Visual Quality Manual (VQM).
Air Quality	None.	None.
Traffic Noise	• Daytime and nighttime state noise standards exceeded at modeled receptor locations. • Approach/exceed federal noise abatement criteria at modeled receptor locations.	• One 20-foot high noise wall proposed along the east side of I-35W, north of West 106th Street. • Other noise walls evaluated throughout project area, but do not meet MnDOT's Highway Noise Policy requirements.
Transportation	• Perpetuates I-35W Minnesota River crossing. • Does not preclude future river crossing capacity needs. • Reduces congestion. • Travel time savings on I-35W corridor.	None.
Cumulative Potential Effects	None.	None.

Issue Area	Anticipated Impact/Benefits	Mitigation Measures
Social Impacts	None.	None.
Relocation and Right-of-Way	Stormwater pond and filtration basin located on parcels owned by City of Bloomington. Parcels to be transferred to MnDOT.	None.
Environmental Justice	Minority population identified along I-35W north of the West 106th Street interchange. No disproportionately high or adverse impacts anticipated.	None.
Pedestrians and Bicyclists	• Proposed trail on I-35W Minnesota River Bridge and trail connections improves pedestrian/bicycle connectivity. • City of Burnsville trail along east side of I-35W closed during construction. Trail would be replaced with the project. • City of Bloomington trail along north side of Minnesota River closed during construction. Trail crossing under I-35W Minnesota River Bridge to be constructed with the project.	• Trails designed and constructed to meet ADA requirements. • Trail closure signs to be provided during construction. • Alternate pedestrian routes (APR) to be identified in Transportation Management Plan during final design.
Section 7 – Endangered Species Act	• No federally-listed mussels identified in Minnesota River (July 2017 survey). • No effect determination for Higgins eye pearlymussel, snuffbox, prairie bush clover, and rusty patched bumble bee. • May affect but will not cause prohibited incidental take of northern long-eared bat.	• Before construction, remove or slide expansion joint gaskets between Nov. 1 and Jan. 31 to increase airflow and moisture entering expansion joints. • Before construction, coordinate with Bloomington or USFWS to place single Rocket Box Bat House adjacent to I-35W Minnesota River Bridge. • Remove trees in winter (Nov. 1 to Mar. 31).
Section 4(f) – Parks, Recreation Areas, Wildlife and Waterfowl Refuges, and Historic Sites	• No Section 4(f) involvement for City of Burnsville trail. Limited use permit (LUP) with MnDOT for trail to be in highway right of way. • Section 4(f) temporary occupancy of Minnesota River State Water Trail. • Section 4(f) temporary occupancy of City of Bloomington Trail. • See correspondence in	• Coordinate timing of Minnesota State Water Trail closures with DNR. • Provide signs along Minnesota River and at Russell A. Sorenson landing regarding State Water Trail closures. • Provide signs along City of Bloomington Trail regarding closures during construction.

Issue Area	Anticipated Impact/Benefits	Mitigation Measures
	Appendix J.	• Coordinate trail detour route with City of Bloomington. • Restore City of Bloomington Trail following construction. • Maintain causeway along north shoreline for gravel access road and planned Minnesota Valley State Trail extension (30-foot wide typical section, see Exhibit E12, Appendix E).
Section 106 – Historic and Archaeological Resources	No historic properties affected determination from MnDOT Cultural Resources Unit (CRU).	• Install fencing surrounding site 21HE497 prior to the start of construction. • Install fencing along north construction limit at proposed stormwater pond site to prevent impacts to possible mound site north of construction area. • Fencing to be inspected by MnDOT CRU staff prior to the start of construction.
Construction Impacts	• Dust generated during construction. • Construction noise. • Vibrations from pile driving for bridge pier and retaining wall construction. • Ground disturbance, tree removal, and sedimentation in Minnesota River. • Temporary disruptions to Minnesota River navigation and boating. • Delays on I-35W because of reduced capacity during construction. • Diversion of traffic to parallel routes crossing the Minnesota River (e.g., US 169, TH 77). • Temporary closures of northbound I-35W entrance ramp and southbound I-35W exit ramp at Cliff Road. • Temporary closures for through traffic on West 106th Street during bridge construction.	• MnDOT standard BMPs for dust control • MnDOT standard specifications for construction noise. High-impact noise prohibited during nighttime hours. • Prepare building susceptibility studies for any properties potentially affected by vibrations. • Prepare SWPPP. Implement erosion control BMPs during construction. Implement in-water BMPs during construction. • Navigation channel to remain open as required by US Coast Guard. • Maintain traffic on I-35W during construction. • When I-35W is restricted to five lanes, provide two general purpose lanes in each direction and a reversible MnPASS lane in the peak period/peak direction. • When I-35W is not restricted to five lanes, a minimum of six lanes will be maintained (two general purpose lanes and one MnPASS lane in

Issue Area	Anticipated Impact/Benefits	Mitigation Measures
		each direction). • Ramp closures at I-35W/ Cliff Road interchange allowed for a period not to exceed 90 days. • Contractor required to maintain access to Black Dog Road and West 106th Street at all times during construction. Detour routes to be provided. • Transportation Management Plan (TMP) developed during final design. Complete outreach to affected stakeholders.
Economics	None.	None.
Farmland Protection Policy Act	None.	None.
Floodplains	• Approximately 33,000 cubic yards of fill. • Transverse floodplain impact (approximately 4,900 feet). • No impact to floodway width or 100-year flood elevation on the Minnesota River. • No rise certification (see Hydraulic Analysis in Appendix I).	• Retaining walls to minimize floodplain fill. • Provide 1:1 compensatory storage (to be identified in final design).
Indirect Effects	None.	None.
Section 404 – Clean Water Act and Section 10 – Rivers and Harbors Act	See aquatic resource impacts discussion above.	Secure Section 404/Section 10 permit and provide mitigation through MnDOT and BWSR Cooperative Wetland Replacement Program.
Section 6(f) – Land and Water Conservation (LAWCON) Act	None.	None.
Transit	• MnPASS lanes accommodated on I-35W Minnesota River Bridge. • Temporary travel time delays/disruptions during construction.	• Reversible MnPASS lane provided during construction. • Coordination with transit providers during construction. • Public information regarding transit routes, schedules, delays, etc. provided during construction.

1.5 Opportunities for Public Comment

Comments on this document may be submitted in writing or verbally at the informational meeting/public hearing during the public comment period (for details, see the transmittal letter distributing this EA). Written comments should be sent to:

Rick Dalton, Environmental Coordinator
MnDOT Metro District
1500 West County Road B2
Roseville, MN 55113
Richard.Dalton@state.mn.us

The EA and additional project information can be found online at http://www.dot.state.mn.us/metro/projects/i35wbloomington/index.html

Hard copies of the EA can be reviewed at the MnDOT Metro District Office (1500 West County Road B2, Roseville), the MnDOT Central Library (395 John Ireland Boulevard, St. Paul), as well as several locations in the project area, including the following city halls and public libraries:

Dakota County

Burnsville City Hall
100 Civic Center Parkway
Burnsville, MN 55337

Burnhaven Library
1101 W County Road 42
Burnsville, MN 55306

Hennepin County

Bloomington City Hall
1800 West Old Shakopee Road
Bloomington, MN 55431

Penn Lake Library
8800 Penn Avenue S.
Bloomington, MN 55431

Chapter 2 Report Purpose

This Environmental Assessment (EA) provides background information for the proposed bridge and road construction project on Interstate Highway 35W (I-35W) in the cities of Burnsville and Bloomington in Dakota and Hennepin counties. This document includes a discussion of:

- Need for the proposed project;
- Alternatives considered;
- Environmental impacts and mitigation; and,
- Agency coordination and public involvement.

This EA was prepared as a part of the National Environmental Policy Act (NEPA) process and state environmental review process to fulfill requirements of both 42 USC 4332 and M.S. 116D. At the federal level, the EA is used to provide sufficient environmental documentation to determine the need for an Environmental Impact Statement (EIS) or that a Finding of No Significant Impact (FONSI) is appropriate. At the state level, the EA is used to provide sufficient environmental documentation to determine the need for a state EIS or that a Negative Declaration is appropriate.

At the state level, this document also serves as an Environmental Assessment Worksheet (EAW). Minnesota Rules 4410.1300 allows the EA to take the place of the EAW form, provided that the EA addresses each of the environmental effects identified in the EAW form. This EA includes each of the environmental effects identified in the EAW form.

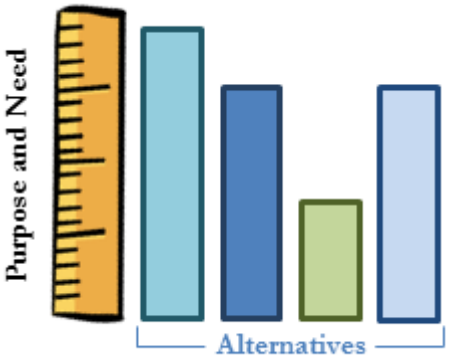
The Minnesota Department of Transportation (MnDOT) is the proposer and Responsible Governmental Unit for this project. Preparation of an EAW is considered mandatory under Minnesota Rules 4410.4300 subp. 1, and under the following subsection:

4410.4300 subp. 22 (B) – For construction of additional travel lanes on an existing road for a length of one or more miles.

This document is made available for public review and comment in accordance with the requirements of 23 CFR 771.119 (d) and Minnesota Rules 4410.1500 through 4410.1600.

Chapter 3 Purpose and Need for Project

3.1 What are Purpose and Need?



The purpose and need for a project define the transportation problems that the project will address. The purpose and need also act as "measuring sticks" for the project alternatives, helping determine to what extent each alternative meets each project need. Alternatives that do not meet the project purpose of the project are not studied further. Assuming all other concerns are equal, if one alternative meets the project purpose and need better than another, then that alternative may be identified as the Preferred Alternative.

The purpose and need also help decide where a project will begin and end by defining the "who, what, where, when and why" of the transportation needs. This allows an agency to create alternatives that satisfy the project's needs.

The Purpose and Need section of this EA has been divided into three subsections: Project Needs, Additional Considerations, and Project Purpose to help the reader better understand how the transportation problem has been solved. The Project Needs section discusses transportation problems identified within the project area. The Additional Considerations section discusses other goals and objectives that will guide project development and the alternatives evaluation process. The Purpose section identifies the objectives for addressing the project's needs that are to be met by project alternatives, and summarizes other concerns that were considered when developing and evaluating alternatives. Alternatives that do not meet the transportation purpose are not considered viable, and therefore, are not analyzed in this EA. See Chapter 4 "Alternatives Considered but Rejected" for additional information.

3.2 Primary Need: A Structurally Sound Minnesota River Crossing at I-35W Between Burnsville and Bloomington

The primary reason for this project is to address the deteriorating condition of the existing I-35W Bridge structure over the Minnesota River. Additional information regarding the structural issues associated with the existing bridge crossing is summarized below.

3.2.1 Background Information

The existing I-35W Bridge over the Minnesota River (MnDOT Br. No. 5983) was constructed in 1957 and currently carries approximately 114,100 vehicles per day (vpd). The bridge is a seven-span, continuous steel girder structure (with pinned hanger assemblies). The total length of the structure is 1,387 feet with minimum span lengths of 169.5 feet and maximum span lengths of 224 feet. The piers are of the single column hammer-head type supported on driven steel piles. The parapet seat abutments are hollow with open chambers under the roadway slab.

The existing I-35W Minnesota River Bridge is 103 feet wide. There are seven lanes on the bridge: four southbound lanes and three northbound lanes. The inside lane in both directions operates as a MnPASS lane during peak periods.

3.2.2 Rehabilitation, Maintenance and Inspection History

At nearly 60 years old, the I-35W Minnesota River Bridge is reaching the end of its useful life. Substantial maintenance needs are anticipated in the future, requiring extensive levels of investment. The bridge was painted, redecked and widened in 1985 by extending the piers using a post-tensioned concrete cap.[1] A stormwater trough system was added to the bridge in 2008 to collect runoff and direct it to stormwater ponds located along the Minnesota River.

The most recent inspection of Br. No. 5983 was conducted in September 2014 and noted the following conditions:

- Superstructure: In 1982, a bottom flange cover plate was observed to have cracked and a splice plate was added. Pack rust is evident along the bottom flange of the steel girders, and at various connections on the riveted girders with ½-inch thick pack rust between one of the beams and the cross bracing connection plate at Joint Number 1 (south end of the I-35W Minnesota River Bridge). The 2011 inspection noted a 25 percent failure of the paint system and the onset of section loss was noted in flanges, particularly near hinge areas due to joint leakage.
- Pinned Assemblies: A special element inspection was performed on the pins in 2010, and no defects were found.[2]

[1] Post tensioning is a technique for reinforcing concrete with high-strength steel bars.

[2] A pinned assembly is a unique bridge component used to connect structural elements that allows for movement of the bridge superstructure (e.g., bridge girders, beams, arches, trusses, etc.).

- Joints: In 2008, a strip seal joint was replaced at the north abutment and the hinge at span 3. In 2011, leaking was identified at Joint No. 6 under beams 10 and 11. The modular joints have undergone numerous repairs. In 1996, the north modular joint at span 5 failed. In 1998, rubber equalizers failed. In 2011, two rubber equalizers were missing between beams 3 and 4 with a joint leaking between beams 3 and 4.
- Bearings: Elatometric pads at the south abutment were reset in 1991 due to movement. Girder 11 at the north abutment is not in contact with the bearing. Metal parts of all bearings show paint failure, rusting, and debris buildup.
- Deck: The 2014 inspection noted that numerous one to two square-foot sized spalls were present in the deck overlay. The 2011 inspection of the deck slab noted over 29,000 feet of cracks with a longitudinal crack along the entire length of the bridge at the construction joint and full width transverse cracking every 6 to 10 feet with some approaching "severe" width in size. The underside of the deck is exhibiting water saturation and delamination sufficient to expose reinforcement.
- Substructure: The north abutment has experienced movement to the west of over four inches since 1990. The 2010 bridge inspection also noted the presence of water moving through the chambers in the abutment. The ends of the post-tensioned pier caps have been showing signs of deterioration and cracking since 1993. An underwater inspection of Piers 2 and 3 in 2012 indicated that the substructure components were good condition with light to moderate debris accumulation and minor channel bottom degradation since 2008.
- Approaches and Barriers: The concrete approach slabs were overlaid with bituminous asphalt in 1994. The approach slabs show signs of settlement at the center median and have been continuously patched. The concrete railings exhibit numerous areas of deterioration, including cracking, spalling, and delamination. Impact damage from vehicles is also evident.

3.2.3 Condition Summary

The deck is currently in fair condition (National Bridge Inventory condition 5) with portions exhibiting substantial cracking and underside delamination which poses a potential safety hazard of falling debris into the Minnesota River. The deck and joints will require significant rehabilitation within the next 5 to 10 years and complete replacement within 10 to 15 years.

The steel girders are in good condition but indicate the onset of section loss due to corrosion, localized pack rust, and coating failure (i.e., paint system) of approximately 25 percent. The unique pinned hanger assemblies require specialized inspection every 48 months, representative of their substantial potential risk should any one pin fail.

The post tensioned pier caps added in 1995 effectively prevent the ability to widen the existing bridge any further in the future (see "River Crossing Capacity" section below). Further, the caps show signs of deterioration and will require rehabilitation or complete replacement within the next 10 to 15 years. Movement of the abutments is expected to continue and require corrective action.

The overall condition rating of the bridge is fair with a Sufficiency Rating of 84.0 and no vehicle load posting requirements; however, normal, progressive deterioration will require substantial rehabilitation and or replacement of bridge elements within the next 5 to 15 years. Further, the structural detailing and high daily traffic loads indicate that the steel girders are likely nearing the end of their design fatigue life after 60 years of continuous service.

3.3 Secondary Needs

3.3.1 Provide a Structurally Sound Bridge at I-35W and West 106th Street in Bloomington

Background Information

The I-35W bridges over West 106th Street in Bloomington were constructed in 1957. MnDOT Br. No. 9043 carries southbound I-35W over West 106th Street. MnDOT Br. No. 9044 caries northbound I-35W over West 106th Street. Br. No. 9043 and Br. No. 9044 are three-span, continuous steel beam bridges. One bridge pier is located along the north side of West 106th Street. Another bridge pier is located along the south side of West 106th Street. Sidewalks are located along West 106th Street between the bridge piers and slope pavement. The total length of each structure is 141 feet. The main spans over West 106th Street are 61 feet long. The deck width on Br. No. 9043 is 55.0 feet. The deck width on Br. No. 9044 is 59.3 feet. There are three lanes on the southbound I-35W bridge and four lanes on the northbound I-35W bridge.

Rehabilitation, Maintenance and Inspection History

The I-35W bridges over West 106th Street were last rehabilitated in 1984. The bridges were widened and redecked, the steel beams were painted, and the approach slabs were replaced. Other routine maintenance activities completed since the 1984 rehabilitation project includes removal of deck delamination, expansion bearing maintenance, and slope maintenance.

The most recent inspection of Br. No. 9043 and Br. No. 9044 was conducted in April 2015 and noted the following conditions:

- Superstructure: In 1972, two beams were added to Br. No. 9044 as part of a bridge widening project. Two beams were added to Br. No. 9043 and Br. No. 9044 with the 1984 rehabilitation and widening project. The 1997 inspection noted that the paint system is deteriorating, and pack rust is evident along the bottom flange of the steel girders. The 1997 inspection observed a possible weld crack in a web reinforcement plate on Beam 7 on Br. No. 9043. The 2015 inspection noted that the beam ends on Br. No. 9044 are showing major rust and corrosion.
- Joints: In 2004 and 2015, a strip seal deck joint was leaking at the south abutment of Br. No. 9043. In 2007, a strip seal deck joint was leaking in the southeast corner of Br. No. 9044. In 2004, an end block joint on Br. No. 9043 had 48 linear feet of seal missing. In 2015, the poured seal joints on Br. No. 9043 and Br. No. 9044 failed.
- Bearings: In 1977, the rocker bearings were jacked and shimmed on both bridges, and rusted pins were replaced. In 2002, the rockers were reset on Br. No. 9043. The 2015 inspection noted that abutment rocker bearings were tipped, and appeared to be froze on two beams on Br. No. 9043. Severe rust was observed on all the bearing assemblies on Br. No. 9043.
- Deck: The 1994 inspection noted transverse leaching cracks on the underside of both bridges. The 2013 inspection noted 8 square feet of delamination on the north end of Br. No. 9044 over the sidewalk, and 20 square feet of delamination over the slope paving. The 2015 inspection noted 10 square feet of delamination on Br. No. 9043.
- Slopes and Slope Protection: The south slope paving on Br. No. 9043 has minor spalls and settling. The 2002 inspection noted that the seal at the top of the slope on Br. No. 9044 was starting to fail. The 2015 inspection noted that the south slope paving on Br. No. 9044 is collapsing on the east end of the slope.

- Approaches and Barriers: The concrete approach slabs show cracking and spalling. The concrete railings exhibit vertical cracks, minor spalling, and surface scaling.

Condition Summary

The decks on Br. No. 9043 and Br. No. 9044 are currently in good condition (National Bridge Inventory condition 7). The concrete approach slabs and deck surfaces on both bridges exhibit cracking. The undersides on both bridges have transverse leaking cracks. The bridge decks are scheduled for rehabilitation within the next 10 years.

The superstructures on Br. No. 9043 and Br. No. 9044 are currently in fair condition (National Bridge Inventory condition 5). Paint is deteriorating on the steel beams, and surface rust is present. The beam ends on Br. No. 9044 are showing major rust and corrosion.

The overall condition rating of Br. No. 9043 is fair with a Sufficiency Rating of 80.4. The overall condition rating of Br. No. 9044 is fair with a Sufficiency Rating of 80.5. There are no vehicle load posting requirements on either bridge. Normal, progressive deterioration will require rehabilitation and/or replacement of bridge elements in the near future.

3.3.2 Maintenance of Traffic During Construction

Maintenance of traffic (MOT) is a term used to describe transportation management during a highway construction project. Maintenance of traffic can include full closure of a roadway with detours for the duration of construction, short-duration closures (e.g., weekend closures) and detours, reductions in the number of lanes, and/or maintaining the existing number of lanes during construction. Maintenance of traffic not only addresses vehicular traffic, but other modes of transportation as well (e.g., river navigation, non-motorized transportation). Maintenance of traffic is addressed in the following four sub-sections:

- Keep I-35W across the Minnesota River open during construction;
- Keep MnPASS lanes open during construction;
- Keep I-35W bus routes and future Orange Line Bus Rapid Transit open during construction; and
- Keep Minnesota River navigation open during construction.

Keep I-35W Across Minnesota River Open During Construction

The I-35W Bridge over the Minnesota River currently carries on average approximately 114,100 vpd. Year 2012 heavy commercial annual average

daily traffic (HCAADT) volume on the I-35W Minnesota River Bridge was 12,200 vpd (approximately 10 percent of the total volume). The two nearest parallel Minnesota River crossings are the TH 169 Bloomington Ferry Bridge to the west (approximately 5.5 miles) and the TH 77 Cedar Avenue Bridge to the east (approximately 3.5 miles). If the I-35W Minnesota River Bridge were to be closed during construction, these two bridges would carry the additional re-routed traffic. This would cause additional congestion and substantial delays at these river crossings.

MnDOT also completed an Allowable Lane Closure Report for the I-35W Minnesota River Bridge in 2011. An Allowable Lane Closure analysis looks at 24-hour weekday and weekend traffic volumes by direction (e.g., northbound and southbound I-35W) and is used to determine the appropriate time of day for potential lane closures on trunk highway and interstates in the Twin Cities area. Average weekday volumes on northbound I-35W during the morning and afternoon periods were greater than 4,000 vehicles. Average weekday volumes on southbound I-35W were greater than 5,000 vehicles during the afternoon period. These volumes indicate that zero lane closures would be acceptable on northbound and southbound I-35W during peak periods.

In addition, the I-35W corridor is a primary evacuation route for the Twin Cities Metropolitan Area.[3] Continuous access across the Minnesota River at I-35W is necessary for I-35W to function in this role.

Keep MnPASS Lanes Open During Construction

MnPASS lanes in the Twin Cities Metropolitan Area typically operate from 6:00 A.M. – 10:00 A.M. and 3:00 P.M. – 7:00 P.M. These lanes are free for transit buses, motorcycles and High Occupant Vehicles (HOV), which is a vehicles with more than one person in the vehicles. Single Occupant Vehicles are charged a fee to drive in the MnPASS lane.

MnPASS lanes are located on both northbound and southbound I-35W, including on the existing I-35W Bridge over the Minnesota River. MnPASS lanes are free for buses, carpools, and motorcycles. Solo drivers can use the I-35W MnPASS lanes by paying a fee. Fees are enforced on weekdays during peak travel times. Northbound I-35W from Crystal Lake Road to TH 62 (Crosstown Highway) is tolled during the morning peak hours from 6:00 A.M. to 10:00 A.M. Southbound I-35W south of I-494 is tolled during the afternoon peak hours from 3:00 P.M. to 7:00 P.M. MnPASS express lanes benefit commuters by providing a more predictable and reliable travel time, reduced congestion, and improved traffic flow.

The I-35W MnPASS lanes are critical in serving commuters and providing reliable transit service between south Metro communities

[3] Source: Minnesota Department of Transportation. 2005. *Metro Evacuation Traffic Management Plan*. Prepared by URS Corporation.

and downtown Minneapolis. More than 1,500 vehicles currently use the northbound I-35W MnPASS lane on the Minnesota River bridge during the A.M. peak hour, while approximately 900 vehicles currently use the southbound I-35W MnPASS lane during the P.M. peak hour.

Keep I-35W Bus Routes and Orange Line Bus Rapid Transit (BRT) Open During Construction

Four express bus routes operated by Minnesota Valley Transit Authority and one operated by Metro Transit currently use the I-35W project corridor (see Table 3.1). A total of 170 daily express bus trips use the I-35W Minnesota River Bridge to connect commuters in communities south of the Minnesota River to destinations in downtown Minneapolis. These express bus routes will also use the MnPASS lanes.

Table 3.1 Existing I-35W Bus Routes

Route #	Type	Service Times (1)	Frequency	# of Daily Northbound I-35W Trips	# of Daily Southbound I-35W Trips	Total # of Daily Trips
460	Express (Burnsville-Minneapolis)	Weekday A.M. and P.M. peak periods	5-15 min.	34	30	64
464	Express (Savage-Burnsville-Minneapolis)	Weekday A.M. and P.M. peak periods	10-30 min.	11	10	21
465	Express (Burnsville-Minneapolis-Univ. of MN)	Weekday A.M. and P.M. peak periods and midday hours	30 min. (A.M. and P.M. peak periods) 60 min. (midday)	24	27	51
467	Express (Lakeville-Minneapolis)	Weekday A.M. and P.M. peak periods	10-20 min.	14	14	28
491	Express (Scott County-Minneapolis Reverse)	Weekday A.M. and P.M. peak periods	2-4 trips	2	4	6
			Total	85	85	170

(1) Weekday rush hours are defined as from 6:00 A.M. to 9:00 A.M. and from 3:00 P.M. to 6:30 P.M. Midday hours run from 9:00 A.M. to 3:30 P.M.

Source: Minnesota Valley Transit Authority. 2015. http://www.mvta.com/routes/ and Metro Transit. 2015. https://www.metrotransit.org/Route/467

The METRO Orange Line is a planned bus rapid transit (BRT) line that extends along I-35W between Burnsville and downtown Minneapolis. The Orange Line BRT is planned to provide all-day, frequent BRT service seven days a week. One BRT station is currently planned south of the Minnesota River at the Burnsville Transit Station (Orange Line BRT southern terminus) (east of I-35W at TH 13 and Nicollet Avenue). In the future, the METRO

Orange Line BRT has the potential to be extended further south to Lakeville. The METRO Orange Line BRT Project is expected to be complete and open to service in 2019.[4] The BRT vehicles will travel in the MnPASS lanes while on I-35W. Continuous access across the Minnesota River at I-35W is necessary to provide and maintain transit services.

Keep Minnesota River Navigation Open During Construction

The Minnesota River provides access for barges and other river traffic. The I-35W Minnesota River Bridge is located at River Mile 10.8. Upriver from the I-35W Bridge are seven barge terminal facilities that handle various commodities including agricultural products and fertilizer, salt, and aggregates.[5] The tonnage of commodities shipped out of Minnesota River ports in Savage over the past 20 years from 1995 to 2014 have ranged from a low of approximately 1.4 million tons in 2013 to approximately 5.8 million tons in 1999. This equates to approximately 300 to 1,300 barges per year traveling under the I-35W Minnesota River Bridge (i.e., the number of barges traveling down river to the confluence of the Minnesota and Mississippi rivers plus the number of barge tows coming back upriver to Minnesota River ports).

Recreational users also have access to the Minnesota River. There are three public water access sites along the Minnesota River from its confluence with the Mississippi River to the I-35W Bridge, including the Russell A. Sorenson Landing in Bloomington along the east side of I-35W. The Minnesota River is also a designated State Water Trail. It is economically important to ensure that the Minnesota River remains open to navigation to the maximum extent possible during construction. The USCG, which also has jurisdiction over structures spanning the Minnesota River navigational channel, will also require this.

3.3.3 Future River Crossing Capacity (Beyond Year 2040)

The I-35W Minnesota River Bridge was last widened in 1985 to add an additional travel lane and outside (right) shoulders in each direction. Widening the bridge required post tensioning the existing pier caps, which effectively prevents widening the bridge any further. Widening the existing bridge could be accommodated by constructing a new pier adjacent to the

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[4] Metro Transit. December 2015. METRO *Orange Line Project Frequently Asked Questions* accessed 2015-06-08 at http://www.metrotransit.org/orange-line-faqs.

[5] Minnesota Department of Transportation. Ports and Waterways Section. March 2011. *Minnesota's River Terminals.*

existing structure; however, the amount of widening that could be accommodated under this scenario is limited.

The existing (year 2013) traffic volume on the I-35W Minnesota River Bridge is approximately 114,100 vpd. The future (year 2040) traffic volume for I-35W Minnesota River Bridge is projected to be approximately 136,700 vpd. Year 2040 is 20 years after the anticipated year of project completion and is the current horizon year for travel demand modeling and transportation planning in the Twin Cities Metropolitan Area. However, a major river crossing project such as the I-35W Minnesota River Bridge represents a long-term infrastructure investment beyond the typical 20-year planning horizon. Increases in traffic volumes could exceed the capacity of the I-35W Minnesota River crossing at some point in the future beyond year 2040, resulting in substantial traffic delays and potential related safety issues. Therefore, there is a need to not preclude the ability to address future I-35W river crossing capacity needs.

3.3.4 Safety and Traffic Operations

Safety

The segment of I-35W between the Cliff Road interchange and the West 106th Street interchange experienced 241 crashes for the three-year period from 2010 to 2012. Of the 241 reported crashes for this segment of I-35W, 113 crashes (approximately 47 percent) were rear-end crashes that occurred in the northbound lanes. Moreover, more than two-thirds of the northbound I-35W rear-end crashes (79 of the 113 northbound crashes) occurred during the morning peak hours of 6:00 A.M. to 9:00 A.M. Rear-end crashes are often associated with areas of congestion on freeway facilities, where higher-speed approaching vehicles reach the slower-moving vehicles already in the traffic queue, or with stop and go conditions within the queue. More than 50 northbound I-35W morning peak hour crashes occurred near Cliff Road (see Figure 3.1) during the three-year period from 2010 to 2012. The area south of the northbound I-35W exit ramp to Cliff Road experienced nearly 35 rear-end crashes, whereas the area between the northbound exit and entrance ramps at Cliff Road experienced 15 rear-end crashes. This indicates that the downstream bottleneck on northbound I-35W may be contributing to congestion-related, rear-end crashes.

Figure 3.1 General Location of Northbound I-35W Crashes During the A.M. Peak Period

Traffic Operations

Metropolitan Freeway System 2014 Congestion Report

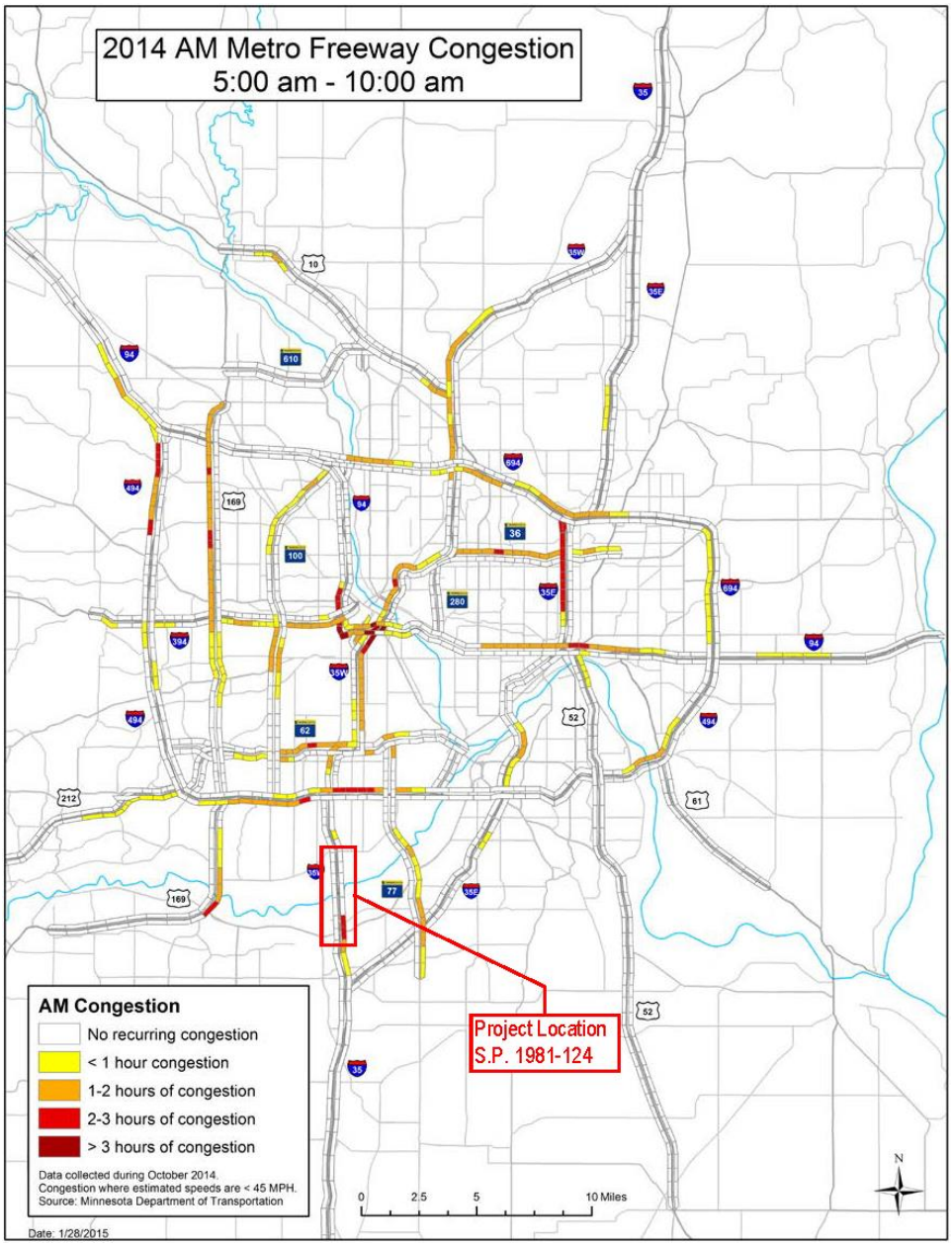
MnDOT annually prepares the Metropolitan Freeway System Congestion Report. This report documents recurring congestion on segments of the Twin Cities freeway system. Congestion is defined as traffic flowing at speeds less than or equal to 45 miles per hour (MPH), and does not include delays that may occur at speeds greater than 45 MPH. Congestion data is collected by detectors in roadways and field observations by MnDOT staff. Traffic data from the month of October is used for the congestion reports as this month generally reflects normal patterns of traffic.

The *Metropolitan Freeway System 2014 Congestion Report* includes freeway maps which display color coding corresponding to a certain number of hours of recurring congestion during the morning and afternoon.[6] The figures in the congestion reports use a range of color coding to indicate the level of congestion; no color represents no recurring congestion while gradually moving to a dark red color that represents multiple hours of recurring congestion. The morning (5:00 A.M. to 10:00 A.M.) congestion figure from the *Metropolitan Freeway System 2014 Congestion Report* is included in Figure 3.2.

The northbound segment of I-35W at the Cliff Road interchange currently experiences two to three hours of congestion (i.e., speeds less than 45 MPH) during the morning period. Nearly 1,000 vehicles currently access northbound I-35W at the Cliff Road interchange during the morning peak hour, causing northbound I-35W to reach capacity. This along with congestion at the TH 13 interchange results in back-ups and congestion on northbound I-35W that extends south to the I-35W/I-35E split in Burnsville, where less than one hour of congestion is experienced.

[6] The *Metropolitan Freeway System 2014 Congestion Report* defines the morning as the five hour period from 5:00 A.M. to 10:00 A.M. The afternoon is defined as the five hour period from 2:00 P.M. to 7:00 P.M.

Figure 3.2 2014 Metro Freeway Congestion (Morning)



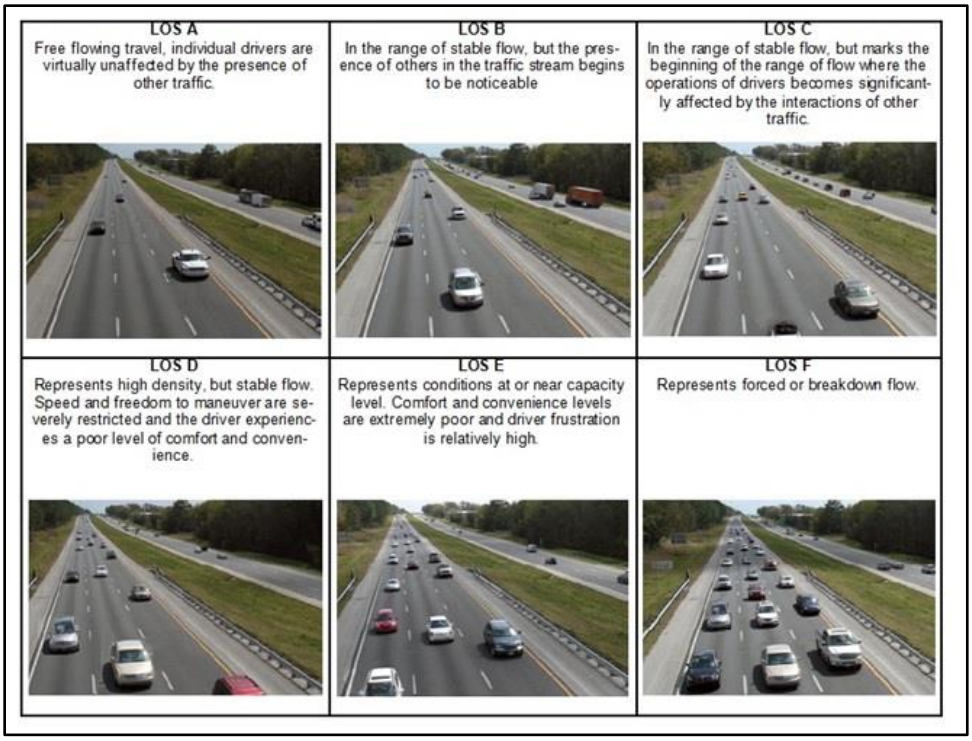
Source: Minnesota Department of Transportation. Metro District Office of Operations and Maintenance. Regional Transportation Management Center. May 2015. Metropolitan Freeway System 2014 Congestion Report.

Operational Traffic Analysis (Existing Conditions)

An operational traffic analysis was conducted as part of the I-35W Minnesota River Bridge Project. A CORSIM traffic model was developed to simulate travel lane conditions during the morning and afternoon peak hours for existing (year 2013) conditions. A future year 2040 model was also developed incorporating programmed highway improvements and forecast year 2040 traffic volumes.

The CORSIM modeling results are expressed in terms of Level of Service (LOS), a grading system of A-F for congestion on the freeway. The LOS for freeway segments is based on vehicle density, as measured in vehicles per lane per hour. Figure 3.3 illustrates the relationship of LOS A-F in terms of density of vehicles (cars, buses, freight) on the freeway. Vehicle speeds on the freeway can be maintained at higher densities (i.e., LOS C and D), however; as the density increases at LOS E and F, the freeway approaches capacity, speeds fluctuate, and traffic flow breaks down.

Figure 3.3 Freeway Traffic Flow Characteristics by Level of Service



Source: *2010 Highway Capacity Manual*. Transportation Research Board. 2010.

Traffic operations analysis results for I-35W under existing conditions during the A.M. and P.M. peak hours are tabulated in Table 3.2. Figure 3.4 illustrates the locations along northbound I-35W that currently experience LOS F conditions during the A.M. peak hour, as well as the duration of the

congested conditions during the A.M. peak period (i.e., 1-2 hours). The LOS results shown in Table 3.2 and illustrated in Figure 3.4 are for the I-35W general purpose lanes only, and do not include operations results for the northbound and southbound MnPASS lanes.

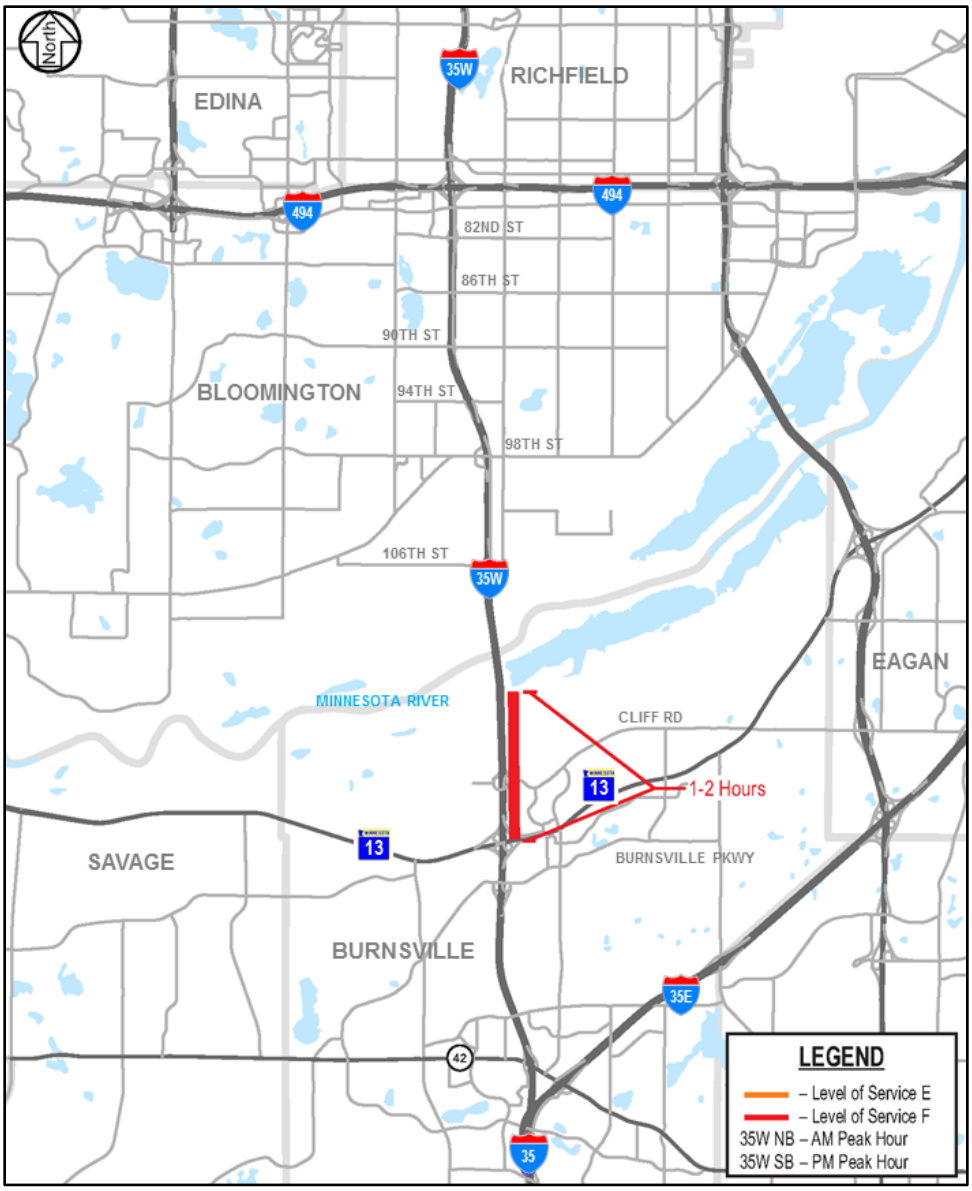
Northbound I-35W currently operates at an LOS F during the A.M. peak hour from the TH 13 interchange to the Black Dog Road interchange. As noted above, about 1,000 vehicles enter northbound I-35W at Cliff Road during the A.M. peak hour. This forces the two northbound general purpose lanes to reach capacity and creates congestion and operational problems on northbound I-35W north of Cliff Road, resulting in traffic queues that spill back south of Cliff Road. North of the Black Dog Road interchange, northbound I-35W operates at LOS D or better during the A.M. peak hour. Both northbound and southbound I-35W operate at LOS D or better during the P.M. peak hour.

Table 3.2 Existing Level of Service Analysis Results

From	To	NB I-35W (A.M. Peak Hour)	SB I-35W (A.M. Peak Hour)	NB I-35W (P.M. Peak Hour)	SB I-35W (P.M. Peak Hour)
CSAH 42	Burnsville Pkwy	B	A	B	C
Burnsville Pkwy	TH 13	D	A	B	B
TH13	Cliff Road	**F**	A	B	B
Cliff Road	Black Dog Road	**F**	A	C	C
Black Dog Road	West 106th Street	D	A	B	C
West 106th Street	West 98th Street	C	B	B	D
West 98th Street	West 94th Street	C	B	B	C

Existing level of service analysis results for I-35W general purpose lanes only. Does not include MnPASS lanes.

Figure 3.4 Existing Conditions Level of Service Analysis Results



Operational Traffic Analysis (Year 2040 No Build Alternative)

Traffic operations analysis results for I-35W under the future (year 2040) No Build Alternative conditions during the A.M. and P.M. peak hours are tabulated in Table 3.3. Northbound I-35W is projected to operate at LOS F during the A.M. peak hour from the County State Aid Highway (CSAH) 42 interchange to the Black Dog Road interchange. The duration of these poor operations is projected to increase under the 2040 No Build Alternative. Northbound I-35W is expected to operate at LOS F for 2-3 hours in the morning period (6:00 A.M. to 9:00 A.M.) from the Black Dog Road interchange to the Burnsville Parkway interchange, and for 1-2 hours from the Burnsville Parkway interchange to CSAH 42. Northbound I-35W is

projected to operate at LOS D or better during the P.M. peak hour under the 2040 No Build Alternative. The segment of southbound I-35W from West 106th Street to 98th Street is projected to operate at an LOS F in the P.M. peak hour under the 2040 No Build Alternative. Poor operations on this segment of southbound I-35W are caused by merging traffic between the West 106th Street and 98th Street interchanges.

Table 3.3 2040 No Build Alternative Level of Service Analysis Results (1)

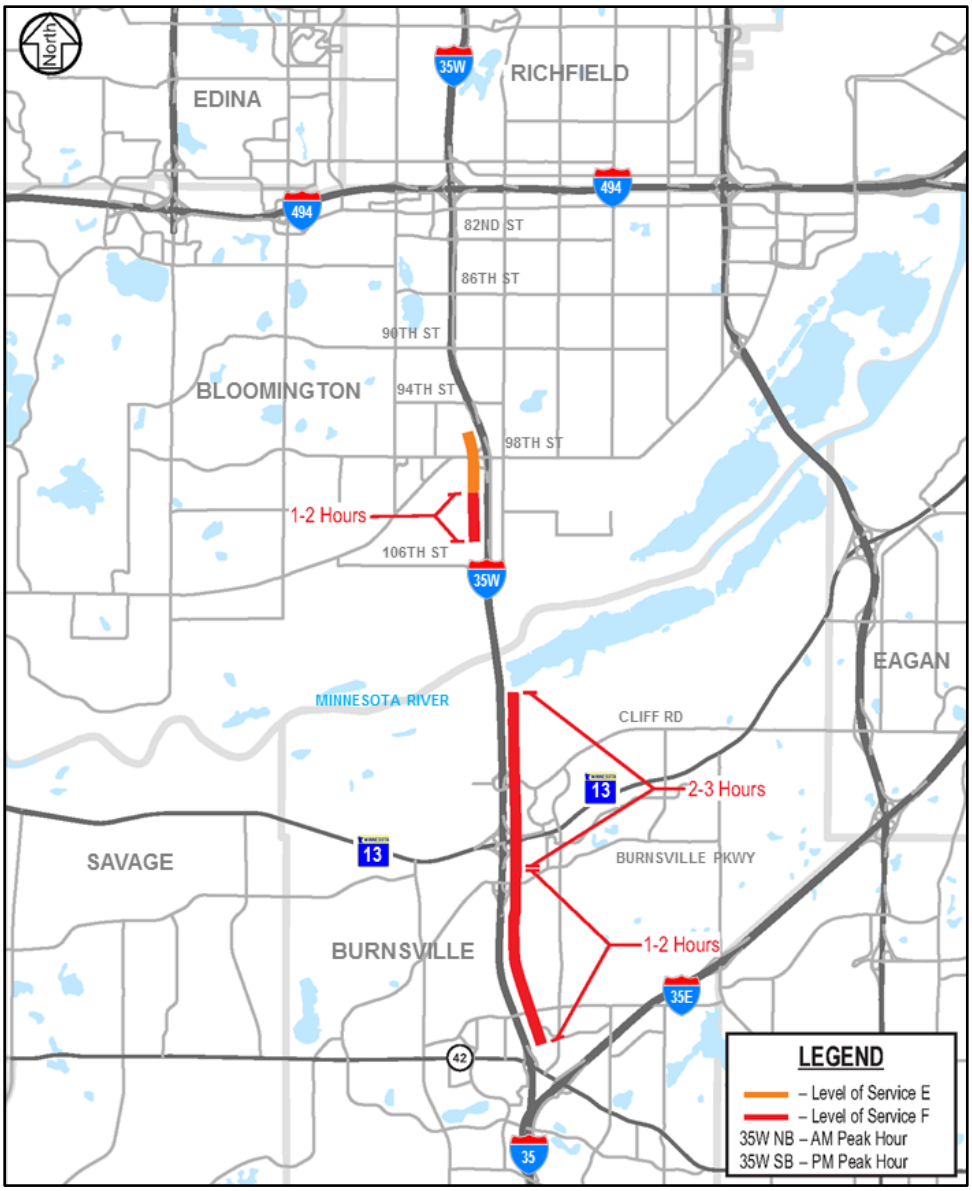
From	To	NB I-35W (A.M. Peak Hour)	SB I-35W (A.M. Peak Hour)	NB I-35W (P.M. Peak Hour)	SB I-35W (P.M. Peak Hour)
CSAH 42	Burnsville Pkwy	F	B	B	C
Burnsville Pkwy	TH 13	F	A	B	C
TH 13	Cliff Road	F	A	B	B
Cliff Road	Black Dog Road	F	B	D	C
Black Dog Road	West 106th Street	D	B	C	D
West 106th Street	West 98th Street	C	B	B	F
West 98th Street (2)	West 94th Street	C	B	B	D

(1) 2040 No Build Alternative level of service analysis results for I-35W general purpose lanes only. Does not include MnPASS lanes.

(2) Southbound I-35W between the 98th Street exit and entrance ramps is projected to operate at LOS E under 2040 No Build Alternative conditions (see Figure 3.5).

The LOS analysis results tabulated in Table 3.3 are illustrated in Figure 3.5. Figure 3.5 also illustrates the duration of congested conditions on northbound I-35W during the A.M. peak period and on southbound I-35W during the P.M. peak period. As shown in Figure 3.5, congestion on northbound I-35W from Black Dog Road to Burnsville Parkway is projected to last for two to three hours during the A.M. peak period under the 2040 No Build Alternative.

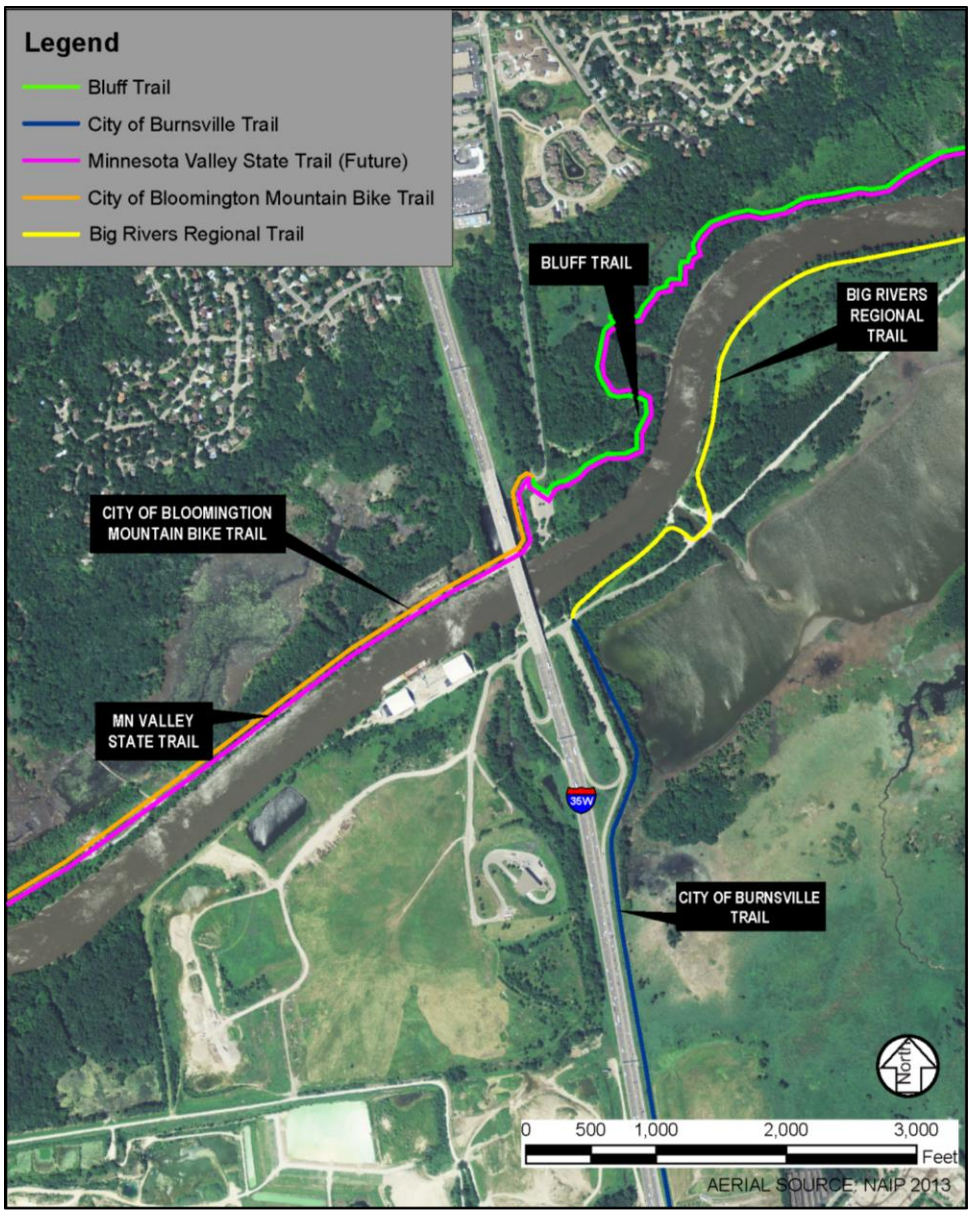
Figure 3.5 2040 No Build Alternative Level of Service Results



3.3.5 Bicycle and Pedestrian Connectivity

There are numerous existing and planned trail facilities on the north and south sides of the Minnesota River near the existing I-35W Bridge. Existing and planned trail facilities within the project area are illustrated in Figure 3.6 and described below.

Figure 3.6 Trails Within the Vicinity of the I-35W Minnesota River Bridge

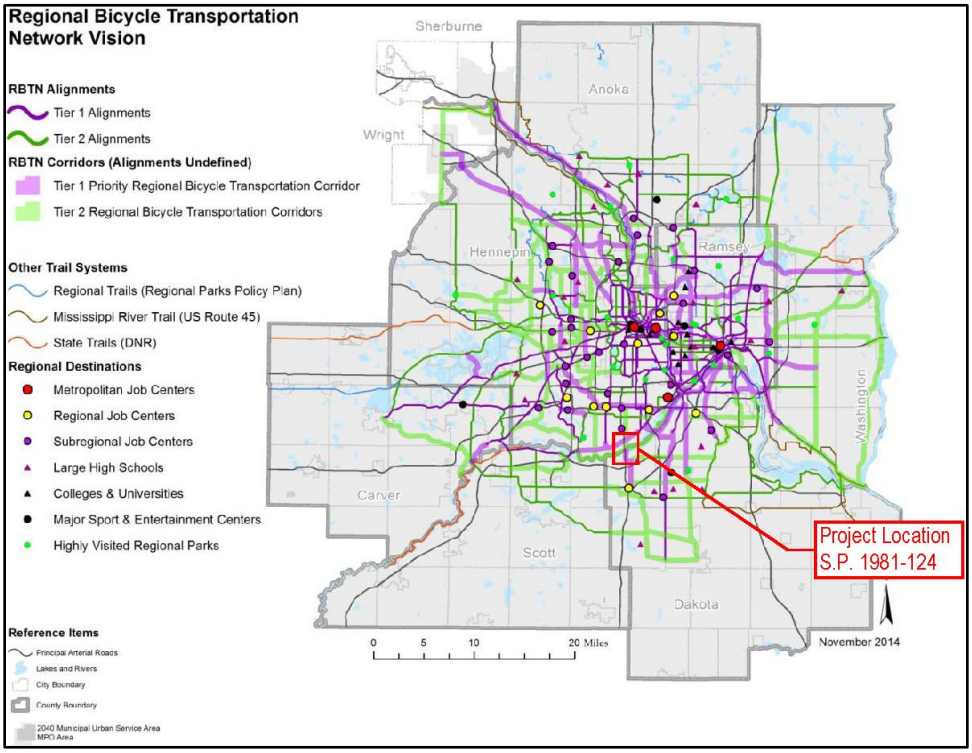


- U.S. Fish and Wildlife Service (USFWS) Bluff Trail is located along the north side of the Minnesota River, and extends from the Russell Sorenson Boat Landing along the east side of I-35W to the Old Cedar Avenue parking area. This trail is located within the Long Meadow Lake Unit of the Minnesota Valley National Wildlife Refuge, and is part of the Long Meadow Lake trail system.
- The Minnesota Department of Natural Resources (DNR) is developing an extension of the Minnesota Valley State Trail. The Minnesota Valley State Trail extension would begin at the Bloomington Ferry Trailhead facility near the US 169 Bridge over the Minnesota River, continue along the north side of the Minnesota River through City of Bloomington

Minnesota River Valley properties, cross under the I-35W Bridge, and terminate near the USFWS Minnesota River Valley Refuge Visitor Center at American Boulevard and I-494. The Minnesota Valley State Trail would consist of two trails – a paved, multiple-use ADA compliant facility and a natural surface facility.[7] The natural surface facility is anticipated to follow an existing City of Bloomington trail alignment (see discussion below), while the paved, multi-use trail is anticipated to be on a separate alignment within the same general trail corridor.

- The Metropolitan Council's *2040 Regional Transportation Policy Plan* (TPP) identifies a crossing of the Minnesota River near I-35W as a Tier 1 Priority Regional Bicycle Transportation Corridor. Tier 1 priority corridors have been identified as the highest priority for regional transportation planning and investment (see Figure 3.7).

Figure 3.7 2040 Transportation Policy Plan. Map of Regional Bicycle Transportation Network Vision



Source: Metropolitan Council. January 2015. *2040 Transportation Policy Plan.* Chapter 7. Bicycle and Pedestrian Investment Direction. Figure 7-1. Regional Bicycle Transportation Network Vision.

[7] ADA = Americans with Disabilities Act

- Dakota County is developing an east/west trail that runs parallel to the river along Black Dog Road as part of the Big Rivers Regional Trail. This trail is anticipated to be complete in late 2016 and will connect the I-35W Bridge to the Old Cedar Avenue Bridge (planned to reopen in 2016). The alignment of this trail is identified in the *Minnesota River Greenway Master Plan* (January 2012).
- The City of Bloomington has a maintenance road that crosses under the I-35W Minnesota River Bridge between the Russell A. Sorenson Landing and the Minnesota River Valley Park. This maintenance road is also used as a trail connection by hikers and mountain bikers to cross under the I-35W Minnesota River Bridge. In addition to functioning as a water access site, the Russell A. Sorenson Landing also serves as a trailhead facility for the Bluff Trail.
- The City of Bloomington's *Alternative Transportation Plan, 2015 Update* (Draft, December 2014) identifies a system of trails, pedestrian-ways, and bikeways. One of the trail/community corridor needs identified in the *Alternative Transportation Plan* is the I-35W Parallel Route, including a connection to the I-35W Minnesota River Bridge. The goal of the future pedestrian/bicycle corridor is to provide connections to the planned Orange Line BRT, Bloomington City Hall, the Minnesota River Valley, and communities south of the Minnesota River.
- One of the future local connections identified in the City of Bloomington's *Alternative Transportation Plan* is the Lyndale Avenue bikeway segment, east of I-35W and the Minnesota River Bridge. The future bikeway along Lyndale Avenue would provide connections to existing trails in the Minnesota River Valley, the future Minnesota Valley State Trail, and the Russell Sorenson Landing east of the I-35W Minnesota River Bridge.
- The City of Burnsville has an existing trail that runs along the east side of I-35W and ends at the interchange of I-35W/Black Dog Road. The need for connections and continuity between local and regional trail systems, such as the proposal to develop a trail along the Minnesota River, is identified as an important goal in the City of Burnsville's *Trail Master Plan* (September 2000).

The Minnesota River is currently a barrier to north-south pedestrian and bicycle mobility with few existing and planned crossing opportunities. There are no existing pedestrian and bicycle travel facilities on the existing I-35W Minnesota River Bridge. The nearest existing pedestrian/bicycle crossings to the I-35W Minnesota River Bridge are I-494 to the east (approximately 6.5 miles) and Bloomington Ferry Road to the west (approximately 5 miles), leaving an 11-mile gap between existing pedestrian/bicycle river crossings.

The Old Cedar Bridge is scheduled to reopen to pedestrian and bicycle traffic in 2016, which will reduce this gap, but will still leave an 8-mile gap in Minnesota River crossings between Old Cedar Avenue and the Bloomington Ferry Bridge.

3.3.6 Roadway Flooding

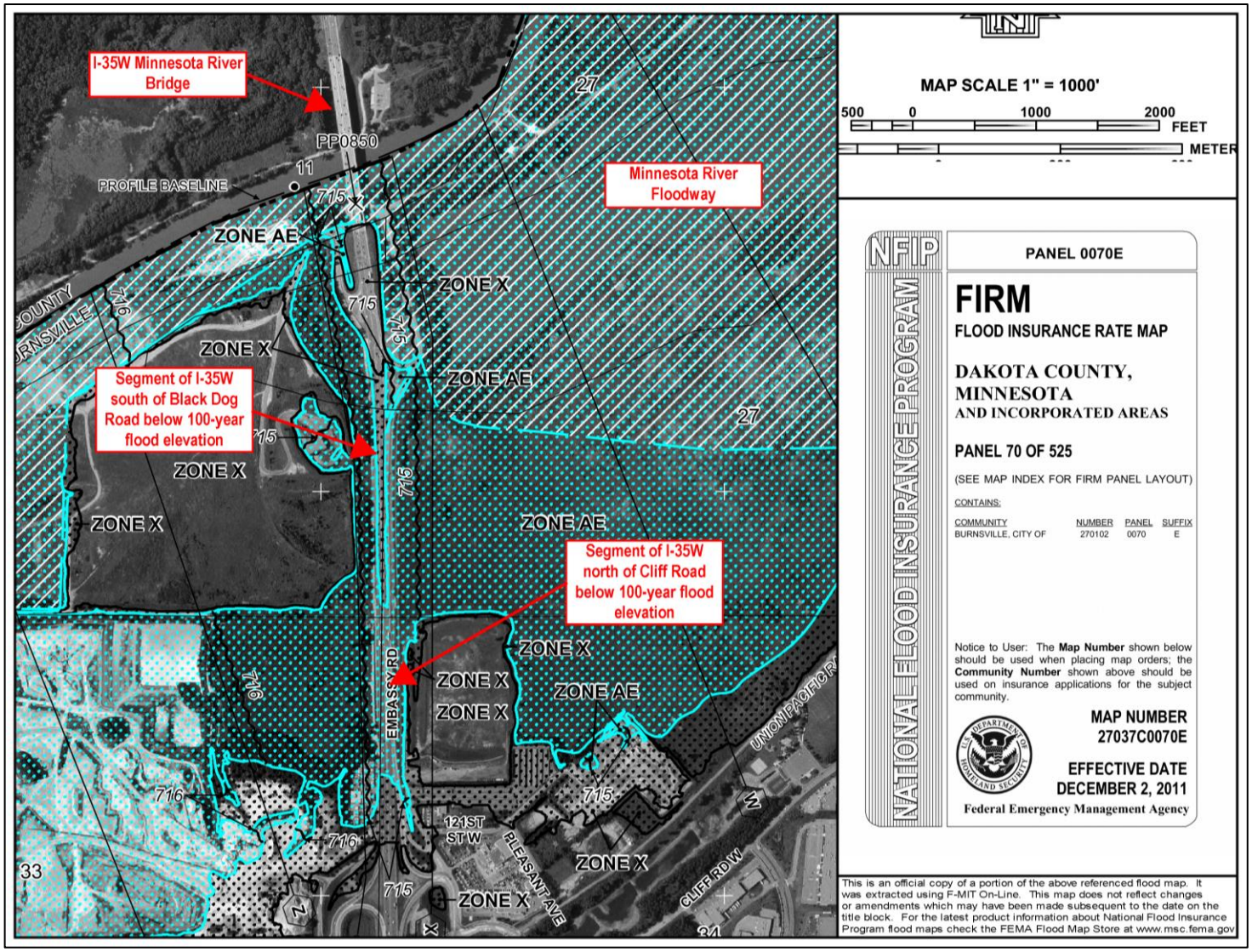
The 100-year floodplain is the area that will be inundated by the flood event having a 1-percent change of being equaled or exceeded in any given year.

The project crosses through the Minnesota River floodway and flood plain. The 100-year floodplain elevation of the Minnesota River at the I-35W Bridge is 715.38 feet. There are two areas along I-35W south of the Minnesota River that are located below the 100-year floodplain elevation: an approximately 900-foot segment of I-35W north of the Cliff Road interchange and an approximately 1,100 segment of I-35W south of the Black Dog Road interchange (see Figure 3.8).

Adjacent lands surrounding I-35W south of the Minnesota River are within the 100-year floodplain and Minnesota River floodway (see Figure 3.8) and are prone to flood events. While segments of I-35W are below the 100-year floodplain as noted above, the project segment of I-35W has never overtopped at its current elevation. The I-35W southbound lanes are largely protected by the landfill berm along the west side of the highway. MnDOT has had to build temporary dikes along northbound I-35W on several occasions to help prevent the highway from flooding. In 2014, flood waters approached the 100-year elevation. A temporary dike was constructed along northbound I-35W to prevent flood waters from overtopping the highway. During the 1993 flood, flood waters were estimated to be approximately one foot below the elevation of I-35W.

Closure of I-35W during a flood event, if ever necessary, would result in substantial congestion on parallel Minnesota River crossings, among other issues (see "Maintenance of Traffic" Section above). The project provides the opportunity to raise the I-35W profile south of the Minnesota River above the 100-year flood elevation, ensuring that the roadway can remain accessible during flooding events.

Figure 3.8 FEMA Flood Insurance Rate Map (Dakota County, Minnesota)



Source: Flood Insurance Rate Map. Dakota County, Minnesota. Panel 70 of 525. Map Number 27037C0070E.

3.4 Additional Considerations

In addition to the project needs described above, the following considerations will guide project development and the alternatives evaluation.

3.4.1 Consistency With Local Development Plans

The City of Burnsville plans to redevelop the area located along the west side of I-35W to the south of the Minnesota River. Currently, this area is a gravel mine and an extant landfill. The City plans to redevelop this area with a mix of commercial, industrial, housing, and recreational uses, potentially including a new interchange with I-35W between Black Dog Road and Cliff Road at future 118th Street. The I-35W Minnesota River Bridge and I-35W corridor improvements will be developed to not preclude the City of Burnsville's redevelopment plans for the area (see Figure 3.9).

Figure 3.9 City of Burnsville Redevelopment Plans

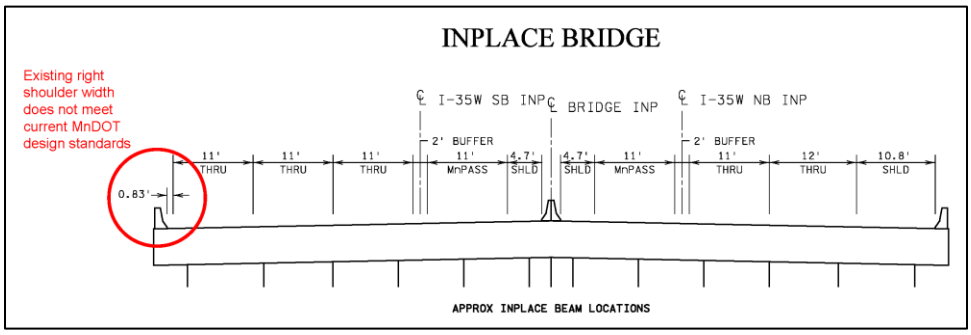
Source: City of Burnsville. 2015. Minnesota River Quadrant Redevelopment Map accessed 02 June 2015 at http://www.ci.burnsville.mn.us/DocumentCenter/Home/View/711.

3.4.2 Geometric Deficiencies

Improve I-35W Minnesota River Bridge Geometrics

The geometric design of the existing I-35W Minnesota River Bridge does not meet current MnDOT design standards and is considered functionally obsolete. A functionally obsolete bridge is one that was constructed to standards at the time, but no longer meets current minimum design standards. The I-35W southbound lanes on the existing bridge includes an inside (left) shoulder, a MnPASS lane, two through traffic lanes, an auxiliary lane, and an outside (right) shoulder (see Figure 3.10).

Figure 3.10 Existing Typical Section (I-35W Minnesota River Bridge)



The southbound right shoulder width on the existing I-35W Minnesota River Bridge is less than one foot. Table 4-4.01A in the MnDOT Road Design Manual specifies a right shoulder width of 10 feet for multi-lane, freeway facilities. The inadequate shoulder width does not allow for snow storage and does not provide a space on the bridge for vehicle breakdowns, emergency stops, or law enforcement activities. The proposed project provides an opportunity for MnDOT to improve the right shoulder width on the I-35W Minnesota River Bridge.

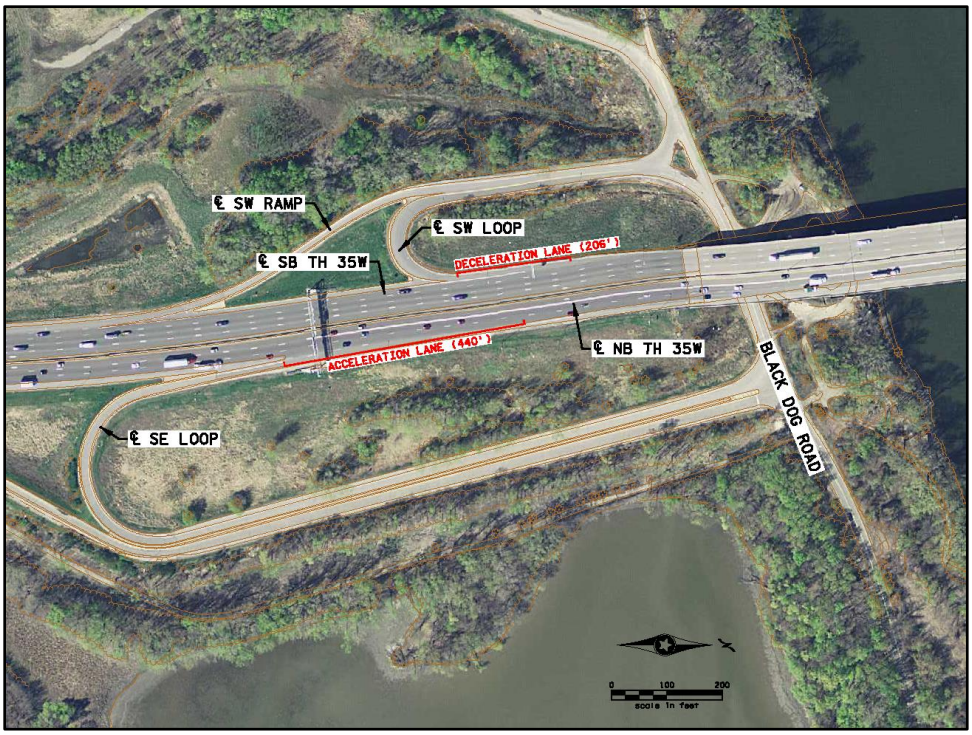
Improve I-35W/Black Dog Road Interchange Geometrics

The acceleration lane from Black Dog Road to northbound I-35W and the deceleration lane from southbound I-35W to Black Dog Road do not meet current MnDOT design standards (see Figure 3.11). The existing acceleration lane length from Black Dog Road to northbound I-35W is 440 feet. Table 6-2.04B in the MnDOT Road Design Manual specifies an acceleration lane length of 1,520 feet. The existing deceleration lane length from southbound I-35W to Black Dog Road is 206 feet. Table 6-2.03A in the MnDOT Road Design Manual specifies a deceleration lane length of 570 feet.

The below-standard acceleration lane distance requires vehicles to merge into the northbound I-35W traffic lanes before reaching freeway speeds. The below-standard deceleration lane distance requires vehicles to slow-down

while still in the southbound I-35W travel lanes prior to existing at Black Dog Road. This is particularly the case with heavy trucks, which require sufficient length to make the appropriate change in speeds between I-35W and Black Dog Road. The proposed project provides an opportunity for MnDOT to improve the acceleration and deceleration lane lengths at the I-35W/Black Dog Road interchange.

Figure 3.11 I-35W/Black Dog Road Interchange Existing Geometrics



Improve I-35W Bridge Geometrics at West 106th Street

Vertical Clearance

The vertical clearance of the I-35W bridges over West 106th Street do not meet current MnDOT design standards. The vertical clearance between the bottom of the existing northbound I-35W bridge to West 106th Street is 15.1 feet. The vertical clearance between the bottom of the existing southbound I-35W bridge to West 106th Street is 15.2 feet. Section 2.1.3 of the MnDOT LFRD Bridge Design Manual (August 2008) specifies that a trunk highway crossing over a local street at a freeway interchange requires a vertical clearance of 16.3 feet (16 feet, 4 inches). The inadequate vertical clearance does not allow for trucks with load heights greater than 15 feet to navigate through the West 106th Street interchange. The proposed project provides an opportunity for MnDOT to provide the standard vertical clearance between I-35W and West 106th Street.

Intersection Sight Distance

Sight distance is the line of sight between two vehicles approaching an intersection. Vehicles approaching an intersection require adequate sight distance to enter (right-turning vehicles) or cross (left-turning vehicles) lanes used by opposing traffic. Insufficient sight distance is often a contributing factor to the crashes experienced at an intersection (MnDOT Road Design Manual, Section 5-2.02, Intersection Sight Distance).

Sight distance at the I-35W/West 106th Street west ramp terminal intersection does not meet current design standards. The existing intersection sight distance length is 130 feet. The sight distance does not meet current design standards because the slope pavement and bridge pier blocks the line of sight between vehicles stopped at the intersection and vehicles traveling on West 106th Street. The American Association of State Highway and Transportation Officials (AASHTO) design guide specifies a sight distance length of 375 feet for a stopped passenger car turning left onto a 30 mph, divided highway, and a sight distance length of 570 feet for a heavy truck turning left onto a 30 mph, divided highway. The proposed project provides an opportunity for MnDOT to improve sight distance at the I-35W/West 106th Street west ramp terminal intersection.

3.4.3 West 106th Street Pedestrian/Bicycle Considerations

Sidewalks are located along the north and south sides of West 106th Street under the I-35W bridges. The sidewalks are located between the slope pavement and bridge piers. West 106th Street is the primary route for pedestrians and bicyclists between Oak Grove Elementary School and Oak Grove Middle School on the west side of I-35W, and residential land uses on the east side of I-35W.

The City of Bloomington has identified a future shared-use pedestrian/bicycle trail along West 106th Street under I-35W. There is currently not adequate space to accommodate a shared-use pedestrian/bicycle trail along West 106th Street between the bridge piers and slope pavement, without having to remove a portion of the slope pavement and construct a retaining wall. The proposed project should be designed and constructed to not preclude a future pedestrian/bicycle trail along West 106th Street under I-35W.

3.4.4 Regulatory Requirements

The project development process for the I-35W Minnesota River Bridge must consider numerous regulatory requirements. Several of the particularly critical requirements are summarized below.

Section 4(f) refers to the section of the Department of Transportation Act of 1966 which requires the consideration of publicly-owned parks, recreation areas, wildlife and waterfowl refuges and historic sites in the development of transportation projects.

Parkland

Section 4(f) of the Department of Transportation Act of 1966 provides protections for publicly-owned parks, recreational areas, wildlife and waterfowl refuges and historic sites. Section 4(f) requires avoidance of the publicly-owned resource unless there is no feasible and prudent alternative to its use. A Section 4(f) "use" is occurs when land from a Section 4(f) resource is permanently incorporated into a transportation facility (i.e., purchased as highway right of way or permanent easement). If avoidance is not feasible and prudent, then all possible planning to minimize harm to the Section 4(f) resource is required.

Section 4(f) resources located near the project area and the agency/unit of government with jurisdiction over each resource (Officials with Jurisdiction) are listed in Table 3.4.

Table 3.4 Section 4(f) Resources Near the Project Area

Section 4(f) Resource	Agency With Jurisdiction
Minnesota Valley National Wildlife Refuge (Black Dog Preserve)	US Fish and Wildlife Service (USFWS)
Minnesota Valley National Wildlife Refuge (Long Meadow Lake Unit)	USFWS
Big Rivers Regional Trail	Dakota County
City of Burnsville Trail	City of Burnsville
City of Bloomington Trail	City of Bloomington
Minnesota River Valley Park	City of Bloomington
Minnesota River State Water Trail	Department of Natural Resources (DNR)
Russell A. Sorenson Landing	USFWS
Minnesota Valley State Trail (Future) [8]	DNR

The Land and Water Conservation (LAWCON) Fund Act of 1965, as amended, provides a nationwide program to help preserve, develop and provide accessibility to outdoor recreation resources. Section 6(f) of the LAWCON Act provides protections to land acquired, developed, or improved using LAWCON funding. Similar to Section 4(f) described above, Section 6(f) requires consideration of all practical alternatives to avoid a LAWCON conversion (i.e., converting LAWCON-funded property to non-public outdoor recreation uses). A parkland conversion that cannot be

[8] The Minnesota Valley State Trail is not currently a Section 4(f) resource. If the Minnesota Valley State Trail is in place and operating prior to initiating construction of the I-35W Minnesota River Bridge Project, then Section 4(f) requirements would apply.

Section 6(f) refers to the section of the Land and Water Conservation Fund Act of 1965 that requires all property acquired or developed with LWCF assistance be maintained perpetually in public outdoor recreation use.

avoided requires the acquisition of replacement parkland of at least equal fair market value and reasonably equivalent usefulness. The City of Bloomington's Minnesota River Valley Park, located along the north side of the Minnesota River and west of I-35W, was acquired using LAWCON funds (Grant LW27-00806). Land along the north side of the Minnesota River and east of I-35W is managed by the USFWS as part of the Minnesota Valley National Wildlife refuge. The DNR has determined that this land would also be subject to LAWCON.

Navigational Channel

The U.S. Coast Guard (USCG) has jurisdiction over structures spanning the navigational channel on the Minnesota River, from near Savage to the confluence with the Mississippi River. The USCG has determined that a navigational opening that provides a minimum vertical clearance of 55.5 feet above the normal pool elevation of the Minnesota River must be maintained to provide for the reasonable needs of river navigation. In addition, the USCG has also determined that a minimum horizontal clearance of 300.0 feet shall be provided (i.e., distance between bridge piers located within the Minnesota River). During project construction, a minimum distance of 200.0 feet is required (see USCG correspondence dated June 1, 2015 in Appendix E).

Aquatic Resources

There are numerous aquatic resources within the project area, including the Minnesota River, Nine Mile Creek and associated backwater areas, other smaller drainages discharging to the Minnesota River, and wetlands located adjacent to and within the I-35W right of way. Aquatic resources are regulated at the federal level by the US Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act. At the state level, public waters are regulated by the DNR and wetlands are protected under the Wetland Conservation Act (WCA). These laws require "sequencing": consideration of avoidance first, then identification of minimization measures, and finally mitigation for any potential unavoidable impacts.

"Sequencing" refers to the process required under state and federal wetland laws and regulations that require avoidance, minimization, and mitigation for potential impacts.

Stormwater Management

Prior to 2008, stormwater runoff from the I-35W Minnesota River Bridge drained directly into the Minnesota River. In 2008, MnDOT completed a project to add a trough system to the I-35W Minnesota River Bridge. This trough system collects stormwater runoff from the bridge and directs it to

stormwater ponds on the north and south sides of the Minnesota River. These ponds provide treatment for runoff prior to discharge to the river. Construction of the I-35W Minnesota River Bridge and adjacent roadway improvements require stormwater best management practices consistent with current regulations.

3.5 Project Purpose

The primary purpose of the project is to provide a structurally sound bridge crossing of the Minnesota River in the I-35W corridor between the cities of Burnsville and Bloomington, Minnesota. In addition, the project needs to provide a structurally sound crossing of West 106th Street, maintain traffic to the maximum extent possible during construction, not preclude additional capacity on the I-35W Minnesota River Bridge in the future, address traffic operations and safety needs on northbound I-35W, and accommodate pedestrian and bicycle connections across the Minnesota River.

Chapter 4 Alternatives Evaluation

This chapter of the EA discusses the project termini, alternatives evaluation process, alternatives that were evaluated for the project but were rejected from further consideration, and alternatives that remain under consideration. The proposed project maintains I-35W within the existing freeway corridor. There are no alternatives to relocate I-35W and the I-35W Minnesota River Bridge as this would have substantial social, economic and environmental impacts.

4.1 Project Termini

The southern project terminus for the project is the I-35W/Cliff Road interchange in Burnsville. The northern project terminus for the project is the I-35W/West 106th Street interchange in Bloomington. These termini were identified based on the needs of the project. Refer to Chapter 3 for a discussion of the project purpose and need.

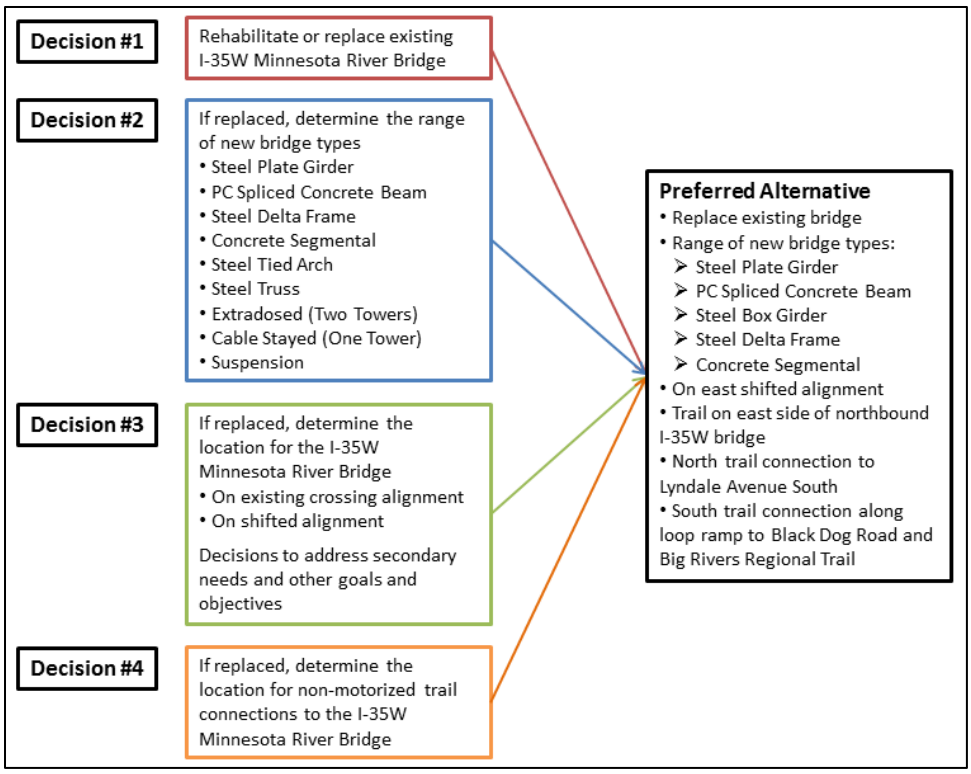
4.2 Alternatives Development and Evaluation Process

The alternatives development and evaluation process for the I-35W Minnesota River Bridge Project was divided into four stages as listed below.

1) Decision #1: Determine if the existing I-35W Minnesota River Bridges should be rehabilitated or replaced.
2) Decision #2: If replaced, determine the range of potential structure types for the replacement bridge.
3) Decision #3: If replaced, determine the location for the I-35W Minnesota River crossing (i.e., on the existing crossing alignment or on a shifted alignment). Interrelated with this step were other decisions to address secondary needs and additional goals and objectives identified for the project.
4) Decision #4: If replaced, determine the location for multi-modal trail connections to the I-35W Minnesota River Bridge.

Figure 4.1 illustrates the alternative development and evaluation process for the project. The following sections describe the alternatives that were considered and the rationale for each of the recommended decisions.

Figure 4.1 Alternatives Development and Evaluation Process



4.2.1 Rehabilitate or Replace the I-35W Minnesota River Bridge

Rehabilitation of the I-35W Minnesota River Bridge was considered but rejected as a viable alternative. The rationale for dismissing the rehabilitation alternative is summarized below.

- Section 3.2.2 describes structural problems and needs associated with the existing bridge elements. Many of these elements would require rehabilitation or complete replacement within the next 5 to 15 years.
- The existing hanger joints are integral to the bridge and must remain in-place. The hanger type joint systems are the primary load path elements of the bridge and are prone to repeated fracture over time. Hanger type joint systems are difficult to properly repair and are not feasible to replace.
- Continued repair of the hanger joint systems would not extend the fatigue life of the existing bridge, which is at the end of its useful life.
- The estimated cost of a rehabilitation alternative is expected to be similar to costs of a new bridge (see *Minnesota River Bridge, Bridge Type*

Replacement Study in Appendix B), but would not effectively extend the service life of the bridge.

The rehabilitation alternative also does not address the secondary need of the project to not preclude future river crossing capacity (beyond 2040). The bridge widening completed in 1985 extended the pier caps using post-tensioned concrete. The internal post tensioning of the pier caps does not allow for additional expansion. The pier foundations of the existing bridge also have no remaining reserve capacity to accommodate the additional loads associated with bridge widening.

Widening the existing bridge could be accommodated by constructing a new pier adjacent to one side of the existing structure; however, the amount of widening that could be accommodated under this scenario is limited because of substructure incompatibility with the existing bridge, as well as other factors (e.g., structure movement and settlement resulting in potential maintenance issues with cracking). Therefore, MnDOT determined that the existing I-35W Minnesota River Bridge should be replaced.

4.2.2 I-35W Minnesota River Bridge Structure Type

Minnesota River Bridge, Bridge Type Replacement Study

The *Minnesota River Bridge, Bridge Type Replacement Study* dated August 5, 2015 and included in Appendix B contains detailed information regarding the bridge type decision-making process for the I-35W Minnesota River Bridge. Ten bridge types were analyzed and include the following:

- Steel Plate Girder
- PC Spliced Concrete Beam
- Steel Box Girder
- Steel Delta Frame
- Concrete Segmental
- Steel Tied Arch
- Steel Truss
- Extradosed (Two Towers)
- Cable Stay (One Tower)
- Suspension

Each of the ten bridge types were evaluated based on a screening process that included 13 evaluation criteria. These evaluation criteria included

schedule impacts/duration of construction, maintenance of traffic (MOT) considerations, river clearance requirements, redundancy issues, future expansion impacts, maintenance and inspection considerations, environmental considerations, geotechnical complexity, and construction cost. Criteria for each of the bridge type alternatives were ranked from low impact, moderate impact, moderate/high impact, and high impact. A low impact finding indicated a desired condition (i.e., greatest benefit to the project with the least risk, impacts and/or cost). A high impact finding indicated a less than desirable condition (i.e., does not meet evaluation criteria, factors with the greatest risk, impacts and/or cost) (see the bridge type evaluation summary matrix in the *Minnesota River Bridge, Bridge Type Replacement Study* in Appendix B).

Based on the results from the Bridge Type Study, along with input from the Technical Advisory Committee (TAC) (see Chapter 7), MnDOT initially identified the steel plate girder as the recommended bridge type for the I-35W crossing as summarized below.

- Low construction schedule risk;
- Optimal construction method flexibility;
- Addresses the secondary need to not preclude future Minnesota River crossing capacity needs;
- Uses simple/standard foundations, minimizing bridge foundation complexity;
- Lower construction cost compared to the other bridge types that were considered; and
- Moderate impacts for future maintenance; however, this can be mitigated through proper detailing and identification of materials such as unpainted weathering steel.

Design-Build Procurement

Since completion of the bridge type replacement study, MnDOT determined that the I-35W Over the Minnesota River Project would be delivered through the design-build process. Design-build is a contracting process for delivering projects that brings designers and construction contractors together early in the detailed design phase of a project. Design-build allows for flexibility and innovation within the standards and requirements identified by MnDOT for a project. MnDOT uses the flexibility and innovation offered through the design-build process to maximize the value received per dollar spent on a project. Additional information regarding the

MnDOT Design-Build Program can be found on the MnDOT webpage at http://www.dot.state.mn.us/designbuild/.

With the decision to use design-build delivery, MnDOT will allow flexibility for the design-build contractor to identify the bridge type for the I-35W Minnesota River crossing. Bridge types that use structural elements above the bridge deck such as trusses, arches, towers, and cables will not be allowed. The top five bridge types identified in the *Minnesota River Bridge, Bridge Type Replacement Study* (August 5, 2015) do not include structural elements above the bridge deck and would be allowed by MnDOT for the project. These five bridge types are listed below.

- Steel Plate Girder
- PC Spliced Concrete Beam
- Steel Box Girder
- Steel Delta Frame
- Concrete Segmental

The *Minnesota River Bridge, Bridge Type Replacement Study* in Appendix B recommended that the concrete segmental bridge type be eliminated from consideration because of cost and ability to allow for future expansion. The evaluation that was prepared for *Minnesota River Bridge, Bridge Type Replacement Study* was based on a comparison of bridge types relative to one another. The evaluation of costs for the concrete segmental bridge type was rated high relative to the other bridge types. Future expansion of a concrete segmental bridge would require construction of an additional structure. This also was rated high relative to the other bridge types considered in the study that would facilitate expansion at a lower cost or impact.

The concrete segmental bridge type does not include structural elements above the bridge deck. The profile of the concrete segmental bridge type also would not be substantially different compared to the other four bridge types allowed by MnDOT for the project. Based on the likelihood of future expansion and potential benefits with construction of a concrete segmental bridge (e.g., precast segments allow for more rapid construction, lower maintenance and inspection impacts), MnDOT determined that the high risks identified in the *Minnesota River Bridge, Bridge Type Replacement Study* for the concrete segmental bridge type were acceptable. The concrete segmental bridge type would be carried forward into the design-build Request For Proposals.

The below bridge deck elements vary among the five bridge types listed above. The steel girder bridge initially identified by MnDOT includes five piers. The steel delta frame bridge (three piers) and concrete segmental (four piers) would result in fewer bridge piers, whereas the steel box girder bridge includes five piers, the same as the steel girder bridge. The PC spliced concrete beam bridge includes six piers; one additional pier on the north side of the Minnesota River compared to the steel girder bridge. The bridge type alternatives figure in the *Minnesota River Bridge, Bridge Type Replacement Study* in Appendix B illustrates the number of piers and span lengths for each bridge type.

During project development, MnDOT coordinated with the US Coast Guard regarding navigational clearance for the Minnesota River. The US Coast Guard determined that a 300-foot navigational opening, with 55 feet of vertical clearance over the normal pool elevation for the middle 200-foot section, and 50 feet of vertical clearance over the normal pool elevation for the remaining 50 feet at the north and south ends of the bridge would be acceptable. Each of the five bridge types identified above would span the Minnesota River. The I-35W Minnesota River crossing Preferred Alternative bridge type shall be designed and constructed to meet US Coast Guard navigational clearance requirements.

The preliminary construction limits identified in this EA are based on the steel girder bridge type initially identified by MnDOT. The preliminary construction limits for the project are within existing highway right of way limits except for a proposed stormwater pond and filtration basin north of the Minnesota River.[9] The preliminary limits extend across the Minnesota River from MnDOT's right of way on the north side of the river to MnDOT's right of way on the south side of the river. Design-build contractors will be required to stay within the identified footprint across the Minnesota River.

The design-build contractor will be required to follow all standards and requirements identified by MnDOT in the design-build Request For Proposals for identifying the I-35W Minnesota River crossing bridge type. The Preferred Alternative bridge type shall meet river navigation clearance requirements; adhere to permitting requirements (e.g., USCG Section 9 permit, USACE Section 404 permit, DNR Public Waters Work Permit); and incorporate commitments identified as part of the environmental review

[9] See Section 4.2.3, Preferred Alignment Alternative Design Refinements. The proposed stormwater pond and filtration basin along the east side of I-35W near the Minnesota River bluff in Bloomington would be located outside of MnDOT right of way. Figure A.7 in Appendix A shows the location of the stormwater pond and filtration basin.

process. The design-build contractor will be required to present the identified bridge type to the public and other stakeholders during the detailed design process.

Replace In-Kind Versus Two New Permanent Bridges

As discussed in Chapter 3, maximizing maintenance of traffic (MOT) on I-35W during construction is a secondary need. The existing traffic volume on the I-35W Minnesota River Bridge is approximately 114,000 vehicles per day. The two nearest parallel Minnesota River crossings are the TH 169 Bloomington Ferry Bridge to the west (approximately 5.5 miles) and the TH 77 Cedar Avenue Bridge to the east (approximately 3.5 miles). A full closure of the I-35W Minnesota River Bridge with detours would cause additional congestion and delays at parallel Minnesota River crossings.

Two options were considered to maintain traffic on I-35W during construction: 1) replace the existing I-35W Bridge in-kind and maintain traffic with a temporary parallel bridge, or 2) replace the existing I-35W Bridge with two permanent parallel bridges.

The replace in-kind/temporary parallel bridge option would involve construction of a temporary bridge adjacent to the existing I-35W Minnesota River Bridge. This temporary parallel bridge would carry traffic while the existing bridge is demolished and replaced. The replacement bridge would carry both northbound and southbound traffic like the existing I-35W Minnesota River Bridge.

Under the two permanent parallel bridges option, a new permanent bridge would be constructed parallel to the existing bridge. Both northbound and southbound I-35W traffic would be carried on the existing bridge while the new parallel bridge is constructed. Once complete, all traffic would be shifted to the new parallel bridge and the existing bridge demolished and replaced. Upon completion, northbound I-35W traffic would be carried on one structure, and southbound I-35W would be carried on a second parallel structure.

MnDOT decided on Option #2; replacement with two permanent parallel bridges. Option #1, replace in-kind/temporary parallel bridge, was rejected because the additional construction costs of a temporary structure do not translate into any additional on-going transportation benefits after construction is complete as the temporary bridge would be removed. The alignment alternatives evaluation for the two permanent parallel bridges is discussed below in Section 4.2.3.

4.2.3 I-35W Minnesota River Bridge Crossing Alignment

Alignment Alternatives Description

Two bridge crossing alignments were identified as part of the project development process: an on existing alignment alternative and an east shifted alignment alternative. The on existing alignment alternative would construct the two permanent parallel bridges along the existing I-35W Minnesota River Bridge alignment. The east shifted alignment alternative would construct the two permanent parallel bridges along an alignment shifted to the east of the existing bridge. The west edge of the southbound I-35W bridge would be located approximately 40 feet to the east of the west edge of the exiting bridge.

A west alignment shift alternative was not analyzed in detail, but was considered and dismissed because this alignment would shift I-35W closer to homes along the west side of I-35W between the Minnesota River and West 106th Street. A west alignment shift would also likely push the Black Dog Road interchange ramps into wetlands west of the interchange and into a MnDOT filtration basin in the southwest quadrant of the Black Dog Road interchange.

Figure C.1, Appendix C illustrates the on existing alignment alternative. Figure C.2, Appendix C illustrates the east shifted alignment alternative. Both alignment alternatives are located within existing MnDOT right of way and share the following common design elements:

- Reconstruction of I-35W north of the Minnesota River to West 106th Street;
- Reconstruction of I-35W south of the Minnesota River to Cliff Road including raising the roadway profile by approximately two feet above the 100-year floodplain elevation;
- Reconstruction of the Black Dog Road interchange to improve ramp acceleration and deceleration lengths; and
- Construction of a new northbound I-35W lane from the Cliff Road entrance ramp to the start of the existing truck climbing lane south of West 106th Street.

Two construction staging options were considered with the on existing alignment alternative: an in-place staging option and a bridge slide option. One construction staging option was considered for the east shifted alignment alternative. Table 4.1 describes the construction staging options for both alignment alternatives. Concept figures illustrating the existing alignment alternative bridge slide option and the east shifted alignment

alternative are included in the *Minnesota River Bridge, Bridge Type Replacement Study* in Appendix B.

Alignment Alternatives: Initial Evaluation

The alignment alternatives evaluation involved a multi-step process. The first step was an initial evaluation based on criteria that reflected the secondary needs for the project (see Section 3.3), additional goals of the project, and a range of potential environmental impacts. MnDOT met with members of the TAC several times to review alignment evaluation criteria and evaluation results. Table 4.1 summarizes the results of the alignment alternatives evaluation.

The second step in the evaluation process involved a more detailed evaluation of potential wetland impacts for each alignment alternative. This detailed evaluation considered several different features of the project, including the roadway, trails, bridge, drainage, and staging impacts. The detailed wetland impact evaluation begins on page 4-21 (see "Alignment Alternatives: Wetland Impact Evaluation").

Secondary Needs: I-35W Bridge over West 106th Street

The on existing alignment alternative and east shifted alignment alternative address the secondary needs regarding the I-35W bridges over West 106th Street. The existing I-35W bridges over West 106th Street would be replaced under both alignment alternatives.

Table 4.1 I-35W Alignment Alternatives Matrix

Evaluation Criteria	On Existing Alignment Alternative	East Shifted Alignment Alternative
I-35W Bridges over West 106th Street	No differentiating impacts anticipated. Includes replacement of I-35W bridges over West 106th Street.	No differentiating impacts anticipated. Includes replacement of I-35W bridges over West 106th Street.
Maintenance of Traffic During Construction (Roadway Staging)	**Additional costs and project duration due to additional construction complexity.** Similar number of lanes accommodated during construction. In-place Staging Option • Year one: five lane section (two northbound, two southbound, reversible MnPASS lane) while most of southbound I-35W is constructed and part of northbound I-35W. • Year two and three: three lanes in both directions possible. • Black Dog Road ramps on west side of I-35W closed during year one, ramps on east side of I-35W closed during year two. • Temporary fill and pavement widening needed throughout project. Bridge Slide Option • Year one: six lane section (three lanes in each direction) while temporary northbound roadway section is constructed. • Year two: three lanes in each direction possible while southbound I-35W and Black Dog Road west ramps are constructed. • Year three: three lanes in each direction on new southbound roadway while northbound lanes are constructed. • Large amount of temporary fill and pavement widening needed on east side of I-35W.	Similar number of lanes accommodated during construction. • Year one: five lane section (two northbound, two southbound, reversible MnPASS lane) while most of northbound I-35W is constructed. • Year two: three lanes in both directions possible. • Black Dog Road ramps on west side of I-35W closed during year one, ramps on east side of I-35W closed during year two. • Temporary fill and pavement widening needed throughout project.
Maintenance of Traffic During Construction (River Bridge Staging)	**Additional costs and project duration due to additional construction complexity.** Similar number of lanes accommodated. In-place Staging Option • Traffic is moved to center of existing bridge. Outside portions of bridge deck removed.	• Part of east side of existing bridge deck removed to construct northbound I-35W Bridge to the east. • All traffic shifts to southbound I-35W Bridge. • In following year, all traffic is shifted to new northbound I-35W Bridge. Remaining portions of existing bridge are demolished. Southbound I-35W Bridge is constructed.

Evaluation Criteria	On Existing Alignment Alternative	East Shifted Alignment Alternative
	• Portions of new bridge constructed to the outside of the existing bridge. • In subsequent year(s), traffic shifted to outside portion of new bridges. Existing bridge in center is demolished. Inside portions of new bridges are constructed. Bridge Slide Option • Year one: northbound I-35W Bridge is constructed on temporary substructures approximately 90 feet east of final bridge location. • Year two: all traffic is shifted to new northbound I-35W Bridge in temporary location while existing bridge is removed, and southbound I-35W Bridge is constructed. • Year three: all traffic is shifted to new southbound I-35W Bridge and northbound I-35W Bridge is slid into place.	
Safety and Traffic Operations	No differentiating impacts anticipated. Includes addition of northbound lane between Cliff Road and truck climbing lane south of West 106th Street. • Reduces potential for congestion-related crashes at Cliff Road interchange. • Reduces congestion compared to 2040 No Build Alternative. • Improves travel times compared to 2040 No Build Alternative.	No differentiating impacts anticipated. Includes addition of northbound lane between Cliff Road and truck climbing lane south of West 106th Street. • Reduces potential for congestion-related crashes at Cliff Road interchange. • Reduces congestion compared to 2040 No Build Alternative. • Improves travel times compared to 2040 No Build Alternative.
Pedestrian and Bicycle Connectivity (North and South Sides of Minnesota River)	No differentiating impacts anticipated. Similar trail options available. See trail option figures in Appendix D.	No differentiating impacts anticipated. Similar trail options available. See trail option figures in Appendix D.
Roadway Flooding (I-35W Profile Revisions)	No differentiating impacts anticipated. Similar profile revisions. • Top of roadway surface approximately two feet above the 100-year floodplain elevation. • Adds high point and second low point in floodplain area to help with staging and earthwork.	No differentiating impacts anticipated. Similar profile revisions. • Top of roadway surface approximately two feet above the 100-year floodplain elevation. • Adds high point and second low point in floodplain area to help with staging and earthwork.
Consistency with Local Development Plans (118th Street Interchange)	No differentiating impacts anticipated. Does not preclude new 118th Street interchange. • 18-foot median width for potential center median bridge pier.	No differentiating impacts anticipated. Does not preclude new 118th Street interchange. • 18-foot median width for potential center median bridge pier.

Evaluation Criteria	On Existing Alignment Alternative	East Shifted Alignment Alternative
	• Trail modifications required (east side of I-35W). • Modification of retaining walls required to accommodate interchange ramps.	• Trail modifications required (east side of I-35W). • Modification of retaining walls required to accommodate interchange ramps.
Geometric Deficiencies (Black Dog Road Interchange)	Requires reconstruction of Black Dog Road interchange ramps to improve geometric design. • Loop radius from southbound I-35W to Black Dog Road increases by 17 feet. • Southbound I-35W to Black Dog Road deceleration lane length increases by 364 feet. Meet design standards for deceleration from 70 MPH to 20 MPH. • Acceleration lane length from Black Dog Road to northbound I-35W increases by 1,080 feet. Meets design standards for acceleration from 20 MPH to 70 MPH.	Requires reconstruction of Black Dog Road interchange ramps to improve geometric design. • Loop radius from southbound I-35W to Black Dog Road increases by 17 feet. • Southbound I-35W to Black Dog Road deceleration lane length increases by 364 feet. Meet design standards for deceleration from 70 MPH to 20 MPH. • Acceleration lane length from Black Dog Road to northbound I-35W increases by 1,080 feet. Meets design standards for acceleration from 20 MPH to 70 MPH.
Constructability Considerations	**Additional costs and project duration due to additional construction complexity.** In-place Staging Option • Distance between existing bridge and proposed bridge is close (less than three feet between edge of existing bridge and new bridges). Presents potential safety concerns for workers during construction. • Completing new bridge decks would require multiple closures of the existing bridge to limit vibration in wet concrete. Four to five deck pours required for each bridge, resulting in up to 10 short-duration, temporary closures during construction. • Difficulties with constructing new bridge footings under existing bridge. Bridge Slide Option • Temporary location of northbound bridge is 40 feet east of existing edge of roadway pavement. Would require fill material and temporary pavement to maintain traffic. • Temporary sheet piling along east side of I-35W and Black Dog Road interchange to stay within right of way.	Alignment shifted far enough to the east to provide room for footing and bridge deck construction.

Evaluation Criteria	On Existing Alignment Alternative	East Shifted Alignment Alternative
Minnesota River Bridge Profile Revisions	Similar profile as existing I-35W Minnesota River Bridge.	**Bridge profile increases by approximately one to two feet compared to On Existing Alignment Alternative.**
North Embankment Impacts	**Additional embankment required on both sides of I-35W.** • Additional fill needed on both sides of bridge to match slopes into existing embankment. • Geotechnical analysis needed.	**Additional embankment required on east side of I-35W only.** • Additional fill needed along northbound I-35W to match slopes into existing embankment. • Geotechnical analysis needed.
Project Costs (Retaining Walls)	No differentiating impacts anticipated. Similar retaining wall needs. • Approximately 6,700 feet of retaining walls. • Retaining walls needed on both sides of I-35W south of the Minnesota River. • Retaining wall needed along northbound I-35W north of bridge to stay within MnDOT right of way.	No differentiating impacts anticipated. Similar retaining wall needs. • Approximately 6,840 feet of retaining walls. • Retaining walls needed on both sides of I-35W south of the Minnesota River. • Retaining wall needed along northbound I-35W north of bridge to stay within MnDOT right of way.
Project Costs (Utility Impacts)	Similar utility impacts anticipated. • Update roadway lighting along I-35W. • Avoids Xcel Energy electric transmission line crossings. • Impacts to buried fiber optic cables and existing drainage structures. • Water mains and sanitary sewer outside of construction limits.	Similar utility impacts anticipated. • Update roadway lighting along I-35W. • Avoids Xcel Energy electric transmission line crossings. • Impacts to buried fiber optic cables and existing drainage structures. • Water mains and sanitary sewer outside of construction limits.
Project Costs (Construction)	**Additional project construction costs due to bridge constructability and duration of construction.** • Bridge and roadway constructability could result in additional costs while work is completed between traffic lanes.	Additional project length on north side of Minnesota River to tie back into existing I-35W alignment (approximately 500 feet), resulting in additional costs for pavement, signing, striping, lighting, drainage, and removals.
Water Quality (Temporary Drainage Needs During Construction)	**Additional temporary drainage needs.** In-place Staging Option • Temporary drainage needed along entire bridge length to route runoff discharges to existing treatment ponds under I-35W (approximately 1,400 feet of bridge deck). • Temporary drainage likely needed on each north and south temporary bridge approach.	• Areas over existing stormwater ponds would drain directly off bridge deck into ponds. • Areas above navigable channel will drain to pipe along east edge of bridge deck. West scuppers would remain in place as a temporary condition.

Evaluation Criteria	On Existing Alignment Alternative	East Shifted Alignment Alternative
	Bridge Slide Option • Temporary drainage needed along entire temporary northbound bridge to route runoff discharges to existing ponds under I-35W.	
Water Quality (Permanent Drainage Needs)	Similar permanent drainage needs. • Scuppers on east and west sides of new bridges. • Standard urban roadway design on I-35W. • Does not preclude potential stormwater pond areas.	Similar permanent drainage needs. • Scuppers on east and west sides of new bridges. • Standard urban roadway design on I-35W. • Does not preclude potential stormwater pond areas.
Right of Way Impacts and Relocations	No differentiating impacts anticipated. Construction limits within MnDOT right of way. No relocations required.	No differentiating impacts anticipated. Construction limits within MnDOT right of way. No relocations required.
Wetland Impacts (acres)	Initial estimate and detailed wetland impact evaluation results • Initial estimate (Level 1 delineation, roadway only): approximately 2.5 acres • Detailed wetland impact evaluation (Level 1 delineation): 4.08 acres (see Table 4.3) • Detailed wetland impact evaluation (Level 1 delineation, with minimization measures): 1.96 acres (see Table 4.3) • Detailed wetland impact evaluation (Level 2 delineation, with minimization measures): 1.35 acres (see Table 4.5)	Initial estimate and detailed wetland impact evaluation results • Initial estimate (Level 1 delineation, roadway only): approximately 3.5 acres • Detailed wetland impact evaluation (Level 1 delineation): 5.01 acres (see Table 4.4) • Detailed wetland impact evaluation (Level 1 delineation, with minimization measures): 1.65 acres (see Table 4.4) • Detailed wetland impact evaluation (Level 2 delineation, with minimization measures): 1.21 acres (see Table 4.5)
Floodplain Encroachment	No differentiating impacts anticipated. Potential for temporary and permanent encroachments along I-35W between Cliff Road and Black Dog Road.	No differentiating impacts anticipated. Potential for temporary and permanent encroachments along I-35W between Cliff Road and Black Dog Road.
Tree Impacts (acres)	Approximately 5.5 acres.	Approximately 5.5 acres.
Minnesota River	Maintains navigational channel. See Bridge Type Study in Appendix B.	Maintains navigational channel. See Bridge Type Study in Appendix B.
Hazardous Waste Sites	No differentiating impacts anticipated. Avoids high potential sites. • Construction limits within MnDOT right of way. • Avoids northwest quadrant of Cliff Road interchange (MnDOT cloverleaf dump site).	No differentiating impacts anticipated. Avoids high potential sites. • Construction limits within MnDOT right of way. • Avoids northwest quadrant of Cliff Road interchange (MnDOT cloverleaf dump site).
Cultural Resources	No differentiating impacts anticipated. No historic properties affected determination from MnDOT CRU. See correspondence in Appendix E.	No differentiating impacts anticipated. No historic properties affected determination from MnDOT CRU. See correspondence in Appendix E.

Evaluation Criteria	On Existing Alignment Alternative	East Shifted Alignment Alternative
Section 4(f) Resources	No anticipated Section 4(f) uses. Alignment within existing right of way. • No use of Minnesota Valley Wildlife Refuge (north and south of I-35W). • No use of City of Bloomington parkland along west side of I-35W (Minnesota Valley Park). • No use of Big Rivers Regional Trail (east side of I-35W, south of Minnesota River). • No use of Russell A. Sorenson Landing (water access site located east side of I-35W, north of Minnesota River).	No anticipated Section 4(f) uses. Alignment within existing right of way. • No use of Minnesota Valley Wildlife Refuge (north and south of I-35W). • No use of City of Bloomington parkland along west side of I-35W (Minnesota Valley Park). • No use of Big Rivers Regional Trail (east side of I-35W, south of Minnesota River). • No use of Russell A. Sorenson Landing (water access site located east side of I-35W, north of Minnesota River).

Secondary Needs: Maintenance of Traffic

Both alignment alternatives address secondary needs related to maintenance of traffic. The existing I-35W Minnesota River Bridge would remain open during the initial stages of construction with both alignment alternatives; however, the number of lanes in each direction would be reduced. In later stages of construction, traffic would be shifted to the new bridges under each alignment alternative, continuing to carry traffic through the end of project construction. Table 4.1 describes the number of lanes that could be maintained under each alignment alternative.

Table 4.1 also describes the potential duration of bridge construction. The on existing alignment alternative would likely require additional time for construction (up to an additional year of construction), prolonging construction-related traffic disruptions compared to the east shifted alignment alternative. Both staging options for the on existing alignment alternative would be more complex to construct and require additional time for construction compared to the east shifted alignment. This would translate into greater construction costs compared to the east shifted alignment alternative, and a longer duration of traffic disruption. For example, the in-place staging option would require several temporary, full closures of the I-35W Minnesota River crossing once concrete is poured for the new bridge decks to limit vibration in wet concrete.

Secondary Needs: Safety and Traffic Operations

The on existing alignment alternative and east shifted alignment alternative address the secondary needs regarding operations and safety. The on existing alignment alternative and east shifted alignment alternative both include an additional northbound lane between the Cliff Road entrance ramp and the existing truck climbing lane south of West 106th Street. The addition of this lane would remove the existing bottleneck at the Cliff Road entrance ramp, reducing A.M. peak period congestion on northbound I-35W compared to the 2040 No Build Alternative. Figure 4.2 illustrates the CORSIM model results for 2040 No Build Alternative conditions. Figure 4.3 illustrates the CORSIM model results for 2040 Build Alternative conditions (i.e., with the additional northbound lane between Cliff Road and the truck climbing lane). Improving traffic operations and relieving the bottleneck on northbound I-35W during the A.M. peak period would help reduce the potential for congestion-related crashes at this location.

While congestion is anticipated to improve compared to the 2040 No Build Alternative, northbound I-35W is still anticipated to experience some congestion during the morning peak period with the 2040 Build Alternative

Figure 4.3 illustrates the CORSIM model results for 2040 Build Alternative conditions. One to two hours of LOS F conditions are projected to spill back from the bottleneck between West 106th Street and West 98th Street during the morning peak period. This bottleneck is created by the northbound I-35W right lane drop between West 106th Street and West 98th Street, additional traffic on northbound I-35W during the A.M. peak period under the 2040 Build Alternative, and merging traffic from local interchanges (e.g., West 106th Street and West 98th Street). Even with this bottleneck, northbound I-35W travel times under the 2040 Build Alternative in the general purpose lanes are anticipated to improve by approximately eight minutes compared to 2040 No Build conditions, and improve by approximately 4 minutes in the MnPASS lanes. Table 4.2 shows peak hour travel times for the 2040 No Build Alternative and 2040 Build Alternative.

Table 4.2 Peak Hour Travel Times

Alternative	Northbound I-35W (A.M. peak hr) GP Lanes (1)	Northbound I-35W (A.M. peak hr) MnPASS Lanes (9.0 miles) (2)	Southbound I-35W (P.M. peak hr) GP Lanes (1)	Southbound I-35W (P.M. peak hr) MnPASS Lanes (7.3 miles) (3)
2040 No Build Alternative	21.4 minutes	14.7 minutes	10.7 minutes	6.9 minutes
2040 Build Alternative	13.4 minutes	10.9 minutes	10.7 minutes	6.9 minutes

GP Lanes = General purpose lanes.

(1) General purpose lane travel times between Southcross Drive in Burnsville and 66th Street in Richfield.

(2) The northbound I-35W MnPASS lane begins near the I-35W/CSAH 42 interchange in Burnsville. A.M. peak hour travel times in the northbound I-35W MnPASS lane from south of the CSAH 42 interchange to 66th Street in Richfield (9.0 miles).

(3) The southbound I-35W MnPASS lane designation ends at the I-35W/TH 13 interchange. P.M. peak hour travel times in the southbound I-35W MnPASS lane from 66th Street to the TH 13 interchange (7.3 miles).

Secondary Needs: Pedestrian and Bicycle Connectivity

The on existing alignment alternative and east shifted alignment alternative address the secondary need regarding pedestrian and bicycle connectivity across the Minnesota River. Options for connecting trails to the proposed trail along the I-35W Minnesota River Bridge are available with both alignment alternatives. See Section 4.2.4 (Trail Connection Options).

Figure 4.2 2040 No Build Alternative Level of Service Results

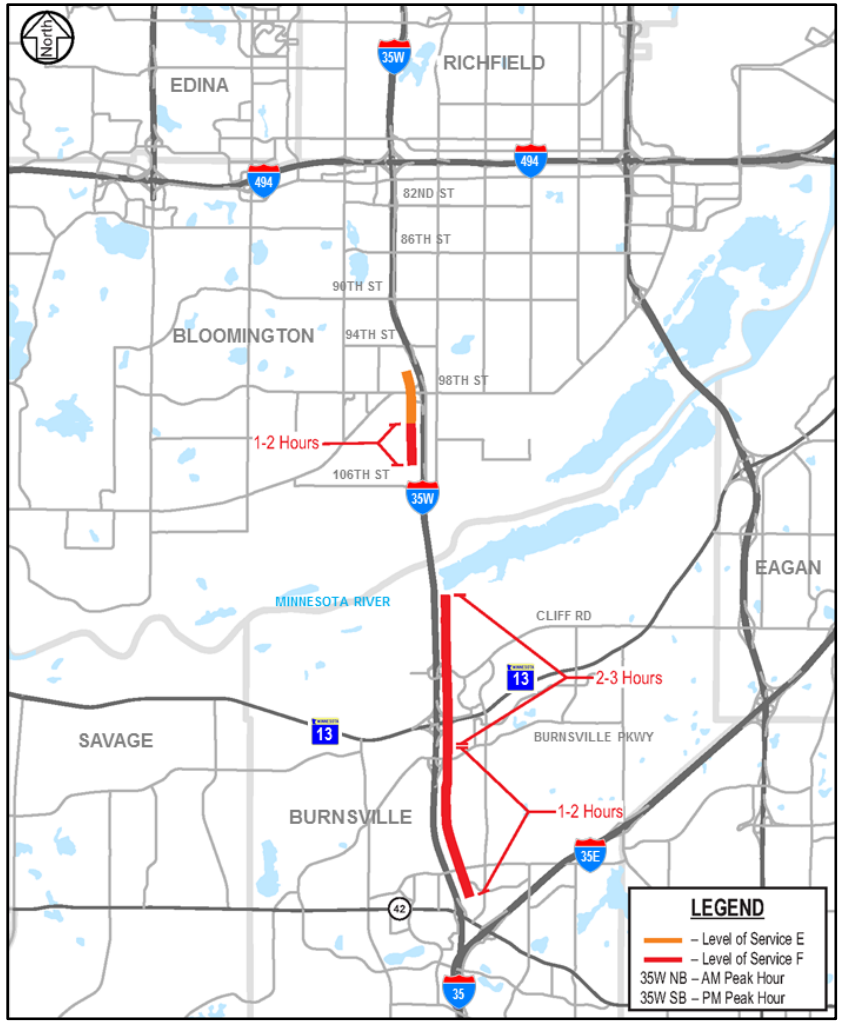
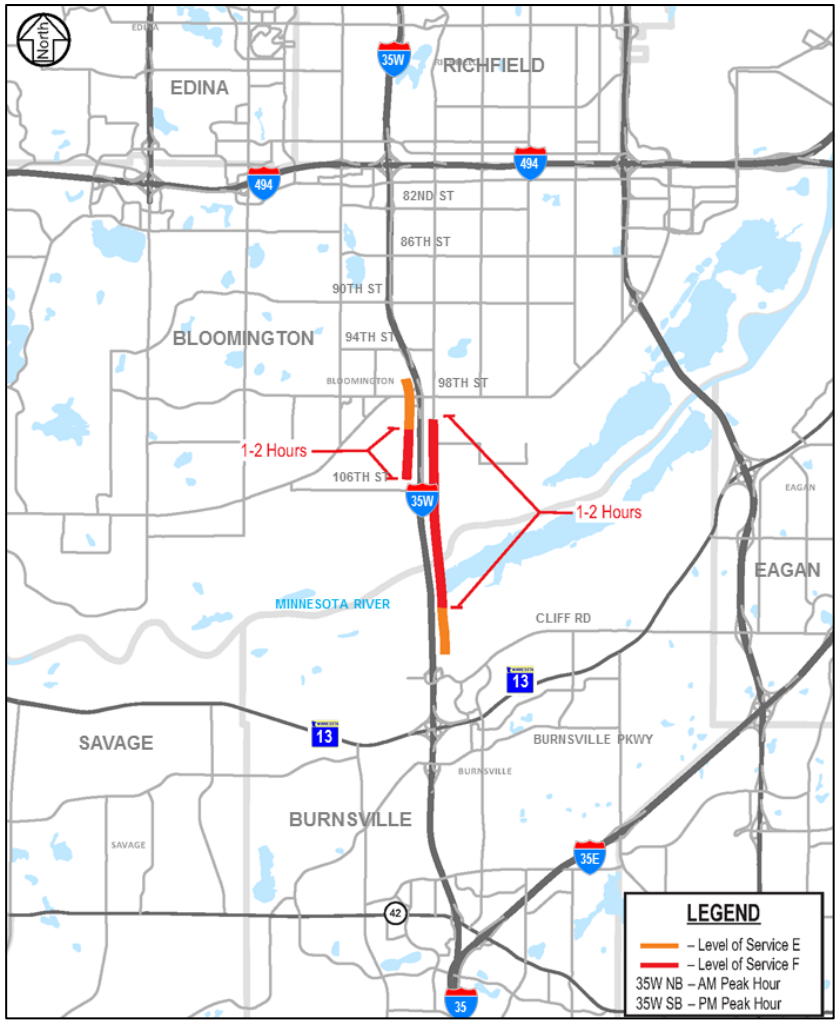


Figure 4.3 2040 Build Alternative Level of Service Results



Secondary Needs: Roadway Flooding

The 100-year floodplain elevation south of the Minnesota River is 715.38 feet. There are two areas along I-35W south of the Minnesota River where the roadway is currently located below the 100-year flood elevation (see Section 3.3.5). MnDOT identified four criteria for evaluating and designing the I-35W profile south of the Minnesota River:

- Raise the I-35W profile grade to provide at least two feet of freeboard above the 100-year flood elevation at the outside shoulder and reduce potential impacts to the freeway during a 100-year flood event;
- Avoid (or minimize) fill impacts below the 100-year flood elevation;
- Avoid (or minimize) right of way impacts to properties along I-35W south of the Minnesota River. The Minnesota River Valley National Wildlife Refuge is located along the east side of I-35W. The Minnesota River Valley National Wildlife Refuge is a Section 4(f) resource (see Section 6.6). The Freeway Landfill site is located along the west side of I-35W. The Freeway Landfill is a designated superfund site due to the presence of hazardous chemicals and landfill gasses.
- Avoid (or minimize) impacts to the I-35W/Cliff Road interchange ramps.

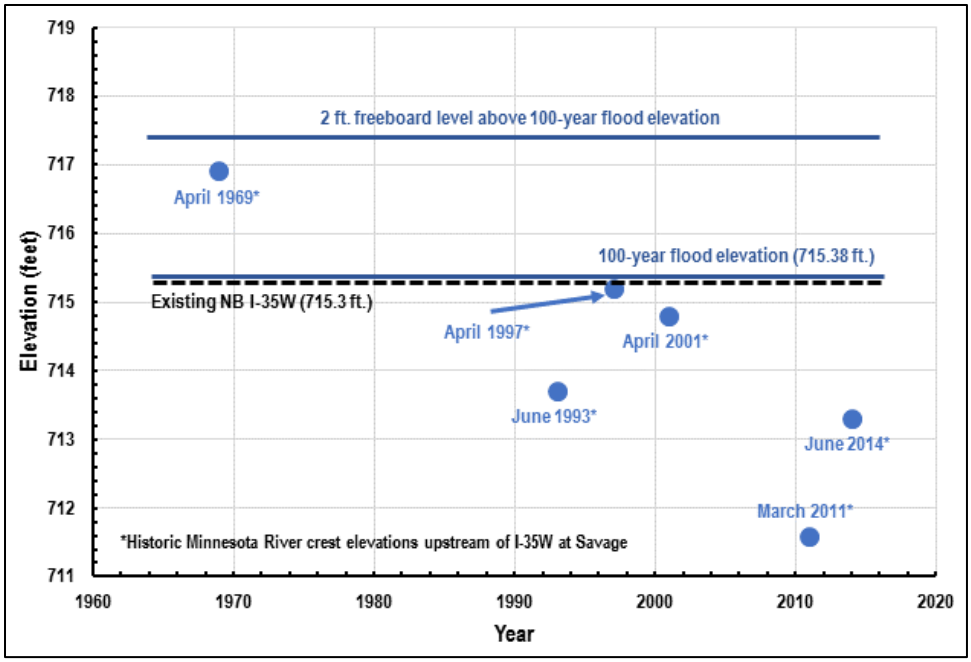
MnDOT determined that a two-foot grade raise at the I-35W low point between the Minnesota River Bridge and Cliff Road interchange best balances the four criteria identified above. The lowest point of the I-35W typical section south of the Minnesota River will be a minimum of two feet above the 100-year floodplain elevation.

- The proposed two-foot grade raise at the I-35W low point raises the roadway profile above the 100-year flood elevation. The hydraulic analysis for the project shows no roadway overtopping during a 100-year flood event (see Appendix I);
- The proposed grade raise provides two feet of freeboard above the 100-year flood elevation. Figure 4.4 illustrates the 100-year floodplain elevation, Minnesota River crest elevations for recent flood events just upstream of I-35W,[10] and the two-foot freeboard level above the

[10] National Weather Service. Advanced Hydrologic Prediction Service. December 21, 2016. Minnesota River at Savage, Historic Crests accessed October 5, 2017 at http://water.weather.gov/ahps2/hydrograph.php?wfo=mpx&gage=SAVM5

100-year flood elevation. The proposed two feet of freeboard places the I-35W elevation several feet above Minnesota River crest levels observed during recent flood events, and provides a buffer to compensate for unknown factors that could potentially contribute to greater flood elevations in a 100-year flood event;

Figure 4.4 Minnesota River 100-Year Flood Elevation and Recent Flood Events



- Any grade raise on I-35W south of the Minnesota River would result in fill below the 100-year flood elevation. The proposed two-foot grade raise is a balance between raising the profile above the 100-year flood elevation and providing freeboard while also minimizing fill impacts below the 100-year flood elevation. The proposed design includes retaining walls along I-35W to further minimize floodplain fill impacts. The hydraulic analysis for the project shows that the proposed two-foot grade raise and corresponding floodplain fill impacts would not impact the floodway or 100-year flood elevation (see Appendix I);
- The proposed two-foot grade raise avoids right of way impacts to the Minnesota River Valley National Wildlife Refuge and the Freeway Landfill site; and
- The proposed I-35W roadway profile with the two-foot grade raise matches the existing I-35W profile just north of the Cliff Road interchange, avoiding impacts to the Cliff Road interchange ramps.

The on existing alignment alternative and east shifted alignment alternative address the secondary need regarding potential roadway flooding. Under both alignment alternatives, the I-35W low-point south of the Minnesota River would be raised by approximately two feet above the 100-year flood elevation, reducing the susceptibility of I-35W to Minnesota River flood events. Raising the I-35W profile above the 100-year flood elevation reduces the likelihood for requiring maintenance activities (i.e., temporary dike construction) to protect the freeway during flood events.

Additional Considerations

The on existing alignment alternative and east shifted alignment alternative were similar regarding additional project considerations identified in Section 3.4.

- Both alignment alternatives would not preclude a future 118th Street interchange in Burnsville.
- Both alignment alternatives would address existing geometric deficiencies on the I-35W Minnesota River Bridge.
- Both alignment alternatives would address existing geometric deficiencies at the Black Dog Road interchange.
- Both alignment alternatives are within existing right of way, and would not require property acquisition from adjacent parkland.
- Both alignment alternatives accommodate navigational clearance requirements on the Minnesota River.
- Both alignment alternatives include design features to convey and treat stormwater runoff from the river bridge prior to discharge to the Minnesota River. The on existing alignment alternative would likely require additional temporary features to manage runoff during construction.

Environmental Impacts

For most of the environmental impact evaluation criteria, the two alignment alternatives were similar. The main differentiating factor was potential wetland impacts. Permanent wetland impacts were initially investigated for roadway construction only. The east shifted alignment alternative was initially estimated to impact approximately 3.5 acres of wetlands, whereas the on existing alignment alternative was initially estimated to impact approximately 2.5 acres of wetlands.

Following this initial assessment, MnDOT then completed a more detailed wetland impact evaluation. This detailed wetland impact evaluation considered other factors beyond roadway construction, and included trail construction, bridge construction, stormwater ponds, and roadway staging.

The detailed wetland impact evaluation process and results are described in the "Alignment Alternatives: Wetland Impact Evaluation" discussion below. This evaluation was based on preliminary construction limits and estimated permanent wetland impacts. Temporary wetland impacts for the project will be identified during final design and permitting.

Alignment Alternatives: Wetland Impact Evaluation

Level 1 Wetland Impact Evaluation Results

MnDOT first completed the detailed evaluation of the wetland impacts of both alignment alternatives using wetland boundaries from the National Wetland Inventory (NWI) (i.e., Level 1 wetland delineation). The Level 2 field delineation was not complete at the time of this initial alignment alternatives evaluation. Impacts for both alignment alternatives were estimated for each wetland and categorized by impact type (e.g., roadway, trail, bridge, drainage, or staging impacts). Measures minimizing wetland fill areas were then considered for both alignment alternatives, including retaining walls and adjustments to trail alignments.

Table 4.3 and Table 4.4 tabulate the results of the wetland evaluation for the two alternatives based on the Level 1 wetland boundaries. Using retaining walls, the estimated wetland impacts for the on existing alignment alternative were reduced by nearly 50 percent, from approximately four acres to approximately two acres. An even greater reduction was observed with the east shifted alignment alternative. Wetland impacts for the east shifted alignment alternative were initially estimated at approximately five acres. Following minimization, wetland impacts were reduced to approximately 1.7 acres, a reduction of more than 65 percent.

Table 4.3 Wetland Impact Matrix (On Existing Alignment Alternative, Level 1 Wetland Delineation)

Wetland ID	Roadway Impacts (acres)	Trail Impacts (acres)	Bridge Impacts (acres)	Drainage Impacts (acres)	Roadway Staging Impacts (acres)	Total Impacts (acres) (before minimization)	Minimization Technique	Minimization Costs	Reduced Wetland Impacts (acres)	Total Impacts (acres) (with minimization)
Wetland #1	0.35	0	0.02	0	0	0.37	Add 15 ft. of retaining wall (15 ft. tall)	0.02	-0.35	
Wetland #2	0	0	0	0	0	0	N/A	0	0	0
Wetland #3, Wetland #4, Wetland #5	0.23	0	0.19	0	0	0.42	Add 1,300 ft. of retaining wall (15 to 30 ft. tall)	$1,978,000	-0.23	0.19
Wetland #6	1.1	0	0	0.84	0	1.94	Add 550 ft. of retaining wall (15 to 20 ft. tall)	$833,000	-0.67	1.27
Wetland #7	0.13	0	0	0	0	0.13	Add 400 ft. of retaining wall (10 ft. tall)	$320,000	-0.13	0
Wetland #8	0.57	0.48	0	0	0	1.05	Add 905 ft. of retaining wall (10 to 20 ft. tall)	$1,020,000	-0.57	0.48
Wetland #9	0	0	0	0	0	0	N/A	$0	0	0
Wetland #10	0	0	0	0	0	0	N/A	$0	0	0
Wetland #11	0	0	0	0	0	0	N/A	$0	-0.11	0
Wetland #12	0.17	0	0	0	0	0.17	• Adjust trail and retaining wall profile • Adjust trail alignment	$0	-0.17	0
Totals	2.55	0.48	0.21	0.84	0	4.08	N/A	$4,789,000	-2.12	1.96

Estimated wetland impacts based on Level 1 wetland delineation (National Wetland Inventory (NWI) boundaries) and preliminary design construction limits for the on existing alignment alternative. The impact evaluation shown in Table 4.3 was completed prior to the Level 2 wetland delineation.

Table 4.4 Wetland Impact Matrix (East Shifted Alignment Alternative, Level 1 Wetland Delineation)

Wetland ID	Roadway Impacts (acres)	Trail Impacts (acres)	Bridge Impacts (acres)	Drainage Impacts (acres)	Roadway Staging Impacts (acres)	Total Impacts (acres) (before minimization)	Minimization Technique	Minimization Costs	Reduced Wetland Impacts (acres)	Total Impacts (acres) (with minimization)
Wetland #1	0	0	0	0	0	0	---	$0	0	0
Wetland #2	0	0	0	0	0	0	---	$0	0	0
Wetland #3, Wetland #4, Wetland #5	0.96	0	0.19	0	0	1.15	Add 1,300 feet of retaining wall (20 to over 30 ft. tall)	$2,715,000	-0.96	0.19
Wetland #6	1.29	0	0	0.72	0.22	2.23	• Realign Black Dog Rd ramps to existing alignment • Add 200 ft. of retaining walls (10 to 20 ft. tall)	$263,000	-1.29	0.94
Wetland #7	0	0	0	0	0	0	---	$0	0	0
Wetland #8	0.86	0.48	0.04	0	0	1.38	Add 1,025 feet of retaining wall (10 to 25 ft. tall)	$1,886,000	-0.86	0.52
Wetland #9	0	0	0	0	0	0	---	$0	0	0
Wetland #10	0	0	0	0	0	0	---	$0	0	0
Wetland #11	0	0	0	0	0	0	N/A	$0	0	0
Wetland #12	0.25	0	0	0	0	0.25	• Adjust trail and retaining wall profile • Adjust trail alignment	$0	-0.25	0
Totals	3.36	0.48	0.23	0.72	0.22	5.01	0	$4,864,000	-3.36	**1.65**

Estimated wetland impacts based on Level 1 wetland delineation (National Wetland Inventory (NWI) boundaries) and preliminary design construction limits for the east shifted alignment alternative. The impact evaluation shown in Table 4.4 was completed prior to the Level 2 wetland delineation.

Level 2 Wetland Impact Evaluation Results

MnDOT completed a Level 2 wetland field delineation in fall 2015. This delineation was completed following the wetland impact evaluation described above. The wetland boundaries identified with the Level 2 delineation differed from the NWI data; therefore, the wetland impact evaluation was revisited using the Level 2 wetland boundaries. The estimated wetland impacts for the on existing alignment alternative with minimization measures and the Level 2 wetland boundaries were approximately 1.35 acres. The estimated wetland impacts for the east shifted alignment alternative with minimization measures and the Level 2 wetland boundaries were approximately 1.12 acres. Table 4.5 tabulates the total potential wetland impacts for each alignment alternative.

Table 4.5 Wetland Impact Matrix (Level 2 Wetland Delineation)

Wetland ID	On Existing Alignment Alternative Total Impacts (acres) (with minimization measures)	East Shifted Alignment Alternative Total Impacts (acres) (with minimization measures)
Wetland #1	0	0
Wetland #2	0	0
Wetland #3, Wetland #4, Wetland #5	0	0
Wetland #6	1.21	0.94
Wetland #7	0	0
Wetland #8	0.14	0.18
Wetland #9	0	0
Wetland #10	0	0
Wetland #11	0	0
Wetland #12	0	0
Totals	1.35	1.12

Estimated wetland impacts based on Level 2 wetland delineation boundaries and preliminary design construction limits for the on existing alignment alternative (see Figure C-1, Appendix C) and east shifted alignment alternative (see Figure C-2, Appendix C). Includes minimization measures (e.g., retaining walls, adjustments to trails).

Preferred Alignment Alternative

Preferred Alignment Alternative Decision

After reviewing the results of the alignment alternatives analysis with the TAC, and the wetland impact evaluation with the U.S. Army Corps of Engineers (USACE), MnDOT identified the east shifted alignment

alternative as the preferred alignment alternative. The east shifted alignment alternative was identified as the Preferred Alternative because it addresses the secondary needs for the project, is the least complex option (resulting in lower project costs), and would have a lower construction duration. The east shifted alignment alternative also minimizes wetland impacts compared to the on existing alignment alternative.

The alternatives evaluation described above and in Table 4.1 through 4.5, including identification of the east shifted alignment as the Preferred Alternative, was completed in 2015. The alternatives evaluation and Preferred Alternative decision does not change with MnDOT's decision to deliver the project as a design-build project.

Preferred Alignment Alternative Design Refinements

Once the east shifted alignment alternative was identified as the preferred alignment alternative, additional studies were completed and project design was further refined as part of the preliminary engineering process. Design refinements incorporated into the Preferred Alternative are summarized below. Because of these design refinements, Preferred Alternative wetland impacts were further reduced from the approximately 1.12 acres shown in Table 4.5 to approximately 0.3 acres.[11] Section 5.11.2 describes the wetland impacts for the Preferred Alternative.

- An existing stormwater pond is in the southwest quadrant of the I-35W/Black Dog Road interchange. Initial drainage design concepts included construction of a filtration basin to the north of the existing pond. This filtration basin was estimated to impact approximately 0.7 acres of Wetland #6 (see Table 4.4).

  Because of flooding concerns (i.e., the filtration basin would be located below the 10-year flood event elevation), maintenance costs, and wetland impacts, MnDOT determined that a second filtration basin in the southwest quadrant of the I-35W/Black Dog Road interchange was not a viable option and dismissed this concept from further study. An alternative location outside of MnDOT right of way along the east side of I-35W north of the Minnesota River in Bloomington was ultimately identified for treatment of stormwater runoff and rate control (see Section 5.11.2). This change reduced Preferred Alternative wetland impacts by approximately 0.7 acres.

[11] Wetland impacts only. Does not include other aquatic resource impacts (e.g., tributary, wet ditch, stormwater basin).

- The Preferred Alternative was initially estimated to impact 0.22 acres of Wetland #6 for roadway construction staging (see Table 4.4). As part of the preliminary design process, this impact was reduced to approximately 0.04 acre.
- The geometry of the I-35W/Black Dog Road interchange was further refined and includes complete reconstruction of the ramp and loop in the southeast quadrant of the interchange. The southeast loop and ramp will be shifted to the south and east of the existing alignments. Retaining walls were incorporated into the Preferred Alternative design along the southeast ramp and loop to minimize impacts adjacent wetlands. Consequently, the Preferred Alternative would impact approximately 0.06 acres of Wetland #9 and approximately 0.07 acres of Wetland #11.

4.2.4 I-35W Typical Section Options

Existing I-35W Typical Section

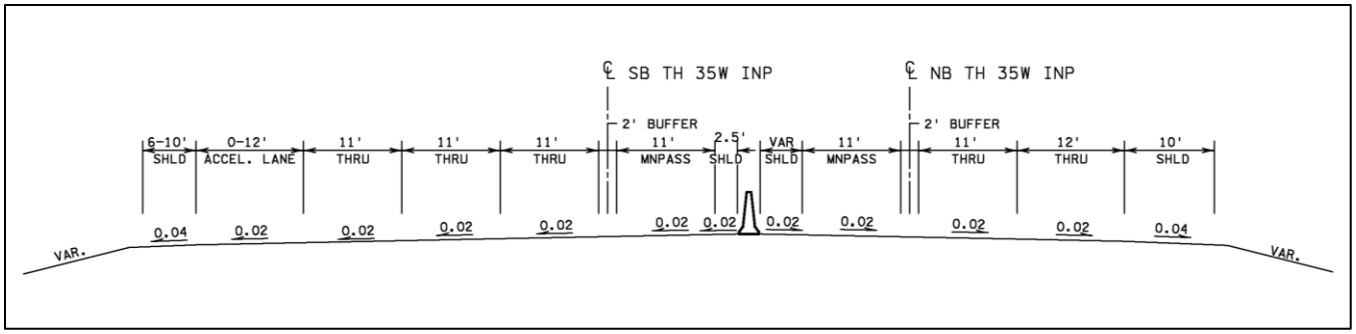
The original construction of I-35W between the Cliff Road interchange and the West 106th Street interchange was completed in 1960. The original roadway typical section provided a minimum 4-foot median, a 13-foot left lane, a 12-foot right lane, and a 10-foot inside and outside shoulder in each direction.

The I-35W roadway was later reconstructed to provide a High Occupancy Vehicle (HOV) lane in each direction. This reconstruction project modified the roadway typical section to include a concrete median barrier between southbound and northbound I-35W, inside shoulders ranging from 2 feet to 5 feet, three 12-foot lanes, and 10-foot outside shoulders.

Southbound I-35W was reconfigured again in 2008 as part of a project to convert the HOV lane to the current MnPASS lane. As part of this project, southbound I-35W was modified to include an auxiliary lane between the West 106th Street interchange in Bloomington and the TH 13 interchange in Burnsville. The roadway typical section on southbound I-35W was modified to provide a 2.5-foot inside shoulder, an 11-foot MnPASS lane, a 2-foot buffer, three 11-foot lanes, and a 6-foot to 10-foot outside shoulder.

There have been no additional modifications to the I-35W typical section south of the Minnesota River since completion of the 2008 project. Figure 4.3 illustrates the existing I-35W typical section south of the Minnesota River.

Figure 4.5 Existing Typical Section South of the Minnesota River



Typical Section Alternatives

The existing I-35W shoulder widths described above do not meet current MnDOT design standards. MnDOT Technical Memorandum 12-12-TS-06 specifies a standard shoulder width of 10 feet (minimum) for multi-lane, freeway facilities (six lanes or more). MnDOT Technical Memorandum 13-18-TS-07 specifies a lane width of 11 feet (minimum) to 12 feet (maximum) for freeway facilities. Reconstructing I-35W south of the Minnesota River to accommodate a new Minnesota River Bridge and to address roadway flooding provides MnDOT the opportunity to improve I-35W shoulder widths.

The I-35W right of way south of the Minnesota River is bordered by two primary features: 1) the Freeway Landfill site along the west side of I-35W, and 2) the Minnesota River Valley National Wildlife Refuge along the east side of I-35W. The Freeway Landfill site is a designated superfund site and contains known soil and groundwater contamination. The Minnesota River Valley National Wildlife Refuge is a Section 4(f) resource characterized by an expansive wetland and floodplain complex associated with the Minnesota River.

With these two resources in mind, MnDOT considered a range of typical section alternatives that included different lane and shoulder width configurations that included 10-foot wide shoulders and 12-foot wide travel lanes. Providing 10-foot wide shoulders and 12-foot wide travel lanes, including retaining walls along the outside shoulders, risks encroaching into the Freeway Landfill site and the Minnesota River Valley National Wildlife

Refuge, resulting in right of way, wetland, floodplain, and contaminated property impacts.

Preferred Alternative Typical Section

Preferred Alternative Typical Section

MnDOT identified a Preferred Alternative typical section for I-35W that stays within the existing right-of-way and avoids the Freeway Landfill site and the Minnesota River Valley National Wildlife Refuge. The Preferred Alternative typical section proposes 4-foot to 4.5-foot inside shoulders, an 11-foot MnPASS lane, a 2-foot buffer, an 11-foot lane; two 12-foot lanes, and a 10-foot outside shoulder in each direction. The 4-foot inside shoulder width would be carried across the Minnesota River Bridge to I-35W north of the Minnesota River to maintain roadway design consistency. Figure 4.6 illustrates the Preferred Alternative typical section for I-35W south of the Minnesota River. Maintaining I-35W within the existing right of way with 11-foot lanes and reduced inside shoulders avoids the adverse environmental effects associated with widening the roadway outside of the existing corridor.

Drainage Spread and Inside Shoulder Width

Drainage Spread

When rain falls on a sloped pavement surface, it forms a film of water. In an urban drainage system, this water is conveyed from the roadway surface by a curb and gutter system to storm drains and a storm sewer system. The water increases in depth as it flows toward the pavement edge and curb, forming a triangular shape. There are many factors which affect the depth of water on the pavement surface, including: rainfall intensity, slope of the roadway, and length of flow.

> "Spread" refers to the distance from the face of curb to the limit of water flowing on a roadway during a storm event.

Stormwater runoff can spread from the curb into the shoulder or further to the adjacent travel lane. "Spread" is a measure of the distance from the face of a curb to the limit of the water flowing on a roadway during a storm event. Figure 4.7 illustrates the spread of stormwater runoff from the face of curb to the edge of the adjacent travel lane. Water that spreads from the shoulder into the travel lane creates conditions which can cause hydroplaning and affect the safe passage of vehicles during a storm event.

Figure 4.6 Preferred Alternative Typical Section South of the Minnesota River

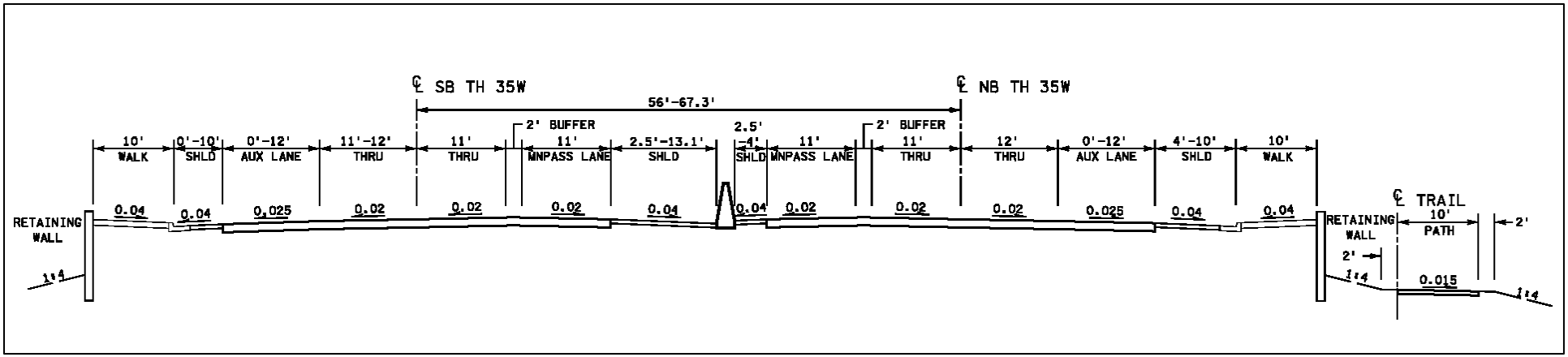
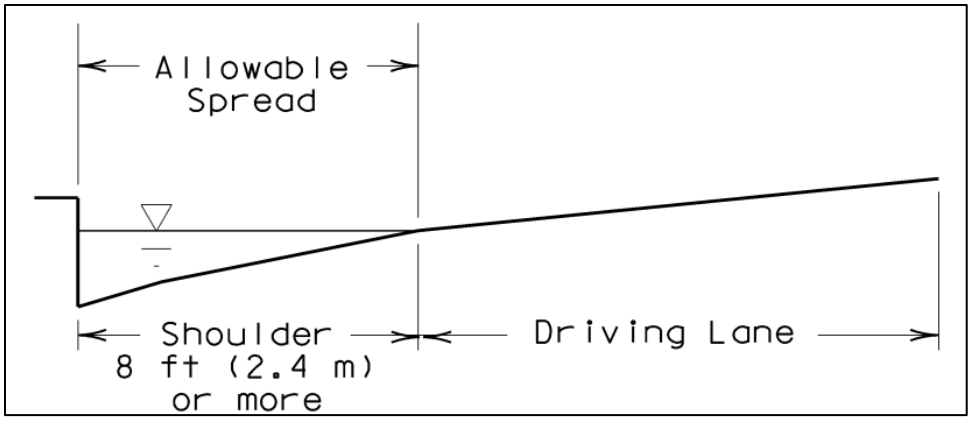


Figure 4.7 Example of Stormwater Runoff Spread from the Face of Curb to Edge of Driving Lane



Source: MnDOT Technical Memorandum No. 11-14-B-05. September 7, 2011. Storm Drain Design Frequency and Catch Basin Spacing.

The amount of allowable spread for a given roadway is based on its functional classification (e.g., principal arterial, minor arterial, collector, etc.), average daily traffic volumes, and design speed. MnDOT Technical Memorandum No. 11-14-B-05 (Storm Drain Design Frequency and Catch Basin Spacing) and FHWA Hydraulic Engineering Circular No. 22, Urban Drainage Design Manual guide the design of highways and drainage spread. The allowable spread for an Interstate highway such as I-35W is to contain the stormwater runoff within the shoulder for a 10-year storm event.

Preferred Alternative Design

The proposed inside shoulder width for the project segment of I-35W is 4 feet to 4.5 feet. The reduced inside shoulder width was identified by MnDOT as part of the Preferred Alternative typical section evaluation to stay within existing I-35W right of way and avoid impacts associated with widening outside of the corridor.

An evaluation of bridge deck drainage shows that a 7-foot wide inside shoulder with a scupper drainage system would be needed to contain runoff within the shoulder during the 10-year storm event. However, scupper drainage systems can create on-going maintenance concerns to keep the scupper system free of debris and functioning properly to remove stormwater runoff from the bridge deck.

As noted in Section 4.2.2, the project will be designed and constructed through MnDOT's Design-Build Program. MnDOT will be preparing a design exception request that provides the design-build contractor the ability

to either provide enough stormwater inlets on I-35W and the I-35W Minnesota River Bridge to contain the runoff for a 10-year storm event within the shoulder, or allow runoff to encroach one-third of the lane width into the adjacent MnPASS lane. Design-build contractors also will be encouraged to identify a design that optimizes the durability of the I-35W Minnesota River Bridge and minimizes on-going maintenance activities. If the final design for the project includes spread encroachment, then MnDOT will modify its Concept of Operations for the I-35W corridor. MnDOT will use dynamic message signs (DMS) along I-35W to indicate MnPASS lane closures for the period when the MnPASS lane is not available, and divert traffic to adjacent general purpose lanes.

4.2.5 Trail Connection Options

Following identification of the steel truss bridge as the Preferred Alternative bridge type and the east shifted alignment as the proposed alignment, the last step in the evaluation process was to identify the trail connections to the north and south of the river bridge. Ten trail connection options were developed – eight for the east side of the I-35W Minnesota River Bridge and two for the west side of the I-35W Minnesota River Bridge. Appendix D contains figures illustrating these trail connection options:

- Southeast 1: Follows Black Dog Ramp (Figure D.1)
- Southeast 1, Phase II: Follows Black Dog Ramp (Figure D.1)
- Southeast 2: Box Culvert Under Ramp (Figure D.2)
- Northeast 1: Elevated Switchback (Figure D.3)
- Northeast 2: Helical Ramp (Figure D.4)
- Northeast 3: Switchback (Figure D.5)
- Northeast 4: Continue to Lyndale Avenue South (Figure D.6)
- Northeast 5: Lower Trail on Bridge (Figure D.7)
- Southwest 1: Follows Black Dog Ramp (Figure D.8)
- Northwest 1: Switchback (Figure D.9)

The ten trail connection options were evaluated against a range of screening criteria, including: cost (trail and non-trail), structure requirements, potential wetland impacts, and other considerations. Table 4.6 tabulates the results of the trail connection evaluation.

Trail options that were dismissed from further consideration following the initial screening process are summarized below.

- Southeast 2 was dismissed because the box culvert under the Black Dog Road interchange ramps would be susceptible to flood events, presenting a safety hazard for trail users.
- Northeast 1, Northeast 2, and Northeast 5 all utilize a structure to make up the elevation difference from the river bridge to the boat ramp area along the river shoreline. These trail options were dismissed because of the structure costs (initial construction costs and ongoing maintenance and inspection costs).
- Northeast 3 was dismissed because of greater wetland impacts.

Based on the results of the trail option screening process and feedback provided by the TAC, four trail connection options were identified by MnDOT for further evaluation. Southeast 1 and Northeast 4 were combined and carried forward as the East Trail Option. Southwest 1 and Northwest 1 were combined and carried forward as the West Trail Option.

The last step in the evaluation process was to compare the East Trail Option and West Trail Option and identify the preferred trail connection. Additional design work was completed, including updated cost estimates and an evaluation of retaining wall needs. The design of the East Trail Option was revised to accommodate proposed stormwater ponds along the east side of I-35W between the highway and Lyndale Avenue South. The proposed ponds are located near the top of the bluff. Trees would be maintained along the bluff line to provide a buffer between the ponds and adjacent land uses to the north. The East Trail Option alignment was shifted to the south of the proposed ponds, and a retaining wall was identified to minimize impacts to adjacent wetlands (see Figure D.10, Appendix D). Table 4.7 tabulates the results of the East Trail Option/West Trail Option evaluation.

Table 4.6 Trail Connection Options (East Shifted Alignment Alternative)

Trail Option	Description	Trail Construction Costs (Including Structures)	Other Costs	Structure Requirements	Other Considerations	Wetland Impacts (acres)
Southeast 1	Trail follows southeast ramp to Black Dog Road and connects with Big Rivers Regional Trail. See Figure D.1, Appendix D.	$203,250	N/A	• 900 ft. of retaining wall. • 2,450 ft. of median barrier. • Retaining wall is required to keep the roadway out of wetlands. • Retaining wall not included in trail costs.	Retaining wall used to keep roadway and trail out of adjacent wetlands.	Approximately 0.5 acres
Southeast 1, Phase II	Connect South 1 option into existing City of Burnsville Trail. Requires removal of Black Dog Road interchange ramps. See Figure D.1, Appendix D.	$9,200	N/A	N/A	If Black Dog Road interchange ramps are removed, shift trail alignment further to the south to avoid wetland impacts.	0 acres
Southeast 2	Trail crosses under southeast ramps using a box culvert to connect to the existing City of Burnsville trail. See Figure D.2, Appendix D.	$680,950	Ongoing maintenance and inspection costs of box culvert.	• 900 ft. of retaining wall. • 1,030 ft. of median barrier. • Box culvert with wing walls. • Retaining wall is required to keep the roadway out of wetlands. • Retaining wall not included in trail costs.	• Retaining wall used to keep roadway and trail out of wetlands. • Safety concerns with box culvert in flood prone area.	Approximately 0.15 acres
Northeast 1	Uses an elevated switchback structure to bring trail down to boat ramp area. See Figure D.3, Appendix D.	$3,805,000	Ongoing maintenance and inspection costs of structure.	Switchback structure	N/A	0 acres

Trail Option	Description	Trail Construction Costs (Including Structures)	Other Costs	Structure Requirements	Other Considerations	Wetland Impacts (acres)
Northeast 2	Uses a helix structure to bring trail down to boat ramp area. See Figure D.4, Appendix D.	$4,205,000	Ongoing maintenance and inspection costs of structure.	Helix structure	N/A	Approximately 0.15 acres
Northeast 3	Uses a switchback spread out on fill slopes to bring trail down to boat ramp area. See Figure D.5, Appendix D.	$37,000	N/A	• 450 ft. of retaining wall. • Retaining wall is required to keep the roadway out of wetlands. • Retaining wall not included in trail costs.	• Retaining wall used to keep roadway and trail out of adjacent wetlands. • Tree loss between I-35W and Lyndale Avenue South.	Approximately 1.75 acres
Northeast 4	Trail follows northbound I-35W for approximately 1,200 feet then turns east to Lyndale Avenue South. See Figure D.6, Appendix D.	$141,150	N/A	• 1,275 ft. of tiered retaining walls. • 1,510 ft. of median barrier. • Retaining wall is required to keep the roadway out of wetlands. • Retaining wall not included in trail costs.	• Retaining wall used to keep roadway and trail out of adjacent wetlands. • Tree loss at top of bluff.	0 acres
Northeast 5	Trail starts descending from north end of bridge on separate structure and switches back south to boat ramp area. See Figure D.7, Appendix D.	$2,116,000	Ongoing maintenance and inspection costs of structure.	• 375 ft. of retaining wall. • Bridge structure. • Retaining wall is required to keep the roadway out of wetlands • Retaining wall not included in trail costs.	Retaining wall used to keep roadway and trail out of adjacent wetlands.	Approximately 0.15 acres
Southwest 1	Trail follows southwest ramp down to Black Dog Road, crosses under I-35W Minnesota River Bridge, and connects with Big Rivers Regional Trail. See Figure D.8, Appendix D.	$115,800	N/A	• 250 ft. of retaining wall. • 1,410 ft. of median barrier. • Retaining wall length is required to keep the roadway out of adjacent wetlands. • Retaining wall not included in trail costs.	Retaining wall used to keep roadway and trail out of adjacent wetlands.	0 acres

Trail Option	Description	Trail Construction Costs (Including Structures)	Other Costs	Structure Requirements	Other Considerations	Wetland Impacts (acres)
Northwest 1	Trail follows southbound I-35W for approximately 450 feet then switches back to south and crosses under I-35W to boat ramp area. See Figure D.9, Appendix D.	$815,200	N/A	690 ft. of retaining wall	N/A	0 acres

Estimated wetland impacts based on Level 1 wetland delineation (National Wetland Inventory (NWI) boundaries). The Level 2 field delineation boundaries were not available at the time of the trail option screening process.

Table 4.7 Trail Connection Options (East Trail Option and West Trail Option)

Trail Option	Description	Trail Construction Costs (Including Structures)	Other Costs	Structure Requirements	Other Considerations	Wetland Impacts (acres)
East Trail Option (South)	Trail follows southeast ramp to Black Dog Road and connects with Big Rivers Regional Trail.	$148,000	N/A	• 380 ft. of retaining wall. • 1,600 ft. of median barrier. • Retaining wall is required to keep roadway out of wetlands. • Retaining wall not included in trail costs.	Retaining wall used to keep roadway and trail out of adjacent wetlands.	Approximately 0.07 acres
East Trail Option (North)	Trail follows northbound I-35W for approximately 1,300 feet then turns east to Lyndale Avenue South.	$1,277,000	Ongoing maintenance and inspection costs of structure.	• 650 ft. of retaining wall. • 1,405 ft. of median barrier. • Box culvert needed to route existing ditch under trail. • Retaining wall is required to keep roadway out of wetlands. • Retaining wall not included in trail costs.	Retaining wall used to keep roadway and trail out of adjacent wetlands.	Approximately 0.05 acres
West Trail Option (South)	Trail follows southwest ramp down to Black Dog Road, crosses under I-35W Minnesota River Bridge, and connects with Big Rivers Regional Trail.	$348,000	N/A	• 145 ft. of retaining wall. • 885 ft. of median barrier.	Retaining wall used to keep roadway and trail out of adjacent wetlands.	Approximately 0.06 acres (0.05 acres with retaining wall)
West Trail Option (North)	Trail follows southbound I-35W then switches back to south and crosses under I-35W to boat ramp area.	$311,000	N/A	• 130 ft. of retaining wall. • 460 ft. of median barrier.	N/A	0 acres

Estimated wetland impacts based on National Wetland Inventory (NWI) boundaries.

The East Trail Option and West Trail Option was reviewed with the TAC and presented to the public at open house meetings in Burnsville and Bloomington in October 2015 (see "Trail Options" board from open house in Appendix D). Attendees were provided the opportunity to "vote" for either the East Trail Option or the West Trail Option. Approximately 100 surveys were received at the open house meetings. Results of the survey with respect to the trail alignment options are summarized below:

- 65 percent of respondents preferred the East Trail Option;
- 31 percent of respondents preferred the West Trail Option; and
- 4 percent had no opinion.

Following the public open house meeting along with input from the TAC, MnDOT identified the East Trail Option as the preferred trail connection to the I-35W Minnesota River Bridge. The City of Bloomington noted that there would be a strong desire by mountain bicyclists to access existing and future trails along the Minnesota River shoreline directly from the I-35W Minnesota River Bridge. Therefore, MnDOT modified the East Trail Option to include a switchback trail along the east embankment between the river bridge and boat landing area at the south end of Lyndale Avenue South. This connection would be a natural-surfaced trail with steeper grades intended for advanced mountain bicyclists. Although the East Trail Option results in greater costs, this option provides better overall connectivity for non-motorized travelers.

- At the south end of the river bridge, the proposed trail connects to the Big Rivers Regional Trail and a City of Burnsville trail. The Big Rivers Regional Trail continues to the east along the Minnesota River shoreline to the Cedar Avenue Bridge. The City of Burnsville Trail continues to the south along I-35W to Cliff Road.
- The switchback trail along the east embankment provides an alternative route for advanced mountain bicyclists and hikers to more quickly access existing and future trails along the north shoreline.
- Lyndale Avenue South is identified in the City of Bloomington's *Alternative Transportation Plan Update* (January 2015 draft) as a future on-street trail corridor. The East Trail Option provides a direct connection into Lyndale Avenue South, facilitating regional non-motorized trips that continue to the north into Bloomington. Non-motorized travelers destined for trails along the Minnesota River would continue south along Lyndale Avenue South to the DNR boat landing area.

4.3 Alternatives Evaluated but Rejected

Section 4.2 describes the process for identifying the Preferred Alternative, including the rationale for rejecting alternatives. The rejected alternatives and trail options include:

- Rehabilitation of the existing I-35W Minnesota River Bridge.
- Five different bridge types (steel tied arch, steel truss, extradosed, cable stay, suspension).
- Reconstruction of the I-35W Minnesota River Bridge on its existing alignment (see the alignment alternatives considered in Appendix C).
- Multi-modal trail connections along the east and west sides of I-35W (see multi-modal trail options considered in Appendix D).

4.4 Alternatives under Consideration

There are two alternatives under consideration in this EA – the No Build Alternative and the Preferred Alternative.

4.4.1 No Build Alternative

The No Build Alternative would maintain the existing I-35W corridor between Cliff Road and West 106th Street as well as the existing bridge over the Minnesota River. The No Build Alternative would be limited to ongoing maintenance work. The No Build Alternative provides the basis of comparison, or baseline, for the Preferred Alternative; it would not satisfy the purpose and need for the project.

4.4.2 Preferred Alternative

The Preferred Alternative is the replacement of the I-35W Minnesota River Bridge with two new parallel bridges (one for northbound I-35W and one for southbound I-35W). The Preferred Alternative proposes constructing the new I-35W Minnesota River Bridges on an alignment shifted to the east by approximately 30 feet compared to the existing bridge.

Table 4.8 summarizes the reasons why the Preferred Alternative includes replacing the existing I-35W Minnesota River Bridge, why the east shifted alignment alternative was identified as the Preferred Alternative alignment, and why the proposed trail options were identified for the project.

Table 4.8 Basis for Preferred Alternative Identification

	Basis for the Identification of the Preferred Alternative
Primary Need	• Replaces the existing I-35W Minnesota River Bridge with a new structure, addressing bridge condition needs.
Secondary Needs	• Replaces the existing I-35W bridges over West 106th Street. • Traffic to be maintained on I-35W during project construction. MnPASS lane and Orange Line BRT to remain in operation during project construction. • Minnesota River navigation to be maintained during project construction. • Does not preclude additional capacity in the future (beyond 2040) if warranted. • Northbound lane addition from Cliff Road provides safety and traffic operations benefits. • Proposed trails address multi-modal connectivity needs across Minnesota River. • Proposed grade raise south of Minnesota River addresses flooding concerns.
Additional Considerations	• Does not preclude future development and 118th Avenue interchange south of Minnesota River. • Improves interchange ramp geometric design at Black Dog Road Interchange. • Improves geometric design related to outside shoulder width on I-35W Minnesota River Bridge. • Improves geometric design related to vertical clearance and intersection sight distance at the West 106th Street interchange. • Does not preclude future trails along West 106th Street under I-35W. • Meets USCG navigation clearance requirements.
Social, Economic, and Environmental Impact Considerations	• BMPs identified to provide treatment of stormwater runoff. • Located within existing right of way. Avoids Section 4(f) use and Section 6(f) LAWCON conversion. • Least overall wetland impacts compared to the on existing alignment alternative. • Wetland impacts minimized through Preferred Alternative design features (retaining walls, trail alignments, drainage design).

The Preferred Alternative includes the following project features:

- Reconstruct the I-35W Bridge over the Minnesota River. The new I-35W Minnesota River Bridge would be constructed approximately 30 feet to the east of the existing bridge. One bridge will be constructed for the southbound I-35W lanes (MnDOT Bridge No. 27W39) and a second bridge will be constructed for the northbound I-35W lanes (MnDOT Bridge No. 27W38). The northbound I-35W Bridge will include a multi-use trail along the east side of the bridge;
- The range of possible bridge types for the I-35W Minnesota River crossing includes a steel plate girder, PC spliced concrete beam, steel box girder, steel delta frame, and concrete segmental. Bridge types that include above-deck structural elements such as trusses, arches, towers, or cables will not be allowed. The design-build contractor will identify a Preferred Alternative bridge type as part of the design-build procurement process.
- Reconstruct the I-35W bridges over West 106th Street. The new I-35W bridge would be constructed as one single structure spanning over the entire width of West 106th Street. The proposed I-35W bridge over West 106th Street would be designed and constructed to not preclude future pedestrian/bicycle trails along West 106th Street under I-35W;
- Reconstruct I-35W from the I-35W Bridge over Cliff Road in Burnsville to the West 106th Street Bridge over I-35W in Bloomington. The roadway grade south of the Minnesota River would be raised by increasing the low roadway elevation approximately two feet above the existing roadway elevation. The proposed roadway elevation would be above the 100-year floodplain elevation, eliminating potential overtopping of the roadway in the 100-year flood event. Retaining walls ranging in height from approximately five feet tall to 20 feet tall would be constructed along both the east and west sides of I-35W;
- Construct a new northbound I-35W lane to the outside of the roadway from the Cliff Road interchange in Burnsville to the existing truck climbing lane located along the Minnesota River bluff south of the West 106th Street interchange in Bloomington;
- Reconstruct the I-35W/Black Dog Road interchange ramps and loops. Retaining walls ranging in height from approximately seven feet tall to 30 feet tall would be constructed along the southeast and southwest interchange ramps;

- Reconstruct the existing City of Burnsville trail along the east side of I-35W from Cliff Road to the I-35W/Black Dog Road interchange;
- Construct two new stormwater ponds between I-35W and Lyndale Avenue South north of the Minnesota River;
- Construct a new multi-use trail within the southeast quadrant of the I-35W/Black Dog Road interchange between northbound I-35W Minnesota River Bridge and Black Dog Road. A trail crossing and connection would be constructed along the south side of Black Dog Road to provide connectivity for non-motorized users to the Big Rivers Regional Trail; and
- Construct a new multi-use trail along the east side of I-35W between the northbound I-35W Minnesota River Bridge and Lyndale Avenue South. A retaining wall ranging in height from approximately 15 feet tall to 40 feet tall would be constructed along the south side of the trail as it curves to the east, away from I-35W, and connects into Lyndale Avenue South near the top of the Minnesota River valley bluff.

4.5 Project Cost and Funding

4.5.1 Project Cost Estimate

The total estimated cost of the project is approximately $157.5 million, adjusted for inflation to year 2020 dollars. This estimated cost includes bridge and roadway construction, retaining wall construction, multi-modal trail construction, contingency, and engineering.

4.5.2 Project Funding

The project is programmed in the 2017-2020 Minnesota *State Transportation Improvement Program* (STIP) for construction in fiscal year 2020.[12] Funding for the project will include a combination of State and Federal-aid funds. Local funds may also be included as part of cost-sharing agreements for project elements that benefit local units of government.

[12] Minnesota Department of Transportation. State of Minnesota. 2017-2020 State Transportation Improvement Program (STIP). Approved by Federal Highway Administration/Federal Transit Administration October 20, 2016 available at https://www.dot.state.mn.us/planning/program/stip.html.

4.6 Benefit Cost Analysis

The purpose of a benefit cost analysis is to evaluate the economic advantages (benefits) and disadvantages (costs) of a proposed highway investment. According to MnDOT guidance, "the objective of a benefit-cost analysis is to translate the effects of an investment into monetary terms and to account for the fact that benefits generally accrue over a long period of time while capital costs are incurred primarily in the initial years." [13] A benefit cost analysis considers highway user benefits (e.g., travel time savings, vehicle operating cost savings, safety benefits) and weighs them against project costs (e.g., initial capital costs, rehabilitation costs, maintenance costs, etc.). This analysis indicates whether transportation savings (travel time, safety) exceed the costs of design, construction, and long-term operations.

Projects are considered cost-effective if the present value of benefits exceeds the present value of the costs of implementing the project (i.e., a benefit/cost ratio greater than 1.0). The benefit/costs analysis for the project was based on preliminary cost estimates for the steel girder bridge type. The benefit/cost ratio for the I-35W Minnesota River Bridge Project was 5.1 compared to replacing the I-35W Minnesota River Bridge in-kind.

A copy of the complete benefit cost analysis technical memorandum is available from the MnDOT Project Manager (see Chapter 7 for contact information).

4.7 Project Schedule

The following is a tentative schedule for the I-35W Over the Minnesota River Project.

Activity	Anticipated Timeline
EA comment period	Winter 2018
EA public hearing	Winter 2018
Conclusion of environmental review process	Winter 2018
Permitting	2018
Final Design (design-build delivery)	2017-2018
Start Construction (1)	Summer 2018
End Construction	Fall 2021

(1) Start of construction dependent on project funding.

[13] Minnesota Department of Transportation. Office of Planning & Programming. 2016. Benefit-Cost Analysis for Transportation Projects available at http://www.dot.state.mn.us/planning/program/benefitcost.html.

Chapter 5 Environmental Assessment Worksheet

Minnesota's EAW form is included in this EA in order to meet state EQB requirements. Additional federal issues not covered by the EAW are in Chapter 6 (Additional Federal Issues.)

This Environmental Assessment Worksheet (EAW) form and EAW Guidelines are available at the Environmental Quality Board's website at: http://www.eqb.state.mn.us/EnvRevGuidanceDocuments.htm. The EAW form provides information about a project that may have the potential for significant environmental effects. The EAW Guidelines provide additional detail and resources for completing the EAW form.

Cumulative potential effects can either be addressed under each applicable EAW Item, or can be addresses collectively under EAW Item 19.

Note to reviewers: Comments must be submitted to the RGU during the 30-day comment period following notice of the EAW in the *EQB Monitor*. Comments should address the accuracy and completeness of information, potential impacts that warrant further investigation and the need for an EIS.

5.1 EAW Item 1: Project Title

I-35W Over the Minnesota River

5.2 EAW Item 2: Proposer

Contact person: Scott Pedersen, P.E.

Address: 1500 West County Road B2

City, State, ZIP: Roseville, MN 55113

Phone: (651) 234-7726

Email: scott.pedersen@state.mn.us

5.3 EAW Item 3: RGU

Contact person: Rick Dalton

Address: 1500 West County Road B2

City, State, ZIP: Roseville, MN 55113

Phone: 651-234-7677

Email: richard.dalton@state.mn.us

5.4 EAW Item 4: Reason for EAW Preparation

Required:	Discretionary:
☐ EIS Scoping	☐ Citizen Petition
X Mandatory EAW	☐ RGU Discretion
	☐ Proposer Initiated

If EAW or EIS is mandatory give EQB rule category subpart number(s) and name(s):

Minnesota Rule 4410.4300 subp 22 Highway Projects (B) – For construction of additional travel lanes on an existing road for a length of one or more miles.

5.5 EAW Item 5: Project Location

County: Hennepin and Dakota Counties

City/Township: City of Burnsville and City of Bloomington

PLS Location (¼, ¼, Section, Township, Range): Sections 21, 22, 27, 28, 33, 34, Township 27 N, Range 24 W

Watershed (81 major watershed scale): Lower Minnesota River Watershed

GPS Coordinates: Not applicable (N/A)

Tax Parcel Numbers: N/A

At a minimum attach each of the following to the EAW:

- County map showing the general location of the project;

  See Figure A.1 (Area Location Map) and Figure A.2 (Project Location Map), Appendix A.

- U.S. Geological Survey 7.5 minute, 1:24,000 scale map indicating project boundaries (photocopy acceptable); and

  See Figure A.3, Appendix A.

- Site plans showing all significant project and natural features. Pre-construction site plan and post-construction site plan.

  See Figure A.4 through Figure A.8, Appendix A.

5.6 EAW Item 6: Project Description

5.6.1 Project Summary

Item 6.a. Provide the brief project summary to be published in the *EQB Monitor*, (approximately 50 words).

MnDOT proposes reconstruction of I-35W between Cliff Road in Burnsville to West 106th Street in Bloomington, including reconstruction of the I-35W Minnesota River Bridge. On northbound I-35W, MnDOT proposes an extension of the existing northbound truck climbing lane from south of West 106th Street to the Cliff Road entrance ramp. At the West 106th Street interchange, MnDOT proposes reconstruction of the I-35W bridges, including reconstruction of the south ramps. Additional project elements include drainage improvements, retaining walls, noise wall, and trail construction.

5.6.2 Complete Description of the Proposed Project

Item 6.b. Give a complete description of the proposed project and related new construction, including infrastructure needs. If the project is an expansion include a description of the existing facility. Emphasize: 1) construction, operation methods and features that will cause physical manipulation of the environment or will produce wastes, 2) modifications to existing equipment or industrial processes, 3) significant demolition, removal or remodeling of existing structures, and 4) timing and duration of construction activities.

Chapter 4, Section 4.4.2 (Preferred Alternative) describes the proposed project is described in detail.

1) Construction, Operation Methods and Features That Will Cause Physical Manipulation of the Environment or Will Produce Wastes.

Construction activities associated with the proposed bridge replacement project would result in noise and dust. Dust generated during construction will be minimized through standard dust control measures such as applying water to exposed soils and limiting the extent and duration of exposed soil conditions. Construction contractors will be required to control dust and other airborne particulates in accordance with MnDOT standard specifications in place at the time of construction. Permanent vegetation cover will be re-established as soon as practicable. While MnDOT and its contractor(s) are exempt from local noise ordinances, it is the practice to

require contractor(s) to comply with applicable local noise restrictions and ordinances to the extent that is reasonable. Advanced notice will be provided to affected communities of any planned abnormally loud construction activities. Section 5.17 (EAW Item 17) discusses noise during construction.

Excess materials and debris generated from the project such as existing pavement, fencing material, unsuitable grading material, and trees/vegetation will be disposed of in accordance with MnDOT standard specifications and applicable rules (e.g., Minnesota Rules 7035.2825) in place at the time of construction. Excess materials and debris will not be placed in wetlands or floodplains.

Vibrations are expected to result from pile driving for sheet piling bridge piers during bridge construction. While vibration is often a nuisance during roadway projects, actual damage to structures is extremely rare. Construction vibrations may be perceptible and possibly annoying to occupants of buildings within the project area. Any necessary building susceptibility studies will be completed prior to construction following MnDOT standard practices in place at that time.

The project would result in some potential for erosion as existing ground cover will be disturbed. Trees would be removed within MnDOT right of way along the Minnesota River shoreline and at the proposed stormwater basin location along the east side of I-35W. A stormwater pollution prevention plan (SWPPP) will be developed during final design. Erosion and sediment control will be followed in accordance with National Pollutant Discharge Elimination System (NPDES) permitting requirements.

Construction staging areas would be located along the north and south shorelines of the Minnesota River within MnDOT right of way limits. Suitable areas within MnDOT right of way at the I-35W/Black Dog Road interchange could also be used. Construction staging details, such as the location of temporary access roads, will be identified during final design.

Traffic During Construction

The project has the potential to cause temporary vehicle delays on I-35W during construction activities. MnDOT completed a traffic analysis for approximately seven miles of southbound I-35W north of TH 13 in 2016. This analysis looked at operations on southbound I-35W with the closure of one travel lane. Based on average travel times, restricting one lane of travel on southbound I-35W was projected to increase peak period travel times by approximately five minutes. The highest average delay was approximately seven minutes during the peak hour.

The September 2016 analysis considered impacts of restricting traffic on I-35W by one lane in the peak period and peak direction. The proposed maintenance of traffic for the project would restrict traffic in the non-peak direction and non-peak period (see maintenance of traffic criteria discussion below). Travel times and delays in the peak direction and peak period during project construction would be expected to be improved compared to the results of this analysis.

The I-35W Minnesota River crossing will remain open during construction. A preliminary construction staging plan is summarized below.

- Shift all traffic to the existing southbound I-35W Minnesota River Bridge.
- Demolition of the existing northbound bridge and construction of the new northbound I-35W Minnesota River Bridge.
- Shift all traffic to the new northbound I-35W Minnesota River Bridge.
- Demolition of the existing southbound bridge and construction of the new southbound I-35W Minnesota River Bridge.
- Shift southbound I-35W traffic back to the southbound lanes once construction of the southbound bridge is complete.

The project will be developed through the MnDOT design-build process. Design-build is a contracting process that brings designers and contractors together early in the detail design portion of a project, and allows for flexibility and innovation within the standards and requirements established for a project.[14] The design-build Request For Proposals for the I-35W Over the Minnesota River Project will define the maintenance of traffic criteria to be used by the contractor during construction:

- The contractor will be allowed to reduce the capacity of I-35W to five lanes of traffic during construction. During the period that I-35W is in the five-lane configuration, the project will provide for two general purpose lanes in each direction with a reversible MnPASS lane in the peak period/peak direction (i.e., northbound I-35W during the a.m. peak period and southbound I-35W during the p.m. peak period). A movable concrete barrier will separate the northbound and southbound lanes.

[14] Additional information on MnDOT's Design-Build Program can be found on the MnDOT webpage at http://www.dot.state.mn.us/designbuild/index.html.

- The design-build contract will include incentives for a contractor to minimize the duration of the five-lane configuration.
- For the period that I-35W is not restricted to five lanes, the contractor will maintain a minimum of six lanes. The configuration of the I-35W six lane condition will include two general purpose lanes and one MnPASS lane in each direction.
- The contractor will be allowed to close the entrance ramp from Cliff Road to northbound I-35W and the exit ramp from southbound I-35W to Cliff Road for a period not to exceed 90 days. The anticipated detour during these periods would include utilizing the interchange at Trunk Highway (TH) 13.
- The contractor will be required to maintain access at Black Dog Road and West 106th Street at all times during construction. This will require the detouring of traffic on I-35W and utilization of the I-35W interchanges at TH 13 and West 98th Street.
- The contractor will be allowed to temporarily close West 106th Street to through traffic during certain phases of bridge construction. The anticipated detour route for West 106th Street through traffic would be Old Shakopee Road, West 98th Street, and Lyndale Avenue South.

Diversion resulting from the restriction of traffic on I-35W is anticipated to occur during project construction. The primary impact would be to traffic crossing the Minnesota River. Diversion of traffic would be focused on other parallel routes that cross of the Minnesota River. It is anticipated that TH 13 to TH 169 (Bloomington Ferry Bridge), I-35E to TH 77 (Cedar Avenue Bridge), and other east-west routes connecting to parallel river crossings (e.g., Cliff Road, County State Aid Highway [CSAH] 42) would receive additional traffic from I-35W, potentially resulting in additional congestion and delays on these routes during peak periods.

MnDOT is reviewing strategies to temporarily provide additional capacity across the Minnesota River to accommodate diverted traffic, and measures to mitigate the impacts of diverting traffic on east-west routes. Highways included in this review are the TH 169 and TH 77 corridors across the Minnesota River, the I-35E corridor from TH 77 to the I-35E/I-35W split, and east-west routes that connect to TH 169 and TH 77. Potential projects on these routes could include the strategies listed below.

- Re-purposing shoulders for additional capacity (e.g., re-striping TH 169 from TH 101 in Shakopee to Pioneer Trail in Bloomington/ Eden Prairie, like the project implemented in 2014 to mitigate flooding of the TH 101 and TH 41 bridges).

- Auxiliary lanes that may help weaving and lengthened acceleration/deceleration lanes at interchanges.
- Signal timing/coordination and temporary channelization on east-west routes connecting to TH 169 and TH 77.

Any temporary strategies that would be implemented on TH 169, TH 77, I-35E, and east-west routes from I-35W to parallel river crossing locations would be limited to the period that I-35W is restricted to five lanes. Once I-35W is returned to the six-lane condition, temporary strategies to mitigate the impacts of diverting traffic will be removed.

MnDOT is reviewing strategies to reduce demand on the I-35W corridor during construction. This includes working with transit providers to provide incentives to shift modes of travel to transit services. Potential strategies could include advertising, leasing parking spaces near park and ride facilities that are currently full, and incentivizing bus passes. MnDOT also will evaluate opportunities to work the University of Minnesota Humphry Institute to expand services for the eWorkPlace Program (i.e., telework).

The design-build contractor will be required to analyze the impacts associated with their proposed maintenance of traffic plans and develop a Transportation Management Plan (TMP) for the project. Outreach to the affected stakeholders will be required during the development of the TMP, including cities, commuters, local businesses, emergency service providers, schools, school bus services, transit services, and neighborhoods.

2) Modifications to Existing Equipment or Industrial Processes.

The project does not modify equipment or industrial processes.

3) Significant Demolition, Removal or Remodeling of Existing Structures.

The proposed project includes demolition and removal of the existing I-35W Minnesota River Bridge, and demolition and removal of the existing I-35W bridges over West 106th Street. The proposed I-35W Minnesota River Bridge and West 106th Street Bridge are described in Chapter 4.

4) Timing and Duration of Construction Activities.

Project construction is anticipated to last for two to three years. See Section 4.7 for the project schedule.

5.6.3 Project Magnitude

Item 6.c. Project Magnitude Data

Table 5.1 lists project magnitude data (total project acreage and linear project length).

Table 5.1 Project Magnitude

	Project Magnitude
Total Project Acreage (based on preliminary construction limits plus area over Minnesota River between MnDOT right of way limits)	Approx. 80.8 acres
Linear Project Length (in miles)	Approx. 2.5 miles
Number and Type of Residential Units	N/A
Commercial Building Area (in square feet)	N/A
Industrial Building Area (in square feet)	N/A
Institutional Building Area (in square feet)	N/A
Other Uses – Specify (in square feet)	N/A
Structure Height(s)	N/A

5.6.4 Project Purpose

Item 6.d. Explain the project purpose; if the project will be carried out by a governmental unit, explain the need for the project and identify its beneficiaries.

The project's purpose and need is explained in detail in Chapter 3.

Replacement of the I-35W Minnesota River Bridge and associated roadway improvements will benefit all users of the I-35W corridor. The project will replace the existing bridge with a structurally sound crossing over the Minnesota River. The proposed northbound I-35W lane addition from the Cliff Road interchange in Burnsville to the existing truck climbing lane south of West 106th Street in Bloomington will improve safety and help alleviate morning peak period congestion. The proposed multi-use trail along the east side of the I-35W Minnesota River Bridge will benefit users of the local and regional trail systems by providing a new trail crossing over the Minnesota River. The reconstruction of the I-35W bridges over West 106th Street will improve safety and will accommodate future improvements by the City of Bloomington for West 106th Street.

5.6.5 Future Stages of Development

Item 6.e. Are future stages of this development including development on any other property planned or likely to happen? ☐ Yes X No

If yes, briefly describe future stages, relationship to present project, timeline and plans for environmental review.

Not applicable.

5.6.6 Subsequent Stage of Earlier Project

Item 6.f. Is this project a subsequent stage of an earlier project? ☐ Yes X No

If yes, briefly describe the past development, timeline and any past environmental review.

Not applicable.

5.7 EAW Item 7: Cover Types

Estimate the acreage of the site with each of the following cover types before and after development:

Table 5.2 tabulates cover types before and after the project.

Table 5.2 Cover Types Before and After Development

	Before	After
Wetlands	0.3 acres	0 acres
Deep Water / Streams	4.8 acres	4.8 acres
Wooded / Forest	6.1 acres	2.8 acres
Brush / Grassland	0 acres	0 acres
Cropland	0 acres	0 acres
Lawn / Landscaping	27.1 acres	23.8 acres
Impervious Surface	39.3 acres	45.8 acres
Stormwater Pond	3.2 acres	3.6 acres
Other (describe)	N/A	N/A
Total	80.8 acres	80.8 acres

Cover types before and after the project are based on the area within preliminary construction limits north and south of the Minnesota River. Cover types were calculated using the Minnesota Land Cover Classification System (MLCCS). Wetland acreage is based on Level 2 delineated wetlands. Deep water / stream acreage is the area of the Minnesota River between I-35W right of way limits along the north and south sides of the river. Impervious surface acreage is based on the preliminary design layout.

5.8 EAW Item 8: Permits and Approvals Required

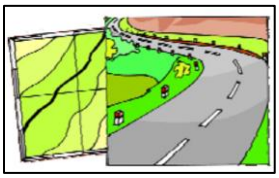
Table 5.3 lists the anticipated permits and approvals required for the project.

Table 5.3 Permits and Approvals

Unit of Government	Type of Application or Approval	Current Status
Federal		
FHWA	Environmental Assessment	Approval (complete)
FHWA	EIS Need Decision	To be completed
MnDOT Cultural Resources Unit (CRU) on behalf of FHWA	Section 106 determination (National Historic Preservation Act)	Complete (see Appendix E)
USACE	Section 404 Permit (Clean Water Act)	To be applied for
USACE	Section 10 Permit (Rivers and Harbors Act)	To be applied for
U.S. Coast Guard (USCG)	Section 9 Permit (Rivers and Harbors Act)	To be applied for
MnDOT Office of Environmental Stewardship (OES) on behalf of the U.S. Fish and Wildlife Service (USFWS)	Endangered Species Act Section 7 determination	Complete (see Appendix E)
State		
MnDOT	Environmental Assessment Worksheet (EAW)	Approval (complete)
MnDOT	EIS Need Decision	To be completed
Minnesota Pollution Control Agency (MPCA)	National Pollutant Discharge Elimination System (NPDES) Construction Stormwater Permit	To be applied for
MPCA	Section 401 Water Quality Certification	To be applied for
MPCA	Dredge Material Management Permit	To be applied for
MnDOT	Wetland Conservation Act (Boundary Approval/ Replacement Plan)	To be applied for
Minnesota Department of Natural Resources (DNR)	Public Waters Work Permit	To be applied for
DNR	Water Appropriation Permit	To be applied for

Unit of Government	Type of Application or Approval	Current Status
DNR	Endangered Species Permit (state-listed mussels in Minnesota River)	Permit request applied for
Local		
City of Burnsville and City of Bloomington	Municipal Consent	To be completed
Lower Minnesota River Watershed Management Organization	Review of Proposed Plans	To be completed

Cumulative potential effects may be considered and addressed in response to individual EAW Item Nos. 9-18, or the RGU can address all cumulative potential effects in response to EAW Item No. 19. If addressing cumulative effect under individual items, make sure to include information requested in EAW Item No. 19.



5.9 EAW Item 9: Land Use

5.9.1 Describe Existing Land Use, Plans and Zoning

Item 9.a.i. Existing land use of the site as well as areas adjacent to and near the site, including parks, trails, prime or unique farmlands.

The project is located within existing MnDOT right of way, except for two parcels owned by the City of Bloomington along the east side of I-35W. The response to this item describes existing land uses adjacent to MnDOT right of way (i.e., study area).

Existing land use within the study area is predominantly characterized by industrial land, commercial, and undeveloped land consisting of floodplain and wetland areas along the Minnesota River. Additionally, a total of eight Section 4(f) resources are in the study area including park and recreation areas, trails, and wildlife and waterfowl refuges. The project extends into the Cities of Bloomington and Burnsville. Existing land uses specific to each city are described in further detail below.

Existing Land Uses

City of Burnsville

The City of Burnsville is considered a fully developed community with approximately 98 percent of the City's total land area developed. The City is characterized by traditional suburban development. Predominant

development in the study area includes industrial, commercial, and park and recreation areas. A U.S. Salt, Inc. barge terminal is located on Black Dog Road, west of the I-35W Bridge on the southern shore of the Minnesota River. The Black Dog Power Plant, owned by Xcel Energy, is located on Black Dog Road, approximately two miles east of the I-35W Minnesota River Bridge.

The Freeway Landfill (commonly referred to as the McGowan Planned Unit Development) encompasses approximately 180 acres of land and is bound by the Minnesota River to the north and I-35W to the east. The landfill has been designated as a superfund site by the U.S. Environmental Protection Agency (EPA) due to the presence of hazardous chemicals and landfill gases. Negotiations between the Minnesota Pollution Control Agency (MPCA), the City of Burnsville, and the property owner to complete the closure of the superfund site are ongoing. Kraemer Quarry is located between I-35W and the Burnsville Sanitary Landfill and encompasses approximately 500 acres of land. The majority of this site is used for a limestone quarry, which is anticipated to remain operational until 2018. The Burnsville Sanitary Landfill is located west of Kraemer Quarry. The landfill encompasses approximately 362 acres and is anticipated to cease operations in 2024.

East of I-35W, existing land uses primarily consist of open space, floodplain and wetland areas, and commercial uses concentrated near the I-35W/Cliff Road interchange. Calcareous fens are in the southern portion of the Minnesota Valley National Wildlife Refuge, east of the study area.

Transmission lines extend east-west across I-35W and traverse the Kraemer Quarry property. Additionally, a Union Pacific railroad line extends from the east, crosses I-35W and bounds the southern limits of the Kraemer Quarry and Burnsville Sanitary Landfill properties.

City of Bloomington

The City of Bloomington is also considered a fully built-out community. Less than two percent of the City's total area is vacant. Public land comprises almost one-third of the City's total area and includes the Minnesota River Valley and large wetland areas along Nine Mile Creek.

The land uses in the Bloomington portion of the study area primarily consist of floodplain and wetland areas along the Minnesota River. Residential properties are located along the west side of I-35W between West 106th Street and the Minnesota River bluff, and long both sides of I-35W north of West 106th Street. Several office and commercial entities are located immediately east of I-35W near the I-35W/West 106th Street interchange. The Oak Grove Elementary and Middle Schools are located about one block west of I-35W and north of West 106th Street.

Parks and Trails

City of Burnsville

Parks, trails and wildlife refuge areas located in the study area in Burnsville include:

- City of Burnsville Trail
- Minnesota Valley National Wildlife Refuge - Black Dog Preserve Unit
- Big Rivers Regional Trail

The Chalet Golf driving range is located northeast of the I-35W/Cliff Road interchange. The driving range is privately owned and formerly consisted of a 28-acre unlined and unpermitted dump (commonly known as the "Old Freeway Dump"). Figure F.1, Appendix F shows the locations of parks in the Burnsville portion of the study area. Figure 3.6 in Section 3.3.5 shows the location of trails in the study area.

City of Bloomington

Parks, trails, and wildlife refuge areas located in the study area in Bloomington include:

- Minnesota Valley National Wildlife Refuge – Long Meadow Lake Unit
- Long Meadow Lake Trails – Bluff Trail
- Minnesota River Valley Park
- Russell A. Sorenson Landing (Water Access Site)

A maintenance road is located along the north side of the Minnesota River. This maintenance road is used by the City of Bloomington to access City-owned properties located along the west side of I-35W. It crosses under the I-35W Minnesota River Bridge and connects Lyndale Avenue South at the Russell A. Sorenson Landing. This maintenance road is also used as a multiple-use trail, providing access for hikers and bicyclists from Bloomington's Minnesota River Valley Park to the National Wildlife Refuge Bluff Trail east of I-35W. The DNR is planning a future extension of the Minnesota Valley State Trail that would also cross under the I-35W Minnesota River Bridge. Figure F.2, Appendix F shows the location of parks in the Bloomington portion of the study area. Figure 3.6 in Section 3.3.5 shows the location of trails in the study area.

Prime or Unique Farmlands

Figure F.3, Appendix F shows prime farmlands within the study area. The project is in an urbanized area adjacent to primarily industrial, commercial, and residential uses. No prime farmland is located within the project limits.

Item 9.a.ii. Plans. Describe planned land use as identified in comprehensive plan (if available) and any other applicable plan for land use, water, or resources management by a local, regional, state, or federal agency.

City of Burnsville

The *City of Burnsville 2030 Comprehensive Plan Update* (dated June 22, 2010) identifies redevelopment opportunities for the landfill and quarry properties immediately west of I-35W as part of the Minnesota River Quadrant (MRQ) redevelopment plan. Figure F.4, Appendix F shows the City of Burnsville's 2030 Land Use Guide Plan. Figure 3.9 in Section 3.4.1 shows the City's MRQ redevelopment plan. It is envisioned that the MRQ will become predominant employment, retail and entertainment center in the City of Burnsville.

The City's comprehensive plan recognizes that substantial transportation improvements are needed to increase capacity, decrease congestion, support businesses, and improve safety at the I-35W/Cliff Road interchange. Past studies have been undertaken to assess necessary improvements to the existing I-35W interchanges at Black Dog Road, Cliff Road and Trunk Highway (TH) 13. Studies have included the *I-35W and TH 13 Burnsville Interchange Report* (June 2005) and the *I-35W and Cliff Road Interchange Feasibility Study* (October 2008). These studies have identified safety concerns, including deficient spacing between I-35W ramp terminals and poor traffic operations resulting in congested traffic conditions.

City of Bloomington

Figure F.5, Appendix F shows the City of Bloomington's 2030 Land Use Guide Plan. Most of the existing and future land uses adjacent to the project area consist of park and conservation, residential and office uses.

The transportation element of the City's comprehensive plan notes that future transportation initiatives within the City should focus on maintaining and improving the existing transportation system given that the City is fully developed and the existing roadway network is complete. The plan recognizes that congestion occurring on the regional highway network is the most significant challenge to the City's roadway network. The plan states that

the City of Bloomington will support roadway improvements to increase roadway capacity, remove existing bottleneck and enhance efficiency and safety. Several capital infrastructure improvements along I-35W are recommended in the City's comprehensive plan.

The City of Bloomington released the *Draft Minnesota River Valley Master Plan* in May 2015. The plan supports the expansion of existing trails, including the DNR's Minnesota Valley State Trail, and the addition of trails, such as a bluff trail west of I-35W.

Item 9.a.iii. Zoning, including special districts or overlays such as shoreland, floodplain, wild and scenic rivers, critical area, agricultural preserves, etc.

City of Burnsville

Study Area Properties Adjacent to MnDOT Right of Way

Properties adjacent to the I-35W right of way in the City of Burnsville are in industrial, commercial, conservation, and Planned Unit Development (PUD) zoning districts. Figure F.6, Appendix F illustrates the zoning districts in the study area. These zoning districts include:

- Gateway Zoning Districts: Adjacent properties in the Gateway Zoning Districts include the Gateway Industrial Medium – Gateway (GIM-GW), General Industry - Gateway (I2-GW) and Highway Commercial - Gateway Districts. The Gateway District is an overlay zone subject to the "Burnsville North Gateway Design Guidelines." The purpose of this district is to foster the conversion of this area from intense industrial uses to alternative future uses that incorporate sustainable design and restore natural resources.
- Planned Unit Development (PUD): Properties west of I-35W are within PUD District. The purpose of the PUD district is to allow a more flexible approach to the development of the property that permits a mix of land uses, housing types and densities.
- Conservancy (CD) District: Properties east of I-35W along the Minnesota River are within the CD District. The purpose of this district is to provide areas for habitat protection and wildlife management.
- Highway Commercial District (B4): Properties located northeast of the Cliff Road/I-35W interchange lie within the Highway Commercial District. The Highway Commercial District provides for a mix of compatible commercial, office and light industrial uses.

Preferred Alternative Project Limits

The I-35W project corridor is located within the City of Burnsville's Shoreland Overlay District. This district follows the Minnesota River from the city limits with Savage to the city limits with Eagan. East of I-35W, the Shoreland Overlay District includes the area within the Minnesota Valley National Wildlife Refuge surrounding Black Dog Lake. Additionally, the I-35W project corridor is in the City of Burnsville's Floodway District (FW) and the Flood Fringe District (FF). The FW District encompasses land designated as floodway and areas within the 100-year flood zone (Zone AE) as designated on the Federal Emergency Management Agency (FEMA) flood insurance rate maps (FIRM Map Number 27037C0070E, see Figure 3.8). The FF District includes portions of the project area within the floodway fringe but located outside of the floodway. Only those permitted and conditional uses are allowed within the FW and FF districts as identified in Chapter 10 of Burnsville's zoning code.

City of Bloomington

Study Area Properties Adjacent to MnDOT Right of Way

The following City of Bloomington zoning districts are located adjacent to the I-35W right of way:

- Single Family Residential (R-1)
- Multiple Family Residential (R-4)
- Conservation (SC)
- Freeway Office (C-4)

Properties in the R-1 District are concentrated on the western side of I-35W. The purpose of the R-1 District is to guide the development of single-family dwellings within areas that are served by public sewer and water. Properties in the R-4 District are in the northeast quadrant of the I-35W/West 106th Street interchange. Parcels located east of I-35W within the project area included in the C-4 District. Figure F.7, Appendix F illustrates the zoning districts for properties adjacent to I-35W.

Preferred Alternative Project Limits

The I-35W project corridor is in the City of Bloomington's Flood Hazard Overlay District (FH) and Bluff Development (BP-2) Overlay District. The FH Overlay District includes those areas of the City within the floodway, flood fringe or floodplain as delineated in the FEMA *Flood Insurance Study, Volume 1 of 2 and Volume 2 of 2, Hennepin County, Minnesota, and all Jurisdictions*.

The I-35W project corridor is illustrated on FIRM Map Number 27053C0466E. Only those uses having a low flood damage potential and not obstructing flood flows are permitted in the FH Overlay District. The intent of the BP-2 Overlay District is to permit regulated development on the Minnesota River Bluff in a manner that maintains the integrity of the area.

5.9.2 Compatibility with Nearby Land Uses, Zoning, and Plans

Item 9.b. Discuss the project's compatibility with nearby land uses, zoning, and plans listed in Item 9a above, concentrating on implications for environmental effects.

The project is located within existing MnDOT right of way, except for two stormwater basins that are proposed along the east side of I-35W on undeveloped land owned by the City of Bloomington. Compatibility with nearby land uses, zoning, and plans is described below.

Compatibility with Nearby Land Uses

Land uses adjacent to the proposed stormwater basins include office uses, conservation/open space, and residential to the east of Lyndale Avenue South. Trees would be maintained adjacent to the proposed stormwater basins, serving as a buffer from adjacent land uses. Trails proposed as part of this project would enhance non-motorized connectivity between land uses north and south of the Minnesota River.

Compatibility with Zoning

City of Burnsville Shoreland Overlay District

The project is located within the existing I-35W right of way in the City of Burnsville's Shoreland Overlay District. The project would not require right of way acquisition with the Shoreland Overlay District boundaries, would not alter shoreland outside of MnDOT right of way, and would not alter vegetation along the bluff. MnDOT will implement best management practices to control soil erosion during construction.

City of Bloomington Bluff Development (BP-2) Overlay District

The project is located within existing I-35W right of way, except for two parcels located along the east side of I-35W in the City of Bloomington. These two parcels are located within the City's BP-2 Overlay District. The parcels are undeveloped and zoned for conservation (SC) uses. A two-cell stormwater treatment pond/filtration basin is proposed at this location,

along with the proposed trail connection from the I-35W Minnesota River Bridge to Lyndale Avenue South. The proposed stormwater basins would improve water quality by treating runoff prior to discharge to the Minnesota River. The proposed trail would improve non-motorized connectivity within the study area.

Floodplain Zoning Districts

The project is in the City of Burnsville's FW and FF Districts. The project would raise the elevation of a section of I-35W to provide two feet of freeboard above the 100-year floodplain elevation, and would transversely encroach into the floodplain south of the Minnesota River. The encroachment length south of the river is approximately 4,400 feet. The estimated fill volume within the floodplain boundaries is approximately 29,200 cubic yards.

The City of Burnsville requires a 1:1 compensatory storage for any fill in the floodplain. However, if the 1:1 compensatory storage is infeasible, the requirement can be waived if a "no-rise" certification is provided along with the supporting model information.

The project is in the City of Bloomington's FH Overlay District. The project would transversely encroach into the floodplain north of the Minnesota River. The encroachment length north of the river is approximately 1,100 feet. The estimated fill volume within the floodplain boundaries is approximately 3,700 cubic yards.

A "No-Rise Certificate" was issued by MnDOT's hydraulic engineer on February 9, 2016 (see the Hydraulic Analysis Memorandum in Appendix I). See the floodplain assessment in Section 6.13.

Compatibility with Plans

The project would not preclude a future I-35W/118th Street interchange and planned redevelopment along I-35W between Cliff Road and the Minnesota River.

The project includes a pedestrian/bicycle trail along the I-35W Minnesota River Bridge, with trail connections to Black Dog Road and Lyndale Avenue South. The proposed trails would support the City of Burnsville and City of Bloomington's trail network.

5.9.3 Measures to Mitigate Any Potential Incompatibility

Item 9.c. Identify measures incorporated into the proposed project to mitigate any potential incompatibility as discussed in Item 9b above.

Residential land uses are located along the west side of I-35W, north of the Minnesota River. A traffic noise study was completed as part of the project, including the evaluation of noise walls at locations where projected traffic noise levels are anticipated to exceed State standards. One modeled noise wall in the northeast quadrant of the I-35W/West 106th Street interchange meets MnDOT's feasibility and reasonableness requirements and is proposed. The existing noise wall in the northwest quadrant of the I-35W/West 106th Street interchange will remain in place with the project. Refer to the Traffic Noise Analysis Report in Appendix H.

The project would result in floodplain fill impacts south of the Minnesota River in Burnsville. MnDOT has issued a "No-Rise Certificate" (see Appendix I). Floodplain fill will be minimized as much as is practicable (i.e., retaining walls along I-35W south of the Minnesota River).

5.10 EAW Item 10: Geology, Soils and Topography/ Land Forms

5.10.1 Geology Underlying the Project Area

Item 10.a. Describe the geology underlying the project area and identify and map any susceptible geologic features such as sinkholes, shallow limestone formations, unconfined/shallow aquifers, or karst conditions. Discuss any limitations of these features for the project and any effects the project could have on these features. Identify any project designs or mitigation measures to address effects to geologic features.

Bedrock

The uppermost bedrock underlying the project area is Prairie du Chien Group, consisting of Shakopee Formation and Oneota Dolomite. In most of the project area in the City of Burnsville, the top of the bedrock is within approximately less than 50 feet of the ground surface (Minnesota Geological Survey, 1999, Geologic Atlas for Dakota County, *Depth to Bedrock and Bedrock Topography*). The bedrock depth to the ground surface is slightly greater, (approximately 50 to 150 feet) in portions of the project area along the Minnesota River. The upper part of the Prairie du Chien is exposed at the Kraemer Quarry located west of I-35W.

In the northern portion of the project area within the City of Bloomington, the top of the bedrock ranges from within approximately 100 to 150 feet near the Minnesota River shoreline to approximately 150 to 250 feet of the ground surface further from the Minnesota River (Minnesota Geological Survey, 1989, Geologic Atlas for Hennepin County, *Depth to Bedrock and Bedrock Topography*).

Groundwater

The Dakota County Geological Atlas Bedrock Hydrogeology map (Minnesota Geological Survey, 1990) indicates a water table elevation of approximately 700 feet above mean sea level in the vicinity of the project.

The potentiometric surface of the Prairie du Chien-Jordan Aquifer near the project area slopes down towards the Minnesota River (Minnesota Geological Survey, 1990, Geologic Atlas for Dakota County, *Bedrock Hydrogeology;* Minnesota Geological Survey, 1989, Geologic Atlas for Hennepin County, *Bedrock Hydrogeology*). The Prairie du Chien-Jordan is the most heavily used aquifer in the Hennepin County and serves as a major high-capacity aquifer in Dakota County. The depth and gradient of the groundwater table can change seasonally in response to weather/ precipitation patterns and recharge.

Geologic Site Hazards

A review of the DNR GIS-based karst database indicates three karst features are mapped within one mile east of the I-35W project area within the Minnesota River Bluffs area (see Figure F.8, Appendix F). Karst topography is susceptible to the formation of sinkholes. Sinkholes serve as direct connections between surface runoff and underlying aquifers. Structures or facilities, including roadways, can be damaged if a sinkhole opens under or adjacent to it. No occurrences of shallow limestone formations have been documented within the project area based on a review of the MGS Geologic Atlas of Dakota County and Hennepin County.

Based on information provided in the MGS Geologic Atlas of Dakota County (1990, *Data Base Map*), sinkholes have not been documented within or near the project area. Most of the sinkholes mapped in Dakota County are in the southeastern areas of the county.

If karst features or sinkholes are encountered within the project site during construction, actions will be taken to mitigate potential effects such as soil stabilization, stormwater routing, and groundwater protection practices.

5.10.2 Soils and Topography

Item 10.b. Describe the soils on the site, giving NRCS (SCS) classifications and descriptions, including limitations of soils. Describe topography, any special site conditions relating to erosion potential, soil stability or other soils limitations, such as steep slopes, highly permeable soils. Provide estimated volume and acreage of soil excavation and/or grading. Discuss impacts from project activities (distinguish between construction and operational activities) related to soils and topography. Identify measures during and after project construction to address soil limitations including stabilization, soil corrections or other measures. Erosion/sedimentation control related to stormwater runoff should be addressed in response to Item 11.b.ii.

NOTE: For silica sand projects, the EAW must include a hydrogeologic investigation assessing the potential groundwater and surface water effects and geologic conditions that could create an increased risk of potentially significant effects on groundwater and surface water. Descriptions of water resources and potential effects from the project in EAW Item 11 must be consistent with the geology, soils and topography/land forms and potential effects described in EAW Item 10.

Topography

The topography of the project area is relatively hilly due to the presence of low areas near the Minnesota River shoreline and high points along the river bluffs. The elevation within the project area ranges from a high point of approximately 810 feet above sea level at the northern portion of the corridor within the City of Bloomington, to a low point of approximately 715 feet above sea level at the southern portion of the corridor within the City of Burnsville.

Soils

Table 5.4 lists soil types within the project area, based on the Natural Resources Conservation Service (NRCS) Soil Survey for Dakota and Hennepin Counties. Figure F.8, Appendix F illustrates soil types in the project area.

Table 5.4 Soil Types

Soil Name	Soil Symbol	Percent Slope	Erodibility	Drainage Class	County
Hawick Loamy Sand (1)	L32F	28%	HEL	Excessively Drained	Hennepin

Soil Name	Soil Symbol	Percent Slope	Erodibility	Drainage Class	County
Minneiska Fine Sandy Loam (2)	L39A	1%	NHEL	Moderately Drained	Hennepin
Muskego, Blue Earth, and Houghton Soils (1)	L12A	0.5%	NHEL	Very Poorly Drained	Hennepin
Urban Land – Marlardi Complex (1)	L55B	3%	N/A	Very Poorly Drained	Hennepin
Urban Land – Udipsamments Complex (cut and fill land) (1)	U4A	1%	NHEL	Somewhat excessively drained	Hennepin
Udorthents (cut and fill land) (1)	U3B	3%	NHEL	Well Drained	Hennepin
Seelyeville Muck (1)	540	0.5%	NHEL	Very poorly drained	Dakota
Udorthents, Wet (1)	1027	1%	NHEL	Not Rated	Dakota

NHEL: NRCS classification for Not Highly Erodible Land based on characteristics for soil type.

HEL: NRCS classification for Highly Erodible Land based on characteristics for soil type.

(1) Not prime farmland

(2) Prime farmland if protected from flooding or not frequently flooded during growing season

Soil Permeability

According to the NRCS Soil Survey for Hennepin and Dakota Counties, the project area is primarily composed of sand, gravelly sand, and sandy loam. Soil types near the Minnesota River shorelines occasionally or frequently flood. Based on the MGS Geologic Atlas for Dakota County (1990, *Surficial Geology*), clay silt deposits are present in the Minnesota River shoreline in the southern portion of the project within the City of Burnsville. The MGS Geologic Atlas for Hennepin County (1989, *Surficial Geology*) indicates soil along the Minnesota River shoreline in the northern portion of the project within the City of Bloomington consists of sandy soil types. Most of soil types in the project area are poorly drained soils, including Seelyeville Muck and Muskego, Blue Earth and Houghton Soils, which are characterized as having moderately rapid to moderately slow permeability.

Steep Slopes and Highly Erodible Soils

According to the NRCS, Highly Erodible Land (HEL) and Potentially Highly Erodible Land (PHEL) are areas of land that have a high potential for erosion. Highly erodible land, when disturbed through construction activities or vegetation removal, has the likelihood of creating unstable conditions that lead to erosion and sedimentation. These classifications are based on soil type and steep slope characteristics.

Most of soil within the project area is classified as Not Highly Erodible Land (NHEL) (see Table 5.3). A small portion of soil in the northern are of the project area is classified as HEL soil. Additionally, there are areas of steep slopes along the Minnesota River Bluffs primarily in the City of Bloomington. Figure F.8, Appendix F illustrates the location of HEL soils in the project area.

Project Impacts

The project would require approximately 96,400 cubic yards of fill. The area to be graded is approximately 76 acres (area within the preliminary construction limits north and south of the Minnesota River).

Most construction impacts will be associated with site grading and site preparation necessary for construction of the new bridge. Section 5.11 (EAW Item 11.b.ii) includes a discussion of erosion control, stormwater management and impacts to water quality.

5.11 EAW Item 11: Water Resources

5.11.1 Surface Water and Groundwater Features

Item 11.a. Describe surface water and groundwater features on or near the site below.

Item 11.a.i. Surface Water - lakes, streams, wetlands, intermittent channels, and county/judicial ditches. Include any special designations such as public waters, trout stream/lake, wildlife lakes, migratory waterfowl feeding/resting lake, and outstanding resource value water. Include water quality impairments or special designations listed on the current MPCA 303d Impaired Waters List that are within 1 mile of the project. Include DNR Public Waters Inventory number(s), if any.

DNR Public Waters

Three public watercourses are located within one mile of the project limits, including the Minnesota River, Nine Mile Creek and an unnamed tributary to Nine Mile Creek (see Figure F.9, Appendix F). Nine Mile Creek and the unnamed tributary to Nine Mile Creek are located west of the project limits.

Aquatic Resources

MnDOT conducted an on-site wetland delineation in fall 2015 in accordance with the routine on-site methods set forth in the *1987 Corps of Engineers Wetlands Delineation Manual* and the *Midwest (V. 2.0) Regional Supplement*. Identified wetlands are classified according to methodologies set forth in *Wetland Plants and Plant Communities of Minnesota & Wisconsin - Third Edition* (USCOE Publication; Eggers and Reed. 2011) and *Wetlands of the United States* (USFWS Circular 39, Shaw and Fredine, 1971). Table 5.5 lists the delineated wetlands in the project area. Figure F.9, Appendix F illustrates the delineated wetlands in the project area. The wetlands within the project area consist primarily of Type 3 (shallow marsh) and Type 1L (floodplain forest).

Table 5.5 Project Area Wetlands

Wetland ID No.	Wetland Classification Cowardin	Wetland Classification Circular 39	Community Type	Overall Size (Acres)	County
1	PFO1A	Type IL	Floodplain forest	12.11	Hennepin
2	PEMC	Type 3	Shallow marsh	2.45	Hennepin
3	PEMC	Type 3	Shallow marsh	0.18	Hennepin
4	PEMC	Type 3	Shallow marsh	0.10	Hennepin
5	PEMC	Type 3	Shallow marsh	0.27	Hennepin
6	PFO1A	Type 1L	Floodplain forest	6.33	Dakota
7	PFO1Ad	Type 1L	Floodplain forest	0.09	Dakota
8	PEMBd	Type 2	Fresh (wet) meadow	0.35	Dakota
9	PFO1A	Type 1L	Floodplain forest	1.07	Dakota
10 (DNR 83P)	PUBH	Type 5	Shallow open water	319.60	Dakota
11	PEMF/ UBH	Type 4/5	Deep marsh/ shallow open water	335.50	Dakota
12	PEMC	Type 3	Shallow marsh	159.33	Dakota

Table 5.6 lists other aquatic resources in the project area (see also Figure F.9, Appendix F). These aquatic resources include the Minnesota River; unnamed

tributaries that discharge to project area wetlands and the Minnesota River; and stormwater ponds that collect and treat runoff from I-35W.

Table 5.6 Other Aquatic Resources

Aquatic Resource ID/Name	Resource Type	Overall Size (Acres)	County
1	Tributary	0.14	Hennepin
2	Tributary	0.12	Hennepin
3	Tributary	3.30	Hennepin
4	Tributary	0.11	Hennepin
5	Tributary	0.15	Hennepin
Minnesota River	River	56.77	Hennepin
Ditch #1	Wet Ditch	0.16	Dakota
Unknown (SP 2782-250)	Stormwater pond	2.91	Hennepin
Black Dog Pond (SP 1981-114)	Stormwater pond	0.73	Dakota
Mud Pond (SP 1981-108)	Stormwater pond	0.27	Dakota
Unknown	Stormwater pond	1.09	Dakota
Unknown (SP 1981-97)	Stormwater pond	0.37	Dakota

MPCA 303d Impaired Waters List

Two impaired watercourses are located within one mile of the project area. The Minnesota River extends into the project limits and is impaired due to concentrations of PCB and mercury, excessive turbidity and insufficient dissolved oxygen (Assessment Unit 07020012-505). A TMDL plan for mercury was approved in 2008 (EPA ID 35500) and dissolved oxygen in 2004 (EPA ID 10832). Nine Mile Creek is identified as an impaired watercourse due to excessive chloride and fish population assessments that indicate the aquatic life of the watercourse may not be thriving (Assessment Unit 07020012-518). A TMDL plan for chloride was approved in 2010 (EPA ID 40253).

Item 11.a.ii. Groundwater – aquifers, springs, seeps. Include: 1) depth to groundwater; 2) if project is within a MDH wellhead protection area; 3) identification of any onsite and/or nearby wells, including unique numbers and well logs if available. If there are no wells known on site or nearby, explain the methodology used to determine this.

1) Depth to Groundwater

Depth to groundwater within the project area varies from approximately 20 to 220 feet below the ground surface.

2) MDH Wellhead Protection Areas

The southern portion of the project area located within the City of Burnsville is within the boundaries of a Drinking Water Supply Management Area (DWSMA) (see Figure F.10, Appendix F). Additionally, DWSMA vulnerability data provided by the Minnesota Department of Health (MDH) was evaluated to assess the likelihood for a potential contaminant source within the DWSMA to contaminate a public water supply well. Based on this data, the portion of the project south of the Minnesota River is ranked as a "very high" DWSMA vulnerability area.

A portion of the project area located south of the Minnesota River in the City of Burnsville is within the boundaries of the Burnsville Wellhead Protection Area (WHPA).

The proposed stormwater management system promotes avoidance of infiltration in an area considered a "very high" vulnerability for potential groundwater contamination. Refer to the stormwater discussion below for additional detail regarding the proposed drainage improvements.

3) Identification of any Onsite and/or Nearby Wells

A search of the Minnesota County Well Index (CWI) indicates that several wells are located within 500 feet of the project area. Table 5.7 lists wells located within 500 feet of the project area. Figure F.10, Appendix F illustrates the location of wells within 500 feet of the project area.

The County Well Index does not represent all wells in the state, but is the most complete listing of state wells. If any unused or unsealed wells are discovered in the project area during construction, they will be addressed in accordance with Minnesota Rules Chapter 4725 or through an annual maintenance permit.

Table 5.7 Well Locations

Well Number	Well Name	Well Use
00223147	Unnamed	Domestic
00229108	Northwestern States Cement Co.	Abandoned
00205498	Unnamed	Domestic
00268043	Freeway Sanitary Landfill MW WT-7	Monitor Well
00268045	Freeway Sanitary Landfill MW J-1	Monitor Well
00237014	U.S. Salt Co.	Commercial
00178991	Burnsville MW-3	Monitor Well
00603289	MW-97-6	Monitor Well
00603285	MW-97-8	Monitor Well
00603283	MW-97-3	Monitor Well
00603281	MW-97-1	Monitor Well
00178993	Burnsville MW-2	Monitor Well
00603284	MW-97-7	Monitor Well
00603282	MW-97-2	Monitor Well

5.11.2. Effects from Project Activities on Water Resources and Measures to Minimize or Mitigate the Effects

Item 11.b. Describe effects from project activities on water resources and measures to minimize or mitigate the effects in Item b.i. through Item b.iv. below.

Item 11.b.i. Wastewater. For each of the following, describe the sources, quantities and composition of all sanitary, municipal/domestic and industrial wastewater produced or treated at the site.

1) If the wastewater discharge is to a publicly owned treatment facility, identify any pretreatment measures and the ability of the facility to handle the added water and waste loadings, including any effects on, or required expansion of, municipal wastewater infrastructure.

Not applicable. The project will not produce wastewater.

2) If the wastewater discharge is to a subsurface sewage treatment systems (SSTS), describe the system used, the design flow, and suitability of site conditions for such a system.

Not applicable.

3) If the wastewater discharge is to surface water, identify the wastewater treatment methods and identify discharge points and proposed effluent limitations to mitigate impacts. Discuss any effects to surface or groundwater from wastewater discharges.

Not applicable.

Item 11.b.ii. Stormwater. Describe the quantity and quality of stormwater runoff at the site prior to and post construction. Include the routes and receiving water bodies for runoff from the site (major downstream water bodies as well as the immediate receiving waters). Discuss any environmental effects from stormwater discharges. Describe stormwater pollution prevention plans including temporary and permanent runoff controls and potential BMP site locations to manage or treat stormwater runoff. Identify specific erosion control, sedimentation control or stabilization measures to address soil limitations during and after project construction.

The existing stormwater drainage system in the project area includes two stormwater ponds under the I-35W Minnesota River Bridge (one on the north side of the river and one on the south side of the river). A third pond is in the southwest quadrant of the I-35W/Black Dog Road interchange. Most of the stormwater runoff from the highway is conveyed through a system of ditches, culverts, and storm pipes to these ponds, which then discharge to the Minnesota River. A few areas of I-35W flow to offsite wetland areas before discharging to the Minnesota River.

The project would increase impervious surface area by approximately 6.5 acres within the I-35W corridor between Cliff Road and West 106th Street. This added impervious surface would increase the volume and rate of stormwater runoff from I-35W. To mitigate for this and meet NPDES permitting and other water quality requirements, a stormwater pond and filtration basin will be constructed along the east side of I-35W north of the Minnesota River (see Figure A.7, Appendix A). Infiltration was investigated; however, soil types in the project area do not support infiltration. Other

available locations for infiltration are wetland areas. In addition to the proposed basins, the existing stormwater ponds described above will also be restored to maximize their design capacity.

The project site is located within the Minnesota River Drainage Basin. Stormwater runoff from the project would discharge to the Minnesota River. Existing drainage patterns will be maintained for both I-35W and offsite drainage areas.

The existing stormwater pond under I-35W on the north side of the Minnesota River would be temporarily filled to facilitate construction of the proposed bridge piers. An analysis will be completed during final design to verify that this pond will maintain sufficient conveyance and storage capacity in compliance with NPDES and watershed district regulations. One preliminary concept to provide additional storage capacity, if necessary and if feasible, would be to expand the pond to the west towards the MnDOT right of way limits. Following construction, this pond will be restored and redesigned to maximize treatment.

Details regarding the preliminary drainage design are described in the *I-35W Bridge Replacement Preliminary Drainage Design Memorandum*, available for review from the MnDOT Project Manager (see contact information in Chapter 7).

Item 11.b.iii. Water Appropriation. Describe if the project proposes to appropriate surface or groundwater (including dewatering). Describe the source, quantity, duration, use and purpose of the water use and if a DNR water appropriation permit is required. Describe any well abandonment. If connecting to an existing municipal water supply, identify the wells to be used as a water source and any effects on, or required expansion of, municipal water infrastructure. Discuss environmental effects from water appropriation, including an assessment of the water resources available for appropriation. Identify any measures to avoid, minimize, or mitigate environmental effects from the water appropriation.

The project would require temporary cofferdams and dock walls along the north and south shores of the Minnesota River to allow for bridge pier construction. Cofferdam dewatering will comply with NPDES permitting requirements, and will be treated prior to discharging to receiving water bodies.

If temporary dewatering is necessary during project construction, the appropriate DNR groundwater appropriation permits will be obtained for temporary dewatering activities. Groundwater will be treated prior to discharge in compliance with NPDES permitting requirements.

Refer to EAW Section 11.a.ii for a discussion of water wells. The project would not involve other water uses (e.g., connection to municipal water system, expansion of municipal water infrastructure).

Item 11.b.iv. Surface Waters

a. Wetlands. Describe any anticipated physical effects or alterations to wetland features such as draining, filling, permanent inundation, dredging and vegetative removal. Discuss direct and indirect environmental effects from physical modification of wetlands, including the anticipated effects that any proposed wetland alterations may have to the host watershed. Identify measures to avoid (e.g., available alternatives that were considered), minimize, or mitigate environmental effects to wetlands. Discuss whether any required compensatory wetland mitigation for unavoidable wetland impacts will occur in the same minor or major watershed, and identify those probable locations.

Aquatic resource sequencing and impacts are described in the Wetland Impact Assessment and Two-Part Finding form in Appendix K. A summary of aquatic resource sequencing and impacts is provided below.

Complete avoidance of aquatic resource impacts is not feasible with the proposed project. Aquatic resources are located within MnDOT right of way and adjacent to the existing roadway. It is not feasible to avoid all aquatic resources while also addressing the need for the project and designing the proposed bridge and roadway improvements to current safety standards.

Wetland impacts were initially minimized by adding retaining walls and adjusting trail alignments. A filtration basin that was initially proposed in the southwest quadrant of the I-35W/Black Dog Road interchange was removed from the project and moved to an upland area in Bloomington on the east side of I-35W. Wetland encroachments were minimized in the southwest quadrant of the I-35W/Black Dog Road interchange with the retaining wall design along southbound I-35W and the end of the Black Dog Road entrance ramp. Refer to the "Wetland Impact Evaluation" in Section 4.2.3 for additional discussion of minimization.

Table 5.8 lists aquatic resource impacts by resource type. Table 5.9 lists estimated impacts by wetland. The Preferred Alternative is anticipated to result in approximately 0.61 acres of aquatic resource impacts, including approximately 0.30 acres of permanent wetland impacts.

Table 5.8 Aquatic Resource Impacts by Type

Resource Type	Total Impact (acres)	Compensatory Mitigation
Wetland	0.30	2:1 Replacement Ratio
Wet Ditch	0.16	None

Resource Type	Total Impact (acres)	Compensatory Mitigation
Tributary (1)	0.15	To be determined
Stormwater Basin (1)	0	To be determined
Total	**0.61**	

(1) Temporary impacts to Minnesota River and stormwater basins to be determined as part of the final design process.

Table 5.9 Wetland Impacts

Wetland ID No.	Community Type	Permanent Wetland Impacts (acres)
1	Floodplain forest	0
2	Shallow marsh	0
3	Shallow marsh	0
4	Shallow marsh	0
5	Shallow marsh	0
6	Floodplain forest	0.04
7	Floodplain forest	0
8	Fresh (wet) meadow	0.13
9	Floodplain forest	0.06
10	Shallow open water	0
11	Deep marsh/shallow open water	0.07
12	Shallow marsh	0
	Total Wetland Impacts	**0.30**

Construction of the new river bridge and demolition of the existing river bridge may result in some temporary construction-related impacts. These impacts will be identified as part of the final design process. Fill in the Minnesota River necessary to accommodate construction will be reviewed by the U.S. Army Corps of Engineers (USACE) as part of the Section 10/404 permitting process.

Impacts to aquatic resources are regulated by the Minnesota Wetland Conservation Act (WCA) and by the USACE under Section 404 of the Clean Water Act (CWA). It is anticipated that wetlands will be replaced at a 2:1 ratio within Bank Service Area 9 (BSA 9). The specific wetland bank credits will be determined through consultation with the USACE and the MnDOT OES.

b. Other Surface Waters. Describe any anticipated physical effects or alterations to surface water features (lakes, streams, ponds, intermittent channels, county/judicial ditches) such as draining, filling, permanent inundation, dredging, diking, stream diversion, impoundment, aquatic plant removal and riparian alteration. Discuss direct and indirect environmental effects from physical modification of water features. Identify measures to avoid, minimize, or mitigate environmental effects to surface water features, including in-water Best Management Practices that are proposed to avoid or minimize turbidity/sedimentation while physically altering the water features. Discuss how the project will change the number or type of watercraft on any water body, including current and projected watercraft usage.

No permanent water body impacts are anticipated because of the project. The existing bridge piers would be removed from the Minnesota River. The proposed bridge piers would be located along the north and south shorelines, above the Minnesota River ordinary high water level (OHWL). Three-sided coffer dams and dock walls would be constructed along the north and south shorelines of the Minnesota River during bridge construction, extending approximately 30 feet into the river from the shoreline. No temporary causeways or falsework are anticipated with bridge construction. Temporary fill impacts from the cofferdams and dock walls will be coordinated with and reviewed by the USACE as part of the Section 10 permitting process.

In-water best management practices (BMPs), such as silt curtains, will be in place during construction. Minimizing the amount of in-water work during high flow periods can also minimize the extent of any sediment plumes and downstream sedimentation. Work within the Minnesota River below the OHWL will be reviewed by the DNR as part of the Public Waters Work Permit. During final design, MnDOT will coordinate with the DNR to identify the best techniques for minimizing in-water impacts to the Minnesota River.

The project would not change the number or type of watercraft on the Minnesota River. Access to the Minnesota River at the Russell A. Sorenson Landing will be maintained during construction.

Construction of the bridge would result in temporary interruptions to river traffic (barges, recreational watercraft). Short-duration closures are anticipated to allow for safe construction of the steel superstructure. Approximately six to eight closures are expected during each construction season. Each closure is anticipated to last two days. Temporary disruptions to commercial and recreational river traffic will be coordinated with the USCG, the USACE, local barge operators, and the DNR. Notification of closures will be provided along the Minnesota River State Water Trail, at the Russell A. Sorenson landing, and on the DNR website.

Navigational clearance requirements will be maintained with the proposed project. The USCG has established a minimum vertical clearance of 55.5 feet above the Minnesota River normal pool elevation for the middle 200 feet of the river, and a horizontal clearance of 300 feet from pier face to pier face. The existing horizontal clearance on the Minnesota River at the I-35W Bridge is 224 feet (pier centerline to pier centerline). A minimum horizontal clearance of 200 feet will be required during bridge construction. Refer to USCG correspondence in Appendix E. All temporary construction impacts and permanent impacts to the Minnesota River navigational channel will be coordinated with the USCG as part of the Section 9 permitting process.

5.12 EAW Item 12: Contamination/Hazardous Materials/Wastes

5.12.1 Pre-Project Site Conditions

Item 12.a. Describe existing contamination or potential environmental hazards on or in close proximity to the project site such as soil or ground water contamination, abandoned dumps, closed landfills, existing or abandoned storage tanks, and hazardous liquid or gas pipelines. Discuss any potential environmental effects from pre-project site conditions that would be caused or exacerbated by project construction and operation. Identify measures to avoid, minimize or mitigate adverse effects from existing contamination or potential environmental hazards. Include development of a Contingency Plan or Response Action Plan.

The presence of potentially contaminated properties (defined as properties where soil and/or groundwater is impacted with pollutants, contaminants, or hazardous wastes) is a concern in the development of highway projects because of potential liabilities associated with ownership of such properties, potential cleanup costs, and safety concerns associated with construction personnel encountering unsuspected wastes or contaminated soil or groundwater. Contaminated materials encountered during highway construction projects must be properly handled and treated in accordance with state and federal regulations. Improper handling of contaminated materials can worsen their impact on the environment. Contaminated materials also cause adverse impacts to highway projects by increasing construction costs and causing construction delays, which also can increase project costs.

Various land use activities are present within and adjacent to the I-35W Minnesota River Bridge project area including residential, commercial, and

industrial. Table 5.10 describes surrounding land use activities adjacent to the project area.

Table 5.10 Surrounding Land Use Activities

Site Name	Description	Location	Contamination
Kraemer Mining and Minerals Quarry	Active quarry	Adjacent to the western side of the project area	Former demolition and construction debris disposal site that has been cleaned up and discontinued
Freeway Sanitary Landfill	Active landfill	Adjacent to the western side of the project area	Superfund site with active remediation activities and known groundwater contamination
Astleford Central Dump	Former landfill (now occupied by Dodge of Burnsville)	Adjacent to the east side of the project area	Superfund site with active remediation activities and known groundwater contamination
Old Freeway Dump	Former landfill	Adjacent to the east side of the project area	Superfund site with active remediation activities and known groundwater contamination
Freeway Transfer Station	Active Landfill	Adjacent to the west side of the project area	Within the groundwater area of concern from the former Freeway Sanitary Landfill
MnDOT Cloverleaf Dump	Former dump	Western portion of the interchange between I-35W and Cliff Road	No records to indicate whether the site was cleaned up and the Dakota County Environmental Management noted that the site was a “low risk” dump site

A Phase I Environmental Site Assessment (ESA) was completed for the proposed project in November 2014. The purpose of the Phase I ESA is to identify all known or potentially contaminated properties in the project area. As part of the project design process, these properties will be evaluated for their potential to be impacted by construction. Any contaminated properties with a potential to be impacted by the project will be investigated (through detailed review of MPCA project files and collection and laboratory analysis of soil and groundwater samples) to determine the extent and magnitude of contaminated soil or groundwater in the areas of concern.

During a Phase I ESA, potentially contaminated properties are identified through review of historic land use records and aerial photographs; Environmental Protection Agency (EPA), MPCA, and county/city records; and reconnaissance of current property conditions. MnDOT categorizes sites of potential concern identified by the Phase I ESA into high, medium, and low environmental risk levels as described below.

- **High Risk Sites:** In general, sites with high environmental risks are properties that have documented releases of chemicals or hazardous or regulated substances (e.g., active and inactive state and federal cleanup sites, active and inactive dump sites, and active leaking underground storage tank sites), strong evidence of contamination (e.g., soil staining, stressed vegetation), or storage of large volumes of petroleum or other chemicals (e.g., bulk storage tank facilities).
- **Medium Risk Sites:** Sites of medium environmental risk are properties where smaller volumes of petroleum, chemicals, or hazardous materials are frequently stored and used (e.g., registered underground and aboveground storage tanks, vehicle repair facilities, and metal working shops) but have no evidence of spills or releases. Properties with documented releases that have been "closed" (signifying no further cleanup actions deemed necessary) by the MPCA are also considered medium risk sites because residual soil or groundwater contamination may exist.
- **Low Risk Sites:** Low environmental risk sites include properties where minor volumes of chemicals or hazardous materials have been used or stored (e.g., hazardous waste generators, and possibly some farmsteads and residences).

During the Phase I ESA, 20 high-risk and two medium-risk sites were identified within the project area (i.e., within 500 feet of the approximate construction limits). These sites include closed landfills, active and inactive superfund sites, unpermitted dump sites, and leaking underground storage tank (LUST) sites. Table 5.11 lists the sites identified in the Phase I ESA. Figure F.12, Appendix F identifies the locations of the sites.

Table 5.11 Sites Identified in the Phase I ESA

Site No.	Site Name	Ranking
3	Burnsville Dodge Ram (Dodge of Burnsville)	High
4, 12, 13, 14	Kraemer Mining & Materials Inc. (Edward Kraemer & Sons)	High
5	Kraemer Mining & Materials Inc. (Edward Kraemer & Sons)	Low
6, 7	Commercial Property (Former Burnsville Volkswagen)	Medium
8	Walser Subaru - Burnsville	High
9	All State Self Storage	High
10	Chalet Golf Shop and Driving Range (Old Freeway/McGowan's Dump)	High

Site No.	Site Name	Ranking
11	Commercial Property (Former Burnsville Volkswagen)	High
15	Federal Property	Low
16, 17, 21	Freeway Sanitary Landfill/ RB McGowan Co. Inc. (McGowan property)	High
18	Northern States Power Co. (Xcel Energy)	High
19, 20, 22, 23	Freeway Transfer Inc. (Transfer Station)	High
24	Port Marilyn LLC (U.S. Salt Inc.)	High
25, 26	Northern States Power Co. (Xcel Energy)	Low
27	City of Bloomington (Former Bloomington Tree Disposal)	High
28	City of Bloomington	Low

Two medium-risk sites (site number 6 and 7) were identified with known or suspected recognized environmental conditions that may affect construction within the project area. The two medium-risk sites are closed LUST sites and are located within the I-35W Minnesota River Bridge project area. The known or suspected recognized environmental conditions include soil and groundwater contamination from documented underground storage tank releases, historic site use, or type of operations conducted on the property (i.e., vehicle maintenance).

Two recognized environmental conditions were identified with the potential to impact proposed construction activities: groundwater and methane contamination from the Freeway Sanitary Landfill that has migrated beneath the I-35W roadway, and demolition and construction debris from the MnDOT Cloverleaf Dump. Additional information regarding groundwater and methane contamination is summarized below. The MnDOT Cloverleaf Dump is an unpermitted dump site located in the northwest quadrant of the I-35W/Cliff Road interchange.

Following completion of the Phase I ESA, MnDOT completed a Phase II investigation of locations where contaminated soil or groundwater may be encountered during construction. The purpose of the Phase II investigation was to identify the potential presence, magnitude, and extent of contamination in soil and groundwater within the approximate construction area. The Phase II investigation included 17 soil borings, field screening of soil samples for organic vapors and evidence of soil contamination, in-situ measurements of methane, and associated sampling for analytical testing.

Impacts from contaminated properties established during the Phase II investigation will be mitigated by modifying the project design where warranted, avoiding purchasing a contaminated property if possible, and/or avoiding encountering contaminated materials during construction. If contaminated materials cannot be avoided, a plan will be developed to properly handle and treat any contaminated materials encountered during project construction in accordance with applicable state and federal regulations.

MnDOT will obtain a No Association Determination (NAD) from the MPCA for any property that will be acquired from the Freeway Sanitary Landfill/RB McGowan Co. Inc. property. MnDOT will prepare special provisions for handling of impacted groundwater and soil during construction. Procedures for special handling of impacted groundwater and soil during construction are summarized below:

- **Methane in Soil Gas:** Because of the high level of methane discovered during the Phase II investigation, MnDOT will complete a methane gas survey within one year of the beginning of construction. The survey will consist of installation of temporary soil vapor monitoring points along the construction corridor and collection of soil gas samples for analytical testing in a laboratory. Based on the findings of the soil gas survey, MnDOT will consider special provisions to address methane in soil gas during intrusive activities.
- **Metals in Fill Materials:** Elevated concentrations of arsenic, barium, and selenium were encountered in the soil from boring DP-6. Boring DP-6 is located along the west side of I-35W, south of the Black Dog Road interchange. During excavation of soils during road construction, fill material fitting the description of the material found in DP-6 will be segregated and sampled for Resource Conservation and Recovery Act (RCRA) metals. Pending the results of the analytical testing, fill material may need to be disposed of offsite.
- **Metals in Soil:** Elevated concentrations of arsenic were detected in a native soil sample collected from DP-15. DP-15 is located along the east side of I-35W, approximately half-way between the Black Dog Road and Cliff Road interchanges. Although the arsenic concentration detected in this sample is within the range of naturally-occurring arsenic in soil in Minnesota, the concentration detected in DP-15 is approximately an order of magnitude higher than the concentrations of arsenic detected in the other soil samples from the project area and the sample was collected adjacent to a former landfill site (Old Freeway/McGowan's Dump). Because arsenic exceeded the soil reference value (SRV) in soil, special provisions for handling and

management of soil from the DP-15 area will be incorporated into the construction plans.

- **Groundwater:** Although no evidence of contamination was found in the groundwater from the unconsolidated sediment, environmental investigations conducted at adjacent properties have noted the presence of contamination in the bedrock aquifer underlying the unconsolidated sediments. If excavation of bedrock material or dewatering of the bedrock aquifer is required, MnDOT will conduct an additional investigation of the bedrock aquifer. The investigation will consist of installing several permanent or temporary bedrock monitoring wells within or near the construction corridor and collection of groundwater samples for laboratory analysis. Results of the analysis can then be used to determine whether special provisions need to be developed for dewatering operations.

A copy of the entire Phase II ESA Report (which also includes the Phase I ESA) is available for review from the MnDOT Project Manager (see contact information in Chapter 7) and at MnDOT's Office of Environmental Stewardship at 395 John Ireland Boulevard in Saint Paul, Minnesota

5.12.2 Project Related Generation/Storage of Solid Wastes

Item 12.b. Describe solid wastes generated/stored during construction and/or operation of the project. Indicate method of disposal. Discuss potential environmental effects from solid waste handling, storage and disposal. Identify measures to avoid, minimize or mitigate adverse effects from the generation/storage of solid waste including source reduction and recycling.

The following regulated materials were identified on the I-35W Minnesota River Bridge that will require special handing: asbestos, mercury (HID), lead paint, lead, PCBs and treated wood. A regulated materials survey will be completed by MnDOT for the I-35W bridges over West 106th Street prior to the start of construction.

All solid wastes generated by construction of the proposed project will be disposed of properly in a permitted, licensed solid waste facility. Project demolition of concrete, asphalt, and other potentially recyclable construction materials will be directed to the appropriate storage, crushing, or renovation facility for recycling.

If a spill of hazardous or toxic substances should occur during or after construction of the proposed project, it is the responsibility of the transport company to notify the Minnesota Department of Public Safety, Division of

Emergency Services, to arrange for corrective action. Any contaminated spills or leaks that occur during construction are the responsibility of the contractor, who will notify and work with the MPCA to contain and remediate contaminated soil/materials in accordance with state and federal standards.

5.12.3 Project Related Use/Storage of Hazardous Materials

Item 12.c. Describe chemicals/hazardous materials used/stored during construction and/or operation of the project including method of storage. Indicate the number, location and size of any above or below ground tanks to store petroleum or other materials. Discuss potential environmental effects from accidental spill or release of hazardous materials. Identify measures to avoid, minimize or mitigate adverse effects from the use/storage of chemicals/hazardous materials including source reduction and recycling. Include development of a spill prevention plan.

No above- or below-ground storage tanks are planned for permanent use in conjunction with this project. Temporary storage tanks for petroleum products may be in the project area for refueling construction equipment during roadway construction. Appropriate measures will be taken during construction to avoid spills that could contaminate groundwater or surface water in the project area. If a leak or spill occurs during construction, appropriate action to remedy the situation will be taken immediately in accordance with MPCA guidelines and regulations.

5.12.4 Project Related Generation/Storage of Hazardous Wastes

Item 12.d. Describe hazardous wastes generated/stored during construction and/or operation of the project. Indicate method of disposal. Discuss potential environmental effects from hazardous waste handling, storage, and disposal. Identify measures to avoid, minimize or mitigate adverse effects from the generation/storage of hazardous waste including source reduction and recycling.

All regulated material and/or waste will be managed on this project in accordance with MnDOT special provisions. The MPCA regulates asbestos management activities and disposal activities. The disposal of asbestos regulated waste will be in accordance with MPCA rules. Toxic or hazardous materials will not be present at the site, except for fuel and oil necessary for maintaining and running heavy construction equipment or chemical products (pavement sealants, etc.) routinely used in roads.

5.13 EAW Item 13: Fish, Wildlife, Plant Communities, and Sensitive Ecological Resources (Rare Features)

5.13.1 Fish and Wildlife Resources

Item 13.a. Describe fish and wildlife resources as well as habitats and vegetation on or in near the site.

There are several large natural areas within, or adjacent to, the project area. These large tracts of land provide habitat, and the resources necessary to support a wide variety of aquatic and terrestrial species. These areas include:

- Minnesota River
- Minnesota Valley National Wildlife Refuge
- Minnesota River Valley Park

Minnesota River

The Minnesota River is a tributary of the Mississippi River with a length of approximately 332 miles, draining a watershed of nearly 17,000 square miles. It begins in Big Stone Lake flowing southeast to Mankato, then turns northeast. It joins the Mississippi south of the Twin Cities of Minneapolis and St. Paul, near Fort Snelling.

The Minnesota River Valley is an important migratory pathway and stopover area for waterfowl, raptors, waterbirds, and for migrant and breeding landbirds.[15] Plant communities along Minnesota River Valley (e.g., floodplain forests, wetlands, upland plant communities) provide feeding, breeding, and nesting habitats. The I-35W corridor is located within the Lower Minnesota River Valley Important Bird Area (IBA). The Important Bird Area Program is a proactive, voluntary program led by the Audubon Society and resource agencies to identify, monitor, and conserve critical bird habitats.

Minnesota Valley National Wildlife Refuge

The I-35W Minnesota River Bridge is bordered to the east by the Minnesota Valley National Wildlife Refuge (NWR). The refuge is a corridor of land and water stretching nearly 70 miles along the Minnesota River. The Minnesota

[15] US Fish and Wildlife Service. Ecological Services. February 10, 2016 Diurnal Avian Corridor Maps, Minnesota accessed at https://www.fws.gov/midwest/es/planning/Minnesota/MNDiurnalBirdMaps.html.

Valley NWR is made up more than 14,000 acres and multiple units, offering a variety of free outdoor recreational experiences for individuals and families. The Minnesota Valley NWR also manages a 14 county Wetland Management District.

The I-35W Minnesota River Bridge is located outside of the Minnesota Valley National Wildlife Refuge boundary. The construction activities would not involve refuge land nor would the activities have any direct or indirect impacts to the refuge or upon the associated recreational opportunities.

Minnesota River Valley Park

The Minnesota River Valley Park is large park property located immediately to the west as the I-35W Bridge crosses over the Minnesota River into the City of Bloomington.

5.13.2 Rare Features

Item 13.b. Describe rare features such as state-listed (endangered, threatened or special concern) species, native plant communities, Minnesota County Biological Survey Sites of Biodiversity Significance, and other sensitive ecological resources on or within close proximity to the site. Provide the license agreement number (LA-____) and/or correspondence number (ERDB _____) from which the data were obtained and attach the Natural Heritage letter from the DNR. Indicate if any additional habitat or species survey work has been conducted within the site and describe the results.

The MnDOT has a liaison position with the DNR who performs the reviews internally, therefore, no LA or ERDB number has been assigned. Correspondence from the DNR is included in Appendix E.

The DNR was contacted and a search of the Natural Heritage Information System (NHIS) Database was conducted to identify rare features within the project area. The NHIS database comprises locational records of rare plants, rare animals, and other rare features including native plant communities, geologic features, and animal aggregations (such as nesting colonies). To ensure future protection of these sensitive resources, the location information will not be provided in this document. Instead, the document will generally identify the sensitive resources in the project area and describe measures to avoid, minimize, or mitigate impacts to those resources.

Rare features identified in the NHIS review include:

- Sensitive Plant Species/Communities: Several occurrence records of plant species under various levels of state protection were identified

during the DNR review. Plant communities such as calcareous fens and seepage meadows were also noted in the project vicinity.

- Terrestrial Wildlife Resources: Occurrence records for state protected reptile and amphibian species such as the Blanding's turtle (*Emydoidea blandingii*) and the Blanchard's cricket frog (*Acris blanchardi*) were noted in the general project vicinity.
- Aquatic Wildlife Resources: There are several records of protected native mussel species identified in the immediate project area along with records of sensitive fish species.
- DNR Public Waters: DNR Public Waters in and immediately adjacent to the project limits include the Minnesota River and Black Dog Lake.

5.13.3 Impacts of the Project

Item 13.c. Discuss how the identified fish, wildlife, plant communities, rare features and ecosystems may be affected by the project. Include a discussion on introduction and spread of invasive species from the project construction and operation. Separately discuss effects to known threatened and endangered species.

Sensitive Plant Species/Communities

There are several occurrence records of sensitive plant species and communities identified in the general project vicinity, many of which are assigned some level of state protection. Based on coordination with the DNR and the information provided with the NHIS data search, no direct or indirect impacts to sensitive plant species or communities are anticipated from the implementation of this project.

Terrestrial Wildlife Resources

State-Listed Species

Blanding's turtles (*Emydoidea blandingii)*, a state-listed threatened species, have been reported in the project vicinity. Because Blanding's turtles required both wetland and upland habitats to complete their life cycle, there is the possibility that these turtles could be encountered during construction as they undertake their seasonal moments.

Blanchard's cricket frog (*Acris blanchardi*), a state-listed endangered species, is a small member of the treefrog family. Blanchard's cricket frogs inhabit shallow wetland, streams, lakes or rivers. Surveys for Blanchard's cricket frog

have been previously conducted in the study area. No Blanchard's cricket frogs were found in wetlands under the I-35W Minnesota River Bridge; however, Blanchard's cricket frogs have been observed west of the bridge. Because Blanchard's cricket frogs have been identified in the general project vicinity, these frogs could be encountered during construction.

Birds

As previously noted, the I-35W Minnesota River Bridge is within the Lower Minnesota River Valley Important Bird Area. The USFWS identifies the Lower Minnesota River Valley as a known corridor of bird concentration, where the likelihood of migratory bird collisions with human-made structures (e.g., bridges) is increased. The groups of birds most vulnerable to potential collisions with structures in the Lower Minnesota River Valley include waterfowl, raptors, and migrant landbirds. [16] Recommended design considerations to minimize impacts to migratory birds include low profile bridge types and lighting considerations.

Aquatic Wildlife Resources

Freshwater Fishes

The Minnesota River is a DNR Public Waters. The Minnesota River supports a large fish population, including walleye (*Sander vitreous*), northern pike (*Esox lucius*), smallmouth bass (*Micropterus dolomieu*), and other rough fish. The project would involve work within the Minnesota River to remove the existing structure/support work along with the construction of the new bridge. Coffer dams and barge docking areas would be constructed along the Minnesota River shoreline. Fish could be encountered during construction; however, effects are anticipated to be minimal. Fish would likely move away from the project area during construction.

Freshwater Mussels

A mussel survey was completed at the I-35W Minnesota River Bridge in July 2017. Two species of state-listed mussels were encountered. No federally-listed mussels were identified. A copy of the mussel survey report is available from the MnDOT Project Manager (see contact information in Chapter 7).

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[16] US Fish and Wildlife Service. Ecological Services. February 10, 2016 Potential Bird-Structure Collison Areas Map accessed at https://www.fws.gov/midwest/es/planning/Minnesota/pdf/MN_BirdCorridorsMap040611.pdf

Invasive Species

The project will involve work within the Minnesota River. The implementation of this project is unlikely to introduce invasive species. Any in-water work will follow the provisions outlined by the DNR in their guidance document *Best Practices for Preventing the Spread of Aquatic Invasive Species* (e.g., all equipment being transported into and out of the project site will be inspected and free of any aquatic plants, water, and prohibited invasive species, see guidance document in Appendix E).

5.13.4 Measures to Avoid, Minimize, or Mitigate Adverse Effects

Item 13.d. Identify measures that will be taken to avoid, minimize, or mitigate adverse effects to fish, wildlife, plant communities, and sensitive ecological resources.

Sensitive Plant Species/Communities

There are several occurrence records of sensitive plant species and communities in the general project vicinity (i.e., Areas of Environmental Sensitivity), many of which are assigned some level of state protection. The project is located within the existing highway right of way and would avoid direct impacts to Areas of Environmental Sensitivity. The DNR's best management practices for protecting Areas of Environmental Sensitivity will be implemented with the project to avoid indirect effects. Areas of Environmental Sensitivity adjacent to MnDOT right of way will be identified on the project plans. No disposal of excess materials will occur outside of MnDOT right of way in Areas of Environmental Sensitivity. Stormwater runoff from the construction area will be prevented from reaching Areas of Environmental Sensitivity, including the use of redundant erosion control measures. Immediately following construction, disturbed areas will be re-vegetated with native vegetation suitable to the local habitat.

Based on coordination with the DNR and the information provided with the NHIS data search, no direct or indirect impacts to sensitive plant species or communities are anticipated from the implementation of this project.

Terrestrial Wildlife Resources

State-Listed Species

Blanding's turtles (*Emydoidea blandingii)*, a state-listed threatened species, have been reported in the project vicinity and may be encountered during construction. The DNR recommended Blanding's Turtle Fact Sheet will be

provided to all contractors working on site so that the appropriate measures can be followed if turtles are encountered during construction.

Blanchard's cricket frog (*Acris blanchardi*), a state-listed endangered species, is known to occur in the general project area. MnDOT will limit staging equipment and materials to the west of the I-35W Minnesota River Bridge. MnDOT will review dewatering plans with DNR nongame wildlife staff. Restriction dates will be incorporated into the project construction schedule, minimizing adverse impacts to any Blanchard's cricket frogs that may be present in the project area.

Birds

Based on the best available information, there are no known bald eagle (*Haliaeetus leucocephalus*) nests within the project area. A survey for bald eagle nests will be completed prior to the start of construction. If bald eagle nests are identified in the project area, then USFWS recommendations to avoid the non-purposeful take of bald eagles or their young will be followed (e.g., maintaining a buffer of at least 660 feet between the nest tree and project activities; restrict all clearing, construction, and landscaping activities within 660 feet of the nest outside of the bald eagle nesting season).

Br. No. 5983 (I-35W Minnesota River Bridge), Br. No. 9043 (southbound I-35W over West 106th Street), and Br. No. 9044 (northbound I-35W over West 106th Street) will be inspected for barn swallow and cliff swallow nests prior to the start of construction. In accordance with MnDOT policy and in compliance with the Federal Migratory Bird Treaty Act, 50 CFR 21.41, the destruction of swallows will be avoided by preventing the birds from nesting until completion of the project.

The following measures will be implemented to minimize the effects of the project on migratory birds:

- The potential bridge types for the proposed I-35W Minnesota River Bridge will be limited to types of bridges without structures above the bridge deck. This is consistent with recommendations to minimize potential effects on migratory birds.
- The Visual Quality Manual (VQM) for the project identifies entry monuments near the bridge abutments on both sides of the Minnesota River (see Section 5.15, Visual). The entry monuments would extend approximately 30 feet above the bridge deck. Concept designs from the VQM were discussed with U.S. Fish and Wildlife (USFWS) staff. USFWS does not anticipate any concerns with the entry monuments and migratory birds. Lighting on the entry

monuments will be directed downwards towards the roadway and bridge deck.

- Highway lighting on I-35W and the Minnesota River Bridge will follow MnDOT's lighting standards to provide 0 percent uplight and restrict backlight. Lighting will be directed downwards towards the roadway and bridge deck. Full cutoff luminaire lighting heads will be used.
- Pedestrian-level lighting will not be constructed on the I-35W Minnesota River Bridge along the trail.

Aquatic Wildlife Resources

Freshwater Fishes

MnDOT will incorporate fish spawning restriction dates (i.e., no in water activity between March 15 and June 15) into the project construction schedule, minimizing impacts to the local fishery during this sensitive time frame.

The DNR noted that work in these areas or adjacent to these areas needs to include the reestablishment of native vegetation suitable to the local habitat. The DNR also noted that the MPCA NPDES general permit for authorization to discharge stormwater associated with construction activities (permit MN R10001) recognizes the DNR "work in water restrictions" during specified fish migration and spawning time frames for areas adjacent to water.

During the restriction period, all exposed soil areas that are within 200 feet of the water's edge and drain to these waters will have erosion prevention and stabilization activities initiated immediately after construction activity has ceased (and be completed within 24 hours). MnDOT will coordinate construction activities with the DNR and will incorporate the applicable spawning restrictions timeframes into the construction schedule. MnDOT will follow the provisions of the NPDES permit including the erosion prevention, stabilization, and revegetation requirements.

Freshwater Mussels

Two state-listed mussel species were encountered in surveys at the I-35W Minnesota River Bridge. MnDOT will coordinate with the DNR to identify compensatory mitigation obligations. MnDOT will also obtain an endangered species take permit from the DNR prior to the start of construction.

Other Wildlife Related Concerns

The DNR recommends the new bridge be designed with a passage bench along each bank under the bridge to facilitate animal movement. The DNR noted that the Minnesota River bluffs and floodplain are historical routes for animal travel. Continuing access would maintain permeability between these large protected land tracts allowing for uninhibited animal movement.

The existing I-35W Minnesota River Bridge includes flat, open space areas between the bridge abutments and the Minnesota River. These areas allow for animal movement under the I-35W Minnesota River Bridge. The space between Black Dog Road and the Minnesota River allows for animal movement under the south side of the bridge. The space between the north abutment and an existing stormwater pond allows for animal movement under the north side of the bridge. A causeway along the north shoreline between the Minnesota River and stormwater pond also allows for animal movement under the bridge.

The proposed bridge will maintain the existing open space areas between the bridge abutments and the Minnesota River. The causeway along the north side of the Minnesota River will be maintained, allowing for animal movement along the river. Passage benches will be designed and constructed along the north and south sides of the I-35W Minnesota River Bridge following MnDOT standard plans and guidance identified in the DNR Manual *Best Practices for Meeting General Permit 2004-0001* (Version 4, October 2014). Locations for passage benches are summarized below.

- Between Black Dog Road and the south shoreline of the Minnesota River.
- Between the bridge abutment and north end of the stormwater basin along the north side of the Minnesota River.

Erosion control best management practices will be identified in the SWPPP. Bio-netting, natural-netting (category 3N or 4N) or woven type products will be used where identified in the SWPPP. Welded plastic mesh netting erosion control products will not be used on the project.

5.14 EAW Item 14: Historic Properties

Describe any historic structures, archeological sites, and/or traditional cultural properties on or in close proximity to the site. Include: 1) historic designations, 2) known artifact areas, and 3) architectural features. Attach letter received from the State Historic Preservation Office (SHPO). Discuss any anticipated effects to historic properties during project construction and operation. Identify measures that will

be taken to avoid, minimize, or mitigate adverse effects to historic properties.

The proposed project was reviewed by MnDOT Cultural Resources Unit (CRU) staff for historic and archaeological resources. MnDOT CRU initially determined that there are no historic properties affected by the proposed project, as there are no historic properties within the area of potential effect (APE). See the correspondence from MnDOT CRU dated April 21, 2015 and March 31, 2017 in Appendix E.

The project APE was expanded in 2016 to include the proposed stormwater basins outside of existing MnDOT right of way along the east side of I-35W, north of the Minnesota River Bridge. Archaeological surveys identified a site that was determined potentially eligible for listing in the National Register of Historic Places (NRHP). The preliminary design for the proposed stormwater basins was revised to avoid the archaeological site. This site is located outside of the area of potential effects (APE). Mitigation measures will be implemented to protect this site during project construction, including:

- A fence will be installed to keep construction equipment away from the archaeological site and to avoid any potential compaction of soils on the site.
- A fence will be installed along the northernmost construction limits between the existing I-35W right of way and the archaeological site to keep construction equipment from impacting a culturally sensitive area north of the project area along the Minnesota River bluff.
- All fencing will be inspected by MnDOT CRU staff prior to the start of construction.

MnDOT CRU determined that the proposed project would have no effect on the archaeological site. See the correspondence from MnDOT CRU dated March 31, 2017 in Appendix E.

MnDOT CRU completed an updated review to include the I-35W bridges over West 106th Street in summer 2017. MnDOT CRU determined that there would be no historic properties affected by the reconstruction of these bridges. See the correspondence from MnDOT CRU dated July 10, 2017 in Appendix E.

5.15 EAW Item 15: Visual

Describe any scenic views or vistas on or near the project site. Describe any project related visual effects such as vapor plumes or glare from intense lights. Discuss the potential visual effects from the

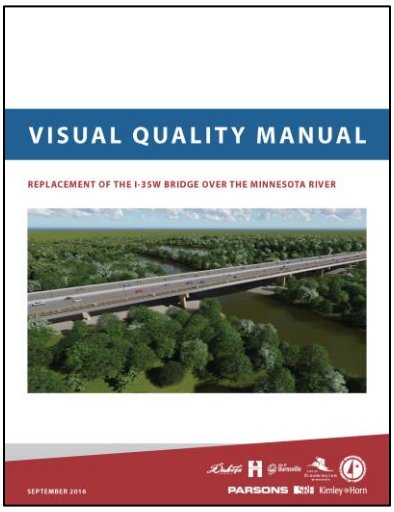
project. Identify any measures to avoid, minimize, or mitigate visual effects.

I-35W bisects the Minnesota River Valley between Bloomington and Burnsville. The Minnesota River Valley National Wildlife Refuge is located to the east of I-35W, and Bloomington's Minnesota River Valley Park is located to the west of I-35W. Trees and other native vegetation are located along the river bluff and within the floodplain adjacent to I-35W. Several built elements are also visible from the highway corridor.

The project would not alter the existing views of the Minnesota River from I-35W as the alignment of the proposed bridge is located within the existing river crossing corridor. Consequently, negative visual impacts for river crossing users are not anticipated.

The project would raise the profile of I-35W over West 106th Street by approximately three to four feet. The new I-35W bridge over West 106th Street would be a single-span structure, compared to the existing three-span bridges. These changes would occur within the existing highway corridor, and would be consistent with existing views of the highway.

A noise wall may be constructed as part of the project. See Section 5.17 for a description of the proposed noise wall and the noise wall voting process. The noise wall would block the view of I-35W from the residential properties adjacent to the wall, and views of the residential properties from I-35W. The proposed noise wall would be made of painted wooden planks and concrete posts.



Visual Quality Manual

MnDOT, along with its project partners, prepared a Visual Quality Manual (VQM) for the project. The VQM describes the visual quality planning process, provides project context and background information, and documents design elements for the overall project as well as specific bridge and roadway components. A Visual Quality Advisory Committee, consisting of representatives from MnDOT, Bloomington, Burnsville, and the public provided input into the development of the VQM. The VQM is available for review from the MnDOT Project Manager (see contact information in Chapter 7).

The VQM identifies concepts for pedestrian lighting along the proposed trail on the I-35W Minnesota River Bridge. Pedestrian lighting would require an agreement among MnDOT, Bloomington, and Burnsville to determine how the lighting, power, and maintenance would be funded. MnDOT reviewed the pedestrian lighting concepts with both cities.

The cities of Bloomington and Burnsville determined that pedestrian-level lighting will not be included on the I-35W Minnesota River Bridge.

The VQM also identifies entry monuments on both sides of I-35W at the ends of the proposed bridge. The entry monuments mark the beginning and end of the bridge, drawing the attention of users to the surrounding Minnesota River Valley. The proposed entry monuments would be approximately 30 feet tall, with detail and color matching the piers. The entry monuments would be lighted at night. Entry monument lighting will be focused downwards towards the road and bridge deck (see also Section 5.13).

The I-35W Minnesota River Bridge would not include aesthetic lighting or accent lighting, other than the lighting on the entry monuments described above. River navigation lighting will be installed on the underside of the bridge deck as required by the U.S. Coast Guard.

Highway lighting would be installed along I-35W and the Minnesota River Bridge. The project will follow MnDOT's lighting standards to provide 0 percent uplight and restrict backlight, minimizing light pollution. Lighting will be directed downwards towards the roadway and bridge deck. Full cutoff luminaire lighting heads will be used.

5.16 EAW Item 16: Air

5.16.1 Stationary Source Emissions

Item 16.a. Stationary Source Emissions. Describe the type, sources, quantities and compositions of any emissions from stationary sources such as boilers or exhaust stacks. Include any hazardous air pollutants, criteria pollutants, and any greenhouse gases. Discuss effects to air quality including any sensitive receptors, human health or applicable regulatory criteria. Include a discussion of any methods used assess the project's effect on air quality and the results of that assessment. Identify pollution control equipment and other measures that will be taken to avoid, minimize, or mitigate adverse effects from stationary source emissions.

Not applicable.

5.16.2 Vehicle emissions

Item 16.b. Vehicle Emissions. Describe the effect of the project's traffic generation on air emissions. Discuss the project's vehicle-related emissions effect on air quality. Identify measures (e.g., traffic operational improvements, diesel idling minimization plan) that will be taken to minimize or mitigate vehicle-related emissions.

The following question format answers the EAW question above in relation to highway projects and summarizes the findings in the Air Quality Report provided in Appendix G.

What is National Ambient Air Quality Standards (NAAQS)?

The United States Environmental Protection Agency (US EPA) establishes maximum allowable levels of six important air pollutants. These limits are called NAAQS, and exceedances of those limits may be harmful to human health. Air pollution has regional consequences, therefore regions are classified as attainment (complying with the limits), not-attainment (not complying with the limits), or maintenance (has now improved and complies, and therefore has to maintain compliance for 20 years before being classified as attainment).

How is air quality evaluated for transportation projects?

In transportation projects, the following air quality elements are addressed: conformity to Minnesota's State Implementation Plan (SIP), a Carbon Monoxide (CO) Analysis and a Mobile Source Air Toxics (MSAT) analysis.

How do the project alternatives address conformity to the SIP?

The I-35W Bridge project area is designated by the EPA as in attainment (or complying) with the National Ambient Air Quality Standards (NAAQS) for all air pollutants. However, while the project area is in attainment with the carbon monoxide (CO) NAAQS, the project area was formerly a nonattainment area for CO and is currently a "maintenance" area for this pollutant. Therefore, Transportation Conformity rules (40 CFR 93, Subpart A) apply only to vehicle emissions of CO in the project area. The CO analysis is performed by evaluating the worst-operating intersections in the project area, known as a hot-spot analysis.

What is a hot-spot analysis?

A hot-spot analysis is defined by the US EPA as an estimation of likely future localized air pollutant concentrations and a comparison of those concentrations to the relevant NAAQS.

The Transportation Conformity rules require that a project be in conformance with the regional emissions budget for CO. When a project has been included in the analysis prepared for the area's Long Range Transportation Plan (LRTP) and is included in the Transportation Improvement Program (TIP) list of planned projects, it is presumed to conform with the regional CO emissions budget. The I-35W Bridge Project is not included in the current TIP, however at such time it is added, a conformity analysis will be completed to demonstrate compliance with the SIP.

How do the project alternatives address CO?

For existing conditions and for both the No Build and Build alternatives, the maximum annual average daily traffic (AADT) levels at signalized ramp intersections will be less than the MnDOT CO hot-spot screening threshold of 79,400 entering vpd for signalized intersections. Therefore, signalized intersections affected by the project are not required to conduct a hot-spot analysis. The Air Quality Report provided in Appendix G explains the CO hot-spot screening procedures in greater detail.

On November 8, 2010, the EPA approved a limited maintenance plan request for the Twin Cities maintenance area. Under a limits maintenance period and that "an emission budget may be treated as essentially not constraining for the length of the maintenance period. The reason is that it is unreasonable to expect that our maintenance area will experience so much growth within this period that a violation of CO National Ambient Air Quality Standard (NAAQS) would result" (US EPA Limited Maintenance Plan Option for Nonclassifiable CO Nonattainment areas, October 6, 1995). Therefore, no regional modeling analysis for the LRTPP and TIP is required; however federally funded and state funded projects are still subject to "hot-spot" analysis requirements. The limited maintenance plan adopted in 2010 determines that the level of CO emissions and resulting ambient concentrations will continue to demonstrate attainment of the CO NAAQS.

How do the project alternatives address MSAT?

Due to incomplete and unavailable information, it is not currently feasible to develop a project specific MSAT health impacts analysis; however, a qualitative assessment of regional MSAT impacts is possible. Please refer to Appendix G for the full qualitative MSAT analysis relative to the project alternatives. In summary, when a highway is widened, the localized level of MSAT emissions for the Build Alternative could be higher relative to the No Build Alternative, but this could be offset due to increases in speeds and reductions in congestion (both of which are associated with lower MSAT emissions). Also, MSAT will be lower in other locations when traffic shifts away from them. However, on a regional basis, EPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions that, in almost all cases, will cause region-wide MSAT levels to be lower than today.

5.16.3 Dust and Odors

Item 16.c. Dusts and Odors. Describe sources, characteristics, duration, quantities, and intensity of dust and odors generated during project

construction and operation. (Fugitive dust may be discussed under item 16.a.). Discuss the effect of dust and odors in the vicinity of the project including nearby sensitive receptors and quality of life. Identify measures that will be taken to minimize or mitigate the effects of dust and odors.

The proposed project will not generate substantial odors during construction. Potential odors will likely include exhaust from diesel engines and fuel storage. Dust generated during construction will be minimized through standard dust control measures such as applying water to exposed soils and limiting the extent and duration of exposed soil conditions. Construction contractors will be required to control dust and other airborne particulates in accordance with the construction contract specifications. After construction is complete, dust levels are anticipated to be minimal because all soil surfaces exposed during construction will be in permanent cover (i.e., paved or re-vegetated areas).

5.17 EAW Item 17: Noise

Describe sources, characteristics, duration, quantities, and intensity of noise generated during project construction and operation. Discuss the effect of noise in the vicinity of the project including 1) existing noise levels/sources in the area, 2) nearby sensitive receptors, 3) conformance to state noise standards, and 4) quality of life. Identify measures that will be taken to minimize or mitigate the effects of noise.

What is noise, what is decibel and dBA?

Noise is defined as unwanted sound. Decibel is the unit of measure used to quantify sound pressure level (SPL). The terms sound and noise are often interchangeable, although noise is considered unwanted sound.

The human hearing organs do not hear all frequencies of sound equally; we hear some frequencies better than others. The A-weighting scale was created to apply more emphasis or weighting on the frequencies we hear best, and to de-emphasize or apply less weighting to frequencies we don't hear well.

The following question format answers the EAW question in relation to highway projects and summarizes the findings in the Noise Report provided in Appendix H.

5.17.1 Construction Noise

Will there be noise during construction?

The construction activities associated with the proposed project are expected to produce noise levels that are louder than existing conditions. Table 5.12 shows peak noise levels measured at 50 feet from several types of construction equipment. This equipment is usually used during site grading/site preparation, which is usually the loudest phase of the roadway construction process.

Table 5.12 Typical Construction Equipment Noise Levels at 50 Feet

Equipment Type	Manufacturers Sampled	Total Number of Models in Sample	Peak Noise Level (dBA) (Range)	Peak Noise Level (dBA) (Average)
Backhoes	5	6	74-92	83
Front Loaders	5	30	75-96	85
Dozers	8	41	65-95	85
Graders	3	15	72-92	84
Scrapers	2	27	76-98	87
Pile Drivers	N/A	N/A	95-105	101

Source: United States Environmental Protection Agency and Federal Highway Administration.

What can be done to reduce the annoyance associated with construction noise?

Load construction noise levels are, to a degree, unavoidable for this type of project. MnDOT normally requires that construction equipment by properly muffled and in proper working order. While MnDOT and its contractor(s) are exempt from local noise ordinances, contractors are required to comply with applicable local noise restrictions and ordinances to the extent that is reasonable.

Communities that might be affected by construction noise will be notified in advance of any planned, unusually loud construction activities. Construction activities may sometimes occur at nighttime and if they do, they will be required to minimize traffic impacts to daytime hours as much as possible. This project will likely be under construction for three construction seasons. Construction is anticipated to begin in the summer of 2019 and end in the fall of 2021. The staging of construction activities will be determined during the final design stage of the project.

Construction activities that make loud impulsive noises, such as pavement sawing or jack hammering, will be unavoidable with construction of the proposed project. Pile-driving noise is associated with any bridge construction and sheet piling necessary for retaining wall construction. Pile-driving produces the highest peak noise levels, as shown in Table 5.11, above. Pile-driving will occur because of bridge construction and retaining wall construction.

It is anticipated that night construction may be required to expedite construction, minimize traffic impacts, and improve safety. Noisy work at night for bridge construction will be limited as much as possible, but may need to occur periodically. Construction or maintenance activities that are generally prohibited during 8:30 P.M. and 7:00 A.M. include pile driving/removal, concrete pavement demolition, pavement sawing, concrete

crushing operations and jack-hammering. However, there will be times when noise producing operations will have to occur at night because of the need for pavement to cure or be sawed, or lanes closures that allow access to the work area.

5.17.2 Traffic Noise Analysis

Traffic Noise Analysis Report

This project is a federal Type 1 project[17] requiring a traffic noise analysis. The following is a summary of the *Traffic Noise Analysis Report* for the project. See Appendix H for the entire text of the *Traffic Noise Analysis Report*. This report includes background information on noise, information regarding traffic noise regulations (i.e., federal traffic noise regulations [see Appendix H, Table 2] and Minnesota state noise standards [see Appendix H, Table 3]), a discussion of the traffic noise analysis methodology, documentation of the potential traffic noise impacts associated with the proposed project, and an evaluation of noise abatement measures.

How is traffic noise regulated at the federal level?

The Federal Highway Administration's (FHWA) traffic noise regulation is in 23 Code of Federal Regulations (CFR) Part 772 (Procedures for Abatement of Highway Traffic Noise and Construction Noise). 23 CFR 772 requires the identification of highway traffic noise impacts and the evaluation of noise abatement measures, along with other considerations, in conjunction with the planning and design of a federal-aid highway project.

Under federal rules, traffic noise impacts are determined based on land use activities and predicted loudest hourly L10 noise levels under future

[17] 23 CFR 772.5 (FHWA) defines a Type 1 project as follows:
(1) The construction of a highway on new location; or,
(2) The physical alteration of an existing highway where there is either:
  (i) Substantial Horizontal Alteration. A project that halves the distance between the traffic noise source and the closest receptor between the existing condition to the future build condition; or,
  (ii) Substantial Vertical Alteration. A project that removes shielding, therefore exposing the line-of-sight between the receptor and the traffic noise source. This is done by either altering the vertical alignment of the highway or by altering the topography between the highway traffic noise source and the receptor; or,
(3) The addition of a through-traffic lane(s). this includes the addition of a through-traffic lane that functions as a 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 addition of a new or substantial alteration of a weigh station, rest stop, ride-share lot or toll plaza.
(8) If a project is determined to be a Type I project under this definition, then the entire project area as defined in the environmental document is a Type I project.

What is L10 and L50?

Measured traffic noise levels are characterized as a function of time. One way to do that is to use a statistical term such as the percent of time a noise level is exceeded. The L10 is the noise level exceeded 10% of the time. The L50 is the noise level exceeded 50% of the time.

conditions (see Appendix H, Table 2, Federal Noise Abatement Criteria). For example, for residential land uses (Activity Category B), the Federal Noise Abatement Criterion (NAC) is 70 dBA (L10). We use the term receptor to refer to land uses that receive traffic noise. Receptor locations where modeled traffic noise levels are "approaching" or exceeding the NAC must be evaluated for noise abatement feasibility and reasonableness. In Minnesota, "approaching" is defined as 1 dBA or less below the Federal NAC. A noise impact is also defined when traffic receivers are projected to experience a "substantial increase" in the future traffic noise levels over the existing modeled noise levels. A "substantial increase" is defined as an increase of 5 dBA or greater from existing to future conditions.

How is traffic noise regulated in Minnesota?

The MPCA is the state agency responsible for enforcing state noise rules (see Appendix H, Table 3, Minnesota state noise standards). The MPCA noise standards are different for daytime and nighttime. MPCA defines daytime as 7:00 A.M. to 10:00 P.M. and nighttime as 10:00 P.M. to 7:00 A.M. The state noise standards also consider the differing noise sensitivities of different land uses such as residential uses, commercial uses, or industrial uses. Minnesota state noise standards apply to the outdoor environment (i.e., exterior noise levels). The MPCA noise standards apply to traffic noise from certain highways including the proposed project area of I-35W.

How are traffic noise impacts determined?

Traffic noise is evaluated by modeling the traffic noise levels during the hours of the day and/or night that have the loudest traffic. The traffic noise model uses existing and forecasted traffic volumes, as well as characteristics of the roadway and surrounding environment, to calculate traffic noise levels at representative receptor locations. Modeled traffic noise levels are then compared to state daytime and nighttime noise standards. If modeled traffic noise levels are projected to exceed state daytime and/or nighttime noise standards under the Build Alternative, then a traffic noise impact is identified and noise abatement measures (e.g., noise barriers) are considered.

How was traffic noise evaluated on this project?

Traffic noise levels were modeled for existing (year 2015) conditions, the future (2040) No Build Alternative, and the future (2040) Preferred Alternative using the "MINNOISEV31" model, a version of the FHWA "STAMINA" model adapted by MnDOT. The 2040 Preferred Alternative model input was based on a profile developed for the steel girder bridge type and a profile developed for I-35W south of the Minnesota River to be

constructed at a minimum of two feet above the 100-year floodplain elevation. Traffic noise levels were modeled at 164 representative receptor locations within the project area. These modeled receptor locations represent residential, commercial, recreational (trail), and industrial land uses.

What were the results of the traffic noise analysis?

The Traffic Noise Report found in Appendix H provides the detailed analysis for each receptor. The 164 receptor points were broken down into individual noise sensitive areas (NSA). Seven NSA locations consisting of 108 receptors, and one trail NSA consisting of 56 receptors, were included in the analysis. Each NSA represented a specific group of one or more similar land uses. Table 5.13 presents the traffic noise analysis results for the 108 non-trail (i.e., parcel) receptors.

Table 5.13 2015 and 2040 Modeling Noise Level Ranges and Parcel Receptors Exceeding Standards

Modeled Year	2015 Existing	2040 No Build Alternative	2040 Preferred Alternative
Parcel Receptors			
Parcel Receptors Exceed MPCA Standards Daytime	L_{10} – 76 of 108 L_{50} – 98 of 108	L_{10} – 80 of 108 L_{50} – 101 of 108	L_{10} – 83 of 108 L_{50} – 101 of 108
Parcel Receptors Exceed MPCA Standards Nighttime	L_{10} – 104 of 108 L_{50} – 106 of 180	L_{10} – 104 of 108 L_{50} – 107 of 108	L_{10} – 104 of 108 L_{50} – 106 of 108
Parcel Receptors Approach or Exceed FHWA Noise Abatement Criteria	43 of 108	47 of 108	51 of 108
Modeled Noise Level Ranges			
Daytime L_{10} Modeled Noise Level Ranges (low/high)	59.5 to 76.5 dBA	60.0 to 77.0 dBA	59.9 to 77.7 dBA
Daytime L_{50} Modeled Noise Level Ranges (low/high)	57.3 to 73.1 dBA	57.9 to 73.8 dBA	57.9 to 74.7 dBA
Nighttime L_{10} Modeled Noise Level Ranges (low/high)	58.1 to 75.5 dBA	59.1 to 76.4 dBA	59.1 to 77.4 dBA
Nighttime L_{50} Modeled Noise Level Ranges (low/high)	55.4 to 71.5 dBA	56.7 to 72.6 dBA	56.7 to74.0 dBA

The existing daytime L10 noise levels at modeled receptors varied between 59.5 dBA and 76.5 dBA. Under existing daytime conditions the state L10

noise standards were exceeded at 76 receptors, and the state L50 noise standards were exceeded at 98 receptors. The existing nighttime L10 noise levels at modeled receptors varied between 58.1 dBA and 75.5 dBA. Under existing nighttime conditions the state L10 nighttime noise standards were exceeded at 104 receptors, and the state L50 noise standards were exceeded at 106 receptors.

The 2040 No Build Alternative daytime L10 noise levels were predicted to range between 60.0 dBA and 77.0 dBA. The state L10 daytime noise standards were exceeded at 80 of the receptors. The state L50 daytime noise standards were exceeded at 101 of the receptors. The No Build Alternative nighttime L10 values are predicted to range between 59.1 dBA and 76.4 dBA. The state L10 nighttime noise standards were exceeded at 104 of the receptors. The state L50 nighttime noise standards were exceeded at 107 of the receptors

The 2040 Preferred Alternative daytime noise levels were predicted to range between 59.9 dBA and 77.7 dBA. The state L10 daytime noise standards were exceeded at 83 of the receptors. The state L50 daytime noise standards were exceeded at 101 of the receptors. The Preferred Alternative nighttime L10 values are predicted to range between 59.1 dBA and 77.4 dBA. The state L10 nighttime noise standards were exceeded at 104 of the receptors. The state L50 nighttime noise standards were exceeded at 106 of the receptors.

Federal noise abatement criteria were approached or exceeded at 51 of the receptors under the 2040 Preferred Alternative. None of the modeled receptors were predicted to experience a substantial increase in traffic noise (i.e., an increase of 5 dBA or greater from existing to the 2040 Preferred Alternative).

Table 5.14 lists the traffic noise analysis results for the trail receptors. There is no existing trail on the I-35W Minnesota River Bridge; therefore, trail receptors were evaluated for the 2040 Preferred Alternative only. Future 2040 daytime noise levels were predicted to range between 64.0 dBA and 84.7 dBA. The state L10 daytime noise standards were exceeded at 47 of the 56 modeled trail receptor locations. The state L50 daytime noise standards were exceeded at 54 of the 56 modeled trail receptor locations.

Table 5.14 2015 and 2040 Modeling Noise Level Ranges and Trail Receptors Exceeding Standards

Modeled Year	2040 Preferred Alternative
Trail Receptors	
Trail Receptors Exceed MPCA Standards Daytime	L_{10} – 47 of 56 L_{50} – 54 of 56
Trail Receptors Exceed MPCA Standards Nighttime	L_{10} – 45 of 56 L_{50} – 50 of 56
Trail Receptors Exceed FHWA Noise Abatement Criteria	49 of 56
Modeled Noise Level Ranges	
Daytime L_{10} Modeled Noise level ranges (low/high)	64.0 to 84.7 dBA
Daytime L_{50} Modeled Noise level ranges (low/high)	62.4 to 79.3 dBA
Nighttime L_{10} Modeled Noise level ranges (low/high)	62.9 to 84.6 dBA
Nighttime L_{50} Modeled Noise level ranges (low/high)	61.0 to 78.8 dBA

The traffic noise analysis was based on a profile developed for the steel girder bridge type and for I-35W to be constructed at a minimum of two feet above the 100-year floodplain elevation south of the Minnesota River. The design-build contractor will be required to evaluate noise impacts based on their design and demonstrate that modeled noise levels do not exceed the levels that were modeled with the steel girder bridge and the I-35W preliminary design profile.

What noise abatement measures were considered?

Noise abatement measures were evaluated along the I-35W Bridge corridor where modeled traffic noise levels are projected to: 1) exceed MPCA noise standards; 2) approach or exceed Federal Noise Abatement Criteria; or 3) increase substantially (i.e., increase by 5 dBA or greater from existing to future Build Alternative conditions).

The I-35W Minnesota River Bridge crossing project is considered a Type I project for the purposes of traffic noise analysis. 23 CFR 775.15(c) describes noise abatement measures that are to be considered when traffic noise

impacts have been identified. These noise abatement measures are described below.

- 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 signing 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 that would be adversely impacted by traffic noise.
- Noise insulation of certain facilities, including auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.

For a noise abatement measure to be proposed as part of a project, it must be both feasible and reasonable as established in MnDOT's Highway Noise Policy (dated June 15, 2015).

What is MnDOT's Noise Reduction Design Goal?

MnDOT's Noise Policy establishes a noise reduction design goal of at least **7 dBA**. This design goal must be achieved at a minimum of one benefited receptor for each proposed noise abatement measure to be considered reasonable. This goal provides that even though the minimum noise reduction required for receptors to be considered as benefited is 5 dBA a minimum 7 dBA reduction must be achieved for at least one benefited receptor.

Feasibility

Noise abatement measures must meet acoustic and engineering feasibility criteria to be proposed. For a noise abatement measure to be considered acoustically feasible, it must provide a substantial reduction in noise, defined as a 5 dBA reduction by at least one impacted receptor per proposed barrier. Engineering feasibility addresses whether it is possible to design and construct a proposed noise abatement measure. Potential constructability factors include safety, topography, drainage, utilities and maintenance.

Reasonableness

Three reasonableness factors or "tests" must be met for a noise abatement measure to be considered reasonable: 1) noise reduction design goal of 7 dBA is met for at least one receptor, 2) cost effectiveness criteria of $43,500 per individual benefited receptor must be met, and 3) the viewpoint of benefited residents and property owners.

What is MnDOT's Noise Wall Cost Effectiveness?

Cost effectiveness threshold of **$43,500** per individual benefited receptor has been established as part of MnDOT's 2015 Noise Policy, based on an estimated construction cost of $20/sq. ft. for noise walls. The cost effectiveness threshold and basis for construction cost estimate will be tracked and the cost effectiveness number will be updated every five years.

Noise Barrier Analysis Results

Noise barriers were assessed at all locations where future (2040) modeled noise levels were projected to exceed state daytime or nighttime standards, approach federal noise abatement criteria, or at locations where future modeled noise levels were projected to exceed existing levels by 5 dBA or greater (i.e., substantial increase). Multiple noise barrier alternatives were modeled with varying heights and lengths. Cost effectiveness calculations and results of the noise barrier analyses are included in the *Traffic Noise Analysis Report* found in Appendix H.

One noise wall met MnDOT's feasibility and reasonableness criteria and is proposed as part of the project. Noise Wall 5 will be located on the east side of I-35W north of West 106th Street. The proposed noise wall is approximately 20 feet height. The length of the noise wall is approximately 1,024 feet. There will be a total of 20 benefited receptors adjacent to the proposed Noise Wall 5 (i.e., receptors achieving a 5 dBA reduction or greater with the proposed noise wall). The preliminary cost effectiveness of Noise Wall 5 is $19,696 per benefited receptor.

An existing 20-foot high noise wall is along the west side of I-35W, north of West 106th Street. This existing noise wall will not be affected by the proposed project and will remain in-place.

What is the likelihood that noise mitigation will be implemented?

The traffic noise analysis for the proposed noise wall described in Appendix H is based upon preliminary design studies completed at the time the noise analysis was performed. Final noise mitigation decisions will be subject to final design considerations and the viewpoint of benefited residents and property owners. Final noise mitigation decisions will be identified in MnDOT's Findings of Fact and Conclusion (FOF&C) document, to be prepared and released following the EA public comment period.

If conditions substantially change by the time the project reaches the final design stage, noise abatement measures may not be provided. If the final plan changes substantially, receptors that would have received benefits from noise walls, along with local officials, will be notified of plans to eliminate or substantially modify a noise abatement measure prior to the final design process. This notification will explain any changes in site conditions, additional site information, any design changes implemented during the final design process, and noise wall feasibility and reasonableness. When the project's final design and public involvement process have been completed, MnDOT can make the final decision regarding noise wall installation.

5.18 EAW Item 18: Transportation

5.18.1 Traffic-Related Aspects of Project Construction and Operation

Item 18.a. Describe traffic-related aspects of project construction and operation. Include: 1) existing and proposed additional parking spaces, 2) estimated total average daily traffic generated, 3) estimated maximum peak hour traffic generated and time of occurrence, 4) indicate source of trip generation rates used in the estimates, and 5) availability of transit and/or other alternative transportation modes.

1) Existing and proposed additional parking spaces.

Not applicable. The project will not add parking spaces.

2) Estimated total average daily traffic generated.

Not applicable. The proposed project will not generate new trips in the same way as a new residential or commercial development because the freeway is not a destination or end-point like a neighborhood or business.

3) Estimated maximum peak hour traffic generated and time of occurrence.

Not applicable. See response above.

4) Indicate source of trip generation rates used in the estimates.

Future (year 2040) travel demand was evaluated for the project using the Twin Cities Regional Travel Demand Model.

5) Availability of transit and/or other alternative transportation modes.

Transit opportunities are available on the project segment of I-35W. Four express bus service routes operated by Minnesota Valley Transit Authority and one operated by Metro Transit currently use the I-35W project corridor. Express bus routes connect commuters in communities south of the Minnesota River to destinations in downtown Minneapolis.

Additionally, the METRO Orange Line BRT is planned to extend along I-35W between Burnsville and downtown Minneapolis. The Orange Line BRT is planned to provide all-day, frequent bus service seven days a week. The METRO Orange Line BRT Project is expected to be complete and open to service in 2019.

Two Metro Transit routes currently use West 106th Street in Bloomington. Route 554 is an express bus route that begins on West 106th Street and follows Lyndale Avenue South and Nicollet Avenue South to downtown Minneapolis. Route 18 is a local bus route that begins on West 106th Street and follows Lyndale Avenue South and Nicollet Avenue South to downtown Minneapolis.

Several trails are also located within the project area, including: City of Burnsville trail along east side of I-35W, Big Rivers Regional, and trails located in the Minnesota Valley National Wildlife Refuge along the north side of the Minnesota River. Sidewalks are located along the north and south sides of West 106th Street under I-35W.

5.18.2 Effect on Traffic Congestion

Item 18.b. Discuss the effect on traffic congestion on affected roads and describe any traffic improvements necessary. The analysis must discuss the project's impact on the regional transportation system. *If the peak hour traffic generated exceeds 250 vehicles or the total daily trips exceeds 2,500, a traffic impact study must be prepared as part of the EAW.* Use the format and procedures described in the Minnesota Department of Transportation's Access Management Manual, Chapter 5 *(available at: http://www.dot.state.mn.us/accessmanagement/resources.html)* or a similar local guidance.

This project is a transportation improvement project that has a purpose to provide a structurally sound bridge over the Minnesota River, provide a structurally sound bridge over West 106th Street, and improve safety and mobility on I-35W between the Cliff Road in Burnsville and West 106th Street in Bloomington. The following discussion demonstrates how mobility would improve in comparison to having no improvement in the corridor.

Will traffic volumes increase on I-35W with the proposed project?

Year 2040 traffic volumes on the I-35W Minnesota River Bridge are projected to be approximately 138,100 vehicles per day. Future (2040) traffic volumes on the I-35W Minnesota River Bridge are projected to increase by approximately 1,400 vehicles per day with the proposed project compared to the 2040 No Build Alternative.

Traffic is expected to shift to the I-35W Minnesota River Bridge from the parallel TH 77 and TH 169 river crossings by the amount of 600 and 300 vehicles per day, respectively. These values are equivalent to approximately 50 and 25 vehicles per peak hour resulting in negligible

impacts to operations on these bridges. These changes (both increases and decreases) at other roadways are negligible particularly at peak hour level.

How was traffic analyzed for the project?

A traffic operations analysis was completed as part of the I-35W Minnesota River Bridge Project using CORSIM traffic modeling software. As previously discussed in Section 3.2.1, the CORSIM modeling results are measured in terms of Level of Service (LOS), a grading system of A through F for congestion on the freeway in which LOS A represents free flowing traffic conditions and LOS E and F indicates that the freeway is approaching or exceeding capacity.

Will the proposed project improve travel in the corridor?

Traffic Operations Analysis (LOS Results)

The traffic modeling analysis compared traffic operations for the future (year 2040) conditions during the morning and afternoon peak hours for the Preferred Alternative. The future (year 2040) model incorporated programmed highway improvements and forecast year 2040 traffic volumes. Table 5.15 tabulates the results of the CORSIM traffic operations analysis for the future (year 2040) Preferred Alternative. For comparison purposes, Table 5.15 includes the traffic operations analysis results for the 2040 No Build Alternative to illustrate that the Preferred Alternative improves traffic operations within the I-35W project corridor.

The traffic operations analysis demonstrates that the Preferred Alternative, which includes the northbound lane extension from the Cliff Road entrance ramp to the existing truck climbing lane south of West 106th Street, results in improved traffic operations at the Cliff Road interchange. As presented in the above tables, I-35W traffic operations improve from LOS F to LOS D between TH 13 and Cliff, and from LOS F to LOS E between Cliff Road and Black Dog Road.

The segment of southbound I-35W from West 106th Street to West 98th Street is projected to operate at an LOS F under the 2040 No Build Alternative and 2040 Preferred Alternative. Poor operations on this segment of southbound I-35W are caused by merging traffic at the West 106th Street and West 98th Street interchanges.

Table 5.15 2040 No Build Alternative and Preferred Alternative Level of Service Results (A.M. and P.M. Peak Hours)

From	To	No Build Alternative A.M. Peak Hour NB I-35W	No Build Alternative A.M. Peak Hour SB I-35W	No Build Alternative P.M. Peak Hour NB I-35W	No Build Alternative P.M. Peak Hour SB I-35W	Preferred Alternative A.M. Peak Hour NB I-35W	Preferred Alternative A.M. Peak Hour SB I-35W	Preferred Alternative P.M. Peak Hour NB I-35W	Preferred Alternative P.M. Peak Hour SB I-35W
CSAH 42	Burnsville Parkway	F	B	B	C	B	B	B	C
Burnsville Parkway	TH 13	F	A	B	C	C	A	B	C
TH 13	Cliff Road	F	A	B	B	D	A	B	B
Cliff Road	Black Dog Road	F	B	D	C	E	B	B	C
Black Dog Road	West 106th Street	D	B	C	D	F	B	B	D
West 106th Street	West 98th Street	C	B	B	F	F	B	C	F
West 98th Street	West 94th Street	C	B	B	D	C	B	B	D

Level of service analysis results for I-35W general purpose lanes only. Does not include the MnPASS lanes.

The extension of the northbound truck climbing lane alleviates congestion at the northbound Cliff Road on-ramp during the morning peak hour. However, the improved operations south of Cliff Road would result in added throughput which would shift the existing bottleneck at Cliff Road further north to West 106th Street and West 98th Street at the truck climbing lane termini. Poor operations at West 106th Street and West 98th Street are a result of the termination of the northbound truck climbing lane and merging issues.

Travel times are expected to improve during the morning peak hour. Table 5.16 compares the peak hour corridor travel times for the 2040 Preferred Alternative and the 2040 No Build Alternative.

Table 5.16 2040 Peak Hour Travel Times

Scenario	A.M. Peak Hour (Northbound)	P.M. Peak Hour (Southbound)
2040 No Build Alternative	21.4 Minutes	10.7 Minutes
2040 Preferred Alternative	13.4 Minutes	10.7 Minutes

How will the proposed project affect transit?

Four express bus routes operated by Minnesota Valley Transit Authority and Metro Transit currently use the MnPASS express lanes within the I-35W project corridor. The Orange Line BRT is anticipated to begin operations in 2019. During construction, five lanes of traffic will be maintained including a reversible MnPASS lane that will operate for northbound I-35W during the morning peak period and for southbound I-35W during the afternoon peak period. While the MnPASS lane will provide a travel time advantage during construction, transit vehicles may experience some construction-related delays, particularly for vehicles traveling in the non-peak direction.

There would be times during bridge construction when West 106th Street would be closed to through traffic in the I-35W/West 106th Street interchange area. Metro Transit Route 18 and Route 554 would be affected by these closures. Detour routes will be identified in final design as part of the TMP. MnDOT will coordinate these closures with Metro Transit. Public information regarding any changes to routes and schedules will be provided during the construction period.

Following construction, the proposed improvements are anticipated to improve traffic operations and travel times for the northbound I-35W corridor. Transit vehicles will benefit from these improvements in operations and travel times.

5.18.3 Measures to Minimize or Mitigate Project-Related Transportation Effects

Item 18.c. Identify measures that will be taken to minimize or mitigate project related transportation effects.

Not applicable.

5.19 EAW Item 19: Cumulative Potential Effects

(Preparers can leave this item blank if cumulative potential effects are addressed under the applicable EAW Items.)

5.19.1 Geographic Scales and Timeframes of Project Related Environmental Effects

Item 19.a. Describe the geographic scales and timeframes of the project related environmental effects that could combine with other environmental effects resulting in cumulative potential effects.

The geographic scale considered for the cumulative effects analysis is the roadway corridor and development areas adjacent to the I-35W Bridge corridor from the I-35W/Cliff Road Interchange in the City of Burnsville to the I-35W/West 106th Street Interchange in the City of Bloomington. The analysis considered other projects under construction or planned to occur between now and 2030, which is consistent with the planning horizon documented in the City of Burnsville and City of Bloomington future land use plans.[18]

5.19.2 Reasonably Foreseeable Future Projects

Item 19.b. Describe any reasonably foreseeable future projects (for which a basis of expectation has been laid) that may interact with environmental effects of the proposed project within the geographic scales and timeframes identified above.

[18] The City of Burnsville and the City of Bloomington are in the process of updating their comprehensive plans into the year 2040 at the time the I-35W Minnesota River Bridge Environmental Assessment was prepared.

Cumulative potential effects are not causally linked to the proposed project; rather they are the total effect of all known actions (past, present, and future) in the vicinity of the proposed project, with impacts on the same types of resources. The purpose of the cumulative potential effects analysis is to look for impacts that may be individually minimal, but which could accumulate and become significant and adverse when combined with the effects of other actions.

Recent (in the last several years) and planned projects within the project area are listed below. Projects that were considered are consistent with guidance provided by the Minnesota Environmental Quality Board (EQB), which establishes that a project be considered if it is actually planned or if a basis of expectation has been laid (i.e., reasonably likely to occur and sufficiently detailed information is available about the project to contribute to the understanding of cumulative potential effects).

Past Actions

Past actions in the project area include decades of predominantly industrial and commercial development. Natural areas near the Minnesota River have been historically preserved as conservation and park land. A residential neighborhood has existed south of West 106th Street and west of I-35W in the City of Bloomington for many years. Construction of the Big Rivers Regional Trail between TH 77 (Cedar Avenue) and I-35W along Black Dog Road and the Minnesota River was completed in 2016.

Future Actions Anticipated

The projects listed below were considered as future actions in this analysis in accordance with the recent Minnesota State Supreme Court Ruling regarding potential cumulative effects. The projects: 1) are either existing, actually planned for, or for which a basis of expectation has been laid; 2) are in the surrounding area; and 3) might reasonably be expected to affect the same natural resources.

- Orange Line Bus Rapid Transit (BRT): The Orange Line BRT project is included in the 2018 – 2021 State Transportation Improvement Program (STIP) (September 2017, pending FHWA/FTA approval). This project includes a 17-miles BRT line between the cities of Minneapolis and Burnsville along the I-35W corridor. The Orange Line BRT will utilize the existing MnPASS lanes along I-35W. It is anticipated that construction of the project would begin in 2017. The Orange Line BRT is anticipated to be in operation in 2019.

- Minnesota Valley State Trail: The Minnesota Valley State Trail project is included in the 2018 – 2021 STIP and the City of Bloomington Combined Five-Year Capital Improvement Plan 2017-2021. The proposed project would extend the existing, paved trail approximately 12.5 miles from the US 169 Minnesota River Bridge (Bloomington Ferry Bridge) to the Minnesota Valley Wildlife Refuge Visitors' Center near I-494.
- West 106th Street: The City of Bloomington initiated a study in 2017 to plan for future improvements along West 106th Street around the I-35W/West 106th Street interchange. The goal of the study is to identify a recommended alternative that improves safety and traffic operations around the I-35W/West 106th Street interchange. West 106th Street is included in the City of Bloomington Combined Five-Year Capital Improvement Plan 2017-2021 as a future project (2022 and beyond).
- East Bloomington Freeway Sidewalk: The East Bloomington Freeway Sidewalk project is included in the 2018-2021 STIP and the City of Bloomington Combined Five-Year Capital Improvement Plan 2017-2021. The proposed project would construct a sidewalk along the east side of I-35W from West 106th Street to West 99th Street, as well as provide pedestrian improvements along West 106th Street.

5.19.3 Nature of Cumulative Potential Effects

Item 19.c. Discuss the nature of the cumulative potential effects and summarize any other available information relevant to determining whether there is potential for significant environmental effects due to these cumulative effects.

Potential impacts that were considered as part of the cumulative potential effects evaluation includes wetlands, water quality, traffic noise, and floodplains.

Water Quality

Additional impervious surface area resulting from the bridge replacement project would increase the rate, volume and quality of stormwater runoff from the roadway. Best management practices (BMPs) are proposed in conjunction with the bridge replacement project to manage stormwater runoff quantity and quality.

Other recent and planned projects will likely result in water quality impacts and will need to incorporate stormwater BMPs in accordance with regulatory requirements. Therefore, adverse cumulative impacts to water quality are not expected.

Wetlands and Other Aquatic Resources

The proposed I-35W Minnesota River Bridge Replacement Project is anticipated to result in 0.61 acres of permanent aquatic resource impacts, including 0.3 acres of wetland impacts and 0.31 acres of impacts to other aquatic resources.

The recent and planned projects described above may also result in wetland fill impacts. Wetlands are protected by federal (Section 404 of the Clean Water Act) and state (Wetland Conservation Act) laws that mandate the "no net loss" of wetlands. Local watershed districts also have regulations pertaining to wetlands. Wetland impacts that cannot be avoided must be minimized and mitigated. Therefore, adverse cumulative impacts to wetlands are not anticipated.

Traffic Noise

The proposed project would result in increases in traffic noise levels along the I-35W corridor. The noise analysis included forecasted (year 2040) traffic volumes that assume future foreseeable development; therefore, the project analysis already considers cumulative impacts associated with traffic noise.

Floodplains

Approximately 33,000 cubic yards of fill (approximately 29,200 cubic yards south of the Minnesota River and approximately 3,700 cubic yards north of the Minnesota River) would be placed within the floodplain with the project. The project includes retaining walls along the east and west sides of I-35W to minimize the amount of floodplain fill. A "No-Rise Certificate" was issued by MnDOT's hydraulic engineer on February 9, 2016 (see the Hydraulic Analysis Memorandum in Appendix I).

Based on the location and nature of the recent and planned projects described above, these actions would likely result in minimal to no floodplain impacts. The City of Bloomington and the City of Burnsville both have zoning requirements regulating development within floodplains. Federally-funded projects must address floodplain impacts as part of the environmental review process. Therefore, cumulative impacts to floodplains are not anticipated.

5.20 EAW Item 20: Other Potential Environmental Effects

If the project may cause any additional environmental effects not addressed by items 1 to 19, describe the effects here, discuss the how the environment will be affected, and identify measures that will be taken to minimize and mitigate these effects.

Chapter 6 discusses additional federal issues. Appendix L includes a list of mitigation commitments for the project.

RGU CERTIFICATION. *(The Environmental Quality Board will only accept* ***SIGNED*** *Environmental Assessment Worksheets for public notice in the EQB Monitor.)*

I hereby certify that:

- The information contained in this document is accurate and complete to the best of my knowledge.
- The EAW describes the complete project; there are no other projects, stages or components other than those described in this document, which are related to the project as connected actions or phased actions, as defined at Minnesota Rules, parts 4410.0200, subparts 9c and 60, respectively.
- Copies of this EAW are being sent to the entire EQB distribution list.

Signature _____ Date 12/4/2017

Title Chief Environmental Officer

Chapter 6 Additional Federal Issues

Why does this document have an Additional Federal Issues Section?

Because the Minnesota EAW does not address all of the federal issues required for completing an Environmental Assessment under the Federal Highway Administration.

FHWA Technical Advisory T 6640.8A, Guidance for Preparing Environmental and Section 4(f) Documents, effective November 27, 1987 provides guidance in the format, content and processing of NEPA and Section 4(f) studies and documents. It includes the following impact categories not addressed in the EAW:

- Social Impacts
- Relocation and Right of Way
- Environmental Justice
- Considerations Related to Pedestrians and Bicyclists
- Section 7 – Endangered Species Act
- Section 4(f) – Parks, Recreation Areas, Wildlife and Waterfowl Refuges and Historic Sites
- Section 106 – Historic and Archaeological Resources
- Air Quality Analysis
- Construction Impacts
- Cumulative Impacts
- Economics
- Farmland Protection Policy Act
- Floodplain Impacts
- Indirect Effects
- Section 404 – Clean Water Act
- Section 6(f) – Land and Water Conservation Act
- Traffic Noise
- Transit

6.1 Social Impacts

The following social impacts were evaluated for the I-35W Minnesota River Bridge Project:

- Travel Patterns and Access
- Accessibility
- Community Facilities and Public Services
- Community and Neighborhood Cohesiveness
- Transportation Sensitive Communities

6.1.1 Travel Patterns and Access

Existing interchange access at Cliff Road, Black Dog Road, and West 106th Street would not change with the proposed project. Temporary interchange ramp closures at the Black Dog Road interchange would be necessary during project construction. Temporary closures also would be necessary along West 106th Street during project construction. The timing and duration of any local street and ramp closures will be determined as part of the project's TMP.

The City of Burnsville's redevelopment plans for the lands south of the Minnesota River include a new interchange access at 118th Street between Black Dog Road and Cliff Road (see Chapter 3, "Additional Considerations"). The proposed project would not preclude a new interchange to I-35W at this location.

Year 2040 traffic volumes on the I-35W Minnesota River Bridge are expected to increase by approximately 1,400 vehicles per day compared to the No Build Alternative. Traffic is expected to shift to the I-35W Minnesota River Bridge from the parallel Cedar Avenue (TH 77) and Bloomington Ferry (TH 169) Minnesota River crossings by approximately 600 and 300 vehicles per day, respectively. This is equivalent to approximately 50 vehicles and 25 vehicles during the morning peak hour, resulting in negligible impacts to operations on the Cedar Avenue and Bloomington Ferry bridges.

6.1.2 Accessibility

Multi-modal trail facilities proposed as part of the I-35W Bridge Project would be located within public right of way. Design and construction of all trail facilities associated with the project will comply with the provisions established by the Americans with Disabilities Act (ADA) of 1990.

6.1.3 Community Facilities and Public Services

Community facilities (schools and churches) within a half-mile radius of the project area are listed below. These community facilities would not be impacted by the proposed project.

- Oak Grove Elementary (1301 West 104th Street, Bloomington)
- Oak Grove Middle School (1300 West 106th Street, Bloomington)
- Burnsville-Eagan-Savage School (100 River Ridge Court, Burnsville)
- Sovereign Grace Church (1300 West 106th Street, Bloomington)

6.1.4 Community and Neighborhood Cohesiveness

The project would not displace any residents or businesses, change any access to I-35W or local roadways, or result in any permanent roadway closures. The project includes the reconstruction of an existing roadway and bridges and would not create a new barrier to community or neighborhood cohesiveness. The proposed trail along the east side of the I-35W Minnesota River Bridge and multi-modal trail connections north and south of the bridge would benefit adjacent communities by improving connectivity for non-motorized travel. The proposed reconstruction of the I-35W bridges over West 106th Street would provide adequate space for future pedestrian/bicycle trails along West 106th Street, improving non-motorized connectivity across I-35W.

6.1.5 Transportation Sensitive Communities

Transportation sensitive communities that depend on public transportation, such as non-drivers, transit dependent, the elderly and handicapped, would benefit from the proposed project. The proposed project is anticipated to improve traffic operations and travel times for northbound I-35W. Therefore, express buses operated by Minnesota Valley Transit Authority and Metro Transit, which utilize the MnPASS lane, would experience more reliable travel times. Additionally, the proposed project would fill a gap in the pedestrian and bicycle trail network by providing a trail crossing over the Minnesota River between the Cities of Bloomington and Burnsville.

6.2 Relocation and Right of Way

6.2.1 What are relocation and right of way impacts?

Property owned by MnDOT is called right of way. Many of MnDOT's highway projects require purchasing land that is not owned by the agency. If a property has people living on the needed right of way, or has businesses

occupying the needed right of way, then relocation of these people and/or businesses is necessary. The purchase of property and relocation of people and businesses are the two items evaluated and reported on in this section.

6.2.2 What are the impacts of the project?

The project would not displace any residents or businesses. The project would not require any right of way acquisition. Stormwater ponds are proposed on two parcels outside of existing right of way limits along the east side of I-35W between the Minnesota River and West 106th Street. A multi-modal trail will also be constructed on these parcels between Lyndale Avenue South and the I-35W right of way. These parcels are owned by the City of Bloomington. The City of Bloomington will deed these parcels to the State of Minnesota. MnDOT will then deed the parcels for highway right of way purposes. MnDOT will also secure an agreement with City of Bloomington for operations and maintenance of the ponds and trail following project construction.

Acquisitions will be conducted in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended.

6.3 Environmental Justice

6.3.1 Why do we consider environmental justice as we plan this project?

How are disproportionately high and adverse effects determined?

An adverse effect that:

a) Is predominantly borne by a minority and/or a low-income population; or
b) Will be suffered by the minority population and/or low-income population and is considerably more severe or greater in magnitude than the adverse effect that will be suffered by the non-minority population and/or non-low-income population.

In 1994, the President of the United States signed Executive Order 12898 requiring federal agencies to identify and avoid "disproportionately high and adverse" effects on minority and/or low-income populations for federal programs that affect human health or the environment. Incorporating environmental justice principles throughout the transportation planning and decision-making processes supports the principles of the NEPA.

6.3.2 How were study area demographics collected?

Race and ethnicity data for the study area was obtained from U.S. Census Bureau's 2010 decennial Census statistics. Income data was obtained from 2011-2015 American Community Survey (ACS) and 2010-2014 ACS five-year summary data. City of Burnsville and City of Bloomington planning staff were also contacted to inquire about the presence of minority and low-income populations near the study area. Figure F.11, Appendix F depicts the boundaries of the census tracts, block groups, and blocks within the study area.

Race and ethnicity data was evaluated at the Census block level for Census blocks adjacent to the I-35W corridor between Cliff Road and West 106th Street (i.e., within approximately 500 feet of the I-35W right of way limits). Thirty (30) Census blocks were included in the analysis. Income data was evaluated at the block group level. Five block groups are located within the study area.

6.3.3 Does the study area include minority and low-income populations?

Minority and low-income populations were identified along I-35W, north of the I-35W/West 106th Street interchange. The locations of minority and low-income populations were identified based on a review of study area demographics as described below.

A minority is defined as: Black or African American, Hispanic, Asian American, American Indian/ Alaskan Native, and Native Hawaiian or Pacific Islander.

Minority Populations

The term "minority" is defined using race and ethnicity definitions from the 2010 U.S. Census. Minority populations are identified by comparing the minority population at the block-level to the minority populations of the county and city. Census blocks are the smallest geographic unit for which race and ethnicity data is available.

City of Burnsville and Dakota County

The minority population was approximately 23 percent of the total population within the City of Burnsville, and approximately 15 percent of the total population within Dakota County. Table 6.1 tabulates U.S. Census 2010 data on race and ethnicity in the City of Burnsville and Dakota County. Sixteen (16) Census blocks are located within the Dakota County portion of the study area (see Figure F.11, Appendix F). For these Census blocks, no population is present. This is because land uses within these Census blocks consist of industrial, commercial and conservation land.

Businesses at the south end of the study area at Cliff Road include an asphalt plant and gravel mining operation, a golf driving range, a self-storage company, car dealerships, and a retail commercial business. City of Burnsville Planning Division provided information regarding businesses near the study area that may employ or are utilized primarily by a minority population. Planning staff are not aware of any specific businesses near the study area that employs or serves a minority population.

City of Bloomington and Hennepin County

The minority population was approximately 20 percent of the total population in the City of Bloomington, and approximately 26 percent of the

total population in Hennepin County. Table 6.1 tabulates U.S. Census 2010 data on race and ethnicity within Hennepin County and the City of Bloomington. The portion of the project located in Hennepin County contains17 Census blocks within three block groups. Most of these Census blocks include a percent minority population that is less than or similar to percentages for Bloomington and Hennepin County. One Census block in the northeast quadrant of the I-35W/West 106th Street interchange includes 60 percent minority population (Census Tract 253.01, Block Group 3, Block 3008). Three Census blocks in the northwest quadrant of the I-35W/West 106th Street interchange contains a 23 percent to 39 percent minority population (Census Tract 258.01; Block Group 3; Block 3000, Block 3001, and Block 3002).

What is considered low-income?

The federal government defines low-income as a person whose median household income is at or below the Department of Health and Human Services (HHS) poverty guidelines.

How is poverty level defined?

Following the Office of Management and Budget's Directive 14, the Census Bureau uses a set of money income thresholds that vary by family size and composition to detect who is poor. If the total income for a family or unrelated individual falls below the relevant poverty threshold, then the family or unrelated individual is classified as being "below the poverty level."

The 2017 HHS poverty guideline for a family of four is $24,600.

Businesses at the north end of the study area near West 106th Street include a bicycle shop, a staffing company, office building, engineering firm, and an event management business. Staff at the City of Bloomington Planning Division was contacted to inquire whether the City was aware of any businesses near the study area that employ or cater to minority populations. The City was not aware of any businesses near the I-35W/West 106th Street interchange that employs or serves a minority population.

Low-Income Populations

Low-income populations were identified based on poverty status and per capita income from the 2011-2015 ACS and 2010-2014 ACS at the block group level. Table 6.2 and Table 6.3 tabulate the ACS data on poverty and income for the study area. FHWA defines a "low-income" individual as a person whose median household income is at or below the Department of Health and Human Services (HHS) poverty guidelines.[19]

City of Burnsville and Dakota County

The percent of households below poverty thresholds in Dakota County and the City of Burnsville is approximately 7.2 percent and 9.3 percent, respectively. Two block groups were included in the analysis for the portion of the project in Dakota County: Census Tract 607.10, Block Group 2 (west side of I-35W between the

[19] US Department of Transportation. Federal Highway Administration. April 2015. Environmental Justice Reference Guide. FHWA-HEP-15035.

Minnesota River and Burnsville Parkway); and Census Tract 607.48, Block Group 1 (east side of I-35W between the Minnesota River and TH 13) (see Figure F.11, Appendix F).

The percent of households below poverty within Census Tract 607.48, Block Group 1 is approximately 3.5 percent, less than the percent of households below poverty for Burnsville and Dakota County. The percent of households below poverty within Census Tract 607.10, Block Group 2 is approximately 18.3 percent, greater than the percentages for Burnsville and Dakota County. Census Tract 607.10, Block Group 2 covers more than 2,300 acres west of I-35W and south of the Minnesota River. The southernmost limit of Census Tract 607.10, Block Group 2 extends south of TH 13 to Burnsville Parkway. Land uses in Census Tract 601.10, Block Group 2 adjacent to the study area include the Freeway Landfill, Kraemer Quarry, and industrial land uses in the northwest quadrant of the I-35W/Cliff Road interchange. There are no residential populations within the portion of Census Tract 607.10, Block Group 2 adjacent to the study area. Residential populations in Census Tract 607.10, Block Group 2 that would potentially include a low-income population are located south of TH 13, beyond the limits of the project.

City of Burnsville Planning Division provided information regarding businesses near the study area that may employ or are utilized primarily by low-income populations. Planning staff were not aware of any specific business near the study area that employs or serves a low-income population.

City of Bloomington and Hennepin County

The percent of households below poverty thresholds in Hennepin County and the City of Bloomington is approximately 11.8 percent and 8.0 percent, respectively. Three block groups are located within the portion of the study area within Hennepin County. Within these block groups the percent of households below poverty thresholds ranged from approximately 0 percent to 8.4 percent. City of Bloomington staff also provided information on low-income housing and employers. City staff are not aware of any low-income populations within the study area. U.S. Census data and information from City staff indicates that there are no low-income populations within this portion of the study area.

Table 6.1 2010 U.S. Census Population and Race

Census Tract #	Census Block Group #	Census Block #	Location	Total Pop.	White	Black or African American	American Indian and Alaska Native	Asian	Native Hawaiian and other Pacific Islander	Other	Two or More Races	Hispanic	Minority as a % of Total Pop.
N/A	N/A	N/A	Dakota Co.	398,552	339,499	18,709	1,647	17,451	216	9,556	11,474	23,966	15%
N/A	N/A	N/A	Hennepin Co.	1,152,425	856,834	136,262	10,591	71,905	506	38,878	37,449	77,676	26%
N/A	N/A	N/A	Burnsville	60,306	46,731	6,046	215	3,043	52	2,085	2,134	4,756	23%
N/A	N/A	N/A	Bloomington	82,893	66,087	5,957	329	4,860	44	3,027	2,589	5,623	20%
607.10	2	N/A	Dakota Co.	2,553	1,741	293	24	169	2	189	135	661	32%
607.48	1	N/A	Dakota Co.	2,823	2,161	414	7	165	8	15	53	74	23%
607.10	2	2000	Dakota Co.	0	0	0	0	0	0	0	0	0	0%
607.10	2	2001	Dakota Co.	0	0	0	0	0	0	0	0	0	0%
607.10	2	2010	Dakota Co.	0	0	0	0	0	0	0	0	0	0%
607.48	1	1004	Dakota Co.	0	0	0	0	0	0	0	0	0	0%
607.48	1	1006	Dakota Co.	0	0	0	0	0	0	0	0	0	0%
607.48	1	1010	Dakota Co.	0	0	0	0	0	0	0	0	0	0%
607.48	1	1021	Dakota Co.	0	0	0	0	0	0	0	0	0	0%
607.48	1	1022	Dakota Co.	0	0	0	0	0	0	0	0	0	0%
607.48	1	1023	Dakota Co.	0	0	0	0	0	0	0	0	0	0%
607.48	1	1024	Dakota Co.	0	0	0	0	0	0	0	0	0	0%
607.48	1	1025	Dakota Co.	0	0	0	0	0	0	0	0	0	0%
607.48	1	1026	Dakota Co.	0	0	0	0	0	0	0	0	0	0%
607.48	1	1027	Dakota Co.	0	0	0	0	0	0	0	0	0	0%
607.48	1	1028	Dakota Co.	0	0	0	0	0	0	0	0	0	0%
607.48	1	1033	Dakota Co.	0	0	0	0	0	0	0	0	0	0%
607.48	1	1034	Dakota Co.	0	0	0	0	0	0	0	0	0	0%
253.01	3	N/A	Hennepin Co.	871	766	17	2	54	0	6	26	21	12%

Census Tract #	Census Block Group #	Census Block #	Location	Total Pop.	White	Black or African American	American Indian and Alaska Native	Asian	Native Hawaiian and other Pacific Islander	Other	Two or More Races	Hispanic	Minority as a % of Total Pop.
253.02	3	N/A	Hennepin Co.	1,577	938	309	18	199	0	49	64	92	41%
258.01	3	N/A	Hennepin Co.	849	760	31	3	22	0	7	26	19	10%
258.05	1	N/A	Hennepin Co.	1,082	999	18	5	21	0	3	36	28	3%
253.01	3	3008	Hennepin Co.	22	22	0	0	0	0	0	0	6	0%
253.01	3	3010	Hennepin Co.	0	0	0	0	0	0	0	0	0	0%
253.01	3	3011	Hennepin Co.	0	0	0	0	0	0	0	0	0	0%
253.02	3	3008	Hennepin Co.	409	165	77	8	111	0	27	21	43	60%
258.01	3	3000	Hennepin Co.	67	47	8	0	9	0	1	2	2	30%
258.01	3	3001	Hennepin Co.	66	40	15	0	0	0	5	6	10	39%
258.01	3	3002	Hennepin Co.	39	30	1	0	0	0	1	7	2	23%
258.01	3	3005	Hennepin Co.	48	46	0	0	2	0	0	0	0	4%
258.01	3	3006	Hennepin Co.	246	231	5	1	2	0	0	7	1	6%
258.01	3	3008	Hennepin Co.	85	81	0	2	2	0	0	0	2	5%
258.01	3	3009	Hennepin Co.	55	55	0	0	0	0	0	0	1	0%
258.01	3	3012	Hennepin Co.	46	46	0	0	0	0	0	0	1	0%
258.01	3	3013	Hennepin Co.	0	0	0	0	0	0	0	0	0	0%
258.01	3	3014	Hennepin Co.	0	0	0	0	0	0	0	0	0	0%
258.01	3	3015	Hennepin Co.	0	0	0	0	0	0	0	0	0	0%
258.05	1	1000	Hennepin Co.	271	259	0	1	6	0	0	5	11	4%
258.05	1	1003	Hennepin Co.	0	0	0	0	0	0	0	0	0	0%

Source: U.S. Census Bureau, 2010 Census, Summary File 1 (SF1), 100% Data, ID P1, P3, P8 and P9.

(1) Hispanic Origin is also counted under the white or other categories; therefore, population totals and percentages will add up to more than 100 percent.

Table 6.2 2011-2015 American Community Survey Income and Poverty (County and City)

	Dakota County	MOE (% of Est.)	Hennepin County	MOE (% of Est.)	Burnsville	MOE (% of Est.)	Bloomington	MOE (% of Est.)
Population	408,456	N/A	1,197,776	N/A	61,059	0.1%	85,136	0.1%
Number of Households	156,466	0.4%	490,196	0.3%	24,445	1.6%	36,608	1.3%
Number of Family Households	108,777	1.0%	283,946	0.7%	15,444	2.7%	21,856	2.1%
Percent of households below poverty (income in 2015 below poverty level)	7.1%	0.5%	11.5%	0.3%	9.3%	1.0%	8.0%	0.9%
Percent of family households below poverty (income in 2015 below poverty level)	5.1%	0.5%	8.1%	0.3%	7.9%	1.1%	5.2%	0.8%
Median household income (in 2015 dollars)	$75,567	1.1%	$65,834	0.9%	$63,997	3.7%	$63,053	2.8%
Median family income (in 2015 dollars)	$91,222	1.3%	$87,230	1.1%	$76,353	2.9%	$81,037	3.3%
Per capita income (in 2015 dollars)	$36,171	1.1%	$38,724	0.8%	$31,911	3.1%	$36,430	3.1%

Source: U.S. Census Bureau, 2011-2015 American Community Survey (Tables S1702, B01003, B11001, B17017, B19013, B19113, B19301) for Dakota County and Hennepin County. 2011-2015 American Community Survey data not available at the City level as of August 2017. 2010-2014 American Community Survey (Tables S1702, B01003, B11001, B17017, B19013, B19113, B19301) for City of Burnsville and City of Bloomington.

MOE: margin of error

Table 6.3 2010-2014 American Community Survey Income and Poverty (Census Tract and Block Group)

	Census Tract 253.01 Block Group 3	MOE (% of Est.)	Census Tract 253.02 Block Group 3	MOE (% of Est.)	Census Tract 258.01 Block Group 3	MOE (% of Est.)	Census Tract 258.05 Block Group 1	MOE (% of Est.)
Population	783	29.1%	1,549	18.5%	756	20.0%	1,249	19.3%
Number of Households	304	22.4%	776	13.4%	334	17.1%	380	15.5%
Number of Family Households	202	30.7%	404	26.0%	203	25.6%	274	21.9%
Percent of households below poverty (income in 2014 below poverty level)	0%	3.0%	21.1%	9.8%	2.4%	4.2%	8.4%	11.1%
Percent of family households below poverty (income in 2014 below poverty level)	0%	4.5%	28.0%	15.8%	3.9%	6.9%	0%	3.3%
Median household income (in 2014 dollars)	$85,833	37.1%	$31,189	11.9%	$102,813	26.8%	$107,000	29.4%
Median family income (in 2014 dollars)	$101,042	11.8%	$31,538	77.0%	$116,528	40.1%	$115,833	17.8%
Per capita income (in 2014 dollars)	$46,432	34.5%	$21,348	20.2%	$57,347	20.5%	$44,484	24.9%

Source: U.S. Census Bureau, 2010-2014 American Community Survey (Tables S1702, B01003, B1101, B17017, B19013, B19113, B19301). 2011-2015 American Community Survey data was not available at the Block Group level as of August 2017.

MOE: margin of error

Table 6.3 2010-2014 American Community Survey Income and Poverty (Census Tract and Block Group)

	Census Tract 607.10 Block Group 2	MOE (% of Est.)	Census Tract 607.48 Block Group 1	MOE (% of Est.)
Population	2,077	17.1%	2,674	7.9%
Number of Households	864	11.7%	1,008	6.9%
Number of Family Households	500	23.2%	756	12.6%
Percent of households below poverty (income in 2013 below poverty level)	18.3%	8.2%	3.5%	3.4%
Percent of family households below poverty (income in 2014 below poverty level)	17.8%	12.8%	3.4%	4.1%
Median household income (in 2014 dollars)	$46,071	29.3%	$78,558	20.7%
Median family income (in 2014 dollars)	$61,429	24.4%	$79,327	20.0%
Per capita income (in 2014 dollars)	$23,515	17.4%	$40,431	15.1%

Source: U.S. Census Bureau, 2010-2014 American Community Survey (Tables S1702, B01003, B1101, B17017, B19013, B19113, B19301). 2011-2015 American Community Survey data was not available at the Block Group level as of August 2017.

MOE: margin of error

6.3.4 How Will MnDOT Gather Feedback from Minority and Low-Income Populations?

Section 7.1 describes public involvement activities. Public open house meetings were held in fall 2015 in the City of Burnsville and City of Bloomington. Residents along the corridor, including minority populations, were invited to participate in these meetings.

MnDOT will host public meetings during the EA comment period. All residents in the study area will be invited and provided an opportunity to comment on the project during this period.

A proposed noise wall is in the northeast quadrant of the I-35W/West 106th Street interchange. A neighborhood meeting will be held with adjacent residents to solicit feedback regarding the proposed noise wall. Benefited receptors behind the noise wall will be provided the opportunity to vote for or against the proposed noise wall as part of MnDOT's noise wall solicitation process.

6.3.5 What Potential Effects Were Evaluated

The potential effects of the project were considered to assess whether these effects fall disproportionately on the minority populations identified in the study area. Issues that were considered when evaluating disproportionately high and adverse effects to low-income and/or minority communities included social impacts, temporary construction impacts, noise impacts, visual impacts, air quality impacts, and right of way impacts.

Social Impacts

Section 6.1 discusses the social impacts of the project. The project would not permanently change access to or across I-35W, would not affect community facilities or public services, and would not create a new barrier to community or neighborhood cohesiveness. Proposed trails would improve non-motorized connectivity. Design and construction of all trail facilities will comply with ADA requirements. Adverse social impacts are not anticipated.

Temporary Construction Impacts

Section 5.6.2 describes construction activities associated with the project, including dust, noise, vibrations, and traffic delays. Section 5.17 discusses construction noise in greater detail. Temporary construction impacts would occur throughout the study area. MnDOT will implement construction best management practices to prevent and mitigate temporary impacts. Temporary construction impacts would be experienced by all populations

adjacent to the project and would not disproportionately affect minority populations in the study area.

Reconstruction of the I-35W bridges over West 106th Street would require periodic closures of West 106th Street, including sidewalks. Closures are anticipated during bridge demolition, beam installation, and phases of deck construction. These closures are necessary for the safety of the traveling public and construction workers. Periodic closures would affect all modes that use West 106th Street, including vehicles, transit, pedestrians, and bicyclists.

MnDOT will identify detour routes for closures on West 106th Street as part of the TMP development. Alternate Pedestrian Routes (APR) through work zone areas will be provided. MnDOT will coordinate with Metro Transit to identify detour routes that maintain transit service to the study area during construction. Temporary closures on West 106th Street during bridge construction would be experienced by all populations that this roadway, and would not be predominately borne by minority populations.

Traffic Noise Impacts

Section 5.17 summarizes the anticipated traffic noise impacts of the project. The traffic noise technical memorandum (see Appendix H) provides detailed information regarding traffic noise impacts of the project. The project would result in the following impacts:

- Daytime L10 noise levels were predicted to range between 59.9 dBA and 77.7 dBA, exceeding state noise standards at 83 receptors.
- Daytime L50 noise levels were predicted to range between 57.9 dBA and 74.7 dBA, exceeding state noise standards at 101 receptors.
- Nighttime L10 values were predicted to range between 59.1 dBA and 77.4 dBA, exceeding state noise standards at 104 receptors.
- Nighttime L50 noise levels were predicted to range between 56.7 dBA and 74.0 dBA, exceeding state noise standards at 106 receptors.
- Daytime L10 noise levels were predicted to approach or exceed federal noise abatement criteria at 51 receptors.

Traffic noise impacts would occur throughout the study area and would not disproportionately affect minority or low-income populations.

Noise walls were evaluated along the project corridor for all residential areas equally, regardless of the income status, race, or ethnicity of the affected neighborhood. A total of six noise walls were analyzed and evaluated against

the feasibility and reasonableness criteria identified in the MnDOT Highway Noise Policy. One noise wall meets MnDOT's feasibility and reasonableness criteria and is proposed. One existing noise wall would not be affected by the project and will remain unchanged.

Noise walls can have positive and negative effects on adjacent residents. Positive effects include reductions in noise levels and improved views/blocking unpleasant views. Negative effects include blocking of pleasant views, microclimate effects (i.e., blocking of sunlight and wind), and graffiti.

The proposed noise wall is in the northeast quadrant of the I-35W/West 106th Street interchange, adjacent to a minority population. At the project-level, the positive and negative effects of the proposed noise wall would be predominately borne by this population because there are no other noise walls proposed with the project. However, these effects are not appreciably more severe or greater in magnitude than the positive and negative effects of noise walls experienced by non-minority or non-low-income populations. MnDOT has constructed noise walls throughout the Twin Cities Metropolitan Area. These noise walls are located adjacent to minority and low-income populations, as well as non-minority or non-low-income populations. All populations adjacent to noise walls experience their positive and negative effects.

All benefited receptors adjacent to the proposed noise wall, regardless of income, race, or ethnicity, will be provided an opportunity to vote for or against the noise wall as part of the noise wall solicitation process. The noise wall solicitation process will be completed during the EA public comment period. Final noise mitigation decisions will be identified in MnDOT's FOF&C document, to be prepared and released following the EA public comment period.

Visual Impacts

Section 5.15 describes the visual impacts of the project. The project would not alter the existing views of the Minnesota River from I-35W as the alignment of the proposed bridge is located within the existing river crossing corridor. Consequently, negative visual impacts for river crossing users are not anticipated.

The project would raise the profile of I-35W over West 106th Street by approximately three to four feet. The new I-35W bridge over West 106th Street would be a single-span structure, different from the existing three-span bridges. These changes would occur within the existing highway corridor, and would be consistent with existing views of the highway.

One noise wall is proposed in the northeast quadrant of the I-35W/West 106th Street interchange. The proposed noise wall would be located adjacent to an identified minority population. The proposed noise wall would be constructed following MnDOT's standard concrete post and wood plank design. This design can be found throughout the Twin Cities Metropolitan Area, and would not be unique to this location. The visual impact of a noise wall, either positive or negative, affects all populations adjacent to noise walls, and is not predominately borne by low-income or minority populations.

Air Quality

No air quality impacts are expected to result from the proposed project.

Right of Way

No relocations would be required for the project. The project would not require any right of way acquisition. Two parcels owned by the City of Bloomington on the east side of I-35W would be deeded to the State of Minnesota by the City. MnDOT would then deed these parcels for highway right of way purposes. This transfer would not affect minority or low-income populations.

6.3.6 Will the Project Benefit Low-Income and Minority Populations?

The project would benefit all populations that use the I-35W corridor between Cliff Road and West 106th Street by perpetuating the bridge crossing of the Minnesota River, improving safety, and alleviating traffic congestion. The project would provide a multi-modal trail connection across the Minnesota River at I-35W, which would improve connectivity for all non-motorized travelers.

The reconstruction of I-35W over West 106th Street would accommodate the City of Bloomington's plans for future improvements along West 106th Street, including pedestrian and bicycle accommodations. All populations would benefit from the future non-motorized connections planned by the City of Bloomington.

The residential neighborhood in the northeast quadrant of the I-35W/West 106th Street interchange would benefit from lower traffic noise levels behind the proposed noise wall.

6.3.7 Environmental Justice Finding

Based on the analysis presented above, the proposed project would not result in disproportionately high or adverse effects to low-income or minority populations. Therefore, in accordance with the provisions of Executive Order 12898 and FHWA Order 6640.23, no further environmental justice analysis is required.

6.4 Considerations Relating to Pedestrians and Bicyclists

A 12-foot wide pedestrian/bike trail would be constructed on the east side of the I-35W Bridge as part of this project. The Minnesota River is a barrier to north-south pedestrian and bicyclist mobility. There is no existing multi-modal trail connection across the Minnesota River between the cities of Burnsville and Bloomington. The closest multi-modal trail crossing is more than five miles away from the I-35W corridor. The proposed multi-modal trail along the east side of the I-35W Minnesota River Bridge and connections north and south of the Minnesota River would improve connectivity within the project area.

A City of Burnsville trail is located along the east side of I-35W between Cliff Road and Black Dog Road within MnDOT right of way. The existing trail would be closed during project construction and removed. The trail will be reconstructed following construction of the adjacent roadway improvements and retaining wall construction. Refer to Section 5.2.6 for a discussion of Section 4(f) involvement related to this trail.

The Big Rivers Regional Trail is located along the south side of the Minnesota River between I-35W and the Fort Snelling State Park Trail at the TH 77 (Cedar Avenue) Bridge. The western terminus of the trail is located between Black Dog Road and the Minnesota River, across from the I-35W/ Black Dog Road interchange southeast ramps. The proposed project would not impact the Big Rivers Regional Trail.

The DNR is planning an extension of the Minnesota Valley State Trail along the north side of the Minnesota River from the Bloomington Ferry Bridge to the USFWS Headquarters Building near I-494. This trail would cross through MnDOT right of way under the I-35W Minnesota River Bridge. The proposed project will not preclude the Minnesota Valley State Trail (see Project Layout Figures in Appendix A).

The City of Bloomington is planning a future sidewalk along the East Bloomington Freeway, north of West 106th Street. The City of Bloomington also has identified a need for future pedestrian/bicycle improvements along

West 106th Street through the I-35W/West 106th Street interchange. The proposed project would not preclude the City of Bloomington's planned improvements along West 106th Street.

6.5 Section 7 – Endangered Species Act

6.5.1 What is Section 7 of the Endangered Species Act?

Section 7 of Endangered Species Act of 1973, as amended, requires each federal agency to review any action that it funds, authorizes, or carries out to determine whether it may affect threatened, endangered, or proposed species or listed critical habitat. Federal agencies (or their designated representatives) must consult with the US Fish and Wildlife Service (USFWS) if any such effects may occur as a result of their actions. Consultation with the USFWS is not necessary if the proposed action will not directly or indirectly affect listed species or critical habitat. If a federal agency finds that an action will have no effect on listed species or critical habitat, it should maintain a written record of that finding that includes the supporting rationale.

6.5.2 What species are in the study area?

Table 6.4 lists the federally-listed threatened, endangered, proposed, and candidate species (revised March 21, 2017) in Dakota and Hennepin counties.

Table 6.4 Federally-Listed Threated, Endangered, Proposed, and Candidate Species in Dakota and Hennepin Counties

County	Species	Status	Habitat
Dakota and Hennepin	Northern long-eared bat (*Myotis septentrionalis*)	Threatened	Hibernates in caves and mines, swarming in surrounding wooded areas in autumn. Roosts and forages in upland forests during spring and summer.
Dakota and Hennepin	Higgens Eye pearlymussel (*Lampsilis higginsi*)	Endangered	Mississippi River

County	Species	Status	Habitat
Dakota and Hennepin	Rusty-patched bumble bee (*Bombus affinis*)	Endangered	Grasslands with flowering plants from April through October, underground and abandoned rodent cavities or clumps of grasses above ground as nesting sites, and undisturbed soil for hibernating queens to overwinter.
Dakota	Prairie bush clover (*Lespedeza leptostachya*)	Threatened	Native prairie on well drained soils
Hennepin	Snuffbox mussel (*Epioblasma triquetra*)	Endangered	Mississippi River

Source: U.S. Fish and Wildlife Service. County Distribution of Minnesota's Federally-Listed Threatened, Endangered, Proposed, and Candidate Species List. Revised March 21, 2017.

The I-35W Minnesota River Bridge was surveyed for bats by MnDOT Office of Environmental Stewardship (OES) staff in July 2016 and September 2016. Based on these surveys, MnDOT OES concluded that the I-35W Minnesota River Bride does not appear to have a large concentration of bats.

Surveys for mussels in the Minnesota River at the I-35W Minnesota River Bridge were completed in July 2017. No federally-listed mussel species were encountered. A copy of the mussel survey report is available for review from the MnDOT Project Manager (see contact information in Chapter 7).

6.5.3 Determinations Under Section 7 of the Endangered Species Act

Determinations under Section 7 of the Endangered Species Act for listed species in Dakota and Hennepin counties are summarized below. See Appendix E for correspondence from MnDOT OES.

Northern Long Eared Bat

Determination: May affect, but will not cause prohibited incidental take.

The project would include bridge work and tree removal. There are no known locations of northern long-eared bat (*Myotis septentrionalis*) maternity roost trees or hibernacula in the project area. Visual surveys of the I-35W Minnesota River Bridge did not identify any northern long-eared bats; however, a small number of bats (non-protected species) were identified roosting on the bridge superstructure and in expansion joints.

MnDOT, acting as the non-federal representative for FHWA, has determined that the proposed action may affect, but will not cause a prohibited incidental take of the northern long-eared bat (*Myotis septentrionalis*) and requested concurrence from USFWS on November 10, 2016 (see correspondence in Appendix E). A response from USFWS was not received within 30 days of this request; therefore, USFWS concurrence is implied.

Higgins Eye Pearlymussel

Determination: No effect.

No extant populations of Higgins eye pearlymussels (*Lampsilis higginsii*) are known from the Minnesota River. No federally-listed species were encountered in the 2017 mussel survey. MnDOT, acting as the non-federal representative for FHWA, has made a determination of no effect for the Higgins eye pearlymussel (*Lampsilis higginsii*).

Rusty-Patched Bumble Bee

Determination: No effect.

The project is located outside of a USFWS identified high potential area for the Rusty patched bumble bee (*Bombus affinis*). No known occurrences and/or suitable habitat exist within the project area. MnDOT, acting as the non-federal representative for FHWA, has made a determination of no effect for the Rusty patched bumble bee (*Bombus affinis*).

Prairie Bush Clover

Determination: No effect.

There are no known occurrences of prairie bush clover (*Lespedeza leptostachya*) within the project area. Suitable habitat for this species is not present within the project area. MnDOT, acting as the non-federal representative for FHWA, has made a determination of no effect for the prairie bush clover (*Lespedeza leptostachya*).

Snuffbox Mussel

Determination: No effect.

No extant populations of the snuffbox mussel (*Epioblasma triquetra*) are known from the Minnesota River. No federally-listed species were encountered in the 2017 mussel survey. MnDOT, acting as the non-federal representative for FHWA, has made a determination of no effect for the snuffbox mussel (*Epioblasma triquetra*).

6.5.4 Conservation Measures

The following conservation measures will be implemented by MnDOT (see MnDOT OES correspondence in Appendix E):

- Before construction begins (between November 1 and January 31), expansion joint gaskets on the I-35W Minnesota River Bridge will be removed or sliced to increase airflow and moisture entering the expansion joint and to reduce the likelihood bats would use the bridge during construction.
- Before construction begins, MnDOT will coordinate with the City of Bloomington or the USFWS and place a single Rocket Box Bat House adjacent to the I-35W Minnesota River Bridge.
- All tree removal will occur during the winter (November 1 to March 31, inclusive).
- Rolled erosion control products (EG erosion control blanket) will be limited to bio-netting, natural netting (category 3N or 4N) or woven type products, and specifically not allow welded plastic mesh netting.

6.6 Section 4(f) – Parks, Recreation Areas, Wildlife and Waterfowl Refuges, and Historic Sites

6.6.1 What is Section 4(f)?

Section 4(f) refers to the original section within the US Department of Transportation Act of 1966 that set the requirement for consideration of park and recreational lands, wildlife and waterfowl refuges, and historic sites in transportation project development. The law, now codified in two places (49 USC 303 and 23 USC 138), is implemented by FHWA and the Federal Transit Administration (FTA) through regulations found at 23 CFR 774.

Section 4(f) applies to all projects that receive funding from or require approval by an agency of the US Department of Transportation (US DOT), including FHWA.

6.6.2 What is a Section 4(f) "use"?

FHWA defines a Section 4(f) "use" as either a direct use or constructive use. A direct use occurs when land is permanently incorporated into a transportation facility or when there is a temporary occupancy of land that is adverse to a resource's protection under Section 4(f). Constructive use occurs when a project's proximity impacts are so severe that the protected activities,

features, or attributes that qualify a resource for protection under Section 4(f) are "substantially impaired."

Before approving a project that "uses" a Section 4(f) resource, FHWA must find that there is no prudent and feasible alternative and that the selected alternative minimizes harm to the resource. If there is a prudent and feasible alternative that completely avoids Section 4(f) resources, it must be selected. If there is no prudent and feasible alternative that avoids Section 4(f) resources, FHWA has some discretion in selecting the alternative that causes the least harm to those resources.

In addition, FHWA regulations state that when a Section 4(f) use is anticipated, applicable regulations also require consultations with the official having jurisdiction over the resource to verify the site's significance and coordinate conclusions on use of the land, including efforts to avoid or mitigate the impacts.

6.6.3 How were Section 4(f) resources identified for the project?

The identification of Section 4(f) resources involved review of mapping and data sources for publicly owned lands in the project area. Section 4(f) resources were reviewed with the TAC to determine if these parcels had a designated recreational use. FHWA is ultimately responsible for making the determination regarding the applicability of Section 4(f) on any identified recreation and refuge resources.

6.6.4 What Section 4(f) resources are located within the project area?

Section 4(f) resources (recreational lands and wildlife refuges) identified within the general project vicinity are listed below. There are no historic properties determined eligible or listed on the National Register of Historic Places (NRHP) within the project area.

Minnesota Valley National Wildlife Refuge

The Minnesota Valley National Wildlife Refuge is located southeast and northeast of I-35W with the Minnesota River dividing the two sections. The Refuge is managed by the U.S. Fish and Wildlife Service and contains a total of 4,149 acres of park and trails. Two units within the Refuge are adjacent to the project area: Black Dog Preserve and Long Meadow Lake Unit Park.

- Black Dog Preserve: Black Dog Preserve is located on the south side of the Minnesota River in Burnsville. The land is owned by Xcel Energy and is managed as a refuge unit under a cooperative agreement. It is comprised of two large lakes and areas of marsh and

fen. Unique species of plants and birds occur there. Due to water input by the power company, large areas of the lake remain unfrozen during the winter, attracting hundreds of ducks and other waterfowl.

- Long Meadow Lake Unit Park: Long Meadow Lake Unit Park is located northeast of the I-35W Bridge in Bloomington and includes large areas of marsh, lakes, forest, and over 9 miles of recreational trails.

City of Burnsville Recreational Trail

A City of Burnsville recreational trail runs along the east side of I-35W from Cliff Road to Black Dog Road. The trail is located within MnDOT right of way under a limited use permit (LUP 1981-0072).

Big Rivers Regional Trail, Black Dog Segment

The Big Rivers Regional Trail, Black Dog Segment is a Dakota County regional trail located along the south side of the Minnesota River. The Big Rivers Regional Trail, Black Dog Segment begins east of the I-35W/Black Dog Road interchange and extends to the east to the Fort Snelling State Park Trail near TH 77 (Cedar Avenue).

Minnesota River State Water Trail

The Minnesota State Water Trail system is a system of rivers and waterways located throughout Minnesota. The DNR manages the Minnesota State Water Trail system for canoeing, kayaking, boating, and camping. The Minnesota River is part of the Minnesota State Water Trail system. The Minnesota River State Water Trail – Le Sueur to Fort Snelling section begins at the Sibley County/Nicollet County line and continues to the east to the confluence with the Mississippi River. The I-35W Bridge crosses the Minnesota River State Water Trail at river mile 10.4.

Minnesota River Valley Park

The Minnesota River Valley Park is located along the west side of I-35W. The Minnesota River Valley Park is owned by the City of Bloomington. The Minnesota River Valley Park consists primarily of undeveloped, open space. Most users of the Minnesota River Valley Park engage in nature-based, outdoor recreational activities. Hiking, trail running, and mountain biking are popular uses in Minnesota River Valley Park.

City of Bloomington Trail

A gravel maintenance road is located along the north shoreline of the Minnesota River at I-35W. The gravel maintenance road begins at the Russell A. Sorenson Landing, crosses under I-35W along the causeway between the river and stormwater pond, and continues into the Minnesota River Valley Park west of I-35W. The City of Bloomington uses this road for maintenance activities and to access City-owned property west of I-35W. Access to the maintenance road is gated at the Russell A. Sorenson Landing. This maintenance road is also used by hikers and mountain bikers to cross under I-35W and access trails in the Minnesota National Wildlife Refuge east of I-35W. The City of Bloomington does not have an agreement or permit for this facility to cross MnDOT right of way. The FHWA has determined that the City of Bloomington Trail is a Section 4(f) resource.

Minnesota Valley State Trail

In 2013, the Minnesota Legislature allocated funding to the DNR to develop a segment of the Minnesota Valley State Trail from the US 169 Minnesota River Bridge (Bloomington Ferry Bridge) to the Minnesota Valley National Wildlife Refuge Visitors' Center near I-494. The trail corridor would consist of a natural surface trail and a paved trail that will meet Americans with Disabilities Act (ADA) accessibility requirements. This planned recreational trail would cross under the I-35W Minnesota River Bridge along the north side of the Minnesota River.[20]

The Minnesota Valley State Trail extension from the Bloomington Ferry Bridge to the Minnesota Valley National Wildlife Refuge Visitors' Center will receive federal-aid funding and is programmed in the 2018-2021 STIP for construction in 2021 (S.P. 092-090-060). The planned Minnesota Valley State Trail is a recreational facility that would be publicly owned by the DNR and open to the public. The FHWA, as the agency with authority for administering Section 4(f), has determined that planned Minnesota Valley State Trail is presently significant within the context of Section 4(f) and requires protection.

Russell A. Sorenson Landing

The Russell A. Sorenson Landing (water access site/public boat landing) is located along the north side of the Minnesota River, east of I-35W. The site is located on USFWS property and is operated by the USFWS. Access to the

[20] Minnesota Department of Natural Resources. February 1, 2016. Minnesota Valley State Trail: New Segment Planned accessed at http://www.dnr.state.mn.us/state_trails/minnesota_valley/plans.html.

site is from Lyndale Avenue South. In addition to functioning as a public boat/canoe landing, this site also functions as a trailhead facility for trails within the Minnesota Valley National Wildlife Refuge.

A portion of the public water access and parking lot is located within MnDOT right of way. Stormwater runoff from the water access site and parking lot drains to the existing MnDOT stormwater pond under the I-35W Minnesota River Bridge. Construction of the portions of the water access site within MnDOT right of way was allowed under a limited use permit with the DNR (LUP 2782-089). This LUP expired in 2005.

6.6.5 Will the project result in a Section 4(f) use?

The project is located within MnDOT right of way, and would not require permanent acquisition of land from any of the Section 4(f) resources identified above.

Minnesota Valley National Wildlife Refuge

The project would not impact the Minnesota Valley National Wildlife Refuge. Preliminary construction limits are located within existing MnDOT right of way and no new right of way would be required would be required from the Minnesota Valley National Wildlife Refuge. Property along the east side of I-35W north of the Minnesota River to be acquired for stormwater management is located outside of the Minnesota Valley National Wildlife Refuge boundary; therefore, no Section 4(f) involvement is necessary.

City of Burnsville Recreational Trail

The City of Burnsville Trail between Cliff Road and Black Dog Road would be temporarily closed during project construction. The trail will be reconstructed following the completion of adjacent roadway improvements. MnDOT's LUP with the City of Burnsville includes a termination clause that allows MnDOT to terminate the permit upon proper notice to the City. Due to the structure of the LUP, FHWA has determined that the trail does not constitute a long-term public interest; therefore, no Section 4(f) involvement is necessary.

Big Rivers Regional Trail, Black Dog Segment

The Big Rivers Regional Trail, Black Dog Segment terminates at Black Dog Road, east of the I-35W Minnesota River Bridge right of way limits. The project construction limits would not impact the Big Rivers Regional Trail

and the trail would remain open during project construction; therefore, no Section 4(f) involvement is necessary.

Minnesota River State Water Trail

The Minnesota River State Water Trail crossing under the I-35W Minnesota River Bridge would be periodically closed during project construction. Correspondence between the DNR and MnDOT regarding the Minnesota River State Water Trail closure is included in Appendix J. Section 4(f) temporary occupancy conditions as identified in 23 CFR 774.13(d) are listed below. FHWA intends to make a determination that the project meets the requirements for a Section 4(f) temporary occupancy exception and does not constitute a Section 4(f) use of the Minnesota River State Water Trail.

- *The duration of the occupancy will be temporary in nature (i.e., less than the time needed for the construction of the project).*

  Construction of the I-35W Minnesota River Project is expected to last three years. Short duration closures of the Minnesota River State Water Trail at the I-35W Minnesota River Bridge are expected to allow for safe construction (i.e., erection of the steel superstructure). Short duration closures are anticipated for the erection of the steel superstructure. No closures are anticipated for construction of the foundations and bridge piers. Approximately six to eight closures are likely during each construction season. Each closure is anticipated to last for approximately two days.

- *There will be no change in ownership of the land.*

  No permanent right of way will be acquired from the DNR as part of the I-35W Minnesota River Bridge Project.

- *The scope of work to be performed will be minor (i.e., both the nature and magnitude of the changes to the Section 4(f) property are minimal).*

  There will be no changes to the Minnesota River State Water Trail as part of the I-35W Minnesota River Bridge Project.

- *There are no anticipated permanent adverse physical impacts nor will there be any interference with the activities or purposes of the property, on either a permanent or temporary basis.*

  MnDOT is proposing construction of two new bridges: one bridge for northbound I-35W and a second bridge for southbound I-35W. The existing I-35W Minnesota River Bridge piers would be removed from the Minnesota River. New bridge piers would be constructed

along the right and left banks of the Minnesota River (see attached preliminary bridge plan).

Passage under the I-35W Minnesota River Bridge for recreational users would be temporarily prohibited during certain phases of the project as described above. MnDOT will coordinate with the DNR to identify locations for posting state water trail closure signs upstream and downstream of the I-35W Minnesota River Bridge (e.g., Russell A. Sorenson Landing). Information regarding timing and duration of closures will be provided to the DNR during construction for posting to the DNR's Minnesota River State Water Trail website. Navigation along the Minnesota River State Water Trail upstream and downstream of the I-35W Minnesota River Bridge would be unaffected by the proposed project.

- *The land being used will be fully restored to a condition that is at least as good as the condition that existed prior to the project.*

  MnDOT will remove the existing I-35W Minnesota River Bridge piers from the Minnesota River and restore the river bottom after the piers have been removed. All equipment and excess materials/soils will be removed and the river channel, and adjacent shoreland areas will be restored prior to the end of construction. The proposed northbound and southbound I-35W bridges would span the Minnesota River, maintaining commercial and recreational navigation along the Minnesota River.

Minnesota River Valley Park

The project would not impact the Minnesota River Valley Park. The Minnesota River Valley Park is located west of I-35W and north of the Minnesota River. Preliminary construction limits are located within existing MnDOT right of way at this location. No right of way would be acquired from the Minnesota River Valley Park; therefore, no Section 4(f) involvement is necessary.

City of Bloomington Trail

The City of Bloomington Trail crossing under the I-35W Minnesota River Bridge would be temporarily closed during project construction. MnDOT will coordinate with the City of Bloomington to identify a trail detour route during final design. Correspondence between the City of Bloomington and MnDOT regarding the trail closure is included in Appendix J. Section 4(f) temporary occupancy conditions as identified in 23 CFR 774.13(d) are listed below. FHWA intends to make a determination that the project meets the

requirements for a Section 4(f) temporary occupancy exception and does not constitute a Section 4(f) use of the City of Bloomington Trail.

- *The duration of the occupancy will be temporary in nature (i.e., less than the time needed for the construction of the project).*

  Construction of the I-35W Minnesota River Project is expected to last three years. The City of Bloomington Trail crossing through I-35W right of way under the new Minnesota River bridges will be opened prior to the end of project construction.

- *There will be no change in ownership of the land.*

  No permanent right of way will be acquired from the City of Bloomington Trail as part of the project.

- *The scope of work to be performed will be minor (i.e., both the nature and magnitude of the changes to the Section 4(f) property are minimal).*

  There will be no changes to the City of Bloomington Trail alignment through I-35W right of way.

- *There are no anticipated permanent adverse physical impacts nor will there be any interference with the activities or purposes of the property, on either a permanent or temporary basis.*

  MnDOT is proposing to keep the trail open during project construction by utilizing a trail detour. Signs notifying trail users of the closure and detour route will be provided during project construction. A detour route will be identified during final design in consultation with the City of Bloomington.

- *The land being used will be fully restored to a condition that is at least as good as the condition that existed prior to the project.*

  The City of Bloomington Trail will be fully restored to its existing condition.

Minnesota Valley State Trail

The planned Minnesota Valley State Trail would cross under the I-35W Minnesota River Bridge along the causeway between the north shoreline and stormwater pond. Exhibit E12, Appendix E illustrates the planned trail alignment. The trail alignment would parallel the gravel access road along the causeway to the Russell A. Sorenson Landing. The gravel access road would be 20 feet wide. The Minnesota Valley State Trail would be 10 feet wide. Exhibit E12, Appendix E includes correspondence between MnDOT and

the DNR regarding the planned Minnesota Valley State Trail crossing under I-35W. The following avoidance measures will be implemented by MnDOT to accommodate the future Minnesota Valley State Trail:

- The causeway along the north shoreline under the I-35W Minnesota River Bridge between the river and stormwater pond will be maintained;
- The existing profile and elevation of the causeway under the I-35W Minnesota River Bridge will be maintained; and
- A 20-foot wide gravel access road and 10-foot wide trail will be accommodated along the causeway and the east side of the I-35W Minnesota River Bridge, connecting to the Russell A. Sorenson Landing. Exhibit E12, Appendix E illustrates the gravel access road and proposed trail typical section.

Russell A. Sorenson Landing

The project would not impact the Russell A. Sorenson landing. No new right of way would be required from the Russell A. Sorenson landing. Preliminary construction limits are located west of the portion of the landing located within MnDOT right of way (see Figure A.7, Appendix A). Vehicular access to the Russell A. Sorenson Landing from Lyndale Avenue South will be maintained during construction. Access to the Minnesota River at the Russell A. Sorenson Landing will also be maintained during construction. Therefore, no Section 4(f) involvement is necessary.

6.7 Section 106 – Historic and Archaeological Resources

The project would not result in impacts to historical, archaeological, or cultural resources. MnDOT's Cultural Resources Unit (CRU) issued a finding of no historic properties affected by the project. Refer to MnDOT CRU correspondence in Appendix E.

6.8 Air Quality Analysis

See Section 5.1.16 (EAW Item 16) for a discussion of air quality. Mobile Source Air Toxics (MSATs) are addressed in the air quality analysis technical memorandum in Appendix G.

6.9 Construction Impacts

See Section 5.1.6 (EAW Item 6) for a discussion of temporary construction impacts of the proposed project.

6.10 Cumulative Impacts

See Section 5.1.19 (EAW Item 19) for a discussion of cumulative impacts.

6.11 Economics

The project includes construction of two stormwater ponds and a multi-modal trail on two parcels of land north of the Minnesota River between MnDOT right of way and Lyndale Avenue South. These two parcels are tax-forfeited properties owned by the City of Bloomington (PID 21-027-24-440019 and PID 21-027-24-44-0021). There is no taxable value associated with either of these properties. Construction of proposed stormwater ponds and trail on these two properties would not result in any fiscal impacts to the City of Bloomington or Hennepin County.

The project does not include any right of way acquisition south of the Minnesota River. The project would not result in any fiscal impacts to the City of Burnsville or Dakota County.

6.12 Farmland Protection Policy Act

The Farmland Protection Policy Act (FPPA) was enacted as a subtitle of the 1981 Farm Bill to minimize the extent to which deferral programs contribute to the unnecessary conversion of farmland to non-agricultural uses (P.L. 97-98, Sec. 1539-1549; 7 U.S.C. 4201, et seq.). FPPA requires federal agencies to examine the impact of projects that convert farmland to non-agricultural uses. If a federal agency, or its representative, determine that a project will impact agricultural lands, a Farmland Conversion Impact Rating Form (Form AD-1006) is completed to rate the relative impact of the project.

The project is located within the Minneapolis-St. Paul urbanized area and is located within an existing freeway corridor. The project is not anticipated to cause any adverse impact to agricultural land or operations. No agricultural land would be acquired, and no farm would be severed or triangulated. The project would not have an impact on agricultural production in Hennepin or Dakota counties (see Section 5.1.9, EAW Item 9).

6.13 Floodplain Impacts

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs) were reviewed for the project (Map Number 27037C0070E in the City of Burnsville, Dakota County, Minnesota dated December 2, 2011 and Map Number 27053C0466F in the City of Bloomington, Hennepin County, Minnesota dated November 4, 2016).

Two segments of I-35W south of the Minnesota River are located below the 100-year floodplain elevation. The project includes raising the I-35W roadway grade by approximately two feet to an elevation above the 100-year floodplain elevation. This grade change would occur over approximately 2,100 feet. The existing I-35W Minnesota River Bridge consists of five bridge piers within the Minnesota River floodway. Under the proposed project, the number of bridge piers in the floodway would be reduced to four piers.

Approximately 33,000 cubic yards of fill (approximately 29,200 cubic yards south of the Minnesota River and approximately 3,700 cubic yards north of the Minnesota River) would be placed within the floodplain with the project. Floodplain fill is the result of the grade change described above, the proposed bridge alignment, construction of the additional northbound I-35W lane, and reconstruction of the I-35W/Black Dog Road interchange ramps. Fill amounts have been minimized with retaining walls along I-35W south of the Minnesota River. The project would result in zero increase in the flood elevation (see "No-Rise Certificate" in Appendix I).

Table 6.5 lists the type of floodplain encroachments and estimated lengths of the encroachments.

Table 6.5 Floodplain Encroachments

Floodplain	Flood Insurance Rate Map (FIRM) (Community)	Flood Insurance Rate Map (FIRM) (Map Number)	Type of Encroachment	Length
Minnesota River (south of I-35W Bridge)	Dakota County, Minnesota and Incorporated Areas (City of Burnsville)	27037C0070E	Transverse	Approximately 4,400 feet
Minnesota River (north of I-35W Bridge)	Hennepin County, Minnesota (All Jurisdictions) (City of Bloomington)	27053C0466E	Transverse	Approximately 500 feet

The project would not result in any significant floodplain impacts as described below.

- There is no significant increased potential for interruption of a transportation facility. The I-35W Minnesota River Bridge is located above the 100-year floodplain. The I-35W roadway grade south of the Minnesota River would be raised above the 100-year floodplain elevation as described above.
- Impacts on the natural environment would be minimal because the fill is within an existing freeway corridor in MnDOT right of way. No substantial fisheries impacts are anticipated. Construction operations within the river would not occur during fish spawning and migration periods as required under the DNR public waters work permit.
- No changes in public access to the Minnesota River would occur because of the project. The Russell A. Sorenson Landing will be maintained with the project.
- No significant increased risk of flooding would result because the project does not cause any changes in headwater or tailwater elevations that would endanger life or property. See the hydraulic analysis and "No-Rise Certificate" issued by MnDOT's hydraulic engineer on February 9, 2016 in Appendix I.
- The project would not cause incompatible floodplain development because the project does not provide new access to the floodplain area for development.

6.14 Indirect Effects

Indirect effects, as defined by the Council on Environmental Quality (CEQ) in 40 CFR 1508.7, are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. The geographic area potentially affected by the interchange footprint includes lands adjacent to the I-35W corridor between Cliff Road in the City of Burnsville and West 106th Street in the City of Bloomington. The Cities of Burnsville and Bloomington have adopted future land use plans that identify a range of uses within the project area, including industrial uses, mixed uses, residential and commercial uses. The future land use maps for the Cities of Burnsville and Bloomington are shown in Figure F.4 and Figure F.5, Appendix F. Long-range planning within the vicinity of the project area include substantial redevelopment of the areas adjacent to I-35W in the City of Burnsville as discussed in greater detail in Section 5.9 (EAW Item 9). The timing of this future development would be influenced by numerous factors, including the cleanup of the freeway landfill and closure of mining activities.

The project is in an existing freeway corridor and would allow for the continuing function of I-35W between Dakota and Hennepin counties. The proposed project would not change access to I-35W. Existing interchanges at Cliff Road, Black Dog Road, and West 106th Street would not be permanently affected by the project and no new access is proposed. The City of Burnsville has identified a future interchange at 118th Street in conjunction with the Minnesota River Quadrant redevelopment. The project would not preclude a future 118th Street interchange. Because the project does not introduce any new roadways or interchange access that will affect the timing or location of future development, potential indirect effects are not anticipated.

6.15 Section 404 – Clean Water Act and Section 10 – Rivers and Harbors Act

6.15.1 Section 404 – Clean Water Act

USACE has jurisdiction over and issues permits under Section 404 of the Clean Water Act for non-exempt discharges of dredged or fill material into waters of the U.S., including wetlands. See Section 5.11 (EAW Item 11) for a discussion of potential aquatic resource impacts resulting from the project and anticipated mitigation measures.

6.15.2 Section 10 – Rivers and Harbors Act

The USACE also has jurisdiction over and issues permits under Section 10 of the Rivers and Harbors Act of 1899. Under Section 10, a USACE permit is required to do any work in, over, or under a navigable water of the U.S. Waterbodies are designated as navigable waters based on their past, present, or potential use for transportation for interstate commerce.[21]

The Minnesota River is designated as a navigable water; therefore, a permit under Section 10 of the Rivers and Harbors Act will be required from the USACE for reconstruction of the I-35W Minnesota River Bridge. See Section 5.11 (EAW Item 11) for a summary of potential temporary impacts to the Minnesota River during construction.

[21] US Army Corps of Engineers, St. Paul District. Regulatory Branch accessed 01 June 2016 at http://www.mvp.usace.army.mil/Missions/Regulatory.aspx.

6.16 Section 6(f) – Land and Water Conservation Act

6.16.1 What is Section 6(f)?

Section 6(f) of the Land and Water Conservation Act (LAWCON) requires that any resource which has received LAWCON funds be protected from conversions to non-recreation uses. Property subject to LAWCON protection cannot be converted to non-recreation uses unless approved by the DNR and National Park Service (NPS), and replacement land of at least equal fair market value and reasonably equivalent usefulness is provided.

6.16.2 How were Section 6(f) resources identified?

The DNR maintains a list of properties in the state that are subject to Section 6(f) requirements, which is available on the DNR's LAWCON webpage.[22] Public lands on the east and west sides of I-35W north of the Minnesota River in Bloomington are subject to Section 6(f):

- The Minnesota River Valley Park (City of Bloomington) is located along the west side of I-35W, north of the Minnesota River. The Minnesota River Valley Park was acquired through a LAWCON grant in 1976 (LW27-00806).
- The City of Bloomington and USFWS own property along the east side of I-35W, east of Lyndale Avenue South. This land is managed by the USFWS as part of the Minnesota Valley National Wildlife Refuge. The Russell A. Sorensen water access site is located on USFWS property along the Minnesota River. The DNR has determined that this land will also be subject to Section 6(f).

6.16.3 Will the project result in a Section 6(f) impact?

The project is located within existing MnDOT right of way. The proposed stormwater basins along the east side of I-35W would be located on City of Bloomington property outside of the Minnesota River Valley LAWCON boundaries. The project would not cause the conversion of any land acquired, planned, or developed with LAWCON funds. Therefore, there is no Section 6(f) involvement on this project.

[22] Available at http://files.dnr.state.mn.us/aboutdnr/lawcon/lawcon_1.pdf.

6.17 Traffic Noise

See Section 5.17 (EAW Item 17) for a discussion of construction noise and traffic noise. The complete traffic noise analysis technical memorandum is included in Appendix H.

6.18 Transit

See Section 5.18 (EAW Item 18) for a discussion of transit.

Chapter 7 Agency and Public Involvement

7.1 Agency and Public Involvement Activities

7.1.1 Agency and Public Involvement

Technical Advisory Committee Meetings

A Technical Advisory Committee (TAC) was formed to help guide the alternatives evaluation process, trail connection options, public outreach, and provide input regarding the overall progress of the EA. TAC members included representatives from the City of Burnsville, City of Bloomington, Dakota County, MnDOT and FHWA. The TAC met three times in spring and summer of 2015.

Visual Quality Planning Process

A Visual Quality Advisory Committee (VQAC) was established which included representatives from MnDOT, the City of Bloomington, City of Burnsville, and members of the public. The purpose of the VQAC was to help the MnDOT Visual Quality Manager and Project Design Team articulate project and community values and to ensure that the mission, goals, and visual quality objectives of this project were achieved.

Public Open House Meetings

Public open house meetings were held on October 27, 2015 and October 29, 2015 in the Cities of Bloomington and Burnsville, respectively. The project design was presented, and meeting participants were given the opportunity to provide feedback on many features of the proposed project including: trail options, bridge piers, retaining walls and other architectural details. MnDOT staff were available to answer questions and discuss. Public feedback received at both open house meetings indicated a preference for the trail to be located on the east side of the I-35W Minnesota River Bridge.

Project Website

A project website was created to provide the public with general information about the proposed project, schedule updates and advertise public meetings. The project website can be viewed at:

http://www.dot.state.mn.us/metro/projects/i35wbloomington/index.html

7.1.2 Persons with Limited English Proficiency (LEP)

Executive Order 13166, "Improving Access to Services for Persons with Limited English Proficiency," signed by President Clinton on August 11, 2000, calls for all agencies to ensure that their federally conducted programs and activities are meaningfully accessible to limited English proficiency (LEP) individuals. Reasonable steps, such as translated notices and language interpreters, are part of MnDOT's public participation process. US Census data from the 2010-2014 American Community Survey indicated that there are no LEP groups within the project area.

7.2 Public Comment Period and Public Hearing for the EA

Comments from the public and agencies affected by this project are requested during the public comment period described on the transmittal letter distributing this EA. A combined public informational meeting/public hearing will be held after this EA has been distributed to the public and to the required and interested federal, state and local agencies for their review.

At the informational meeting/public hearing, preliminary design layouts for the alternatives under consideration along with other project documentation will be available for public review. The public will also be given the opportunity to express their comments, ideas and concerns about the proposed project. These comments will be received at the hearing and during the remainder of the comment period, and will become a part of the official hearing record.

7.2.1 Distribution and Availability of the EA

Copies of the EA have been sent to agencies, local government units, libraries and others as per Minnesota Rule 4410.1500 (Publication and Distribution of an EAW).

Additional information on the project can be found online at:

http://www.dot.state.mn.us/metro/projects/i35wbloomington/index.html

Hard copies of the EA can be reviewed at several locations, including project area city halls and the following library locations:

Dakota County	Hennepin County
Burnsville City Hall 100 Civic Center Parkway Burnsville, MN 55337	Bloomington City Hall 1800 West Old Shakopee Road Bloomington, MN 55431
Burnhaven Library 1101 West County Road 42 Burnsville, MN 55306	Penn Lake Library 8800 Penn Avenue S. Bloomington, MN 55431

7.2.2 Project Contacts

For additional information about this project, please contact:

Contacts			
FHWA:	Abbi Ginsberg Area Engineer Galtier Plaza 380 Jackson Street, Suite 500 St. Paul, MN 55101 Phone: 651-291-6104	MnDOT:	Scott Pedersen, PE Project Manager MnDOT Metro District 1500 West County Road B2 Roseville, MN 55113 Phone: 651-234-7726

7.3 Process Beyond the Public Hearing

Following the comment period, MnDOT and the FHWA will make a determination as to the adequacy of the environmental documentation. If further documentation is necessary it could be accomplished by preparing an Environmental Impact Statement (EIS), by revising the Environmental Assessment, or clarification in the Findings of Fact and Conclusion, whichever is appropriate.

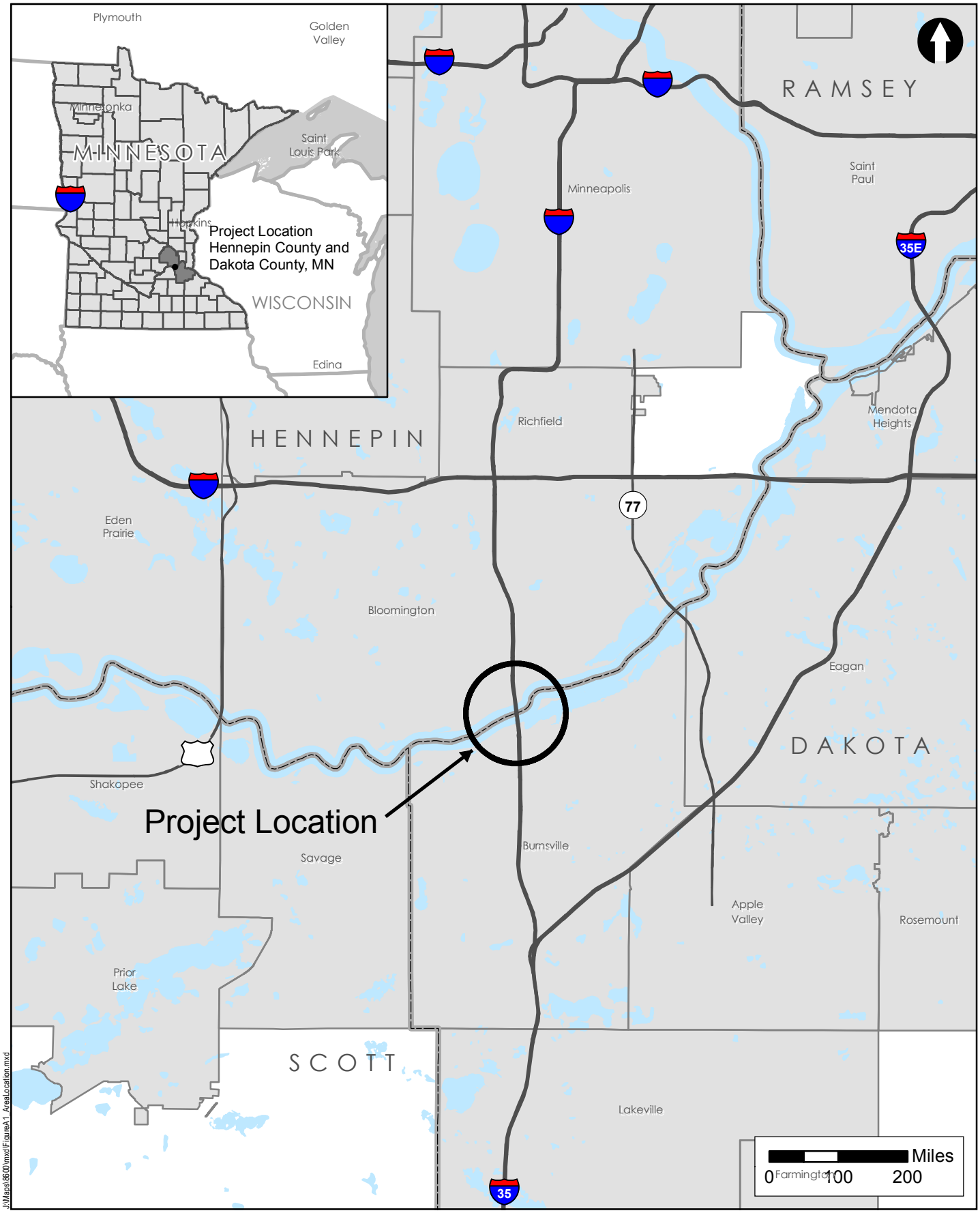
When the environmental documentation is determined adequate, MnDOT will choose a project alternative, either the No Build or one of the alternatives under consideration.

If an EIS is not necessary, as currently anticipated, MnDOT will prepare a "Negative Declaration" for the state environmental requirements. MnDOT will also prepare a request for a "Finding of No Significant Impact" (FONSI) that will be submitted to the FHWA. If the FHWA agrees that this finding is appropriate, it will issue a FONSI.

Notices of the federal and state decisions and availability of the above documents will be placed in the Federal Register and the Minnesota Environmental Quality Board (MEQB) *Monitor*. MnDOT will also distribute the Negative Declaration and FONSI to the EAW distribution list.

Appendix A

Location Figures and Project Layout



Area Location

Figure A.1

I-35W over the Minnesota River
SP 1981-124
MnDOT

Project Location

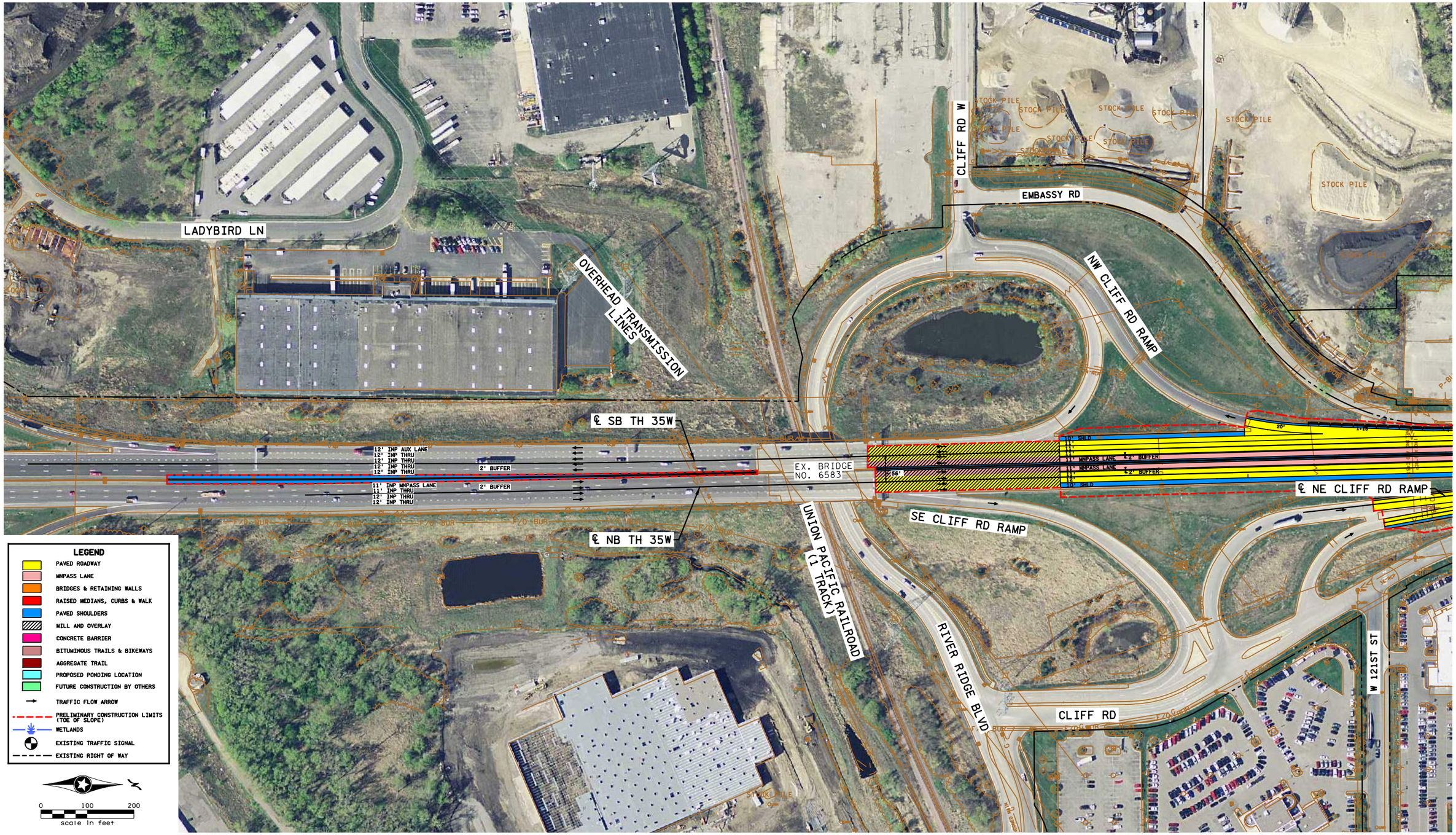
Figure A.2

I-35W over the Minnesota River
SP 1981-124
MnDOT

USGS 24k Topo Map

Figure A.3

I-35W over the Minnesota River
SP 1981-124
MnDOT



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SRF Consulting Group, Inc.

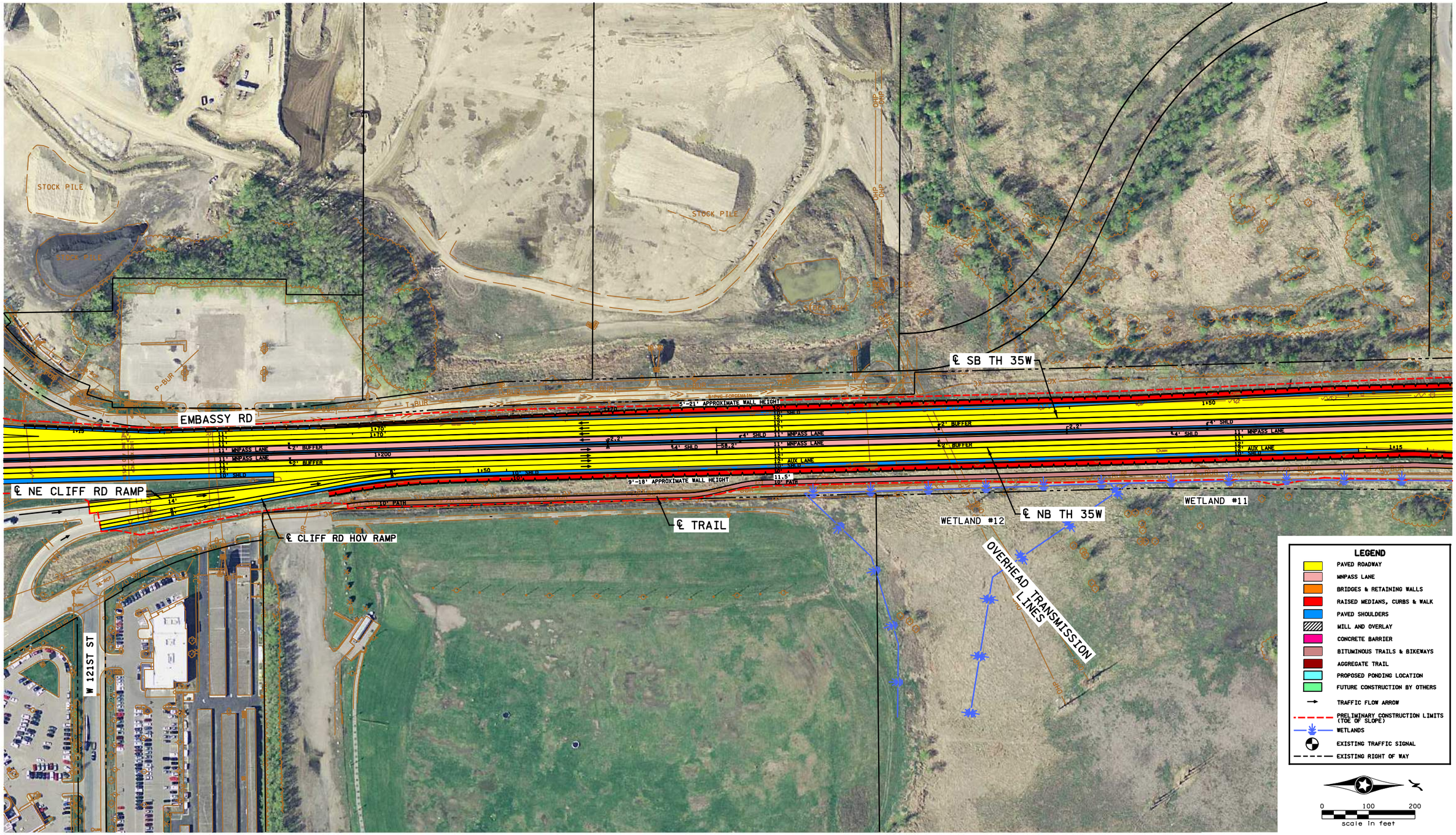
I-35W Bridge Replacement over the Minnesota River (Project Layout)

Minnesota Department of Transportation

SP 1981-124

8600
4/10/2017

Figure A.4



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SRF Consulting Group, Inc.

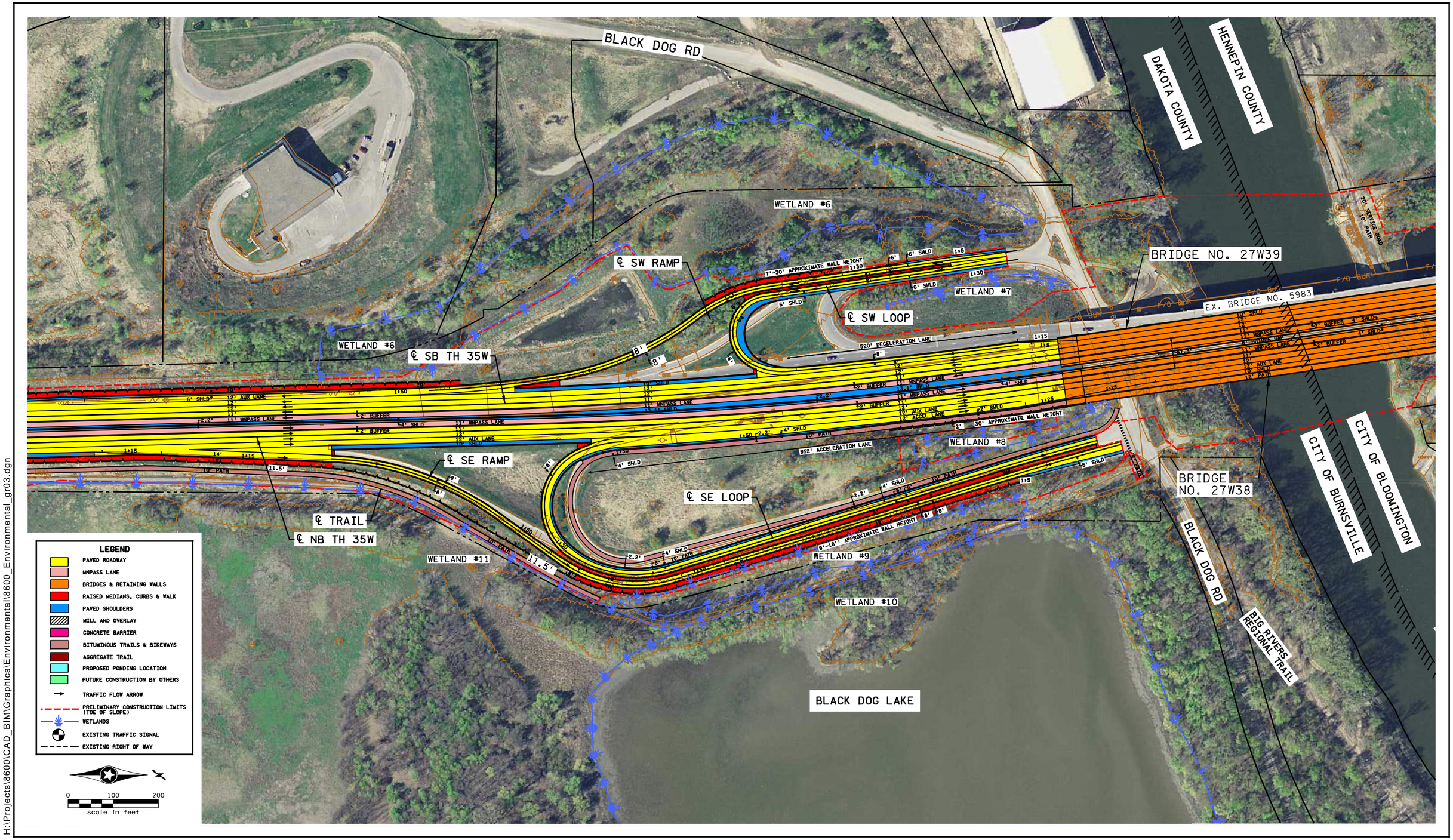
8600
4/10/2017

I-35W Bridge Replacement over the Minnesota River (Project Layout)

Minnesota Department of Transportation

SP 1981-124

Figure A.5



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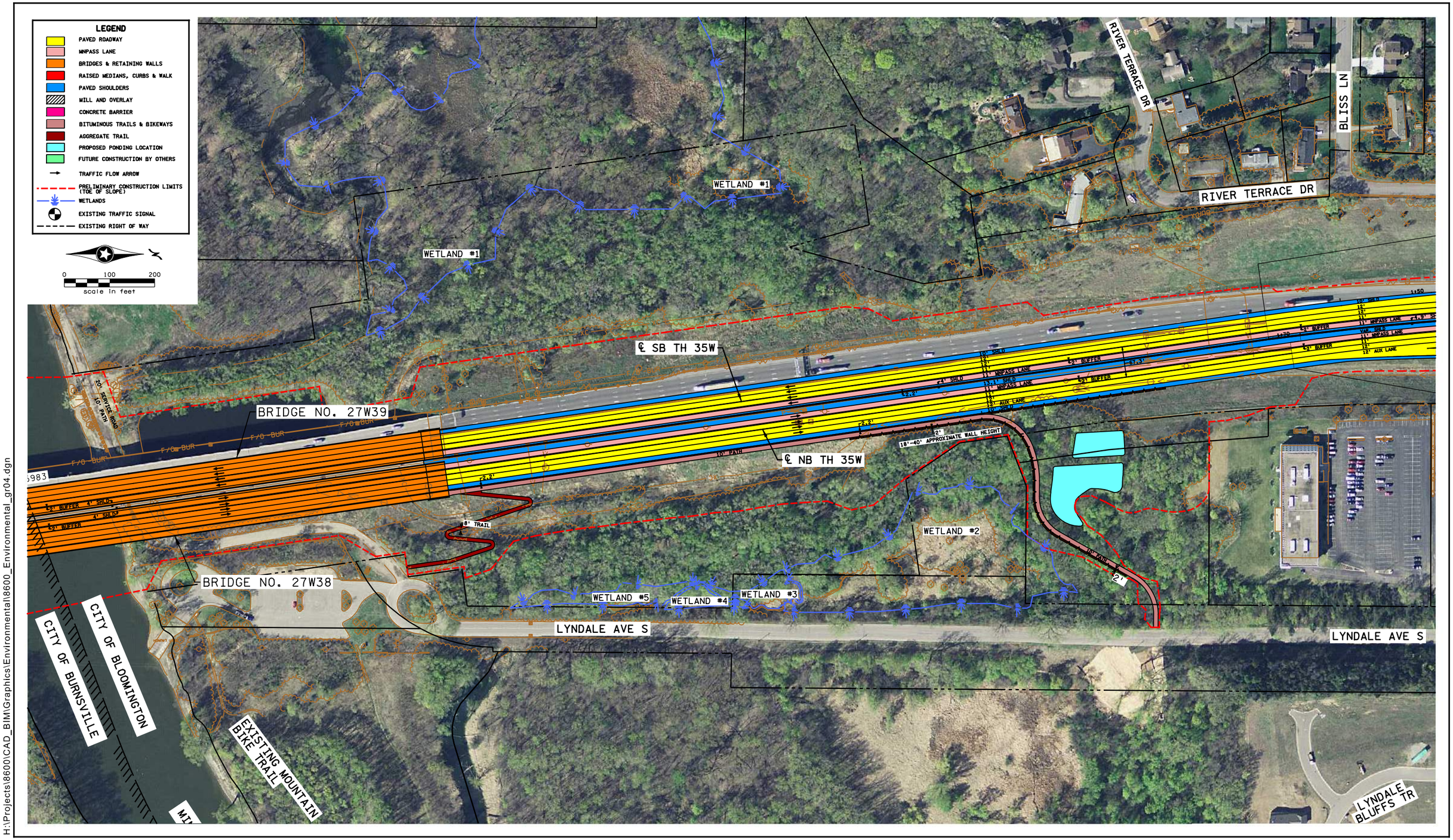
SRF Consulting Group, Inc.

8600
10/11/2017

I-35W Bridge Replacement over the Minnesota River (Project Layout)

Minnesota Department of Transportation
SP 1981-124

Figure A.6



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SRF Consulting Group, Inc.

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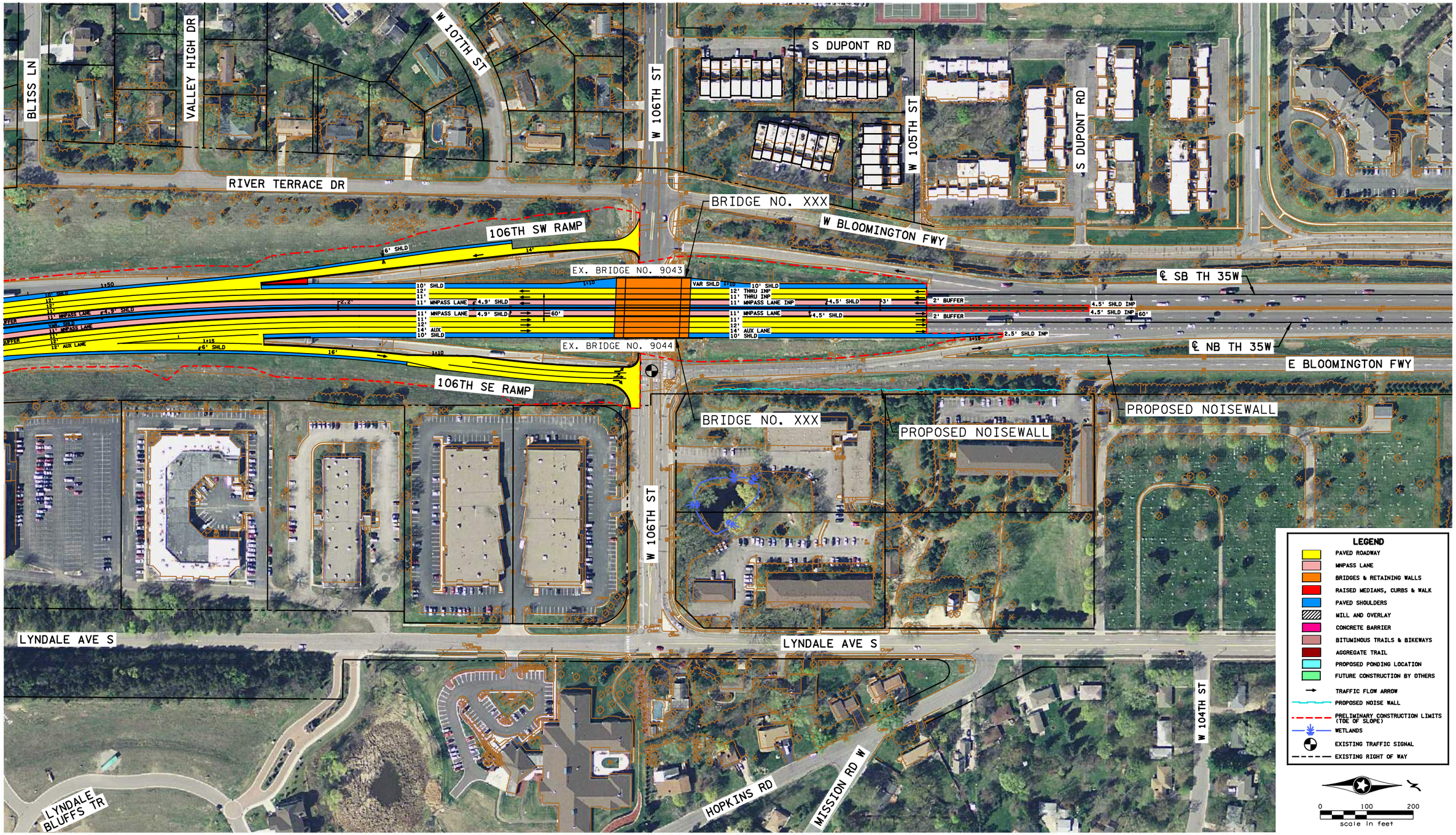
10/11/2017

I-35W Bridge Replacement over the Minnesota River (Project Layout)

Minnesota Department of Transportation
SP 1981-124

Figure A.7



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8/23/2017

I-35W Bridge Replacement over the Minnesota River (Project Layout)

Minnesota Department of Transportation
SP 1981-124

Figure A.8

Appendix B

Bridge Type Selection Report

PARSONS

Memorandum

File ID: 150805_Memo_35W_Type_Report.docx

To: Scott A. Pedersen, P.E.
Metro District Program Delivery – Lead Project Manager.

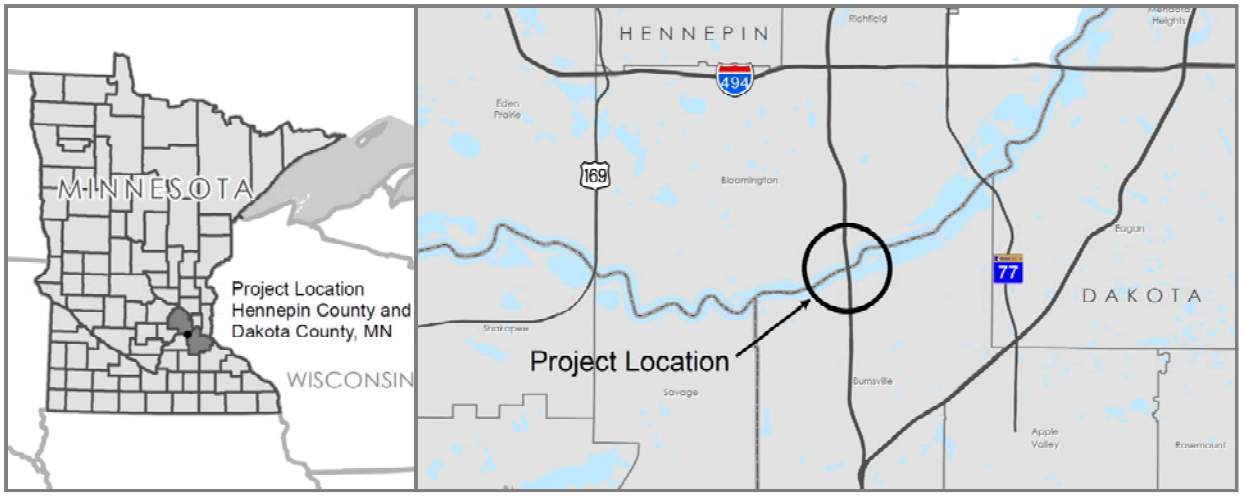
From: Vince Gastoni,PE
Principal, Parsons Transportation Group .

Date: August 5, 2015

Subject: SP1981-124; Minnesota River Bridge, Bridge Replacement Type Study.

SECTION A-TYPE SELECTION SUMMARY

Introduction: This memorandum is to document the type study evaluation process for the replacement of the I-35W bridge over the Minnesota River and address issues related to the development of the Environmental Assessment documents and the Preliminary Bridge Plans for the recommended bridge type.



Location Map

Existing Bridge Site

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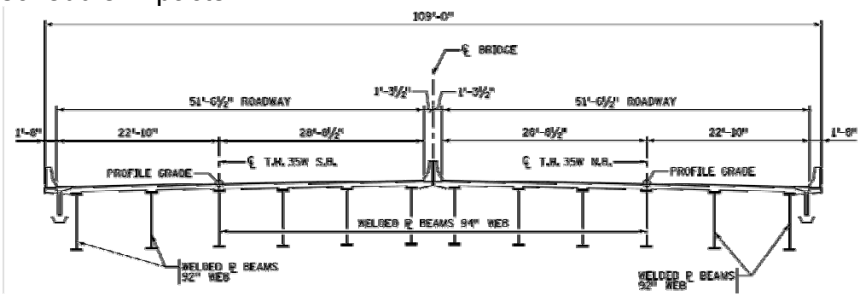
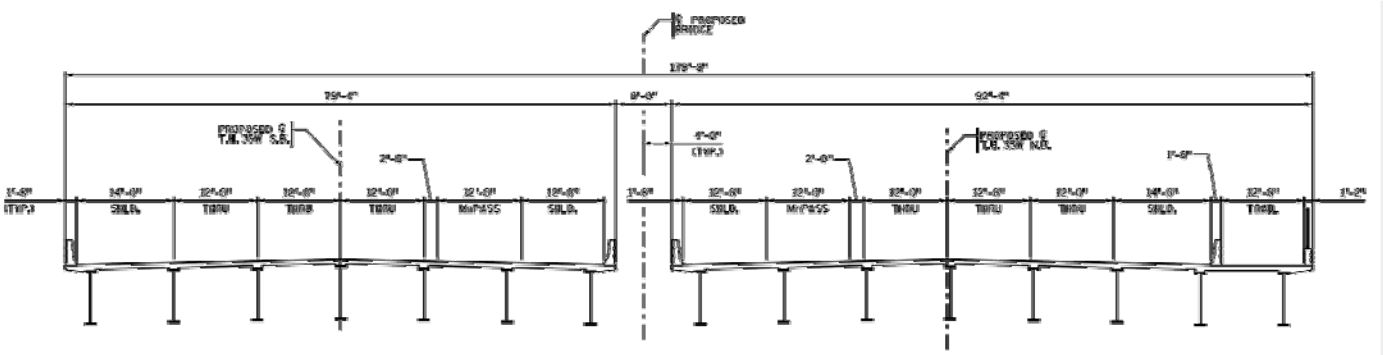
Overview: The existing continuous steel girder bridge (Br. No. 5983) was built in 1957 with minimum span lengths of 169.5 feet and maximum span length of 224 feet and currently carries over 100,000 vehicles per day. To replace the existing bridge, two new structures are planned to carry the northbound and southbound traffic respectively. Each structure will include three general purpose through lanes, one MnPASS lane and shoulders. The northbound bridge will also include a 12 foot wide pedestrian/bike trail on the east side of the bridge. Due to the high level of daily traffic and because I-35W is a primary evacuation route for the Twin Cities; minimizing impacts to the traveling public is essential. Accelerated Bridge Construction (ABC) techniques were considered as part of this study to address flexibility in the construction staging and minimize schedule impacts.



Transverse Section- Existing Bridge



Transverse Section- Replacement Bridge (Steel Plate Girder Option Shown)

Project Criteria & Evaluation Matrix: As part of the evaluation process an alternatives matrix was developed to evaluate structure types. The matrix evaluated project specific criteria for multiple alternatives to capture and document the screening analysis in support of the Environmental Assessment process. The following criteria were used to develop the Bridge Type Evaluation Summary Matrix (Exhibit 1):

- Schedule Impacts (Durations/Conflicts with ABC Opportunities)
- Maintenance of Traffic/Staged Construction Impacts (Alignment Shift/Profile Revisions)
- Waterway Clearance Conflicts
- Redundancy Issues
- Future Expansion Impacts
- Maintenance and Inspection Impacts (Including Life Cycle Costs)
- Environmental impacts (Mainspan/Approaches)
- Geotechnical Complexity (Foundations/North Approach Embankment)
- Construction Cost

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(Note-Aesthetics for this bridge will be "Level B" and therefore was not included as screening criteria in the matrix)

Bridge Concepts Evaluated: The matrix utilizes the screening criteria to provide a relative comparison of the alternatives based on issues and impacts; a "Low" impact ranking is the most desirable. A broad spectrum of structure types was selected as part of the process and to also serve as a public information tool. Structure types included in the study were:

- Steel Plate Girder
- PC Spliced Concrete Beam
- Steel Tub Girder
- Steel Delta Frame
- Concrete Segmental box Girder
- Steel Tied Arch
- Steel Truss
- Extradosed
- Cable stayed
- Suspension

Bridge Type Recommendation: Screening criteria and structure types were presented at the April 8, 2015 Technical Advisory Committee (TAC) meeting for review and comment. After comments were incorporated, the bridge types were evaluated for each criteria. The completed matrix was presented at the June 10th TAC meeting along with the Bridge Type Evaluation Summary of Recommendations. Based on the screening criteria the steel plate girder structure is the recommended bridge type:

Steel Plate Girder: Advance as recommended alternative-Best meets the overall project criteria. Alternative presents a low schedule risk, optimal construction flexibility, and easy accommodation of future expansion, simple foundations and the lowest cost. Moderate impacts for future maintenance can be mitigated though proper detailing and selection of materials such as unpainted weathering steel.

The TAC accepted the recommendation based on its lowest overall impact in comparison to the other alternatives. This alternative also provides more ABC opportunities to mitigate environmental and/or schedule risks due the line-girder prefabricated nature of steel plate girder structures.

Reference Bridge Type Study Exhibits:

- Bridge Type Alternatives
- Bridge Type Evaluation Summary Matrix
- Bridge Type Evaluation Summary of Recommendations
- Bridge General Plan & Elevation (Recommended Alternative)
- Staging Configuration (Recommended Alternative)

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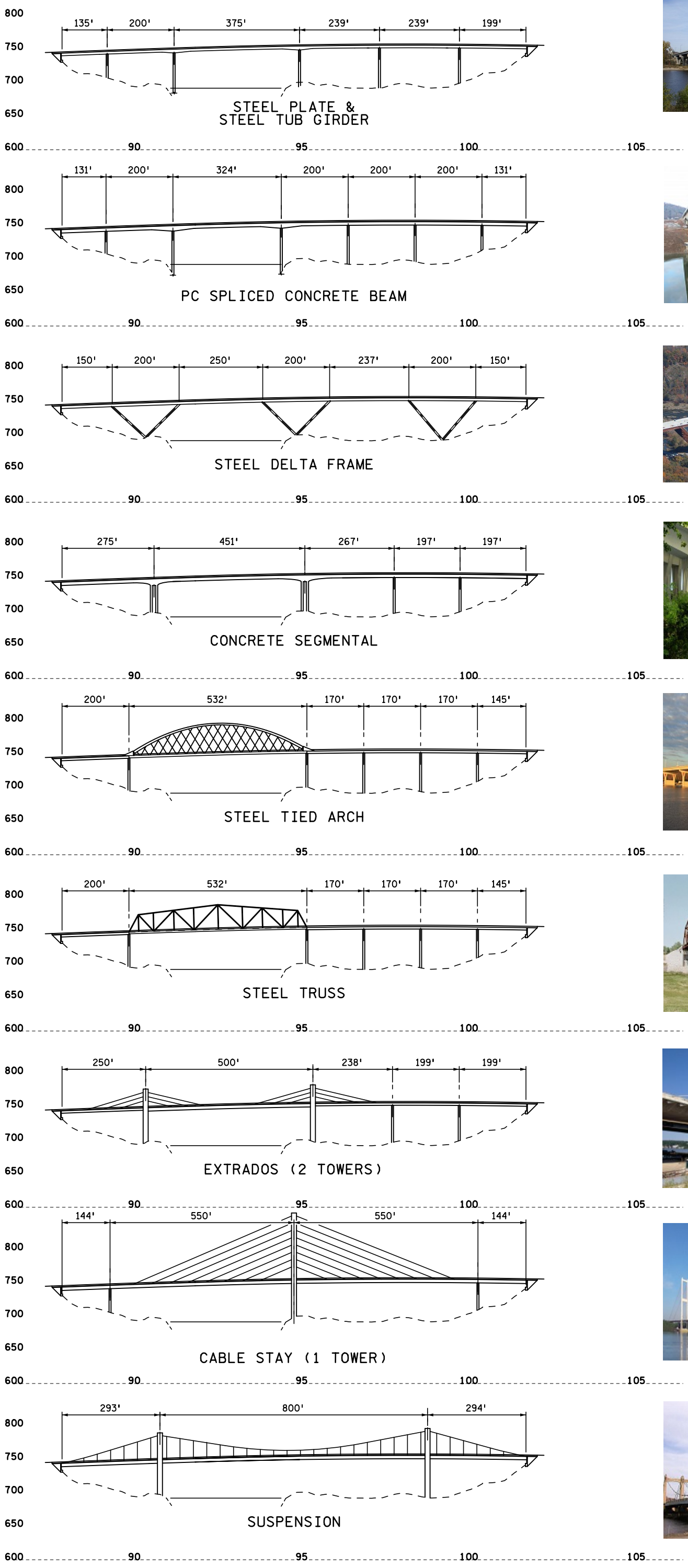


PARSONS

TITLE: BRIDGE TYPE ALTERNATIVES

DES: ASP
CHK:
DR: ASP
CHK:
APPROVED:

SHEET NO. 1 OF 1 SHEETS

BRIDGE NO.

Bridge Type Evaluation Summary Matrix

The table below provides a comparison of the alternates based on selected criteria of issues and impacts. In all criteria the "Low" ranking is most desirable.

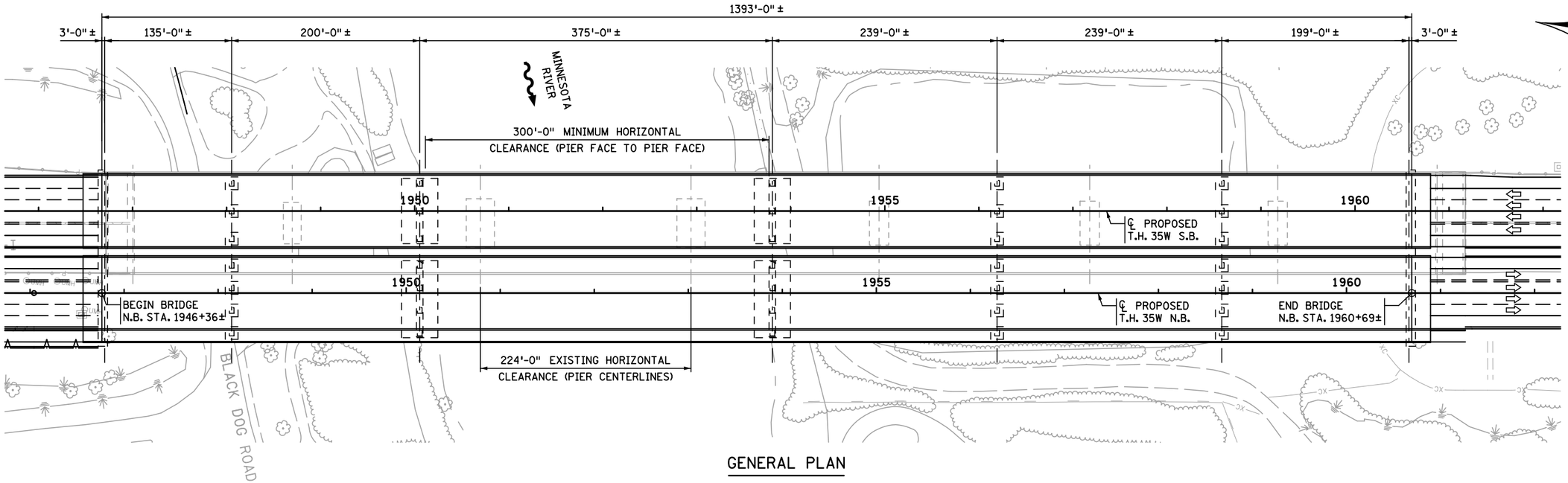
Low Impact	Greatest benefit to project with least impacts, costs or risk
Moderate Impact	Good benefit to project with average impacts, costs or risk
Moderate/High Impact	Marginal benefit to project with impacts, higher cost and more risk than other alternatives
High Impact	Does not meet project criteria-Significant impacts, costs or risks related to other alternatives.

Main Span Bridge Type	Approach Spans Bridge Type	River Span Length	No. of Spans	No. of Piers	Schedule Impacts		MOT/Staged Construction Impacts		Waterway Clearance Conflicts	Redundancy Issues	Future Expansion Impacts	Maintenance and Inspection Impacts (PV $M's)	Environmental impacts		Geotechnical Complexity		Construction Cost (Avg $/SF, $2015) (Main Span $/SF, $2015) Total Br. Cost $M's (2020$)
					Durations	Conflicts with ABC Opportunities	Alignment Shift	Profile Revisions					Mainspan	Approaches	Foundation Complexity/ Criteria	North embankment stability impacts	
					Estimated impact to schedule duration based on bridge type selected. The smaller the impact indicates a lower risk and shorter or more flexible construction schedule for this bridge type.	*Low conflicts indicate more opportunities for global Accelerated Bridge Construction (ABC) methods such as "Slide-In" or "Launching". Some bridge types do not allow certain global ABC methods to be used which can limit construction methods and add schedule risk.*	*The ability of the proposed bridge type to be constructed on the existing alignment while maintaining traffic reduces impacts and cost to the roadway approach construction.*	*The ability of the proposed bridge type to be constructed on the existing profile reduces impacts and cost to the roadway approach construction.*	*The ability of the bridge to meet the navigational waterway vertical and horizontal clearances. Low impact indicates no significant issues while higher impacts indicate the risk for potential for conflicts due to bridge type.*	*Low impact indicates a structure type that is highly redundant, increasing impacts indicate structure types with inherently less redundancy requiring additional costs and typically higher inspection and maintenance.*	*The ability and ease of which the type of bridge considered can accommodate expansion for future lanes. Some structure types cannot be widened and require an additional structure in the future for additional roadway capacity.*	*The amount, and difficulty, of maintenance and inspection required to keep the proposed bridge type in proper working condition. The less maintenance and inspection required the greater the benefit to the bridge. The estimated maintenance cost is given in "today's" dollars.*	*Based on number of river piers required compared to the existing bridge and other bridge types. Considerations related to mussels and migratory birds.*	*Based on the number of approach span piers required compared to the number of existing piers and other bridge types.*	*Standard footings require less complex design and are easier to construct reducing cost and schedule risk. Cost and schedule risk increases with the complexity and size of the foundations based on structure type. This is further compounded by the complexity of construction in the river channel environment.*	*Related to staging, low impact solution limit the modifications and/or additional work at the embankments and reduce the risk of slope stability and settlement issues.*	*Estimated construction cost 2020 dollars. Does not include cost of removing existing bridge or future maintenance cost of proposed bridge. Low < $60M 'Mod <$85M 'Mod/High <$90M 'High>$90M*
Steel Plate Girder	**Steel Plate Girder**	**344 ft.**	**6**	**5**	Low- Prefabrication and traditional erection methods	Low-Allows multiple ABC opportunities (Slide-In, launch, Precast deck panels)	Low-Can be built on existing or shifted alignment	Low-New profile similar to existing	Low-Existing clearance easily maintained	Low - Multiple girder lines provide redundancy.	Low - Additional girders could be constructed to add additional lanes at a future date.	Moderate -Requires future painting but will be easy to inspect. ($10.1)	Moderate-Two main river piers similar to existing. Mussel survey required for determination of impacts. Less above-deck structure, minimizing the potential for migratory bird impacts.	Moderate-One approach pier less than existing	Low - Standard Foundations	Low-Line girder superstructure allows staged construction to minimize embankment impacts	Low ($181/SF) ($185/SF) $55M
PC Spliced Concrete Beam	**PC Concrete Beam**	**324 ft**	**7**	**6**	Moderate-Winter shutdown during erection for Post-Tensioning & Grouting operations	Moderate-Complex structure does not allow many ABC opportunities	Low-Can be built on existing or shifted alignment	Moderate-Raise profile over 1-2 ft	Moderate-Haunched pier segment increases profile to clear vertical clearance	Low - Multiple girder lines provide redundancy.	Low - Additional girders could be constructed to add additional lanes at a future date.	Moderate - Concrete girders require little maintenance and will be easy to inspect. ($10.5)	Moderate-Two main river piers similar to existing. Mussel survey required for determination of impacts. Less above-deck structure, minimizing the potential for migratory bird impacts.	Moderate-Same number of approach piers as existing	Moderate - Larger Fnd's required due to heavier weight superstructure	Low-Line girder superstructure allows staged construction to minimize embankment impacts	Low ($196/SF) ($225/SF) $59.6M
Steel Box Girder	**Steel Box Girder**	**344 ft.**	**6**	**5**	Low- Prefabrication and traditional erection methods	Low-Allows multiple ABC opportunities (Slide-In, launch, Precast deck panels)	Low-Can be built on existing or shifted alignment	Low-New profile similar to existing	Low-Existing clearance easily maintained	Low - Multiple girder lines provide redundancy.	Low - Additional girders could be constructed to add additional lanes at a future date.	Moderate -Requires future painting but will be easy to inspect. ($9.7)	Moderate-Two main river piers similar to existing. Mussel survey required for determination of impacts. Less above-deck structure, minimizing the potential for migratory bird impacts.	Moderate-One approach pier less than existing	Low - Standard Foundations	Low-Line girder superstructure allows staged construction to minimize embankment impacts	Moderate ($245/SF) ($280/SF) $74.4M
Steel Delta Frame	**Steel Plate Girder**	**250 ft**	**7**	**3**	Moderate/High-Complex geometry increases fabrication & erection durations	Moderate/High-Complex structure does not allow many ABC opportunities	Moderate/High - Construct on shifted alignment	Low-New profile similar to existing	Moderate/High-Delta tower legs increase main span to clear channel	Low - Multiple girder lines provide redundancy.	Moderate - Additional frame needs to be constructed to add additional lanes at a future date.	Moderate - Requires future painting and greater inspection. ($11.4)	Moderate-Two main river piers similar to existing. Mussel survey required for determination of impacts. Less above-deck structure, minimizing the potential for migratory bird impacts.	Low-Three approach piers less than existing	Moderate - Larger Fnd's required due to heavier weight superstructure	Moderate/High - Structure type must be constructed on shifted alignment impacting embankment	Moderate/High ($281/SF) ($420/SF) $85.4M
Concrete Segmental	**PC Concrete Beam**	**451 ft.**	**5**	**4**	Moderate-Winter shutdown during erection for Post-Tensioning & Grouting operations	Low-Precast segments allow for rapid construction	Moderate/High - Construct on shifted alignment	Moderate-Raise profile over 1-2 ft	Moderate-Haunched box girder increase main span to clear channel	Low - Concrete segments are pre-compressed and tendons are redundant at each location.	High -Not expandable. Original design would have to account for future addition or add a third bridge.	Low - Concrete box girders require little maintenance and will be fairly easy to inspect. ($6.8)	Moderate-Two main river piers similar to existing. Mussel survey required for determination of impacts. Less above-deck structure, minimizing the potential for migratory bird impacts.	Low-Two approach piers less than existing	Moderate/High - Significant Fnd's required	Moderate/High - Structure type must be constructed on shifted alignment impacting embankment	High ($387/SF) ($475/SF) $117.5M
Steel Tied Arch	**PC Concrete Beam**	**532 ft.**	**6**	**5**	Moderate-Steel fabrication & erection increases durations	Moderate-Some ABC opportunities for precast deck & launch, float or slide-in erection	Moderate - Construct on shifted alignment or use ABC to slide into existing alignment. Additional width necessary to accommodate Arch	Low-New profile similar to existing, may be opportunity to lower profile.	Low-Shallow superstructure may provide additional vertical clearance.	Moderate - Tie girder will require special design.	High -Not expandable. Original design would have to account for future addition or add a third bridge.	Moderate - Requires future painting. Inspection will require special expertise. ($11)	Moderate-Two main river piers similar to existing. Mussel survey required for determination of impacts. Above-deck structure, potential for migratory bird impacts.	Moderate-One approach pier less than existing	Moderate - Larger Fnd's required due to heavier weight superstructure	Moderate - Construct on shifted alignment or use ABC to slide into existing alignment	High ($341/SF) ($625/SF) $103.8M
Steel Truss	**PC Concrete Beam**	**532 ft.**	**6**	**5**	Moderate-Steel fabrication & erection increases durations	Moderate-Some ABC opportunities for precast deck & launch, float or slide-in erection	Moderate - Construct on shifted alignment or use ABC to slide into existing alignment. Additional width necessary to accommodate Truss	Low-New profile similar to existing, may be opportunity to lower profile.	Low-Shallow superstructure may proved additional vertical clearance.	Moderate/High - Lower chord, tension diagonals and verticals will require special design for redundancy.	High -Not expandable. Original design would have to account for future addition or add a third bridge.	Moderate - Requires future painting. Inspection will be costly. ($10.7)	Moderate-Two main river piers similar to existing. Mussel survey required for determination of impacts. Above-deck structure, potential for migratory bird impacts.	Moderate-One approach pier less than existing	Moderate - Larger Fnd's required due to heavier weight superstructure	Moderate - Construct on shifted alignment or use ABC to slide into existing alignment	High ($361/SF) ($675/SF) $109.6M
Extradosed (2 Tower)	**PC Concrete Beam**	**500 ft.**	**5**	**4**	High-Complicated tower and super-structure erection	Moderate-Some ABC opportunities for precast concrete superstructure	Moderate/High - Construct on shifted alignment. Additional width necessary to accommodate stays	Moderate/High-Raise profile over 3 ft	Moderate-Requires raised profile to maintain clearance	Low - Concrete segments are pre-compressed and cables are redundant at each location.	High -Not expandable. Original design would have to account for future addition or add a third bridge.	Low - Concrete box girders require little maintenance. Inspection of cables and anchorages will require some special expertise. One cable replacement.	Moderate-Two main river piers similar to existing. Mussel survey required for determination of impacts. Above-deck structure, potential for migratory bird impacts.	Low-Two approach piers less than existing	Moderate/High - Significant Fnd's required	Moderate/High - Structure type must be constructed on shifted alignment impacting embankment	High ($510/SF) ($650/SF) $155.1M
Cable stayed (1 Tower)	**Steel Plate Girder**	**550 ft.**	**4**	**3**	High-Complicated tower and super-structure erection	Moderate-Some ABC opportunities for precast deck & modular superstructure erection	Moderate/High - Construct on shifted alignment. . Additional width necessary to accommodate stays	Moderate-Raise profile over 1-2 ft	Moderate-Requires raised profile to maintain clearance	Low- Floor system contains multiple members or is pre-compressed, and cables are redundant at each location.	High -Not expandable. Original design would have to account for future addition or add a third bridge.	Moderate/High - Inspection of cables and anchorages will require some special expertise. One cable replacement. ($13)	Moderate/High-One main river pier similar to existing. Mussel survey required for determination of impacts. Above-deck structure (> 100' tower), greater potential for migratory bird impacts.	Low-Two approach piers less than existing	Moderate/High - Significant Fnd's required	Moderate/High - Structure type must be constructed on shifted alignment impacting embankment	High ($611/SF) ($725/SF) $185.7M
Suspension	**None**	**800 ft**	**3**	**2**	High-Complicated tower , cabling & super-structure erection	High-Not applicable to ABC techniques	Moderate/High - Construct on shifted alignment.. Additional width necessary to accommodate cables and hangers	Moderate-Raise profile over 1-2 ft	Moderate-Requires raised profile to maintain clearance	Low - Cables are redundant at each location	High -Not expandable. Original design would have to account for future addition or add a third bridge.	Moderate - Inspection of cables and anchorages will require some special expertise. One Hanger replacement. ($10.7)	Moderate-One main river pier similar to existing. Mussel survey required for determination of impacts. Above-deck structure (entire length of structure), greater potential for migratory bird impacts.	Low-No approach piers	Moderate/High - Significant Fnd's required	Moderate/High - Structure type must be constructed on shifted alignment impacting embankment	High ($850/SF) ($850/SF) $258.3M

Bridge Type Evaluation Summary of Recommendations

Table provides recommendations for advancing alternatives which meet the project criteria based on selected issues and impacts.

Main Span Bridge Type	Approach Spans Bridge Type	River Span Length	No. of Spans	No. of Piers	Recommended Status *Final recommendation for bridge type being considered. Those advanced will be investigated further leading to a preferred structure type.*
Steel Plate Girder	Steel Plate Girder	344 ft.	6	5	**Advance as recommended alternative- Best meets the overall project criteria.** Alternative presents a low schedule risk, optimal construction flexibility, and easy accommodation of future expansion, simple foundations and the lowest cost. Moderate impacts for future maintenance can be mitigated though proper detailing and selection of materials such as unpainted weathering steel .
PC Spliced Concrete Beam	PC Concrete Beam	324 ft	7	6	Meets project criteria with some moderate impacts. Moderate complexity of alternative presents moderate schedule risk, limits global ABC techniques, huanched section will require profile rise to accommodate navigation clearance, requires more significant foundations but allows for easy future expansion at cost comparable to the lowest cost alternative. Moderate maintained impacts due to the higher number of bearings and joints in this system
Steel Box Girder	Steel Box Girder	344 ft.	6	5	Meets project criteria with some moderate impacts. Alternative presents a low schedule risk, good construction flexibility, and easy accommodation of future expansion, simple foundations but at a higher cost than the lowest cost alternative. Moderate impacts for future maintenance can be mitigated though proper detailing and selection of materials such as unpainted weathering steel .
Steel Delta Frame	Steel Plate Girder	250 ft	7	3	Generally meets project criteria but with moderate to high impacts. High complexity of structure type presents a significant risk to schedule, limits global ABC techniques, may not be able to meet waterway clearances, difficult accommodation of future expansion, complex foundations at a significantly higher cost than the lowest cost alternative.
Concrete Segmental	PC Concrete Beam	451 ft.	5	4	**Eliminate, Does Not Meet Project Criteria-**Alternative type cannot accommodate future expansion, limits global ABC techniques, requires complex foundations, and cost far exceeds the project budget.
Steel Tied Arch	PC Concrete Beam	532 ft.	6	5	**Eliminate, Does Not Meet Project Criteria-**Alternative type cannot accommodate future expansion, requires additional width to accommodate arch element and cost far exceeds the project budget.
Steel Truss	PC Concrete Beam	532 ft.	6	5	**Eliminate, Does Not Meet Project Criteria-**Alternative type cannot accommodate future expansion, requires additional width to accommodate truss element, present significant redundancy risks and cost far exceeds the project budget.
Extradosed (2 Tower)	PC Concrete Beam	500 ft.	5	4	**Eliminate, Does Not Meet Project Criteria-**Alternative presents significant schedule risk, requires significant profile grade rise, requires additional width to accommodate stay cables, cannot accommodate future expansion, requires complex foundations and cost far exceeds the project budget.
Cable stayed (1 Tower)	Steel Plate Girder	550 ft.	4	3	**Eliminate, Does Not Meet Project Criteria-**Alternative presents significant schedule risk, cannot accommodate future expansion, requires additional width to accommodate stay cables, requires complex foundations and cost far exceeds the project budget.
Suspension	None	800 ft	3	2	**Eliminate, Does Not Meet Project Criteria-**Alternative presents significant schedule risk, precludes global ABC techniques, cannot accommodate future expansion, requires additional width to accommodate suspension cables and hangers, requires complex foundations and cost far exceeds the project budget.



GENERAL PLAN

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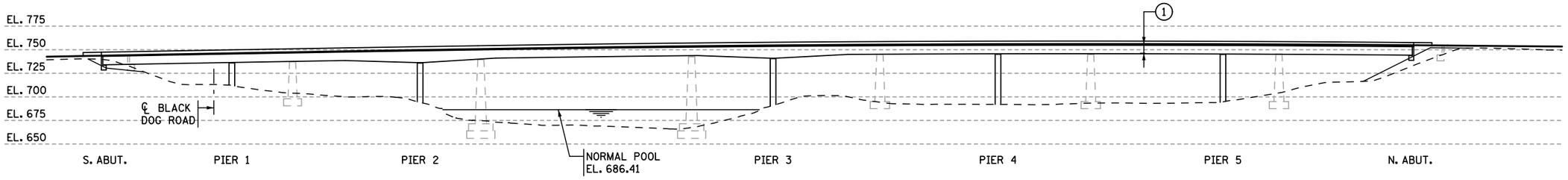

GENERAL ELEVATION

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NOTES:

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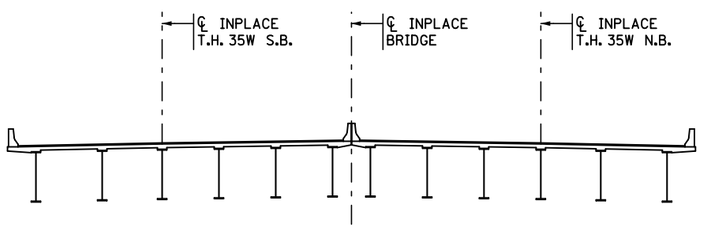
   14.0 FT. (AT ℄ PIERS 2 & 3)



INPLACE TRANSVERSE SECTION

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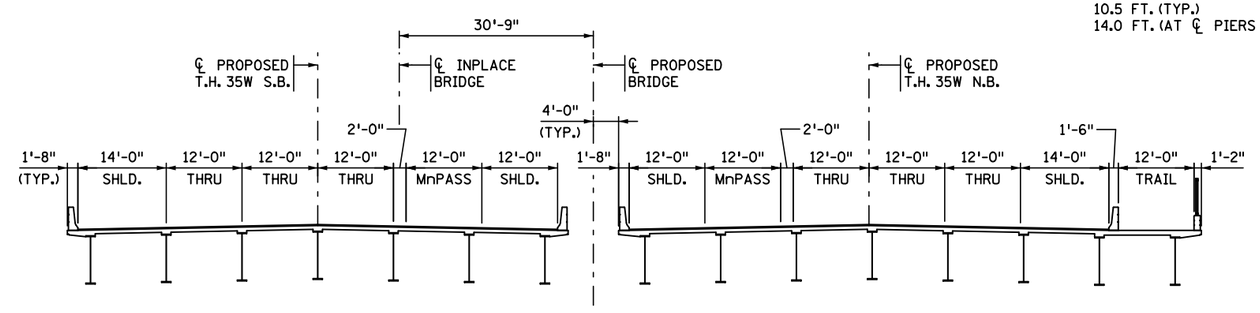

PROPOSED TRANSVERSE SECTION

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Page 3D

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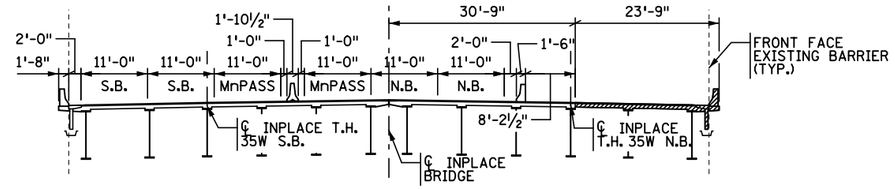
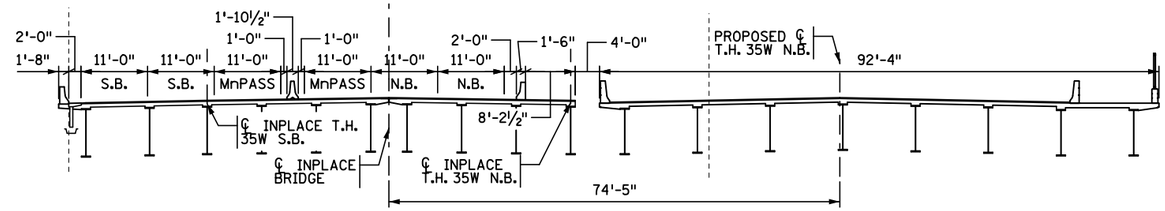
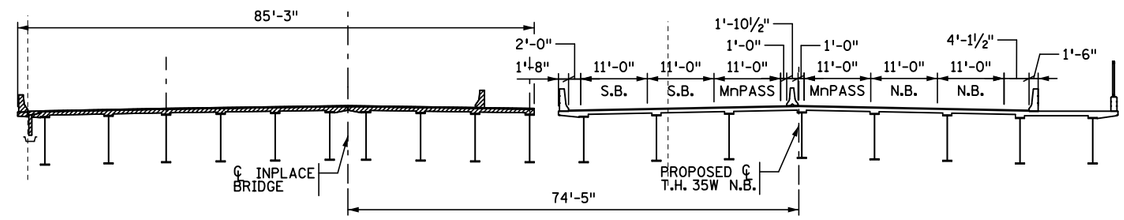
SHIFTED ALIGNMENT STAGING CONFIGURATION



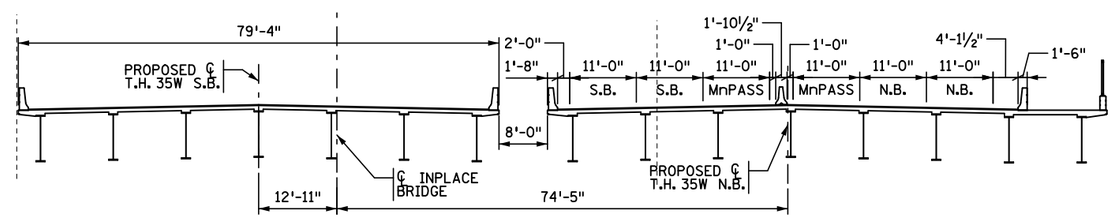
STAGE 1 - PARTIALLY REMOVE EXISTING STRUCTURE



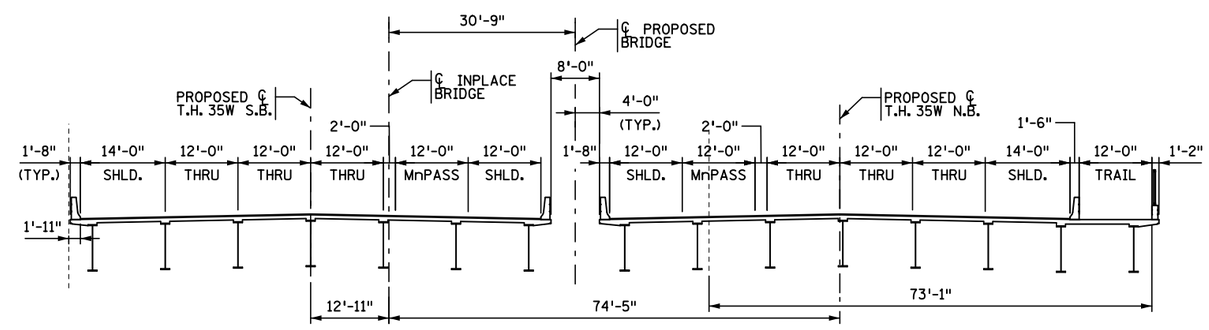
STAGE 2 - CONSTRUCT PROPOSED T.H. 35W N.B.



STAGE 3 - REMOVE REMAINING INPLACE STRUCTURE



STAGE 4 - CONSTRUCT PROPOSED T.H. 35W S.B.



STAGE 5 - PROPOSED CROSS SECTION

EDGE OF PAVEMENT OFFSET TABLE*		
STAGING OPTION	EDGE OF PAVEMENT LEFT (DIFFERENCE)	EDGE OF PAVEMENT RIGHT (DIFFERENCE)
EXISTING	52'-10" (0'-0")	52'-10" (0'-0")
TEMPORARY	-36'-5" (36'-5")	125'-11" (73'-1")
FINAL	50'-11" -(1'-11")	125'-11" (73'-1")

ALL DIMENSIONS TAKEN FROM ℄ OF EXISTING BRIDGE.
DIFFERENCE GIVEN IS DIFFERENCE FROM PROPOSED BRIDGE
EDGE OF PAVEMENT TO EXISTING BRIDGE EDGE OF PAVEMENT.
EDGE OF PAVEMENT TO EDGE OF PAVEMENT EXISTING BRIDGE = 108'-8"
EDGE OF PAVEMENT TO EDGE OF PAVEMENT PROPOSED BRIDGE = 167'-4"

*ROADWAY WIDTH IS ASSUMED TO BE THE SAME FOR ALL BRIDGE TYPES. FOR TRUSS, ARCH, CABLE STAY, EXTRADOSED, AND SUSPENSION TYPE BRIDGES AN ADDITIONAL 4' OF WIDTH ON EACH SIDE, 8' TOTAL, WILL BE REQUIRED TO ACCOMMODATE FOR CABLES, HANGERS, ETC.. THIS WOULD ALSO REQUIRE AN ADDITIONAL 8' OF ALIGNMENT SHIFT.

Plotted By: D006958B
Date Plotted: 04-JUN-2015
Time Plotted: 10:14:29 AM
Pen Table: MnDOT-1plot.pen
File Path: 648228.dgn

REVISION				
DATE	DESCRIPTION	DR.	CHK.	APPROVED

PARSONS

CERTIFIED BY _____ LICENSED PROFESSIONAL ENGINEER _____ DATE
NAME: LIC. NO.

TITLE: STAGGING CONFIGURATION STEEL PLATE GIRDER

DES: ASP DR: ASP APPROVED:
CHK: CHK:
SHEET NO. 1 OF 1 SHEETS

BRIDGE NO.

SECTION B- PRELIMINARY ENGINEERING CONSIDERATIONS FOR RECOMMENDED BRIDGE TYPE

The following section summarizes the concept evaluation of the recommended alternative steel plate girder structure for use in the preliminary engineering phase of the project. Detailed engineering analysis, refined concept evaluation and collaboration with other disciplines for each of these items will shape the final concept toward the development of the Preliminary Bridge Plan.

Geometrics and Deck: The bridges are on a tangent alignment with a mild vertical curve. Ramps at the south end of the bridge may require deck tapers to accommodate the final roadway geometry. Each structure will include three 12 foot general purpose through lanes, one 12 foot MnPASS lane with a 2 foot buffer zone. Both structures will include a 14 foot outside shoulder and a 12 foot inside shoulder (shoulder widths are assumed and being coordinated with Central Office Geometrics). The northbound bridge will include a 12 foot pedestrian/bike trail separated from traffic by a concrete barrier. Standard concrete barriers will be utilized with a concrete parapet and ornamental railing located on the northbound bridge trail. See "Exhibit 4-Type, Size & Location Plan" for more detailed information of geometrics and the bridge transverse section.

Clearances: The current geometrics provide ample vertical and lateral vehicular clearance at Black Dog Road and the DNR Trails. The following river navigation clearance will need to be maintained for the new bridge located at Mile 10.8 on the Minnesota River (See Exhibit 1, U.S. Coast Guard Memorandum dated June 1, 2015):

> *Minimum Horizontal Clearance:* 300.0 feet measured pier face to pier face or from the new right descending bank. During the construction phase, a minimum horizontal distance of 200.0 feet is required.
>
> *Minimum Vertical Clearance:* The navigation span must provide a minimum vertical clearance of 55.5 feet above normal pool elevation.

Aesthetics: Aesthetics for this bridge will be "Level B" and will be developed through the Visual Quality Planning Process and detailed in the Visual Quality Manual. For this study a traditional multi-column pier was used for estimating purposes.

Utilities: No major utilities are currently carried or identified to be carried on the structure. Roadway lighting and ITS conduits are expected to be included in the final design.

Deck and Drainage System: A standard MnDOT cast-in-place deck system and overlay is expected for this structure type. A full depth cast-in-place deck system with an epoxy overlay may also be a consideration for schedule optimization and/or durability. Storm water will be carried off the structure in a fully enclosed system and maintaining existing drainage patterns. Standard drainage scuppers on each side of the bridge deck(s) are anticipated utilizing with a fiber reinforced pipe (FRP) system to carry the water to the storm water system off the bridge.

Maintenance and Durability: The nature of the plate girder bridge type makes it very accessible for inspection and long term maintenance. An 8'-0" separation between the northbound and southbound structures will allow for an inspection "snooper" vehicle to access the undersides of each bridge. Additional considerations for long term maintenance and durability should include:

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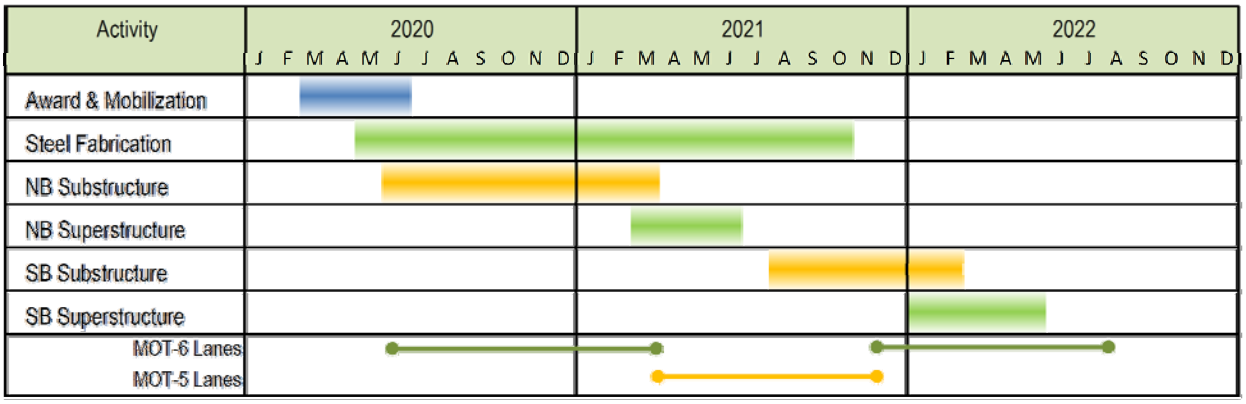
- Use of weathering steel to prevent corrosion and eliminate long term maintenance of painted bridge girders (MnDOT policy is to utilize MnDOT Spec. 3309 Gr. 50 Weathering steel, included in cost estimate).
- Additional “high-build” polyurethane or ethylene girder coatings at expansion joints.
- Minimize number of bridge joints of joint sizes, modular joints can lead to long-term maintenance issues.
- Use of stainless steel reinforcement in the bridge deck and select location in the substructures near expansion joints (MnDOT Policy may require the use of Stainless steel reinforcement for this structure due to its ADT, included in cost estimate).

Staging: In order to maintain maximum traffic capacity during the project, staged construction will be necessary. Based on shifting the alignment 30’-9” to the east, the northbound bridge can be constructed in its entirety with minor modifications to the existing bridge. Traffic can then be moved to the new northbound structure allowing for the demolition and construction of the southbound bridge (See Staging Configuration (Recommended Alternative)). This also confines the western limit of construction to remain within the existing bridge, limiting approach construction to the northbound lanes.

Other staging alternatives reviewed included a center alignment with approach improvements to both sides of the existing approaches. This alternative was not advanced due to the added complexity of constructing parts of the northbound and southbound structure on each side of the existing bridge simultaneously, switching traffic to each new bridge and then constructing the remainder of the bridge in between the previously constructed spans. This approach also decreased durability due to the necessary deck closures between the construction phases, which historically have shown poor long-term performance.

Construction Schedule: Based on a detailed evaluation of construction activities, standard construction practices, traditional manpower resources and environmental constraints the expected construction duration is approximately 27 months. Optimal project start dates is spring 2020 with expected completion occurring in summer 2022.



Schedule notes:

1. Constraints include limited river pier construction activity from June to July due to high water and no deck construction from October 15 to April 15.
2. The erection of the NB superstructure is controlled by steel delivery, potential schedule savings from early steel contract is approximately 90 days.

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3. MOT shown is based on staged construction scheme of the shifted alignment and partial removal of existing NB bridge to allow substructure construction. Hammerhead piers may reduce the MOT impacts 150 days by constructing piers under exiting NB bridge ahead of abutment and superstructure construction.
4. Schedule represents a Baseline with no accelerated bridge construction techniques assumed for this analyses.

Geotechnical: Rock is relatively deep at the site (70-100 ft below existing ground) with piers expected to be supported on pile footings. Friction type MnDOT CIP-piles may be optimal for the approach piers while larger diameter pipe piles founded on rock may be the most economical for the main river piers for the higher vertical loads, desire for more compact footing size and design requirements for vessel impact. The site is also applicable to large diameter drilled shaft foundations and should be considered in the foundation recommendations. Minor scour of the existing structure has been reported and long term scour on the replacement bridge will need to be considered in the design.

Hydraulics: Summary of known hydraulic data is:

River Elevation Data:

- The 2% flow line elevation is 704.582 NAVD88 (stage duration at the Savage Gage minus slope to the bridge).
- 100 year flood is 715.382 NAVD88

Flood Categories (Elev. in feet)

Major Flood Stage:	712.0
Moderate Flood Stage:	710.0
Flood Stage:	702.0
Action Stage:	697.0

River Crest Data (Past 20 years, Elev in Ft):

Max:	715.2 on 4/13/1997
Min:	693.9 on 7/15/2004
Average:	704.0 in Late May/Early June

Constructability: Special constructability considerations for this bridge type and site are:

- The existing post-tensioned “hammer-head” pier cap may need to remain in place during the northbound superstructure construction requiring the new girders to clear the cap during erection. Profile grade, and structure depth will need to be reviewed. Partial removal of the post-tensioned cap will be difficult due to the post-tensioned tendons. The tendons are which will mitigate the impacts but external shoring may be still be required.
- Pier footings should be strategically located to avoid conflicts with the existing piers and minimize in-river work. However due to the proximity to the river bank and water levels, the main span pier footings are expect to be deep and require a significant cofferdam system. The approach piers present a similar issue due to the proximity to the low ground level and existing pond system.
- Existing bridge shall be removed completely upon completion of the project. All piers shall be removed to an elevation at least to 672.8 NAVD88.
- Flooding presents a recurring risk on the project. Annual river crests can be expected to impact foundation construction for 2-3 weeks per season. Mitigation for this impact may include installation of temporary causeways and coffer sheets around the land based piers.

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River pier cofferdams should be constructed to a level that allows operations to continue during moderate flood stages.

- Access will need to be reviewed with the potential need to temporarily fill in the existing ponds or allow causeways for access for pier construction and girder erection. Maintaining navigational clearance in the river during construction will also be considerations for any temporary supports (See Clearances)

Construction Costs: A refined cost analysis commensurate with the level of this conceptual type study was performed (See Exhibit 2). Basic construction elements were quantified based on engineering analysis, previous experience and industry standards. Average unit costs were applied to these quantities and modified if necessary based on complexity of the work. For this baseline cost estimate, traditional construction and contract methods were assumed without inclusion of any Accelerated Bridge Construction techniques. Data is provided in 2020 dollars without any additional risk contingencies added.

Total Const. Cost (2020 $'s)	$55,900,000
Cost per Square Foot of Bridge:	$236 /SF

Accelerated Bridge Construction: When project costs are evaluated as both the cost of construction and user costs (measured as delays due to construction), Accelerated Bridge Construction (ABC) approaches to reduce schedule and user costs can be evaluated against the increased construction costs of these approaches. ABC approaches include the evaluation of design type, materials selection and construction methods to reduce the onsite construction time. ABC techniques include global construction methods such as slide-in, float-in and launching as well design and material selection such as prefabricated bridge elements and systems such as precast concrete substructure and deck panels. Evaluation of ABC techniques and elements should be considered where project challenges exist or benefits can be achieved for the following needs:

- Increased safety
- Minimized traffic disruption
- Improved quality
- Reduced environmental impacts

Contracting methods can also be used as an ABC approach to reduce schedule with relative increases to construction costs. Methods include:

- Early procurement contracts for long lead items (such as steel bridge girders)
- A+B contracts which quantifies user costs in days bid.
- Lane Rentals which quantifies user costs in lane closure durations bid.
- Locked Incentive Dates (LID) which incentivizes the contractor based on a set completion date.

Exhibit 3 summarizes the review of ABC opportunities and user cost/benefits. Based on our review, recommendations for further consideration include:

Bridge Slide-Construct Bridge and Slide into Place: Reduces user impacts by a year due by delaying impacts to the existing bridge. Hammerhead substructure would be constructed under the bridge deck with the new while the northbound bridge is constructed and decked. Traffic impacts would due to partial removal of the existing bridge just prior to sliding the bridge into position (See Staging Configuration Exhibit 3A).

Impact Reduction=365 days Cost Impact=$4.5M User Cost Value=$12,300/day

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Prefabricated Elements-Precast Concrete Substructures: Alternative has the potential to reduce substructure construction durations however benefits are potentially offset by cost and duration to set up a precast plant, winter impacts to erection & grouting operations and durability concerns of segmented joints within a river flood zone.

Impact Reduction=90 days Cost Impact=$1.5M User Cost Value=$16,600/day

Prefabricated Elements-Decking Systems: Alternative benefits project by accelerating construction of the deck which is critical due to the October to April construction constraint. Deck system must be carefully selected to realize schedule benefits and ensure durability.

Impact Reduction= 30 days Cost Impact=$1.2M User Cost Value=$3,300/day

Alternative Substructure-Post Tensioned Hammerhead Piers: Alternative allows for the construction of the piers under the existing bridge delaying traffic impacts until superstructure construction starts (See Exhibit 3B)

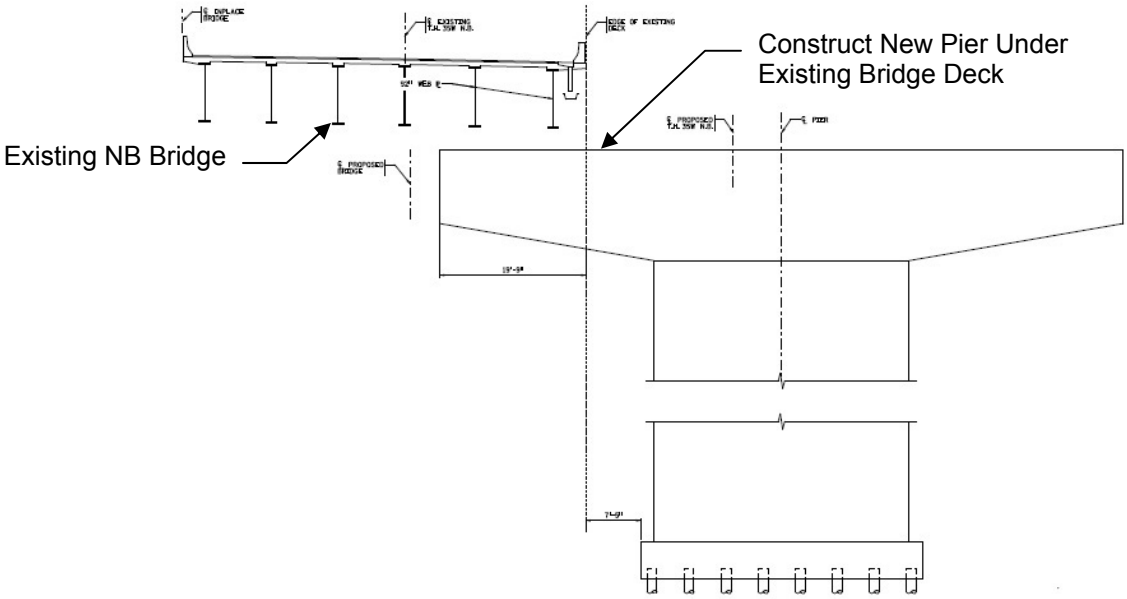
Impact Reduction= 185 days Cost Impact=$0.9M User Cost Value=$4,900/day

Alternative Contracting Methods-Early Steel Contract: Reduces overall schedule by allowing the fabrication of the steel girder to start early. Impacts are not significant on this project due to the anticipated duration of substructure construction. While user costs are, this alternative is recommend since user cost value may be reduced if greater schedule savings can be realized.

Impact Reduction= 90 days Cost Impact=$1.5M User Cost Value=$16,700/day

Alternative Contracting Methods-LID/A+B/Lane rental: Target a shorted construction schedule by quantifying user costs through competitive bidding process. Incentive must be enough to offset Contractors costs for schedule benefits to be realized.

Impact Reduction= 140 days Cost Impact=$1.7M User Cost Value=$11,300/day



Post-Tensioned Hammerhead Pier Concept

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Exhibit 1

U.S. Department of Homeland Security
United States Coast Guard

Commander
Eighth Coast Guard District

1222 Spruce Street, Room 2.102D
St. Louis, MO 63103-2832
Staff Symbol: dwb
Phone: (314)269--2378
Fax: (314)269-2737
Email: david.a.orzechowski@uscg.mil
www.uscg.mil/d8/westerriversbridges

16591.1/10.8 MIN
June 1, 2015

Mr. Daniel T. Prather, P.E.
Acting Preliminary Bridge Plans Engineer
Minnesota Department of Transportation
3485 Hadley Avenue North
Oakdale, MN 55128

Subj: PROPOSED LYNDALE AVENUE (I-35W) BRIDGE REPLACEMENT, MILE 10.8, MINNESOTA RIVER

Dear Mr. Prather:

This is in reply to your email dated May 11, 2015, concerning the proposed pier locations and minimum horizontal requirements for a new bridge at Mile 10.8, Minnesota River.

The Coast Guard has determined for a replacement bridge a minimum horizontal clearance of 300.0 feet shall be provided. The new right descending pier be located at the bank and the left descending pier be located a distance of 300.0 feet measured pier face to pier face. The navigation span must provide a minimum vertical clearance of 55.5 feet above normal pool elevation 687.2 m.s.l. measured normal to axis of the navigation channel. These clearances would satisfy the reasonable needs of navigation for a replacement bridge at this location. During the construction phase, a minimum horizontal distance of 200.0 feet is required.

If there are any questions about our requirements, please contact Mr. David Orzechowski at the above telephone number.

Sincerely,

ERIC A. WASHBURN
Bridge Administrator, Western Rivers
By direction of the District Commander

Minnesota River Bridge Replacement Project,

State Project Number: 1981-124
MnDOT Contract 05986
August 5, 2015

I-35W over Minnesota RiverBridges

SUMMARY

Concept Level Construction Cost Estimate

	NB Bridge	SB Bridge	Total
Approx. Deck Area=	126,289	110,604	236,894
SUPERSTRUCTURE			
Sub Total Superstructure	$20,906,000	$17,990,000	$38,896,000
Cost/Sq Ft=	$166	$163	$164
SUBSTRUCTURE			
Sub Total Substructure	$9,102,000	$7,828,000	$16,930,000
Cost/Sq Ft=	$72	$71	$71
TOTAL			
Total	**$30,008,000**	**$25,818,000**	**$55,826,000**
Cost/Sq Ft=	**$238**	**$233**	**$236**

Cost in 2020 $'s

Minnesota River Bridge Replacement Project,

State Project Number: 1981-124
MnDOT Contract 05986
August 5, 2015

North Bound Bridge

Concept Level Construction Cost Estimate

Approx. Deck Area= 126,289

Description	Unit		Total Quantity	Unit Price	Total Amount
SUPERSTRUCTURE					
RAILING CONCRETE (3Y46)	LF	LIN FT	4,329	$101.00	$437,000
REINFORCEMENT BARS (EPOXY COATED)	LB	POUND	77,922	$1.25	$97,000
REINFORCEMENT BARS (STAINLESS STEEL)	LB	POUND	757,636	$3.65	$2,765,000
BRIDGE SLAB CONCRETE (3YJMHP)	SF	SQ FT	126,289	$17.50	$2,210,000
STRUCTURAL STEEL (3309)	LB	POUND	6,881,840	$1.95	$13,420,000
ORNAMENTAL METAL RAILING TYPE SPECIAL	LF	LIN FT	1,443	$185.00	$267,000
BEARING ASSEMBLY	EA	EACH	24	$1,250.00	$30,000
DRAINAGE SYSTEM BRIDGE DECK	LS	LUMP SUM	1	$309,000.00	$309,000
POT-TYPE BEARING ASSEMBLY	EA	EACH	32	$14,200.00	$454,000
MODULAR BRIDGE JOINT SYSTEM, TYPE 9	LF	LIN FT	181	$2,050.00	$372,000
CONCRETE WEARING COURSE (3U17A)	SF	SQ FT	121,122	$4.50	$545,000
				Sub Total Superstructure	$20,906,000
				Cost/Sq Ft=	$166
SUBSTRUCTURE					
REINFORCEMENT BARS	LB	POUND	247,175	$1.10	$272,000
REINFORCEMENT BARS (EPOXY COATED)	LB	POUND	1,383,001	$1.29	$1,784,000
FOUNDATION PREPARATION PIER 2	LS	LUMP SUM	1	$590,000.00	$590,000
FOUNDATION PREPARATION PIER 3	LS	LUMP SUM	1	$255,000.00	$255,000
STRUCTURAL CONCRETE (1AJM)	CY	CU YD	2,983	$435.00	$1,297,000
STRUCTURAL CONCRETE (3YJM)	CY	CU YD	3,979	$590.00	$2,347,000
CIP PILING DELIVERED	LF	LIN FT	36,020	$62.00	$2,233,000
CIP -PILING DRIVEN	LF	LIN FT	36,020	$9.00	$324,000
				Sub Total Substructure	$9,102,000
				Cost/Sq Ft=	$72

		Total	**$30,008,000**
	Cost in 2020 $'s	**Cost/Sq Ft=**	**$238**

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Minnesota River Bridge Replacement Project,

State Project Number: 1981-124
MnDOT Contract 05986
August 5, 2015

South Bound Bridge

Concept Level Construction Cost Estimate

Approx. Deck Area= 110,604

Description	Unit		Total Quantity	Unit Price	Total Amount
SUPERSTRUCTURE					
RAILING CONCRETE (3Y46)	LF	LIN FT	2,886	$101.00	$291,000
REINFORCEMENT BARS (EPOXY COATED)	LB	POUND	51,948	$1.25	$65,000
REINFORCEMENT BARS (STAINLESS STEEL)	LB	POUND	663,534	$3.65	$2,422,000
BRIDGE SLAB CONCRETE (3YJMHP)	SF	SQ FT	110,604	$17.50	$1,936,000
STRUCTURAL STEEL (3309)	LB	POUND	6,021,610	$1.95	$11,742,000
ORNAMENTAL METAL RAILING TYPE SPECIAL	LF	LIN FT	0	$185.00	$0
BEARING ASSEMBLY	EA	EACH	21	$1,250.00	$26,000
DRAINAGE SYSTEM BRIDGE DECK	LS	LUMP SUM	1	$309,000.00	$309,000
POT-TYPE BEARING ASSEMBLY	EA	EACH	28	$14,200.00	$398,000
MODULAR BRIDGE JOINT SYSTEM, TYPE 9	LF	LIN FT	159	$2,050.00	$326,000
CONCRETE WEARING COURSE (3U17A)	SF	SQ FT	105,504	$4.50	$475,000
				Sub Total Superstructure	$17,990,000
				Cost/Sq Ft=	$163
SUBSTRUCTURE					
REINFORCEMENT BARS	LB	POUND	213,702	$1.10	$235,000
REINFORCEMENT BARS (EPOXY COATED)	LB	POUND	1,184,622	$1.29	$1,528,000
FOUNDATION PREPARATION PIER 2	LS	LUMP SUM	1	$590,000.00	$590,000
FOUNDATION PREPARATION PIER 3	LS	LUMP SUM	1	$255,000.00	$255,000
STRUCTURAL CONCRETE (1AJM)	CY	CU YD	2,569	$435.00	$1,118,000
STRUCTURAL CONCRETE (3YJM)	CY	CU YD	3,434	$590.00	$2,026,000
CIP PILING DELIVERED	LF	LIN FT	29,240	$62.00	$1,813,000
CIP -PILING DRIVEN	LF	LIN FT	29,240	$9.00	$263,000
				Sub Total Substructure	$7,828,000
				Cost/Sq Ft=	$71

		Total	**$25,818,000**
	Cost in 2020 $'s	**Cost/Sq Ft=**	**$233**

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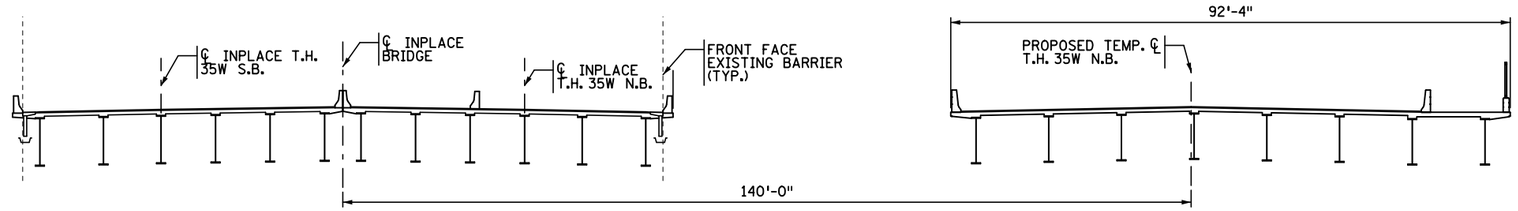
ABC Description	Benefit/Need	Risks/Impacts	User Impact Reduction(1)	Potential Cost Impact	Relative User Cost (2)	Recommendation
Bridge Slide (existing) • Construct temporary supports • Slide existing bridge onto supports • Construct new bridge in final location.	Reduces schedule and minimizes traffic disruption by relocating existing bridge allowing for the construction of NB and NB bridges at the same time.	• Existing bridge is poor candidate for move & vulnerable to damage. • Limited site space to accommodate full move. • Increase cost with limited overall schedule savings.	825 Days	$6,000,000	$7,300/day	Not Applicable-Significant safety risk to move bridge due to structure configuration.
Bridge Slide (new) • Construct full NB superstructure on temporary supports while constructing NB substructure. • Slide new superstructure onto substructure.	Reduces schedule by 5-6 months and possibly by allowing operations to overlap rather than follow sequentially.	• Requires separate steel contract 5-6 months early. • Increases cost associated with temporary supports and move. • Significant structure has inherent risks to long term durability during move	365 Days	$4,500,000	$12,300/day	Limited Applicability -Other, less costly prefabricated element systems may achieve similar schedule reductions at less cost and risk.
Launching • Construct NB girders on grade south of bridge while constructing NB substructure. • Launch new superstructure onto substructure	Reduces environmental impacts with “top-down” type construction; provides small schedule benefits due to overlapping construction operations	• Requires separate steel contract 5-6 months early. • Increased cost associated with launch. • Deck system must be placed after launch minimizing schedule saving.	65 Days	$2,000,000	$30,800/day	Not Applicable -No significant environmental constraints identified warranting additional cost associated with launching.
Float-In • Build main span on shore while constructing substructure. • Float in main span segment and lift/set into place.	Minimizes river traffic impacts during construction to one closure period.	• No significant risks or impacts identified.	30 Days	$500,000	$16,700/day	Not Applicable -Method applicable to contractor’s means and methods vs. traditional barge and crane operations.
Prefabricated Elements • Precast Concrete Substructure	Reduces schedule due to faster construction of piers.	• Schedule reductions offset by precast plant set up and winter impacts to erection & grouting operations • Reduced durability due to submerged segment joints.	90 days	$1,500,000	$16,600/day	Limited Applicability-Review during next phase of project for opportunities such as precast pier caps and abutments.
Prefabricated Elements • Ultra High Performance Concrete (UHPC) precast full depth deck panel system	Reduces schedule due to faster construction of deck system.	• Reduced durability due to multiple joints in UHPC • Panel joint closures increased risk for cold weather operations. • UHPC increases costs over conventional deck system.	15 days	$600,000	$40,000/day	Not Applicable-No significant schedule savings achieved for increased durability risk and increased cost to project.
Prefabricated Elements • Full depth post-tensioned (FDPT) precast deck panel system	Reduces schedule due to faster construction of deck system.	• Post-Tensioning system increases risk for cold weather operations due to grouting. • Post-Tensioning increases cost of system over conventional deck system • Post-Tensioning increase structural steel demand due to long term losses.	5 days	$1,200,000	$240,000/day	Not Applicable-No significant schedule savings achieved for increased cost to project.

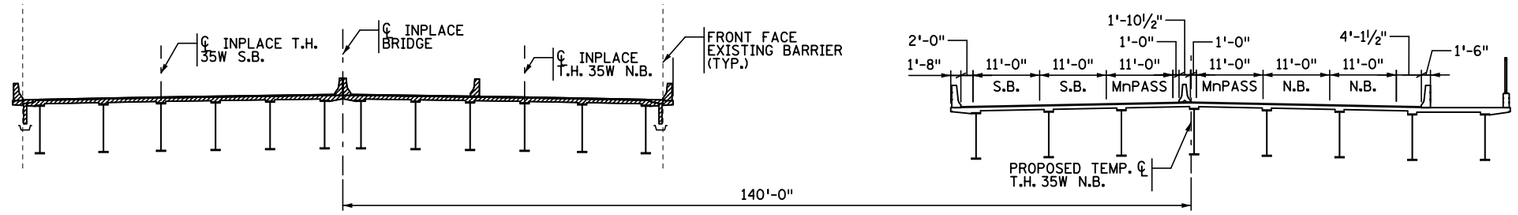
Prefabricated Elements • Partial depth precast deck panel system	Reduces schedule due to faster construction of deck system. Reduces cost by eliminating traditional form removal cost.	• Potential for reflective cracking of deck system above partial depth deck panels.	30 days	-$520,000	Net benefit	Limited Applicability -Review applicability of systems during next phase of project for opportunities due to schedule.
Prefabricated Elements • Stay-In-Place (SIP) metal deck form system	Reduces schedule due to faster construction of deck system. Reduces cost by eliminating traditional form removal cost.	• SIP system impedes maintenance inspections. Removing SIP forms negates cost savings and reduces schedule savings.	30 days	-$520,000	Net benefit	Limited Applicability -Review applicability of systems during next phase of project for opportunities due to schedule.
Alternative Substructures • Post-Tensioned Hammerhead Piers (See Exhibit 3B)	Reduces user impacts by allowing the construction of the NB bridge piers under the existing structure and delaying impacts to traffic.	• Increased construction cost due to working under existing structure and complicated post-tensioned pier caps.	185 days	$900,000	$4,900/day	Applicable-Proceed with review of alternative in preliminary engineering.
Alternative Contracting Methods • Early Steel Contract	Reduces schedule by taking a long lead procurement item off the critical path	• Schedule reduction are minor due to significant pier construction duration.	90 days	$1,500,000	$16,700/day	Limited Applicability –Durations of pier construction reduces significant schedule savings.
Alternative Contracting Methods • LID • A+B • Lane Rentals	Reduces schedule by quantifying user costs through competitive bidding process.	• Incentive/disincentive costs need to be of high enough value to ensure added construction costs are offset.	140 days	$1,650,000	$11,300/day	Limited Applicability –Department to review cost and determine value.

(1) Impacts measured in increase or decrease in traffic impacts based on traditional staged construction of 29 months (885 calendar days).
(2) Daily Road User Cost is $155,000/day based on ADT of 106,000, HCADT 8,480, Detour of 10 miles and travel cost of $0.42/mile

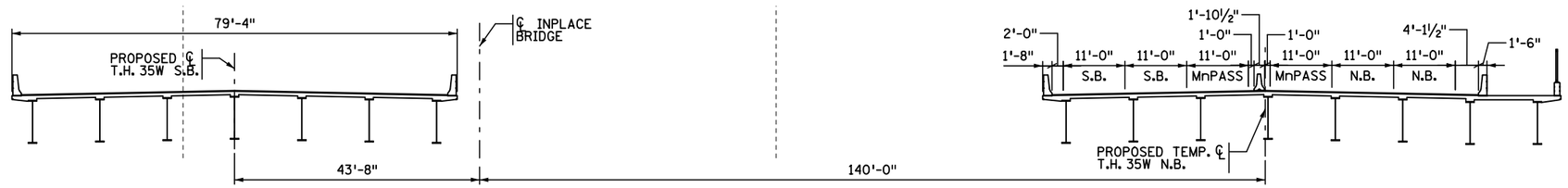
ORIGINAL ALIGNMENT - SLIDE NEW BRIDGE STAGING CONFIGURATION



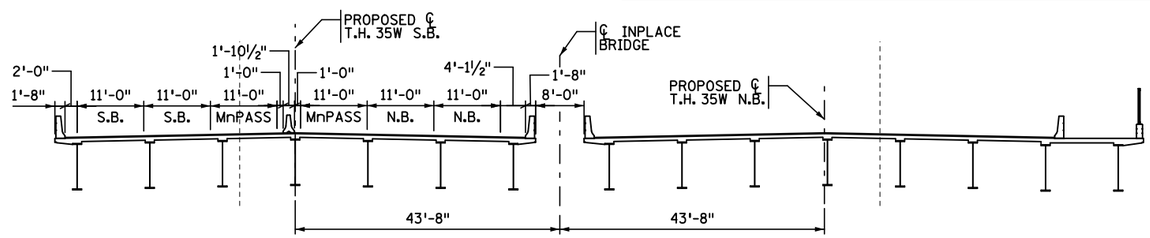
STAGE 1 - CONSTRUCT PROPOSED T.H. 35W N.B. ON TEMPORARY SUB STRUCTURES



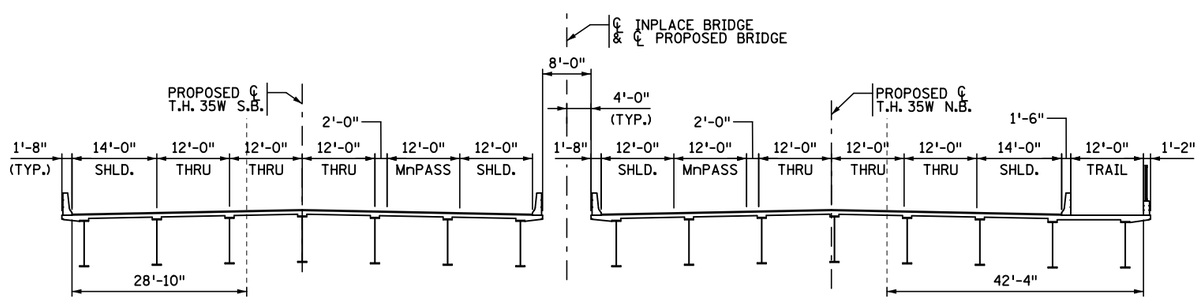
STAGE 2 - REMOVE ALL OF EXISTING STRUCTURE



STAGE 3 - CONSTRUCT T.H. 35W S.B., AND N.B. SUB STRUCTURES



STAGE 4 - SLIDE PROPOSED T.H. 35W N.B. TO FINAL POSITION



STAGE 5 - PROPOSED CROSS SECTION

EDGE OF PAVEMENT OFFSET TABLE		
STAGING OPTION	EDGE OF PAVEMENT LEFT (DIFFERENCE)	EDGE OF PAVEMENT RIGHT (DIFFERENCE)
EXISTING	52'-10" (0'-0")	52'-10" (0'-0")
TEMPORARY	-102'-0" -(102'-0")	191'-6"" (138'-8")
FINAL	81'-8" (28'-10")	95'-2" (42'-4")

ALL DIMENSIONS TAKEN FROM ℄ OF EXISTING BRIDGE.
DIFFERENCE GIVEN IS DIFFERENCE FROM PROPOSED BRIDGE EDGE OF PAVEMENT TO EXISTING BRIDGE EDGE OF PAVEMENT.
EDGE OF PAVEMENT TO EDGE OF PAVEMENT EXISTING BRIDGE = 108'-8"
EDGE OF PAVEMENT TO EDGE OF PAVEMENT PROPOSED BRIDGE = 167'-4"

Exhibit 3A

Plotted By: p0069958B
Date Plotted: 20-MAY-2015
Time Plotted: 11:29:18 AM
Pen Table: MnDOT-1plot.pen
File Path: 648228.dgn

REVISION				
DATE	DESCRIPTION	DR.	CHK.	APPROVED

PARSONS

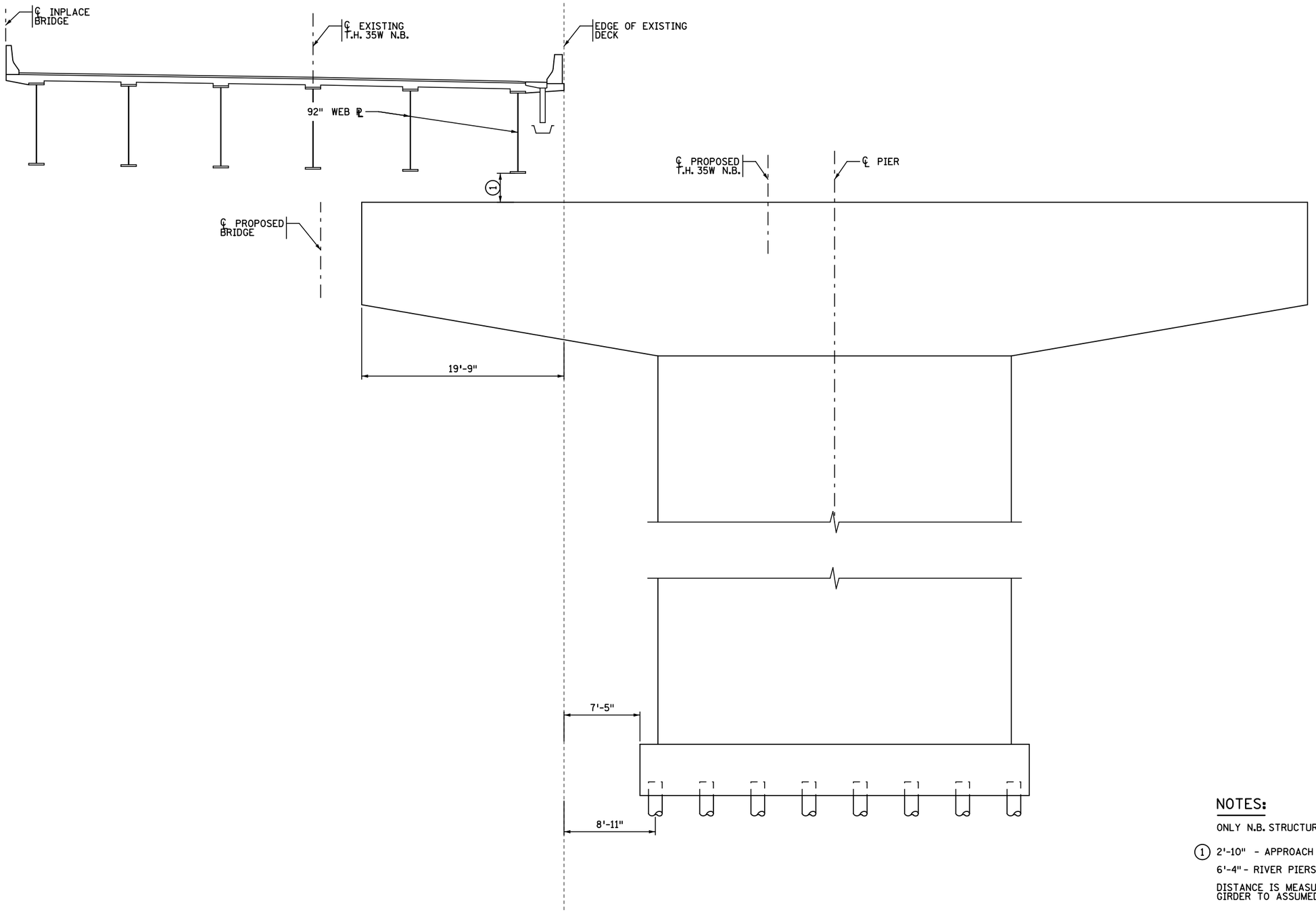
CERTIFIED BY _____ LICENSED PROFESSIONAL ENGINEER _____ DATE
NAME: LIC. NO.

TITLE:

DES: DR: CHK: CHK: APPROVED:
SHEET NO. OF SHEETS

BRIDGE NO.

Exhibit 3B



NOTES:

ONLY N.B. STRUCTURES SHOWN

(1) 2'-10" - APPROACH PIERS

6'-4" - RIVER PIERS

DISTANCE IS MEASURED FROM THE BOTTOM OF EXISTING LOW GIRDER TO ASSUMED TOP OF PROPOSED PIER CAPS.

Plotted By: p006958B
Date Plotted: 05-AUG-2015
Time Plotted: 12:06:49 PM
Pen Table: MnDOT-iplot.pen
File Path: 648228.dgn

REVISION				
DATE	DESCRIPTION	DR.	CHK.	APPROVED

PARSONS

CERTIFIED BY _____ LICENSED PROFESSIONAL ENGINEER _____ DATE

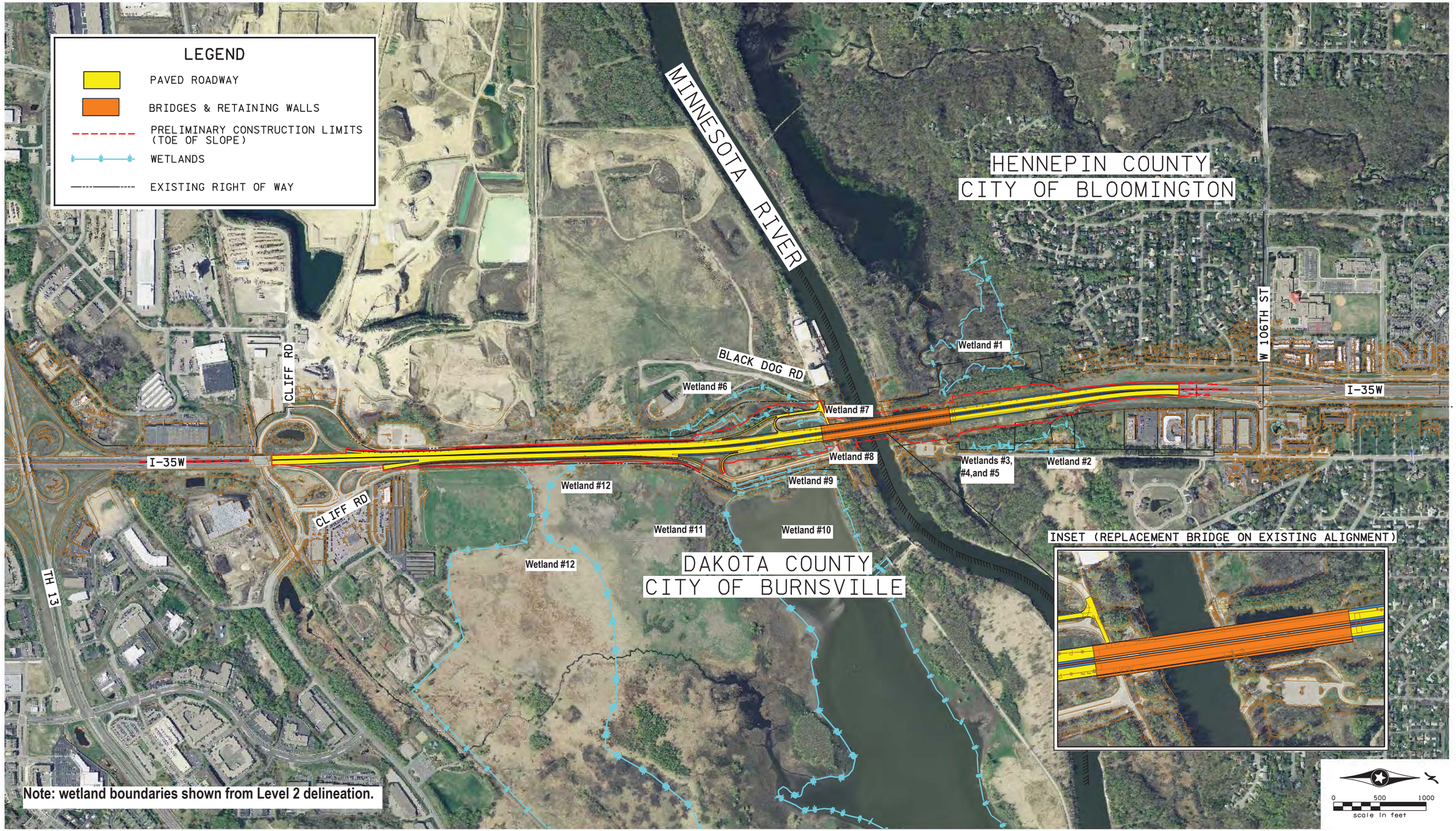
NAME: LIC. NO.

TITLE:

DES:	DR:	APPROVED:	BRIDGE NO.
CHK:	CHK:		
SHEET NO.	OF	SHEETS	

Appendix C

Alignment Alternatives Figures



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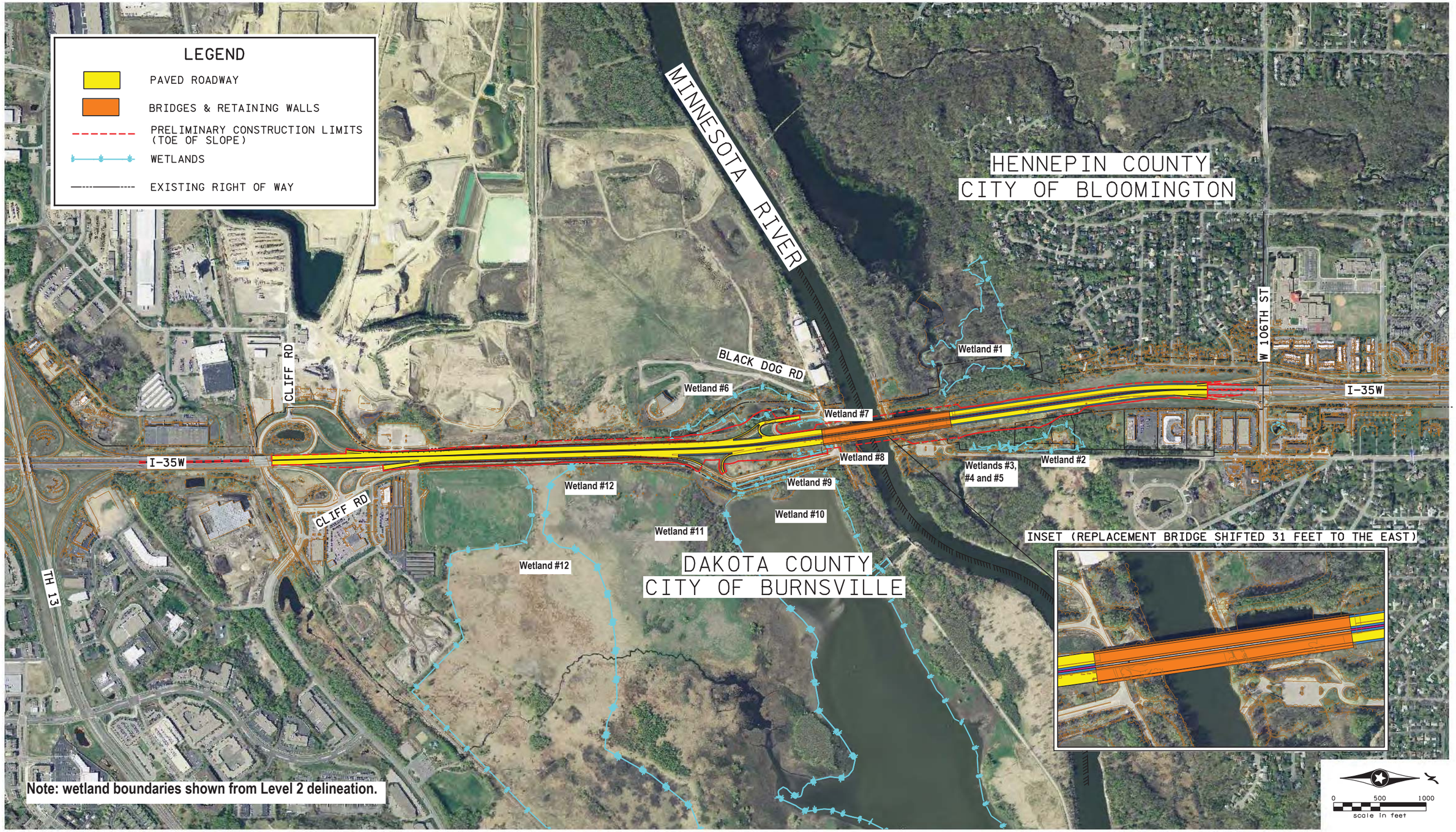
SRF Consulting Group, Inc.

Job #8600
11/19/2015

On Existing Alignment Alternative

I-35W Bridge over the Minnesota River
SP 1981-124
Minnesota Department of Transportation

Figure C1



H:\Projects\8600\CAD_BIM\Graphics\EA\8600_optionb.dgn

SRF Consulting Group, Inc.

Job #8600
11/19/2015

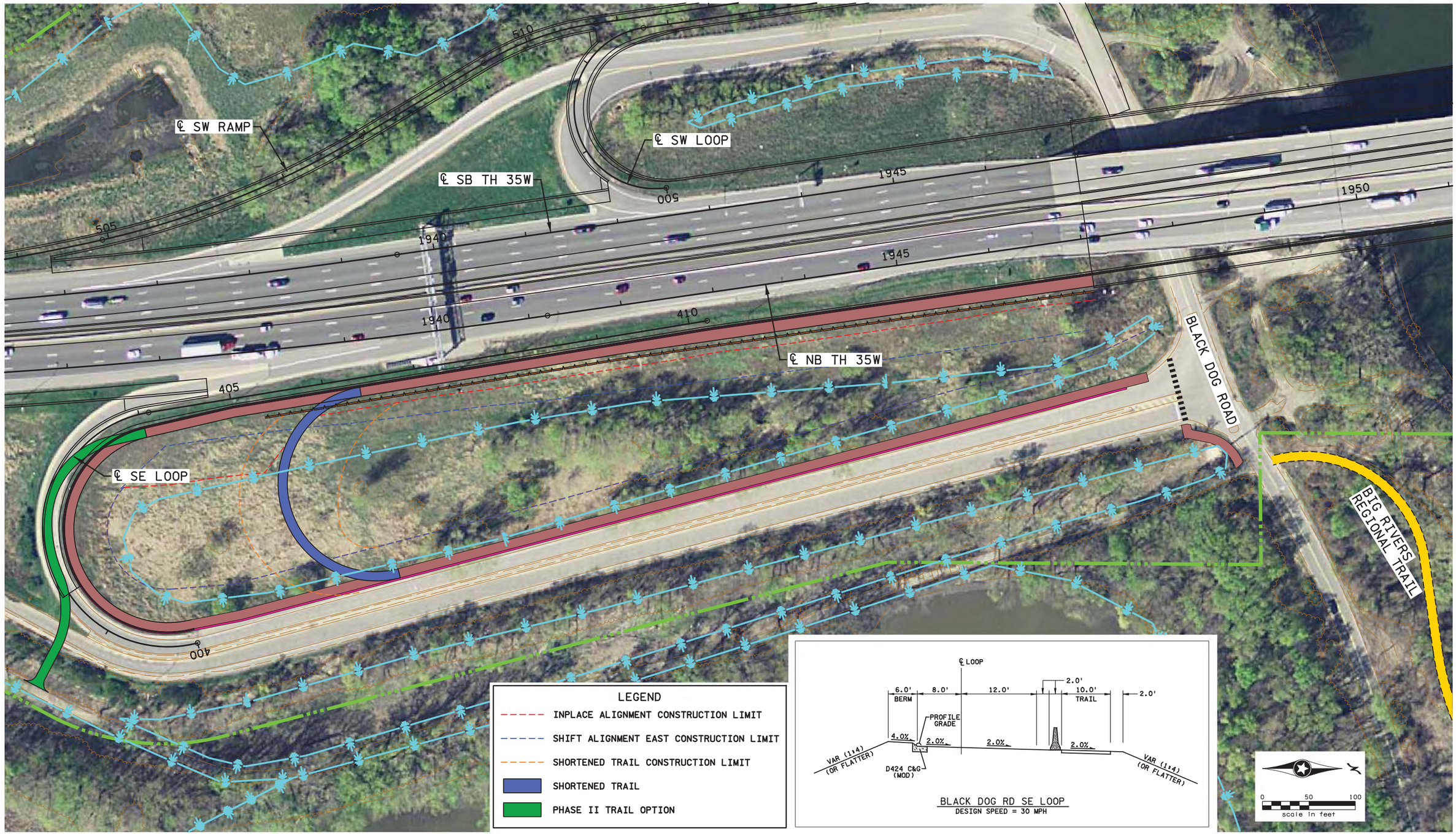
East Shifted Alignment Alternative

I-35W Bridge over the Minnesota River
SP 1981-124
Minnesota Department of Transportation

Figure C2

Appendix D

Trail Connection Options



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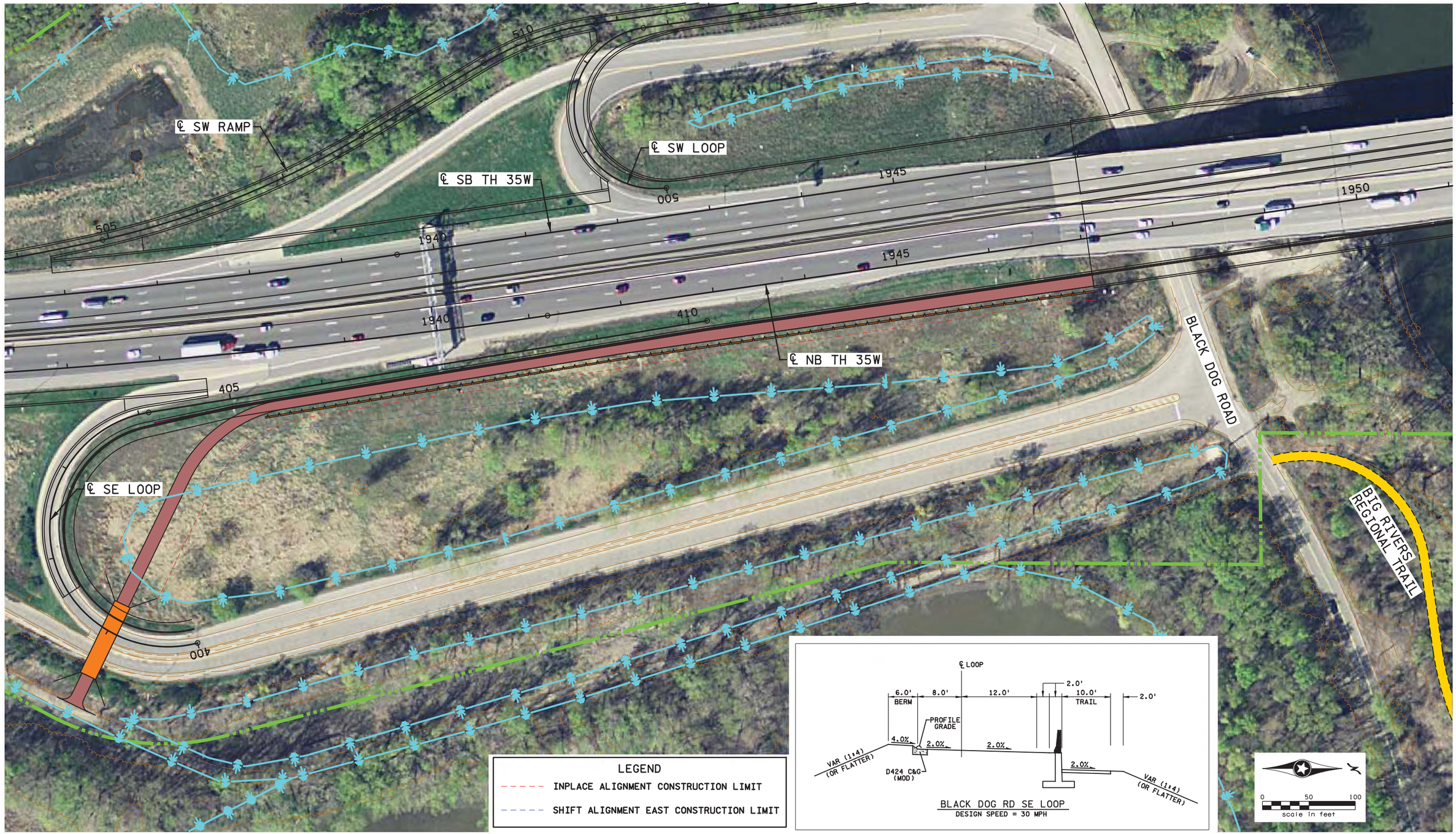
SRF Consulting Group, Inc.

Job #8600
7/7/2015

Southeast Trail Connection Option 1 - Trail Follows Ramp

I-35W Minnesota River Bridge Project
Burnsville, MN

Figure D.1



H:\Projects\8600\CAD_BIM\Graphics\8600_South Trail_2.dgn

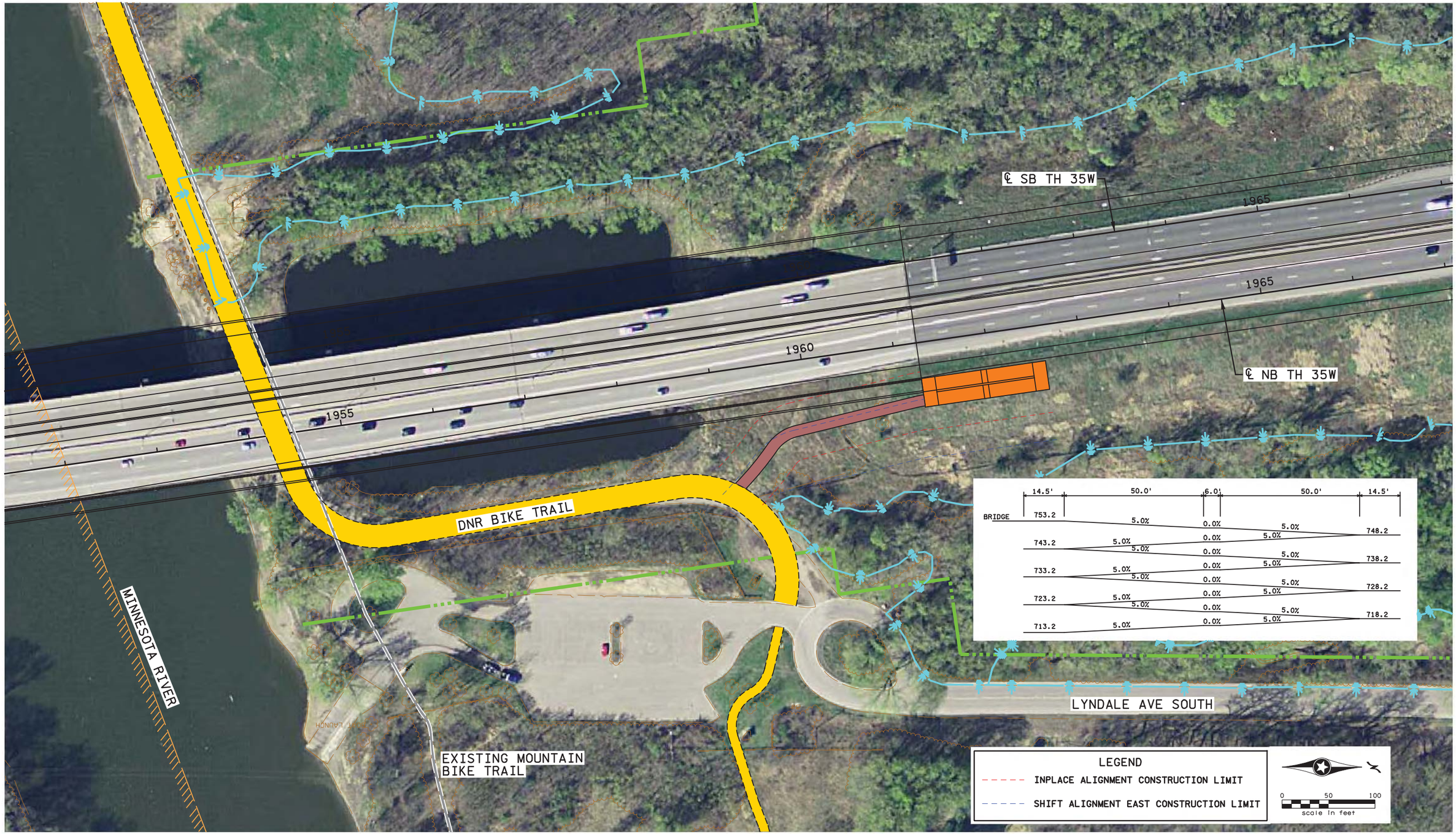
SRF Consulting Group, Inc.

Job #8600
7/6/2015

Southeast Trail Connection Option 2 - Trail Under Ramps

I-35W Minnesota River Bridge Project
Burnsville, MN

Figure D.2



H:\Projects\8600\CAD_BIM\Graphics\8600_North Trail_1.dgn

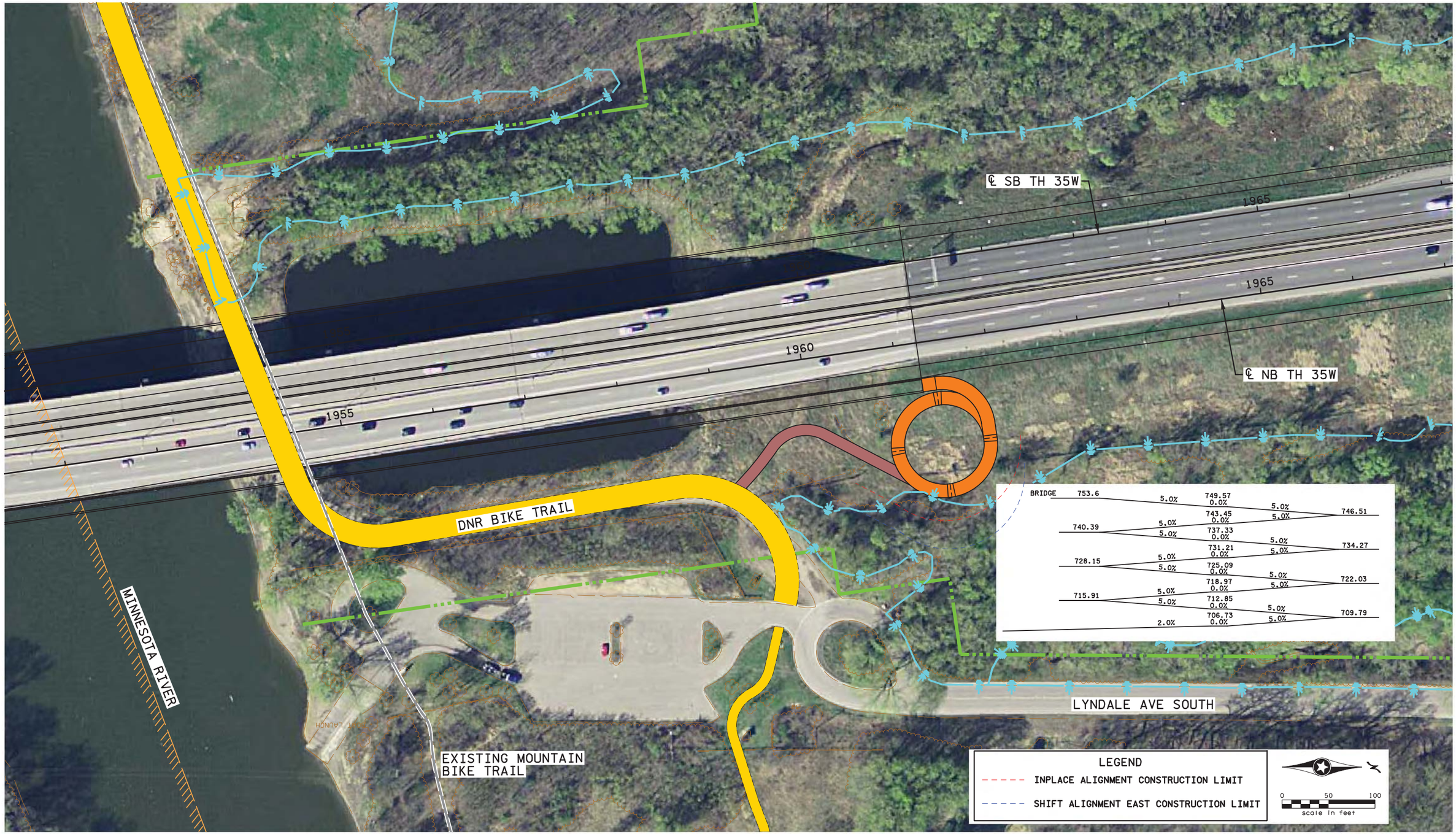
SRF Consulting Group, Inc.

Job #8600
7/6/2015

Northeast Trail Connection Option 1 - Elevated Switchback

I-35W Minnesota River Bridge Project
Bloomington, MN

Figure D.3



H:\Projects\8600\CAD_BIM\Graphics\8600_North Trail_2.dgn

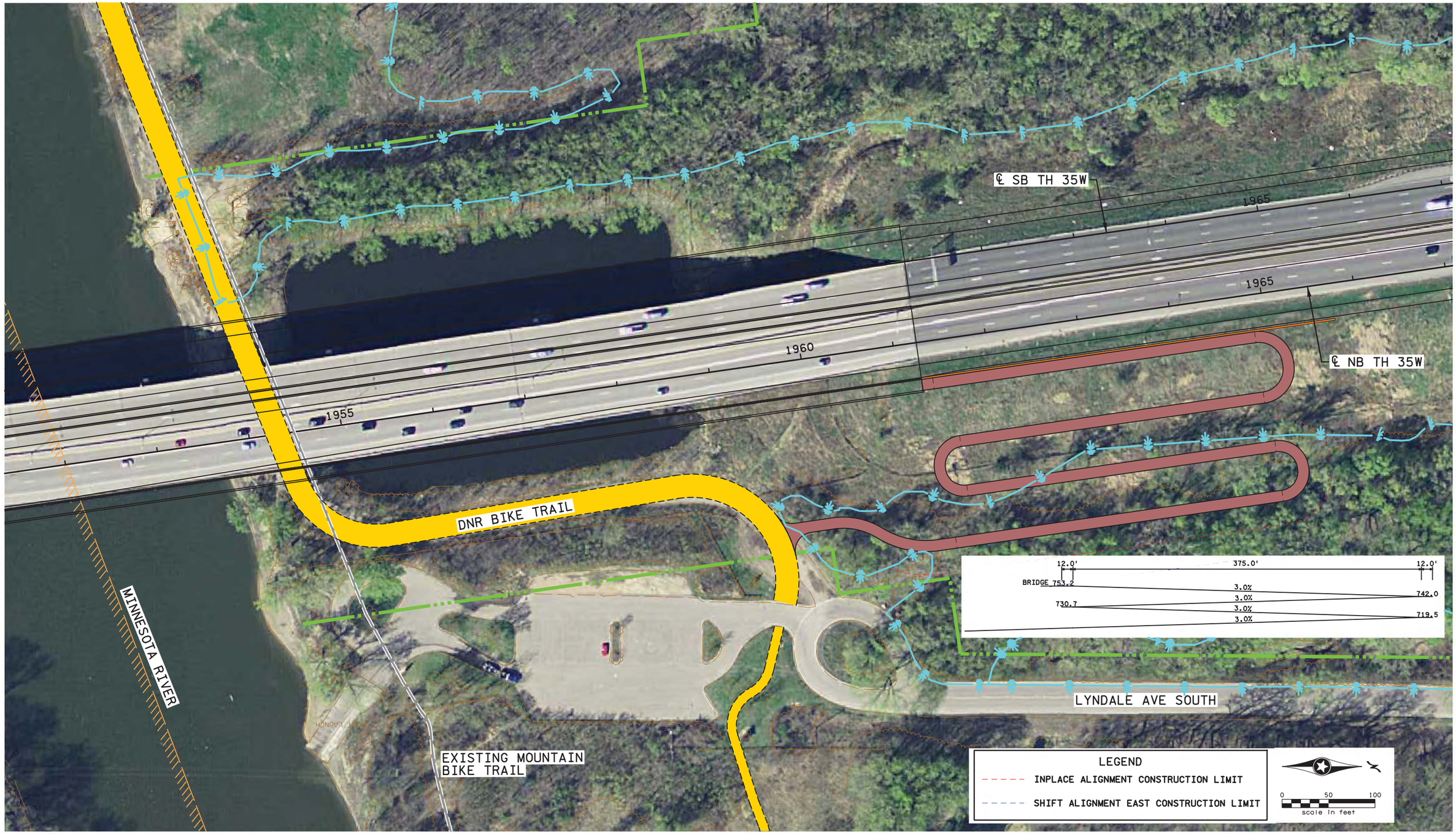
SRF Consulting Group, Inc.

Job #8600
7/6/2015

Northeast Trail Connection Option 2 - Helical Ramp

I-35W Minnesota River Bridge Project
Bloomington, MN

Figure D.4



H:\Projects\8600\CAD_BIM\Graphics\8600_North Trail_3.dgn

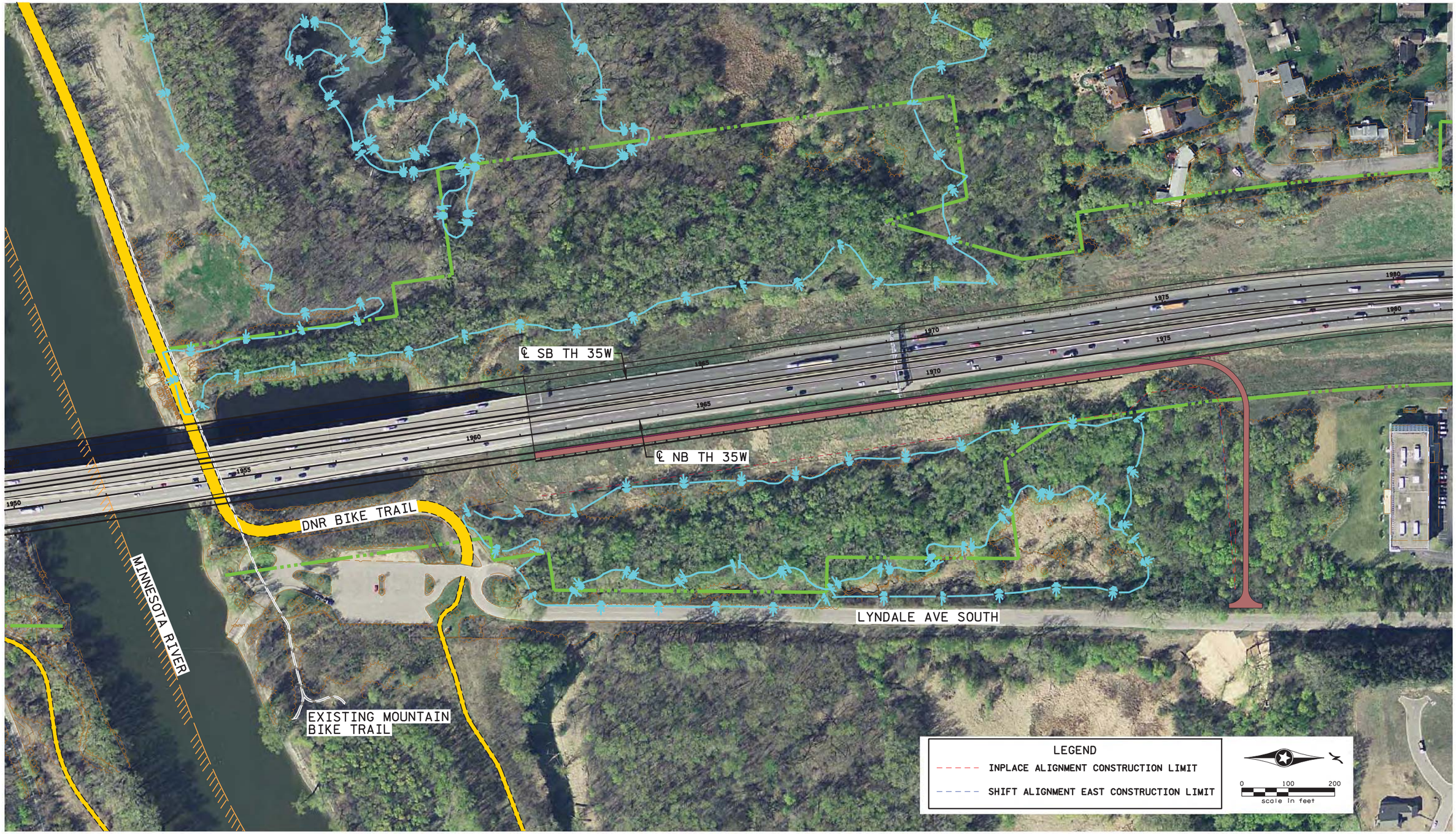
SRF Consulting Group, Inc.

Job #8600
7/6/2015

Northeast Trail Connection Option 3 - Switchback

I-35W Minnesota River Bridge Project
Bloomington, MN

Figure D.5



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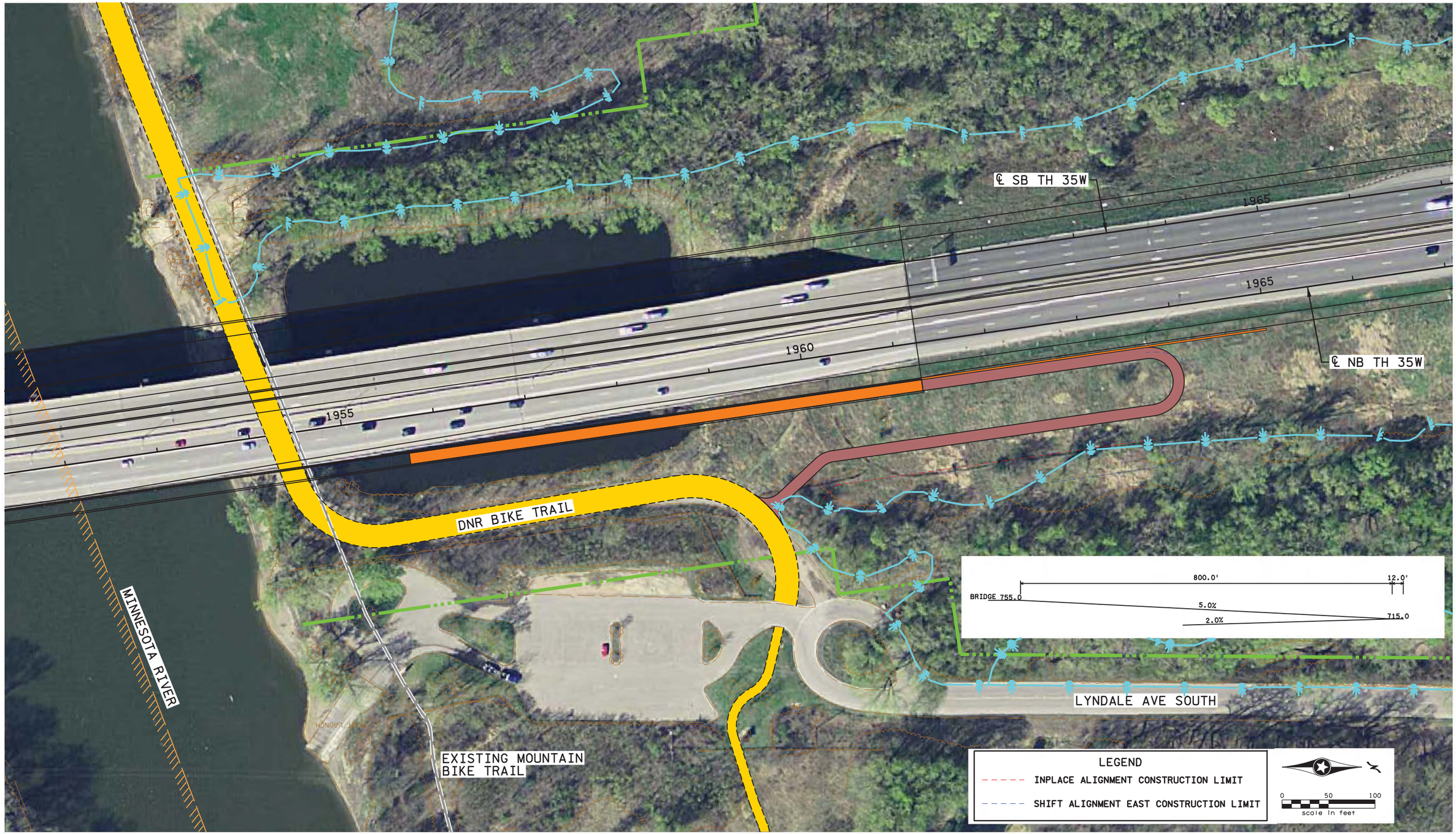
SRF Consulting Group, Inc.

Job #8600
7/7/2015

Northeast Trail Connection Option 4 - Continue to the North

I-35W Minnesota River Bridge Project
Bloomington, MN

Figure D.6



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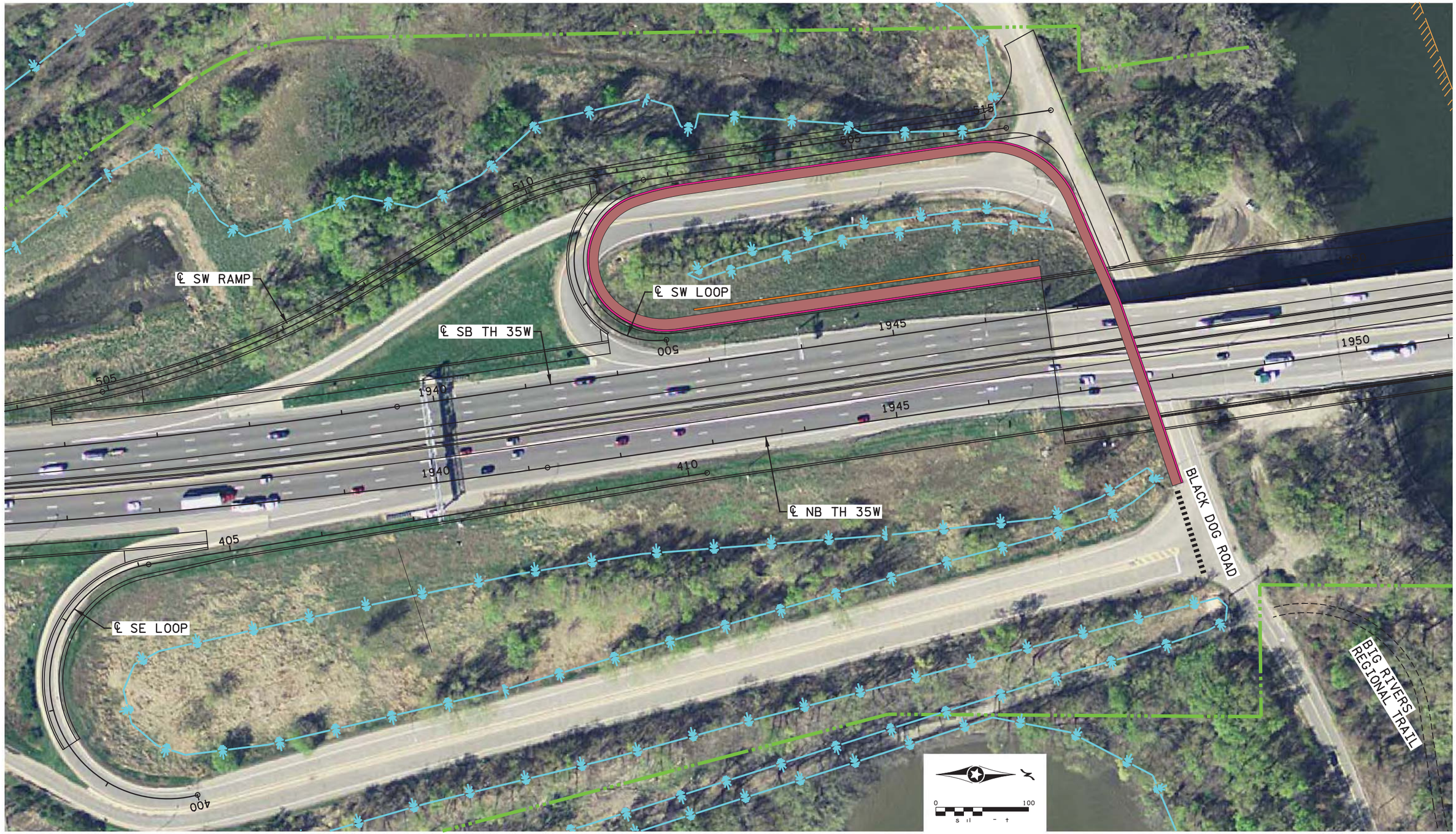
SRF Consulting Group, Inc.

Job #8600
7/6/2015

Northeast Trail Connection Option 5 - Lower Trail on Bridge

I-35W Minnesota River Bridge Project
Bloomington, MN

Figure D.7



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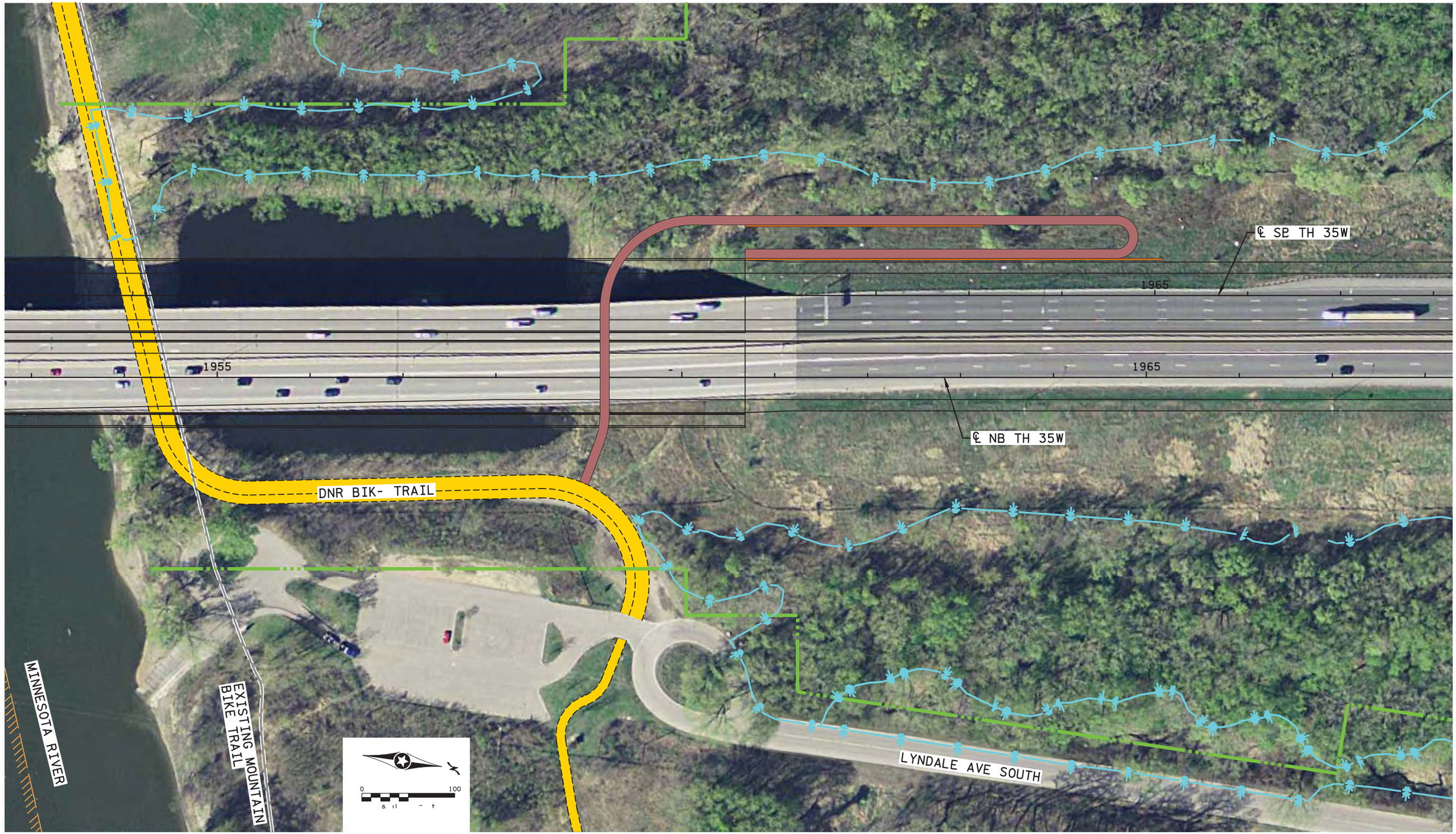
SRF Consulting Group, Inc.

Job #8600
8/26/2015

Southwest Trail Connection Option 1 - Trail Follows Ramp

I innesota iver B idge Pr
ille, MN

Figure D.8



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SRF Consulting Group, Inc.

Job #8600
/26/2015

Northwest Trail Connection Option 1

I innesota iver B idge Pr
loo ington, MN

Figure D.9

H:\Projects\8600\CAD_BIM\Graphics\8600_NE_Treatment.dgn

SRF Consulting Group, Inc.

Job #8600
11/6/2015

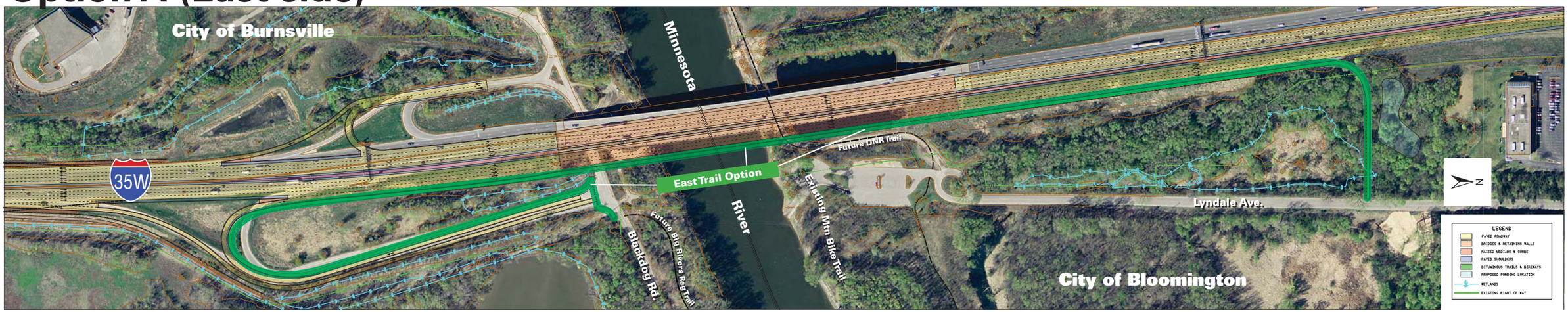
Northeast Trail Option 4 - Continue to the North (Preliminary Design with Ponds)

I-35W Minnesota River Bridge Project
Bloomington, MN

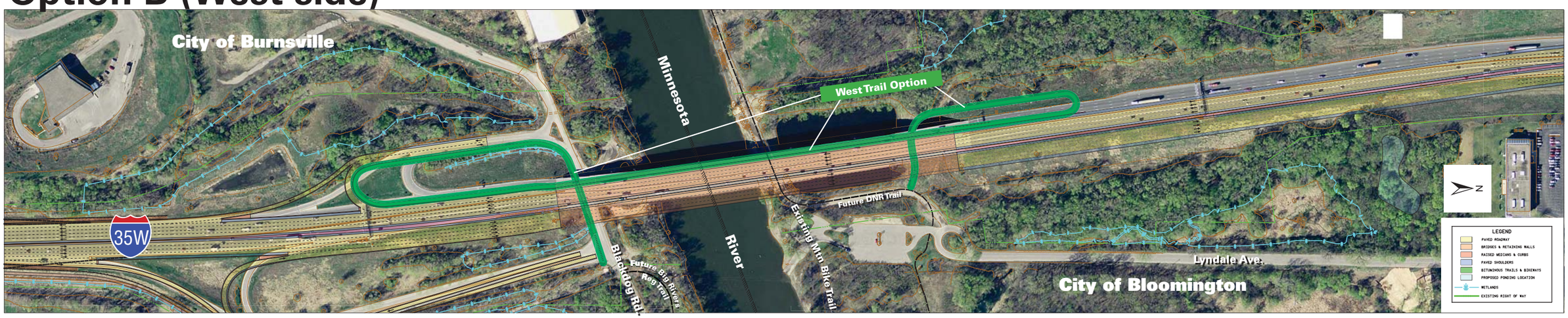
Figure D.10

Trail Options

Option A (East side)



Option B (West side)



Appendix E

Agency Correspondence

Exhibit E1. MnDOT CRU Letter (Page 1 of 1) (July 10, 2017)

DEPARTMENT OF TRANSPORTATION

Office of Environmental Stewardship
Mail Stop 620
395 John Ireland Boulevard
St. Paul, MN 55155-1899

Office Tel: (651) 366-3614
craig.johnson@state.mn.us

July 10, 2017

Scott Pedersen
MnDOT Metro District
1500 W. CR B-2
Roseville, MN 55113-3175

Re: S.P. 1981-124. Replacement of Bridge 5983 on I-35W, Hennepin and Dakota counties

Dear Mr. Pedersen:

We have reviewed the above-referenced undertaking pursuant to our FHWA-delegated responsibilities for compliance with Section 106 of the National Historic Preservation Act, as amended (36 CFR 800), and as per the terms of the 2005 Section 106 Programmatic Agreement between the FHWA and the Minnesota State Historic Preservation Office (SHPO). The Section 106 review fulfills MnDOT's responsibilities under the Minnesota Historic Sites Act (MS 138.665-.666), the Field Archaeology Act of Minnesota (MS 138.40); and the Private Cemeteries Act (MS 307.08, Subd. 9 and 10).

We last reviewed this project on 3/31/2017. We have now been informed that the project has been expanded about 1100 feet to the north to include the replacement of the I-35W bridges over West 106th Street (Bridges #9043 and #9044). Also included is additional work on the entrance and exit ramps. All work will remain within the existing right-of-way.

There are no known archaeological sites in the expanded area of potential effect (APE) and a low potential for unknown or undisturbed sites due to previous road and bridge construction. No historic structures are located within the APE. Based on our existing programmatic agreements with various tribal groups, there are no tribes that want to be consulted on this project.

The finding of this office is that there will be **no historic properties affected** by the project as currently proposed. If the project scope changes, please provide our office with the revised information and we will conduct an additional review.

Your request for review indicates that the project may require a permit from the U.S. Army Corps of Engineers. As per the terms of the 2005 PA, between FHWA and the Corps, the FHWA is the lead federal agency for any Section 106 review when both agencies are involved. This letter concludes the Section 106 review for this project and the Corps has no further responsibilities under 36 CFR 800. **Please include a copy of this findings letter (and the SHPO concurrence letter when appropriate) with your permit application to document that no further Section 106 review is needed.**

Sincerely,

Craig Johnson
Cultural Resources Unit (CRU)

cc: MnDOT CRU Project File
Rick Dalton, MnDOT Metro

Exhibit E2. MnDOT CRU Letter (Page 1 of 2) (March 31, 2017)

Minnesota Department of Transportation

Office of Environmental Stewardship Office Tel: (651) 366-3614
Mail Stop 620
395 John Ireland Boulevard
St. Paul, MN 55155-1800

March 31, 2017

Scott Pedersen
MnDOT Metro District
1500 W. CR B-2
Roseville, MN 55113-3175

Re: S.P. 1981-124. Replacement of Bridge 5983 on I-35W, Hennepin and Dakota counties

Dear Mr. Pedersen:

We have reviewed the above-referenced undertaking pursuant to our FHWA-delegated responsibilities for compliance with Section 106 of the National Historic Preservation Act, as amended (36 CFR 800), and as per the terms of the 2005 Section 106 Programmatic Agreement between the FHWA and the Minnesota State Historic Preservation Office (SHPO). The Section 106 review fulfills MnDOT's responsibilities under the Minnesota Historic Sites Act (MS 138.665-.666), the Field Archaeology Act of Minnesota (MS 138.40); and the Private Cemeteries Act (MS 307.08, Subd. 9 and 10).

This project involves the replacement of Bridge 5983 along I-35 W over the Minnesota River. The road approach work will extend from Cliff Road in Burnsville to 106th Street in Bloomington. The north-bound lanes will include the construction of two multiuse trails and stormwater ponds to the east of I-35W. The I-35 W/Black Dog Road interchange will be reconstructed and a northbound truck climbing lane will be added. Retaining and noise walls will be added at various locations. A multi-use trail will be constructed in the southeast quadrant of the I-35W/Black Dog Road interchange.

Phase I-II archaeology was conducted by Florin Cultural Resource Services in 2014 and 2016, documented in a 2017 report entitled *Phase I Archaeological Survey and Phase II Evaluation of Sites 21HE494, 495, 496, and 497 for the I-35W Bridge Replacement over the Minnesota River in Hennepin and Dakota Counties,* MN. The survey identified four pre-contact archaeological sites in the area of potential effect (APE). Although sites 21HE494, 21HE495, and 21HE496 are not eligible, site 21HE497 is eligible for listing in the National Register of Historic Places. This site is located east of I-35W on the north side of the Minnesota River on a small high terrace remnant just south of some commercial buildings. Initial construction plans indicated that a stormwater pond and filtration basin would adversely affect the site. These plans were modified to exclude the site area from any construction impacts by moving the pond and basin. As a result, site 21HE497 now falls outside of the APE. The site will be fenced off before construction begins to avoid any impacts. Fencing will also prevent any impacts to a possible mound site north of the construction area.

Exhibit E2. MnDOT CRU Letter (Page 2 of 2) (March 31, 2017)

No historic structures are located within the APE. Based on our existing programmatic agreements with various tribal groups, there are no tribes that want to be consulted on this project.

The finding of this office is that there will be **no historic properties affected** by the project as currently proposed. If the project scope changes, please provide our office with the revised information and we will conduct an additional review.

Your request for review indicates that the project may require a permit from the U.S. Army Corps of Engineers. As per the terms of the 2005 PA, between FHWA and the Corps, the FHWA is the lead federal agency for any Section 106 review when both agencies are involved. This letter concludes the Section 106 review for this project and the Corps has no further responsibilities under 36 CFR 800. **Please include a copy of this findings letter (and the SHPO concurrence letter when appropriate) with your permit application to document that no further Section 106 review is needed.**

Sincerely,

Craig Johnson
Archaeologist
Cultural Resources Unit (CRU)

cc: MnDOT CRU Project File
Rick Dalton, MnDOT Metro
Brett Danner, SRF

Exhibit E3. MnDOT CRU Letter (Page 1 of 1) (April 21, 2015)

Minnesota Department of Transportation

Office of Environmental Stewardship
Mail Stop 620
395 John Ireland Boulevard
St. Paul, MN 55155

Office Tel: (651) 366-3614
Fax: (651) 366-3603

April 21, 2015

April Crockett
MnDOT Metro District
1500 W. CR B2
Roseville, MN 55113

Regarding: S.P. 1981-124, Replacement of Bridge 5983 on I-35W over the Minnesota River, T. 27 N., R. 24 W., S. 21, 22, 27, 28, 33 & 34, cities of Burnsville and Bloomington, Dakota and Hennepin counties

Dear Ms. Crockett:

We have reviewed the above-referenced undertaking pursuant to our FHWA-delegated responsibilities for compliance with Section 106 of the National Historic Preservation Act, as amended (36 CFR 800), and as per the terms of the Programmatic Agreement (PA) between the FHWA and the Minnesota State Historic Preservation Office (SHPO) (June 2005). The Section 106 review fulfills MnDOT's responsibilities under the Minnesota Historic Sites Act (MS 138.665-.666), the Field Archaeology Act of Minnesota (MS 138.40), and the Private Cemeteries Act (MS 307.08, Subd. 9 & 10).

The project involves replacing Bridge 5983, including the addition of a northbound lane from Cliff Road to 106th Street and a pedestrian bike lane on the east side of the bridge. No additional right-of-way will be acquired.

A Phase I archaeological survey of the area of potential effect (APE) was conducted by Florin Cultural Resource Services in 2014. Results of the survey summarized in a letter report indicate that two pre-contact archaeological sites are present within the APE, designated as Field Site 281-1 and Field Site 281-2. Phase II evaluations of these two sites indicate that due to very low artifact numbers and disturbance from previous construction, they are not eligible for listing in the National Register of Historic Places under criteria A or D. A full report will be forthcoming. There are no eligible or potentially eligible structures in the APE. Based on our existing programmatic agreements with various tribal groups, there are no tribes that want to be consulted on this project.

We have determined that there will be **no historic properties affected** by the project as currently proposed. As there are no historic properties within the project APE, the section 106 review of this project is now complete and no SHPO comment period and response are required under the terms of the new PA. If the project scope changes, please provide our office with the revised information and we will conduct an additional review.

Your request for review indicates that the project may require a permit from the U.S. Army Corps of Engineers. As per the terms of the 2005 PA, between FHWA and the Corps, the FHWA is the lead federal agency for any Section 106 review when both agencies are involved. This letter concludes the Section 106 review for this project and the Corps has no further responsibilities under 36 CFR 800. **Please include a copy of this findings letter (and the SHPO concurrence letter when appropriate) with your permit application to document that no further Section 106 review is needed.**

Sincerely,

Craig Johnson
Cultural Resources Unit (CRU)

cc: MnDOT CRU Files Brigid Gombold, MnDOT Metro Jon Solberg, MnDOT Metro

Exhibit E4. Tribal Correspondence (Page 1 of 2) (June 3, 2014)

Minnesota Department of Transportation

Office of Environmental Stewardship
Mail Stop 620
395 John Ireland Boulevard
St. Paul, MN 55155

Office Tel: (651) 366-3614
Fax: (651) 366-3603

Cultural Resources Unit
craig.johnson@state.mn.us
Mail Stop 620

June 3, 2014

To: Interested Tribal Representative

From: Craig Johnson, Mn/DOT Cultural Resources Unit

Re: S.P. 1981-124 (I-35W, Dakota & Hennepin counties)
Replacement of bridge 5983 over the Minnesota River
T. 27 N., R. 24 W., S. 21, 22, 27, 28, 33 & 34, Burnsville & Bloomington

The Minnesota Department of Transportation is planning on replacing the I-35W bridge over the Minnesota River with funds administered by the Federal Highway Administration (FHWA). Although most of the work will take place within the right-of-way, portions will be constructed outside of the right-of-way. The project is not on tribal property. This undertaking is subject to review under Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, and under the National Environmental Policy Act (NEPA). Section 106 of the NHPA requires Federal agencies to take into account the effects of their undertakings on historic properties (i.e., those properties eligible for or listed on the National Register of Historic Places). This process involves efforts to identify historic properties potentially affected by the undertaking, assess its effects and seek ways to avoid, minimize or mitigate any adverse effects on historic properties. On behalf of the FHWA, which has designated its Section 106 responsibilities to the Minnesota Department of Transportation (Mn/DOT) Cultural Resources Unit (CRU), we are now initiating review to determine the possible effects of the undertaking (if any) on historic properties. In accordance with 36 CFR 800.2(c) of the NHPA we are contacting you to see if you know of any historic properties of religious or historic significance in the area, and to see if you would like to participate in the Section 106 process for this project (i.e., to be a consulting party).

Our office has defined the area of potential effect (APE) for the project as the proposed construction limits. The APE is defined as the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. Once the APE was established, we examined the SHPO database for the list of previously recorded resources in the area. Based on these queries, there are no existing archaeological sites in or near the APE.

Exhibit E4. Tribal Correspondence (Page 2 of 2) (June 3, 2014)

We would appreciate any comments you may have about historic, cultural, and archaeological resources and other concerns regarding this project. Our planning schedule is such that we must initiate work on our environmental and historic preservation studies, so we hope to hear from you within **30 days** of receipt of this letter. If you indicate that you are not aware of any historic properties with religious or cultural significance and that you do not wish to comment on the project, or if our office does not receive a response within 30 days, we will conclude that you do not wish to be a consulting party for this project and no further project information will be forwarded.

Thank you for your attention to this request. We look forward to working with you on this project.

cc: MnDOT CRU Project File
Brigid Gombold, MnDOT Metro

Exhibit E5. USCG Letter (Page 1 of 1) (June 1, 2015)

U.S. Department of Homeland Security
United States Coast Guard

Commander
Eighth Coast Guard District

1222 Spruce Street, Room 2.102D
St. Louis, MO 63103-2832
Staff Symbol: dwb
Phone: (314)269--2378
Fax: (314)269-2737
Email: david.a.orzechowski@uscg.mil
www.uscg.mil/d8/westerriversbridges

16591.1/10.8 MIN
June 1, 2015

Mr. Daniel T. Prather, P.E.
Acting Preliminary Bridge Plans Engineer
Minnesota Department of Transportation
3485 Hadley Avenue North
Oakdale, MN 55128

Subj: PROPOSED LYNDALE AVENUE (I-35W) BRIDGE REPLACEMENT, MILE 10.8, MINNESOTA RIVER

Dear Mr. Prather:

This is in reply to your email dated May 11, 2015, concerning the proposed pier locations and minimum horizontal requirements for a new bridge at Mile 10.8, Minnesota River.

The Coast Guard has determined for a replacement bridge a minimum horizontal clearance of 300.0 feet shall be provided. The new right descending pier be located at the bank and the left descending pier be located a distance of 300.0 feet measured pier face to pier face. The navigation span must provide a minimum vertical clearance of 55.5 feet above normal pool elevation 687.2 m.s.l. measured normal to axis of the navigation channel. These clearances would satisfy the reasonable needs of navigation for a replacement bridge at this location. During the construction phase, a minimum horizontal distance of 200.0 feet is required.

If there are any questions about our requirements, please contact Mr. David Orzechowski at the above telephone number.

Sincerely,

ERIC A. WASHBURN
Bridge Administrator, Western Rivers
By direction of the District Commander

Exhibit E6. USCG Letter (Page 1 of 2) (September 3, 2014)

U.S. Department of Homeland Security
United States Coast Guard

Commander
Eighth Coast Guard District

1222 Spruce Street, Room 2.102D
St. Louis, MO 63103-2832
Staff Symbol: dwb
Phone: (314)269--2378
Fax: (314)269-2737
Email: david.a.orzechowski@uscg.mil
www.uscg.mil/d8/westerriversbridges

16591.1/10.8 MIN
September 3, 2014

Mr. Daniel T. Prather, P.E.
Acting Preliminary Bridge Plans Engineer
Minnesota Department of Transportation
3485 Hadley Avenue North
Oakdale, MN 55128

Subj: PROPOSED LYNDALE AVENUE (I-35W) BRIDGE REPLACEMENT, MILE 10.8, MINNESOTA RIVER

Dear Mr. Prather:

This is in reply to your email dated August 6, 2014 concerning the proposed bridge project at Mile 10.8, Minnesota River.

The General Bridge Act of 1946 requires that the location and plans for bridges over navigable waters of the United States be approved by the Commandant, U.S. Coast Guard prior to commencing construction. The Minnesota River is considered to be a navigable waterway of the United States for bridge administration purposes at the bridge site.

Applications for bridge permits should be addressed to Commander (dwb), Eighth Coast Guard District, 1222 Spruce Street, St. Louis, Missouri 63103-2832, Attention: Bridge Branch. To assist you in submitting a bridge permit application, the Bridge Permit Application Guide can be found at the following link: http://www.uscg.mil/hq/cg5/cg551/BPAG_Page.asp. The application must be supported by sufficient information to permit a thorough assessment of the impact of the bridge and its immediate approaches on the environment. We recommend that the impacts of procedures for constructing cofferdams, sand islands, and falsework bents, etc., that will be employed to build the bridge or modify the existing bridge as well as the removal of the old bridge be discussed. The environmental document should also contain data on the number, size and types of vessels currently using the waterway. This information should be compared with past and projected future trends on the use of the waterway.

It is our understanding the Federal Highway Administration has assumed the role as the lead federal agency. We require a letter from FHWA stating that they will serve as lead federal agency for the National Environmental Policy Act and other environmental laws such as the National Historic Preservation Act, Threatened and Endangered Species Act and the Invasive Species Act. We agree to serve as a Cooperating Agency for the project from a navigation standpoint. We should be given the opportunity to review the environmental document before it is finalized.

Exhibit E6. USCG Letter (Page 2 of 2) (September 3, 2014)

Subj: PROPOSED LYNDALE AVENUE (I-35W) BRIDGE REPLACEMENT, MILE 10.8, MINNESOTA RIVER

16591.1/10.8 MIN
September 3, 2014

A proposed navigational opening that provides a minimum vertical clearance of 55.5 feet above normal pool elevation 687.2 m.s.l. would satisfy the reasonable needs of navigation for a replacement bridge at this location. Once the actual pier placement and alignment for the bridge has been determined, please forward these drawings to us for review and approval

We appreciate the opportunity to comment on the project in this early stage. You can contact Mr. David Orzechowski at the above telephone number if you have questions regarding our comments or requirements.

Sincerely,

ERIC A. WASHBURN
Bridge Administrator, Western Rivers
By direction of the District Commander

Copy: Philip Forst, Minnesota FHWA

2

Exhibit E7. MnDOT OES Letter (Page 1 of 10) (November 10, 2016)

Minnesota Department of Transportation
395 John Ireland Boulevard
Saint Paul, MN 55155

November 10, 2016

Phil Delphey
Fish and Wildlife Biologist
U.S. Fish and Wildlife Service
Twin Cities ES Field Office
4101 American Blvd East
Bloomington, MN 55425-1665

Notification of Determination – May affect, but will not cause prohibited incidental take – northern long-eared bat (*Myotis septentrionalis*)

No Effect Determination – Higgins eye pearlymussel (*Lampsilis higginsii*)
No Effect Determination – Snuffbox (*Epioblasma triquetra*)
No Effect Determination – Prairie bush clover (*Lespedeza leptostachya*)
No Jeopardy Determination – Rusty-patched bumble bee (*Bombus affinis*)

S.P. 1981-124, I-35W Bridge – Minnesota River
Dakota and Hennepin counties, Minnesota

Project Description

The proposed project is described below. ***Maps attached below.***

- Reconstruct the northbound and southbound I-35W Bridges over the Minnesota River. The new I-35W Minnesota River Bridges will be constructed approximately 30 feet to the east of the existing bridges. The new I-35W Minnesota River Bridges will be steel girder-type bridges. The northbound bridge will include a multiuse trail along the east side of the bridge;
- Reconstruct I-35W from the I-35W bridges over Cliff Road in Burnsville to the 106th Street Bridge over I-35W in Bloomington. The roadway grade south of the Minnesota River will be raised by approximately seven feet compared to the existing roadway elevation. Retaining walls ranging in height from approximately five feet tall to 20 feet tall will be constructed along both the east and west sides of I-35W;
- Construct a new northbound I-35W lane to the outside of the roadway from the Cliff Road interchange in Burnsville to the existing truck climbing lane located along the Minnesota River bluff south of the 106th Street interchange in Bloomington;
- Reconstruct the I-35W/Black Dog Road interchange ramps and loops. Retaining walls ranging in height from approximately seven feet tall to 30 feet tall will be constructed along the southeast and southwest interchange ramps;
- Reconstruct the existing City of Burnsville Trail along the east side of I-35W from Cliff Road to the I 35W/Black Dog Road interchange;
- Construct a stormwater pond and filtration basin located between I-35W and Lyndale Avenue to the south of existing business office/commercial development;
- Construct new multi-use trail within the southeast quadrant of the I-35W/Black Dog Road interchange. This trail will connect the northbound I-35W Minnesota River Bridge and Black Dog Road. A trail crossing and connection will be constructed along the south side of Black Dog Road to provide connectivity for nonmotorized users to the Big Rivers Regional Trail – Black Dog Segment;
- Construct a new multi-use trail along the east side of I-35W between the northbound I-35W Minnesota River Bridge and Lyndale Avenue. A retaining wall ranging in height from approximately 15 feet tall to 40 feet tall will be constructed along the south side of the trail as it curves to the east, away from I-35W, and connects into Lyndale Avenue near the bluffline.

Exhibit E7. MnDOT OES Letter (Page 2 of 10) (November 10, 2016)

Bat and Mussel Surveys

MnDOT environmental staff surveyed the bridge abutments for bats on July 26, 2016, and resurveyed the abutments and cave-like confined spaces within the abutments again on September 1, 2016. On both occasions, a single tricolored bat (*Perimyotis subflavus*) and two little brown bats (*Myotis lucifugus*) were observed. Bats were observed hanging on the bridge superstructure and within the expansion joint. No bats or bat signs were observed within the cave-like confined spaces. Despite the presence of two species of bats on the bridge, bat numbers were low (3 individuals) and bat droppings were scarce during both visits. Based on these surveys, the I-35W Bridge over the Minnesota River does not appear to have a large concentration of bats.

The most recent mussel survey for this area was completed in 2006 (MnDNR 2016). No federally listed mussels were encountered during these surveys, but a single deceased male *L. higginsii* was documented from the area in 1989 and was estimated to have been deceased for approximately 20 years. MnDOT contracted with MnDNR to conduct mussel surveys during the 2016 field season; however, due to high water these surveys were unable to be completed. MnDOT plans to conduct a mussel survey for this area during the 2017 season.

Tricolored bat (*Perimyotis subflavus*) located behind a small metal flange on the bridge superstructure.

Little brown bat (*Myotis lucifugus*) located in the expansion joint.

Cave-like environmental located within bridge abutments.

Conservation Measures

- Before construction begins, remove or slice expansion joint gaskets/glands, between November 1 and January 31, to increase airflow and moisture entering the expansion joint to reduce the likelihood bats will use the bridge during construction.
- Before construction begins, coordinate with the City of Bloomington or the Service to place a single Rocket Box Bat House adjacent to bridge structure. Plan: http://www.batcon.org/files/RocketBoxPlans.pdf
- Winter tree removal – tree removal November 1 to March 31, inclusive.
- If rolled erosion control products (EG erosion control blanket) are to be utilized, shall be limited to 'bio-netting', 'natural-netting' (category 3N or 4N) or woven type products, and specifically not allow welded plastic mesh netting. See page 25 of chapter one in the manual:' Best Practices for Meeting GP 2004-0001', at: http://www.dnr.state.mn.us/waters/watermgmt_section/pwpermits/gp_2004_0001_manual.html and DNR's Nongame Wildlife Program factsheet at http://files.dnr.state.mn.us/eco/nongame/wildlife-friendly-erosion-control.pdf.

Exhibit E7. MnDOT OES Letter (Page 3 of 10) (November 10, 2016)

Species List for the Project County

According to the official County Distribution of Minnesota Federally-Listed Threatened, Endangered, Proposed, and Candidate Species list (revised in October 2016), maintained by the Service, the project county is within the distribution range of the following:

Revised October 2016

County	Species	Status	Habitat
Dakota	Northern long-eared bat *Myotis septentrionalis*	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. Roosts and forages in upland forests during spring and summer.
	Higgins eye pearlymussel *Lampsilis higginsii*	Endangered	Mississippi River
	Rusty patched bumble bee *Bombus affinis*	Proposed as Endangered	Grasslands with flowering plants from April through October, underground and abandoned rodent cavities or clumps of grasses above ground as nesting sites, and undisturbed soil for hibernating queens to overwinter.
	Prairie bush clover *Lespedeza leptostachya*	Threatened	Native prairie on well-drained soils
Hennepin	Northern long-eared bat *Myotis septentrionalis*	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. Roosts and forages in upland forests during spring and summer.
	Higgins eye pearlymussel *Lampsilis higginsii*	Endangered	Mississippi River
	Snuffbox *Epioblasma triquetra*	Endangered	Mississippi River
	Rusty patched bumble bee *Bombus affinis*	Proposed as Endangered	Grasslands with flowering plants from April through October, underground and abandoned rodent cavities or clumps of grasses above ground as nesting sites, and undisturbed soil for hibernating queens to overwinter.

Information to Determine NLEB 4(d) Rule Compliance:	YES	NO
1. Does the project occur wholly outside of the WNS Zone?	☐	☒
2. Have you contacted the appropriate agency to determine if your project is near known hibernacula or maternity roost trees?	☒	☐
3. Could the project disturb hibernating NLEBs in a known hibernaculum?	☐	☒
4. Could the project alter the entrance or interior environment of a known hibernaculum?	☐	☒
5. Does the project remove any trees within 0.25 miles of a known hibernaculum at any time of year?	☐	☒
6. Would the project cut or destroy known occupied maternity roost trees, or any other trees within a 150-foot radius from the maternity roost tree from June 1 through July 31.	☐	☒

You are eligible to use this form if you have answered yes to question #1 **or** yes to question #2 **and** no to questions 3, 4, 5 and 6. The remainder of the form will be used by the USFWS to track our assumptions in the Biological Opinion.

Streamlined NLEB Consultation Table - General Project Information	YES	NO
Does the project occur within 0.25 miles of a known hibernaculum?	☐	☒
Does the project occur within 150 feet of a known maternity roost tree?	☐	☒
Does the project include forest conversion[1]? (if yes, report acreage below)	☒	☐
Estimated total acres of forest conversion (including winter)	9	
If known, estimated acres[2] of forest conversion from April 1 to October 31	0	
If known, estimated acres of forest conversion from June 1 to July 31[3]	0	
Does the project include timber harvest? (if yes, report acreage below)	☐	☒

State Project 1981-124
ESA (Section 7) Notice of Determination
November 10, 2016

Exhibit E7. MnDOT OES Letter (Page 4 of 10) (November 10, 2016)

Estimated total acres of timber harvest		
If known, estimated acres of timber harvest from April 1 to October 31		
If known, estimated acres of timber harvest from June 1 to July 31		
Does the project include prescribed fire? (if yes, report acreage below)	☐	☒
Estimated total acres of prescribed fire		
If known, estimated acres of prescribed fire from April 1 to October 31		
If known, estimated acres of prescribed fire from June 1 to July 31		
Does the project install new wind turbines? (if yes, report capacity in MW below)	☐	☒
Estimated wind capacity (MW)		

[1] Any activity that temporarily or permanently removes suitable forested habitat, including, but not limited to, tree removal from development, energy production and transmission, mining, agriculture, etc. (see page 48 of the Biological Opinion).
[2] If the project removes less than 10 trees and the acreage is unknown, report the acreage as less than 0.1 acre.
[3] If the activity includes tree clearing in June and July, also include that acreage in April to October.

Endangered Species Act – Section 7 Consultation

Section 7 of Endangered Species Act of 1973, as amended (Act), requires each Federal agency to review any action that it funds, authorizes or carries out to determine whether it may affect threatened, endangered, proposed species or listed critical habitat. Federal agencies (or their designated representatives) must consult with the U.S. Fish and Wildlife Service (Service) if any such effects may occur as a result of their actions. Consultation with the Service is not necessary if the proposed action will not directly or indirectly affect listed species or critical habitat. If a federal agency finds that an action will have no effect on listed species or critical habitat, it should maintain a written record of that finding that includes the supporting rationale.

No Effect / No Jeopardy Determinations

No Effect Determination – Higgins eye pearlymussel (*Lampsilis higginsii*)
No Effect Determination – Snuffbox (*Epioblasma triquetra*)
No Effect Determination – Prairie bush clover (*Lespedeza leptostachya*)
No Jeopardy Determination – Rusty-patched bumble bee (*Bombus affinis*)

Higgins eye and Snuffbox– *No effect determination*
No extant populations of Higgins eye or Snuffbox mussels are known from the Minnesota River. If 2017 mussel surveys discover federally listed species MnDOT will reinitiate consultation with the Service. ***Therefore, MnDOT on behalf of the FHWA has made a determination of no effect for this species.***

Prairie bush clover – *No effect determination*.
No known occurrences for this species exist within the project area. Suitable habitat is not present. ***Therefore, MnDOT on behalf of the FHWA has made a determination of no effect for this species.***

Rusty-patched bumble bee – *No jeopardy determination*.
No known occurrences for this species exist within the project area. The proposed action is not expected to jeopardize the continued existence of this species. ***Therefore, MnDOT on behalf of the FHWA has made a determination of no effect for this species.***

Notice of Determination

Northern Long-eared Bat— May affect, but will not cause prohibited incidental take.

According to the information provided, this project will include bridge work and tree removal. There are no known locations of NLEB roost trees or hibernacula in the vicinity of this project (MNDNR 2016). Visual bat surveys on the bridge that were conducted in 2016 did not detect NLEBs. By signing this form, MnDOT on behalf of the FHWA, determines that this project may affect the NLEB, but that any resulting incidental take of the NLEB is not prohibited by the final 4(d) rule.

If the USFWS does not respond within 30 days from submittal of this form, MnDOT may presume that its determination is informed by the best available information and that its project responsibilities under 7(a)(2) with respect to the NLEB are fulfilled through the USFWS January 5, 2016, Programmatic Biological Opinion. MnDOT will update this determination annually for multi-year activities.

Exhibit E7. MnDOT OES Letter (Page 5 of 10) (November 10, 2016)

MnDOT, on behalf of the FHWA, understands that the USFWS presumes that all activities are implemented as described herein. The action agency will promptly report any departures from the described activities to the appropriate USFWS Field Office. MnDOT will provide the appropriate USFWS Field Office with the results of any surveys conducted for the NLEB. **Involved parties will promptly notify the appropriate USFWS Field Office, and MnDOT Office of Environmental Stewardship, upon finding a dead, injured, or sick NLEB.**

Please contact me if there are any questions or concerns.

Christopher E Smith Digitally signed by Christopher E Smith
DN: cn=Christopher E Smith
Date: 2016.11.10 11:41:37 -06'00'

Christopher E. Smith, M.Sc., CWB®
Wildlife Ecologist | Office of Environmental Stewardship
Minnesota Department of Transportation
395 John Ireland Blvd., MS 620
Saint Paul, MN 55155

E-mail: Christopher.E.Smith@state.mn.us
Phone: 651-366-3605

Exhibit E7. MnDOT OES Letter (Page 6 of 10) (November 10, 2016)

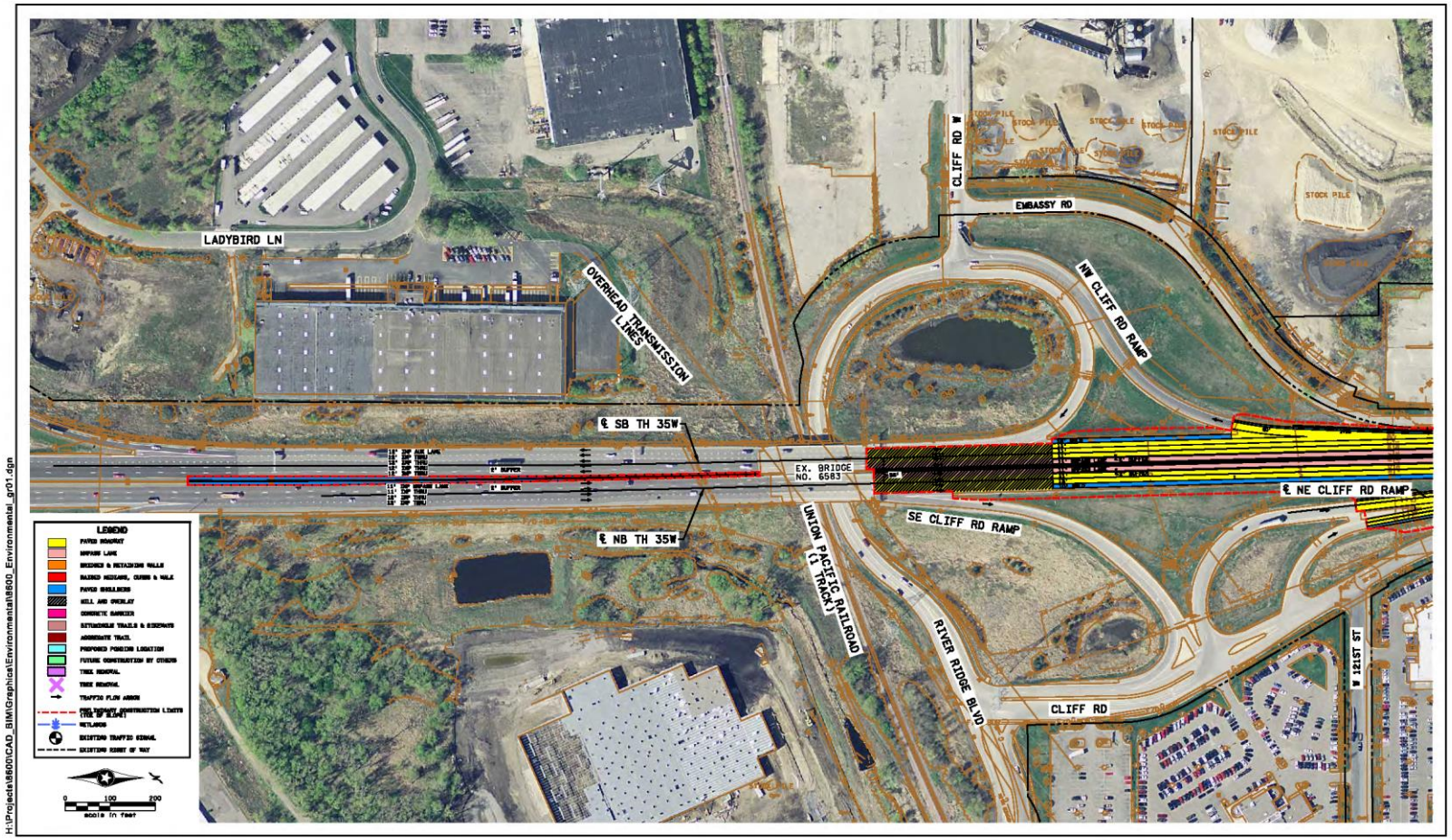
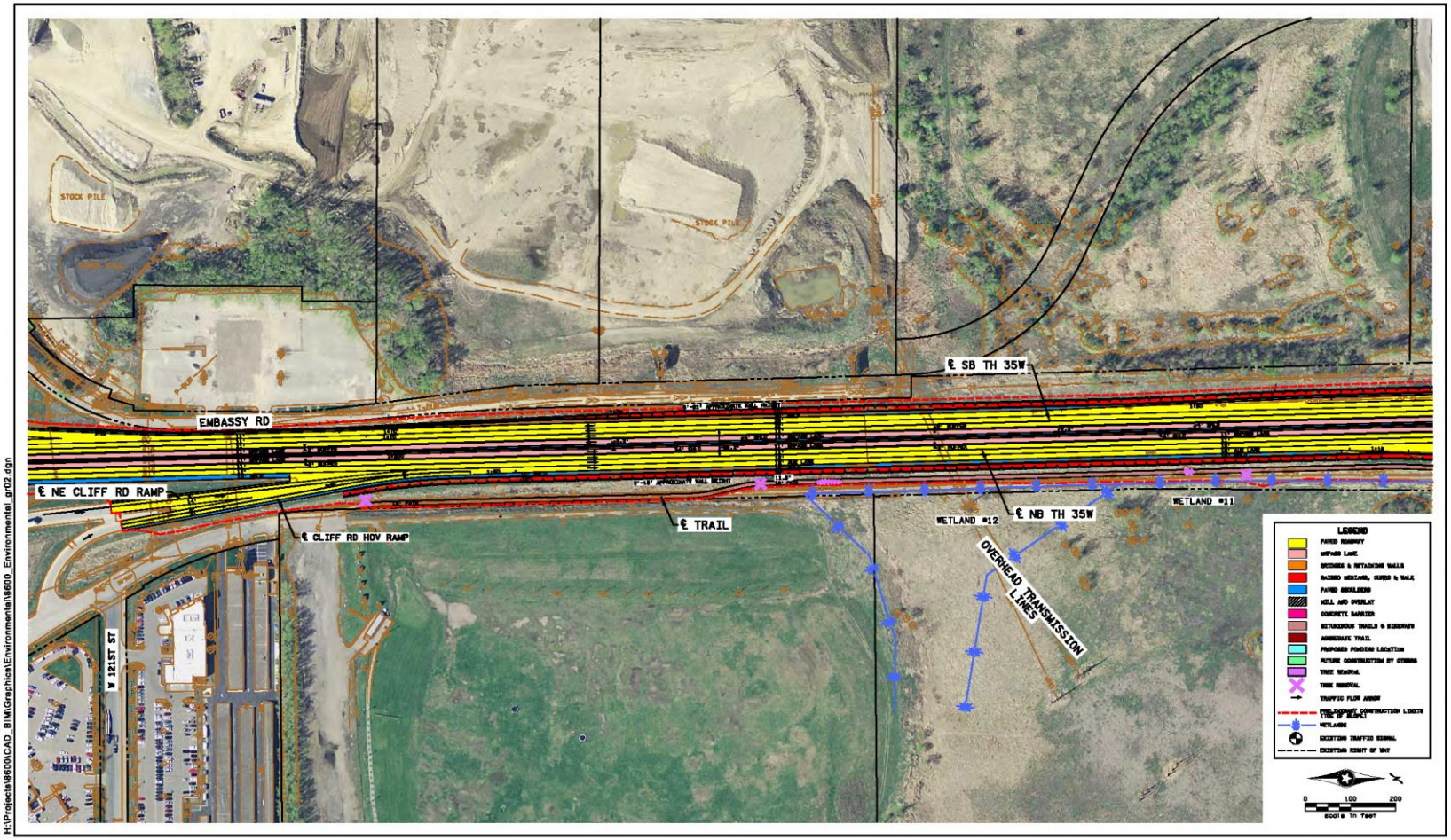


Exhibit E7. MnDOT OES Letter (Page 7 of 10) (November 10, 2016)

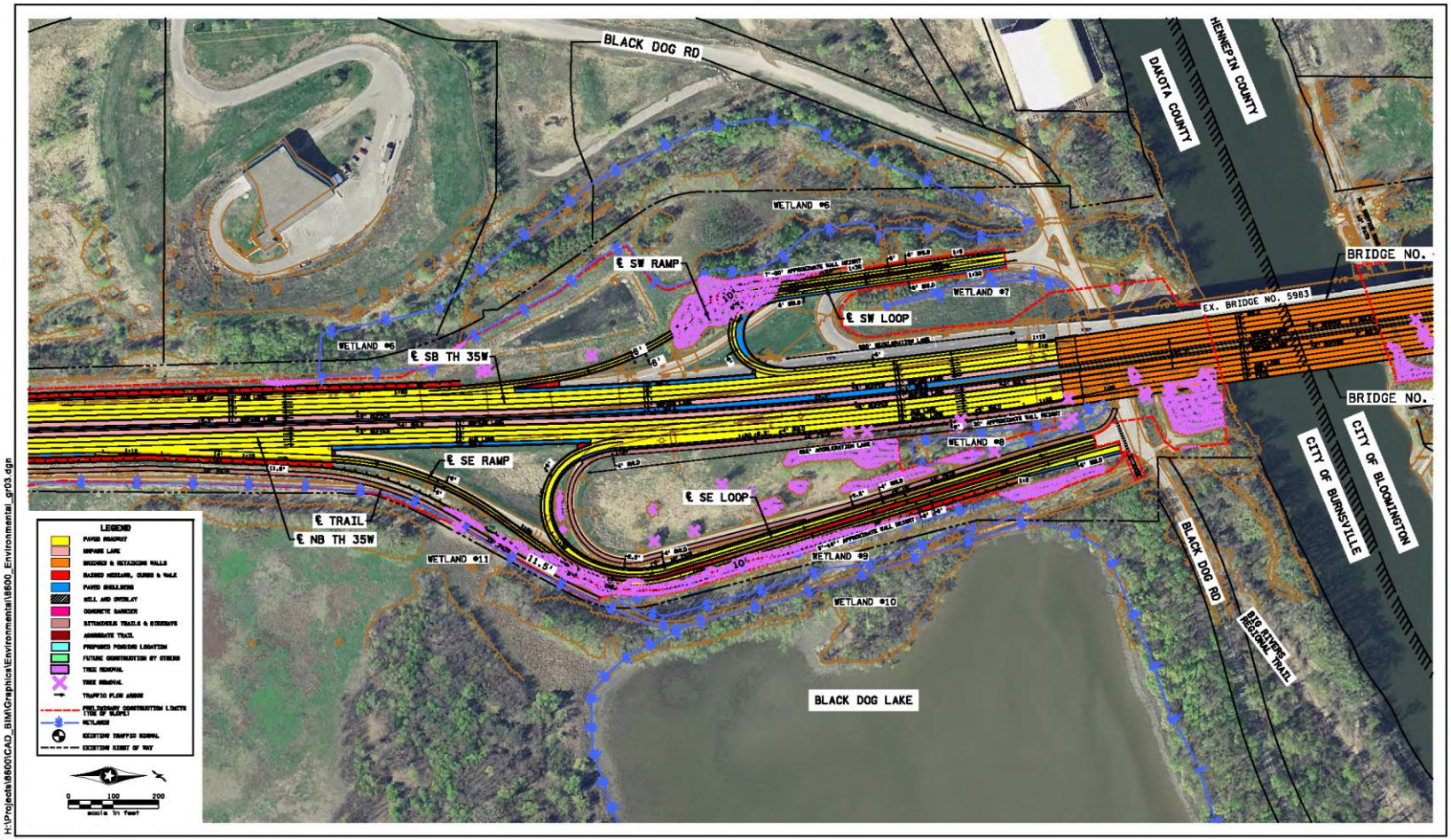


SRF Consulting Group, Inc.
8600
9/26/2016

I-35W Bridge Replacement over the Minnesota River (Project Layout)
Minnesota Department of Transportation
SP 1981-124

Figure A.5

Exhibit E7. MnDOT OES Letter (Page 8 of 10) (November 10, 2016)



SRF Consulting Group, Inc.

I-35W Bridge Replacement over the Minnesota River (Project Layout)

Minnesota Department of Transportation

SP 1981-124

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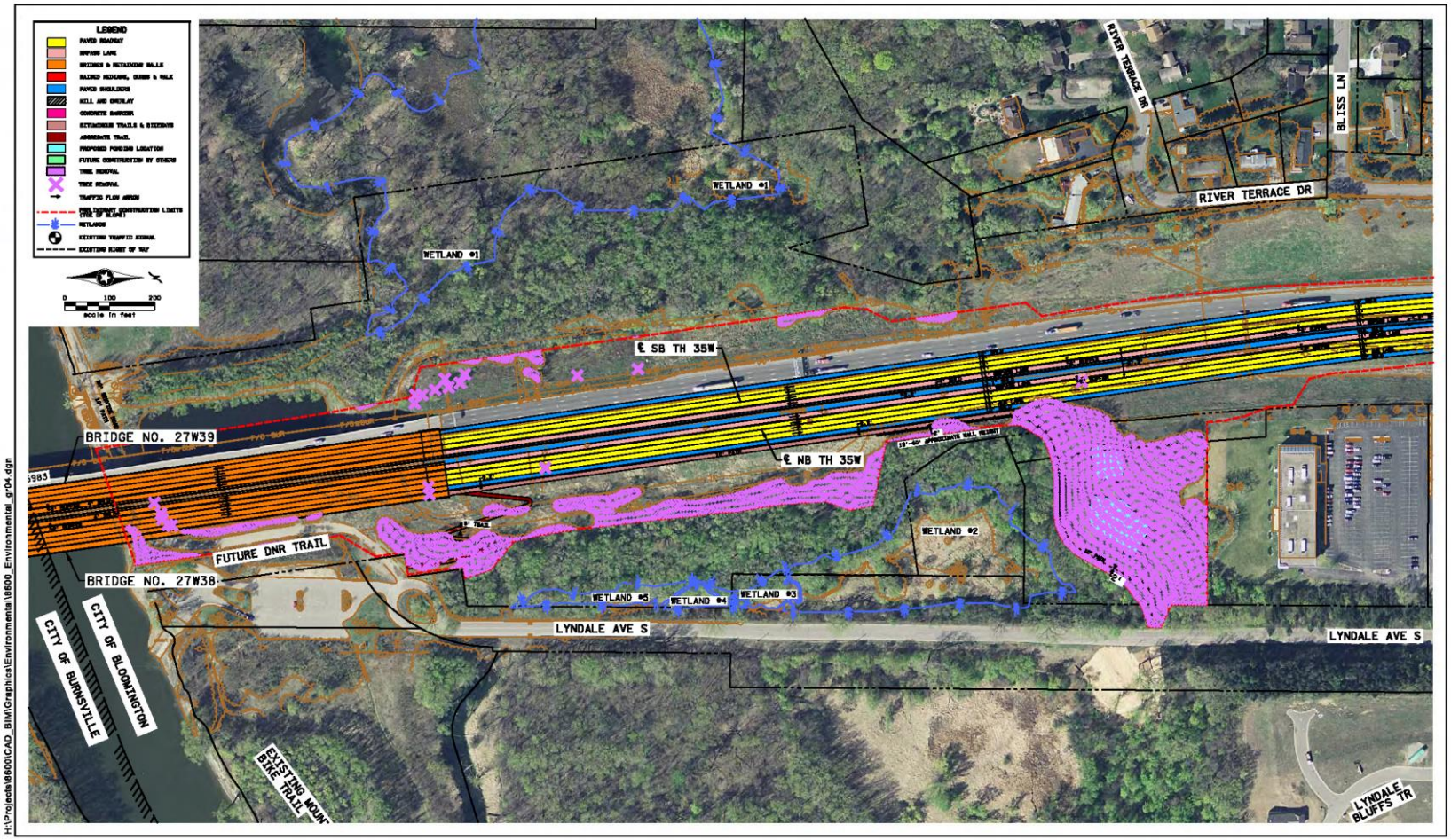
9/28/2016

Figure A.6

Exhibit E7. MnDOT OES Letter (Page 9 of 10) (November 10, 2016)



SRF Consulting Group, Inc.

I-35W Bridge Replacement over the Minnesota River (Project Layout)

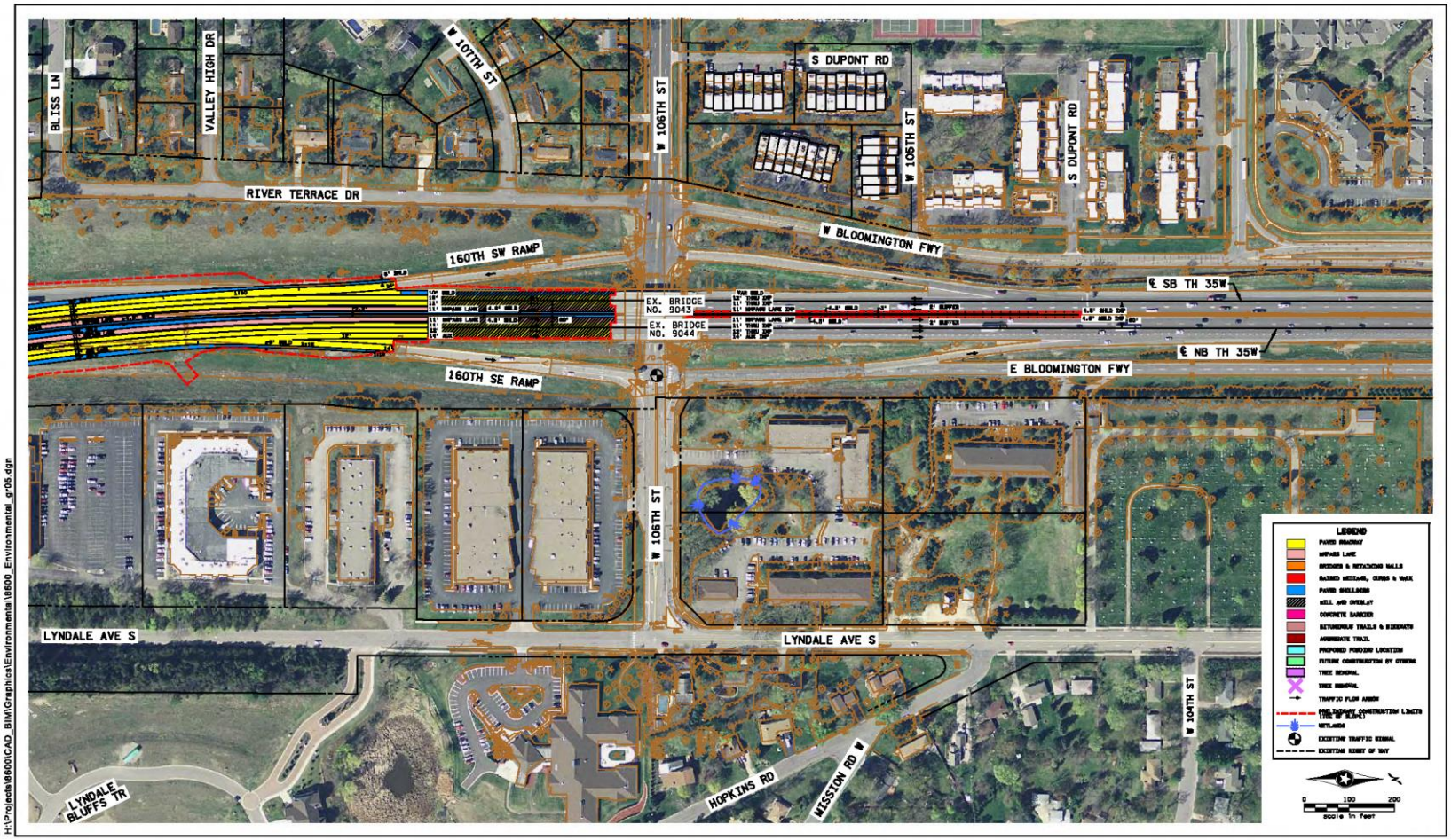
Minnesota Department of Transportation

SP 1981-124

8600
9/28/2016

Figure A.7

Exhibit E7. MnDOT OES Letter (Page 10 of 10) (November 10, 2016)



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SRF Consulting Group, Inc.

I-35W Bridge Replacement over the Minnesota River (Project Layout)

Minnesota Department of Transportation

SP 1981-124

8600
9/28/2016

Figure A.8

Exhibit E8. MnDOT OES Letter (Page 1 of 2) (March 24, 2017)

DEPARTMENT OF TRANSPORTATION

March 24, 2017

No Effect Determination – Rusty-patched Bumble Bee (*Bombus affinis*)

Project(s):

State Project #	District	Road	County	Short Description
0205-101	Metro	NA	Anoka	Install traffic control devices.
3111-30	1	65	Aitkin / Itasca	Repaving, culvert repairs, and associated improvements.
0411-17	2	71	Beltrami / Itasca	Roadway surfacing, turn lane construction, and associated improvements.
1008-85 / 010-596-011	Metro	41	Carver	Project reconstructs and expands a portion of TH 41 between TH 212 and CSAH 14. ***A small portion of the project is within a HPA, but action area is unsuitable paved and mowed turf-grass habitat.***
1120-56	2	371	Cass	Urban roadway reconstruction and associated improvements.
8822-193	2	Various	Clearwater / Itasca	The project consists of lining 70 centerline culverts in various locations throughout MnDOT District 2 with a UV Cured-In-Place (CIPP) liner.
1985-149	Metro	494	Dakota	Construct auxiliary lane, entrance improvements, noise barrier construction, bridge widening and repair, mill and overlay, sewer and drainage, lighting upgrades, signage, curb and gutter, and associated activities.
1981-124	Metro	35W	Dakota / Hennepin	Minnesota River bridge replacement and associated activities.
2305-28	6	30	Fillmore / Olmsted	Culvert lining and associated repairs.
2726-74	Metro	47	Hennepin	Roadway surfacing and associated improvements.
6280-390	Metro	35E	Ramsey	Bridge rehab. Bridge #9534.
7005-121	Metro	169	Scott	New intersections, roadway alignments, ditch grading, culvert replacement, wetland impacts, trail construction, and associated improvements (TIED TO 010-596-011)
8282-129	Metro	94	Washington	Truck station parking expansion and associated improvements.
8217-4654D	Metro	36	Washington	Historic lift bridge renovation.
8214-114AK, 8214-169, & 8214-172	Metro	NA	Washington	St. Croix Crossing - Loop Trail Project

In response to your request, the above referenced action has been reviewed for potential effect to federally-listed threatened, endangered, proposed, candidate species and listed critical habitat. As a result of this review, a determination of **No Effect** has been made.

Rationale for Determination: No known occurrences for rusty-patched bumble bee (RPBB) and/or suitable habitat(s) exist within the action area.

- Project within USFWS identified High Potential Area: **No (unless otherwise noted above)**

All other species previously reviewed for Section 7 compliance not re-reviewed here.

Exhibit E8. MnDOT OES Letter (Page 2 of 2) (March 24, 2017)

Federally-Listed Species/Designated Critical Habitat in the Action Area

Section 7 of Endangered Species Act of 1973, as amended (Act), requires each Federal agency to review any action that it funds, authorizes or carries out to determine whether it may affect threatened, endangered, proposed species, or listed critical habitat. Federal agencies (or their designated representatives) must consult with the U.S. Fish and Wildlife Service (Service) if any such effects may occur as a result of their actions. Consultation with the Service is not necessary if the proposed action will not directly or indirectly affect listed species or critical habitat. If a federal agency finds that an action will have no effect on listed species or critical habitat, it should maintain a written record of that finding that includes the supporting rationale.

All species previously reviewed for Section 7 compliance not re-reviewed here.

Based on the information that you provided and the nature of the activities proposed, MnDOT on behalf of the FHWA, has made a determination of No Effect for the above referenced project. No further action under Section 7 of the Act is required. However, if information becomes available indicating that federally-listed species or designated critical habitat may be affected, please contact this office and consultation with the Service will be initiated if necessary.

Please contact me if there are questions or concerns.

Thank you,

Christopher E Smith Digitally signed by Christopher E Smith
DN: cn=Christopher E Smith
Date: 2017.03.24 13:00:00 -05'00'

Christopher E. Smith, M.Sc., CWB®
Wildlife Ecologist | Office of Environmental Stewardship
Minnesota Department of Transportation
395 John Ireland Blvd., MS 620 | Saint Paul, MN 55155
E-mail: Christopher.E.Smith@state.mn.us | Phone: 651-366-3605

Exhibit E9. DNR Letter (Page 1 of 3) (July 27, 2016)

From: Dalton, Richard (DOT)
To: Brett Danner
Cc: Pedersen, Scott (DOT); Leete, Peter (DOT)
Subject: FW: UPDATE on preliminary comments: 1981-124 (I-35W/Mn R) - REVISED Early Notification Memo (ENM)
Date: Wednesday, July 27, 2016 12:55:55 PM
Attachments: DNR - EARLY NOTIFICATION MEMO - 35W BRIDGE OVER MN RIVER.PDF
DNRbasemap(july2016).pdf

Thanks Peter.

Brett – see Peter's notes below, and the attached DNR dbase map (2016) he refers to in his note.

From: Leete, Peter (DOT)
Sent: Monday, July 25, 2016 7:40 PM
To: Dalton, Richard (DOT); Heinz, Katherine (DOT)
Subject: UPDATE on preliminary comments: 1981-124 (I-35W/Mn R) - REVISED Early Notification Memo (ENM)

Rick/Katie,
The attached list is still good for this point in project development. The attached map is what I see (minus the NHIS info).
A summary of some added details:

a. Beth Brown here in OES is coordinating the mussel survey.
b. There is ongoing work on identifying an alignment for the Minnesota Valley State Trail through the area.
c. For Katie's TEP wetland work, there are Calcareous fens nearby. There are several sites to the SE which are known as the BlackDog fen complex…
d. In addition to the native mussels, the NHIS has:

    i. Cricket frog surveys have been conducted in the area. No cricket frogs were found in the wetlands under the bridge, but they have been found less than a mile to the west. We recommend avoiding staging equipment or materials to the west of the bridge. O at least limit the use in this direction. The closer you get to the cricket frogs, the more likely they are to have impacts. Dewatering plans will have to be done in conjunction with DNR nongame staff in regards to timing for construction activities tol minimize adverse impacts.

    ii. There are a number of native plant communities along that corridor They are not particularly rare (S3-vulnerable, S4-aparently secure), and probably are of degraded quality. Still, the landscape on both sides (north of river) and on the east side (south of river) are also Regionally Significant Ecological Areas of outstanding quality and Sites of Biodiversity Significance of high and moderate quality. They begin immediately outside of the existing ROW. Given the slopes in that area, strict erosion control will be important to keep impacts from those communities. Also the potential for spread of invasive plant seeds will be high, depending on the season of work. IE the usual care for Areas of Environmental Sensitivity

Exhibit E9. DNR Letter (Page 2 of 3) (July 27, 2016)

iii. The calcareous fen on the east side of the southern leg is in the Mn Valley National Wildlife Area; it is pretty far removed from the ROW, but should stay on their radar to keep any drainage impacts from heading that way.

iv. Bats and trees….

Contact me if you have questions

Peter Leete
Transportation Hydrologist (DNR-MnDOT Liaison)
DNR Ecological & Water Resources
Ph: 651-366-3634

From: Dalton, Richard (DOT)
Sent: Thursday, July 21, 2016 7:53 AM
To: Leete, Peter (DOT)
Subject: RE: 1981-124 (I-35W/Mn R) - REVISED Early Notification Memo (ENM) - RESPONSES BY 03/25/2016 (please)

Hi Peter – I don't have an e-mail from you replying to the revised ENM, but here is your response to the 2014 ENM. When the EA will be published is a bit up in the air, since this project is not programmed yet.

The draft EA indicated a mussel survey in the summer of 2016. Who is coordinating mussel surveys now that Jason is gone; Chris?

From: Leete, Peter (DOT)
Sent: Wednesday, July 20, 2016 3:23 PM
To: Dalton, Richard (DOT)
Subject: RE: 1981-124 (I-35W/Mn R) - REVISED Early Notification Memo (ENM) - RESPONSES BY 03/25/2016 (please)

Did I ever do a formal response for this? I've reviewed things a piece at a time, but find no overall comment email in my foolproof filing system

peter
651-366-3634

From: Dalton, Richard (DOT)
Sent: Wednesday, February 24, 2016 1:22 PM
To: Leete, Peter (DOT); Graeve, Kenneth M (DOT); Johnson, Craig (DOT); Jarman, Sarah (DOT); Markeson, Christina (DOT)
Cc: Vogel, Mark (DOT); Mitteco, Gina (DOT); Prather, Daniel (DOT); Weatherhead, James (DOT); Henricksen, Jim (DOT); Wasko, Peter (DOT); Nelson, Douglas (DOT); Aguirre, Matthew (DOT); Heinz, Katherine (DOT); Irish, Bruce (DOT); Sheen, Mooa David (DOT); Moynihan, Debra (DOT); 'Abbi.Ginsberg@dot.gov'; Milkert, Anjani (DOT);

Exhibit E9. DNR Letter (Page 3 of 3) (July 27, 2016)

Pedersen, Scott (DOT); Gombold, Brigid (DOT); Brett Danner
Subject: 1981-124 (I-35W/Mn R) - REVISED Early Notification Memo (ENM) - RESPONSES BY 03/25/2016 (please)

Hi – Metro needs to amend the ENM sent in February 2014 for SP 1981-124. Attached is the Revised ENM. I have highlighted in yellow items that have changed since the 2014 ENM.

The 2013 ENM (and responses received) can be viewed within MnDOT in EDMS doc 1418276. A copy of the Revised ENM will be placed in front of the 2014 ENM in EDMS doc 1418276; see the pdf-book mark "2014 ENM" for responses to the 2014 ENM (on about pdf-page 23 of this EDMS doc).

The purpose of this Revised ENM is to obtain new reviews based on the preliminary layout. The preliminary layout is attached to the Revised ENM. In particular, the following reviews are needed:

- Mussel surveys. The ENM can be used to help "kick-off" this discussion with Peter Leete and DNR staff.
- A Section 7, Endangered Species Act review is needed from Ken Graeve to address the northern long-eared bat following the final 4d rule.
- Cultural resources should review proposed stormwater pond locations (in or out of APE, and is the previous no historic properties determination still valid)
- Same for contaminated materials. Stormwater ponds are proposed along the east side of I-35W (outside of MnDOT right of way) north of the river. Affected parcels are tax-forfeited properties owned by the City of Bloomington.

Not everyone on the original ENM will likely need to respond to this amended ENM. I have listed your name in the "To" field of this e-mail if I believe you should respond to the Revised ENM, and the "Cc" field if I believe this Revised ENM is more for your information (FYI).
We request your ENM response by March 25, 2016.

If you find it helpful, view the project area scoping map in Georilla at:
http://georilla/metrogis/?call=search_scoping2&fieldname0=PROJECT_ID&value0=1270

Please call me if you have questions.

Rick Dalton
651-234-7677

Exhibit E10. DNR Letter (Page 1 of 3) (March 27, 2014)

From: Leete, Peter (DOT)
To: Hintzman, Rachel (DNR); Joyal, Lisa (DNR); Haworth, Brooke (DNR); DeBates, TJ (DNR); Ellison, Daryl G (DNR); Hintzman, Rachel (DNR); Skancke, Jennie (DNR); Gleason, John (DNR); Fashingbauer, Robert (DNR); Marion, Tim J (DNR)
Cc: Alcott, Jason (DOT); Gombold, Brigid (DOT); Sullivan, Dan (MPCA); Davis, Mike J (DNR)
Subject: MnDOT Early Notification Memo, I-35W bridge replacement (Minnesota River) SP1981-124
Date: Thursday, March 27, 2014 11:39:44 AM
Attachments: EMN.pdf
DNRbasemap.pdf

HI,
Attached is MnDOT Early Notification Memo for the replacement of the I-35W Minnesota River bridge. Also included is the raising of I-35W across the floodplain. One cannot occur without the other, so they are doing both. Briefly, from what I know of the area and see on the attached DNRbasemap (my GIS review) this is what I will comment on.

1. Floodplain models for the raising of I-35W will need to be completed to determine bridge designs. MnDOT is working on this.
2. Native Mussels. Surveys in 2006 found T&E species in the area. MnDOT will need to develop a map showing potential areas of impact for the construction of this bridge. MnDOT will then have to survey these areas for determination of impacts. It's a process that is familiar to MnDOT, our malacologists, and I.
3. Nine Mile Creek impacts? It something to keep in the mix as the area has a multitude of rare features in it.
4. Connectivity though the area. The bridge should be designed so passage under either bank continues to be possible (and hopefully improved). The river bluffs and floodplain are obviously a historical route for animal movement.
5. The Public Access. Not sure what will occur here, but we will want to be at the table when designs are being discussed.
6. The rivers trial systems. I am not sure what the long term plans are along the shorelines, but obviously folks involved in the river trail system need to be at the table too. The river itself is a state trail, but commercial navigation requirements will obviously encompass recreational needs.
7. I am not seeing that the DNR owns any land that would be impacted by this project. The feds appear to, but not us (I am guessing the public access is under cooperative agreements with MnDOT and/or the USFWS. Let me know if I am wrong on that.
8. Stormwater treatment. Half the current bridge currently directly discharges to the river. The entire new bridge should have a treatment system prior to discharge to the river.
9. The bluffs and floodplain areas do contain a multitude of T&E species. I do not see a direct impact as long as connectivity concerns are designed into the project and construction methods will not harm them.

Anything else? There are no details to share yet, so generic comments are fine. The project is on a fast track (due to the availability of federal funding) with construction beginning in 2017. Please provide any comments by April 11 and I will include them in my write up for MnDOT.

Contact me if you have questions

Exhibit E10. DNR Letter (Page 2 of 3) (March 27, 2014)

peter

Peter Leete
Transportation Hydrologist (DNR-MnDOT Liaison)
DNR Ecological & Water Resources
Ph: 651-366-3634

Office location: MnDOT's Office of Environmental Stewardship

Exhibit E10. DNR Letter (Page 3 of 3) (March 27, 2014)

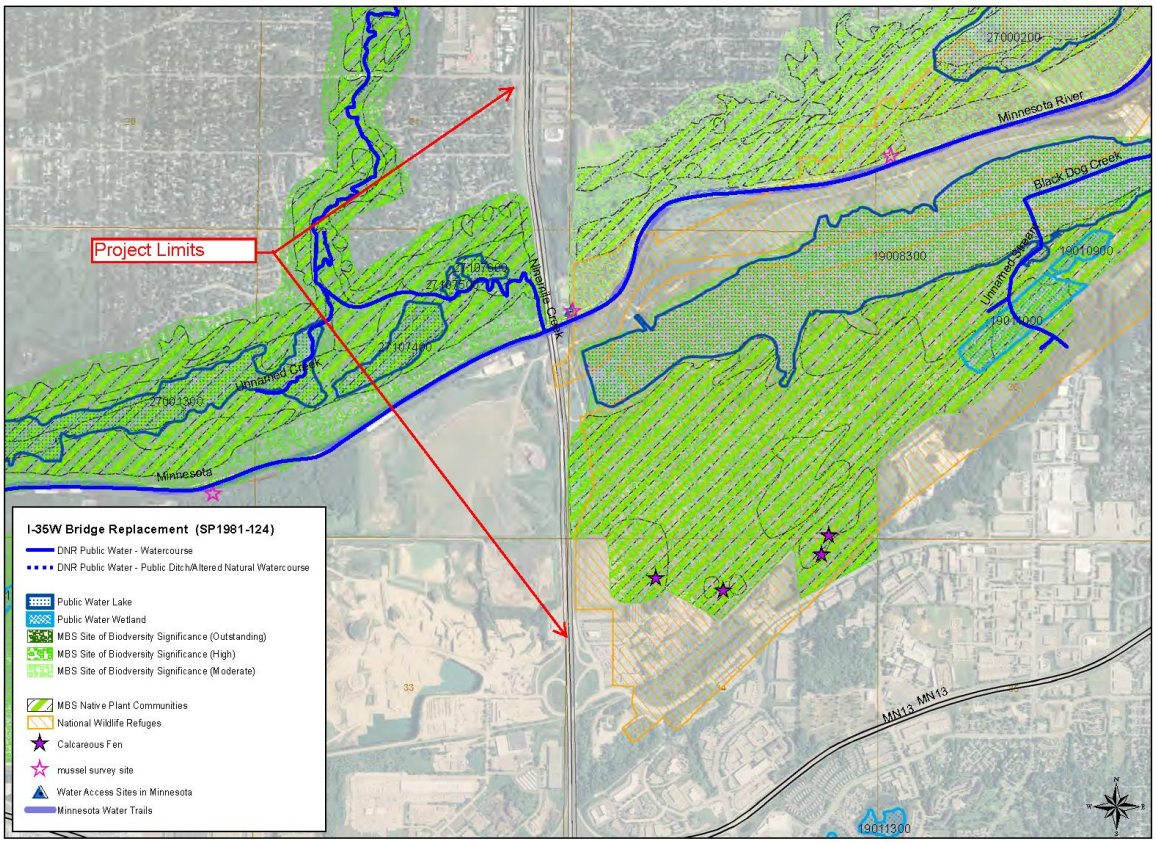

Exhibit E11. DNR Guidance Document (Page 1 of 2) (Best Practices for Preventing the Spread of Aquatic Invasive Species)

Best Practices for Preventing the Spread of Aquatic Invasive Species

All equipment[1] being transported on roads or placed in Waters of the State shall be free of prohibited and regulated invasive species and unlisted non-native species (any other species not native to Minnesota)

1. **Project plans or documents should identify Designated Infested Waters[2]** located in or near the project area.

2. **Prior to transportation along roads into or out of any worksite, or between water bodies within a project area, all equipment** must be free of any aquatic plants, water, and prohibited invasive species.
   A. **Drain** all water from equipment where water may be trapped, such as tanks, pumps, hoses, silt curtains, and water-retaining components of boats/barges (see Figures 5 & 6) **AND**
   B. **Remove** all visible aquatic remnants (plants, seeds and animals). Removal of mud & soil is not required at all sites, though is encouraged as a Best Practice. Removal of mud and soil may be required on sites designated as infested (see #4).

3. **Prior to placing equipment <u>into any waters</u>**, all equipment must be free of aquatic plants and non-native animals.

4. **Additional measures are required on *Designated Infested Waters* to remove and kill prohibited species such as zebra mussels, quagga mussels, New Zealand mudsnails, faucet snails, or spiny waterfleas.**
   Note: The DNR is available to train site inspectors and/or assist in these inspections. Contact the appropriate Regional Invasive Species Specialist: www.mndnr.gov/invasives/ais/contacts.html
   A. For day use equipment (in contact with the water for 24 hours or less); Perform #2 above or,
   B. For in-water exposure greater than 24 hours: Perform #2 above, and inspect all equipment for the prohibited invasive species present (see Figure 1).

   Then choose one of the following three: **on-site treatment**, **off-site treatment**, or **customized alternative**.

Figure 1. Invasive species may not be readily visible on equipment. Some species are less than 1/4 inch in size.
Photo credit: Brent Wilber, Lunda Construction

On-Site Treatment

Remove by handscraping or powerwashing (minimum 3000 psi) all accessible areas (Figures 1 and 2) **AND**
Kill Prohibited Aquatic Invasive Species in non-accessible areas using one or more of the following four techniques:

- **Hot Water (minimum 140°F) for ten seconds** (Figure 2) for zebra mussels, quagga mussels, New Zealand mudsnails, faucet snails **OR**
- **Air Dry** (Figures 3 & 4)
  Spiny waterfleas – air dry for a minimum of 2 days
  New Zealand mudsnails – air dry for a minimum of 7 days
  zebra or quagga mussels, faucet snails – air dry for a minimum of 21 days **OR**
- **Freezing Temperatures**
  zebra mussels - expose to continuous temperature below 32°F for 2 days **OR**
- **Crush**
  Crush rock, concrete, or other debris by running it through a crushing plant to kill prohibited species

Figure 2. Removal of aquatic remnants is required before transporting.
Photo credit: Peter Leete, DNR

Off-Site Treatment

Under certain conditions, the DNR will allow transportation of equipment off-site after partial removal of prohibited species (for example, after "removal" has been done and equipment will be taken to a facility to complete final treatment [i.e., "kill"]) This is a 'one-way pass' to allow transport to a storage area or disposal facility. This option can only be utilized if the receiving site is at least 300 feet from riparian areas, wetlands, ditches, stormwater inlets or treatment facilities, seasonally-flooded areas, or other waters of the state. To be allowed to use the off-site treatment option you must do the following:

- Read, complete, and comply with the appropriate authorization form for transportation of Prohibited Invasive Species at www.mndnr.gov/invasives/ais_transport.html (Note that a completed form is required to be in every vehicle that is transporting equipment containing infested species) **AND**
- Complete on-site treatment described in 4B above prior to re-use in or adjacent to water.

Best Practices for Preventing the Spread of Aquatic Invasive Species, April 2013 *Page 1 of 2*

Source: http://files.dnr.state.mn.us/publications/ewr/invasives/ais/best_practices_for_prevention_ais.pdf

Exhibit E11. DNR Guidance Document (Page 2 of 2) (Best Practices for Preventing the Spread of Aquatic Invasive Species)

Best Practices for Preventing the Spread of Aquatic Invasive Species

Contact a DNR Invasive Species Specialist for authorization of a customized alternative

There may be situations due to time of year, length of exposure, type of equipment, or site conditions that a DNR Invasive Species Specialist could approve alternative methods or requirements for treatment. Contact the appropriate Regional Invasive Species Specialist: www.mndnr.gov/invasives/contacts.html

5. **Temporary appropriations of water from Designated Invested Waters to utilize elsewhere (such as for dust control, landscaping, bridge washing, etc.) is not allowed except by permit, thus should be avoided.**

If use of Designated Infested Waters is unavoidable, permit information is located at www.mndnr.gov/waters/watermgmt_section/appropriations/permits.html

Figure 3. Drying will also kill aquatic organisms. Lay out materials to dry in the proper time. Drying times vary by species. Inspect after drying period is over.
Photo credit: Dwayne Stenlund, MnDOT

Figure 4. Drying techniques must not trap water. This equipment will not dry adequately.
Photo credit: Peter Leete, DNR

Figure 5. Pumping from designated infested waters for use elsewhere on the project is prohibited without a permit.
Photo credit: Peter Leete, DNR

Figure 6. Drain all water from equipment where water may be trapped. Remove drain plugs and drain hoses prior to transport.
Photo Credit: Peter Leete, DNR

Document Information
www.mndnr.gov/waters/watermgmt_section/pwpermits/gp_2004_0001_manual.html
Best Practices for Meeting DNR GP 2004-0001 (published 5/11, updated 12/12) – Chapter 1/Page 8
More on the DNR Invasives Species Program can be found at: www.mndnr.gov/AIS

[1] **'Equipment'** is defined as any implement utilized in construction. This includes boats, barges, heavy machinery, light machinery, or other material that may be moved on-site or off-site, including but not limited to rock (riprap) or timber for temporary workpads, backhoes, pumps, hoses, worksite isolation materials (eg, sheet pile or jersey barriers), boats, barges, temporary staging materials, erosion prevention products, sediment control products (eg, silt curtain), water trucks that take water from open bodies of water (eg, dust control), or dewatering components.
[2] **List of Designated Infested Waters**: http://files.dnr.state.mn.us/eco/invasives/infested_waters.pdf

DNR Contact Information

DNR Ecological and Water Resources lists area office staff at www.mndnr.gov/waters

DNR Ecological and Water Resources
500 Lafayette Road, Box 32, St. Paul, MN 55155-4032, (651)259-5700 or 5100

DNR Ecological and Water Resources website provides information at www.mndnr.gov or by calling (651) 259-5700 or 5100.

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DNR Information Center

This information is available in an alternative format on request

Twin Cities: (651) 296-6157
Minnesota toll free: 1-888-646-6367
Telecommunication device for the deaf (TDD): (651) 296-5484
TDD toll free: 1-800-657-3929

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Best Practices for Preventing the Spread of Aquatic Invasive Species, April 2013 *Page 2 of 2*

Exhibit E12. DNR Coordination (Minnesota Valley State Trail) (Page 1 of 3)

Brett Danner

From: Skaar, Kent (DNR) <kent.skaar@state.mn.us>
Sent: Thursday, November 02, 2017 6:21 AM
To: Pedersen, Scott (DOT); Helm, Brandon (DNR)
Cc: Brett Danner
Subject: RE: Trail Facility under proposed bridges for 35W over the Minnesota River

Scott,

I do not see a problem with that approach. Just let us know what you need for correspondence. However, given the existing pedestrian and bicycle use in the area is administered by the City of Bloomington I would recommend that they be consulted regarding current use/uses.

Kent Skaar

From: Pedersen, Scott (DOT)
Sent: Wednesday, November 01, 2017 6:00 PM
To: Skaar, Kent (DNR) <kent.skaar@state.mn.us>; Helm, Brandon (DNR) <brandon.helm@state.mn.us>
Cc: Brett Danner (bdanner@srfconsulting.com) <bdanner@srfconsulting.com>
Subject: Trail Facility under proposed bridges for 35W over the Minnesota River

I wanted to follow up regarding our discussion regarding the proposed platform under the bridge. As we have been working through the environmental documentation, we have been addressing potential 4f impacts associated with the project. As the trail is not inplace as of yet, FHWA has requested that we receive correspondence stating that the provision of a 30 foot platform under the bridge to facilitate the access road and the bridge. With this correspondence, it would potentially save a lot of paperwork regarding the 4f work for the project. I believe the primary concern is that the project is not prohibiting any future plans for the trail facility under the bridge. Do you see this as being problematic? Thank you.

Scott Pedersen, P.E.
Metro District – Project Management Manager
1500 West County Road B2
Roseville, Minnesota 55113
Phone: 651-234-7726
E-Mail: Scott.Pedersen@state.mn.us

1

Exhibit E12. DNR Coordination (Minnesota Valley State Trail) (Page 2 of 3)

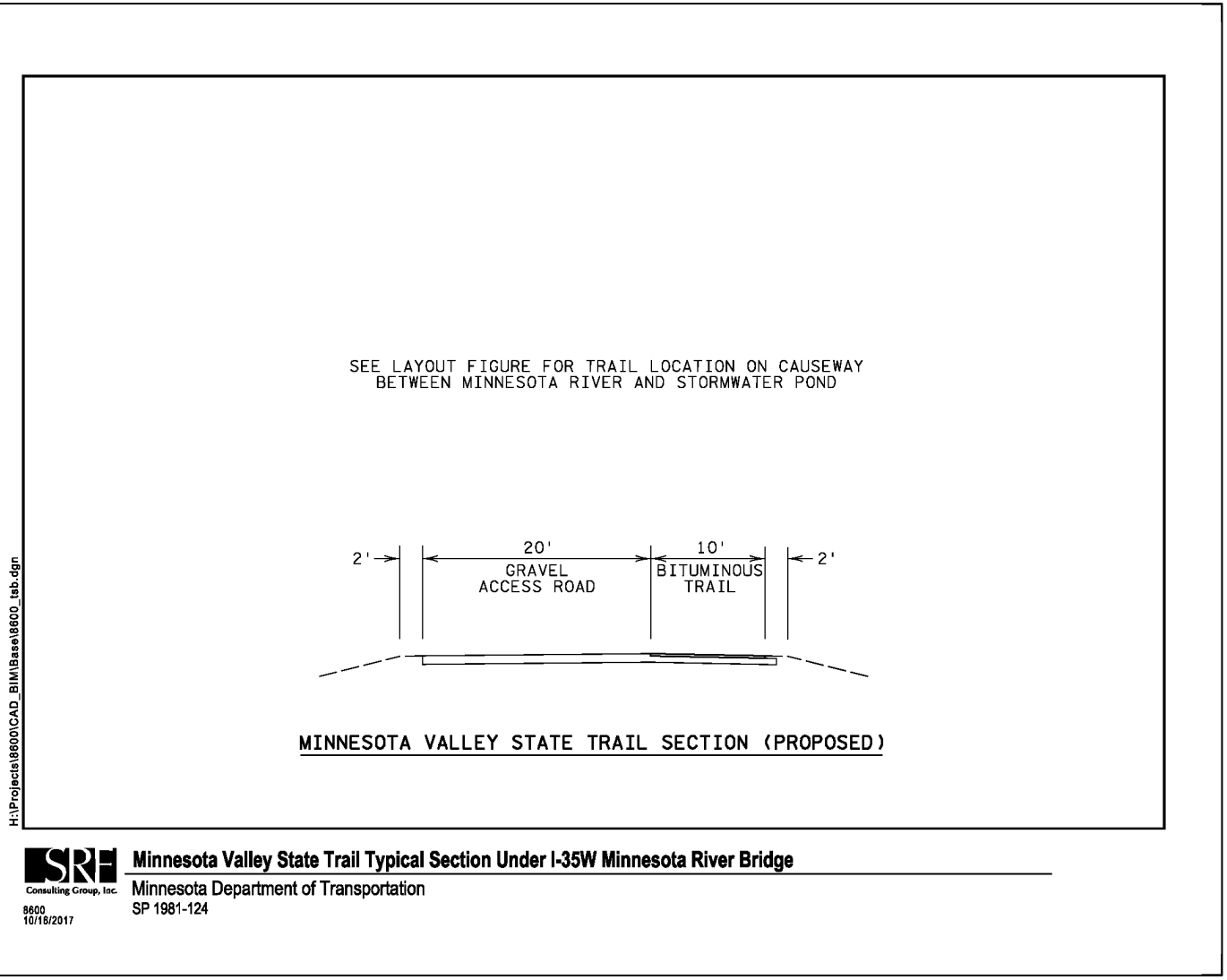
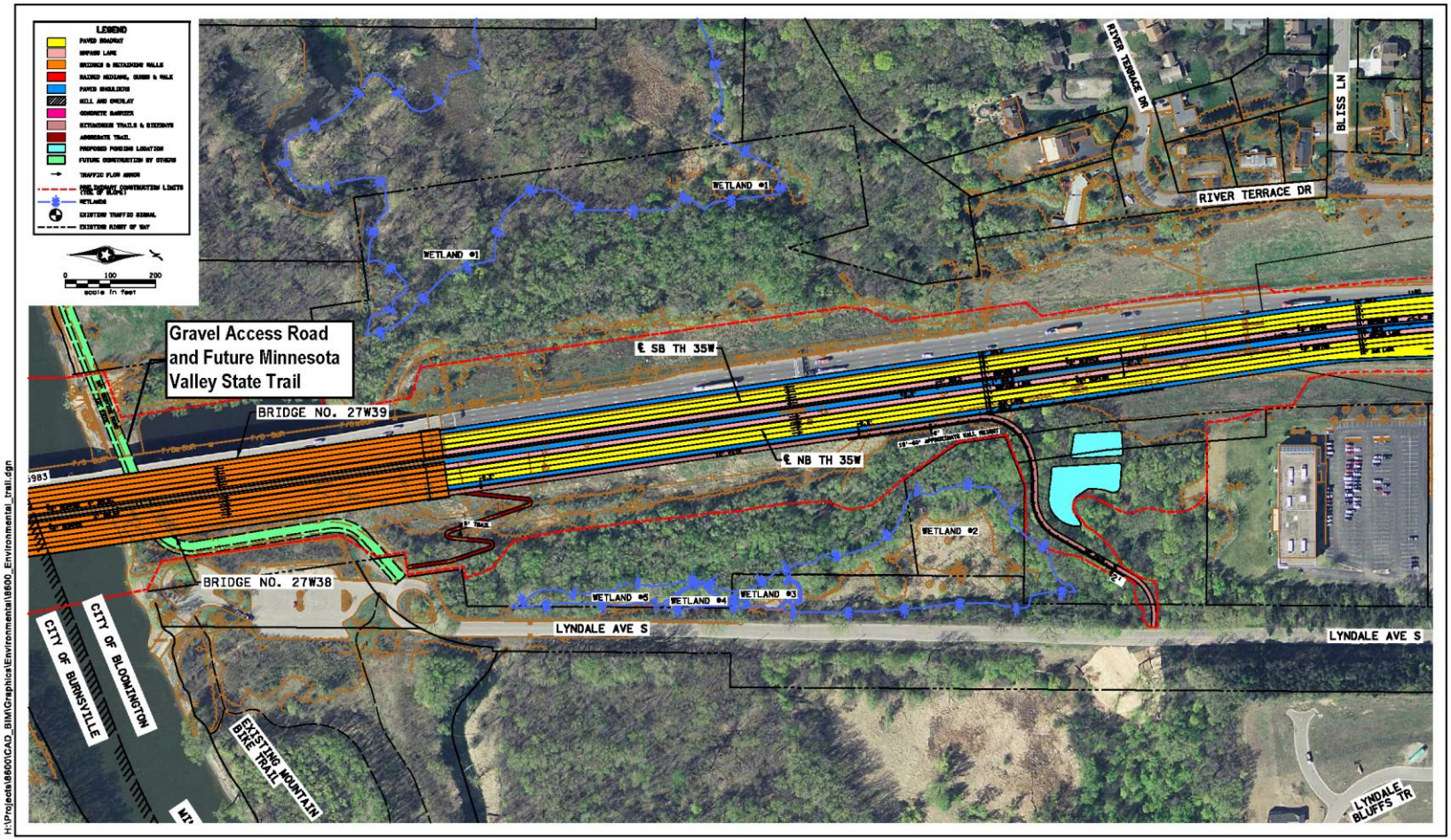


Exhibit E12. DNR Coordination (Minnesota Valley State Trail) (Page 3 of 3)



SRF Consulting Group, Inc.
8600
10/18/2017

Future Minnesota Valley State Trail Under I-35W Minnesota River Bridge
Minnesota Department of Transportation
SP 1981-124

Appendix F

Environmental Assessment Worksheet Figures

Figure F.1

City of Burnsville Parks and Trails Map

The Burnsville Park System contains approximately 1750 acres spread throughout 76 parks. Approximately 1/3 of the parkland is developed for active uses. The other 2/3 is preserved as natural areas, some accessed by trails. Some of the many amenities in the park system are:

- natural hiking trails
- cross-country ski trails
- mountain bike trails
- tennis courts
- volleyball courts
- basketball courts
- in-line skating rinks
- public beach
- boat launch
- recreation buildings
- picnic areas and shelters
- playground areas
- hockey and pleasure rinks
- archery range
- disc golf course
- athletic complexes used for tournament play for softball, baseball and soccer

CONTACT INFORMATION

Parks & Recreation

Parks Department (parks maintenance and development)	952-895-4550
Recreation Department (activities and facility reservations)	952-895-4500
24-hour Recreation Hotline	952-895-4507
Burnsville Ice Center	952-895-4651
Birnamwood Golf Course	952-641-1370
Burnsville Senior Center	952-707-4120
THE GARAGE Youth Center	952-895-4664

Youth Sports

Youth athletic programs are coordinated by the following volunteer organizations:

Burnsville Athletic Club	952-895-4425
Burnsville Hockey Club	952-895-4651
Valley Athletic Association	952-432-5618
Lakeville Athletic Association	952-953-7471
Burnsville Minnesota Valley Figure Skating Club	952-895-4651

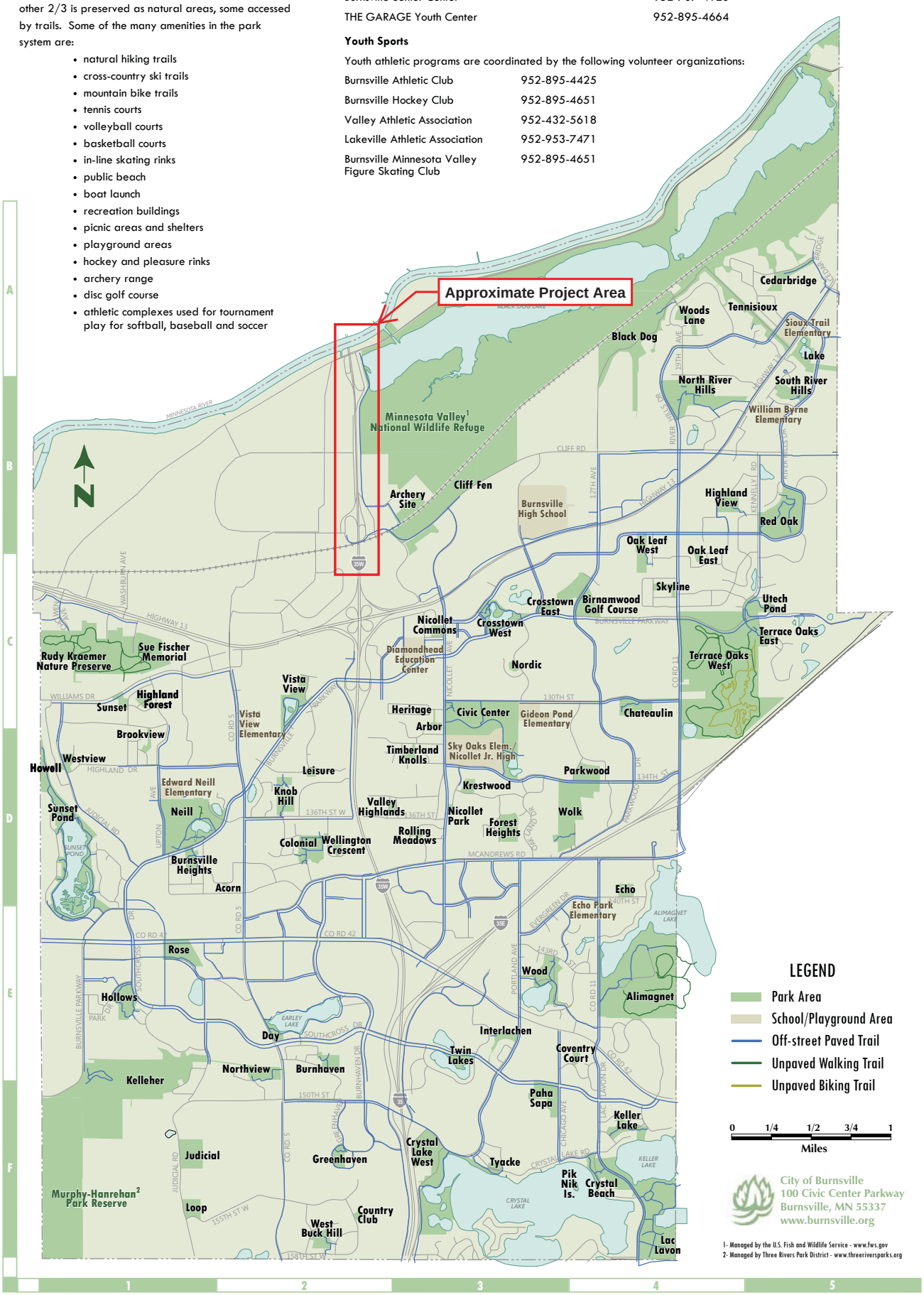


Figure F.2

Bloomington, Minnesota
Parks and Recreation Facilities

Parks and Playgrounds Regulations

Parks hours:
Sunrise to 10 p.m.
or as posted

It's illegal to:

1. Possess, display or use intoxicating liquors in any park.
2. Possess, display or use non-intoxicating malt liquor except under special event license permit or in a designated picnic area (Moir Picnic Grounds, Parker's Picnic Grounds, Bush Lake Park Picnic Grounds, Normandale Lake Picnic Area).
3. Allow dogs without a leash.
4. Park or operate a motor vehicle including mopeds or motorcycles except on roads or designated parking areas.
5. Use or possess glass containers or bottles of any type.
6. Golf or play any games except in areas provided.
7. Swim in any water except at designated beach area.
8. Injure any plant, flower, shrub, tree, grounds or other property.
9. Remain in any park area after closing.
10. Walk on bike paths.
11. Bike on walking paths.
12. Use floatables on waters unless so licensed.
13. Litter or dump.
14. Commit any nuisance or offense against decency or public morals.
15. Light fires except in areas provided.

Copies of City of Bloomington Park Ordinance 5.21 and full City Code are available at the Parks and Recreation Division or on the City's website.

The City of Bloomington *Parks and Facilities Map* is provided as a service to residents and is designed to show the general location of the properties. This map does not reflect legal property lines.

For more information or to report a problem, please contact the City of Bloomington Parks and Recreation Division at 952-563-8877.

City of Bloomington Minnesota

Bloomington Parks and Recreation • 1800 West Old Shakopee Road • Bloomington MN 55431-3027 • 952-563-8877 • TTY: 952-563-8740 • www.ci.bloomington.mn.us • parksrec@ci.bloomington.mn.us

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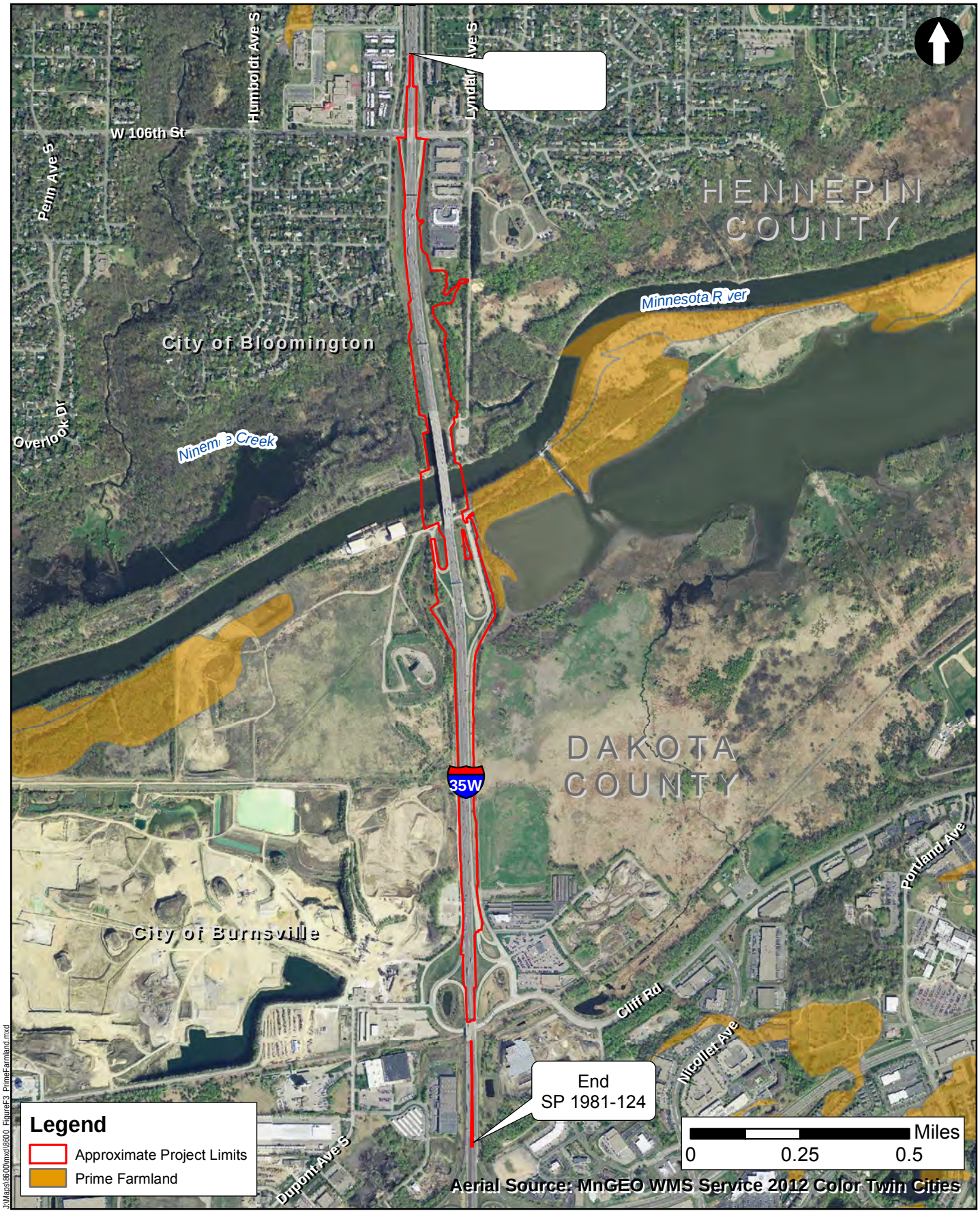
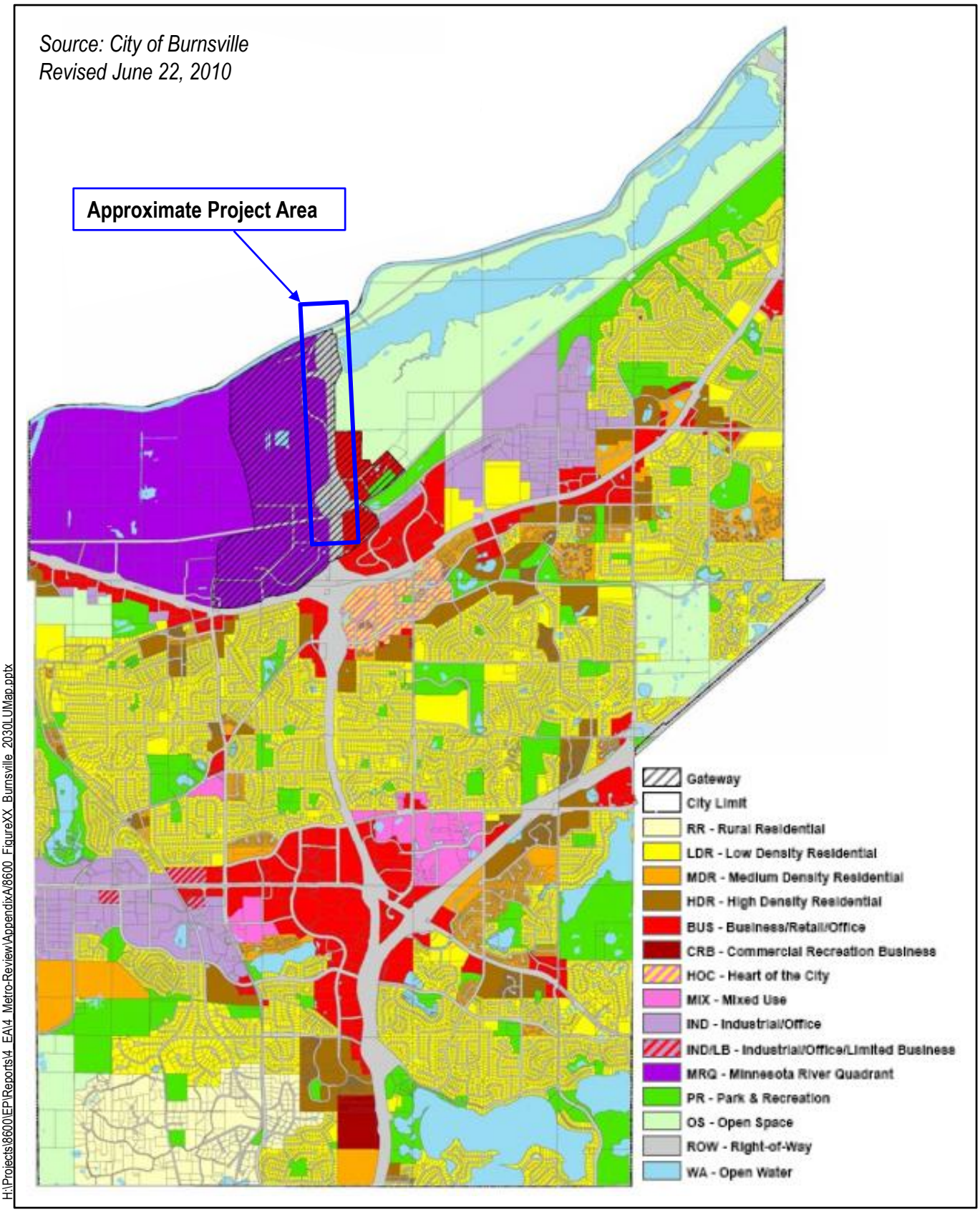


Prime Farmland

Figure F.3

I-35W over the Minnesota River
SP 1981-124
MnDOT



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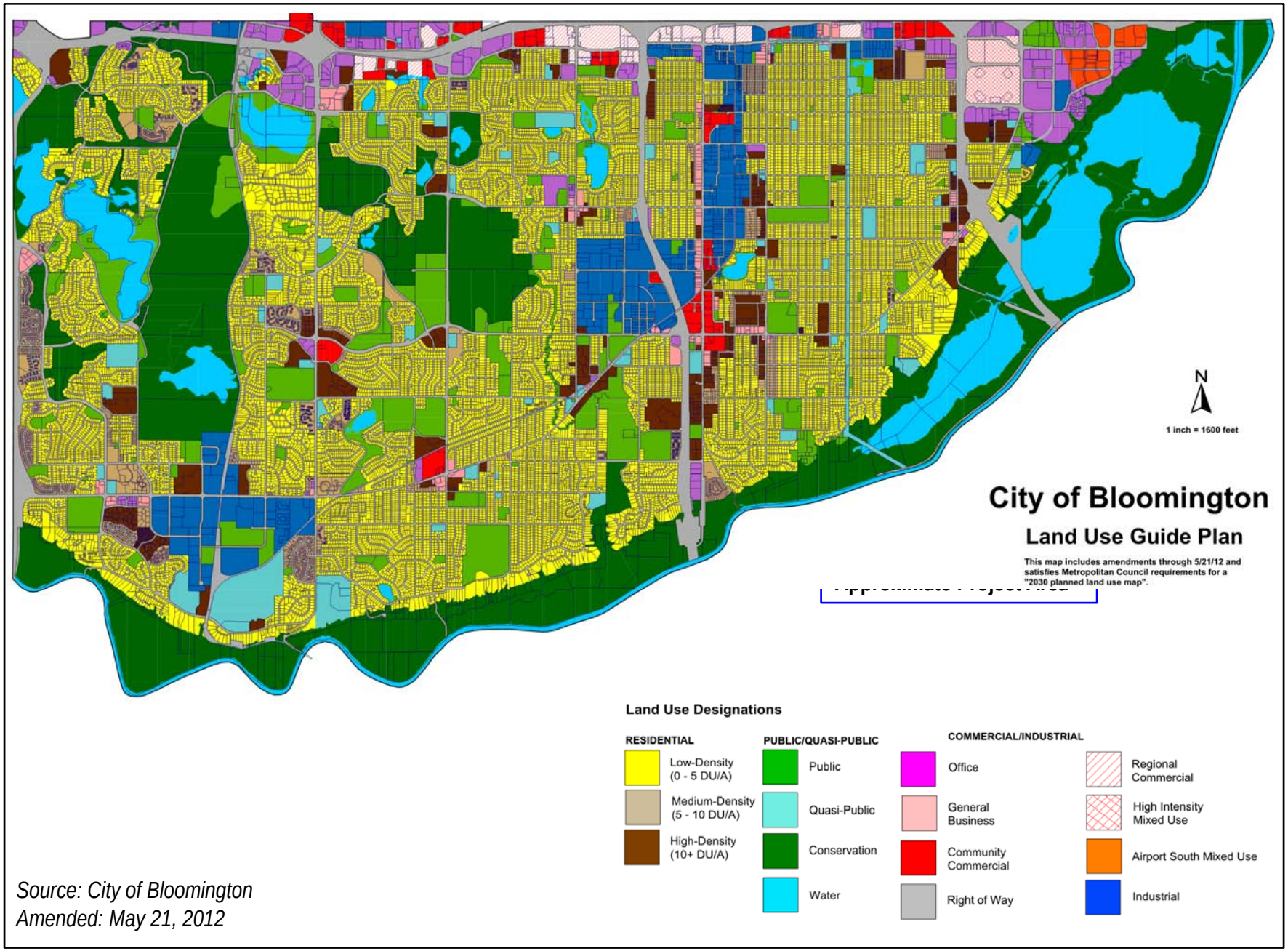
City of Burnsville 2030 Land Use Guide Plan

Figure F.4

I-35W over the Minnesota River
SP 1981-124
MnDOT



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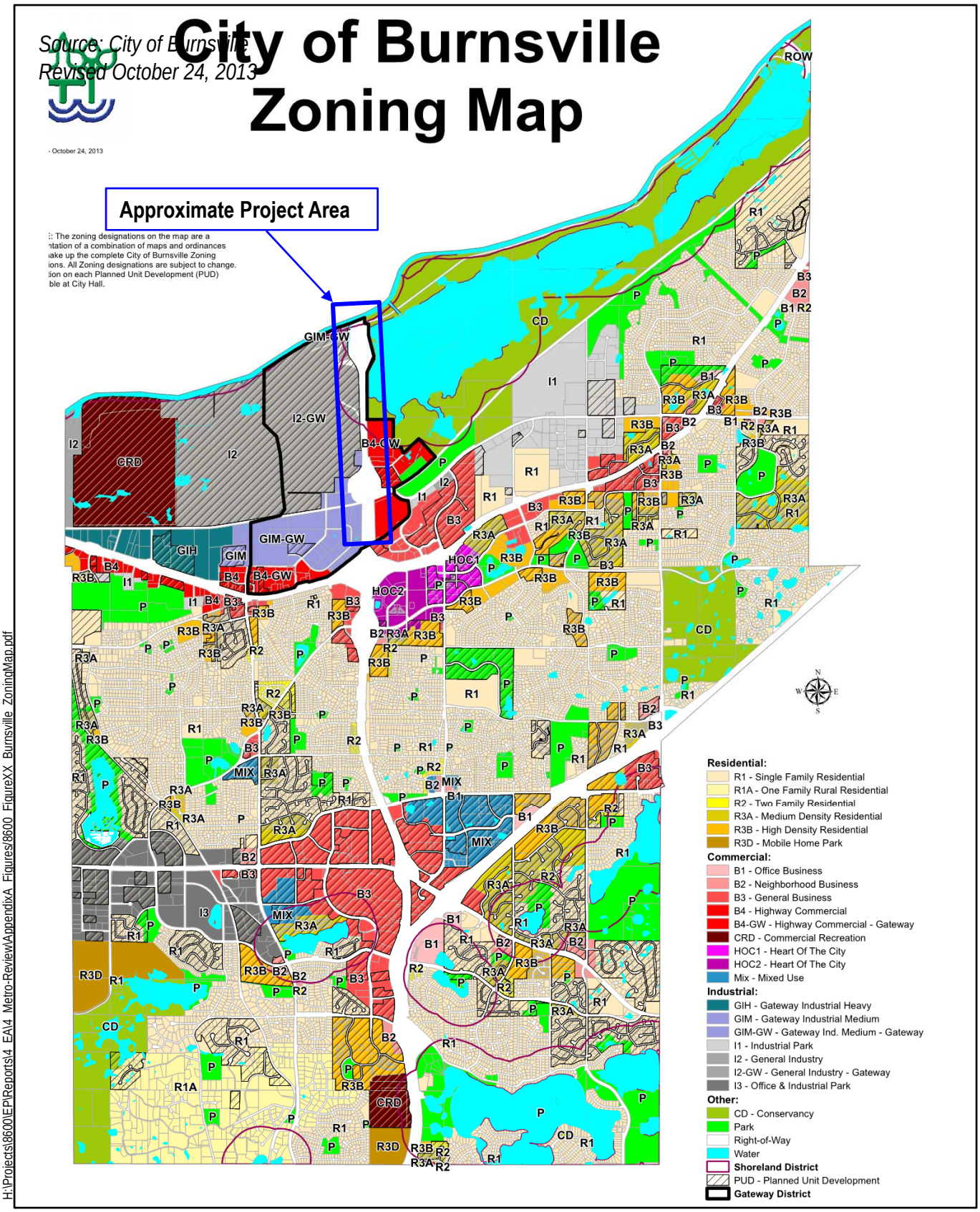
City of Bloomington 2030 Land Use Guide Plan

Figure F.5

I-35W over the Minnesota River
SP 1981-124
MnDOT



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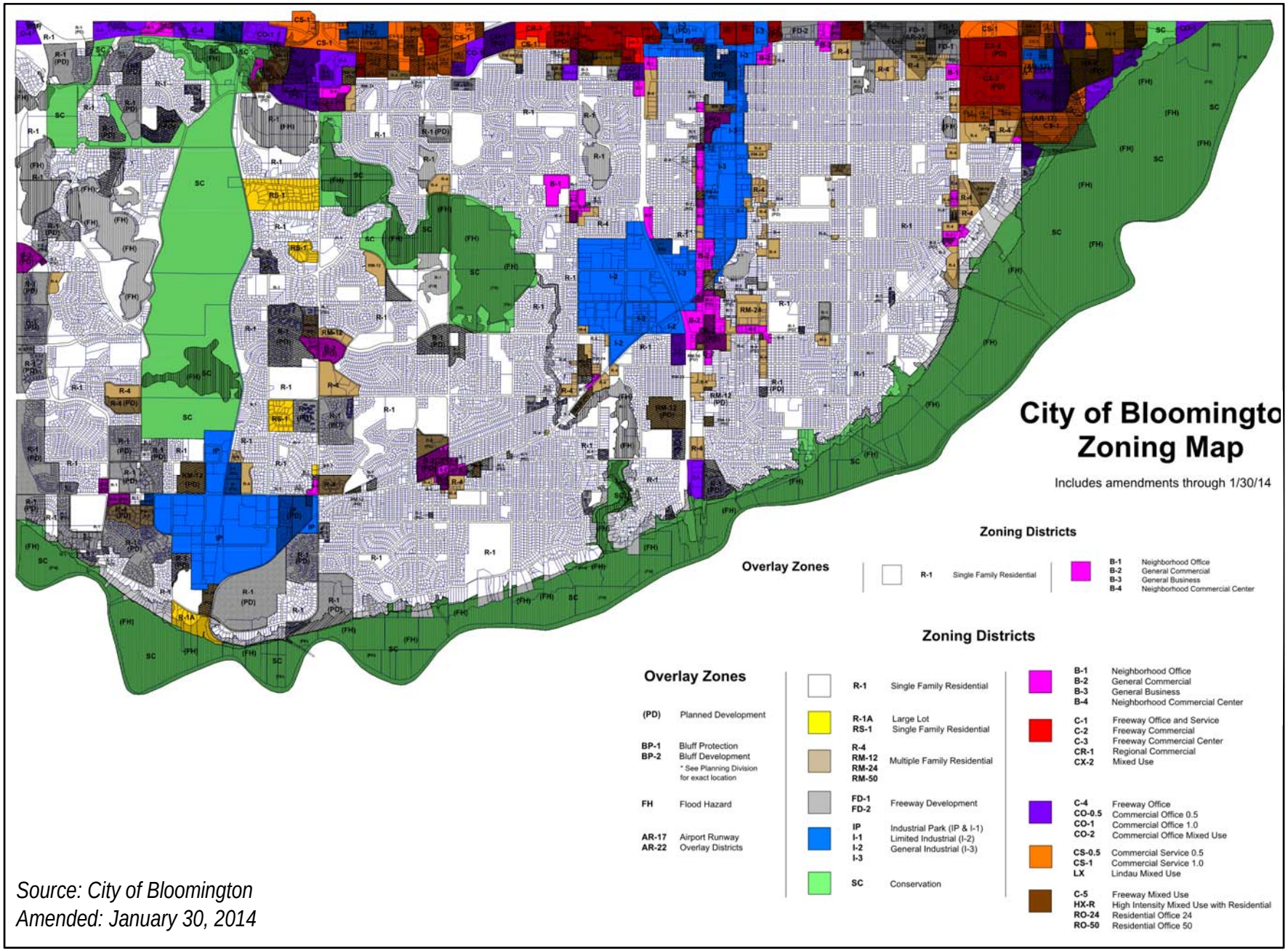
City of Burnsville Zoning Map

Figure F.6

I-35W over the Minnesota River
SP 1981-124
MnDOT



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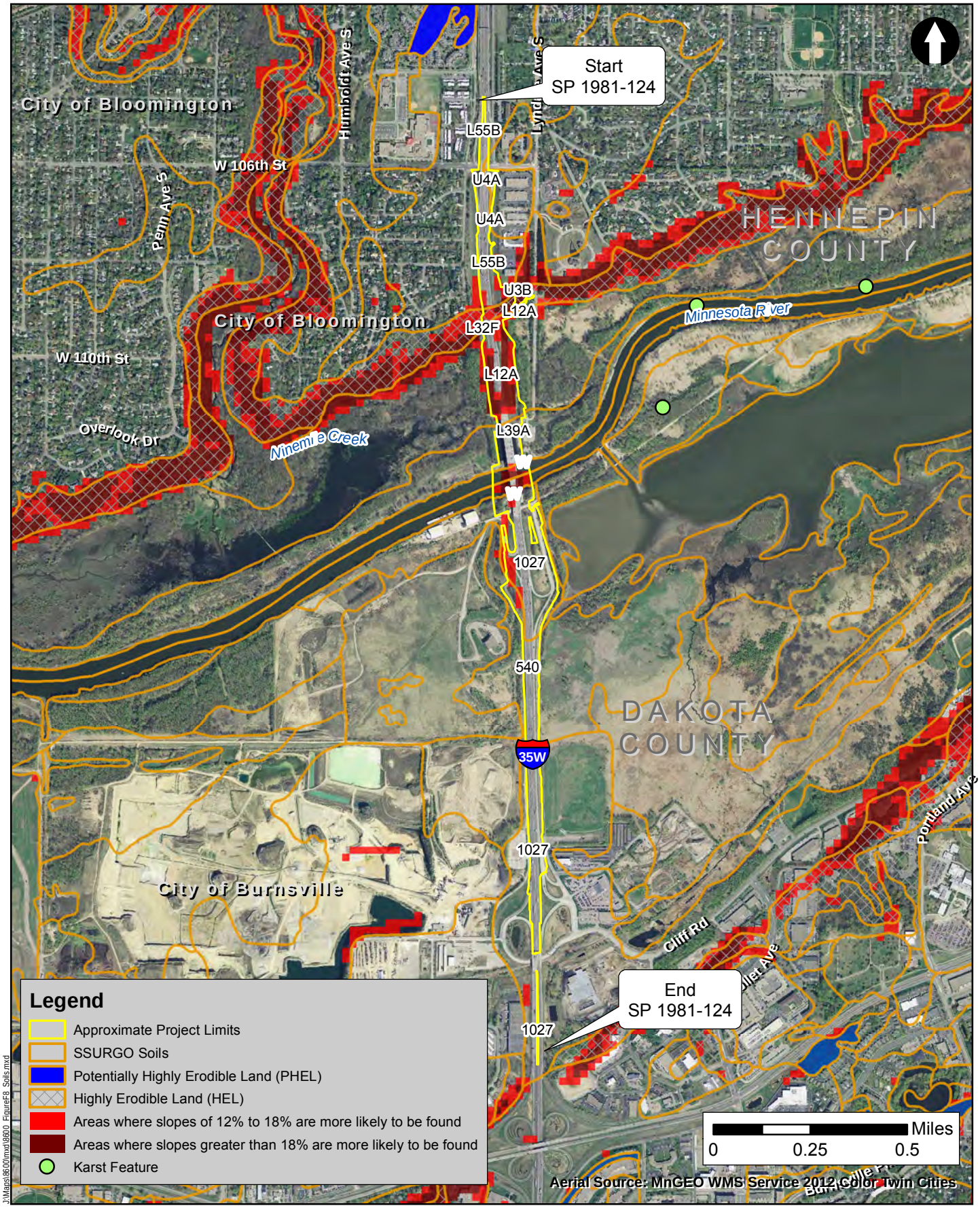
City of Bloomington Zoning Map

Figure F.7

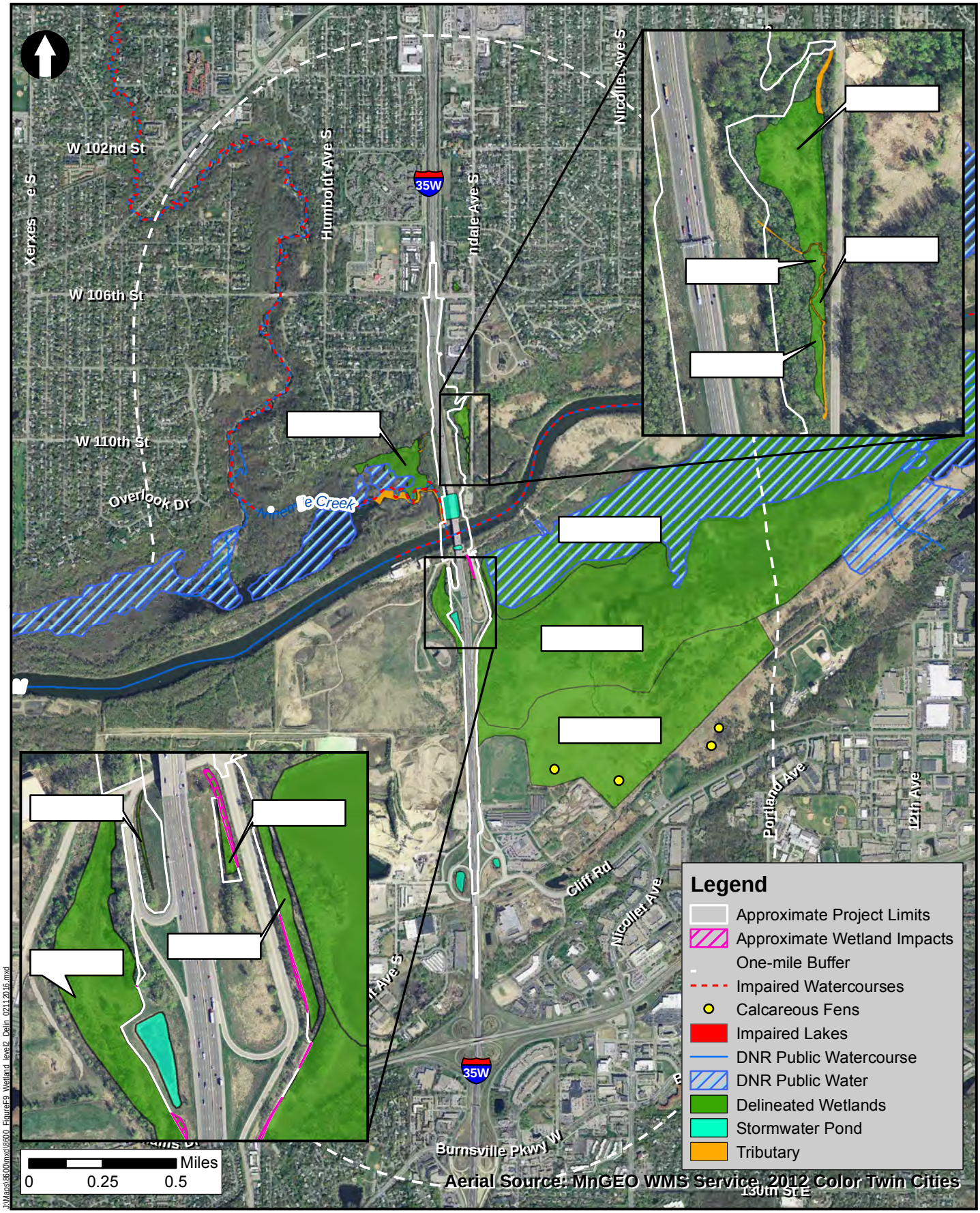
I-35W over the Minnesota River
SP 1981-124
MnDOT



Soil Types and Karst Features

Figure F.8

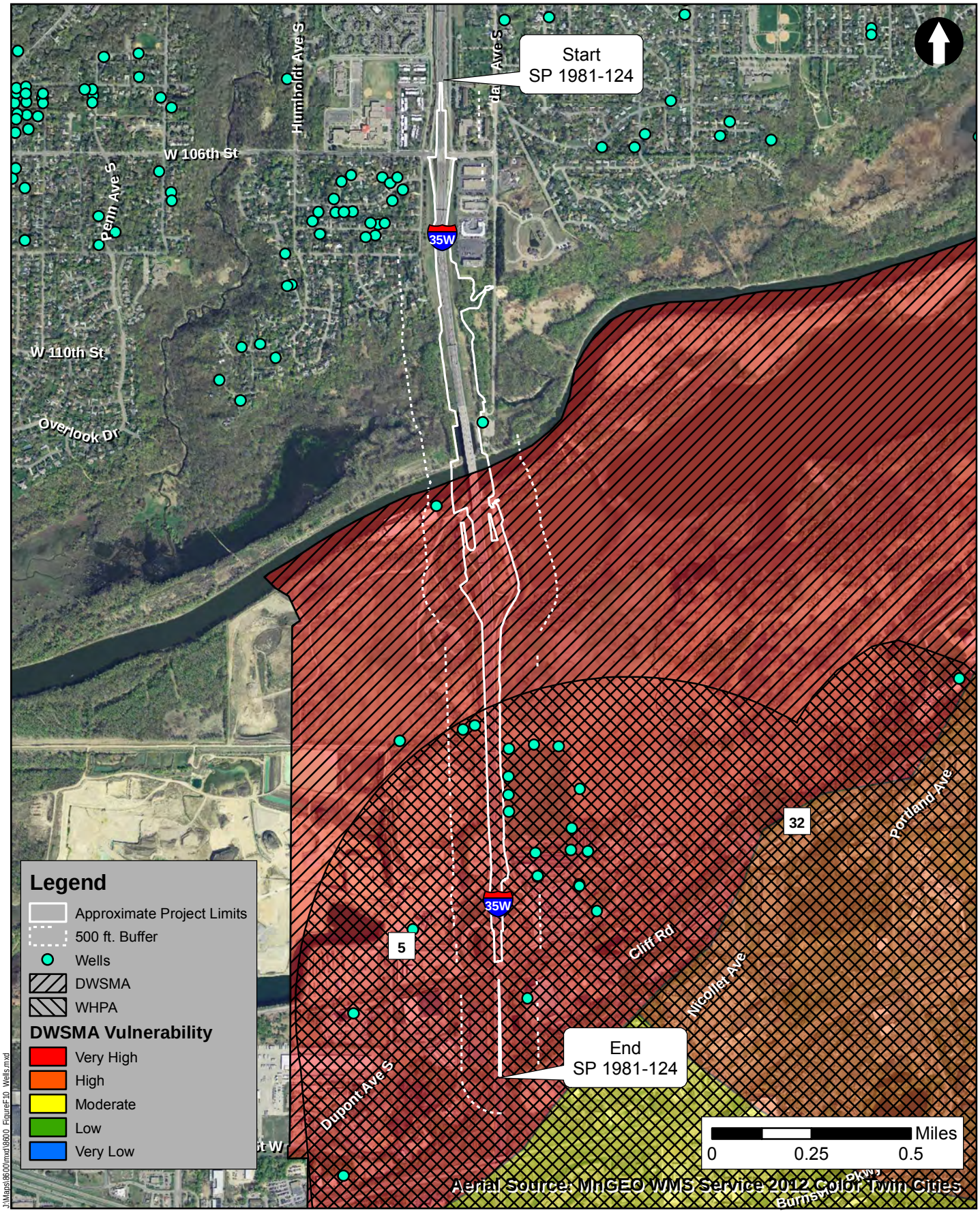
I-35W over the Minnesota River
SP 1981-124
MnDOT



Wetland Review

Figure F.9

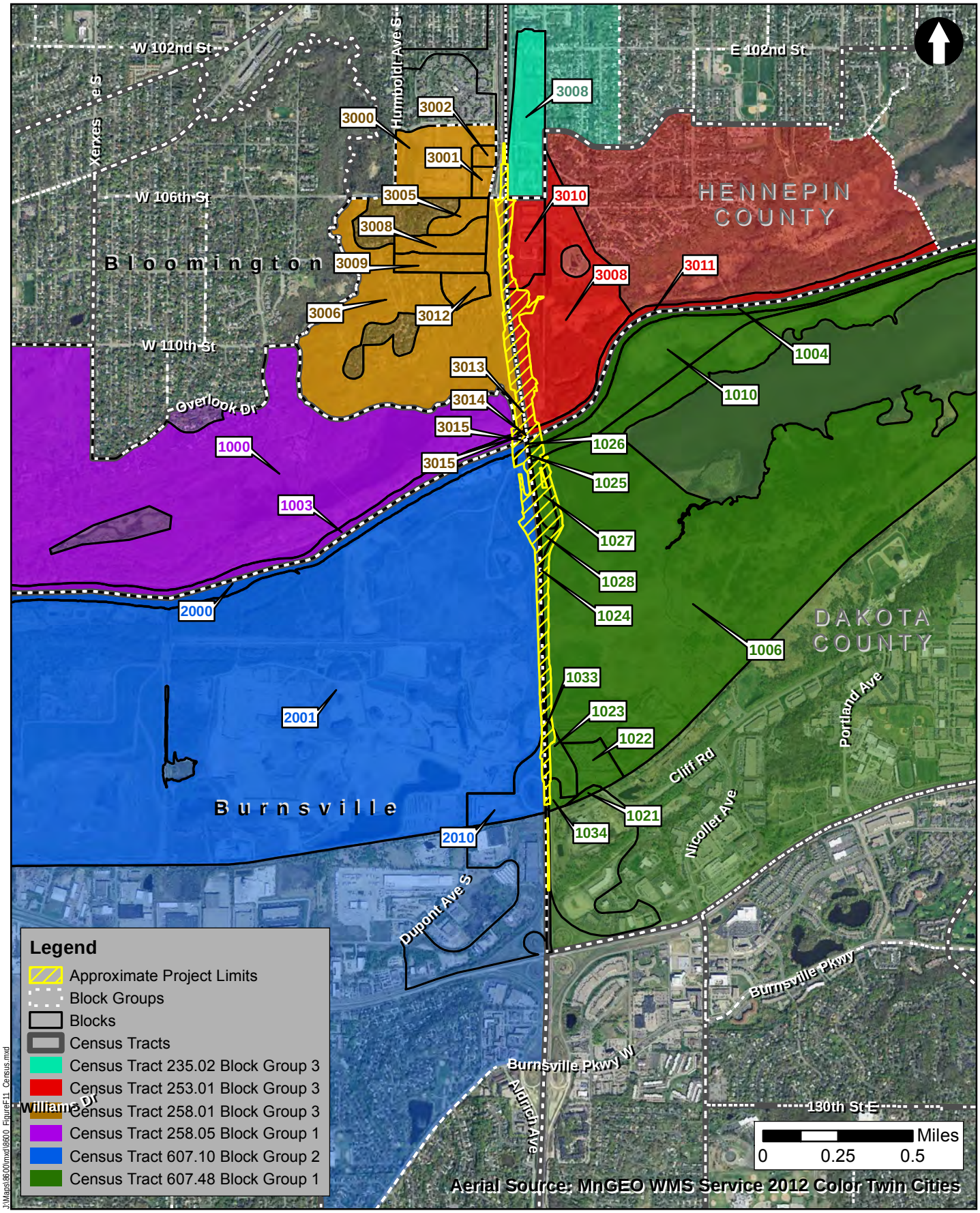
I-35W over the Minnesota River
SP 1981-124
MnDOT



Well Locations

Figure F.10

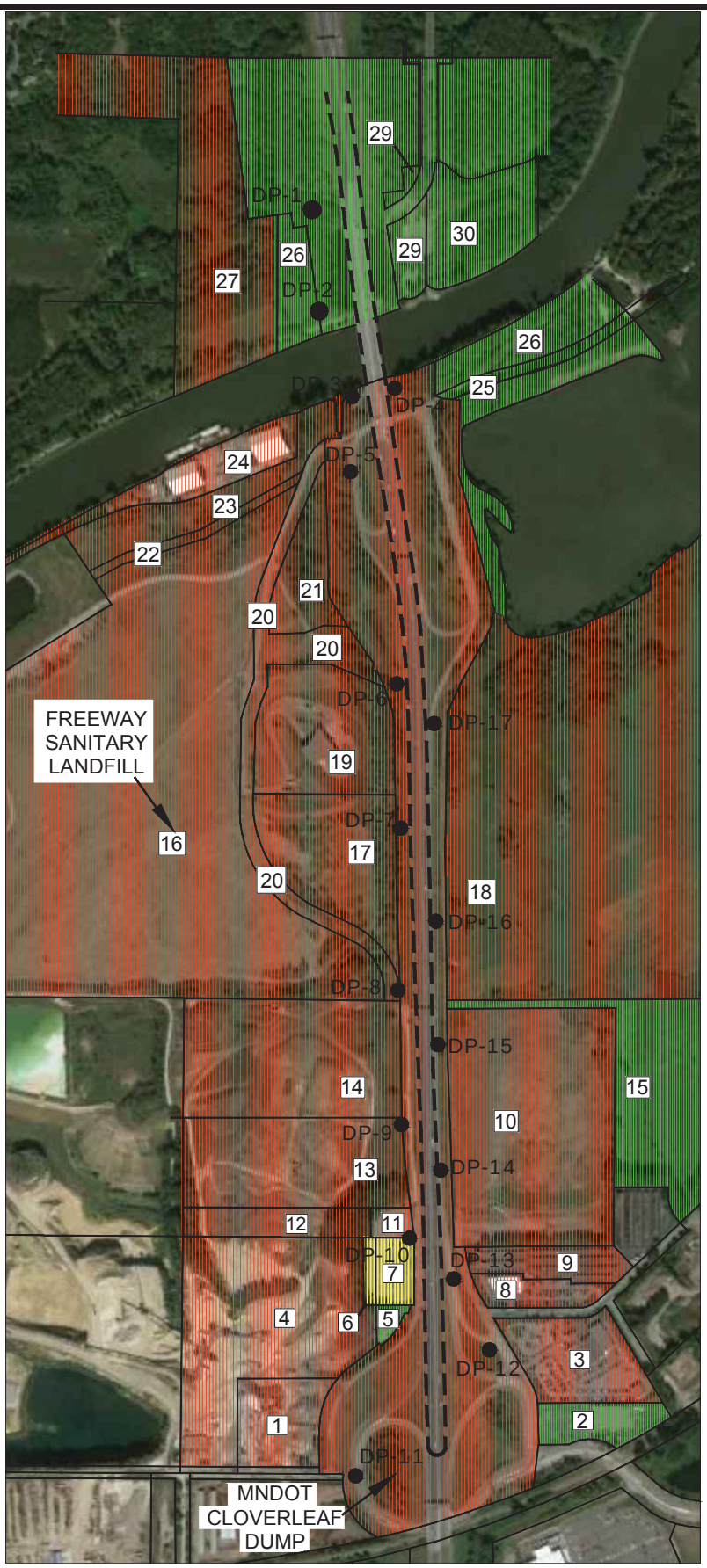
I-35W over the Minnesota River
SP 1981-124
MnDOT



Census Tracts, Block Groups and Blocks

Figure F.11

I-35W over the Minnesota River
SP 1981-124
MnDOT



REFERENCE: AERIAL FROM GOOGLE EARTH PRO, 10/11/2014.

Site #	Name	Ranking
3	Burnsville Dodge Ram (Dodge of Burnsville)	High
4, 12, 13 & 14	Kraemer Mining & Materials Inc. (Edward Kraemer & Sons)	High
5	Kraemer Mining & Materials Inc. (Edward Kraemer & Sons)	Low
6 & 7	Commercial Property (Former Burnsville Volkswagen)	Medium
8	Walser Subaru - Burnsville	High
9	All State Self Storage	High
10	Chalet Golf Shop and Driving Range (Old Freeway/McGowan's Dump)	High
11	Commercial Property (Former Burnsville Volkswagen)	High
15	Federal Property	Low
16,17 & 21	Freeway Sanitary Landfill/ R B McGowan Co Inc (McGowan Property)	High
18	Northern States Power Co (Xcel Energy)	High
19, 20, 22 & 23	Freeway Transfer Inc. (Transfer Station)	High
24	Port Marilyn LLC (U.S. Salt Inc)	High
25 & 26	Northern States Power Co (Xcel Energy)	Low
27	City of Bloomington (Former Bloomington Tree Disposal)	High
28	City of Bloomington	Low
29 & 30	US Fish & Wildife Service Minnesota Valley Wildlife Refuge Russell Sorenson Landing	Low

LEGEND

- SOIL SAMPLING LOCATION
- SITES WITH HIGH RISK
- SITES WITH MEDIUM RISK
- SITES WITH LOW RISK
- APPROXIMATE CONSTRUCTION LIMITS

N

0 600 1,200

APPROXIMATE SCALE IN FEET

DWG Name: 14M2370-002

Checked:

Approved:

Drawn By: LS 1/19/2015

A

R:\Acad\CADD\2014\1402370\CADD\14M2370-002.dwg 1/19/2015 12:20 PM Usls01166

WSP USA Corp.
123 North Third Street, Suite 507
Minneapolis, Minnesota 55401
(612) 343-0510
www.wspgroup.com/usa

Figure F.12

SITE LAYOUT AND SAMPLE LOCATIONS

INTERSTATE 35W MINNESOTA RIVER BRIDGE PROJECT AREA
STATE PROJECT NUMBER 1981-124
DAKOTA AND HENNEPIN COUNTIES, MINNESOTA
PREPARED FOR MNDOT

Appendix G

Air Quality Memorandum

Kimley»Horn

MEMORANDUM

To: Brett Danner
SRF Consulting Group, Inc.

From: John Crawford, P.E., PTOE

Date: May 24, 2016

Subject: ***I-35W Bridge Replacement over Minnesota River***
Air Quality Analysis

Introduction

Motorized vehicles affect air quality by emitting airborne pollutants. Changes in traffic volumes, travel patterns, and roadway locations affect air quality as the number of vehicles and the congestion levels in a given area change. The adverse impacts this project could have on air quality have been analyzed by addressing criteria air pollutants, a group of common air pollutants that are regulated by the U.S. Environmental Protection Agency (EPA) on the basis of specific criteria that reflect the effects of pollution on public health and the environment. The criteria air pollutants identified by the EPA are ozone, particulate matter, carbon monoxide, nitrogen dioxide, lead, and sulfur dioxide. Potential impacts resulting from these pollutants are assessed by comparing the project's projected concentrations to National Ambient Air Quality Standards (NAAQS).

In addition to the criteria air pollutants, the EPA also regulates a category of pollutants known as mobile source air toxics (MSATs), which are generated by emissions from mobile sources. The Federal Highway Administration (FHWA) provides guidance for the assessment of MSAT effects for transportation projects in the National Environmental Policy Act (NEPA) process. A qualitative evaluation of MSATs has been performed for this project, as documented below. The scope and methods of the analysis performed were developed in collaboration with the Minnesota Department of Transportation (MnDOT), the Minnesota Pollution Control Agency (MPCA), and the Federal Highway Administration (FHWA).

Criteria Air Pollutant Analysis

OZONE

Ground-level ozone is a primary constituent of smog and is a pollution problem throughout many areas of the United States. Exposures to ozone can make people more susceptible to respiratory infection, resulting in lung inflammation, and aggravate preexisting respiratory diseases such as asthma. Ozone is not emitted directly from vehicles but is formed as volatile organic compounds (VOCs) and nitrogen oxides (NO_x) that react in the presence of sunlight. Transportation sources emit NO_x and VOCs and can therefore affect ozone concentrations. However, due to the phenomenon of atmospheric formation of ozone from chemical precursors, concentrations are not expected to be elevated near a particular roadway.

The MPCA, in cooperation with various other agencies, industries, and groups, has encouraged voluntary control measures for ozone and has begun developing a regional ozone modeling effort.

Ozone concentrations in the lower atmosphere are influenced by a complex relationship of precursor concentrations, meteorological conditions, and regional influences on background concentrations. MPCA states in *Air Quality in Minnesota: 2015 Report to the Legislature* (January 2015) that:

> *On November 24, 2014, the EPA announced proposed changes to the National Ambient Air Quality Standard for ozone. The proposal seeks to strengthen the ozone standard by lowering the standard from 75 ppb to a value between 65 ppb and 70 ppb. The proposal is based on scientific evidence that strongly indicates ozone impacts human health at levels below the existing standard of 75 ppb.*
>
> *Based on 2013 ozone monitoring results, all areas of Minnesota will meet the revised ozone standard if it is set at 70 ppb*. If the ozone standard is set at 66 ppb or lower, the Twin Cities metropolitan area will not meet the standard. The EPA is expected to finalize the revised ozone standard in October 2015. EPA plans to use monitoring data from 2014-2016 to determine compliance. The MPCA will closely monitor ozone levels over the summer of 2015 and 2016 to assess the likelihood of violating the revised ozone standard.*
>
> * Note that on October 1, 2015, the EPA set the ozone standard at 70 ppb. All areas of Minnesota will meet this new ozone standard.

Additionally, the State of Minnesota is classified by the EPA as an "ozone attainment area," which means that Minnesota has been identified as a geographic area that meets the national health-based standards for ozone levels. Because of these factors, a quantitative ozone analysis was not conducted for this project.

PARTICULATE MATTER

Particulate matter (PM) is the term for particles and liquid droplets suspended in the air. Particles come in a wide variety of sizes and have been historically assessed based on size, typically measured by the diameter of the particle in micrometers. $PM_{2.5}$ or fine particulate matter refers to particles that are 2.5 micrometers or less in diameter. PM_{10} refers to particulate matter that is 10 micrometers or less in diameter.

Motor vehicles (i.e., cars, trucks, and buses) emit direct PM from their tailpipes, as well as from normal brake and tire wear. Vehicle dust from paved and unpaved roads may be re-entrained, or re-suspended, in the atmosphere. In addition, $PM_{2.5}$ can be formed in the atmosphere from gases such as sulfur dioxide, nitrogen oxides, and volatile organic compounds. $PM_{2.5}$ can penetrate the human respiratory system's natural defenses and damage the respiratory tract when inhaled. Numerous scientific studies have linked particle pollution exposure to a variety of problems, including:

- Increased respiratory symptoms, such as irritation of the airways, coughing, or difficulty breathing;
- Decreased lung function;
- Aggravated asthma;
- Development of chronic bronchitis;
- Irregular heartbeat;

- Nonfatal heart attacks; and
- Premature death in people with heart or lung disease.[1]

On December 14, 2012, the EPA issued a final rule revising the annual health NAAQS for fine particles ($PM_{2.5}$). The EPA website states:

> *With regard to primary (health-based) standards for fine particles (generally referring to particles less than or equal to 2.5 micrometers (mm) in diameter, PM2.5), the EPA is strengthening the annual PM2.5 standard by lowering the level to 12.0 micrograms per cubic meter (µg/m3). The existing annual standard, 15.0 µg/m3, was set in 1997. The EPA is revising the annual PM2.5 standard to 12.0 µg/m3 so as to provide increased protection against health effects associated with long- and short-term exposures (including premature mortality, increased hospital admissions and emergency department visits, and development of chronic respiratory disease), and to retain the 24-hour PM2.5 standard at a level of 35 µg/m3 (the EPA issued the 24-hour standard in 2006). The EPA is revising the Air Quality Index (AQI) for PM2.5 to be consistent with the revised primary PM2.5 standards.*[2]

The agency also retained the existing standards for coarse particle pollution (PM_{10}). The NAAQS 24-hour standard for PM_{10} is 150 µg / m^3, which is not to be exceeded more than once per year on average over three years.

The Clean Air Act conformity requirements include the assessment of localized air quality impacts of federally-funded or federally-approved transportation projects that are deemed to be projects of air quality concern located within $PM_{2.5}$ nonattainment and maintenance areas. This project is not considered one of air quality concern. This is supported, in part, by the designation of the majority of the State of Minnesota as an unclassifiable/ attainment area for PM. A small part of St. Paul is classified as a maintenance area for PM_{10}. This means that Minnesota has been identified as a geographic area that meets or exceeds the national standards for the reduction of PM levels, and our project area is located outside of the maintenance area, and therefore is exempt from performing PM qualitative hot-spot analyses.

NITROGEN DIOXIDE (NITROGEN OXIDES)

Nitrogen oxides, or NO_x, are the generic term for a group of highly reactive gases, all of which contain nitrogen and oxygen in varying amounts. Nitrogen oxides form when fuel is burned at high temperatures, as in a combustion process. The primary sources of NO_x are motor vehicles, electric utilities, and other industrial, commercial, and residential sources that burn fuels. In addition to being a precursor to ozone, NO_x can worsen bronchitis, emphysema and asthma and increase risk of premature death from heart or lung disease.[3]

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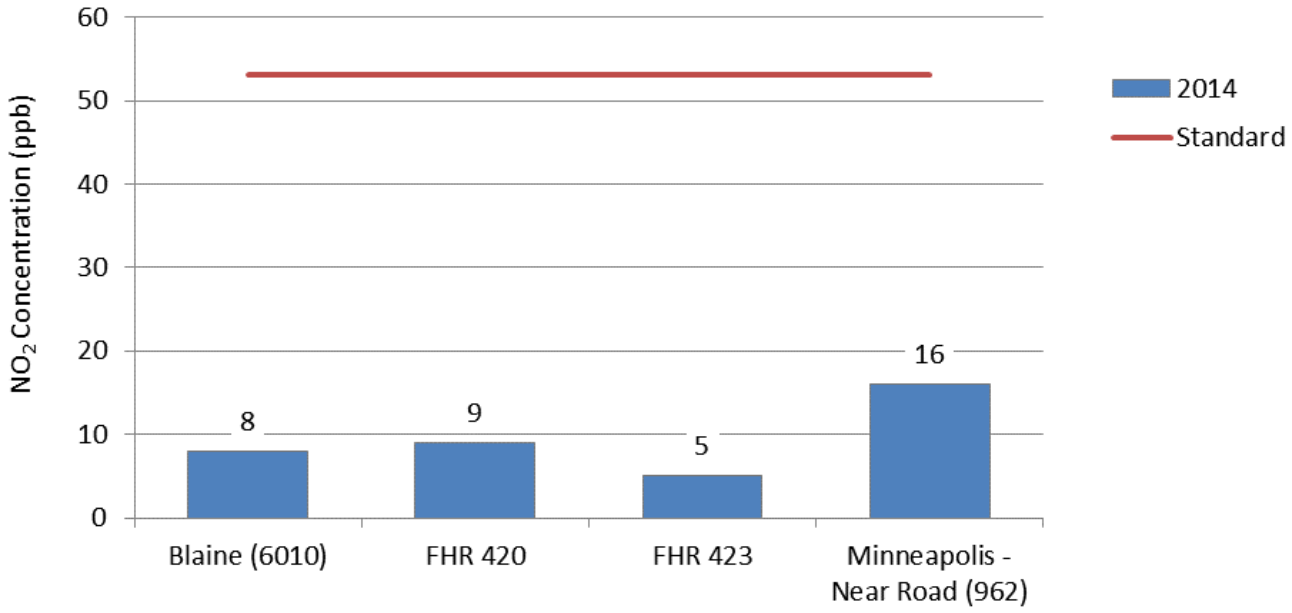
[1] Source: http://www.epa.gov/air/particlepollution/health.html
[2] Source: http://www.epa.gov/pm/actions.html
[3] Source: 2015 Report to the Legislature, MPCA, January 2015

Minnesota currently meets federal nitrogen dioxide standards, as shown in Exhibit 1 from *2016 Annual Air Monitoring Network Plan* (October 2015). This document states: "A monitoring site meets the annual NAAQS for NO_2 if the annual average is less than or equal to 53 ppb. The 2014 Minnesota averages ranged from 5 ppb at Flint Hills Refinery (FHR) 423 to 16 ppb at Minneapolis – Near Road 962; therefore, Minnesota currently meets the annual NAAQS for NO_2."

Exhibit 1: Average Annual NO_2 concentrations compared to the NAAQS



In the *2016 Annual Air Monitoring Network Plan for Minnesota, October 2015*, it states the following with regard to the 1-hour NO_2 standard:

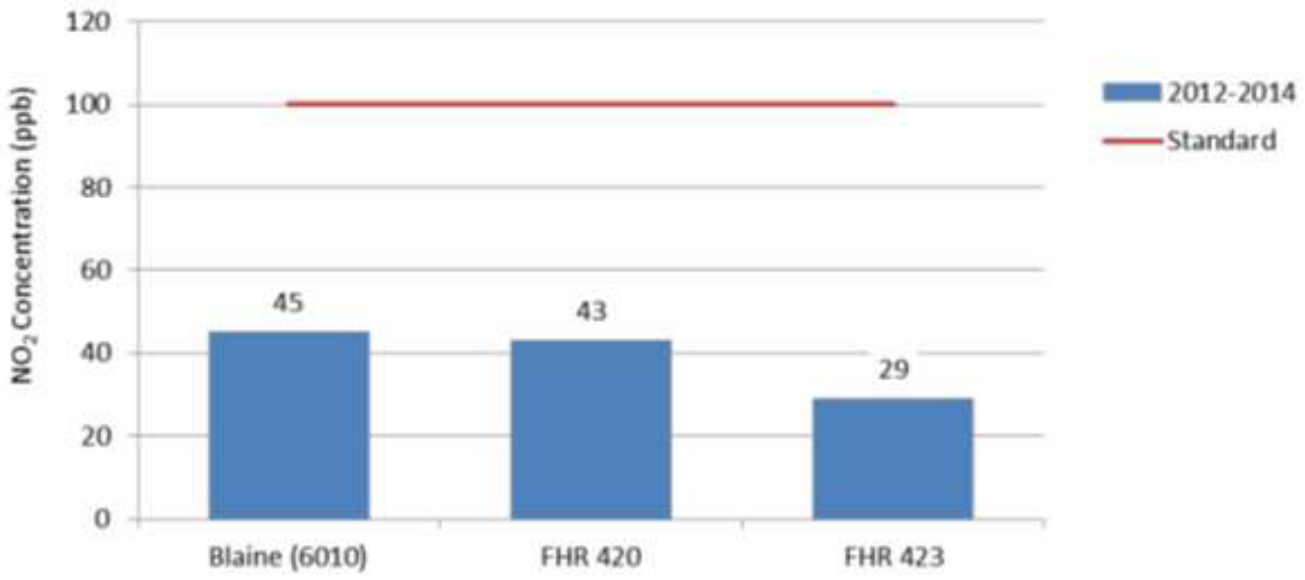
> *On January 22, 2010 the EPA finalized revisions to the NO2 NAAQS. As part of the standard review process, the EPA retained the existing annual NO2 NAAQS, but also created a new 1-hour standard. This new 1-hour NAAQS will protect against adverse health effects associated with short term exposures to elevated NO2. To meet this standard, the three-year average of the annual 98th percentile daily maximum 1-hour NO2 concentration must not exceed 100 ppb. Figure 22 shows the 2012-2014 average of the annual 98th percentile daily maximum 1-hour NO2 concentrations at Minnesota sites and compares them to the 1-hour standard. Minnesota averages ranged from 29 ppb at FHR 423 to 45 ppb at Blaine (6010); therefore, all Minnesota sites currently meet the1-hour NAAQS for NO2.*

The EPA's regulatory announcement, EPA420-F-99-051 (December 1999), describes the Tier 2 standards for tailpipe emissions, and states:

The new tailpipe standards are set at an average standard of 0.07 grams per mile for nitrogen oxides for all classes of passenger vehicles beginning in 2004. This includes all light-duty trucks, as well as the largest SUVs. Vehicles weighing less than 6,000 pounds will be phased-in to this standard between 2004 and 2007.

As newer, cleaner cars enter the national fleet, the new tailpipe standards will significantly reduce emissions of nitrogen oxides from vehicles by about 74 percent by 2030. The standards also will reduce emissions by more than 2 million tons per year by 2020 and nearly 3 million tons annually by 2030.

Exhibit 2: 1-hour NO_2 concentrations compared to the NAAQS



Within the project area, it is unlikely that NO_2 standards will be approached or exceeded based on the relatively low ambient concentrations of NO_2 in Minnesota and on the long-term trend toward reduction of NO_x emissions. Because of these factors, a specific analysis of NO_2 was not conducted for this project.

SULFUR DIOXIDE

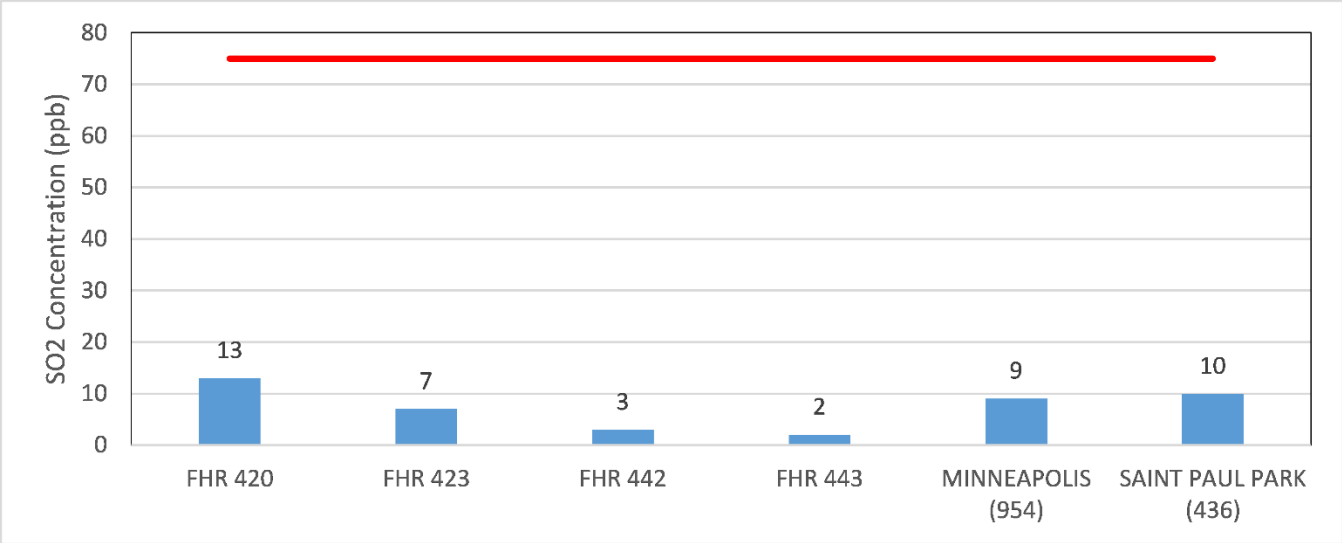
Sulfur dioxide (SO_2) and other sulfur oxide gases (SO_x) are formed when fuel containing sulfur, such as coal, oil, and diesel fuel is burned. Sulfur dioxide is a heavy, pungent, colorless gas. Elevated levels can impair breathing, lead to other respiratory symptoms, and at very high levels aggravate heart disease. People with asthma are most at risk when SO_2 levels increase. Once emitted into the atmosphere, SO_2 can be further oxidized to sulfuric acid, a component of acid rain.

MPCA monitoring shows that ambient SO_2 concentrations were at less than 20 percent of the federal standards over the 3-year period from 2012 through 2014, as shown in Exhibit 3 below.[4] The MPCA has concluded that long-term trends in both ambient air concentrations and total SO_2 emissions in Minnesota indicate steady improvement.

In the 2016 Annual Air Monitoring Network Plan for Minnesota, it states the following with regard to SO_2:

> *On June 2, 2010, the EPA finalized revisions to the primary SO2 NAAQS. EPA established a new 1-hour standard which is met if the three-year average of the annual 99th percentile daily maximum 1-hour SO2 concentration is less than 75 ppb. In addition to creating the new 1-hour standard, the EPA revoked the existing 24-hour and annual standards. Figure 24 describes the 2012 -2014 average 99th percentile 1-hour SO2 concentration and compares them to the 1-hour standard. Minnesota averages ranged from 2 ppb at FHR 443 to 13 ppb at FHR 420; therefore, all Minnesota sites currently meet the1-hour NAAQS for SO2.*

Exhibit 3: 1-hour SO_2 concentrations compared to the NAAQS



Emissions of sulfur oxides from transportation sources are a small component of overall emissions and continue to decline due to the desulphurization of fuels. Additionally, the project area is classified by the EPA as a "sulfur dioxide attainment area," which means that the project area has been identified as a geographic area that meets the national health-based standards for sulfur dioxide

[4] Source: Annual Air Monitoring Network Plan for Minnesota, 2016, October 2015

levels. Because of these factors, a quantitative analysis for sulfur dioxide was not conducted for this project.

LEAD

Due to the phase out of leaded gasoline, lead is no longer a pollutant associated with vehicular emissions.

CARBON MONOXIDE

Carbon monoxide (CO) is the traffic-related pollutant that has been of concern in the Twin Cities Metropolitan area. In 1999, the EPA re-designated all of Hennepin, Ramsey, Anoka, and portions of Carver, Scott, Dakota, Washington, and Wright Counties as a maintenance area for CO. This means the area was previously classified as a nonattainment area but has now been found to be in attainment. This area includes the project area, which is located in Ramsey and Anoka Counties. Evaluation of CO for assessment of air quality impacts is required for environmental approval in National Environmental Policy Act (NEPA) documents.

Air Quality Conformity

The EPA issued final rules on transportation conformity (40 CFR 93, Subpart A) which describe the methods required to demonstrate State Implementation Plan (SIP) compliance for transportation projects. It requires that transportation projects that meet the criteria to be classified as regionally significant be included in a regional emissions analysis and are approved as part of a conforming Long Range Transportation Policy Plan (LRTPP) and four-year Transportation Improvement Program (TIP). The project construction is not identified in the 2016 – 2019 STIP, however $1.1 million is set aside in 2016 for the EA and preliminary design.

On November 8, 2010, the EPA approved a limited maintenance plan request for the Twin Cities maintenance area. Under a limited maintenance plan, the EPA has determined that there is no requirement for project emissions over the maintenance period and that "an emission budget may be treated as essentially non-constraining for the length of the maintenance period. The reason is that it is unreasonable to expect that our maintenance area will experience so much growth within this period that a violation of CO National Ambient Air Quality Standard (NAAQS) would result."[5] Therefore, no regional modeling analysis for the LRTPP and TIP is required; however, federally funded and state funded projects are still subject to "hot-spot" analysis requirements. The limited maintenance plan adopted in 2010 determines that the level of CO emissions and resulting ambient concentrations will continue to demonstrate attainment of the CO NAAQS. This project does not interfere with implementation of any transportation control measure included in the SIP. The TIP was determined to conform to the requirements of the 1990 CAAA by MPCA. The project's design concept and scope are not significantly different from that used in the TIP conformity analysis. As

[5] US EPA Limited Maintenance Plan Option for Nonclassifiable CO Nonattainment Areas, October 6, 1995

demonstrated by the above information, this project conforms to the requirements of the CAAA and to the Conformity Rules, 40 CFR 93.

HOT-SPOT ANALYSIS

CO assessment is performed by evaluating the worst-operating (hot-spot) intersections in the project area. The EPA has approved a screening method to determine which intersections need hot-spot analysis. The hot-spot screening method uses a traffic volume threshold of 79,400 entering vehicle per day. Intersections with traffic volumes above this threshold must be evaluated using EPA-approved emission and dispersion models. Intersections with traffic volumes below this threshold are not expected to result in CO concentrations that exceed state or federal standards, and detailed modeling is not required. Entering traffic volumes at all intersections in the project area are forecast to be less than this threshold, as shown in ***Table 1***. MnDOT demonstrates by the results of the screening procedure that the intersections do not require hot-spot analysis.

Table 1
YEAR 2040 INTERSECTION VOLUMES FOR BUILD ALTERNATIVE (VEHICLES PER DAY)

I-35W Bridge	NB Approach	EB Approach	SB Approach	WB Approach	Total Entering
106th Street (East)	6,900	4,700	-	4,700	16,300
106th Street (West)	-	7,050	2,000	7,050	16,100
Cliff Road (East)	-	9,000	10,500	9,000	28,500
Cliff Road (West)	9,000	7,000	10,500	-	26,500

Improvements in vehicle technology and in motor fuel regulations continue to result in reductions in vehicle emission rates. The EPA MOVES 2010b emissions model estimates that emission rates will continue to fall from existing rates through year 2040. Consequently, year 2040 vehicle-related CO concentrations in the study area are likely to be lower than existing concentrations even considering the increase in development-related and background traffic.

Qualitative Mobile Source Air Toxics (MSAT) Analysis[6]

BACKGROUND

Controlling air toxic emissions became a national priority with the passage of the Clean Air Act Amendments (CAAA) of 1990, whereby Congress mandated that the U.S. Environmental Protection Agency (EPA) regulate 188 air toxics, also known as hazardous air pollutants. The EPA has

[6] *Interim Guidance on Mobile Source Air Toxic Analysis in NEPA, December 6, 2012*
http://www.fhwa.dot.gov/environment/air_quality/air_toxics/policy_and_guidance/aqintguidmem.cfm

assessed this expansive list in their latest rule on the Control of Hazardous Air Pollutants from Mobile Sources (Federal Register, Vol. 72, No. 37, page 8430, February 26, 2007), and identified a group of 93 compounds emitted from mobile sources that are listed in their Integrated Risk Information System (IRIS) (http://www.epa.gov/iris/). In addition, EPA identified seven compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers from their 1999 National Air Toxics Assessment (NATA) (http://www.epa.gov/ttn/atw/nata1999/). These are acrolein, benzene, 1,3-butidiene, diesel particulate matter plus diesel exhaust organic gases (diesel PM), formaldehyde, naphthalene, and polycyclic organic matter. While FHWA considers these the priority mobile source air toxics, the list is subject to change and may be adjusted in consideration of future EPA rules. The 2007 EPA rule mentioned above requires controls that will dramatically decrease MSAT emissions through cleaner fuels and cleaner engines.

QUALITATIVE VS QUANTITATIVE MSAT ANALYSIS

A qualitative analysis provides a basis for identifying and comparing the potential differences among MSAT emissions, if any, from the various alternatives. For the purposes of assessing impacts of the I-35W River Crossing project, the alternatives compared here will be the No Build Alternative and the proposed project alternative, consisting of an extension of the existing northbound I-35W truck climbing lane.

The qualitative assessment presented below is derived in part from a study conducted by the FHWA[7].

According to FHWA guidance, a highway widening project is minor if the design year traffic does not exceed the upper range limit of 150,000 vehicles/day. Projected 2040 Build traffic volumes are forecasted to be 138,100 on the river crossing bridge (Source: I-35W Bridge Replacement over Minnesota River Traffic Forecast Technical Memorandum, by SRF Consulting Group, Inc. June 19, 2015). Because the design year (2040) “Build” projection for annual average daily traffic (AADT) will not exceed 150,000 vehicles/day within the project corridor, a qualitative MSAT analysis, rather than a quantitative MSAT analysis, is warranted for this project.

For each Alternative (No Build and Build) evaluated for this project, the amount of MSAT emitted would be proportional to the vehicle miles traveled, or VMT, assuming that other variables such as fleet mix are the same for each alternative. The VMT values within the corridor will be proportional to the average daily traffic volumes, or ADT. The minor changes in ADT on area roadways means MSAT under the Build Alternative is not likely to be significantly different than the No Build Alternative. There could be localized differences in MSAT resulting from the changes in travel patterns as area trips are attracted to the I-35W Minnesota River crossing. Conversely, the emissions decrease would be enhanced somewhat by lower MSAT emission rates due to increased speeds with project implementation; according to EPA's MOVES2010b model, emissions of all of the priority MSAT decrease as speed increases.

---

[7]Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA - Appendix B
http://www.fhwa.dot.gov/environment/air_quality/air_toxics/policy_and_guidance/aqintguidapb.cfm

Because the estimated ADT under each of the Alternatives are nearly the same, varying by approximately one percent, it is expected there would be no appreciable difference in overall MSAT emissions among the No Build and Build Alternatives. Also, regardless of the alternative chosen, emissions will likely be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce annual MSAT emissions by over 80 percent between 2010 and 2050. Local conditions may differ from these national projections in terms of fleet mix and turnover, ADT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for ADT growth) that MSAT emissions in the study area are likely to be lower in the future in nearly all cases.

MSAT EMISSION TRENDS

Regardless of the alternative chosen, emissions will likely be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce annual MSAT emissions by over 80 percent between 2010 and 2050, as shown in Exhibit 4. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in nearly all cases.

Based on the downward trend in MSAT emissions shown in Exhibit 4, build alternative ambient concentrations of MSAT are expected to decrease from current levels over the next decade or more. Also, on a regional basis, EPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions that, in almost all cases, will cause region-wide MSAT levels to be significantly lower than today.

MSAT RESEARCH

Air toxics analysis is a continuing area of research. While much work has been done to assess the overall health risk of air toxics, many questions remain unanswered. In particular, the tools and techniques for assessing project-specific health outcomes as a result of lifetime MSAT exposure remain limited. These limitations impede the ability to evaluate how potential public health risks posed by MSAT exposure should be factored into project-level decision-making within the context of NEPA.

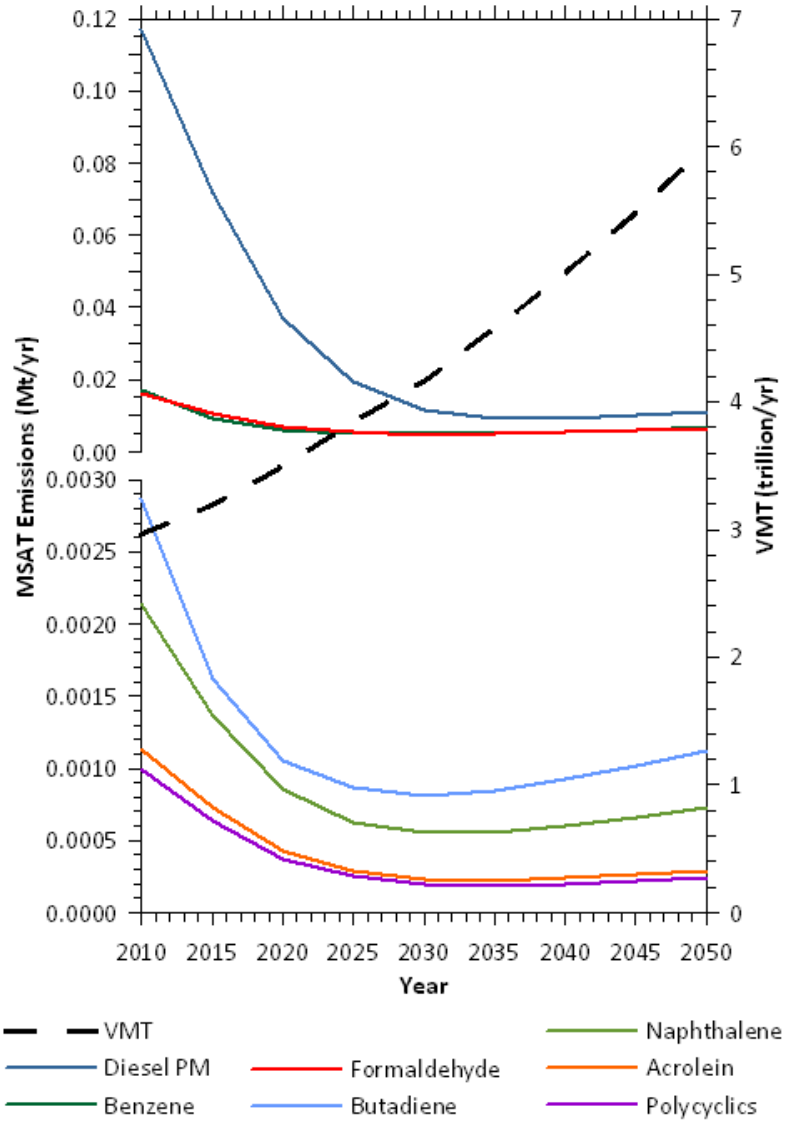
Nonetheless, air toxics concerns continue to be raised on highway projects during the NEPA process. Even as the science emerges, we are duly expected by the public and other agencies to address MSAT impacts in our environmental documents. The FHWA, EPA, the Health Effects Institute, and others have funded and conducted research studies to try to more clearly define potential risks from MSAT emissions associated with highway projects. The FHWA will continue to monitor the developing research in this field.

NEPA CONTEXT

The NEPA requires, to the fullest extent possible, that the policies, regulations, and laws of the Federal Government be interpreted and administered in accordance with its environmental protection goals. The NEPA also requires Federal agencies to use an interdisciplinary approach in planning and decision-making for any action that adversely impacts the environment. The NEPA requires and

FHWA is committed to the examination and avoidance of potential impacts to the natural and human environment when considering approval of proposed transportation projects. In addition to evaluating the potential environmental effects, we must also take into account the need for safe and efficient transportation in reaching a decision that is in the best overall public interest. The FHWA policies and procedures for implementing NEPA are contained in regulation at 23 CFR Part 771.

Exhibit 4: National MSAT Emission Trends 1999 – 2050 for Vehicles Operating On Roadways Using EPA's MOVES2010b Model



Note: Trends for specific locations may be different, depending on locally derived information representing vehicle-miles travelled, vehicle speeds, vehicle mix, fuels, emission control programs, meteorology, and other factors

Source: EPA MOVES2010b model runs conducted during May - June 2012 by FHWA.

INCOMPLETE OR UNAVAILABLE INFORMATION FOR PROJECT-SPECIFIC MSAT HEALTH IMPACTS ANALYSIS

Under Council of Environmental Quality rules applicable to the NEPA process, in 40 CFR 1502.22 it is stated that agencies preparing NEPA documentation should disclose cases of incomplete or unavailable information. In the case of MSAT assessments for highways, it is FHWA's view that information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in MSAT emissions associated with a proposed set of highway alternatives. The outcome of such an assessment, adverse or not, would be influenced more by the uncertainty introduced into the process through assumption and speculation rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action.

The U.S. Environmental Protection Agency (EPA) is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. They are the lead authority for administering the Clean Air Act and its amendments and have specific statutory obligations with respect to hazardous air pollutants and MSAT. The EPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. They maintain the Integrated Risk Information System (IRIS), which is "a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects" (EPA, http://www.epa.gov/iris/). Each report contains assessments of non-cancerous and cancerous effects for individual compounds and quantitative estimates of risk levels from lifetime oral and inhalation exposures with uncertainty spanning perhaps an order of magnitude.

Other organizations are also active in the research and analyses of the human health effects of MSAT, including the Health Effects Institute (HEI). Two HEI studies are summarized in Appendix D of FHWA's Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA Documents. Among the adverse health effects linked to MSAT compounds at high exposures are; cancer in humans in occupational settings; cancer in animals; and irritation to the respiratory tract, including the exacerbation of asthma. Less obvious is the adverse human health effects of MSAT compounds at current environmental concentrations (HEI, http://pubs.healtheffects.org/view.php?id=282) or in the future as vehicle emissions substantially decrease (HEI, http://pubs.healtheffects.org/view.php?id=306).

The methodologies for forecasting health impacts include emissions modeling; dispersion modeling; exposure modeling; and then final determination of health impacts - each step in the process building on the model predictions obtained in the previous step. All are encumbered by technical shortcomings or uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified for lifetime (i.e., 70 year) assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over that time frame, since such information is unavailable.

It is particularly difficult to reliably forecast 70-year lifetime MSAT concentrations and exposure near roadways; to determine the portion of time that people are actually exposed at a specific location; and to establish the extent attributable to a proposed action, especially given that some of the information needed is unavailable.

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSAT, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population, a concern expressed by HEI (http://pubs.healtheffects.org/view.php?id=282). As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds, and in particular for diesel PM. The EPA and the HEI have not established a basis for quantitative risk assessment of diesel PM in ambient settings (http://www.epa.gov/risk/basicinformation.htm#g and http://pubs.healtheffects.org/getfile.php?u=395).

There is also the lack of a national consensus on an acceptable level of risk. The current context is the process used by the EPA as provided by the Clean Air Act to determine whether more stringent controls are required in order to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control technology standards, such as benzene emissions from refineries. The decision framework is a two-step process. The first step requires EPA to determine an "acceptable" level of risk due to emissions from a source, which is generally no greater than approximately 100 in a million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than 1 in a million due to emissions from a source. The results of this statutory two-step process do not guarantee that cancer risks from exposure to air toxics are less than 1 in a million; in some cases, the residual risk determination could result in maximum individual cancer risks that are as high as approximately 100 in a million. In a June 2008 decision, the U.S. Court of Appeals for the District of Columbia Circuit upheld EPA's approach to addressing risk in its two step decision framework. Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than deemed acceptable.

Because of the limitations in the methodologies for forecasting health impacts described, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against project benefits, such as reducing traffic congestion, accident rates, and fatalities plus improved access for emergency response, that are better suited for quantitative analysis.

CONCLUSIONS

The Project area is currently meeting all NAAQS for the criteria air pollutants. For the foreseeable future the trend of lower per vehicle emissions is expected to at least offset growth in vehicle volumes. Therefore, the project area is expected to continue meeting NAAQS, without or with implementation of the proposed project.

Under the build alternative the project corridor will have a maximum total AADT volume of approximately 138,100 vehicles/day, which does not exceed the FHWA recommended upper threshold of 150,000 vehicles/day, above which FHWA recommends a quantitative MSAT analysis. Based on the qualitative MSAT analysis provided above, the project is not expected to adversely affect air quality with respect to MSATs.

Appendix H

Traffic Noise Analysis Report

Traffic Noise Analysis Report

for

Interstate 35W Over the Minnesota River
(West 106th Street to Cliff Road)
S.P. 1981-124

In the Cities of Bloomington and Burnsville
And the Counties of Dakota and Hennepin, Minnesota

October 2017

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Interstate 35W Minnesota River Bridge Project

Traffic Noise Analysis Report

The purpose of this analysis is to evaluate how traffic generated noise levels are affected by the proposed Interstate 35W Minnesota River Bridge Project. This traffic noise analysis is consistent with the requirements and guidance of the Minnesota Department of Transportation (MnDOT) traffic noise policy (*MnDOT Noise Policy for Type I Federal-aid Projects as per 23 CFR 772*, effective June 15, 2015).[1]

Federal and state funding sources are included in the proposed project. To address Minnesota environmental review requirements for the project, a state environmental assessment worksheet (EAW) has been prepared. An Environmental Assessment (EA) has been prepared to address federal environmental review requirements for the proposed project. This traffic noise analysis will address both the state environmental review process as well as the federal environmental review requirements.

Chapter 1: Introduction

General Project Description

The project is located in the cities of Bloomington and Burnsville, Dakota and Hennepin Counties, Minnesota (see **Figure 1 in Appendix A**). The proposed project includes reconstruction of the I-35W Minnesota River Bridge, construction of a new north bound auxiliary lane between Cliff Road and West 106th Street, and reconstruction of I-35W between Cliff Road and West 106th Street. The I-35W vertical profile would be raised south of the Minnesota River to provide two feet of freeboard above the 100-year flood elevation. The proposed project also includes reconstruction of the I-35W bridge over West 106th Street and construction of a new trail from the north side of the I-35W Minnesota River Bridge to Lyndale Avenue South. An existing trail south of the Minnesota River along the east side of I-35W would be reconstructed from Cliff Road to Black Dog Road with the proposed project.

Background Information on Noise

Noise is defined as any unwanted sound. Sound travels in a wave motion and produces a sound pressure level that is commonly measured in decibels (dB). A logarithm of the ratio of a sound energy level relative to a reference sound energy is a decibel. Sound levels are measured in "A-weighted decibels," which is an adjustment of the high-and-low pitched sound and is the way that the average person hears sound. The adjusted sound levels are in units of "A weighted decibels" (dBA). A sound increase of 3 dBA is barely noticeable by the average person. A sound increase of 5 dBA is clearly noticeable, and a 10 dBA increase is considered to be twice as loud. For example, if the sound energy is doubled (i.e., the amount of traffic doubles), there is a 3 dBA increase in noise, which is just barely noticeable to most people. On the other hand, if traffic

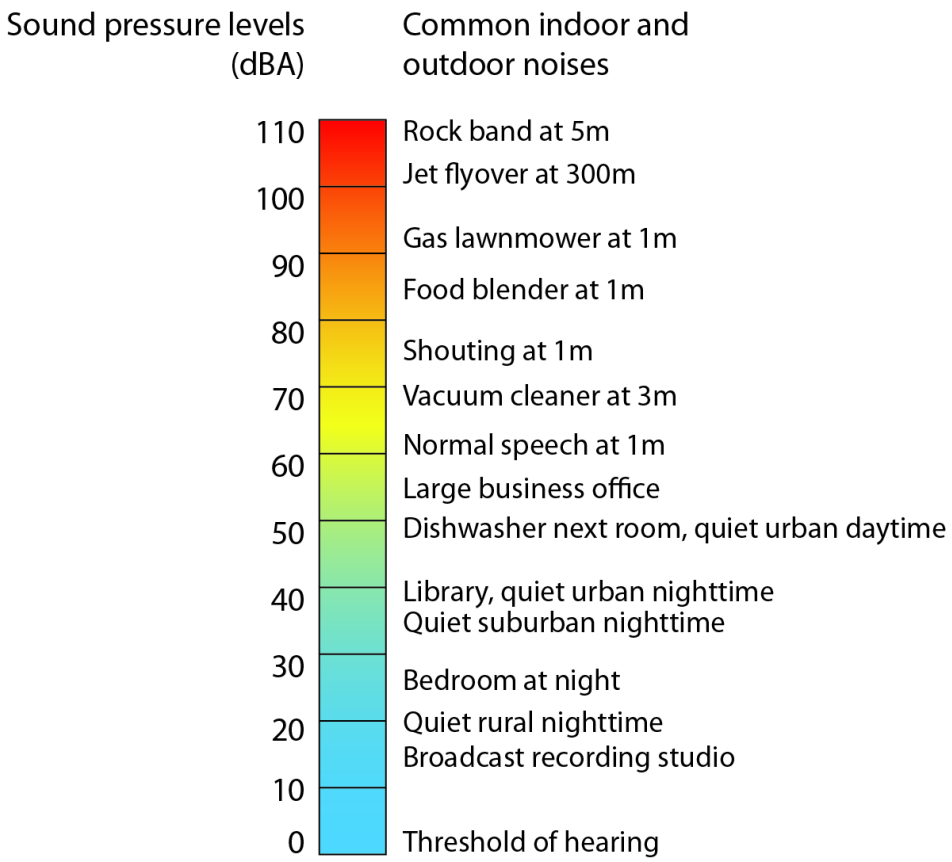
[1] The *2015 MnDOT Noise Policy* is available online on the MnDOT Office of Environmental Stewardship website at http://www.dot.state.mn.us/environment/noise/policy/2015.html.

increases by a factor of ten times, the resulting sound level will increase by about 10 dBA and be heard to be twice as loud.

Minnesota evaluates traffic noise impacts by measuring and/or modeling the traffic noise levels that are exceeded 10 percent and 50 percent of the time during the hours of the day and/or night that have the loudest traffic noise levels. The noise level that is exceeded for a total of 10 percent, or 6 minutes, of an hour is the L_{10} value. The noise level that is exceeded for a total of 50 percent, or 30 minutes, of an hour is the L_{50} value.

Table 1 shows a rough comparison of the noise levels of some common noise sources.

Table 1: Decibel Levels of Common Sources[2]



There are many factors that contribute to the loudness of traffic noise, including the topography of the area, the number of vehicles, and the medium/heavy truck percentages. An important factor is the distance the receptor is placed from the source of the sound. As the distance from the source increases, the sound level decreases. Doubling the distance from the line source over hard ground (such as pavement or water) will generally reduce the sound level by 3 dBA.

[2] Source: "A Guide to Noise Control in Minnesota," Minnesota Pollution Control Agency, http://www.pca.state.mn.us/index.php/view-document.html?gid=5355

Doubling the distance over soft ground (such as vegetated or grassy ground) will generally result in a decrease in the sound level of 4.5 dBA. This general rule of change in sound level due to doubling the distance applies when the distance from the line source is greater than approximately 50 feet.

Federal Traffic Noise Regulations

23 Code of Federal Regulations (CFR) Part 772 (Procedures for Abatement of Highway Traffic Noise and Construction Noise) describes the Federal Highway Administration's (FHWA) traffic noise regulation. The land use activities and the predicted worst hourly L_{10} noise levels under future conditions determine the traffic noise impacts. **Table 2** shows the Federal Noise Abatement Criteria (L_{10}).

Table 2: 23 CFR Part 772: Federal Noise Abatement Criteria

Activity Category	Activity Criteria [(1) (2)] (L_{10}(h))	Evaluation Location	Activity Description
A	60	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 [(3)]	70	Exterior	Residential
C [(3)]	70	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	55	Interior	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E [(3), (4)]	75	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F.
F	--	--	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	--	--	Undeveloped lands that are not permitted.

(1) In Minnesota, traffic noise impacts are determined using the hourly L_{10} value.
(2) The L_{10}(h) Activity Criteria values are for impact determination only, and are not design standards for noise abatement measures.
(3) Includes undeveloped lands permitted for this activity category.
(4) Hotels and motels that function as apartment buildings are classified under Activity Category B.

Minnesota State Noise Standards

The Minnesota state noise standards have been established for both daytime and nighttime periods. The Minnesota Pollution Control Agency (MPCA) defines daytime as 7:00 AM to 10:00 PM and nighttime as 10:00 PM to 7:00 AM. There are three noise area classifications within the Minnesota state noise standards. These include residential (NAC-1), commercial (NAC-2), and industrial (NAC-3). The Minnesota state noise standards look at both the L_{10} and L_{50} values for the daytime and nighttime loudest hours. **Table 3** shows the noise standards for the Minnesota state standards.

Table 3: Minnesota State Noise Standards

Land Use	Code	Daytime (7:00 AM – 10:00 PM) dBA		Nighttime (10:00 PM – 7:00 AM) dBA	
Residential	**NAC-1** (1)	L_{10} of 65	L_{50} of 60	L_{10} of 55	L_{50} of 50
Commercial	**NAC-2** (2)	L_{10} of 70	L_{50} of 65	L_{10} of 70	L_{50} of 65
Industrial	**NAC-3** (3)	L_{10} of 80	L_{50} of 75	L_{10} of 80	L_{50} of 75

(1) NAC-1 includes household units, transient lodging and hotels, educational, religious, cultural, entertainment, camping, and picnicking land uses.
(2) NAC-2 includes retail and restaurants, transportation terminals, professional offices, parks, recreational, and amusement land uses.
(3) NAC-3 includes industrial manufacturing, transportation facilities (except terminals), and utilities land uses.

State noise standards apply to the I-35W segment for the Minnesota River project since state standards apply to trunk highway facilities.

Chapter 2: Analysis Methodology

Affected Environment

The I-35W Minnesota River Bridge project is located in the cities of Bloomington and Burnsville in Dakota and Hennepin Counties. Existing land uses along the project section include residential housing, business office, commercial, and industrial properties. There is one existing trail located within the project corridor that runs along the eastern side of I-35W on the south side of the river. The Bloomington Cemetery is located on the east side of I-35W, north of West 106th Street. For the purposes of this project, the segment of I-35W extends from West 104th Street on the north to Cliff Road on the south.

Noise Monitoring

<u>Noise Level Monitoring Results</u>

Noise level monitoring is an important commonly completed task as part of a highway noise study. Noise level monitoring is completed to analyze existing noise at sensitive locations throughout the corridor and is used to ensure the noise model is accurately modeling existing noise levels along the corridor. For this project, traffic noise levels were measured at five locations along the corridor. These five locations were selected because each site is representative of the surrounding area and are located adjacent to representative cross sections of

the project segment of I-35W. The sites are described below and can be seen in **Figure 2, Appendix B.**

- Monitoring Site 1: Located on the eastern side of I-35W near the office building at 10800 Lyndale Avenue. This site represents the business office sites located south of West 106th Street on the eastern side I-35W.
- Monitoring Site 2: Located on the western side of I-35W at 10824 River Terrace. This site represents the residences south of West 106th Street on the west side of I-35W that have a line of sight blocked to I-35W.
- Monitoring Site 3: Located at the trail head of the Minnesota Valley National Wildlife Refuge. This site represents the trail receptors around the park and bridge.
- Monitoring Site 4: Located in the Walser Subaru parking lot. This site represents the commercial sites at the south end of the project area.
- Monitoring Site 5: Located on the west side of I-35W at 10727 River Terrace. This site represents the houses just south of West 106th Street that do not have a line of sight blocked to I-35W.

Two 15-minute measurement periods were completed at each measurement location. The first was during the morning (after the AM peak but before noon), and the second was during the afternoon period (after noon but before PM peak). The results were used to validate the noise model.

Field Measurement and Predicted Noise Levels

Table 9, Appendix A shows the results of the noise model validation. Field measurements at all five of the noise monitoring sites were within +/- 3 dBA of modeled noise levels.

Worst Hourly Traffic Noise Analysis

The worst noise hour was determined by looking at the vehicle and heavy truck percentages at different times of the day. Four different hours were chosen based on data received from SRF Consulting Group. The four hours that were chosen were:

- 7:00-8:00 AM
- 9:00-10:00 AM
- 5:00-6:00 PM
- 6:00-7:00 PM

Based on the results shown in **Table 4**, the loudest hour was determined to be 5:00-6:00 PM. 5:00 – 6:00 PM represents the highest volume hour without congestion and was the main contributing factor in determining the worst hourly traffic noise. Truck percentages during 5:00 – 6:00 PM and 6:00 – 7:00 PM were the same based on values received from the microsimulation

report. The loudest nighttime hour was determined to be 6:00-7:00 AM, with considerably higher traffic volumes than any other nighttime hour.

Table 4: Loudest Hour Determination

Receptor ID	Existing Modeled Daytime Noise Levels (dBA)							
	By Time Period							
	7:00 - 8:00 AM		9:00 - 10:00 AM		5:00 - 6:00 PM		6:00 - 7:00 PM	
	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}
A1	**73.5**	**70.7**	**73.6**	**70.9**	**74.3**	**71.9**	**74.3**	**71.9**
A2	**72.9**	**70.2**	**73.0**	**70.4**	**73.7**	**71.4**	**73.7**	**71.4**
A3	**74.8**	**71.8**	**74.9**	**72.0**	**75.5**	**73.0**	**75.5**	**73.0**
A4	**78.8**	**76.2**	**79.0**	**76.5**	**79.7**	**77.5**	**79.7**	**77.5**
B1	**69.5**	**67.0**	**69.8**	**67.3**	**71.0**	**68.8**	**71.0**	**68.8**
B2	**69.4**	**66.9**	**69.6**	**67.2**	**70.8**	**68.7**	**70.8**	**68.7**
B3	**69.3**	**66.9**	**69.6**	**67.2**	**70.7**	**68.6**	**70.7**	**68.6**
B4	**68.3**	**65.9**	**68.5**	**66.2**	**69.6**	**67.6**	**69.6**	**67.6**
B5	**65.5**	**63.4**	**65.7**	**63.7**	**66.8**	**65.0**	**66.8**	**65.0**
B6	**67.9**	**65.6**	**68.1**	**65.9**	**69.2**	**67.3**	**69.2**	**67.3**
B7	65.0	**63.0**	**65.2**	**63.3**	**66.3**	**64.6**	**66.3**	**64.6**
B8	**66.7**	**64.5**	**66.9**	**64.8**	**68.0**	**66.1**	**68.0**	**66.1**
B9	**69.1**	**66.6**	**69.4**	**66.9**	**70.4**	**68.1**	**70.4**	**68.1**
B10	**66.7**	**64.5**	**67.0**	**64.8**	**68.1**	**66.1**	**68.1**	**66.1**
B11	64.8	**63.0**	**65.1**	**63.3**	**66.2**	**64.7**	**66.2**	**64.7**
B12	62.9	**61.2**	63.2	**61.6**	64.3	**62.9**	64.3	**62.9**
B13	64.0	**62.2**	64.3	**62.5**	**65.6**	**64.0**	**65.5**	**64.0**
B14	**73.5**	**70.7**	**73.9**	**71.1**	**75.3**	**72.8**	**75.3**	**72.8**
B15	**68.6**	**66.0**	**68.9**	**66.4**	**70.2**	**68.0**	**70.2**	**67.9**
B16	**67.9**	**65.6**	**68.2**	**66.0**	**69.5**	**67.5**	**69.5**	**67.5**
C1	68.7	**66.0**	68.8	**66.2**	69.3	**67.0**	69.3	**67.0**
C2	67.6	**65.2**	67.7	**65.4**	68.4	**66.4**	68.4	**66.4**
D1	70.4	67.9	70.8	68.4	72.3	70.1	72.3	70.1
E1	**72.0**	**69.4**	**72.1**	**69.6**	**72.8**	**70.6**	**72.8**	**70.6**
E2	**74.9**	**71.7**	**75.0**	**71.9**	**75.4**	**72.6**	**75.4**	**72.6**
E3	**72.8**	**70.0**	**72.9**	**70.1**	**73.5**	**71.1**	**73.5**	**71.1**
E4	68.4	**66.2**	68.5	**66.3**	69.5	**67.6**	69.5	**67.6**
State Daytime Standard (NAC-1)	65	60	65	60	65	60	65	60
State Daytime Standard (NAC-2)	70	65	70	65	70	65	70	65
State Daytime Standard (NAC-3)	80	75	80	75	80	75	80	75
Federal NAC (Activity Category B & C)	70	--	70	--	70	--	70	--

Receptor ID	Existing Modeled Daytime Noise Levels (dBA)							
	By Time Period							
	7:00 - 8:00 AM		9:00 - 10:00 AM		5:00 - 6:00 PM		6:00 - 7:00 PM	
	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}
Federal NAC (Activity Category E)	75	--	75	--	75	--	75	--

Any value exceeding the MN State daytime standard is **bolded** and anything approaching or exceeding the Federal Noise Abatement Criteria is <u>underlined</u>.

Traffic Noise Modeling

Noise modeling was completed using Minnoisev31, a version of FHWA's STAMINA model adapted by MnDOT. Minnoisev31 uses basic inputs to model existing noise levels and to predict future noise levels. The program uses vehicle volume, speed, and vehicle class to model the traffic. It also uses elevations of roadways and receptors to capture ground lines and grade changes. The noise model was run for existing conditions (2015) and build conditions (2040 horizon year). The build conditions (2040) model input was based on a profile developed for the steel girder bridge type and a profile developed for I-35W south of the Minnesota River to be constructed at a minimum of two feet above the 100-year floodplain elevation.

All volumes used in the model were gathered from the CORSIM modeling completed for the project. The loudest hour was compared to the highest volume hour that did not show signs of congestion through the corridor. The daytime loudest hour represented approximately 8.1% of the daily traffic. The nighttime loudest hour represented approximately 5.8% of the traffic.

Chapter 3: Predicted Noise Levels and Noise Impacts

Noise Receptors

Noise impacts were assessed at all receptors within approximately 500 feet of the roadway. Noise levels were modeled at a total of 164 receptor locations. The 164 receptor points were broken down into individual noise sensitive areas (NSA). There was a total of 7 NSA locations and 1 trail NSA. Each NSA represented a specific group of one or similar land uses. A description of each NSA is provided below. **Figure 3 through Figure 10, Appendix A** illustrates the location of the NSA's and modeled receptor locations.

<u>NSA A</u>

NSA A represents four business office properties in the southeast quadrant of the I-35W/West 106th Street interchange. Each receptor in NSA A is classified under NAC-2 for state noise standards and Activity Category E for federal criteria. Each receptor represents one building.

<u>NSA B</u>

NSA B is located on the west side of I-35W between West 106th Street and the Minnesota River. NSA B represents 22 residential receptors. Each receptor represents one household or single family home. All 22 receptors are classified under NAC-1 for state noise standards and under Activity Category B for federal criteria. A ground line was coded in at this location due to the

steep slope down to the interstate. It was confirmed on site that the slope blocks the line of sight to some of the receptors.

NSA C

NSA C represents two receptors along the east side of I-35W along the north shoreline of the Minnesota River. These two receptors represent a trail within the Minnesota Valley National Wildlife Refuge. Each receptor is classified under NAC-2 for state noise standards and under Activity Category C for federal criteria.

NSA D

NSA D represents an industrial site in the southwest quadrant of the I-35W/Black Dog Road interchange. NSA D is classified under NAC-3 for state noise standards and under Activity Category F for federal criteria. There is no federal noise abatement criterion associated with Activity Category F uses (see **Table 2**).

NSA E

NSA E represents four receptors near the southeast quadrant of the I-35W/Cliff Road interchange. Two the four receptors represent car dealerships, one represents a golf driving range, and the final receptor represents a storage facility. Each receptor was classified under NAC-2 for state noise standards and under Activity Category E for federal criteria.

NSA F

NSA F represents residential land uses (townhomes) on the west side of I-35W between West 106th Street and West 104th Street in Bloomington. NSA F includes 36 receptors representing 82 residences and a commons area (Receptor F24, outdoor swimming pool). Each receptor is classified under NAC-1 for state noise standards and under Activity Category B for federal criteria. An existing noise wall is in NSA F along southbound I-35W. This existing noise wall begins approximately 300 feet north of West 106th Street and continues beyond the project limits to north of West 100th Street. The noise wall is located on top of an earthen berm. The height of the earthen berm varies from two feet to eight feet. The height of the noise wall varies from 12 feet to 22 feet. The segment of the existing noise barrier (noise wall plus earthen berm) within the project limits, from north of West 106th Street to West 104th Street, is 20 feet tall.[3]

NSA G

NSA G represents residential land uses in the northeast quadrant of the I-35W/West 106th Street interchange. NSA G includes a total of 39 receptor locations. Thirty-two (32) of these receptors represent balconies associated with individual units at two apartment buildings (see Receptor G1-1 through Receptor G16-2). Ground-floor units at the northernmost apartment building in NSA G have patios (see Receptor G20 through G23). Other units above the ground floor do not have balconies or outdoor gathering areas associated with each individual unit. The easternmost apartment building at West 106th Street and Lyndale Avenue South does not have balconies or outdoor gathering areas associated with each individual unit. Two receptors were located at the façade this apartment building, representing the first-floor units facing I-35W (see Receptor G18

[3] Does not include taper (steps) at the south end of the noise wall near West 106th Street.

and G19). Receptor G17 represents a common use, open space area within the apartment complex along West 106th Street. Each of the receptors described above are classified under NAC-1 for state noise standards and under Activity Category B for federal criteria.

Trails

There is an existing trail that runs along the southern portion of the corridor between Cliff Road and Black Dog Road. A trail would be constructed as part of the proposed project along the southeast loop ramp of the I-35W/Black Dog Road interchange, the east side of the I-35W Minnesota River Bridge, and the east side of I-35W north of the Minnesota River, connecting to Lyndale Avenue South. As per the methodology defined in the 2015 MnDOT Highway Noise Policy, noise receptors were modeled every 200 feet on the existing and proposed portions of the trail. The combination of the existing and proposed trail sections includes 56 receptors.

Noise Model Results

The noise model was run for the existing 2015 daytime and nighttime loudest hours, no build 2040 daytime and nighttime loudest hours, and build 2040 daytime and nighttime loudest hours. **Tables 5 and 6** summarize the existing and build model results for each NSA**.**

The existing daytime L_{10} noise levels varied between 59.5 dBA and 76.5 dBA. Under existing daytime conditions, the L_{10} state noise standards were exceeded at 76 receptors. The daytime L_{50} state noise standards were exceeded at 98 receptors. The federal noise abatement criteria were approached or exceeded at 43 receptors. The existing nighttime L_{10} noise levels at modeled receptors varied between 58.1 dBA and 75.5 dBA. Under existing nighttime conditions, the L_{10} state noise standards were exceeded at 104 receptors. The nighttime L_{50} state noise standards were exceeded at 106 receptors.

Future 2040 no build daytime L_{10} noise levels were predicted to range between 60.0 dBA and 77.0 dBA. The daytime L_{10} state noise standards were exceeded at 80 of the receptors. The daytime L_{50} state noise standards were exceeded at 101 receptors. The federal noise abatement criteria were predicted to be approached or exceeded at 47 receptors. The no build nighttime L_{10} levels were predicted to range between 59.1 dBA and 76.4 dBA. The nighttime L_{10} state noise standards were exceeded at 104 receptors. The nighttime L_{50} state noise standards were exceeded at 107 receptors.

Future 2040 build daytime L_{10} noise levels were predicted to range between 59.9 dBA and 77.7 dBA. The daytime L_{10} state noise standards were exceeded at 83 of the receptors. The daytime L_{50} state noise standards were exceeded at 101 receptors. The build nighttime L_{10} levels were predicted to range between 59.1 dBA and 77.4 dBA. The nighttime L_{10} state noise standards were exceeded at 104 receptors. The L_{50} nighttime state noise standards were exceeded at 106 receptors.

The federal noise abatement criteria were predicted to be approached or exceeded at 51 receptors under the build 2040 condition. No receptors were predicted to experience a substantial noise increase (increase of 5 dBA or more) between existing conditions and build conditions (see **Table 5**).

Table 5: Daytime Noise Modeling Results

Receptor ID	Modeled Noise Levels							
	Daytime Period							
	2015 Existing		2040 No Build		2040 Build		Difference (2040 Build – 2015 Existing)	
	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}
A1 (NAC 2, CAT E)	**74.2**	**71.2**	**74.8**	**72.6**	**74.2**	**71.9**	0.0	0.7
A2 (NAC 2, CAT E)	**73.6**	**70.7**	**74.2**	**72.1**	**74.1**	**71.9**	0.5	1.2
A3 (NAC 2, CAT E)	**75.4**	**72.3**	**76.0**	**73.7**	**76.3**	**73.5**	0.9	1.2
A4 (NAC 2, CAT E)	**75.5**	**72.4**	**76.1**	**73.7**	**77.5**	**74.7**	2.0	2.3
B1 (NAC 1, CAT B)	**68.7**	**65.6**	**69.3**	**67.4**	**70.5**	**68.6**	1.8	3.0
B2 (NAC 1, CAT B)	**68.0**	**65.0**	**68.6**	**66.8**	**70.3**	**68.2**	2.3	3.2
B3 (NAC 1, CAT B)	**67.9**	**64.9**	**68.4**	**66.6**	**70.3**	**68.1**	2.4	3.2
B4 (NAC 1, CAT B)	**66.8**	**63.9**	**67.4**	**65.6**	**68.8**	**66.8**	2.0	2.9
B5 (NAC 1, CAT B)	64.2	**61.7**	64.8	**63.3**	**66.1**	**64.3**	1.9	2.6
B6 (NAC 1, CAT B)	**66.4**	**63.6**	**67.0**	**65.3**	**68.1**	**66.2**	1.7	2.6
B7 (NAC 1, CAT B)	63.8	**61.3**	64.4	**62.9**	**65.5**	**63.8**	1.7	2.5
B8 (NAC 1, CAT B)	**65.1**	**62.5**	**65.7**	**64.1**	**66.4**	**64.6**	1.3	2.1
B9 (NAC 1, CAT B)	**67.5**	**64.5**	**68.1**	**66.1**	**69.2**	**66.7**	1.7	2.2
B10 (NAC 1, CAT B)	**65.2**	**62.4**	**65.8**	**64.0**	**66.1**	**64.2**	0.9	1.8
B11 (NAC 1, CAT B)	63.9	**61.6**	64.5	**63.3**	64.3	**63.0**	0.4	1.4
B12 (NAC 1, CAT B)	62.4	**60.2**	63.0	**61.8**	63.2	**61.9**	0.8	1.7
B13 (NAC 1, CAT B)	64.6	**61.7**	**65.2**	**63.5**	64.7	**63.1**	0.1	1.4
B14 (NAC 1, CAT B)	**75.2**	**71.2**	**75.7**	**73.3**	**74.7**	**72.4**	-0.5	1.2
B15 (NAC 1, CAT B)	**69.9**	**66.4**	**70.5**	**68.3**	**69.8**	**67.6**	-0.1	1.2
B16 (NAC 1, CAT B)	**69.2**	**66.0**	**69.8**	**67.9**	**69.2**	**67.2**	0.0	1.2
B17 (NAC 1, CAT B)	**70.1**	**66.8**	**70.7**	**68.6**	**71.9**	**69.8**	1.8	3.0
B18 (NAC 1, CAT B)	**72.4**	**68.7**	**73.0**	**70.7**	**73.2**	**71.0**	0.8	2.3
B19 (NAC 1, CAT B)	**72.0**	**68.6**	**72.6**	**70.5**	**72.9**	**70.8**	0.9	2.2
B20 (NAC 1, CAT B)	**69.9**	**66.7**	**70.5**	**68.5**	**70.9**	**69.0**	1.0	2.3
B21 (NAC 1, CAT B)	**69.9**	**66.6**	**70.5**	**68.4**	**70.8**	**68.9**	0.9	2.3
B22 (NAC 1, CAT B)	**67.7**	**64.6**	**68.3**	**66.3**	**69.0**	**67.1**	1.3	2.5
C1 (NAC 2, CAT C)	69.2	**67.0**	69.9	**67.8**	68.6	**66.2**	-0.6	-0.8
C2 (NAC 2, CAT C)	68.3	**66.3**	68.9	**67.1**	67.9	**65.8**	-0.4	-0.5
D1 (NAC 3, CAT F)	72.1	68.6	72.7	70.7	72.7	70.8	0.6	2.2
E1 (NAC 2, CAT E)	**72.7**	**69.9**	**73.3**	**71.2**	**73.5**	**71.5**	0.8	1.6
E2 (NAC 2, CAT E)	**75.3**	**72.2**	**76.0**	**73.3**	**76.4**	**73.9**	1.1	1.7
E3 (NAC 2, CAT E)	**73.4**	**70.5**	**74.0**	**71.7**	**74.3**	**72.1**	0.9	1.6
E4 (NAC 2, CAT E)	69.4	**66.7**	69.9	**68.1**	70.0	**68.3**	0.6	1.6
F1 (NAC 1, CAT B)	**70.1**	**67.9**	**70.7**	**68.6**	**70.9**	**68.9**	0.8	1.0

Receptor ID	Modeled Noise Levels							
	Daytime Period							
	2015 Existing		2040 No Build		2040 Build		Difference (2040 Build – 2015 Existing)	
	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}
F2 (NAC 1, CAT B)	**69.4**	**67.2**	**70.0**	**67.9**	**70.3**	**68.2**	0.9	1.0
F3 (NAC 1, CAT B)	**66.9**	**64.8**	**67.5**	**65.5**	**67.6**	**65.7**	0.7	0.9
F4 (NAC 1, CAT B)	64.6	**62.9**	**65.1**	**63.6**	**65.4**	**63.8**	0.8	0.9
F5 (NAC 1, CAT B)	64.2	**62.4**	64.7	**63.1**	**65.2**	**63.5**	1.0	1.1
F6 (NAC 1, CAT B)	64.4	**62.4**	64.9	**63.1**	**65.3**	**63.4**	0.9	1.0
F7 (NAC 1, CAT B)	**72.0**	**69.3**	**72.5**	**70.0**	**73.0**	**70.5**	1.0	1.2
F8 (NAC 1, CAT B)	**71.6**	**68.9**	**72.2**	**69.6**	**72.6**	**70.0**	1.0	1.1
F9 (NAC 1, CAT B)	**71.3**	**68.5**	**71.8**	**69.2**	**72.2**	**69.6**	0.9	1.1
F10 (NAC 1, CAT B)	**70.6**	**67.8**	**71.1**	**68.6**	**71.4**	**68.8**	0.8	1.0
F11 (NAC 1, CAT B)	**66.0**	**62.4**	**66.5**	**63.2**	**66.9**	**63.6**	0.9	1.2
F12 (NAC 1, CAT B)	**68.2**	**65.6**	**68.7**	**66.3**	**69.0**	**66.6**	0.8	1.0
F13 (NAC 1, CAT B)	**68.7**	**66.1**	**69.2**	**66.8**	**69.5**	**67.1**	0.8	1.0
F14 (NAC 1, CAT B)	64.2	**62.3**	64.8	**63.0**	**65.3**	**63.4**	1.1	1.1
F15 (NAC 1, CAT B)	63.9	**61.9**	64.4	**62.6**	64.9	**63.1**	1.0	1.2
F16 (NAC 1, CAT B)	63.7	**61.8**	64.3	**62.5**	64.8	**63.0**	1.1	1.2
F17 (NAC 1, CAT B)	**67.6**	**65.4**	**68.1**	**66.1**	**68.4**	**66.4**	0.8	1.0
F18 (NAC 1, CAT B)	**67.6**	**65.4**	**68.0**	**66.0**	**68.3**	**66.3**	0.7	0.9
F19 (NAC 1, CAT B)	**67.3**	**65.1**	**67.8**	**65.8**	**68.0**	**66.1**	0.7	1.0
F20 (NAC 1, CAT B)	**67.2**	**65.1**	**67.7**	**65.7**	**67.9**	**66.0**	0.7	0.9
F21 (NAC 1, CAT B)	63.3	**61.3**	63.8	**62.0**	64.3	**62.5**	1.0	1.2
F22 (NAC 1, CAT B)	63.6	**61.6**	64.1	**62.3**	64.4	**62.6**	0.8	1.0
F23 (NAC 1, CAT B)	62.2	59.1	62.7	59.7	62.6	59.6	0.4	0.5
F24 (NAC 1, CAT B)	**66.8**	**64.8**	**67.4**	**65.4**	**67.5**	**65.6**	0.7	0.8
F25 (NAC 1, CAT B)	59.7	57.5	60.2	58.1	60.1	58.0	0.4	0.5
F26 (NAC 1, CAT B)	60.3	57.9	60.8	58.6	60.7	58.5	0.4	0.6
F27 (NAC 1, CAT B)	61.4	58.9	61.9	59.5	61.6	59.4	0.2	0.5
F28 (NAC 1, CAT B)	62.4	59.7	62.8	**60.3**	62.7	**60.3**	0.3	0.6
F29 (NAC 1, CAT B)	63.2	**60.2**	63.6	**60.9**	63.5	**60.8**	0.3	0.6
F30 (NAC 1, CAT B)	64.7	**61.7**	65.2	**62.3**	65.0	**62.2**	0.3	0.5
F31 (NAC 1, CAT B)	59.5	57.3	60.0	57.9	59.9	57.9	0.4	0.6
F32 (NAC 1, CAT B)	60.2	57.8	60.7	58.5	60.6	58.4	0.4	0.6
F33 (NAC 1, CAT B)	62.1	59.7	62.6	**60.3**	62.6	**60.5**	0.5	0.8
F34 (NAC 1, CAT B)	62.3	59.7	62.8	**60.3**	62.7	**60.3**	0.4	0.6
F35 (NAC 1, CAT B)	63.1	**60.1**	63.6	**60.8**	63.5	**60.8**	0.4	0.7
F36 (NAC 1, CAT B)	64.9	**61.8**	**65.4**	**62.4**	**65.2**	**62.3**	0.3	0.5

Receptor ID	Modeled Noise Levels							
	Daytime Period							
	2015 Existing		2040 No Build		2040 Build		Difference (2040 Build – 2015 Existing)	
	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}
G1-1 (NAC 1, CAT B)	**74.6**	**71.7**	**75.1**	**72.4**	**75.2**	**72.5**	0.6	0.8
G1-2 (NAC 1, CAT B)	**76.1**	**73.1**	**76.6**	**73.8**	**77.7**	**74.7**	1.6	1.6
G2-1 (NAC 1, CAT B)	**74.4**	**71.5**	**75.0**	**72.3**	**75.1**	**72.3**	0.7	0.8
G2-2 (NAC 1, CAT B)	**76.2**	**73.0**	**76.7**	**73.8**	**77.7**	**74.6**	1.5	1.6
G3-1 (NAC 1, CAT B)	**73.4**	**70.7**	**73.9**	**71.4**	**74.2**	**71.7**	0.8	1.0
G3-2 (NAC 1, CAT B)	**76.4**	**73.0**	**76.9**	**73.7**	**77.6**	**74.5**	1.2	1.5
G4-1 (NAC 1, CAT B)	**72.6**	**70.0**	**73.1**	**70.7**	**73.4**	**71.0**	0.8	1.0
G4-2 (NAC 1, CAT B)	**76.5**	**73.0**	**77.0**	**73.8**	**77.6**	**74.5**	1.1	1.5
G5-1 (NAC 1, CAT B)	**65.9**	**64.1**	**66.4**	**64.7**	**67.2**	**65.4**	1.3	1.3
G5-2 (NAC 1, CAT B)	**70.6**	**68.4**	**71.2**	**69.1**	**71.8**	**69.7**	1.2	1.3
G6-1 (NAC 1, CAT B)	**65.9**	**63.8**	**66.5**	**64.5**	**66.8**	**64.9**	0.9	1.1
G6-2 (NAC 1, CAT B)	**71.0**	**68.7**	**71.5**	**69.4**	**72.1**	**70.0**	1.1	1.3
G7-1 (NAC 1, CAT B)	**66.4**	**64.0**	**66.9**	**64.7**	**67.2**	**65.1**	0.8	1.1
G7-2 (NAC 1, CAT B)	**71.4**	**69.0**	**71.9**	**69.7**	**72.4**	**70.2**	1.0	1.2
G8-1 (NAC 1, CAT B)	**67.0**	**64.2**	**67.5**	**64.9**	**67.8**	**65.3**	0.8	1.1
G8-2 (NAC 1, CAT B)	**72.0**	**69.2**	**72.6**	**69.9**	**72.8**	**70.3**	0.8	1.1
G9-1 (NAC 1, CAT B)	63.7	**61.5**	64.3	62.2	64.9	62.8	1.2	1.3
G9-2 (NAC 1, CAT B)	**69.6**	**67.2**	**70.2**	**67.9**	**70.8**	**68.6**	1.2	1.4
G10-1 (NAC 1, CAT B)	**65.5**	**63.5**	**66.1**	**64.2**	**67.1**	**65.2**	1.6	1.7
G10-2 (NAC 1, CAT B)	**70.0**	**67.8**	**70.6**	**68.5**	**71.2**	**69.1**	1.2	1.3
G11-1 (NAC 1, CAT B)	**66.1**	**64.0**	**66.6**	**64.7**	**67.8**	**65.8**	1.7	1.8
G11-2 (NAC 1, CAT B)	**69.8**	**67.6**	**70.4**	**68.3**	**71.1**	**69.1**	1.3	1.5
G12-1 (NAC 1, CAT B)	**66.4**	**64.4**	**67.0**	**65.1**	**68.4**	**66.3**	2.0	1.9
G12-2 (NAC 1, CAT B)	**69.6**	**67.4**	**70.2**	**68.1**	**70.9**	**69.0**	1.3	1.6
G13-1 (NAC 1, CAT B)	**70.1**	**66.9**	**70.6**	**67.5**	**70.5**	**67.4**	0.4	0.5
G13-2 (NAC 1, CAT B)	**74.7**	**70.9**	**75.2**	**71.6**	**75.0**	**71.4**	0.3	0.5
G14-1 (NAC 1, CAT B)	**69.7**	**66.5**	**70.2**	**67.2**	**70.0**	**67.1**	0.3	0.6
G14-2 (NAC 1, CAT B)	**73.8**	**70.2**	**74.3**	**70.9**	**74.2**	**70.8**	0.4	0.6
G15-1 (NAC 1, CAT B)	**68.4**	**65.1**	**68.9**	**65.8**	**68.8**	**65.7**	0.4	0.6
G15-2 (NAC 1, CAT B)	**72.0**	**68.1**	**72.5**	**68.8**	**72.5**	**68.8**	0.5	0.7
G16-1 (NAC 1, CAT B)	**67.8**	**64.6**	**68.3**	**65.3**	**68.2**	**65.2**	0.4	0.6
G16-2 (NAC 1, CAT B)	**71.7**	**68.1**	**72.2**	**68.8**	**72.1**	**68.8**	0.4	0.7
G17 (NAC 1, CAT B)	**67.4**	**65.2**	**68.0**	**66.0**	**68.1**	**66.1**	0.7	0.9
G18 (NAC 1, CAT B)	**66.7**	**64.8**	**67.3**	**65.5**	**67.4**	**65.7**	0.7	0.9
G19 (NAC 1, CAT B)	**66.3**	**64.5**	**66.9**	**65.2**	**67.0**	**65.4**	0.7	0.9

Receptor ID	Modeled Noise Levels							
	Daytime Period							
	2015 Existing		2040 No Build		2040 Build		Difference (2040 Build – 2015 Existing)	
	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}
G20 (NAC 1, CAT B)	**73.4**	**70.8**	**73.9**	**71.5**	**73.9**	**71.5**	0.5	0.7
G21 (NAC 1, CAT B)	**73.5**	**70.9**	**74.0**	**71.6**	**73.9**	**71.5**	0.4	0.6
G22 (NAC 1, CAT B)	61.8	**60.2**	**62.4**	**60.9**	**62.1**	**60.7**	0.3	0.5
G23 (NAC 1, CAT B)	**65.5**	**63.1**	**66.0**	**63.7**	**65.8**	**63.5**	0.3	0.4
State Standards (NAC 1)	65	60	65	60	65	60	--	--
State Standards (NAC 2)	70	65	70	65	70	65	--	--
State Standards (NAC 3)	80	75	80	75	80	75	--	--
Federal NAC (Activity Category B & C)	70	--	70	--	70	--	--	--
Federal NAC (Activity Category E)	75	--	75	--	75	--	--	--

Any value exceeding the MN State daytime standard is **bolded** and any value approaching or exceeding the Federal Noise Abatement Criteria is underlined.

Table 6: Nighttime Noise Modeling Results

Receptor ID	Modeled Noise Levels							
	Nighttime Period							
	2015 Existing		2040 No Build		2040 Build		Difference (2040 Build – 2015 Existing)	
	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}
A1 (NAC 2, CAT E)	**73.2**	**70.4**	**73.9**	**71.2**	**73.4**	**70.7**	0.2	0.3
A2 (NAC 2, CAT E)	**72.6**	**69.8**	**73.3**	**70.7**	**73.4**	**70.7**	0.8	0.9
A3 (NAC 2, CAT E)	**74.5**	**71.5**	**75.2**	**72.3**	**75.8**	**72.6**	1.3	1.1
A4 (NAC 2, CAT E)	**74.7**	**71.5**	**75.3**	**72.4**	**77.0**	**73.6**	2.3	2.1
B1 (NAC 1, CAT B)	**67.0**	**64.6**	**67.7**	**65.5**	**69.1**	**66.8**	2.1	2.2
B2 (NAC 1, CAT B)	**66.4**	**64.1**	**67.1**	**65.0**	**69.2**	**66.7**	2.8	2.6
B3 (NAC 1, CAT B)	**66.3**	**64.0**	**67.0**	**64.9**	**69.4**	**66.6**	3.1	2.6
B4 (NAC 1, CAT B)	**65.3**	**63.0**	**66.0**	**63.9**	**67.6**	**65.1**	2.3	2.1
B5 (NAC 1, CAT B)	**62.7**	**60.8**	**63.5**	**61.7**	**64.8**	**62.7**	2.1	1.9
B6 (NAC 1, CAT B)	**64.9**	**62.7**	**65.6**	**63.6**	**67.0**	**64.6**	2.1	1.9
B7 (NAC 1, CAT B)	**62.3**	**60.4**	**63.0**	**61.3**	**64.2**	**62.2**	1.9	1.8
B8 (NAC 1, CAT B)	**63.7**	**61.6**	**64.4**	**62.5**	**65.2**	**63.0**	1.5	1.4

Receptor ID	Modeled Noise Levels							
	Nighttime Period							
	2015 Existing		2040 No Build		2040 Build		Difference (2040 Build – 2015 Existing)	
	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}
B9 (NAC 1, CAT B)	**66.1**	**63.6**	**66.8**	**64.5**	**68.3**	**65.2**	2.2	1.6
B10 (NAC 1, CAT B)	**63.7**	**61.5**	**64.4**	**62.4**	**64.9**	**62.6**	1.2	1.1
B11 (NAC 1, CAT B)	**62.3**	**60.7**	**63.0**	**61.5**	**62.9**	**61.2**	0.6	0.5
B12 (NAC 1, CAT B)	**60.8**	**59.3**	**61.6**	**60.1**	**61.8**	**60.2**	1.0	0.9
B13 (NAC 1, CAT B)	**62.9**	**60.8**	**63.6**	**61.7**	**63.2**	**61.2**	0.3	0.4
B14 (NAC 1, CAT B)	**73.3**	**70.2**	**73.9**	**71.1**	**72.9**	**70.2**	-0.4	0.0
B15 (NAC 1, CAT B)	**68.2**	**65.5**	**68.9**	**66.3**	**68.2**	**65.6**	0.0	0.1
B16 (NAC 1, CAT B)	**67.6**	**65.1**	**68.2**	**65.9**	**67.6**	**65.2**	0.0	0.1
B17 (NAC 1, CAT B)	**68.4**	**65.8**	**69.1**	**66.7**	**70.4**	**68.0**	2.0	2.2
B18 (NAC 1, CAT B)	**70.6**	**67.7**	**71.3**	**68.7**	**71.6**	**69.1**	1.0	1.4
B19 (NAC 1, CAT B)	**70.2**	**67.5**	**70.9**	**68.5**	**71.3**	**68.9**	1.1	1.4
B20 (NAC 1, CAT B)	**68.2**	**65.7**	**68.9**	**66.7**	**69.5**	**67.3**	1.3	1.6
B21 (NAC 1, CAT B)	**68.2**	**65.6**	**68.9**	**66.6**	**69.3**	**67.1**	1.1	1.5
B22 (NAC 1, CAT B)	**66.0**	**63.6**	**66.7**	**64.5**	**67.6**	**65.5**	1.6	1.9
C1 (NAC 2, CAT C)	68.5	**65.7**	69.1	**66.6**	68.0	**65.2**	-0.5	-0.5
C2 (NAC 2, CAT C)	67.4	64.9	68.0	**65.7**	67.3	64.7	-0.1	-0.2
D1 (NAC 3, CAT F)	70.2	67.6	70.9	68.5	71.0	68.7	0.8	1.1
E1 (NAC 2, CAT E)	**71.8**	**69.1**	**72.4**	**69.9**	**72.5**	**70.1**	0.7	1.0
E2 (NAC 2, CAT E)	**74.7**	**71.4**	**75.3**	**72.3**	**75.5**	**72.5**	0.8	1.1
E3 (NAC 2, CAT E)	**72.5**	**69.6**	**73.2**	**70.5**	**73.3**	**70.7**	0.8	1.1
E4 (NAC 2, CAT E)	68.2	**65.9**	68.8	**66.7**	68.9	**66.8**	0.7	0.9
F1 (NAC 1, CAT B)	**68.7**	**66.0**	**69.4**	**66.9**	**69.6**	**67.1**	0.9	1.1
F2 (NAC 1, CAT B)	**67.8**	**65.2**	**68.5**	**66.1**	**68.8**	**66.4**	1.0	1.2
F3 (NAC 1, CAT B)	**65.3**	**62.8**	**66.0**	**63.8**	**66.1**	**63.9**	0.8	1.1
F4 (NAC 1, CAT B)	**63.0**	**61.0**	**63.9**	**62.1**	**64.1**	**62.3**	1.1	1.3
F5 (NAC 1, CAT B)	**62.7**	**60.6**	**63.6**	**61.6**	**64.1**	**62.0**	1.4	1.4
F6 (NAC 1, CAT B)	**62.9**	**60.6**	**63.8**	**61.7**	**64.1**	**62.0**	1.2	1.4
F7 (NAC 1, CAT B)	**70.3**	**67.2**	**71.0**	**68.2**	**71.4**	**68.6**	1.1	1.4
F8 (NAC 1, CAT B)	**70.0**	**66.8**	**70.6**	**67.7**	**71.0**	**68.1**	1.0	1.3
F9 (NAC 1, CAT B)	**69.6**	**66.4**	**70.3**	**67.4**	**70.6**	**67.6**	1.0	1.2
F10 (NAC 1, CAT B)	**69.0**	**65.7**	**69.6**	**66.7**	**69.9**	**66.9**	0.9	1.2
F11 (NAC 1, CAT B)	**64.4**	**60.3**	**65.1**	**61.4**	**65.5**	**61.8**	1.1	1.5
F12 (NAC 1, CAT B)	**66.5**	**63.5**	**67.2**	**64.4**	**67.5**	**64.7**	1.0	1.2
F13 (NAC 1, CAT B)	**67.0**	**63.9**	**67.7**	**64.9**	**68.0**	**65.2**	1.0	1.3
F14 (NAC 1, CAT B)	**62.8**	**60.5**	**63.7**	**61.6**	**64.2**	**62.0**	1.4	1.5
F15 (NAC 1, CAT B)	**62.3**	**60.1**	**63.2**	**61.2**	**63.8**	**61.7**	1.5	1.6

Receptor ID	Modeled Noise Levels							
	Nighttime Period							
	2015 Existing		2040 No Build		2040 Build		Difference (2040 Build – 2015 Existing)	
	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}
F16 (NAC 1, CAT B)	**62.2**	**59.9**	**63.1**	**61.0**	**63.5**	**61.5**	1.3	1.6
F17 (NAC 1, CAT B)	**66.5**	**63.2**	**67.2**	**64.5**	**67.5**	**64.8**	1.0	1.6
F18 (NAC 1, CAT B)	**66.4**	**63.2**	**67.2**	**64.5**	**67.5**	**64.8**	1.1	1.6
F19 (NAC 1, CAT B)	**66.1**	**63.0**	**67.0**	**64.3**	**67.2**	**64.6**	1.1	1.6
F20 (NAC 1, CAT B)	**66.1**	**63.1**	**66.9**	**64.3**	**67.1**	**64.6**	1.0	1.5
F21 (NAC 1, CAT B)	**61.8**	**59.4**	**62.6**	**60.5**	**63.1**	**61.0**	1.3	1.6
F22 (NAC 1, CAT B)	**62.0**	**59.6**	**62.8**	**60.7**	**63.1**	**61.0**	1.1	1.4
F23 (NAC 1, CAT B)	**61.2**	**57.3**	**62.1**	**58.7**	**62.0**	**58.6**	0.8	1.3
F24 (NAC 1, CAT B)	**65.7**	**63.0**	**66.5**	**64.2**	**66.7**	**64.4**	1.0	1.4
F25 (NAC 1, CAT B)	**58.3**	**55.5**	**59.3**	**56.9**	**59.2**	**56.8**	0.9	1.3
F26 (NAC 1, CAT B)	**59.0**	**56.0**	**60.0**	**57.4**	**59.9**	**57.3**	0.9	1.3
F27 (NAC 1, CAT B)	**60.2**	**57.2**	**61.1**	**58.5**	**61.0**	**58.4**	0.8	1.2
F28 (NAC 1, CAT B)	**60.9**	**57.7**	**62.0**	**59.1**	**61.9**	**59.0**	1.0	1.3
F29 (NAC 1, CAT B)	**61.8**	**58.0**	**62.8**	**59.5**	**62.7**	**59.5**	0.9	1.5
F30 (NAC 1, CAT B)	**63.7**	**59.6**	**64.6**	**61.1**	**64.5**	**61.0**	0.8	1.4
F31 (NAC 1, CAT B)	**58.1**	**55.4**	**59.1**	**56.7**	**59.1**	**56.7**	1.0	1.3
F32 (NAC 1, CAT B)	**58.9**	**56.0**	**59.9**	**57.3**	**59.8**	**57.2**	0.9	1.2
F33 (NAC 1, CAT B)	**60.9**	**58.0**	**61.8**	**59.2**	**61.9**	**59.4**	1.0	1.4
F34 (NAC 1, CAT B)	**61.0**	**57.7**	**62.0**	**59.1**	**61.9**	**59.1**	0.9	1.4
F35 (NAC 1, CAT B)	**61.9**	**58.1**	**62.8**	**59.5**	**62.8**	**59.5**	0.9	1.4
F36 (NAC 1, CAT B)	**63.9**	**59.9**	**64.8**	**61.3**	**64.7**	**61.2**	0.8	1.3
F37 (NAC 1, CAT B)	**73.6**	**70.1**	**74.4**	**71.2**	**74.6**	**71.5**	1.0	1.4
G1-1 (NAC 1, CAT B)	**75.1**	**71.5**	**75.9**	**72.6**	**77.4**	**74.0**	2.3	2.5
G1-2 (NAC 1, CAT B)	**73.5**	**70.0**	**74.3**	**71.1**	**74.5**	**71.3**	1.0	1.3
G2-1 (NAC 1, CAT B)	**75.2**	**71.4**	**76.1**	**72.6**	**77.4**	**73.9**	2.2	2.5
G2-2 (NAC 1, CAT B)	**72.4**	**69.1**	**73.2**	**70.2**	**73.6**	**70.6**	1.2	1.5
G3-1 (NAC 1, CAT B)	**75.4**	**71.3**	**76.3**	**72.6**	**77.3**	**73.8**	0.9	1.2
G3-2 (NAC 1, CAT B)	**71.7**	**68.5**	**72.4**	**69.6**	**72.8**	**70.0**	1.9	2.5
G4-1 (NAC 1, CAT B)	**75.5**	**71.3**	**76.4**	**72.6**	**77.3**	**73.7**	1.1	1.5
G4-2 (NAC 1, CAT B)	**64.8**	**62.5**	**65.6**	**63.6**	**66.7**	**64.5**	1.8	2.4
G5-1 (NAC 1, CAT B)	**69.5**	**66.7**	**70.3**	**67.9**	**71.1**	**68.7**	1.9	2.0
G5-2 (NAC 1, CAT B)	**64.8**	**62.2**	**65.7**	**63.4**	**66.1**	**63.8**	1.6	2.0
G6-1 (NAC 1, CAT B)	**69.9**	**67.1**	**70.7**	**68.2**	**71.3**	**68.8**	1.3	1.6
G6-2 (NAC 1, CAT B)	**65.3**	**62.4**	**66.1**	**63.5**	**66.5**	**64.0**	1.4	1.7
G7-1 (NAC 1, CAT B)	**70.3**	**67.3**	**71.2**	**68.5**	**71.6**	**69.0**	1.2	1.6
G7-2 (NAC 1, CAT B)	**65.9**	**62.5**	**66.8**	**63.7**	**67.1**	**64.1**	1.3	1.7

Receptor ID	Modeled Noise Levels							
	Nighttime Period							
	2015 Existing		2040 No Build		2040 Build		Difference (2040 Build – 2015 Existing)	
	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}
G8-1 (NAC 1, CAT B)	**70.9**	**67.4**	**71.8**	**68.6**	**72.1**	**69.1**	1.2	1.6
G8-2 (NAC 1, CAT B)	**62.6**	**59.9**	**63.4**	**61.0**	**64.1**	**61.6**	1.2	1.7
G9-1 (NAC 1, CAT B)	**68.5**	**65.5**	**69.3**	**66.6**	**70.0**	**67.3**	1.5	1.7
G9-2 (NAC 1, CAT B)	**64.4**	**61.9**	**65.2**	**62.9**	**66.4**	**64.1**	1.5	1.8
G10-1 (NAC 1, CAT B)	**68.8**	**66.1**	**69.7**	**67.2**	**70.3**	**68.0**	2.0	2.2
G10-2 (NAC 1, CAT B)	**64.9**	**62.4**	**65.7**	**63.5**	**67.1**	**64.8**	1.5	1.9
G11-1 (NAC 1, CAT B)	**68.7**	**65.9**	**69.5**	**67.0**	**70.3**	**68.0**	2.2	2.4
G11-2 (NAC 1, CAT B)	**68.7**	**65.9**	**69.5**	**67.0**	**70.3**	**68.0**	1.6	2.1
G12-1 (NAC 1, CAT B)	**65.3**	**62.8**	**66.1**	**63.8**	**67.9**	**65.4**	2.6	2.6
G12-2 (NAC 1, CAT B)	**68.4**	**65.7**	**69.2**	**66.8**	**70.2**	**67.9**	1.8	2.2
G13-1 (NAC 1, CAT B)	**69.1**	**65.2**	**70.1**	**66.6**	**70.0**	**66.5**	0.9	1.3
G13-2 (NAC 1, CAT B)	**73.6**	**69.0**	**74.6**	**70.5**	**74.5**	**70.4**	0.9	1.4
G14-1 (NAC 1, CAT B)	**68.6**	**64.7**	**69.6**	**66.2**	**69.5**	**66.1**	0.9	1.4
G14-2 (NAC 1, CAT B)	**72.6**	**68.3**	**73.7**	**69.8**	**73.6**	**69.7**	1.0	1.4
G15-1 (NAC 1, CAT B)	**67.2**	**63.3**	**68.2**	**64.7**	**68.2**	**64.7**	1.0	1.4
G15-2 (NAC 1, CAT B)	**70.9**	**66.2**	**71.9**	**67.7**	**71.9**	**67.8**	1.0	1.6
G16-1 (NAC 1, CAT B)	**66.7**	**62.8**	**67.6**	**64.2**	**67.5**	**64.1**	0.8	1.3
G16-2 (NAC 1, CAT B)	**70.5**	**66.2**	**71.5**	**67.7**	**71.5**	**67.7**	1.0	1.5
G17 (NAC 1, CAT B)	**66.3**	**63.6**	**67.0**	**64.6**	**67.2**	**64.8**	0.9	1.2
G18 (NAC 1, CAT B)	**65.5**	**63.2**	**66.2**	**64.1**	**66.4**	**64.4**	0.9	1.2
G19 (NAC 1, CAT B)	**65.1**	**62.9**	**65.9**	**64.0**	**66.1**	**64.2**	1.0	1.3
G20 (NAC 1, CAT B)	**72.4**	**69.2**	**73.3**	**70.5**	**73.3**	**70.5**	0.9	1.3
G21 (NAC 1, CAT B)	**72.4**	**69.3**	**73.4**	**70.6**	**73.3**	**70.6**	0.9	1.3
G22 (NAC 1, CAT B)	**60.7**	**58.7**	**61.7**	**59.9**	**61.4**	**59.7**	0.7	1.0
G23 (NAC 1, CAT B)	**64.4**	**61.4**	**65.4**	**62.8**	**65.2**	**62.6**	0.8	1.2
State Standards (NAC 1)	55	50	55	50	55	50	--	--
State Standards (NAC 2)	70	65	70	65	70	65	--	--
State Standards (NAC 3)	80	75	80	75	80	75	--	--

Any value exceeding the MN State nighttime standard is **bolded**.

There is a proposed extension to the trail that runs along I-35W. The existing and proposed trails were modeled under the build conditions only. The state L_{10} noise standards are predicted to be exceeded at 47 of the 56 receptors under the build daytime conditions and 45 of the 56 receptors under the build nighttime conditions. The state L_{50} noise standards are predicted to be exceeded at 54 of the 56 receptors under the build daytime conditions and 50 of the 56 receptors under the build nighttime conditions. 49 of the 56 receptors are anticipated to approach or exceed the federal noise abatement criterion for Activity Category C. **Table 7** shows the model results for trail receptor locations.

Table 7: Build Trail Receptor Summary

Receptor ID	Daytime Period		Nighttime Period	
	L_{10}	L_{50}	L_{10}	L_{50}
Trail 1 (NAC 2, CAT C)	68.6	66.9	67.7	65.6
Trail 2 (NAC 2, CAT C)	70.9	68.7	70.1	67.5
Trail 3 (NAC 2, CAT C)	74.0	71.0	73.5	70.0
Trail 4 (NAC 2, CAT C)	79.5	74.7	79.1	73.7
Trail 5 (NAC 2, CAT C)	82.6	77.6	82.3	76.7
Trail 6 (NAC 2, CAT C)	82.3	77.5	81.8	76.5
Trail 7 (NAC 2, CAT C)	81.4	76.9	80.8	75.6
Trail 8 (NAC 2, CAT C)	81.7	77.3	81.1	76.1
Trail 9 (NAC 2, CAT C)	81.5	77.1	80.9	75.9
Trail 10 (NAC 2, CAT C)	80.6	76.2	80.1	75.0
Trail 11 (NAC 2, CAT C)	82.5	77.8	82.1	77.0
Trail 12 (NAC 2, CAT C)	80.2	76.0	79.6	74.7
Trail 13 (NAC 2, CAT C)	80.7	76.4	80.1	75.1
Trail 14 (NAC 2, CAT C)	80.8	76.5	80.1	75.2
Trail 15 (NAC 2, CAT C)	81.4	77.1	80.8	75.9
Trail 16 (NAC 2, CAT C)	81.3	77.2	80.6	75.9
Trail 17 (NAC 2, CAT C)	84.7	79.3	84.6	78.8
Trail 18 (NAC 2, CAT C)	81.0	77.0	80.3	75.6
Trail 19 (NAC 2, CAT C)	80.9	76.9	80.2	75.6
Trail 20 (NAC 2, CAT C)	81.2	77.1	80.6	75.9
Trail 21 (NAC 2, CAT C)	81.1	77.1	80.4	75.8
Trail 22 (NAC 2, CAT C)	80.4	76.5	79.9	75.5
Trail 23 (NAC 2, CAT C)	78.6	75.3	77.8	74.0
Trail 24 (NAC 2, CAT C)	73.2	70.8	72.3	69.5
Trail 25 (NAC 2, CAT C)	71.8	69.5	70.9	68.0
Trail 26 (NAC 2, CAT C)	71.7	69.2	71.0	67.8
Trail 27 (NAC 2, CAT C)	71.0	68.2	70.6	67.2
Trail 28 (NAC 2, CAT C)	70.1	67.5	69.7	66.6
Trail 29 (NAC 2, CAT C)	69.6	66.4	69.4	65.7
Trail 30 (NAC 2, CAT C)	78.2	73.0	77.9	72.2

Receptor ID	Daytime Period		Nighttime Period	
	L_{10}	L_{50}	L_{10}	L_{50}
Trail 31 (NAC 2, CAT C)	64.0	62.4	62.9	61.0
Trail 32 (NAC 2, CAT C)	65.4	63.5	64.4	62.1
Trail 33 (NAC 2, CAT C)	67.5	**65.4**	66.7	64.2
Trail 34 (NAC 2, CAT C)	**70.5**	**68.1**	69.9	**67.0**
Trail 35 (NAC 2, CAT C)	**72.2**	**69.4**	**71.7**	**68.5**
Trail 36 (NAC 2, CAT C)	**72.5**	**69.4**	**72.1**	**68.5**
Trail 37 (NAC 2, CAT C)	**71.4**	**68.4**	**71.0**	**67.6**
Trail 38 (NAC 2, CAT C)	**71.8**	**68.7**	**71.5**	**68.0**
Trail 39 (NAC 2, CAT C)	**72.0**	**68.8**	**71.7**	**68.0**
Trail 40 (NAC 2, CAT C)	**71.8**	**68.8**	**71.5**	**68.0**
Trail 41 (NAC 2, CAT C)	**73.3**	**70.1**	**73.0**	**69.2**
Trail 42 (NAC 2, CAT C)	**74.8**	**71.1**	**74.5**	**70.2**
Trail 43 (NAC 2, CAT C)	**75.4**	**71.6**	**75.1**	**70.7**
Trail 44 (NAC 2, CAT C)	**77.7**	**74.0**	**77.1**	**72.7**
Trail 45 (NAC 2, CAT C)	**78.1**	**74.5**	**77.3**	**73.0**
Trail 46 (NAC 2, CAT C)	**78.0**	**74.4**	**77.1**	**72.9**
Trail 47 (NAC 2, CAT C)	**78.3**	**74.8**	**77.3**	**73.2**
Trail 48 (NAC 2, CAT C)	**79.4**	**75.7**	**78.8**	**74.7**
Trail 49 (NAC 2, CAT C)	68.5	**66.6**	66.3	64.2
Trail 50 (NAC 2, CAT C)	69.0	**66.8**	66.7	64.3
Trail 51 (NAC 2, CAT C)	67.8	**65.9**	66.9	64.7
Trail 52 (NAC 2, CAT C)	69.9	**67.1**	69.1	**65.9**
Trail 53 (NAC 2, CAT C)	**73.2**	**68.4**	**72.7**	**67.4**
Trail 54 (NAC 2, CAT C)	**75.6**	**71.0**	**75.4**	**70.3**
Trail 55 (NAC 2, CAT C)	**73.1**	**69.4**	**72.7**	**68.6**
Trail 56 (NAC 2, CAT C)	**71.2**	**68.1**	**70.8**	**67.2**
State Standards (NAC-1)	65	60	55	50
State Standards (NAC-2)	70	65	70	65
State Standards (NAC-3)	80	75	80	75
Federal NAC (Activity Category B & C)	70	--	70	--
Federal NAC (Activity Category E)	75	--	75	--

Any value exceeding the MN State standard is **bolded** and any value approaching or exceeding the Federal Noise Abatement Criteria is underlined.

Chapter 4: Consideration of Noise Abatement

Noise Abatement Measures

The I-35W River Bridge crossing project is considered a Type I project for the purposes of traffic noise analysis. 23 CFR 775.15(c) describes noise abatement measures that are to be considered when traffic noise impacts have been identified with a Type I highway project. These noise abatement measures are described below.

- Construction of noise walls, 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 signing 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 that would be adversely impacted by traffic noise.
- Noise insulation of certain facilities, including auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.

Noise Wall Evaluation

Noise walls that are proposed in the state of Minnesota must meet MnDOT's policies and procedures for evaluating wall feasibility and reasonableness. These criteria are set forth in Section 5.2 (Feasibility) and Section 5.3 (Reasonableness) of the MnDOT Highway Noise Policy. The factors for determining noise wall feasibility and reasonableness as described in the MnDOT noise policy are summarized below.

<u>Noise Wall Feasibility</u>

- **Acoustic Feasibility:** For a noise wall to be considered acoustically effective, it must achieve a noise reduction of at least 5 dBA at the impacted receptors for those receptors to be considered benefited by a noise wall. Not every impacted receptor must receive this minimum 5 dBA reduction; however, at least one impacted receptor must meet the minimum 5 dBA reduction for a noise wall to achieve acoustic feasibility.
- **Engineering Feasibility:** Engineering feasibility addresses whether or not it is possible to design and construct a proposed noise abatement measure. A sample of potential constructability considerations includes safety, topography, drainage, utilities, and maintenance considerations. Engineering considerations are also taken into consideration in determining noise wall height. MnDOT has established a maximum noise wall height of 20 feet above the finished ground line at the noise wall.

For the purpose of this analysis, all potential noise walls were considered feasible from an engineering and constructability standpoint. If any walls were shown to be cost effective and acoustically feasible as part of this study, each wall would be further evaluated to ensure that it was in fact constructible.

Noise Wall Reasonableness

Noise wall reasonableness decisions are based on a consideration of three reasonableness factors: 1) noise reduction design goal of 7 dBA is met for at least one receptor behind each of the analyzed walls, 2) cost effectiveness, and 3) the viewpoint of benefited residents and property owners.

- **Noise reduction design goal:** A minimum 7 dBA reduction must be achieved for at least one benefited receptor behind the noise wall to meet noise reduction design goal.

- **Cost effectiveness:** To be considered cost-effective, the cost per individual benefited receptor should be equal to or less than $43,500. In order to assess cost effectiveness, at least one benefited receptor behind the noise wall must meet the noise reduction design goal described above. The following formula is used to determine the cost-effectiveness of the wall:

  > The cost-effectiveness index is equal to the cost of the noise wall divided by the number of individual benefited receptors (i.e., residences, commercial entities, industrial entities) that are predicted to experience noise level reductions of 5 dBA or more. Only those receptors that experience a 5 dBA or greater decibel decrease are considered in this formula. The result is a cost per benefited receptor value (residence, commercial entity, or industrial entity represented by each modeled receptor). The cost of a noise wall is calculated using $20 per square foot of wall, based on historical data over the five-year period from 2005-2010. To be considered cost-effective, the cost per individual benefited receptor must be equal to or less than $43,500 per receptor.

  There are several steps in determining if a noise wall is cost effective. The first step involves modeling the noise wall at a maximum height of 20 feet. If the 20-foot noise wall does not achieve a 7 dBA reduction at any receptor located behind the wall, then the wall is considered to not be reasonable and is not proposed. If one receptor achieves the design goal reduction of 7 dBA, the total number of benefited receptors are identified (i.e., receptors that achieve a 5 dBA reduction or greater). The total cost of the noise wall is then divided by the total number of benefited receptors to determine the cost per receptor. If this value is below the $43,500 per benefited receptor threshold, the wall is considered cost effective and would be proposed. If the 20-foot wall meets the design goal reduction but is not cost effective, walls of lower heights are modeled until the wall does not meet the noise reduction design goal. If no walls are found to meet the noise reduction design goal, meet cost-effectiveness threshold, and be feasible, then no walls are proposed.

- **Viewpoint of benefited residents and property owners:** The third criterion in determining noise wall reasonableness is the viewpoint of benefited residents and property owners. A benefited property is defined as a receptor adjacent to a proposed noise abatement measure that receives a noise reduction equal to or greater than 5 dBA. If benefited residents and property owners indicate that a proposed noise wall is not desired, then the noise wall is removed from further consideration and would not be constructed with the project.

  There are two steps in determining the desires of the benefited property owners and residents regarding the construction of proposed noise abatement measures. First, the viewpoint of benefited property owners and residents is solicited through a public involvement process (e.g., open house meeting, direct mailing of a solicitation form). Second, the input received from benefited property owners and residents through this public involvement process is expressed in a vote that is weighted as follows:

  > The owner of a benefited property immediately adjacent to the highway right-of-way for the proposed project (i.e., first-row properties) receives 4 points and the resident (owner or renter) receives 2 points. The owner/resident of a benefited property receives a total of 6 points.
  >
  > The owner of a benefited property not immediately adjacent to the highway right-of-way for the proposed project (e.g., second-row properties, third-row properties) receives 2 points and the resident (owner or renter) receives 1 point. The owner/resident of a benefited property receives a total of 3 points.

  Only those benefited property owners and residents, including individual units of multi-family residential buildings that are considered to be benefited receptors, regardless of floor location (e.g., first floor, second floor, etc.), have a vote according to the point system described above. Non-benefiting receptors do not receive points.

  Initial Solicitation: If 50 percent or more of all possible voting points from eligible voters are received after the initial request for votes, the majority of points (based upon the votes received) determine the outcome of the noise barrier. If there is a tie, where there are equal numbers of points for and against a noise barrier, the noise barrier will be constructed. If less than 50 percent of the possible voting points for a barrier are received after this initial request, then a second ballot will be distributed to the benefited property owners who did not respond.

  Second Solicitation (if required): If 25 percent or more of all possible points for a barrier are received after the second request for votes, then the outcome is determined by the majority of votes received. If less than 25 percent of total possible points for a noise barrier are received after the second request for votes, then the barrier will not be constructed. If there is a tie, where there are equal numbers of points for and against a noise barrier, the noise barrier will be constructed.

Noise Wall Analysis Results

Noise walls were analyzed at all locations where future build noise model results predicted sound levels would exceed the state standards for either the daytime or nighttime periods, or approach or exceed the federal noise abatement criteria. **Figures 11 through 19 in Appendix A** illustrate the locations of modeled noise walls.

Noise wall cost-effectiveness calculations and results are tabulated in **Appendix B**. Multiple noise wall alternatives were modeled with varying heights and lengths. The results presented below represent the most acoustically effective and/or cost effective noise wall configuration. Results for 20-foot high noise walls are described first, followed by additional wall heights where appropriate. The discussion of noise walls only includes calculations for the daytime period. Nighttime period calculations can be found in **Appendix B.** In general, the daytime noise wall cost effectiveness calculations are consistent with the nighttime noise wall cost effectiveness calculations. The following discussion of noise wall analysis results refer to L_{10} levels unless otherwise noted.

Wall 1 (Located on the west side of I-35W between West 106th Street and the Minnesota River)

INCLUDES RECEPTORS B1 – B22

An approximately 1,960-foot long, 20-foot high noise wall was modeled on the west side of I-35W, south of West 106th Street. This noise wall extends from West 106th Street to a point located approximately 2,200 feet north of the Minnesota River. The noise wall was located along the east side of River Terrace, inside of MnDOT right of way. The 20-foot high noise wall provides a reduction that varies from 0.5 dBA to 7.4 dBA. The cost-effectiveness of the noise wall is $85,369 per benefited receptor. The 20-foot high noise wall does not meet MnDOT's minimum $43,500 per benefited receptor cost effectiveness criteria and is not proposed.

An approximate noise wall height of 18 feet would be the minimum height required for this noise wall to meet MnDOT's noise reduction design goal (i.e., a minimum 7 dBA reduction for at least one benefited receptor behind the noise wall). Therefore, an 18-foot high noise wall was evaluated.

An approximately 1,960-foot long, 18-foot high noise barrier was modeled on the west side of I-35W, south of West 106th Street. This noise wall extends from West 106th Street to a point located approximately 2,200 feet north of the Minnesota River. The noise wall was located along the east side of River Terrace, inside of MnDOT right of way. The 18-foot high noise wall provides a reduction that varies from 0.5 dBA to 7.0 dBA. The cost-effectiveness of the noise wall is $86,700 per benefited receptor. The 18-foot high noise wall does not meet MnDOT's minimum $43,500 per benefited receptor cost effectiveness criteria and is not proposed.

An approximately 1,960-foot long, 15-foot high noise barrier was modeled on the west side of I-35W, south of West 106th Street. This noise wall extends from West 106th Street to a point located approximately 2,200 feet north of the Minnesota River. The noise wall was located along the east side of River Terrace, inside of MnDOT right of way. The 15-foot high noise wall provides a reduction that varies from 0.2 dBA to 6.1 dBA. The 15-foot high noise wall does not meet MnDOT's 7 dBA noise reduction design goal and is not proposed.

Wall 2 (Located on the east side of I-35W between West 106th Street and the office building located just north of the river)

INCLUDES RECEPTORS A1 – A4

An approximately 1,445-foot long, 20-foot high noise wall was modeled on the east side of I-35W, south of West 106th Street. This noise wall extends from West 106th Street to a point located approximately 2,400 feet north of the Minnesota River. The 20-foot high noise wall provides a reduction that varies from 4.6 dBA to 11.4 dBA. The cost-effectiveness of the noise wall is $187,440 per benefited receptor. The 20-foot high noise wall does not meet MnDOT's minimum $43,500 per benefited receptor cost effectiveness criteria and is not proposed.

An approximately 1,445-foot long, 18-foot high noise wall was modeled on the east side of I-35W, south of West 106th Street. This noise wall extends from West 106th Street to a point located approximately 2,400 feet north of the Minnesota River. The 18-foot high noise wall provides a reduction that varies from 4.5 dBA to 10.5 dBA. The cost-effectiveness of the noise wall is $169,400 per benefited receptor. The 18-foot high noise wall does not meet MnDOT's minimum $43,500 per benefited receptor cost effectiveness criteria and is not proposed.

An approximately 1,445-foot long, 15-foot high noise wall was modeled on the east side of I-35W, south of West 106th Street. This noise wall extends from West 106th Street to a point located approximately 2,400 feet north of the Minnesota River. The 15-foot high noise wall provides a reduction that varies from 3.8 dBA to 8.9 dBA. The cost-effectiveness of the noise wall is $142,100 per benefited receptor. The 15-foot high noise wall does not meet MnDOT's minimum $43,500 per benefited receptor cost effectiveness criteria and is not proposed.

An approximate noise wall height of 12 feet would be the minimum height required for this noise wall to meet MnDOT's noise reduction design goal (i.e., a minimum 7 dBA reduction for at least one benefited receptor behind the noise wall). Therefore, a 12-foot high noise wall was evaluated.

An approximately 1,445-foot long, 12-foot high noise wall was modeled on the east side of I-35W, south of West 106th Street. This noise wall extends from West 106th Street to a point located approximately 2,400 feet north of the Minnesota River. The 12-foot high noise wall provides a reduction that varies from 3.7 dBA to 7.2 dBA. The cost-effectiveness of the noise wall is $115,600 per benefited receptor. The 12-foot high noise wall does not meet MnDOT's minimum $43,500 per benefited receptor cost effectiveness criteria and is not proposed.

An approximately 1,445-foot long, 10-foot high noise wall was modeled on the east side of I-35W, south of West 106th Street. This noise wall extends from West 106th Street to a point located approximately 2,400 feet north of the Minnesota River. The 10-foot high noise wall provides a reduction that varies from 2.9 dBA to 6.4 dBA. The 10-foot high noise wall does not meet MnDOT's 7 dBA noise reduction design goal and is not proposed.

Trail Wall (Located adjacent to the existing and proposed trail on the east side of the roadway)

INCLUDES TRAIL RECEPTORS T1 – T56

The trail wall was broken into three distinct parts due to the length of the trail, the cross section of the proposed roadway, and the varying cost per square foot for the wall due to the change in noise wall type. The three sections associated with the trail include: the northern trail wall section (Northern Trail Wall), the bridge trail section (Bridge Trail Wall), and the southern trail wall section (Southern Trail Wall). The Northern Trail Wall begins approximately 1,370 feet north of the I-35W Minnesota River Bridge and extends to the north end of the bridge. The Bridge Trail Wall runs across the I-35W Minnesota River Bridge. The Southern Trail Wall begins at the south end of the I-35W Minnesota River Bridge and extends to the I-35W/Cliff Road interchange. Each trail noise wall was modeled independently of one another.

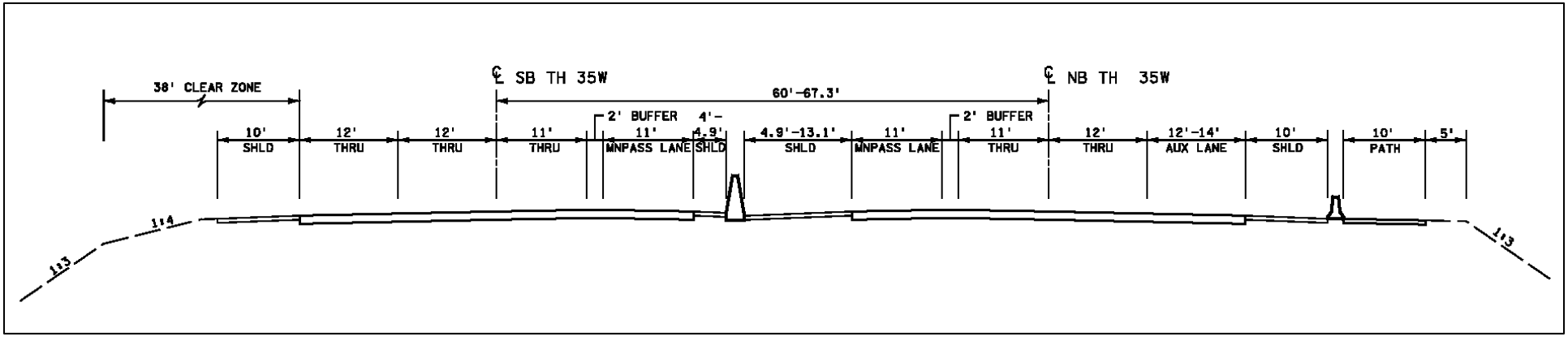
NORTHERN TRAIL WALL SECTION

The Northern Trail Wall was located on the east side of I-35W north of the I-35W Minnesota River Bridge, adjacent to receptors T1 – T10 and receptors T54 – T56. **Exhibit 1** illustrates the proposed I-35W typical section at the north end of the Minnesota River Bridge. The trail is separated from the northbound I-35W outside shoulder by a concrete barrier. The concrete barrier runs along the west side of the trail from the Minnesota River Bridge to the point where the trail turns and continues to the east towards Lyndale Avenue South. The north end of the trail at the Minnesota River bluff is supported by a retaining wall. Approximately 300 feet of the retaining wall runs along the east side of the trail adjacent to I-35W, and follows the south side of the trail from I-35W to Lyndale Avenue South. The retaining wall varies from approximately 18 feet high to 40 feet high.

To provide space for the noise wall behind the concrete barrier, the trail alignment would be shifted to the east away from the concrete barrier. The noise wall would be located between the concrete barrier and trail. Because the retaining wall is immediately behind the trail, the retaining wall would also be shifted to the east down the embankment, increasing the retaining wall height by approximately two feet. The estimated cost for the approximately 300-foot long retaining wall without the noise wall between the concrete barrier and trail is $705,000. The estimated cost for the taller, 300-foot long retaining wall with the noise wall and trail alignment shift is $870,000. The estimated cost for the additional retaining wall height over the length of the retaining wall parallel to I-35W is $165,000.

An approximately 1,370-foot long, 20-foot high noise wall was modeled along the trail on the east side of I-35W north of the Minnesota River Bridge. The 20-foot high noise wall provides a reduction that varies from 0.9 dBA to 13.7 dBA. The cost-effectiveness of the 20-foot high noise wall is $99,617 per benefited receptor. The 20-foot high noise wall does not meet MnDOT's minimum $43,500 per benefited receptor cost effectiveness criteria and is not proposed.

Exhibit 1. I-35W Typical Section (North of Minnesota River Bridge)



Based on the number of benefited receptors with a 20-foot high noise wall (7 receptors), an approximate noise wall height of 11 feet would be required to meet the cost effectiveness calculations for this wall. Therefore, a 11-foot high noise wall was evaluated.

An approximately 1,370-foot long, 11-foot high noise wall was modeled along the east side of I-35W north of the Minnesota River Bridge. The 11-foot high noise wall provides a reduction that varies from 0.4 dBA to 7.9 dBA. The cost-effectiveness of the 11-foot high noise wall is $66,629 per benefited receptor. The 11-foot high noise wall does not meet MnDOT's minimum $43,500 per benefited receptor cost effectiveness criteria and is not proposed.

Based on the MnDOT Noise Policy of no more than one receptor per 200 feet of trail, and with no other adjacent benefited receptors, the maximum possible noise wall height adjacent to a trail that can meet MnDOT's cost effectiveness criteria is a 10-foot high noise wall. Therefore, a 10-foot high noise wall was evaluated.

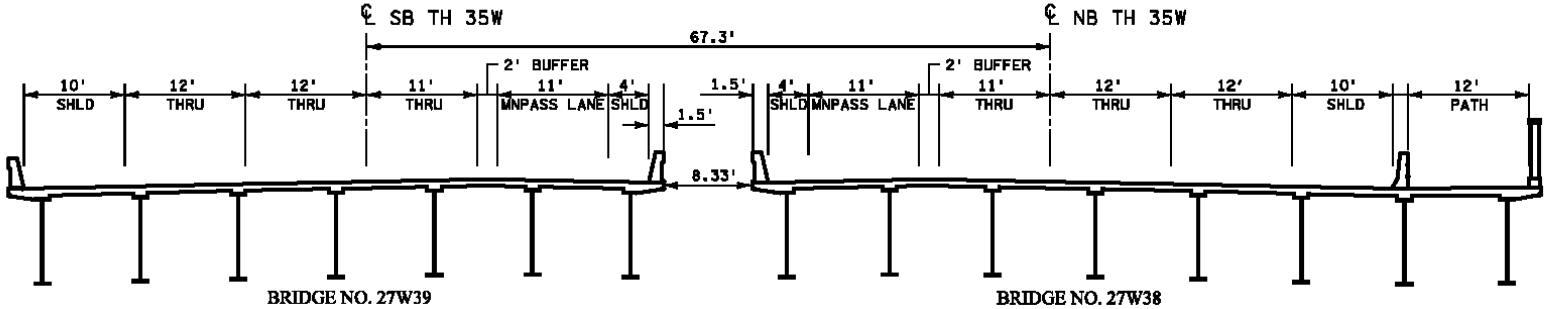
An approximately 1,370-foot long, 10-foot high noise wall was modeled along the east side of I-35W north of the Minnesota River Bridge. The 10-foot high noise wall provides a reduction that varies from 0.3 dBA to 6.9 dBA. The 10-foot high noise wall does not meet MnDOT's 7 dBA noise reduction design goal and is not proposed.

Bridge Trail Wall

The Bridge Trail Wall was located along the east side of the I-35W Minnesota River Bridge adjacent to receptors T11 – T17, T51 – T56, C1, and C2. The Bridge Trail Wall was modeled along the concrete barrier separating the northbound I-35W shoulder from the trail. **Exhibit 2** illustrates the I-35W Minnesota River Bridge typical section. A noise wall that is located along a concrete barrier on a bridge must meet crash impact specifications and be lightweight. Because of these requirements, a barrier mounted noise wall on a bridge has a greater estimated construction cost compared to the standard MnDOT noise wall construction cost of $20 per square foot. The estimated cost for a test level-4 (TL-4) crash tested noise wall is $136 per square foot.

An approximately 1,450-foot long, 20-foot high noise wall was modeled along the east side of the I-35W Minnesota River Bridge between the northbound shoulder and the trail. A 20-foot high noise wall is MnDOT's maximum noise wall height. The 20-foot high noise wall provides a reduction that varies from 0 dBA to 11.7 dBA. The cost-effectiveness of the 20-foot high noise wall is $788,800 per benefited receptor. The 20-foot high noise wall does not meet MnDOT's minimum $43,500 per benefited receptor cost effectiveness criteria and is not proposed.

Exhibit 2. I-35W Minnesota River Bridge Typical Section



Based on the costs for a crash tested, barrier mounted noise wall on the I-35W Minnesota River Bridge and the maximum number of benefited trail receptors with the 20-foot high noise wall (5 benefited receptors), it is not possible to construct a noise wall that would meet MnDOT's cost effectiveness criteria. An 11-foot high noise wall is the lowest possible noise wall height adjacent to the trail that would meet MnDOT's 7dBA noise reduction design goal. An approximately 1,450-foot long, 11-foot high noise wall provides a reduction that varies from 0 dBA to 7.7 dBA. The cost effectiveness of the 11-foot high noise wall is $433,840 per benefited receptor. The 11-foot high noise wall does not meet MnDOT's minimum $43,500 per benefited receptor cost effectiveness criteria and is not proposed.

Based on the MnDOT Noise Policy of no more than one receptor per 200 feet of trail, and with no other adjacent benefited receptors, the maximum possible noise wall height adjacent to a trail that can meet MnDOT's cost effectiveness criteria is a 10-foot high noise wall. Therefore, a 10-foot high noise wall was evaluated.

An approximately 1,450-foot long, 10-foot high noise wall was modeled along the east side of the I-35W Minnesota River bridge between the northbound shoulder and the trail. The 10-foot high noise wall provides a reduction that varies from 0 dBA to 6.7 dBA. The 10-foot high noise wall does not meet MnDOT's 7 dBA noise reduction design goal and is not proposed.

SOUTHERN TRAIL WALL

The Southern Trail Wall was located on the east side of I-35W south of the I-35W Minnesota River Bridge, adjacent to receptors T18 – T48 and receptor E1. Two noise walls were evaluated for this area. The first noise wall was located south of the I-35W Minnesota River Bridge along the Black Dog Road entrance ramp. The second noise wall was located along the east side of I-35W from the Black Dog Road interchange to the Cliff Road interchange.

Southern Trail Wall 1 (Black Dog Road Entrance Ramp)

The Southern Trail Wall 1 was located along the east side of I-35W and the entrance ramp from Black Dog Road to northbound I-35W, adjacent to receptors T18 – T30. The trail at this location is separated from I-35W and the Black Dog Road entrance ramp by a concrete barrier. An approximately 300-foot long retaining wall is located along the east side of the trail at the south end of the bridge. The height of this retaining wall is approximately 30 feet.

To provide space for the noise wall behind the concrete barrier, the trail alignment would be shifted to the east away from the concrete barrier. Because the retaining wall is immediately behind the trail, the retaining wall would also be shifted to the east down the embankment, increasing the retaining wall height by up to three feet. The estimated cost for the approximately 300-foot long retaining wall without the noise wall between the concrete barrier and trail is $870,000. The estimated cost for the taller, 300-foot long retaining wall with the noise wall and trail alignment shift is $969,000. The cost estimate for the additional retaining wall height over the length of the retaining wall is $99,000.

An approximately 1,150-foot long, 20-foot high noise wall was modeled along the east side of the Black Dog Road entrance ramp to northbound I-35W. A 20-foot high noise wall is

MnDOT's maximum noise wall height. The 20-foot high noise wall provides a reduction that varies from 0 dBA to 14.0 dBA. The cost-effectiveness of the 20-foot high noise wall is $67,915 per benefited receptor. The 20-foot high noise wall does not meet MnDOT's minimum $43,500 per benefited receptor cost effectiveness criteria and is not proposed.

Based on the number of benefited receptors with a 20-foot high noise wall (8 receptors), an approximate noise wall height of 15 feet would be required to meet the cost effectiveness calculations for this wall. Therefore, a 15-foot high noise wall was evaluated.

An approximately 1,150-foot long, 15-foot high noise wall was modeled along the east side of the Black Dog Road entrance ramp to northbound I-35W. The 15-foot high noise wall provides a reduction that varies from 0 dBA to 12.0 dBA. The cost-effectiveness of the 15-foot high noise wall is $54,600 per benefited receptor. The 15-foot high noise wall does not meet MnDOT's minimum $43,500 per benefited receptor cost effectiveness criteria and is not proposed.

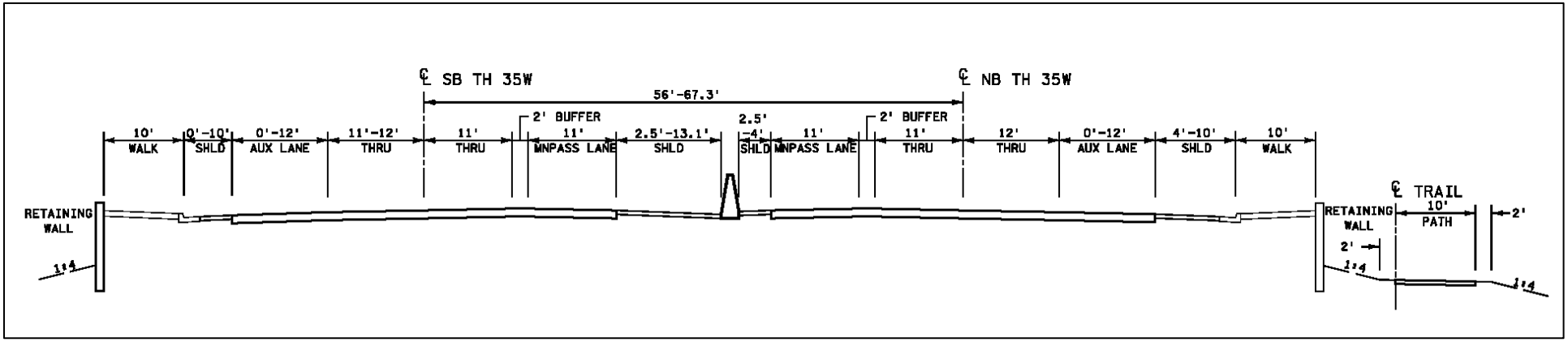
Based on the MnDOT Noise Policy of no more than one receptor per 200 feet of trail, and with no other adjacent benefited receptors, the maximum possible noise wall height adjacent to a trail that can meet MnDOT's cost effectiveness criteria is a 10-foot high noise wall. Therefore, a 10-foot high noise wall was evaluated.

An approximately 1,150-foot long, 10-foot high noise wall provides a reduction that varies from 0 dBA to 7.7 dBA. The cost effectiveness of the 10-foot high noise wall is $54,833 per benefited receptor. The 10-foot high noise wall does not meet MnDOT's minimum $43,500 per benefited receptor cost effectiveness criteria and is not proposed. An approximately 1,150-foot long, 9-foot high noise wall provides a reduction that varies from 0 dBA to 6.4 dBA. The 9-foot high noise wall does not meet MnDOT's 7 dBA noise reduction design goal and is not proposed.

Southern Trail Wall 2 (Black Dog Road to Cliff Road)

The Southern Trail Wall 2 was located along the east side of I-35W from Black Dog Road to Cliff Road, adjacent to receptors T31 – T48 and E1. **Exhibit 3** illustrates the proposed I-35W typical section south of the Minnesota River between Black Dog Road and Cliff Road. A retaining wall is located along the east side of I-35W. The retaining wall varies from approximately 9 feet high to approximately 18 feet high. The trail is located along the bottom of the retaining wall and below the I-35W roadway elevation. The Southern Trail Wall 2 was located on top of the retaining wall.

Exhibit 3. I-35W Typical Section (South of Minnesota River, Black Dog Road to Cliff Road)



To support the loads associated with a noise wall on top of a retaining wall, the retaining wall design is increased (e.g., larger footings). The additional retaining wall features necessary to accommodate a noise wall would increase the retaining wall costs by an estimated 10 percent. The estimated cost of the retaining wall along the east side of I-35W between Black Dog Road and Cliff Road is $4,482,500. A noise wall on top of the retaining wall would increase the wall costs by an additional $448,250.

An approximately 3,590-foot long, 20-foot high noise wall was modeled along the east side of I-35W from Black Dog Road to Cliff Road along the retaining wall. A 20-foot high noise wall is MnDOT's maximum noise wall height. The 20-foot high noise wall provides a reduction that varies from 3.7 dBA to 12.2 dBA. The cost-effectiveness of the 20-foot high noise wall is $116,786 per benefited receptor. The 20-foot high noise wall does not meet MnDOT's minimum $43,500 per benefited receptor cost effectiveness criteria and is not proposed.

An approximately 3,590-foot long, 12-foot high noise wall was modeled along the east side of I-35W from Black Dog Road to Cliff Road along the retaining wall. A 12-foot high noise wall is the lowest possible noise wall height adjacent to the trail that would maximize the number of benefited receptors and meet MnDOT's 7dBA noise reduction design goal. The 12-foot high noise wall provides a reduction that varies from 1.8 dBA to 8.2 dBA. The cost-effectiveness of the 12-foot high noise wall is $93,561 per benefited receptor. The 12-foot high noise wall does not meet MnDOT's minimum $43,500 per benefited receptor cost effectiveness criteria and is not proposed.

An 11-foot high noise wall was identified as the lowest possible noise wall height adjacent to the trail that would meet MnDOT's 7dBA noise reduction design goal. Therefore, a 11-foot high noise wall was modeled.

An approximately 3,590-foot long, 11-foot high noise wall was modeled along the east side of I-35W from Black Dog Road to Cliff Road along the retaining wall. The 11-foot high noise wall provides a reduction that varies from 1.5 dBA to 7.5 dBA. The cost-effectiveness of the 11-foot high noise wall is $123,805 per benefited receptor. The 11-foot high noise wall does not meet MnDOT's minimum $43,500 per benefited receptor cost effectiveness criteria and is not proposed.

Based on the MnDOT Noise Policy of no more than one receptor per 200 feet of trail, and with no other adjacent benefited receptors, the maximum noise wall height adjacent to a trail that can meet MnDOT's cost effectiveness criteria is a 10-foot high noise wall. Therefore, a 10-foot high noise wall was evaluated.

An approximately 3,590-foot long, 10-foot high noise wall was modeled along the east side of I-35W between Black Dog Road and Cliff Road along the retaining wall. The 10-foot high noise wall provides a reduction that varies from 1.2 dBA to 6.7 dBA. The 10-foot high noise wall does not meet MnDOT's 7 dBA noise reduction design goal and is not proposed.

Wall 3 (Located around the Cliff Road interchange ramps)

INCLUDES RECEPTORS E2 – E4

An approximately 830-foot long, 20-foot high noise wall was modeled in the northeast quadrant of the I-35W/Cliff Road interchange. The noise wall was located within MnDOT right of way between the northbound I-35W interchange ramps and Cliff Road. The 20-foot high noise wall provides a reduction that varies from 1.4 dBA to 2.7 dBA. The wall does not meet MnDOT's 7 dBA noise reduction design goal and is not proposed.

Wall 4 (Located on the west side of I-35W, north of West 106th Street)

INCLUDES RECEPTORS F1 – F36

An existing noise wall is in the northwest quadrant of the I-35W/West 106th Street interchange. This noise wall begins approximately 270 feet north of West 106th Street and extends north past West 100th Street. The noise wall is located on top of an earthen berm. The height of the earthen berm varies from two feet to eight feet. The height of the noise wall varies from 12 feet to 22 feet. The segment of the existing noise barrier (noise wall plus earthen berm) within the project limits is 20 feet tall. MnDOT's maximum noise wall height is 20 feet (see "Engineering Feasibility" section); therefore, a replacement noise wall was not evaluated. The existing noise wall and earthen berm will remain in-place with the proposed project.

An approximately 390-foot long, 20-foot high noise wall was modeled in the northeast quadrant of the I-35W/West 106th Street interchange. The noise wall was located within MnDOT right of way along the west side of West Bloomington Freeway. The location of this noise wall was identified to benefit residential receptor locations between West 106th Street and the existing noise wall to the north. The north end of this modeled noise wall overlaps with the existing noise wall by approximately 150 feet. The 20-foot high noise wall provides a reduction that varies from 0.0 dBA to 3.4 dBA. The noise wall does not meet MnDOT's minimum 5 dBA reduction to be acoustically feasible and is not proposed.

Wall 5 (Located on the east side of I-35W, north of West 106th Street)

INCLUDES RECEPTORS G1-1 –G23

An approximately 1,024-foot long, 20-foot high noise wall was modeled in the northeast quadrant of the I-35W/West 106th Street interchange. A gap was included in the noise wall at the entrance ramp to northbound I-35W and the East Bloomington Freeway (frontage road). The two wall segments overlap one another by approximately 100 feet. The southern portion of this wall was located within MnDOT right of way along the east side of East Bloomington Freeway. The northern portion of this wall was located within MnDOT right of way between the northbound I-35W entrance ramp and East Bloomington Freeway.

The approximately 1,024-foot long, 20-foot high noise wall provides a reduction that varies from 0.0 dBA to 8.5 dBA. Wall 5 achieved a 7 dBA reduction or greater at 13 receptors, and a 5 dBA reduction or greater at 20 receptors. The cost-effectiveness of the noise wall is $19,696 per benefited receptor. The approximately 1,024-foot long, 20-foot high noise wall is below

MnDOT's cost effectiveness criteria of $43,500 per benefited receptor; therefore, Wall 5 is proposed.

Other Noise Mitigation Techniques

Noise abatement measures other than noise walls were considered but determined not feasible and/or reasonable for the proposed project. These measures are summarized below.

- Traffic Management Measures: Traffic management measures include prohibiting vehicle types, imposing time-restricted access to certain vehicle types. These traffic measures are not reasonable for this project as I-35W is an interstate highway and principle arterial roadway. These measures are inconsistent with the intended use of the facility.

- Modified Speed Limits: Existing posted speed limits on the corridor are 70 mph. In general, a significant decrease in the speed limit would be needed for a noticeable drop in speed. Similar to the traffic management measures above, this would be inconsistent with the function of the roadway.
- Vertical and Horizontal Alignment: All possible vertical and horizontal alignment modifications were already explored as part of the preferred alternative selection process. Additional modification would require modification of the preferred alternative and this is not feasible.

- Landscaping/Natural Noise Screening: Vegetation is only effective for reducing noise levels if it is at least 100 to 200 feet deep, a minimum of 15 feet above the line of sight, and dense enough that it cannot be seen through. The part of I-35W around the river bridge is well developed and would not allow for such vegetation to be planted.

- Exclusive Land Use Designations: Buffer zones of undeveloped, open spaces adjacent to a roadway corridor. Land uses adjacent to the project corridor consist of residential, business office, commercial, and industrial land uses. Acquisition of property to serve as a buffer zone between the I-35W project corridor and adjacent lands is not feasible because the project is located in a fully developed area.

- Noise Insulation of Non-Residential Buildings: Under MnDOT and FHWA policy, only non-residential buildings such as schools, hospitals, and places of worship should be considered for acoustical insulation if there are no exterior areas of frequent human use associated with the property. It is also important to note that acoustical insulation of non-residential buildings would not affect noise levels that exceed Minnesota State Noise Standards because Minnesota State Noise Standards are intended for exterior uses only. There are no non-residential buildings satisfying this criteria within the project limits.

Construction Noise

The construction activities associated with implementation of the proposed project would result in increased noise levels relative to existing conditions. These impacts would primarily be associated with construction equipment and pile driving.

Table 8 shows peak noise levels monitored at 50 feet from various types of construction equipment. This equipment is primarily associated with site grading/site preparation, which is generally the roadway construction phase associated with the greatest noise levels.

Table 8: Typical Construction Equipment Noise Levels at 50 feet[4]

Equipment Type	Manufacturers Sampled	Total Number of Models in Sample	Peak Noise Level (dBA)	
			Range	Average
Backhoes	5	6	74-92	83
Front Loaders	5	30	75-96	85
Dozers	8	41	65-95	85
Graders	3	15	72-92	84
Scrapers	2	27	76-98	87
Pile Drivers	N/A	N/A	95-105	101

Elevated noise levels are, to a degree, unavoidable for this type of project. MnDOT will require that construction equipment be properly muffled and in proper working order. While MnDOT and its contractor(s) are exempt from local noise ordinances, it is the practice to require contractor(s) to comply with applicable local noise restrictions and ordinances to the extent that is reasonable. Advanced notice will be provided to affected communities of any planned abnormally loud construction activities. It is anticipated that night construction may sometimes be required to minimize traffic impacts and to improve safety. However, construction will be limited to daytime hours as much as possible. This project is expected to be under construction for two years. If necessary, a detailed nighttime construction mitigation plan will be developed during the project final design stage.

Any associated high-impact equipment noise, such as pile driving, pavement sawing, or jack hammering, would be unavoidable with construction of the proposed project. Pile-driving noise is associated with any bridge construction and sheet piling necessary for retaining wall construction. While pile-driving equipment results in the highest peak noise level, as shown in **Table 8**, it is limited in duration to the activities noted above (e.g., bridge and retaining wall construction). Noisy work at night for I-35W construction will be limited as much as possible, but may need to occur periodically. Construction or maintenance activities that are generally prohibited during 8:30 PM and 7:00 AM include pile driving/removal, concrete pavement demolition, pavement sawing, concrete crushing operations and jack-hammering. However, there will be times when noise producing operations will have to occur at night because of the need for pavement to cure or be sawed, or lanes closures that allow access to work areas.

Chapter 5: Conclusions and Recommendations

Summary of Noise Model Results

Reconstruction of the I-35W Minnesota River Bridge will result in an increase in traffic noise levels compared to existing conditions. Daytime L_{10} modeled noise levels are predicted to range

[4] Source: United States Environmental Protection Agency and Federal Highway Administration

between 59.9 dBA and 77.7 dBA under 2040 build conditions. Daytime L_{50} modeled noise levels are predicted to range between 57.9 dBA and 74.7 dBA under 2040 build conditions. Modeled traffic noise levels are predicted to exceed the state daytime L_{10} noise standards at 141 of the 164 receptor locations. Modeled traffic noise levels are predicted to exceed the state daytime L_{50} noise standards at 141 of the 164 receptor locations. Build nighttime L_{10} modeled noise levels are predicted to range between 59.1 dBA and 77.4 dBA. Build nighttime L_{50} modeled noise levels are predicted to range between 56.7 dBA and 74.0 dBA. Modeled traffic noise levels are predicted to exceed the state nighttime L_{10} noise standards at 162 of the 164 receptor locations. Modeled traffic noise levels are predicted to exceed the state nighttime L_{50} noise standards at 163 of the 164 receptor locations.

There are 52 of the 108 parcel receptors that approach or exceed the federal noise abatement criteria under the Build Alternative. and 50 of the 56 trail receptors are approaching or exceeding the federal noise abatement criteria. No receptors are expected to experience a substantial increase in noise.

The traffic noise analysis was based on a profile developed for the steel girder bridge type and for I-35W to be constructed at a minimum of two feet above the 100-year floodplain elevation south of the Minnesota River. The design-build contractor will be required to evaluate the noise impacts of their design and demonstrate that modeled noise levels do not exceed the levels that were modeled with the steel girder bridge and the I-35W preliminary design profile.

Proposed Noise Wall

Based upon the analysis completed following the guidelines and procedures laid out by the MnDOT Noise Policy, MnDOT intends to construct one noise wall with the proposed project. Noise Wall 5 is in the northeast quadrant of the I-35W/West 106th Street intersection. Noise Wall 5 has a preliminary cost per benefited receptor of $19,696. Noise Wall 5 is 20 feet tall, with a proposed length of 1,024 feet. There is a total of 20 benefited receptors with Noise Wall 5. **Figure 19, Appendix A** illustrates the location of proposed Noise Wall 5.

Statement of Likelihood

The traffic noise analysis for the proposed noise wall described above is based upon preliminary design studies completed to date. Final noise mitigation decisions will be subject to final design considerations and the viewpoint of benefited residents and property owners. Final noise mitigation decisions will be identified in MnDOT's Findings of Fact and Conclusion (FOF&C) document, to be prepared and released following the EA/EAW public comment period.

If conditions substantially change by the time the project reaches the final design stage, noise abatement measures may not be provided. If the final plan changes substantially, receptors that would have received benefits from noise walls, along with local officials, will be notified of plans to eliminate or substantially modify a noise abatement measure prior to the final design process. This notification will explain any changes in site conditions (if any), additional site information, any design changes implemented during the final design process, and explanation of noise wall feasibility and reasonableness. A final decision regarding installation of the proposed abatement measure will be made upon completion of the project's final design and the public involvement process.

Appendix A

Existing Model Validation and Figures

Table 9: Existing Model Validation

Site Number	Field Measured Value (L_{10})			Modeled	Difference	Validated
	Day 1	Day 2	Average			
1	76.9	76.1	76.50	75.9	0.6	Yes
2	60.0	56.3	58.15	60.9	-2.75	Yes
3	64.0	63.6	63.80	65.6	-1.8	Yes
4	70.3	70.2	70.25	68.8	1.45	Yes
5	64.5	61.4	62.95	64.2	-1.25	Yes

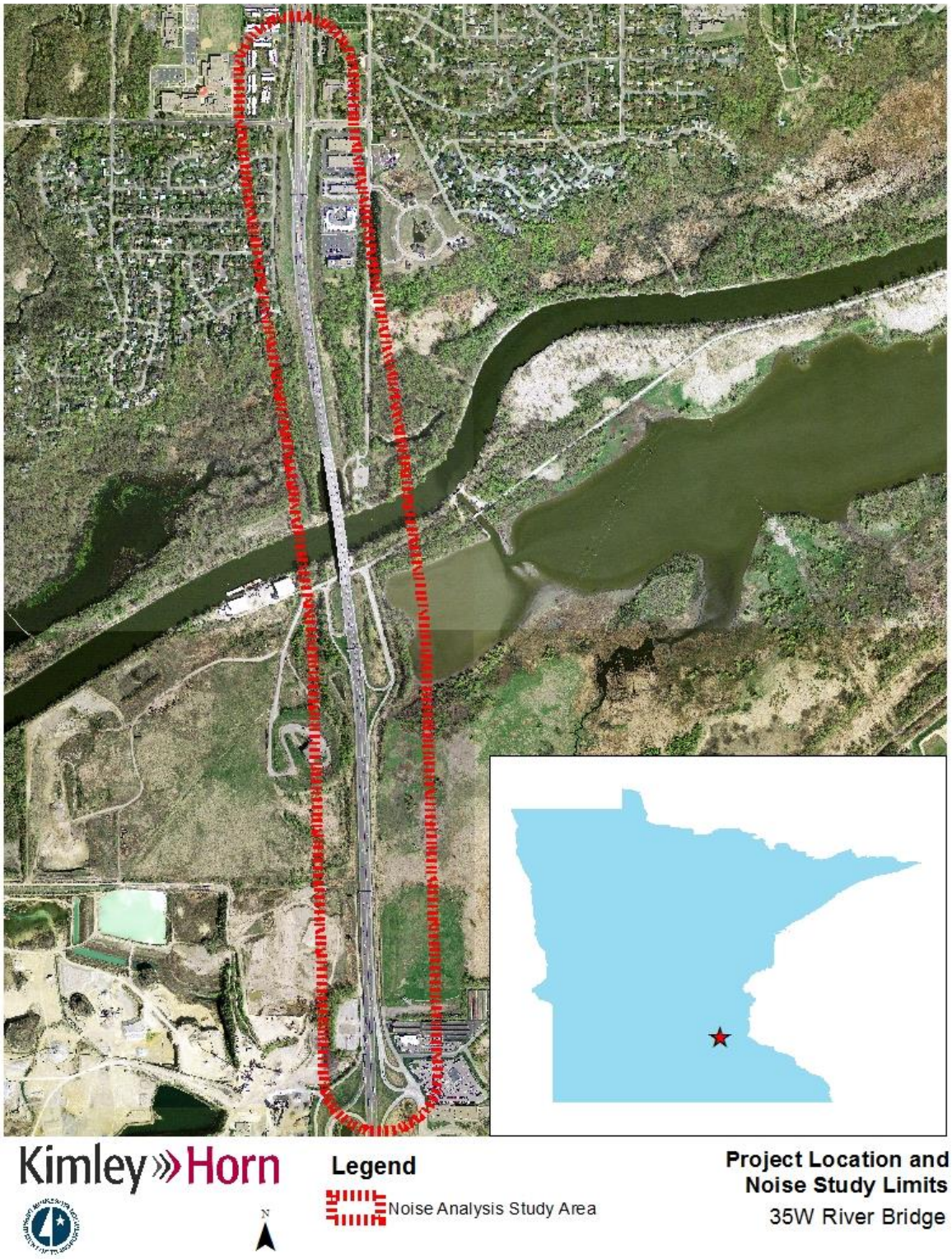


Figure 1: Project Location and Noise Study Limits

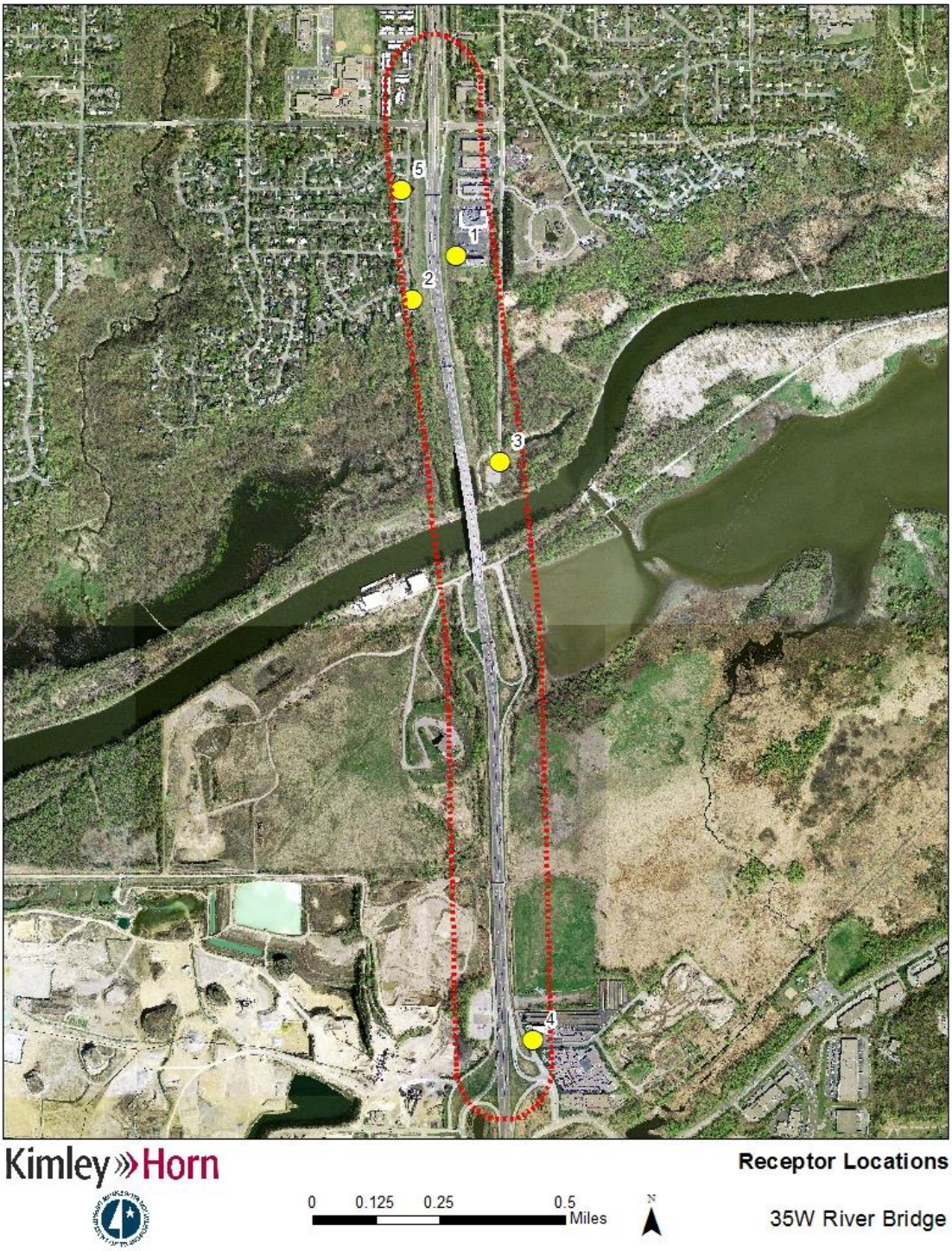


Figure 2: Existing Measurement Locations

Figure 3: NSA A Location Map

Figure 4: NSA B Location Map

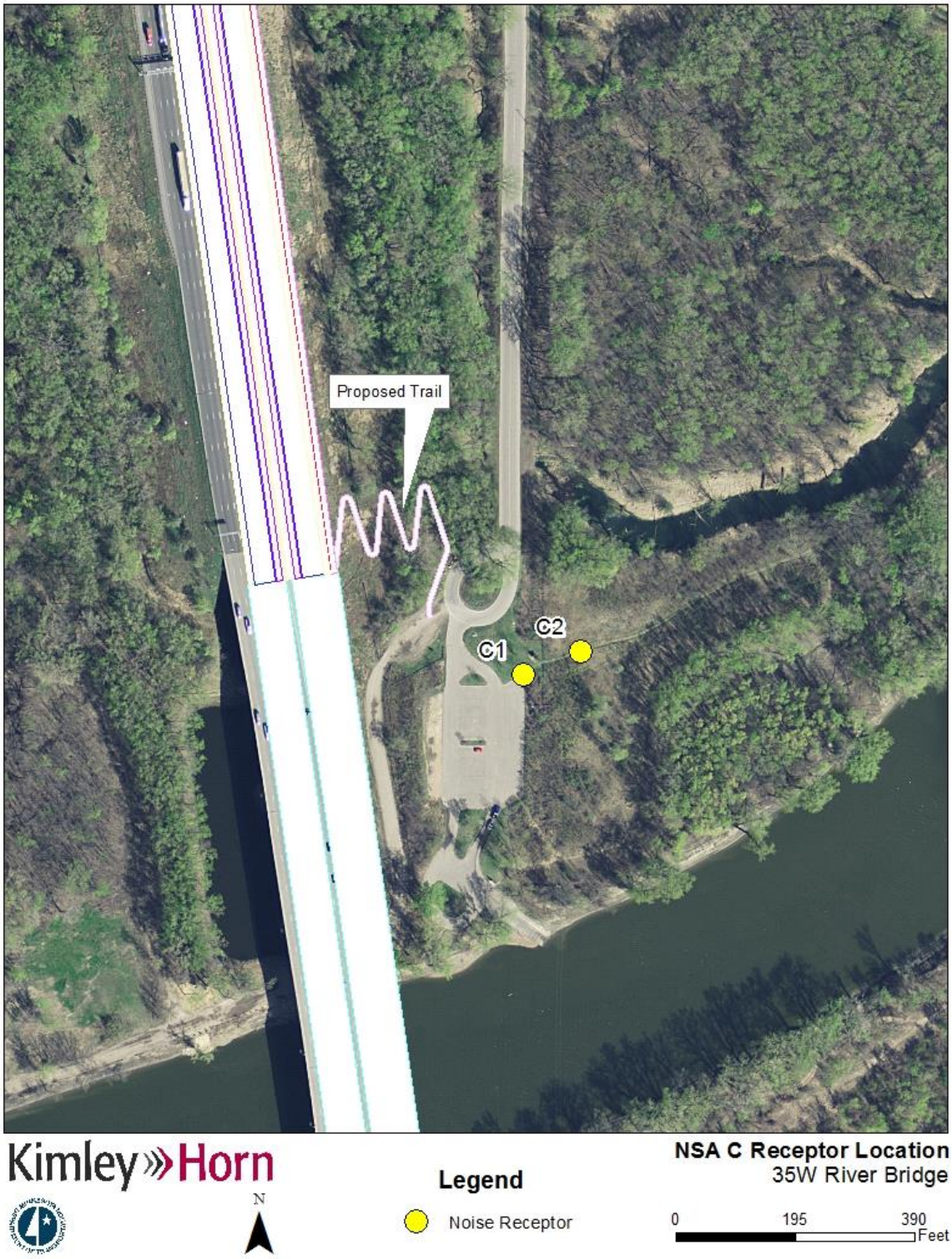


Figure 5: NSA C Location Map

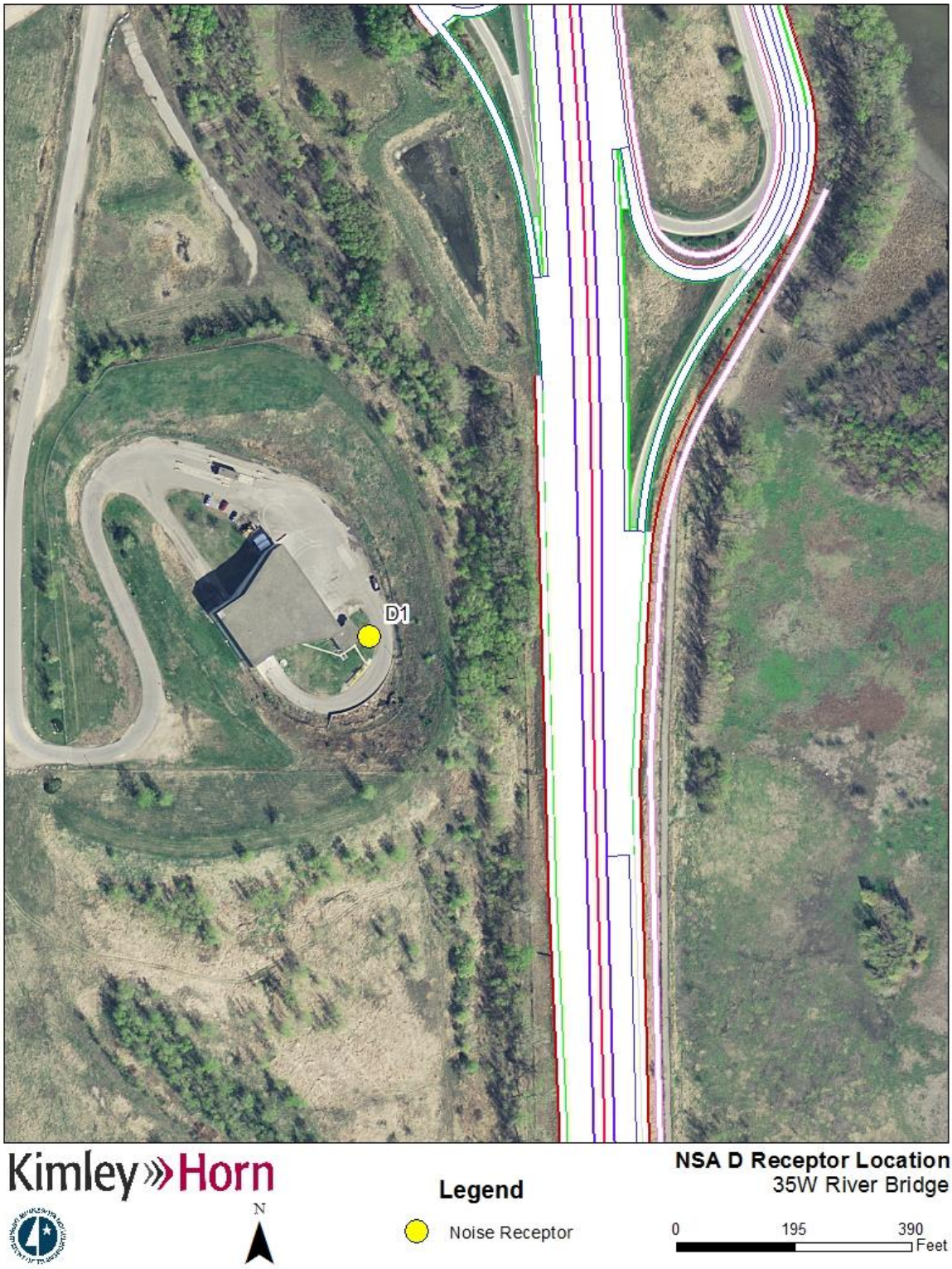


Figure 6: NSA D Location Map

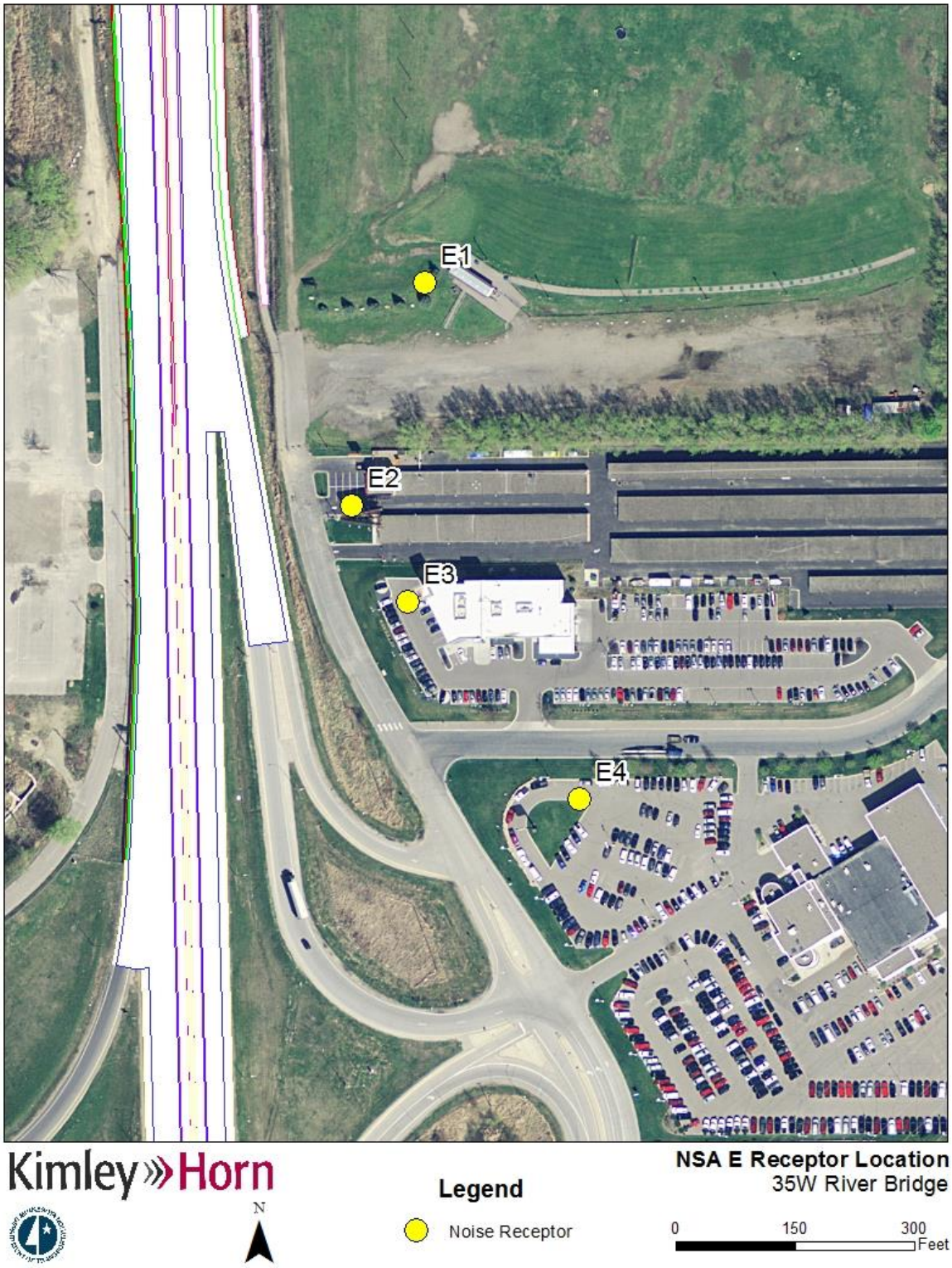


Figure 7: NSA E Location Map

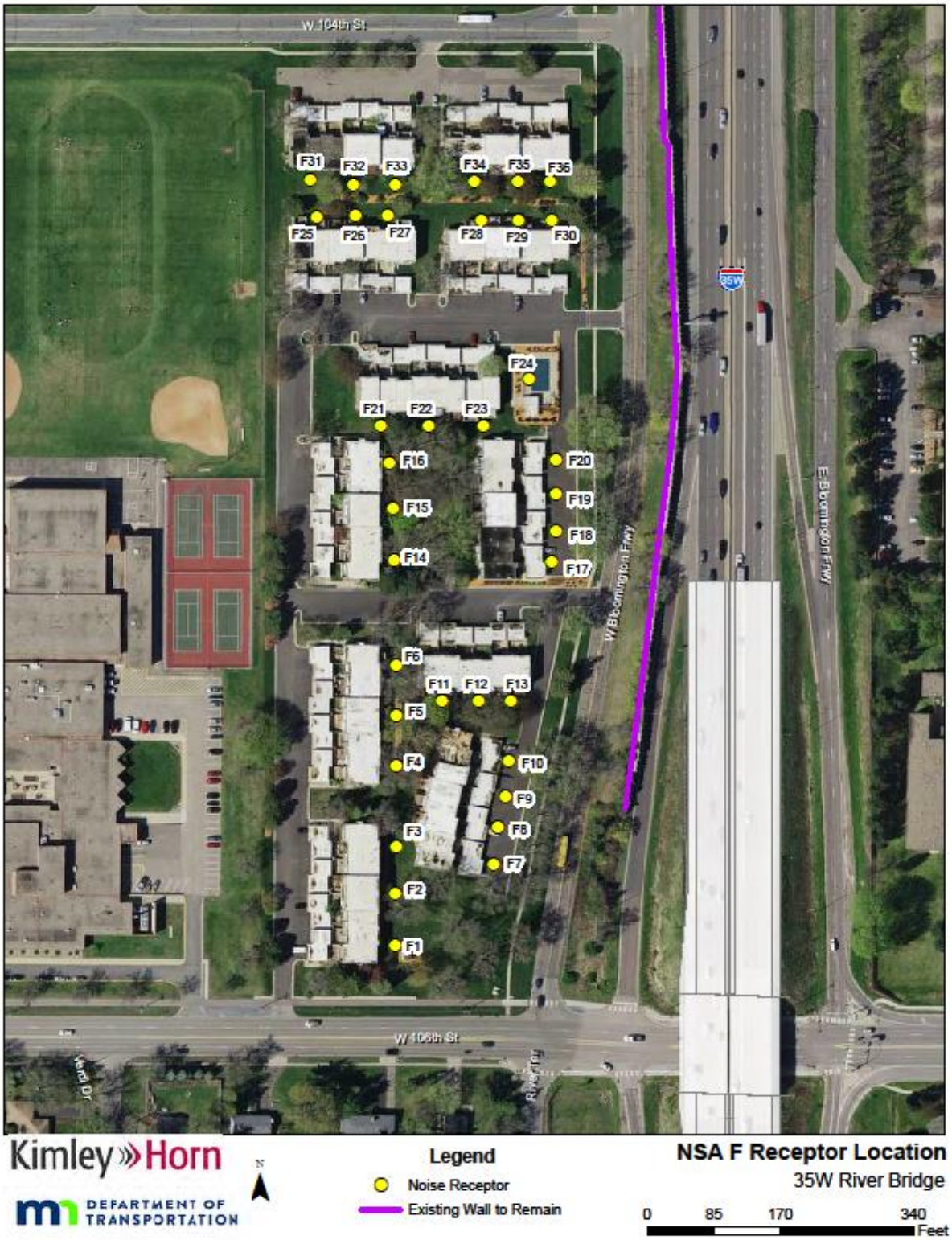


Figure 8: NSA F Location Map

Figure 9: NSA G Location Map

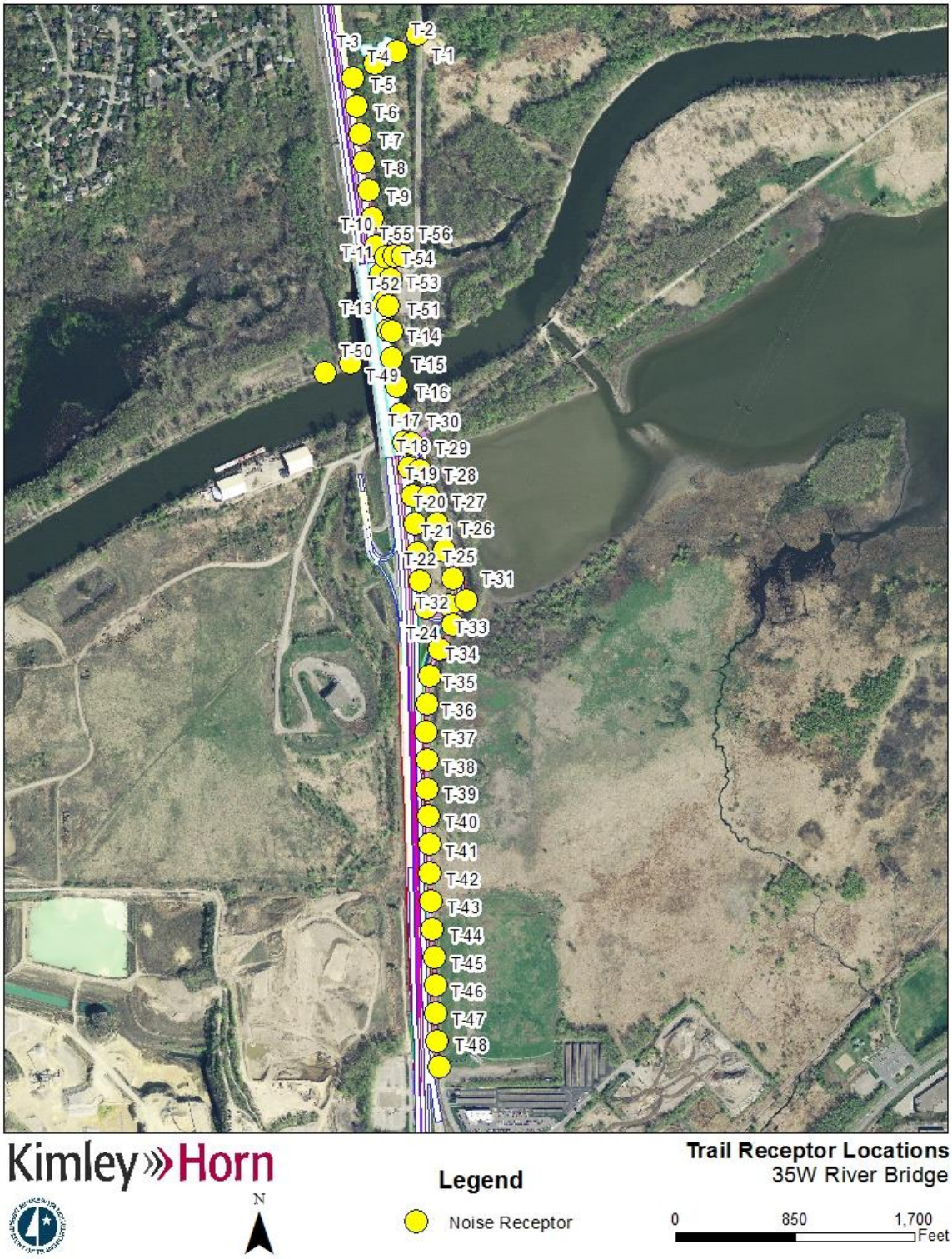


Figure 10: Trail Receptor Location Map

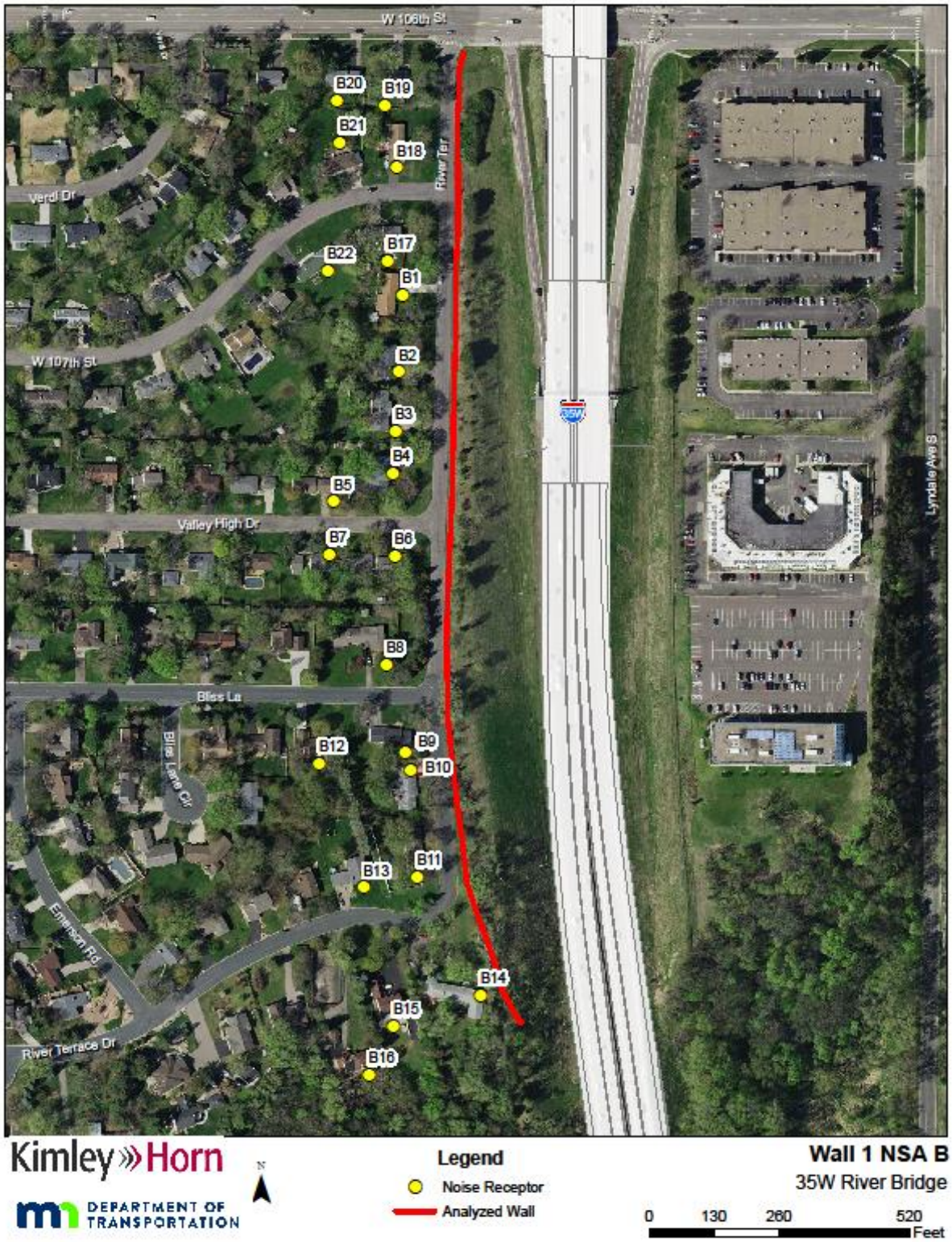


Figure 11: Wall 1 Location Map

Figure 12: Wall 2 Location Map

Figure 13: Northern Trail Wall Location Map

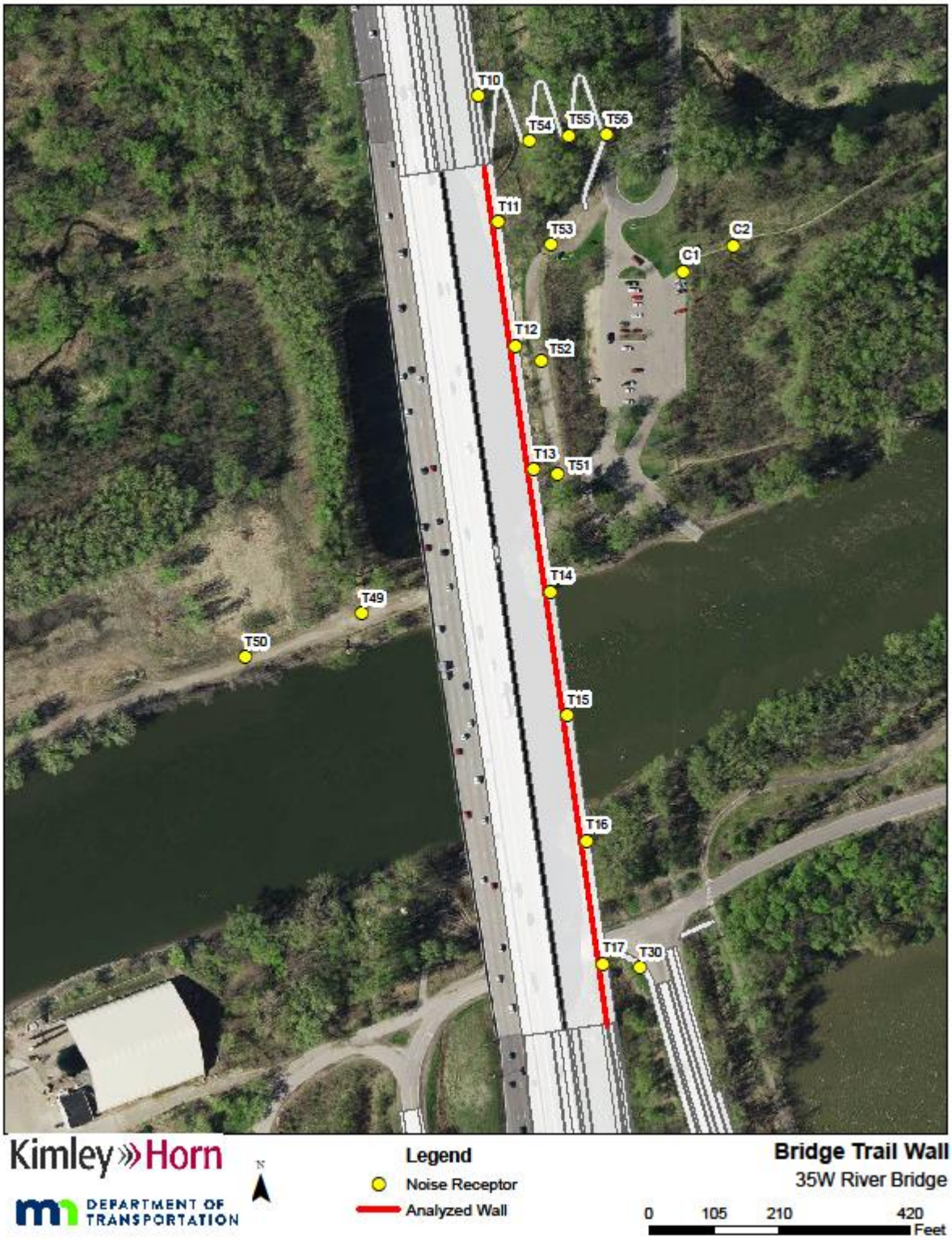


Figure 14: Bridge Trail Wall Location Map

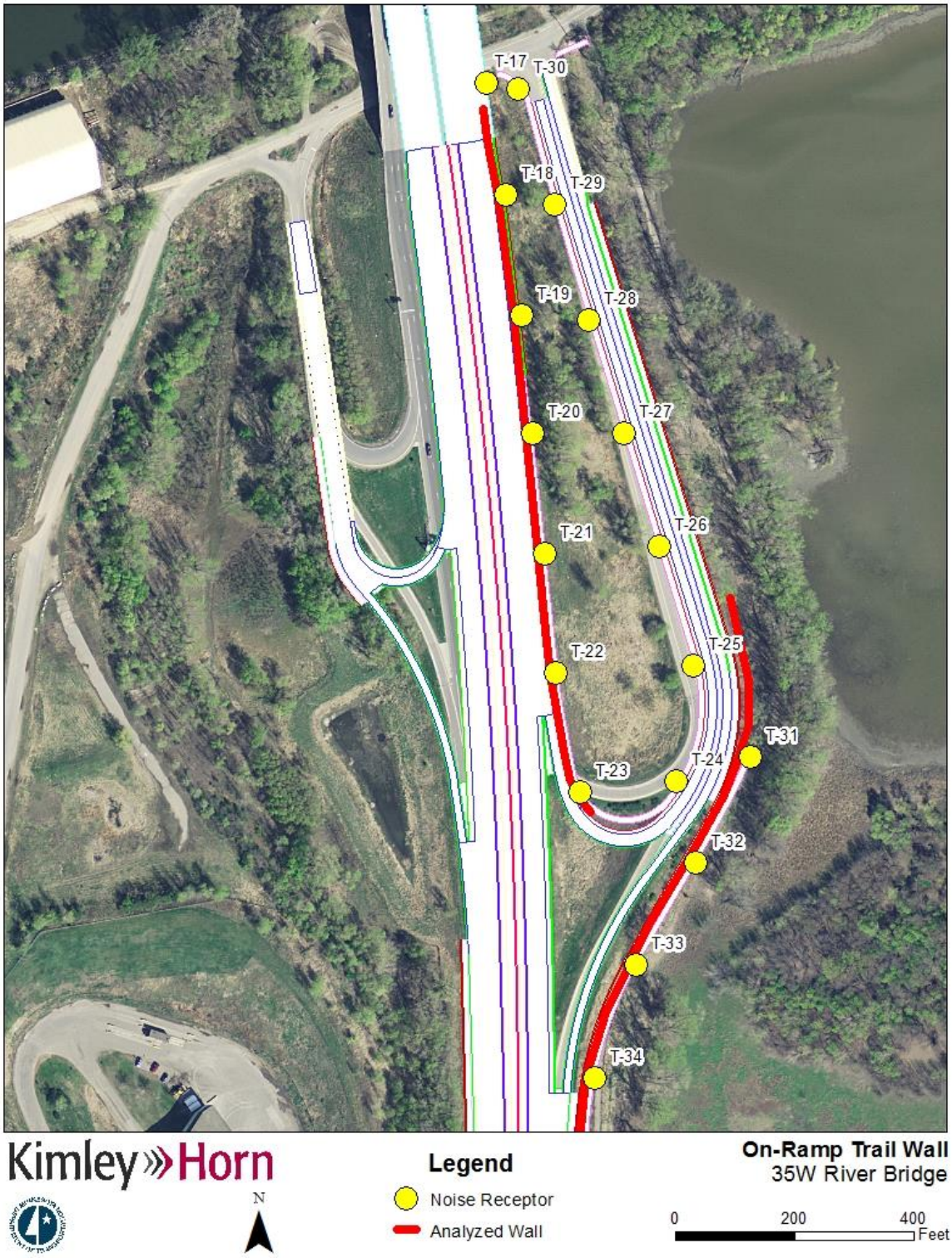


Figure 15: Southern Trail Wall 1 Location Map (Black Dog Road Entrance Ramp)

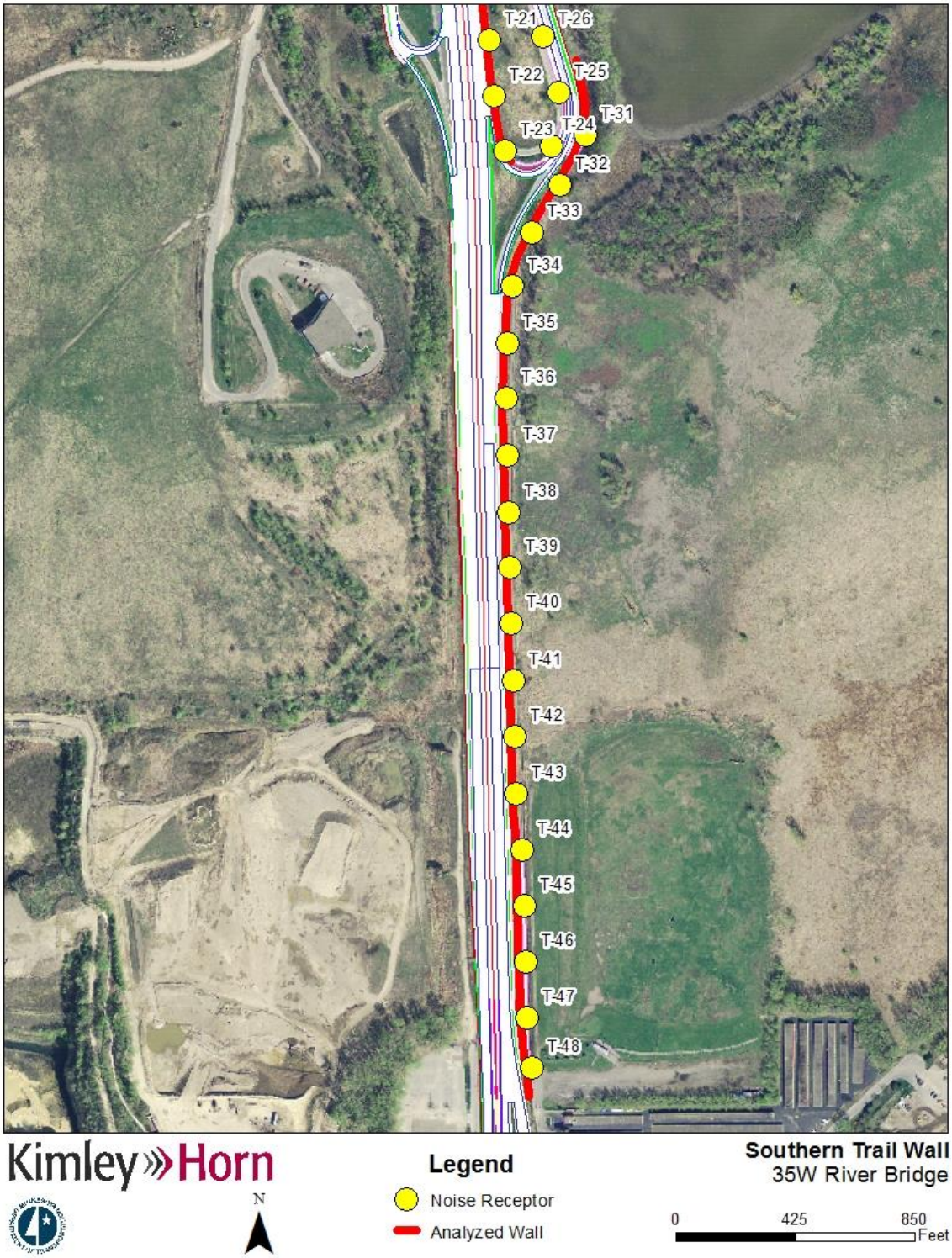


Figure 16: Southern Trail Wall 2 Location Map (Black Dog Road to Cliff Road)

Figure 17: Wall 3 Location Map

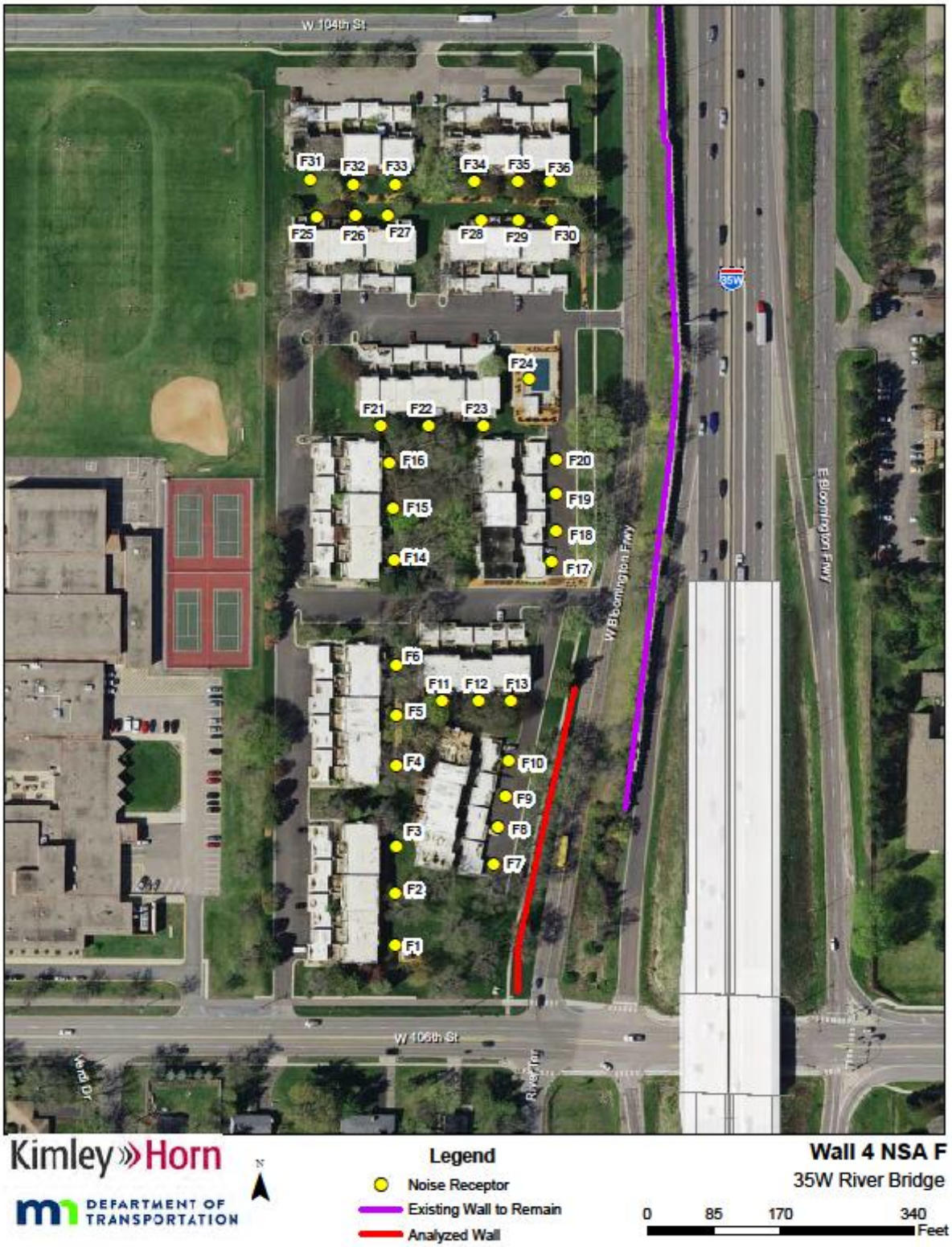


Figure 18: Wall 4 Location Map

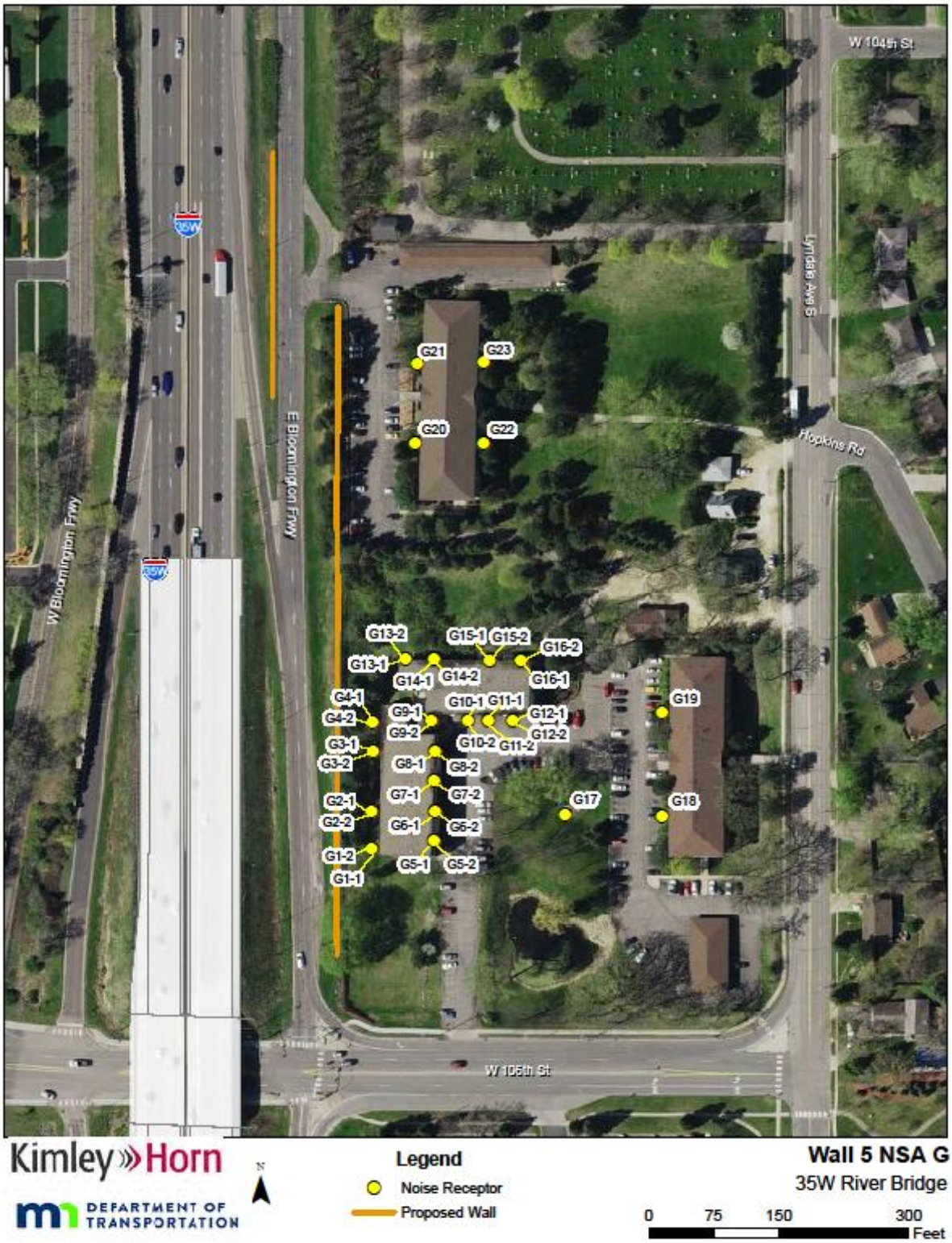


Figure 19: Wall 5 Location Map

Appendix B

Noise Wall Cost Effectiveness Results

Table B1: Wall 1 Daytime 20 Foot Wall Cost Calculation

	Receptors	Daytime L_{10} Noise Level (dBA)		Reduction (in dBA) with noise wall	Number of benefited establishments	Design goal reduction ≥ 7 dBA	Length of Wall (ft)	Wall Area (sq ft)	Total cost of wall $20/sq ft	Cost/ Benefited Receptor
		Build year 2040 (no wall)	Build year 2040 (with noise wall)							
	No wall vs 20-foot wall									
Daytime	**B1**	70.5	65.4	5.1	**1**	0	1,960	38,416	$768,320	$85,369
	B2	70.3	64.2	6.1	**1**	0				
	B3	70.3	63.7	6.6	**1**	0				
	B4	68.8	62.7	6.1	**1**	0				
	B5	66.1	62.4	3.7	0	0				
	B6	68.3	61.9	6.4	**1**	0				
	B7	65.7	61.9	3.8	0	0				
	B8	66.7	61.1	5.6	**1**	0				
	B9	69.2	61.9	7.3	**1**	**1**				
	B10	67.3	59.9	7.4	**1**	**1**				
	B11	64.9	61.4	3.5	0	0				
	B12	63.8	61.2	2.6	0	0				
	B13	64.7	63.4	1.3	0	0				
	B14	72.9	67.1	5.8	**1**	0				
	B15	68.7	68.2	0.5	0	0				
	B16	68.6	68.3	0.3	0	0				
	B17	71.9	68.2	3.7	0	0				
	B18	73.2	69.7	3.5	0	0				
	B19	72.8	71.4	1.4	0	0				
	B20	70.8	70.1	0.7	0	0				
	B21	70.8	69.6	1.2	0	0				
	B22	69.0	66.7	2.3	0	0				

Table B2: Wall 1 Nighttime 20 Foot Wall Cost Calculation

	Receptors	Nighttime L_{10} Noise Level (dBA)		Reduction (in dBA) with noise wall	Number of benefited establishments	Design goal reduction ≥ 7 dBA	Length of Wall (ft)	Wall Area (sq ft)	Total cost of wall $20/sq ft	Cost/ Benefited Receptor
		Build year 2040 (no wall)	Build year 2040 (with noise wall)							
	No wall vs 20-foot wall									
Nighttime	**B1**	69.1	63.9	5.2	**1**	0	1,960	38,416	$768,320	$85,369
	B2	69.2	62.8	6.4	**1**	0				
	B3	69.4	62.3	7.1	**1**	**1**				
	B4	67.5	61.3	6.2	**1**	0				
	B5	64.8	61.0	3.8	0	0				
	B6	67.1	60.5	6.6	**1**	0				
	B7	64.4	60.5	3.9	0	0				
	B8	65.6	59.7	5.9	**1**	0				
	B9	68.3	60.4	7.9	**1**	**1**				
	B10	66.1	58.3	7.8	**1**	**1**				
	B11	63.4	59.6	3.8	0	0				
	B12	62.6	59.6	3.0	0	0				
	B13	63.2	61.8	1.4	0	0				
	B14	71.4	65.4	6.0	**1**	0				
	B15	67.2	66.6	0.6	0	0				
	B16	67.1	66.7	0.4	0	0				
	B17	70.4	66.7	3.7	0	0				
	B18	71.6	68.2	3.4	0	0				
	B19	71.2	69.9	1.3	0	0				
	B20	69.4	68.7	0.7	0	0				
	B21	69.3	68.1	1.2	0	0				
	B22	67.6	65.3	2.3	0	0				

Table B3: Wall 1 Daytime 18 Foot Wall Cost Calculation

	Receptors	Daytime L_{10} Noise Level (dBA)		Reduction (in dBA) with noise wall	Number of benefited establishments	Design goal reduction ≥ 7 dBA	Length of Wall (ft)	Wall Area (sq ft)	Total cost of wall $20/sq ft	Cost/ Benefited Receptor
		Build year 2040 (no wall)	Build year 2040 (with noise wall)							
	No wall vs 18-foot wall									
Daytime	**B1**	70.5	66.2	4.3	0	0	1,960	34,680	$693,600	$86,700
	B2	70.3	65.0	5.3	**1**	0				
	B3	70.3	64.5	5.8	**1**	0				
	B4	68.8	63.4	5.4	**1**	0				
	B5	66.1	62.9	3.2	0	0				
	B6	68.3	62.6	5.7	**1**	0				
	B7	65.7	62.4	3.3	0	0				
	B8	66.7	61.7	5.0	**1**	0				
	B9	69.2	62.6	6.6	**1**	0				
	B10	67.3	60.3	7.0	**1**	**1**				
	B11	64.9	61.6	3.3	0	0				
	B12	63.8	61.4	2.4	0	0				
	B13	64.7	63.5	1.2	0	0				
	B14	72.9	67.4	5.5	**1**	0				
	B15	68.7	68.2	0.5	0	0				
	B16	68.6	68.3	0.3	0	0				
	B17	71.9	69.0	2.9	0	0				
	B18	73.2	70.7	2.5	0	0				
	B19	72.8	71.9	0.9	0	0				
	B20	70.8	70.3	0.5	0	0				
	B21	70.8	70.0	0.8	0	0				
	B22	69.0	67.3	1.7	0	0				

Table B4: Wall 1 Nighttime 18 Foot Wall Cost Calculation

	Receptors	Nighttime L_{10} Noise Level (dBA)		Reduction (in dBA) with noise wall	Number of benefited establishments	Design goal reduction ≥ 7 dBA	Length of Wall (ft)	Wall Area (sq ft)	Total cost of wall $20/sq ft	Cost/ Benefited Receptor
		Build year 2040 (no wall)	Build year 2040 (with noise wall)							
	No wall vs 18-foot wall									
Nighttime	**B1**	69.1	64.7	4.4	0	0	1,960	34,680	$693,600	$86,700
	B2	69.2	63.5	5.7	**1**	0				
	B3	69.4	63.0	6.4	**1**	0				
	B4	67.5	62.0	5.5	**1**	0				
	B5	64.8	61.6	3.2	0	0				
	B6	67.1	61.2	5.9	**1**	0				
	B7	64.4	61.0	3.4	0	0				
	B8	65.6	60.3	5.3	**1**	0				
	B9	68.3	61.1	7.2	**1**	**1**				
	B10	66.1	58.7	7.4	**1**	**1**				
	B11	63.4	59.9	3.5	0	0				
	B12	62.6	59.9	2.7	0	0				
	B13	63.2	61.9	1.3	0	0				
	B14	71.4	65.7	5.7	1	0				
	B15	67.2	66.6	0.6	0	0				
	B16	67.1	66.7	0.4	0	0				
	B17	70.4	67.5	2.9	0	0				
	B18	71.6	69.2	2.4	0	0				
	B19	71.2	70.4	0.8	0	0				
	B20	69.4	69.0	0.4	0	0				
	B21	69.3	68.5	0.8	0	0				
	B22	67.6	65.9	1.7	0	0				

Table B5: Wall 1 Daytime 15 Foot Wall Cost Calculation

	Receptors	Daytime L_{10} Noise Level (dBA)		Reduction (in dBA) with noise wall	Number of benefited establishments	Design goal reduction ≥ 7 dBA	Length of Wall (ft)	Wall Area (sq ft)	Total cost of wall $20/sq ft	Cost/ Benefited Receptor
		Build year 2040 (no wall)	Build year 2040 (with noise wall)							
	No wall vs 15-foot wall									
Daytime	**B1**	70.5	67.6	2.9	0	0	1,960	29,040	$580,800	N/A
	B2	70.3	66.2	4.1	0	0				
	B3	70.3	65.7	4.6	0	0				
	B4	68.8	64.5	4.3	0	0				
	B5	66.1	63.7	2.4	0	0				
	B6	68.3	63.8	4.5	0	0				
	B7	65.7	63.2	2.5	0	0				
	B8	66.7	62.7	4.0	0	0				
	B9	69.2	63.8	5.4	**1**	0				
	B10	67.3	61.2	6.1	**1**	0				
	B11	64.9	62.1	2.8	0	0				
	B12	63.8	61.9	1.9	0	0				
	B13	64.7	63.6	1.1	0	0				
	B14	72.9	67.3	5.6	**1**	0				
	B15	68.7	68.3	0.4	0	0				
	B16	68.6	68.3	0.3	0	0				
	B17	71.9	70.2	1.7	0	0				
	B18	73.2	72.0	1.2	0	0				
	B19	72.8	72.5	0.3	0	0				
	B20	70.8	70.6	0.2	0	0				
	B21	70.8	70.4	0.4	0	0				
	B22	69.0	68.0	1.0	0	0				

Table B6: Wall 1 Nighttime 15 Foot Wall Cost Calculation

	Receptors	Nighttime L_{10} Noise Level (dBA)		Reduction (in dBA) with noise wall	Number of benefited establishments	Design goal reduction ≥ 7 dBA	Length of Wall (ft)	Wall Area (sq ft)	Total cost of wall $20/sq ft	Cost/ Benefited Receptor
		Build year 2040 (no wall)	Build year 2040 (with noise wall)							
	No wall vs 15-foot wall									
Nighttime	**B1**	69.1	66.0	3.1	0	0	1,960	29,040	$580,800	N/A
	B2	69.2	64.8	4.4	0	0				
	B3	69.4	64.3	5.1	**1**	0				
	B4	67.5	63.1	4.4	0	0				
	B5	64.8	62.4	2.4	0	0				
	B6	67.1	62.4	4.7	0	0				
	B7	64.4	61.8	2.6	0	0				
	B8	65.6	61.3	4.3	0	0				
	B9	68.3	62.3	6.0	**1**	0				
	B10	66.1	59.6	6.5	**1**	0				
	B11	63.4	60.1	3.3	0	0				
	B12	62.6	60.3	2.3	0	0				
	B13	63.2	62.0	1.2	0	0				
	B14	71.4	65.5	5.9	**1**	0				
	B15	67.2	66.6	0.6	0	0				
	B16	67.1	66.7	0.4	0	0				
	B17	70.4	68.7	1.7	0	0				
	B18	71.6	70.4	1.2	0	0				
	B19	71.2	70.9	0.3	0	0				
	B20	69.4	69.2	0.2	0	0				
	B21	69.3	68.9	0.4	0	0				
	B22	67.6	66.6	1.0	0	0				

Table B7: Wall 2 Daytime 20 Foot Wall Cost Calculation

	Receptors	Daytime L_{10} Noise Level (dBA)		Reduction (in dBA) with noise wall	Number of benefited establishments	Design goal reduction ≥ 7 dBA	Length of Wall (ft)	Wall Area (sq ft)	Total cost of wall $20/sq ft	Cost/ Benefited Receptor
		Build year 2040 (no wall)	Build year 2040 (with noise wall)							
Daytime	**No wall vs. 20-foot wall**									
	A1	72.5	62.8	9.7	**1**	**1**	1,445	28,116	$562,320	$187,440
	A2	73.7	64.3	9.4	**1**	**1**				
	A3	76.3	64.9	11.4	**1**	**1**				
	A4	77.3	72.7	4.6	0	0				

Table B8: Wall 2 Nighttime 20 Foot Wall Cost Calculation

	Receptors	Nighttime L_{10} Noise Level (dBA)		Reduction (in dBA) with noise wall	Number of benefited establishments	Design goal reduction ≥ 7 dBA	Length of Wall (ft)	Wall Area (sq ft)	Total cost of wall $20/sq ft	Cost/ Benefited Receptor
		Build year 2040 (no wall)	Build year 2040 (with noise wall)							
Nighttime	**No wall vs. 20-foot wall**									
	A1	71.6	62.0	9.6	**1**	**1**	1,445	28,116	$562,320	$187,440
	A2	72.9	63.4	9.5	**1**	**1**				
	A3	75.8	64.0	11.8	**1**	**1**				
	A4	76.7	72.0	4.7	0	0				

Table B9: Wall 2 Daytime 18 Foot Wall Cost Calculation

	Receptors	Daytime L_{10} Noise Level (dBA)		Reduction (in dBA) with noise wall	Number of benefited establishments	Design goal reduction ≥ 7 dBA	Length of Wall (ft)	Wall Area (sq ft)	Total cost of wall $20/sq ft	Cost/ Benefited Receptor
		Build year 2040 (no wall)	Build year 2040 (with noise wall)							
Daytime	**No wall vs. 18-foot wall**									
	A1	72.5	63.3	9.2	**1**	**1**	1,445	25,410	$508,200	$169,400
	A2	73.7	65.1	8.6	**1**	**1**				
	A3	76.3	65.8	10.5	**1**	**1**				
	A4	77.3	72.8	4.5	0	0				

Table B10: Wall 2 Nighttime 18 Foot Wall Cost Calculation

	Receptors	Nighttime L_{10} Noise Level (dBA)		Reduction (in dBA) with noise wall	Number of benefited establishments	Design goal reduction ≥ 7 dBA	Length of Wall (ft)	Wall Area (sq ft)	Total cost of wall $20/sq ft	Cost/ Benefited Receptor
		Build year 2040 (no wall)	Build year 2040 (with noise wall)							
Nighttime	**No wall vs. 18-foot wall**									
	A1	71.6	62.4	9.2	**1**	**1**	1,445	25,410	$508,200	$169,400
	A2	72.9	64.1	8.8	**1**	**1**				
	A3	75.8	64.9	10.9	**1**	**1**				
	A4	76.7	72.1	4.6	0	0				

Table B11: Wall 2 Daytime 15 Foot Wall Cost Calculation

	Receptors	Daytime L_{10} Noise Level (dBA)		Reduction (in dBA) with noise wall	Number of benefited establishments	Design goal reduction ≥ 7 dBA	Length of Wall (ft)	Wall Area (sq ft)	Total cost of wall $20/sq ft	Cost/ Benefited Receptor
		Build year 2040 (no wall)	Build year 2040 (with noise wall)							
Daytime	**No wall vs. 15-foot wall**									
	A1	72.5	64.2	8.3	**1**	**1**	1,445	21,315	$426,300	$142,100
	A2	73.7	66.4	7.3	**1**	**1**				
	A3	76.3	67.4	8.9	**1**	**1**				
	A4	77.3	73.5	3.8	0	0				

Table B12: Wall 2 Nighttime 15 Foot Wall Cost Calculation

	Receptors	Nighttime L_{10} Noise Level (dBA)		Reduction (in dBA) with noise wall	Number of benefited establishments	Design goal reduction ≥ 7 dBA	Length of Wall (ft)	Wall Area (sq ft)	Total cost of wall $20/sq ft	Cost/ Benefited Receptor
		Build year 2040 (no wall)	Build year 2040 (with noise wall)							
Nighttime	**No wall vs. 15-foot wall**									
	A1	71.6	63.3	8.3	**1**	**1**	1,445	21,315	$426,300	$142,100
	A2	72.9	65.5	7.4	**1**	**1**				
	A3	75.8	66.5	9.3	**1**	**1**				
	A4	76.7	72.4	4.3	0	0				

Table B13: Wall 2 Daytime 12 Foot Wall Cost Calculation

	Receptors	Daytime L_{10} Noise Level (dBA)		Reduction (in dBA) with noise wall	Number of benefited establishments	Design goal reduction ≥ 7 dBA	Length of Wall (ft)	Wall Area (sq ft)	Total cost of wall $20/sq ft	Cost/ Benefited Receptor
		Build year 2040 (no wall)	Build year 2040 (with noise wall)							
Daytime	**No wall vs. 12-foot wall**									
	A1	72.5	65.3	7.2	**1**	**1**	1,445	17,340	$346,800	$115,600
	A2	73.7	68.0	5.7	**1**	0				
	A3	76.3	69.4	6.9	**1**	0				
	A4	77.3	73.6	3.7	0	0				

Table B14: Wall 2 Nighttime 12 Foot Wall Cost Calculation

	Receptors	Nighttime L_{10} Noise Level (dBA)		Reduction (in dBA) with noise wall	Number of benefited establishments	Design goal reduction ≥ 7 dBA	Length of Wall (ft)	Wall Area (sq ft)	Total cost of wall $20/sq ft	Cost/ Benefited Receptor
		Build year 2040 (no wall)	Build year 2040 (with noise wall)							
Nighttime	**No wall vs. 12-foot wall**									
	A1	71.6	64.4	7.2	**1**	**1**	1,445	17,340	$346,800	$115,600
	A2	72.9	67.1	5.8	**1**	0				
	A3	75.8	68.6	7.2	**1**	**1**				
	A4	76.7	72.8	3.9	0	0				

Table B15: Wall 2 Daytime 10 Foot Wall Cost Calculation

	Receptors	Daytime L_{10} Noise Level (dBA)		Reduction (in dBA) with noise wall	Number of benefited establishments	Design goal reduction ≥ 7 dBA	Length of Wall (ft)	Wall Area (sq ft)	Total cost of wall $20/sq ft	Cost/ Benefited Receptor
		Build year 2040 (no wall)	Build year 2040 (with noise wall)							
Daytime	**No wall vs. 10-foot wall**									
	A1	72.5	66.1	6.4	**1**	0	1,445	14,450	$289,000	N/A
	A2	73.7	69.2	4.5	0	0				
	A3	76.3	71.0	5.3	**1**	0				
	A4	77.3	74.4	2.9	0	0				

Table B16: Wall 2 Nighttime 10 Foot Wall Cost Calculation

	Receptors	Nighttime L_{10} Noise Level (dBA)		Reduction (in dBA) with noise wall	Number of benefited establishments	Design goal reduction ≥ 7 dBA	Length of Wall (ft)	Wall Area (sq ft)	Total cost of wall $20/sq ft	Cost/ Benefited Receptor
		Build year 2040 (no wall)	Build year 2040 (with noise wall)							
Nighttime	**No wall vs. 10-foot wall**									
	A1	71.6	65.3	6.3	**1**	0	1,445	14,450	$289,000	N/A
	A2	72.9	68.3	4.6	0	0				
	A3	75.8	70.2	5.6	**1**	0				
	A4	76.7	73.4	3.3	0	0				

Table B17: Northern Trail Wall Daytime 20 Foot Wall Cost Calculation

	Receptors	Daytime L_{10} Noise Level (dBA)		Reduction (in dBA) with noise wall	Number of benefited establishments	Design goal reduction ≥ 7 dBA	Length of Wall (ft)	Wall Area (sq ft)	Total cost of wall $20/sq ft	Cost/ Benefited Receptor
		Build year 2040 (no wall)	Build year 2040 (with noise wall)							
	No wall vs 20-foot wall									
Daytime	**T1**	68.6	67.7	0.9	0	0	1,370	26,616	$697,320	$99,617
	T2	70.9	69.7	1.2	0	0				
	T3	74.0	72.8	1.2	0	0				
	T4	79.5	72.5	7.0	**1**	**1**				
	T5	82.6	68.9	13.7	**1**	**1**				
	T6	82.3	68.7	13.6	**1**	**1**				
	T7	81.4	68.4	13.0	**1**	**1**				
	T8	81.7	68.2	13.5	**1**	**1**				
	T9	81.5	68.2	13.3	**1**	**1**				
	T10	80.6	69.6	11.0	**1**	**1**				
	T54	75.6	74.3	1.3	0	0				
	T55	73.1	71.7	1.4	0	0				
	T56	71.2	69.8	1.4	0	0				

A trail alignment shift is needed to provide space to accommodate the modeled noise wall behind the highway shoulder. The trail alignment shift moves the retaining wall down the east embankment and requires additional retaining wall height. The additional retaining wall height increases the cost estimate of the retaining wall by $165,000. The total cost of the noise wall includes the additional $165,000 retaining wall costs.

Table B18: Northern Trail Wall Nighttime 20 Foot Wall Cost Calculation

	Receptors	Nighttime L_{10} Noise Level (dBA)		Reduction (in dBA) with noise wall	Number of benefited establishments	Design goal reduction ≥ 7 dBA	Length of Wall (ft)	Wall Area (sq ft)	Total cost of wall $20/sq ft	Cost/ Benefited Receptor
		Build year 2040 (no wall)	Build year 2040 (with noise wall)							
	No wall vs 20-foot wall									
Nighttime	**T1**	67.7	66.8	0.9	0	0	1,370	26,616	$697,320	$99,617
	T2	70.1	68.9	1.2	0	0				
	T3	73.5	72.1	1.4	0	0				
	T4	79.1	72.2	6.9	**1**	0				
	T5	82.3	68.6	13.7	**1**	**1**				
	T6	81.8	68.3	13.5	**1**	**1**				
	T7	80.8	68.1	12.7	**1**	**1**				
	T8	81.1	67.8	13.3	**1**	**1**				
	T9	80.9	67.8	13.1	**1**	**1**				
	T10	80.1	69.3	10.8	**1**	**1**				
	T54	75.4	74.1	1.3	0	0				
	T55	72.7	71.2	1.5	0	0				
	T56	70.8	69.3	1.5	0	0				

A trail alignment shift is needed to provide space to accommodate the modeled noise wall behind the highway shoulder. The trail alignment shift moves the retaining wall down the east embankment and requires additional retaining wall height. The additional retaining wall height increases the cost estimate of the retaining wall by $165,000. The total cost of the noise wall includes the additional $165,000 retaining wall costs.

Table B19: Northern Trail Wall Daytime 11 Foot Wall Cost Calculation

	Receptors	Daytime L_{10} Noise Level (dBA)		Reduction (in dBA) with noise wall	Number of benefited establishments	Design goal reduction ≥ 7 dBA	Length of Wall (ft)	Wall Area (sq ft)	Total cost of wall $20/sq ft	Cost/ Benefited Receptor
		Build year 2040 (no wall)	Build year 2040 (with noise wall)							
	No wall vs 11-foot wall									
Daytime	**T1**	68.6	68.2	0.4	0	0	1,370	15,070	$466,400	$66,629
	T2	70.9	70.1	0.8	0	0				
	T3	74.0	73.0	1.0	0	0				
	T4	79.5	73.1	6.4	**1**	**1**				
	T5	82.6	75.1	7.5	**1**	**1**				
	T6	82.3	75.0	7.3	**1**	**1**				
	T7	81.4	74.0	7.4	**1**	**1**				
	T8	81.7	74.5	7.2	**1**	**1**				
	T9	81.5	74.2	7.3	**1**	**1**				
	T10	80.6	72.7	7.9	**1**	**1**				
	T54	75.6	74.7	0.9	0	0				
	T55	73.1	72.1	1.0	0	0				
	T56	71.2	70.2	1.0	0	0				

A trail alignment shift is needed to provide space to accommodate the modeled noise wall behind the highway shoulder. The trail alignment shift moves the retaining wall down the east embankment and requires additional retaining wall height. The additional retaining wall height increases the cost estimate of the retaining wall by $165,000. The total cost of the noise wall includes the additional $165,000 retaining wall costs.

Table B20: Northern Trail Wall Nighttime 11 Foot Wall Cost Calculation

	Receptors	Nighttime L_{10} Noise Level (dBA)		Reduction (in dBA) with noise wall	Number of benefited establishments	Design goal reduction ≥ 7 dBA	Length of Wall (ft)	Wall Area (sq ft)	Total cost of wall $20/sq ft	Cost/ Benefited Receptor
		Build year 2040 (no wall)	Build year 2040 (with noise wall)							
	No wall vs 11-foot wall									
Nighttime	**T1**	67.7	67.2	0.5	0	0	1,370	15,070	$466,400	$66,629
	T2	70.1	69.3	0.8	0	0				
	T3	73.5	72.4	1.1	0	0				
	T4	79.1	72.9	6.2	**1**	0				
	T5	82.3	74.8	7.5	**1**	**1**				
	T6	81.8	74.6	7.2	**1**	**1**				
	T7	80.8	73.6	7.2	**1**	**1**				
	T8	81.1	74	7.1	**1**	**1**				
	T9	80.9	73.7	7.2	**1**	**1**				
	T10	80.1	72.4	7.7	**1**	**1**				
	T54	75.4	74.4	1.0	0	0				
	T55	72.7	71.6	1.1	0	0				
	T56	70.8	69.7	1.1	0	0				

A trail alignment shift is needed to provide space to accommodate the modeled noise wall behind the highway shoulder. The trail alignment shift moves the retaining wall down the east embankment and requires additional retaining wall height. The additional retaining wall height increases the cost estimate of the retaining wall by $165,000. The total cost of the noise wall includes the additional $165,000 retaining wall costs.

Table B21: Northern Trail Wall Daytime 10 Foot Wall Cost Calculation

	Receptors	Daytime L_{10} Noise Level (dBA)		Reduction (in dBA) with noise wall	Number of benefited establishments	Design goal reduction ≥ 7 dBA	Length of Wall (ft)	Wall Area (sq ft)	Total cost of wall $20/sq ft	Cost/ Benefited Receptor
		Build year 2040 (no wall)	Build year 2040 (with noise wall)							
	No wall vs 10-foot wall									
Daytime	**T1**	68.6	68.3	0.3	0	0	1,370	13,700	$439,000	N/A
	T2	70.9	70.2	0.7	0	0				
	T3	74.0	73.1	0.9	0	0				
	T4	79.5	73.6	5.9	**1**	0				
	T5	82.6	76.4	6.2	**1**	0				
	T6	82.3	76.3	6.0	**1**	0				
	T7	81.4	75.2	6.2	**1**	0				
	T8	81.7	75.7	6.0	**1**	0				
	T9	81.5	75.4	6.1	**1**	0				
	T10	80.6	73.7	6.9	**1**	0				
	T54	75.6	74.7	0.9	0	0				
	T55	73.1	72.2	0.9	0	0				
	T56	71.2	70.3	0.9	0	0				

A trail alignment shift is needed to provide space to accommodate the modeled noise wall behind the highway shoulder. The trail alignment shift moves the retaining wall down the east embankment and requires additional retaining wall height. The additional retaining wall height increases the cost estimate of the retaining wall by $165,000. The total cost of the noise wall includes the additional $165,000 retaining wall costs.

Table B22: Northern Trail Wall Nighttime 10 Foot Wall Cost Calculation

	Receptors	Nighttime L_{10} Noise Level (dBA)		Reduction (in dBA) with noise wall	Number of benefited establishments	Design goal reduction ≥ 7 dBA	Length of Wall (ft)	Wall Area (sq ft)	Total cost of wall $20/sq ft	Cost/ Benefited Receptor
		Build year 2040 (no wall)	Build year 2040 (with noise wall)							
	No wall vs 10-foot wall									
Nighttime	**T1**	67.7	67.4	0.3	0	0	1,370	13,700	$439,000	N/A
	T2	70.1	69.5	0.6	0	0				
	T3	73.5	72.6	0.9	0	0				
	T4	79.1	73.4	5.7	**1**	0				
	T5	82.3	76.1	6.2	**1**	0				
	T6	81.8	75.9	5.9	**1**	0				
	T7	80.8	74.8	6.0	**1**	**1**				
	T8	81.1	75.2	5.9	**1**	0				
	T9	80.9	74.9	6.0	**1**	**1**				
	T10	80.1	73.3	6.8	**1**	**1**				
	T54	75.4	74.5	0.9	0	0				
	T55	72.7	71.7	1.0	0	0				
	T56	70.8	69.8	1.0	0	0				

A trail alignment shift is needed to provide space to accommodate the modeled noise wall behind the highway shoulder. The trail alignment shift moves the retaining wall down the east embankment and requires additional retaining wall height. The additional retaining wall height increases the cost estimate of the retaining wall by $165,000. The total cost of the noise wall includes the additional $165,000 retaining wall costs.

Table B23: Bridge Trail Wall Daytime 20 Foot Wall Cost Calculation

	Receptors	Daytime L_{10} Noise Level (dBA)		Reduction (in dBA) with noise wall	Number of benefited establishments	Design goal reduction ≥ 7 dBA	Length of Wall (ft)	Wall Area (sq ft)	Total cost of wall $136/sq ft	Cost/ Benefited Receptor
		Build year 2040 (no wall)	Build year 2040 (with noise wall)							
	No wall vs 20-foot wall									
Daytime	**T11**	82.5	80.5	2.0	0	0	1,450	29,000	$3,944,000	$788,800
	T12	80.2	71.8	8.4	**1**	**1**				
	T13	80.7	69.5	11.2	**1**	**1**				
	T14	80.8	69.1	11.7	**1**	**1**				
	T15	81.4	70.0	11.4	**1**	**1**				
	T16	81.3	73.6	7.7	**1**	**1**				
	T17	84.7	84.0	0.7	0	0				
	T51	67.8	67.7	0.1	0	0				
	T52	69.9	69.9	0.0	0	0				
	T53	73.2	73.1	0.1	0	0				
	C1	68.6	68.6	0.0	0	0				
	C2	67.9	67.9	0.0	0	0				
	T54	75.6	75.6	0.0	0	0				
	T55	73.1	73.1	0.0	0	0				
	T56	71.2	71.2	0.0	0	0				

Table B24: Bridge Trail Wall Nighttime 20 Foot Wall Cost Calculation

	Receptors	Nighttime L_{10} Noise Level (dBA)		Reduction (in dBA) with noise wall	Number of benefited establishments	Design goal reduction >7 dBA	Length of Wall (ft)	Wall Area (sq ft)	Total cost of wall $136/sq ft	Cost/ Benefited Receptor
		Build year 2040 (no wall)	Build year 2040 (with noise wall)							
	No wall vs 20-foot wall									
Nighttime	**T11**	82.1	80.3	1.8	0	0	1,450	29,000	$3,944,000	$788,800
	T12	79.6	71.0	8.6	**1**	**1**				
	T13	80.1	68.7	11.4	**1**	**1**				
	T14	80.1	68.4	11.7	**1**	**1**				
	T15	80.8	69.2	11.6	**1**	**1**				
	T16	80.6	72.7	7.9	**1**	**1**				
	T17	84.6	83.9	0.7	0	0				
	T51	66.9	66.8	0.1	0	0				
	T52	69.1	69.0	0.1	0	0				
	T53	72.7	72.6	0.1	0	0				
	C1	68.0	66.5	1.5	0	0				
	C2	67.3	65.5	1.8	0	0				
	T54	75.4	74.8	0.6	0	0				
	T55	72.7	71.9	0.8	0	0				
	T56	70.8	69.9	0.9	0	0				

Table B25: Bridge Trail Wall Daytime 11 Foot Wall Cost Calculation

	Receptors	Daytime L_{10} Noise Level (dBA)		Reduction (in dBA) with noise wall	Number of benefited establishments	Design goal reduction ≥ 7 dBA	Length of Wall (ft)	Wall Area (sq ft)	Total cost of wall $136/sq ft	Cost/ Benefited Receptor
		Build year 2040 (no wall)	Build year 2040 (with noise wall)							
	No wall vs 11-foot wall									
Daytime	**T11**	82.5	80.8	1.7	0	0	1,450	15,950	$2,169,200	$433,840
	T12	80.2	73.5	6.7	**1**	0				
	T13	80.7	73.2	7.5	**1**	**1**				
	T14	80.8	73.1	7.7	**1**	**1**				
	T15	81.4	73.9	7.5	**1**	**1**				
	T16	81.3	75.3	6.0	**1**	0				
	T17	84.7	84.1	0.6	0	0				
	T51	67.8	67.7	0.1	0	0				
	T52	69.9	69.9	0.0	0	0				
	T53	73.2	73.2	0.0	0	0				
	C1	68.6	67.6	1.0	0	0				
	C2	67.9	66.7	1.2	0	0				
	T54	75.6	75.2	0.4	0	0				
	T55	73.1	72.6	0.5	0	0				
	T56	71.2	70.6	0.6	0	0				

Table B26: Bridge Trail Wall Nighttime 11 Foot Wall Cost Calculation

	Receptors	Nighttime L_{10} Noise Level (dBA)		Reduction (in dBA) with noise wall	Number of benefited establishments	Design goal reduction >7 dBA	Length of Wall (ft)	Wall Area (sq ft)	Total cost of wall $136/sq ft	Cost/ Benefited Receptor
		Build year 2040 (no wall)	Build year 2040 (with noise wall)							
	No wall vs 11-foot wall									
Nighttime	**T11**	82.1	80.5	1.6	0	0	1,450	15,950	$2,169,200	$433,840
	T12	79.6	72.8	6.8	**1**	0				
	T13	80.1	72.6	7.5	**1**	**1**				
	T14	80.1	72.6	7.5	**1**	**1**				
	T15	80.8	73.4	7.4	**1**	**1**				
	T16	80.6	74.6	6.0	**1**	0				
	T17	84.6	84.0	0.6	0	0				
	T51	66.9	66.8	0.1	0	0				
	T52	69.1	69.0	0.1	0	0				
	T53	72.7	72.6	0.1	0	0				
	C1	68.0	66.8	1.2	0	0				
	C2	67.3	65.9	1.4	0	0				
	T54	75.4	74.9	0.5	0	0				
	T55	72.7	72.1	0.6	0	0				
	T56	70.8	70.1	0.7	0	0				

Table B27: Bridge Trail Wall Daytime 10 Foot Wall Cost Calculation

	Receptors	Daytime L_{10} Noise Level (dBA)		Reduction (in dBA) with noise wall	Number of benefited establishments	Design goal reduction ≥ 7 dBA	Length of Wall (ft)	Wall Area (sq ft)	Total cost of wall $136/sq ft	Cost/ Benefited Receptor
		Build year 2040 (no wall)	Build year 2040 (with noise wall)							
	No wall vs 10-foot wall									
Daytime	**T11**	82.5	80.9	1.6	0	0	1,450	14,500	$1,972,000	N/A
	T12	80.2	74.1	6.1	**1**	0				
	T13	80.7	74.2	6.5	**1**	0				
	T14	80.8	74.1	6.7	**1**	0				
	T15	81.4	75.0	6.4	**1**	0				
	T16	81.3	76.0	5.3	**1**	0				
	T17	84.7	84.2	0.5	0	0				
	T51	67.8	67.7	0.1	0	0				
	T52	69.9	69.9	0.0	0	0				
	T53	73.2	73.2	0.0	0	0				
	C1	68.6	67.7	0.9	0	0				
	C2	67.9	66.8	1.1	0	0				
	T54	75.6	75.2	0.4	0	0				
	T55	73.1	72.6	0.5	0	0				
	T56	71.2	70.7	0.5	0	0				

Table B28: Bridge Trail Wall Nighttime 10 Foot Wall Cost Calculation

	Receptors	Nighttime L_{10} Noise Level (dBA)		Reduction (in dBA) with noise wall	Number of benefited establishments	Design goal reduction >7 dBA	Length of Wall (ft)	Wall Area (sq ft)	Total cost of wall $136/sq ft	Cost/ Benefited Receptor
		Build year 2040 (no wall)	Build year 2040 (with noise wall)							
	No wall vs 10-foot wall									
Nighttime	**T11**	82.1	80.7	1.4	0	0	1,450	14,500	$1,972,000	N/A
	T12	79.6	73.5	6.1	**1**	0				
	T13	80.1	73.7	6.4	**1**	0				
	T14	80.1	73.7	6.4	**1**	0				
	T15	80.8	74.5	6.3	**1**	0				
	T16	80.6	75.3	5.3	**1**	0				
	T17	84.6	84.1	0.5	0	0				
	T51	66.9	66.8	0.1	0	0				
	T52	69.1	69.0	0.1	0	0				
	T53	72.7	72.6	0.1	0	0				
	C1	68.0	66.9	1.1	0	0				
	C2	67.3	66.0	1.3	0	0				
	T54	75.4	75.0	0.4	0	0				
	T55	72.7	72.2	0.5	0	0				
	T56	70.8	70.2	0.6	0	0				

Table B29: Southern Trail Wall 1 (Black Dog Road Entrance Ramp) Daytime 20 Foot Wall Cost Calculation

	Receptors	Daytime L_{10} Noise Level (dBA)		Reduction (in dBA) with noise wall	Number of benefited establishments	Design goal reduction >7 dBA	Length of Wall (ft)	Wall Area (sq ft)	Total cost of wall $20/sq ft	Cost/ Benefited Receptor
		Build year 2040 (no wall)	Build year 2040 (with noise wall)							
	No wall vs 20-foot wall									
Daytime	**T18**	81.0	70.2	10.8	**1**	**1**	1,150	22,216	$543,320	$67,915
	T19	80.9	67.5	13.4	**1**	**1**				
	T20	81.2	67.3	13.9	**1**	**1**				
	T21	81.1	67.3	13.8	**1**	**1**				
	T22	80.4	66.4	14.0	**1**	**1**				
	T23	78.6	66.7	11.9	**1**	**1**				
	T24	73.2	71.0	2.2	0	0				
	T25	71.8	66.9	4.9	0	0				
	T26	71.7	65.0	6.7	**1**	0				
	T27	71.0	64.5	6.5	**1**	0				
	T28	70.1	65.3	4.8	0	0				
	T29	69.6	68.0	1.6	0	0				
	T30	78.2	78.2	0.0	0	0				

A trail alignment shift is needed to provide space to accommodate the modeled noise wall behind the highway shoulder. The trail alignment shift moves the retaining wall down the east embankment and requires additional retaining wall height. The additional retaining wall height increases the cost estimate of the retaining wall by $99,000. The total cost of the noise wall includes the additional $99,000 retaining wall costs.

Table B30: Southern Trail Wall 1 (Black Dog Road Entrance Ramp) Nighttime 20 Foot Wall Cost Calculation

	Receptors	Nighttime L_{10} Noise Level (dBA)		Reduction (in dBA) with noise wall	Number of benefited establishments	Design goal reduction >7 dBA	Length of Wall (ft)	Wall Area (sq ft)	Total cost of wall $20/sq ft	Cost/ Benefited Receptor
		Build year 2040 (no wall)	Build year 2040 (with noise wall)							
	No wall vs 20-foot wall									
Nighttime	**T18**	80.3	69.8	10.5	**1**	**1**	1,150	22,216	$543,320	$54,332
	T19	80.2	67.1	13.1	**1**	**1**				
	T20	80.6	66.9	13.7	**1**	**1**				
	T21	80.4	66.9	13.5	**1**	**1**				
	T22	79.9	65.9	14.0	**1**	**1**				
	T23	77.8	66.0	11.8	**1**	**1**				
	T24	72.3	70.2	2.1	0	0				
	T25	70.9	65.9	5.0	**1**	0				
	T26	71.0	63.8	7.2	**1**	**1**				
	T27	70.6	63.6	7.0	**1**	**1**				
	T28	69.7	64.6	5.1	**1**	0				
	T29	69.4	67.8	1.6	0	0				
	T30	77.9	77.8	0.1	0	0				

A trail alignment shift is needed to provide space to accommodate the modeled noise wall behind the highway shoulder. The trail alignment shift moves the retaining wall down the east embankment and requires additional retaining wall height. The additional retaining wall height increases the cost estimate of the retaining wall by $99,000. The total cost of the noise wall includes the additional $99,000 retaining wall costs.

Table B31: Southern Trail Wall 1 (Black Dog Road Entrance Ramp) Daytime 15 Foot Wall Cost Calculation

	Receptors	Daytime L_{10} Noise Level (dBA)		Reduction (in dBA) with noise wall	Number of benefited establishments	Design goal reduction >7 dBA	Length of Wall (ft)	Wall Area (sq ft)	Total cost of wall $20/sq ft	Cost/ Benefited Receptor
		Build year 2040 (no wall)	Build year 2040 (with noise wall)							
	No wall vs 15-foot wall									
Daytime	**T18**	81.0	71.1	9.9	**1**	**1**	1,150	16,890	$436,800	$54,600
	T19	80.9	69.7	11.2	**1**	**1**				
	T20	81.2	69.4	11.8	**1**	**1**				
	T21	81.1	69.4	11.7	**1**	**1**				
	T22	80.4	68.4	12.0	**1**	**1**				
	T23	78.6	67.4	11.2	**1**	**1**				
	T24	73.2	71.2	2.0	0	0				
	T25	71.8	67.6	4.2	0	0				
	T26	71.7	66.1	5.6	**1**	0				
	T27	71.0	65.5	5.5	**1**	0				
	T28	70.1	65.9	4.2	0	0				
	T29	69.6	68.2	1.4	0	0				
	T30	78.2	78.2	0.0	0	0				

A trail alignment shift is needed to provide space to accommodate the modeled noise wall behind the highway shoulder. The trail alignment shift moves the retaining wall down the east embankment and requires additional retaining wall height. The additional retaining wall height increases the cost estimate of the retaining wall by $99,000. The total cost of the noise wall includes the additional $99,000 retaining wall costs.

Table B32: Southern Trail Wall 1 (Black Dog Road Entrance Ramp) Nighttime 15 Foot Wall Cost Calculation

	Receptors	Nighttime L_{10} Noise Level (dBA)		Reduction (in dBA) with noise wall	Number of benefited establishments	Design goal reduction >7 dBA	Length of Wall (ft)	Wall Area (sq ft)	Total cost of wall $20/sq ft	Cost/ Benefited Receptor
		Build year 2040 (no wall)	Build year 2040 (with noise wall)							
	No wall vs 18-foot wall									
Nighttime	**T18**	83.0	70.8	12.2	**1**	**1**	1,150	16,890	$436,800	$48,533
	T19	82.9	69.2	13.7	**1**	**1**				
	T20	83.3	69.0	14.3	**1**	**1**				
	T21	83.2	68.9	14.3	**1**	**1**				
	T22	82.6	67.9	14.7	**1**	**1**				
	T23	80.1	66.7	13.4	**1**	**1**				
	T24	72.6	70.4	2.2	0	0				
	T25	71.5	66.6	4.9	0	0				
	T26	71.8	65.0	6.8	**1**	0				
	T27	72.0	64.6	7.4	**1**	**1**				
	T28	71.4	65.2	6.2	**1**	0				
	T29	71.0	67.9	3.1	0	0				
	T30	78.0	77.9	0.1	0	0				

A trail alignment shift is needed to provide space to accommodate the modeled noise wall behind the highway shoulder. The trail alignment shift moves the retaining wall down the east embankment and requires additional retaining wall height. The additional retaining wall height increases the cost estimate of the retaining wall by $99,000. The total cost of the noise wall includes the additional $99,000 retaining wall costs.

Table B33: Southern Trail Wall 1 (Black Dog Road Entrance Ramp) Daytime 10 Foot Wall Cost Calculation

	Receptors	Daytime L_{10} Noise Level (dBA)		Reduction (in dBA) with noise wall	Number of benefited establishments	Design goal reduction >7 dBA	Length of Wall (ft)	Wall Area (sq ft)	Total cost of wall $20/sq ft	Cost/ Benefited Receptor
		Build year 2040 (no wall)	Build year 2040 (with noise wall)							
	No wall vs 10-foot wall									
Daytime	**T18**	81.0	74.8	6.2	**1**	0	1,150	11,500	$329,000	$54,833
	T19	80.9	74.4	6.5	**1**	0				
	T20	81.2	74.4	6.8	**1**	0				
	T21	81.1	74.3	6.8	**1**	0				
	T22	80.4	73.4	7.0	**1**	**1**				
	T23	78.6	70.9	7.7	**1**	**1**				
	T24	73.2	71.8	1.4	0	0				
	T25	71.8	69.4	2.4	0	0				
	T26	71.7	68.4	3.3	0	0				
	T27	71.0	67.5	3.5	0	0				
	T28	70.1	67.3	2.8	0	0				
	T29	69.6	68.5	1.1	0	0				
	T30	78.2	78.2	0.0	0	0				

A trail alignment shift is needed to provide space to accommodate the modeled noise wall behind the highway shoulder. The trail alignment shift moves the retaining wall down the east embankment and requires additional retaining wall height. The additional retaining wall height increases the cost estimate of the retaining wall by $99,000. The total cost of the noise wall includes the additional $99,000 retaining wall costs.

Table B34: Southern Trail Wall 1 (Black Dog Road Entrance Ramp) Nighttime 10 Foot Wall Cost Calculation

	Receptors	Nighttime L_{10} Noise Level (dBA)		Reduction (in dBA) with noise wall	Number of benefited establishments	Design goal reduction >7 dBA	Length of Wall (ft)	Wall Area (sq ft)	Total cost of wall $20/sq ft	Cost/ Benefited Receptor
		Build year 2040 (no wall)	Build year 2040 (with noise wall)							
	No wall vs 10-foot wall									
Nighttime	**T18**	80.3	74.3	6.0	**1**	0	1,150	11,500	$329,000	$54,833
	T19	80.2	73.9	6.3	**1**	0				
	T20	80.6	73.9	6.7	**1**	0				
	T21	80.4	73.8	6.6	**1**	0				
	T22	79.9	72.9	7.0	**1**	**1**				
	T23	77.8	70.3	7.5	**1**	**1**				
	T24	72.3	71.0	1.3	0	0				
	T25	70.9	68.4	2.5	0	0				
	T26	71.0	67.4	3.6	0	0				
	T27	70.6	66.8	3.8	0	0				
	T28	69.7	66.6	3.1	0	0				
	T29	69.4	68.2	1.2	0	0				
	T30	77.9	77.9	0.0	0	0				

A trail alignment shift is needed to provide space to accommodate the modeled noise wall behind the highway shoulder. The trail alignment shift moves the retaining wall down the east embankment and requires additional retaining wall height. The additional retaining wall height increases the cost estimate of the retaining wall by $100,000. The total cost of the noise wall includes the additional $100,000 retaining wall costs.

Table B35: Southern Trail Wall 1 (Black Dog Road Entrance Ramp) Daytime 9 Foot Wall Cost Calculation

	Receptors	Daytime L_{10} Noise Level (dBA)		Reduction (in dBA) with noise wall	Number of benefited establishments	Design goal reduction >7 dBA	Length of Wall (ft)	Wall Area (sq ft)	Total cost of wall $20/sq ft	Cost/ Benefited Receptor
		Build year 2040 (no wall)	Build year 2040 (with noise wall)							
	No wall vs 9-foot wall									
Daytime	**T18**	81.0	76.0	5.0	**1**	0	1,150	10,350	$306,000	N/A
	T19	80.9	75.8	5.1	**1**	0				
	T20	81.2	75.8	5.4	**1**	0				
	T21	81.1	75.7	5.4	**1**	0				
	T22	80.4	74.8	5.6	**1**	0				
	T23	78.6	72.2	6.4	**1**	0				
	T24	73.2	72.1	1.1	0	0				
	T25	71.8	69.9	1.9	0	0				
	T26	71.7	69.0	2.7	0	0				
	T27	71.0	68.1	2.9	0	0				
	T28	70.1	67.7	2.4	0	0				
	T29	69.6	68.6	1.0	0	0				
	T30	78.2	78.2	0.0	0	0				

A trail alignment shift is needed to provide space to accommodate the modeled noise wall behind the highway shoulder. The trail alignment shift moves the retaining wall down the east embankment and requires additional retaining wall height. The additional retaining wall height increases the cost estimate of the retaining wall by $99,000. The total cost of the noise wall includes the additional $99,000 retaining wall costs.

Table B36: Southern Trail Wall 1 (Black Dog Road Entrance Ramp) Nighttime 9 Foot Wall Cost Calculation

	Receptors	Nighttime L_{10} Noise Level (dBA)		Reduction (in dBA) with noise wall	Number of benefited establishments	Design goal reduction >7 dBA	Length of Wall (ft)	Wall Area (sq ft)	Total cost of wall $20/sq ft	Cost/ Benefited Receptor
		Build year 2040 (no wall)	Build year 2040 (with noise wall)							
	No wall vs 9-foot wall									
Nighttime	**T18**	80.3	75.6	4.7	0	0	1,150	10,350	$306,000	N/A
	T19	80.2	75.3	4.9	0	0				
	T20	80.6	75.4	5.2	**1**	0				
	T21	80.4	75.2	5.2	**1**	0				
	T22	79.9	74.4	5.5	**1**	0				
	T23	77.8	71.6	6.2	**1**	0				
	T24	72.3	71.2	1.1	0	0				
	T25	70.9	69.0	1.9	0	0				
	T26	71.0	68.1	2.9	0	0				
	T27	70.6	67.4	3.2	0	0				
	T28	69.7	67.1	2.6	0	0				
	T29	69.4	68.4	1.0	0	0				
	T30	77.9	77.9	0.0	0	0				

A trail alignment shift is needed to provide space to accommodate the modeled noise wall behind the highway shoulder. The trail alignment shift moves the retaining wall down the east embankment and requires additional retaining wall height. The additional retaining wall height increases the cost estimate of the retaining wall by $99,000. The total cost of the noise wall includes the additional $99,000 retaining wall costs.

Table B37: Southern Trail Wall 2 (Black Dog Road to Cliff Road) Daytime 20 Foot Wall Cost Calculation

	Receptors	Daytime L_{10} Noise Level (dBA)		Reduction (in dBA) with noise wall	Number of benefited establishments	Design goal reduction >7 dBA	Length of Wall (ft)	Wall Area (sq ft)	Total cost of wall $20/sq ft	Cost/ Benefited Receptor
		Build year 2040 (no wall)	Build year 2040 (with noise wall)							
	No wall vs 20-foot wall									
Daytime	T31	64.0	59.7	4.3	0	0	3,590	71,016	$1,868,570	$116,786
	T32	65.4	60.5	4.9	0	0				
	T33	67.5	62.1	5.4	1	0				
	T34	70.5	64.0	6.5	1	0				
	T35	72.2	64.9	7.3	1	1				
	T36	72.5	65.5	7.0	1	1				
	T37	71.4	65.4	6.0	1	0				
	T38	71.8	65.6	6.2	1	0				
	T39	72.0	65.6	6.4	1	0				
	T40	71.8	65.6	6.2	1	0				
	T41	73.3	65.8	7.5	1	1				
	T42	74.8	65.9	8.9	1	1				
	T43	75.4	66.0	9.4	1	1				
	T44	77.7	66.0	11.7	1	1				
	T45	78.1	66.0	12.1	1	1				
	T46	78.0	66.0	12.0	1	1				
	T47	78.3	66.1	12.2	1	1				
	T48	79.4	68.9	10.5	1	1				
	E1	73.1	69.4	3.7	0	0				

The noise wall is located on top of the retaining wall. Total cost of wall includes $448,250 in retaining wall costs. Additional costs are necessary to construct the retaining wall to support noise wall loads.

Table B38: Southern Trail Wall 2 (Black Dog Road to Cliff Road) Nighttime 20 Foot Wall Cost Calculation

	Receptors	Nighttime L_{10} Noise Level (dBA)		Reduction (in dBA) with noise wall	Number of benefited establishments	Design goal reduction >7 dBA	Length of Wall (ft)	Wall Area (sq ft)	Total cost of wall $20/sq ft	Cost/ Benefited Receptor
		Build year 2040 (no wall)	Build year 2040 (with noise wall)							
	No wall vs 20-foot wall									
Nighttime	T31	62.9	58.4	4.5	0	0	3,590	71,016	$1,868,570	$109,916
	T32	64.4	59.2	5.2	1	0				
	T33	66.7	61.1	5.6	1	0				
	T34	69.9	63.2	6.7	1	0				
	T35	71.7	64.3	7.4	1	1				
	T36	72.1	64.9	7.2	1	1				
	T37	71.0	64.8	6.2	1	0				
	T38	71.5	65.0	6.5	1	0				
	T39	71.7	65.1	6.6	1	0				
	T40	71.5	65.1	6.4	1	0				
	T41	73.0	65.3	7.7	1	1				
	T42	74.5	65.4	9.1	1	1				
	T43	75.1	65.5	9.6	1	1				
	T44	77.1	65.3	11.8	1	1				
	T45	77.3	65.2	12.1	1	1				
	T46	77.1	65.2	11.9	1	1				
	T47	77.3	65.2	12.1	1	1				
	T48	78.8	68.1	10.7	1	1				
	E1	72.2	68.3	3.9	0	0				

The noise wall is located on top of the retaining wall. Total cost of wall includes $448,250 in retaining wall costs. Additional costs are necessary to construct the retaining wall to support noise wall loads.

Table B39: Southern Trail Wall 2 (Black Dog Road to Cliff Road) Daytime 12 Foot Wall Cost Calculation

	Receptors	Daytime L_{10} Noise Level (dBA)		Reduction (in dBA) with noise wall	Number of benefited establishments	Design goal reduction >7 dBA	Length of Wall (ft)	Wall Area (sq ft)	Total cost of wall $20/sq ft	Cost/ Benefited Receptor
		Build year 2040 (no wall)	Build year 2040 (with noise wall)							
	No wall vs 12-foot wall									
Daytime	T31	64.0	61.5	2.5	0	0	3,590	43,080	$1,309,850	$93,561
	T32	65.4	62.6	2.8	0	0				
	T33	67.5	63.9	3.6	0	0				
	T34	70.5	65.4	5.1	1	0				
	T35	72.2	66.4	5.8	1	0				
	T36	72.5	66.7	5.8	1	0				
	T37	71.4	66.5	4.9	1	0				
	T38	71.8	66.7	5.1	1	0				
	T39	72.0	66.8	5.2	1	0				
	T40	71.8	66.8	5.0	1	0				
	T41	73.3	67.3	6.0	1	0				
	T42	74.8	67.9	6.9	1	0				
	T43	75.4	68.3	7.1	1	1				
	T44	77.7	69.9	7.8	1	1				
	T45	78.1	70.0	8.1	1	1				
	T46	78.0	70.0	8.0	1	1				
	T47	78.3	70.1	8.2	1	1				
	T48	79.4	72.8	6.6	1	0				
	E1	73.1	71.3	1.8	0	0				

The noise wall is located on top of the retaining wall. Total cost of wall includes $448,250 in retaining wall costs. Additional costs are necessary to construct the retaining wall to support noise wall loads.

Table B40: Southern Trail Wall 2 (Black Dog Road to Cliff Road) Nighttime 12 Foot Wall Cost Calculation

	Receptors	Nighttime L_{10} Noise Level (dBA)		Reduction (in dBA) with noise wall	Number of benefited establishments	Design goal reduction >7 dBA	Length of Wall (ft)	Wall Area (sq ft)	Total cost of wall $20/sq ft	Cost/ Benefited Receptor
		Build year 2040 (no wall)	Build year 2040 (with noise wall)							
	No wall vs 12-foot wall									
Nighttime	T31	62.9	60.2	2.7	0	0	3,590	43,080	$1,309,850	$87,323
	T32	64.4	61.4	3.0	0	0				
	T33	66.7	63.0	3.7	0	0				
	T34	69.9	64.7	5.2	1	0				
	T35	71.7	65.8	5.9	1	0				
	T36	72.1	66.2	5.9	1	0				
	T37	71.0	66.0	5.0	1	0				
	T38	71.5	66.2	5.3	1	0				
	T39	71.7	66.3	5.4	1	0				
	T40	71.5	66.3	5.2	1	0				
	T41	73.0	66.8	6.2	1	0				
	T42	74.5	67.4	7.1	1	1				
	T43	75.1	67.7	7.4	1	1				
	T44	77.1	69.2	7.9	1	1				
	T45	77.3	69.2	8.1	1	1				
	T46	77.1	69.2	7.9	1	1				
	T47	77.3	69.3	8.0	1	1				
	T48	78.8	72.0	6.8	1	0				
	E1	72.2	70.1	2.1	0	0				

The noise wall is located on top of the retaining wall. Total cost of wall includes $448,250 in retaining wall costs. Additional costs are necessary to construct the retaining wall to support noise wall loads.

Table B41: Southern Trail Wall 2 (Black Dog Road to Cliff Road) Daytime 11 Foot Wall Cost Calculation

	Receptors	Daytime L_{10} Noise Level (dBA)		Reduction (in dBA) with noise wall	Number of benefited establishments	Design goal reduction >7 dBA	Length of Wall (ft)	Wall Area (sq ft)	Total cost of wall $20/sq ft	Cost/ Benefited Receptor
		Build year 2040 (no wall)	Build year 2040 (with noise wall)							
	No wall vs 11-foot wall									
Daytime	T31	64.0	61.8	2.2	0	0	3,590	39,490	$1,238,050	$123,805
	T32	65.4	62.9	2.5	0	0				
	T33	67.5	64.2	3.3	0	0				
	T34	70.5	65.7	4.8	0	0				
	T35	72.2	66.8	5.4	**1**	0				
	T36	72.5	67.1	5.4	**1**	0				
	T37	71.4	66.7	4.7	0	0				
	T38	71.8	67.0	4.8	0	0				
	T39	72.0	67.1	4.9	0	0				
	T40	71.8	67.1	4.7	0	0				
	T41	73.3	67.7	5.6	**1**	0				
	T42	74.8	68.4	6.4	**1**	0				
	T43	75.4	68.8	6.6	**1**	0				
	T44	77.7	70.6	7.1	**1**	**1**				
	T45	78.1	70.7	7.4	**1**	**1**				
	T46	78.0	70.7	7.3	**1**	**1**				
	T47	78.3	70.8	7.5	**1**	**1**				
	T48	79.4	73.6	5.8	**1**	0				
	E1	73.1	71.6	1.5	0	0				

The noise wall is located on top of the retaining wall. Total cost of wall includes $448,250 in retaining wall costs. Additional costs are necessary to construct the retaining wall to support noise wall loads.

Table B42: Southern Trail Wall 2 (Black Dog Road to Cliff Road) Nighttime 11 Foot Wall Cost Calculation

	Receptors	Nighttime L_{10} Noise Level (dBA)		Reduction (in dBA) with noise wall	Number of benefited establishments	Design goal reduction >7 dBA	Length of Wall (ft)	Wall Area (sq ft)	Total cost of wall $20/sq ft	Cost/ Benefited Receptor
		Build year 2040 (no wall)	Build year 2040 (with noise wall)							
	No wall vs 11-foot wall									
Nighttime	T31	62.9	60.6	2.3	0	0	3,590	39,490	$1,238,050	$103,171
	T32	64.4	61.8	2.6	0	0				
	T33	66.7	63.3	3.4	0	0				
	T34	69.9	65.0	4.9	0	0				
	T35	71.7	66.2	5.5	**1**	0				
	T36	72.1	66.6	5.5	**1**	0				
	T37	71.0	66.2	4.8	0	0				
	T38	71.5	66.5	5.0	**1**	0				
	T39	71.7	66.6	5.1	**1**	0				
	T40	71.5	66.6	4.9	0	0				
	T41	73.0	67.2	5.8	**1**	0				
	T42	74.5	67.9	6.6	**1**	0				
	T43	75.1	68.3	6.8	**1**	0				
	T44	77.1	69.9	7.2	**1**	**1**				
	T45	77.3	69.9	7.4	**1**	**1**				
	T46	77.1	69.9	7.2	**1**	**1**				
	T47	77.3	70.1	7.2	**1**	**1**				
	T48	78.8	72.8	6.0	**1**	0				
	E1	72.2	70.4	1.8	0	0				

The noise wall is located on top of the retaining wall. Total cost of wall includes $448,250 in retaining wall costs. Additional costs are necessary to construct the retaining wall to support noise wall loads.

Table B43: Southern Trail Wall 2 (Black Dog Road to Cliff Road) Daytime 10 Foot Wall Cost Calculation

	Receptors	Daytime L_{10} Noise Level (dBA)		Reduction (in dBA) with noise wall	Number of benefited establishments	Design goal reduction >7 dBA	Length of Wall (ft)	Wall Area (sq ft)	Total cost of wall $20/sq ft	Cost/ Benefited Receptor
		Build year 2040 (no wall)	Build year 2040 (with noise wall)							
	No wall vs 10-foot wall									
Daytime	T31	64.0	62.1	1.9	0	0	3,590	35,900	$1,166,250	N/A
	T32	65.4	63.2	2.2	0	0				
	T33	67.5	64.6	2.9	0	0				
	T34	70.5	66.2	4.3	0	0				
	T35	72.2	67.3	4.9	0	0				
	T36	72.5	67.6	4.9	0	0				
	T37	71.4	67.1	4.3	0	0				
	T38	71.8	67.4	4.4	0	0				
	T39	72.0	67.5	4.5	0	0				
	T40	71.8	67.5	4.3	0	0				
	T41	73.3	68.2	5.1	**1**	0				
	T42	74.8	69.0	5.8	**1**	0				
	T43	75.4	69.4	6.0	**1**	0				
	T44	77.7	71.3	6.4	**1**	0				
	T45	78.1	71.4	6.7	**1**	0				
	T46	78.0	71.4	6.6	**1**	0				
	T47	78.3	71.6	6.7	**1**	0				
	T48	79.4	74.3	5.1	**1**	0				
	E1	73.1	71.9	1.2	0	0				

The noise wall is located on top of the retaining wall. Total cost of wall includes $448,250 in retaining wall costs. Additional costs are necessary to construct the retaining wall to support noise wall loads.

Table B44: Southern Trail Wall 2 (Black Dog Road to Cliff Road) Nighttime 10 Foot Wall Cost Calculation

	Receptors	Nighttime L_{10} Noise Level (dBA)		Reduction (in dBA) with noise wall	Number of benefited establishments	Design goal reduction >7 dBA	Length of Wall (ft)	Wall Area (sq ft)	Total cost of wall $20/sq ft	Cost/ Benefited Receptor
		Build year 2040 (no wall)	Build year 2040 (with noise wall)							
	No wall vs 10-foot wall									
Nighttime	T31	62.9	60.9	2.0	0	0	3,590	35,900	$1,166,250	N/A
	T32	64.4	62.1	2.3	0	0				
	T33	66.7	63.7	3.0	0	0				
	T34	69.9	65.5	4.4	0	0				
	T35	71.7	66.7	5.0	**1**	0				
	T36	72.1	67.1	5.0	**1**	0				
	T37	71.0	66.6	4.4	0	0				
	T38	71.5	67.0	4.5	0	0				
	T39	71.7	67.1	4.6	0	0				
	T40	71.5	67.0	4.5	0	0				
	T41	73.0	67.7	5.3	**1**	0				
	T42	74.5	68.5	6.0	**1**	0				
	T43	75.1	68.9	6.2	**1**	0				
	T44	77.1	70.7	6.4	**1**	0				
	T45	77.3	70.7	6.6	**1**	0				
	T46	77.1	70.7	6.4	**1**	0				
	T47	77.3	70.9	6.4	**1**	0				
	T48	78.8	73.5	5.3	**1**	0				
	E1	72.2	70.8	1.4	0	0				

The noise wall is located on top of the retaining wall. Total cost of wall includes $448,250 in retaining wall costs. Additional costs are necessary to construct the retaining wall to support noise wall loads.

Table B45: Wall 3 Daytime 20 Foot Wall Cost Calculation

	Receptors	Daytime L_{10} Noise Level (dBA)		Reduction (in dBA) with noise wall	Number of benefited establishments	Design goal reduction ≥ 7 dBA	Length of Wall (ft)	Wall Area (sq ft)	Total cost of wall $20/sq ft	Cost/ Benefited Receptor
		Build year 2040 (no wall)	Build year 2040 (with noise wall)							
Daytime	No wall vs 20-foot wall									
	E2	73.7	71.4	2.3	0	0	830	16,600	$332,000	N/A
	E3	71.9	69.2	2.7	0	0				
	E4	68.0	66.6	1.4	0	0				

Table B46: Wall 3 Nighttime 20 Foot Wall Cost Calculation

	Receptors	Nighttime L_{10} Noise Level (dBA)		Reduction (in dBA) with noise wall	Number of benefited establishments	Design goal reduction ≥ 7 dBA	Length of Wall (ft)	Wall Area (sq ft)	Total cost of wall $20/sq ft	Cost/ Benefited Receptor
		Build year 2040 (no wall)	Build year 2040 (with noise wall)							
Nighttime	No wall vs 20-foot wall									
	E2	72.9	70.2	2.7	0	0	830	16,600	$332,000	N/A
	E3	70.9	67.9	3.0	0	0				
	E4	66.9	65.2	1.7	0	0				

Table B47: Wall 4 Daytime 20 Foot Wall Cost Calculation

	Receptors	Daytime L_{10} Noise Level (dBA)		Reduction (in dBA) with noise wall	Number of benefited establishments	Design goal reduction ≥ 7 dBA	Length of Wall (ft)	Wall Area (sq ft)	Total cost of wall $20/sq ft	Cost/ Benefited Receptor
		Build year 2040 (no wall)	Build year 2040 (with noise wall)							
	No wall vs 20-foot wall									
Daytime	F1	70.9	70.7	0.2	0	0	390	7,408	$148,160	N/A
	F2	70.3	69.7	0.6	0	0				
	F3	67.6	67.2	0.4	0	0				
	F4	65.4	65.4	0.0	0	0				
	F5	65.2	65.2	0.0	0	0				
	F6	65.2	65.2	0.0	0	0				
	F7	73.0	69.6	3.4	0	0				
	F8	72.6	69.3	3.3	0	0				
	F9	72.2	69.0	3.2	0	0				
	F10	71.4	68.0	3.4	0	0				
	F11	66.9	65.5	1.4	0	0				
	F12	69.0	66.9	2.1	0	0				
	F13	69.5	66.8	2.7	0	0				
	F14	65.3	65.3	0.0	0	0				
	F15	64.9	64.9	0.0	0	0				
	F16	64.8	64.8	0.0	0	0				
	F17	68.4	68.4	0.0	0	0				
	F18	68.3	68.3	0.0	0	0				
	F19	68.0	68.0	0.0	0	0				
	F20	67.9	67.9	0.0	0	0				
	F21	64.3	64.3	0.0	0	0				
	F22	64.4	64.4	0.0	0	0				

	Receptors	Daytime L_{10} Noise Level (dBA)		Reduction (in dBA) with noise wall	Number of benefited establishments	Design goal reduction ≥ 7 dBA	Length of Wall (ft)	Wall Area (sq ft)	Total cost of wall $20/sq ft	Cost/ Benefited Receptor
		Build year 2040 (no wall)	Build year 2040 (with noise wall)							
	No wall vs 20-foot wall									
Daytime	**F23**	62.6	62.6	0.0	0	0	390	7,408	$148,160	N/A
	F24	67.5	67.5	0.0	0	0				
	F25	60.1	60.1	0.0	0	0				
	F26	60.7	60.7	0.0	0	0				
	F27	61.6	61.6	0.0	0	0				
	F28	62.7	62.7	0.0	0	0				
	F29	63.5	63.5	0.0	0	0				
	F30	65.0	65.0	0.0	0	0				
	F31	59.9	59.9	0.0	0	0				
	F32	60.6	60.6	0.0	0	0				
	F33	62.6	62.6	0.0	0	0				
	F34	62.7	62.7	0.0	0	0				
	F35	63.5	63.5	0.0	0	0				
	F36	65.2	65.2	0.0	0	0				

Table B48: Wall 4 Nighttime 20 Foot Wall Cost Calculation

	Receptors	Nighttime L_{10} Noise Level (dBA)		Reduction (in dBA) with noise wall	Number of benefited establishments	Design goal reduction ≥ 7 dBA	Length of Wall (ft)	Wall Area (sq ft)	Total cost of wall $20/sq ft	Cost/ Benefited Receptor
		Build year 2040 (no wall)	Build year 2040 (with noise wall)							
	No wall vs 20-foot wall									
Nighttime	F1	69.6	69.4	0.2	0	0	390	7,408	$148,160	N/A
	F2	68.8	68.2	0.6	0	0				
	F3	66.1	65.7	0.4	0	0				
	F4	64.1	64.1	0.0	0	0				
	F5	64.0	64.0	0.0	0	0				
	F6	64.1	64.1	0.0	0	0				
	F7	71.4	68.1	3.3	0	0				
	F8	71.0	67.8	3.2	0	0				
	F9	70.6	67.5	3.1	0	0				
	F10	69.9	66.5	3.4	0	0				
	F11	65.4	64.1	1.3	0	0				
	F12	67.4	65.4	2.0	0	0				
	F13	68.0	65.4	2.6	0	0				
	F14	64.2	64.2	0.0	0	0				
	F15	63.8	63.8	0.0	0	0				
	F16	63.5	63.5	0.0	0	0				
	F17	67.5	67.5	0.0	0	0				
	F18	67.5	67.5	0.0	0	0				
	F19	67.2	67.2	0.0	0	0				
	F20	67.1	67.1	0.0	0	0				
	F21	63.1	63.1	0.0	0	0				
	F22	63.1	63.1	0.0	0	0				

	Receptors	Nighttime L_{10} Noise Level (dBA)		Reduction (in dBA) with noise wall	Number of benefited establishments	Design goal reduction ≥ 7 dBA	Length of Wall (ft)	Wall Area (sq ft)	Total cost of wall $20/sq ft	Cost/ Benefited Receptor
		Build year 2040 (no wall)	Build year 2040 (with noise wall)							
	No wall vs 20-foot wall									
Nighttime	**F23**	62.0	62.0	0.0	0	0	390	7,408	$148,160	N/A
	F24	66.7	66.7	0.0	0	0				
	F25	59.2	59.2	0.0	0	0				
	F26	59.9	59.9	0.0	0	0				
	F27	61.0	61.0	0.0	0	0				
	F28	61.9	61.9	0.0	0	0				
	F29	62.7	62.7	0.0	0	0				
	F30	64.5	64.5	0.0	0	0				
	F31	59.1	59.1	0.0	0	0				
	F32	59.8	59.8	0.0	0	0				
	F33	61.9	61.9	0.0	0	0				
	F34	61.9	61.9	0.0	0	0				
	F35	62.8	62.8	0.0	0	0				
	F36	64.7	64.7	0.0	0	0				

Table B49: Wall 5 Daytime 20 Foot Wall Cost Calculation

	Receptors	Daytime L_{10} Noise Level (dBA)		Reduction (in dBA) with noise wall	Number of benefited establishments	Design goal reduction ≥ 7 dBA	Length of Wall (ft)	Wall Area (sq ft)	Total cost of wall $20/sq ft	Cost/ Benefited Receptor
		Build year 2040 (no wall)	Build year 2040 (with noise wall)							
	No wall vs 20-foot wall									
Daytime	**G1-1**	75.2	69.7	5.5	**1**	0	1,024	19,696	$393,920	$19,696
	G1-2	77.7	74.1	3.6	0	0				
	G2-1	75.1	68.0	7.1	**1**	**1**				
	G2-2	77.7	72.5	5.2	**1**	0				
	G3-1	74.2	66.1	8.1	**1**	**1**				
	G3-2	77.6	70.0	7.6	**1**	**1**				
	G4-1	73.4	65.3	8.1	**1**	**1**				
	G4-2	77.6	69.1	8.5	**1**	**1**				
	G5-1	67.2	66.4	0.8	0	0				
	G5-2	71.8	70.9	0.9	0	0				
	G6-1	66.8	65.6	1.2	0	0				
	G6-2	72.1	70.9	1.2	0	0				
	G7-1	67.2	65.6	1.6	0	0				
	G7-2	72.4	70.5	1.9	0	0				
	G8-1	67.8	65.4	2.4	0	0				
	G8-2	72.8	70.1	2.7	0	0				
	G9-1	64.9	64.6	0.3	0	0				
	G9-2	70.8	69.5	1.3	0	0				
	G10-1	67.1	66.7	0.4	0	0				
	G10-2	71.1	69.6	1.5	0	0				
	G11-1	67.8	67.3	0.5	0	0				
	G11-2	71.1	69.6	1.5	0	0				

	Receptors	Daytime L_{10} Noise Level (dBA)		Reduction (in dBA) with noise wall	Number of benefited establishments	Design goal reduction ≥ 7 dBA	Length of Wall (ft)	Wall Area (sq ft)	Total cost of wall $20/sq ft	Cost/ Benefited Receptor
		Build year 2040 (no wall)	Build year 2040 (with noise wall)							
	No wall vs 20-foot wall									
Daytime	**G12-1**	68.4	67.9	0.5	0	0	1,024	19,696	$393,920	$19,696
	G12-2	70.9	69.5	1.4	0	0				
	G13-1	70.5	62.2	8.3	**1**	**1**				
	G13-2	75.1	67.3	7.8	**1**	**1**				
	G14-1	70.0	62.5	7.5	**1**	**1**				
	G14-2	74.2	67.5	6.7	**1**	0				
	G15-1	68.7	61.1	7.6	**1**	**1**				
	G15-2	72.5	64.5	8.0	**1**	**1**				
	G16-1	68.1	61.5	6.6	**1**	0				
	G16-2	72.1	66.1	6.0	**1**	0				
	G17	68.1	67.7	0.4	0	0				
	G18	67.4	67.0	0.4	0	0				
	G19	67.0	65.9	1.1	0	0				
	G20	73.8	66.5	7.3	**3**	**3**				
	G21	73.6	67.6	6.0	**2**	0				
	G22	62.1	62.1	0.0	0	0				
	G23	65.8	65.8	0.0	0	0				

Table B50: Wall 5 Nighttime 20 Foot Wall Cost Calculation

	Receptors	Nighttime L_{10} Noise Level (dBA)		Reduction (in dBA) with noise wall	Number of benefited establishments	Design goal reduction ≥ 7 dBA	Length of Wall (ft)	Wall Area (sq ft)	Total cost of wall $20/sq ft	Cost/ Benefited Receptor
		Build year 2040 (no wall)	Build year 2040 (with noise wall)							
	No wall vs 20-foot wall									
Nighttime	**G1-1**	74.6	68.9	5.7	**1**	0	1,024	19,696	$393,920	$19,696
	G1-2	77.4	73.5	3.9	0	0				
	G2-1	74.5	67.2	7.3	**1**	**1**				
	G2-2	77.4	71.9	5.5	**1**	0				
	G3-1	73.6	65.3	8.3	**1**	**1**				
	G3-2	77.3	69.4	7.9	**1**	**1**				
	G4-1	72.8	64.5	8.3	**1**	**1**				
	G4-2	77.3	68.4	8.9	**1**	**1**				
	G5-1	66.7	65.9	0.8	0	0				
	G5-2	71.1	70.2	0.9	0	0				
	G6-1	66.1	64.8	1.3	0	0				
	G6-2	71.3	70.1	1.2	0	0				
	G7-1	66.5	64.8	1.7	0	0				
	G7-2	71.6	69.7	1.9	0	0				
	G8-1	67.1	64.6	2.5	0	0				
	G8-2	72.1	69.2	2.9	0	0				
	G9-1	64.1	63.8	0.3	0	0				
	G9-2	70.0	68.6	1.4	0	0				
	G10-1	66.4	66.0	0.4	0	0				
	G10-2	70.3	68.7	1.6	0	0				
	G11-1	67.1	66.6	0.5	0	0				
	G11-2	70.3	68.8	1.5	0	0				

	Receptors	Nighttime L_{10} Noise Level (dBA)		Reduction (in dBA) with noise wall	Number of benefited establishments	Design goal reduction ≥ 7 dBA	Length of Wall (ft)	Wall Area (sq ft)	Total cost of wall $20/sq ft	Cost/ Benefited Receptor
		Build year 2040 (no wall)	Build year 2040 (with noise wall)							
	No wall vs 20-foot wall									
Nighttime	**G12-1**	67.8	67.3	0.5	0	0	1,024	19,696	$393,920	$19,696
	G12-2	70.2	68.9	1.3	0	0				
	G13-1	70.0	61.6	8.4	**1**	**1**				
	G13-2	74.6	66.7	7.9	**1**	**1**				
	G14-1	69.4	61.9	7.5	**1**	**1**				
	G14-2	73.7	66.8	6.9	**1**	0				
	G15-1	68.1	60.3	7.8	**1**	**1**				
	G15-2	71.9	63.7	8.2	**1**	**1**				
	G16-1	67.5	60.8	6.7	**1**	0				
	G16-2	71.5	65.3	6.2	**1**	0				
	G17	67.1	66.8	0.3	0	0				
	G18	66.4	66.0	0.4	0	0				
	G19	66.1	64.9	1.2	0	0				
	G20	73.3	65.9	7.4	**3**	**3**				
	G21	73.1	66.9	6.2	**2**	0				
	G22	61.4	61.4	0.0	0	0				
	G23	65.2	65.2	0.0	0	0				

Appendix I

Hydraulic Analysis

Minnesota Department of Transportation

Memo

Bridge Office
Mail Stop 610
3485 Hadley Avenue North
Oakdale, MN 55128-3307

Office Tel.: 651/366-4500
Fax: 651/366-4509

Date: February 9, 2016

To: Andrea Hendrickson
State Hydraulics Engineer

From: Petra DeWall
State Waterway Engineer

Subject: S.P. 1981-124 I-35W over Minnesota River
Sec. 27, Twp. 27N, R. 24W, in Hennepin County, City of Bloomington
Replacement of Bridge #5983 New Bridge #27W38 & 27W39
Waterway Analysis

As requested, we have analyzed the waterway needs for the 35W Minnesota River bridge crossing, proposed Bridges No. 27W38 and 27W39. The proposed bridges are aligned perpendicular to the roadway, have 4 piers on the floodplain (none in the main channel). The piers were assumed to be 6-ft wide, aligned perpendicular to the roadway. Proposed bridge and roadway geometry was modeled based on draft preliminary bridge and roadway plans dated December 17, 2015. The proposed roadway profile south of the bridge will be raised above the 100-year floodplain elevation, see Figure 1 for inplace versus proposed 100-yr flooding extents. See Appendix 1 for additional geometric details.

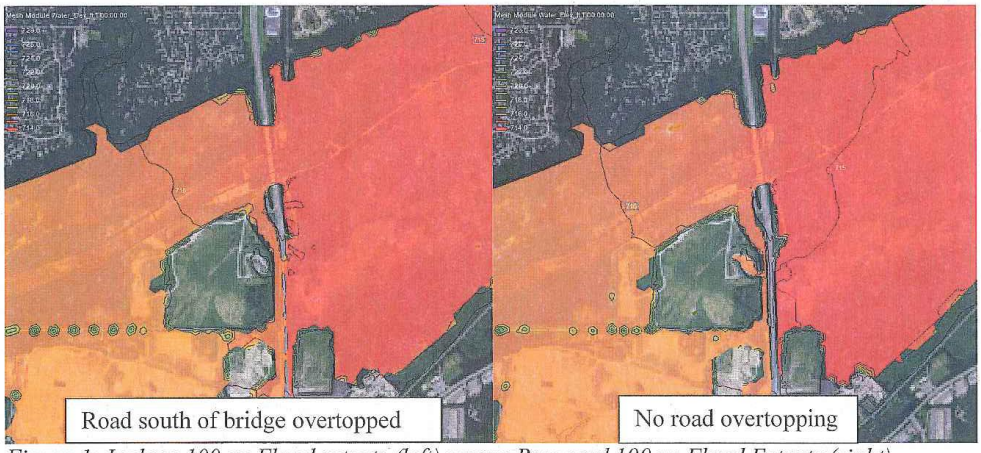


Figure 1: Inplace 100-yr Flood extents (left) versus Proposed 100-yr Flood Extents (right).

The hydraulic analysis did not include the landfill mitigation plans for the McGowan site immediately upstream of the bridge along the south approach.

This crossing is located in a detailed Flood Insurance Study for Dakota and Hennepin Counties dated December 2, 2011 and September 2, 2004 respectively. A "No-Rise Certificate" has been completed based on this analysis. See Appendix 2 for the FEMA mapping of this area and the "No-Rise Certificate".

Below is a YouTube link showing an animation of the proposed and inplace flooding extents for the 100-year event. The inplace south approach is overtopped during the 100-yr event. The proposed condition is not overtopped during the 100-yr event. This video also shows the proposed bridge replacement and grade raise causes no rise in the 100-yr water surface elevation.

https://youtu.be/ygUrRNnDPK4

Any temporary stage increase as a result of construction staging will have to be analyzed, and approved by the local communities as shown in the flow chart in Appendix 3.

The hydrology for this analysis was taken from the Mn/DNR and US Army Corps of Engineers (USACE) Hydrologic Analysis for the main stem of the Minnesota River from Ortonville, Minnesota to its confluence with the Mississippi River at Mendota Heights (December 19, 2001).

Two river models were used in this analysis. The first is a HEC-RAS modeled developed by the USACE for the Lower Minnesota River Floodplain Study (October 2004). This is the model used for the detailed FIS reports for Dakota and Hennepin Counties. This model extends from the confluence with the Mississippi River upstream to Carver, MN. The inplace condition of the HEC-RAS model includes all of the recently completed and in-process work on County Highway 101, County Highway 61, and State Highway 41. Additional details are available in the waterway file and in the HEC-RAS model.

The second river model is a two-dimensional finite volume hydraulic model, Sedimentation and Riverine Hydraulics – 2D (SRH2D), run out of the Surface water Modeling System (SMS) software platform. This model was developed to better show flow and velocity patterns in the study area. Appendix 4 contains detailed graphical output from the SRH2D model.

There is good agreement between the models with respect to water surface profiles. The hydraulic data as reported below is from the HEC-RAS model (with the exception of the reported velocities for the 100 and 500-yr events, which are from the SRH2D model).

The hydraulic data for this structure is as follows:

3

Hydraulic Data				
(1)	Vertical Datum	NGVD 29	NAVD 88	
*	Stream Name	Minnesota River		
	Drainage area	16,550		mi^2
(2)	Flood of record	117,000		ft^3/s
(3)	Maximum observed highwater elevation	716.04	716.22	ft
*	Design flood (100-year frequency)	103,000		ft^3/s
(4)	Road sag point elevation of proposed	718.52	718.7	ft
*	Headwater elevation of proposed condition	715.33	715.51	ft
	Headwater elevation of inplace condition	715.36	715.54	ft
	Stage increase over inplace condition	(0.03), no increase		ft
	Minimum waterway opening	24,886		ft^2
	below elevation	715.2	715.4	ft
(5)	Low member at or above elevation	See Note 5 and Appendix 5		
(6)	Velocity through structure	5.5		ft/s
(6)	Main channel velocity	2.7		ft/s
	Estimated preliminary pier scour depth	11.5		ft
	Estimated preliminary contraction scour depth	10.5		ft
	Estimated preliminary total scour at pier elevation	645.8	646.0	ft
*	Greatest flood (Overtopping = 1.28*Q100)	132,000		ft^3/s
(4)	Road sag point elevation	718.52	718.7	ft
*	Headwater elevation of proposed condition	718.96	719.14	ft
	Headwater elevation of inplace condition	718.99	719.17	ft
	Stage increase over inplace condition	(0.03)		ft
(6)	Velocity through structure	5.9		ft/s
(6)	Main channel velocity	2.8		ft/s
	Estimated preliminary pier scour depth	12		ft
	Estimated preliminary contraction scour depth	12		ft
	Estimated preliminary total scour at pier elevation	643.8	644	ft
	Other flood (50-year frequency)	85,300		ft^3/s
	Headwater elevation of the proposed condition	712.96	713.14	ft
	Headwater elevation of the inplace condition	713.0	713.18	Ft
	Stage increase over the inplace condition	(0.04), no increase		ft
	Mean velocity through structure	3.9		ft/s
	Main channel velocity	3.3		ft/s
(7)	Approximate flowline elevation	667.8	668.0	ft
	Skew	0		°
	Riprap size	N/A – abutments set well back from river.		

* Items to be shown on grading plan

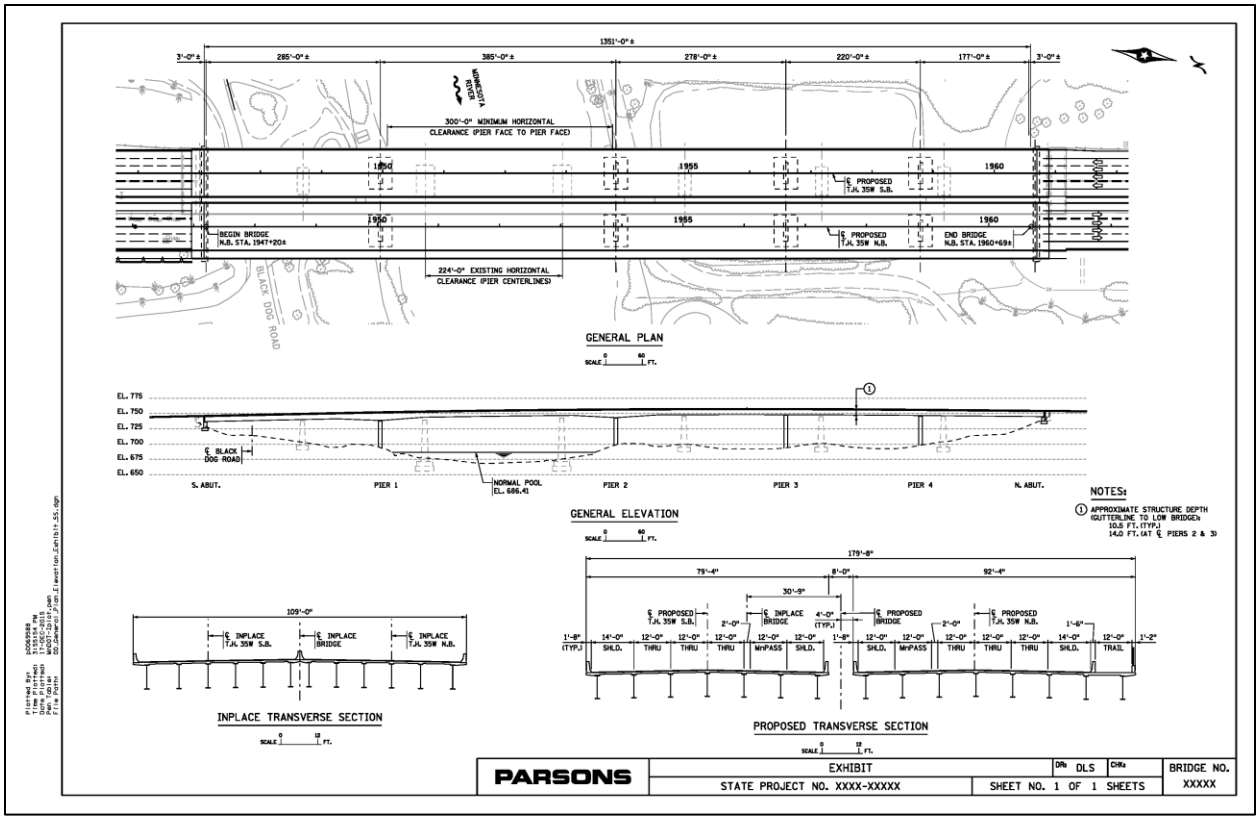
1) At this location, NAVD88 = NGVD29 + 0.18 ft, per correspondence with MnDOT Surveys, USACE, and US Coast Guard. See Appendix 5 for further information.
2) Flow at Jordan USGS gage on April 11, 1965. High water mark not recorded at I-35W during 1965 event.
3) Highwater Mark just upstream of I-35W (BR 5983) during April 1969 flood.
4) Road sag of the inplace roadway is 715.3 (NGVD29), so the roadway is just overtopping at the 100-yr event. The proposed roadway will be raised to be (at a minimum) 2-ft above the 100-yr water surface elevation.
5) Low member elevation should be set based on navigation requirements for the crossing, as prescribed by the US Coast Guard. Typical major river navigation requirements are 52 ft above the 2% flowline or 60 ft above the normal pool (whichever is greater).
    a. 2% flowline elevation for this location is 704.58 (NAVD88), see Appendix 5.
    b. Normal pool elevation for this location is 687.38 (NAVD88), see Appendix 5.
6) Velocities for 100-yr and OT event were reported from the SRH2D output, see Appendix 4 for more information.
7) From MnDOT Bathymetric survey on August 1, 2014, near centerline of inplace bridge.

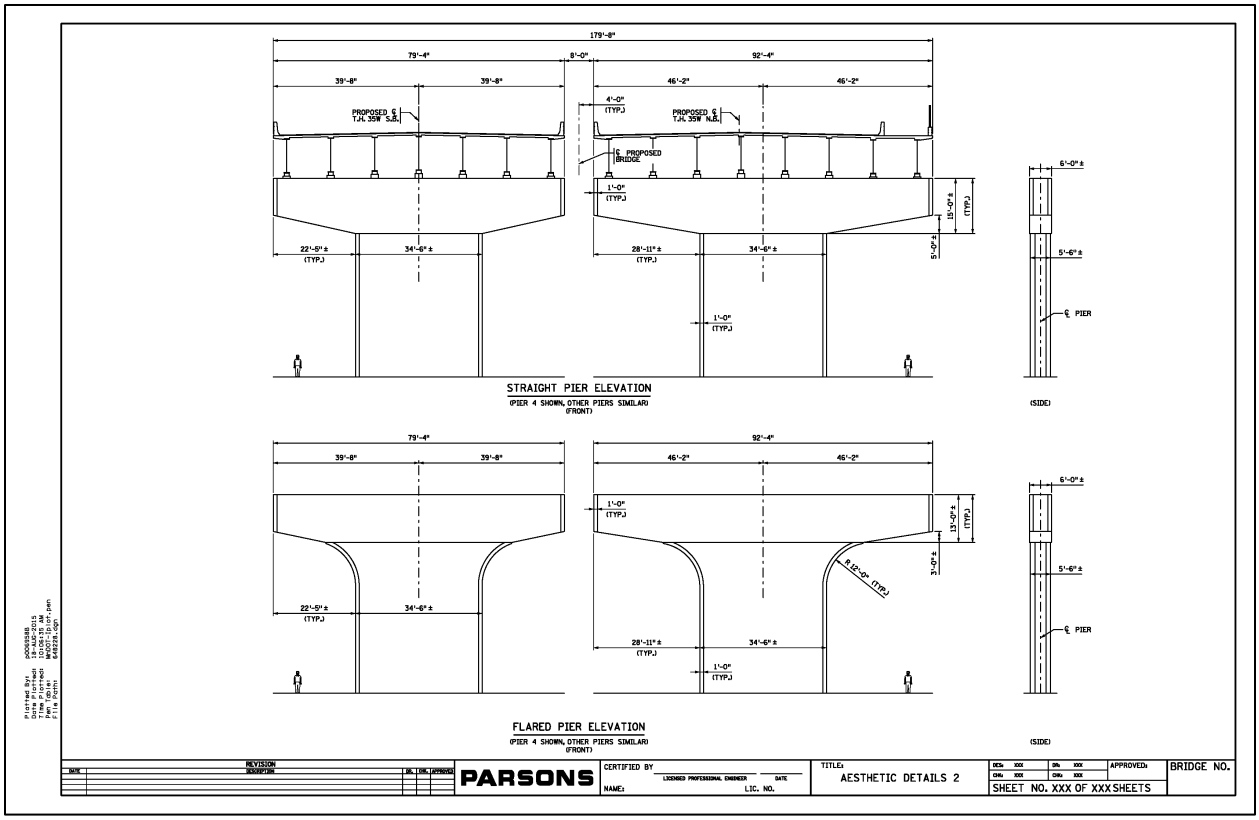
All Scour elevations are initial and were calculated using assumptions as to pier shape and type, and soil characteristics. A Hydraulic Scour Confirmation letter will be issued after reviewing the preliminary bridge plan and the foundations report to verify initial assumptions.

cc: B. Farraher – Acting State Bridge Engineer
A. Blanchard - Bridge Planning and Hydraulics Engineer
D. Prather – Acting Bridge Preliminary Design Engineer
B. Neuendorf - District Hydraulics Engineer
S. Pederson - District Project Manager
G. Person - Foundations
Z. Vue - State Program Administrator
P. Leete- DNR Liaison

Appendix 1

Proposed Bridge and Roadway Geometry


1351'-0" ±
3'-0" ±
285'-0" ±
385'-0" ±
278'-0" ±
220'-0" ±
177'-0" ±
3'-0" ±
MINNESOTA RIVER
300'-0" MINIMUM HORIZONTAL CLEARANCE (PIER FACE TO PIER FACE)
1950
1955
1960
℄ PROPOSED T.H. 35W S.B.
℄ PROPOSED T.H. 35W N.B.
BEGIN BRIDGE N.B. STA. 1947+20±
END BRIDGE N.B. STA. 1960+69±
224'-0" EXISTING HORIZONTAL CLEARANCE (PIER CENTERLINES)
BLACK DOG ROAD
GENERAL PLAN
SCALE 0 60 FT.
EL. 775
EL. 750
EL. 725
EL. 700
EL. 675
EL. 650
℄ BLACK DOG ROAD
NORMAL POOL EL. 686.4±
S. ABUT.
PIER 1
PIER 2
PIER 3
PIER 4
N. ABUT.
GENERAL ELEVATION
SCALE 0 60 FT.
NOTES:
1 APPROXIMATE STRUCTURE DEPTH (GUTTERLINE TO LOW BRIDGE): 10.5 FT. (TYP.) 14.0 FT. (AT ℄ PIERS 2 & 3)
109'-0"
℄ INPLACE T.H. 35W S.B.
℄ INPLACE BRIDGE
℄ INPLACE T.H. 35W N.B.
INPLACE TRANSVERSE SECTION
SCALE 0 12 FT.
179'-8"
79'-4"
8'-0"
92'-4"
30'-9"
℄ PROPOSED T.H. 35W S.B.
2'-0"
℄ INPLACE BRIDGE
4'-0" (TYP.)
℄ PROPOSED BRIDGE
2'-0"
℄ PROPOSED T.H. 35W N.B.
1'-6"
1'-8" (TYP.)
14'-0" SHLD.
12'-0" THRU
12'-0" THRU
12'-0" THRU
12'-0" MNPASS
12'-0" SHLD.
1'-8"
12'-0" SHLD.
12'-0" MNPASS
12'-0" THRU
12'-0" THRU
12'-0" THRU
14'-0" SHLD.
12'-0" TRAIL
1'-2"
PROPOSED TRANSVERSE SECTION
SCALE 0 12 FT.
PARSONS
EXHIBIT
DRN: DLS
CHK:
BRIDGE NO. XXXXX
STATE PROJECT NO. XXXX-XXXXX
SHEET NO. 1 OF 1 SHEETS

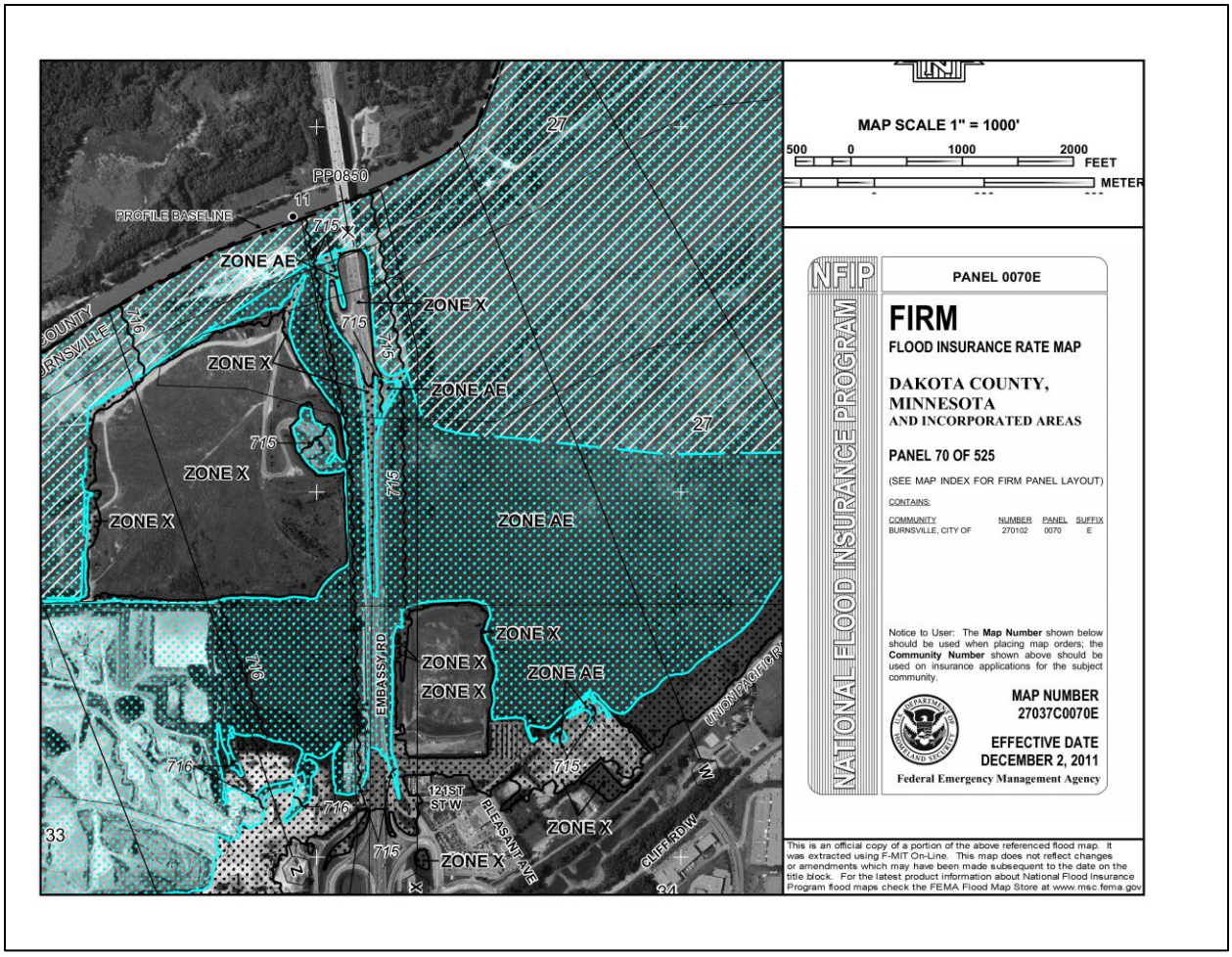

179'-8"
79'-4"
8'-0"
92'-4"
39'-8"
39'-8"
46'-2"
46'-2"
4'-0" (TYP.)
PROPOSED ℄ T.H. 35W S.B.
PROPOSED ℄ T.H. 35W N.B.
℄ PROPOSED BRIDGE
1'-0" (TYP.)
15'-0"± (TYP.)
5'-0"±
22'-5"± (TYP.)
34'-6"±
28'-11"± (TYP.)
34'-6"±
1'-0" (TYP.)
6'-0"±
5'-6"±
℄ PIER
STRAIGHT PIER ELEVATION
(PIER 4 SHOWN, OTHER PIERS SIMILAR)
(FRONT)
(SIDE)
79'-4"
39'-8"
39'-8"
92'-4"
46'-2"
46'-2"
1'-0" (TYP.)
13'-0"± (TYP.)
3'-0"±
R 12'-0" (TYP.)
22'-5"± (TYP.)
34'-6"±
28'-11"± (TYP.)
34'-6"±
1'-0" (TYP.)
6'-0"±
5'-6"±
℄ PIER
FLARED PIER ELEVATION
(PIER 4 SHOWN, OTHER PIERS SIMILAR)
(FRONT)
(SIDE)
REVISION
DATE
DESCRIPTION
PARSONS
CERTIFIED BY
LICENSED PROFESSIONAL ENGINEER
DATE
NAME:
LIC. NO.
TITLE:
AESTHETIC DETAILS 2
DES: XXX
DR: XXX
CHK: XXX
CHK: XXX
APPROVED:
SHEET NO. XXX OF XXX SHEETS
BRIDGE NO.

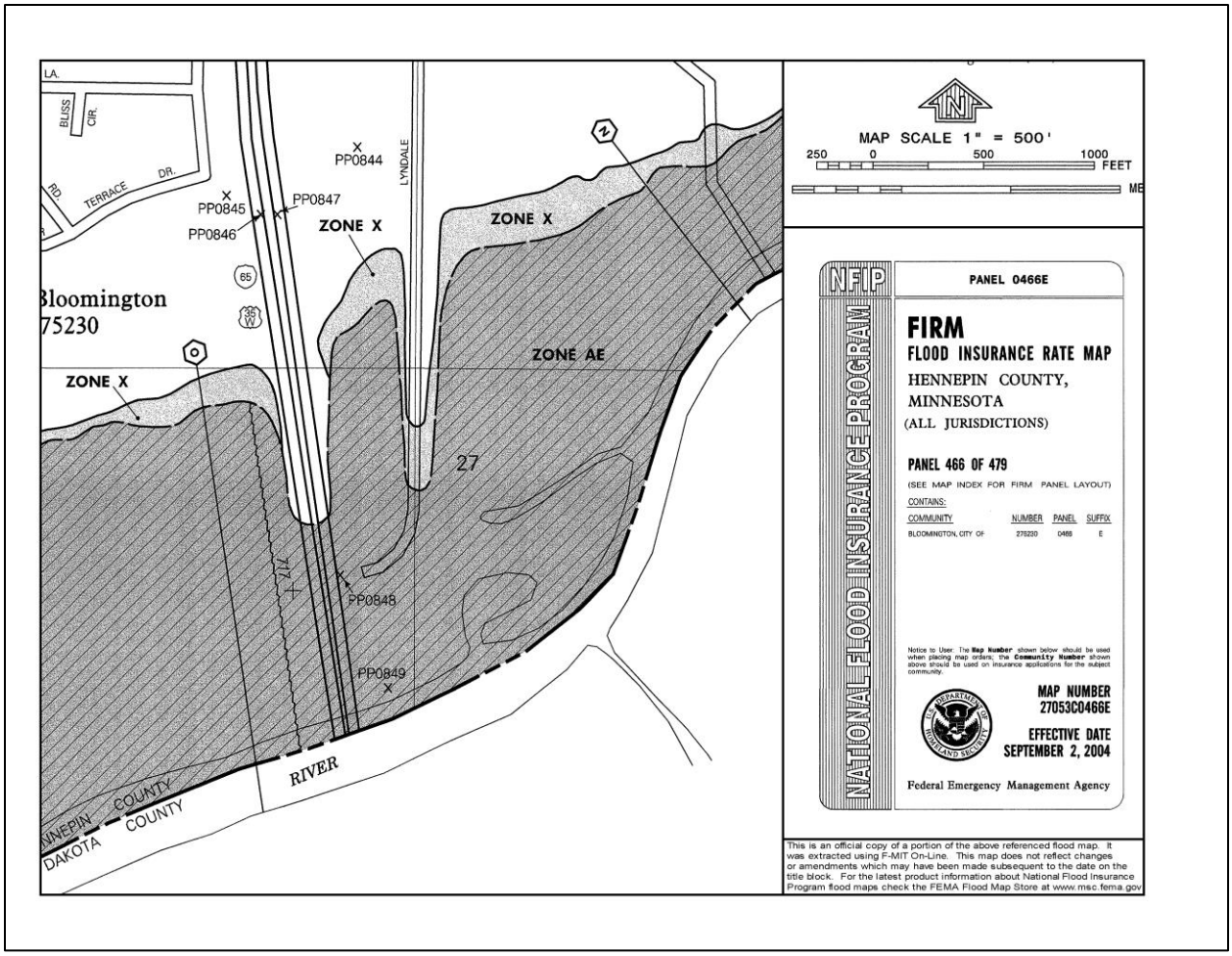
Appendix 2

Published FEMA Maps

and

No Rise Certificate


MAP SCALE 1" = 1000'
500 0 1000 2000 FEET
METER
PANEL 0070E
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
FIRM
FLOOD INSURANCE RATE MAP
DAKOTA COUNTY, MINNESOTA
AND INCORPORATED AREAS
PANEL 70 OF 525
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
BURNSVILLE, CITY OF 270102 0070 E
Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.
MAP NUMBER
27037C0070E
EFFECTIVE DATE
DECEMBER 2, 2011
Federal Emergency Management Agency
This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov
PP0850
11
PROFILE BASELINE
ZONE AE
ZONE X
715
716
27
33
34
EMBASSY RD
121ST ST W
PLEASANT AVE
CLIFF ROW
UNION PACIFIC RR


LA.
BLISS
CIR.
TERRACE
DR.
RD
PP0844
PP0845
PP0846
PP0847
PP0848
PP0849
LYNDALE
ZONE X
ZONE X
ZONE X
ZONE AE
65
Bloomington
75230
27
RIVER
DAKOTA COUNTY
MAP SCALE 1" = 500'
250 0 500 1000 FEET
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
PANEL 0466E
FIRM
FLOOD INSURANCE RATE MAP
HENNEPIN COUNTY, MINNESOTA
(ALL JURISDICTIONS)
PANEL 466 OF 479
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
BLOOMINGTON, CITY OF 275230 0466 E
Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.
MAP NUMBER
27053C0466E
EFFECTIVE DATE
SEPTEMBER 2, 2004
Federal Emergency Management Agency
This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

MINNESOTA "NO-RISE" CERTIFICATION

This is to certify that I am a duly qualified professional engineer licensed to practice in the State of Minnesota.

It is further to certify that the attached technical data supports the fact that the proposal to replace Bridge No. 5983 (Interstate 35W over Minnesota River at Bloomington, MN) will not impact the floodway width or 100-year flood elevation (will not raise by more than 0.00 feet) on the Minnesota River at published sections in the Flood Insurance Studies for Dakota and Hennepin Counties, dated December 2, 2011 and September 2, 2004 respectively. And will not impact the 100-year flood elevation (will not raise by more than 0.00 feet) at unpublished cross-sections in the vicinity of the proposed development / project.

Attached are the following documents that support my findings:

Waterway Analysis for Bridge No. 27W38 & 27W39 dated February 9, 2016

Date: February 9, 2016

Signature: Nicole Bartelt, License #46227

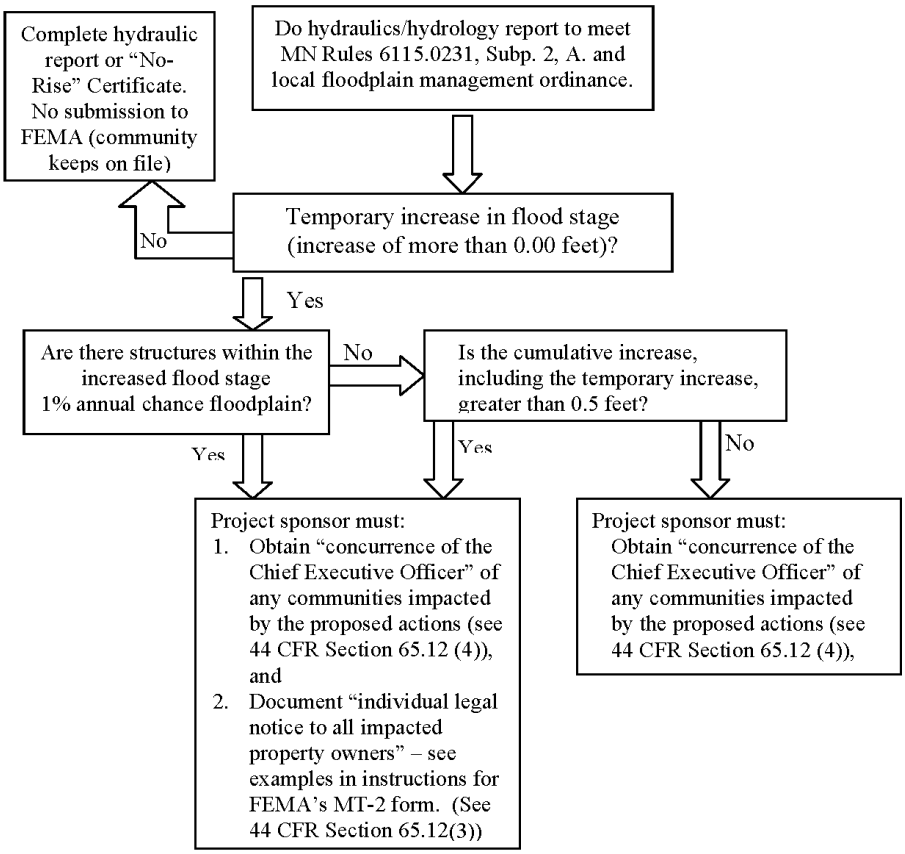
Title: Hydraulic Design Engineer, MnDOT

MN DNR Waters - 4/2/2004 revision

Appendix 3

Temporary Stage Increase Flowchart
(DNR Floodplain Unit Permit)

Bridges & Culverts
Temporary* (construction-related) stage increase in AE Zones

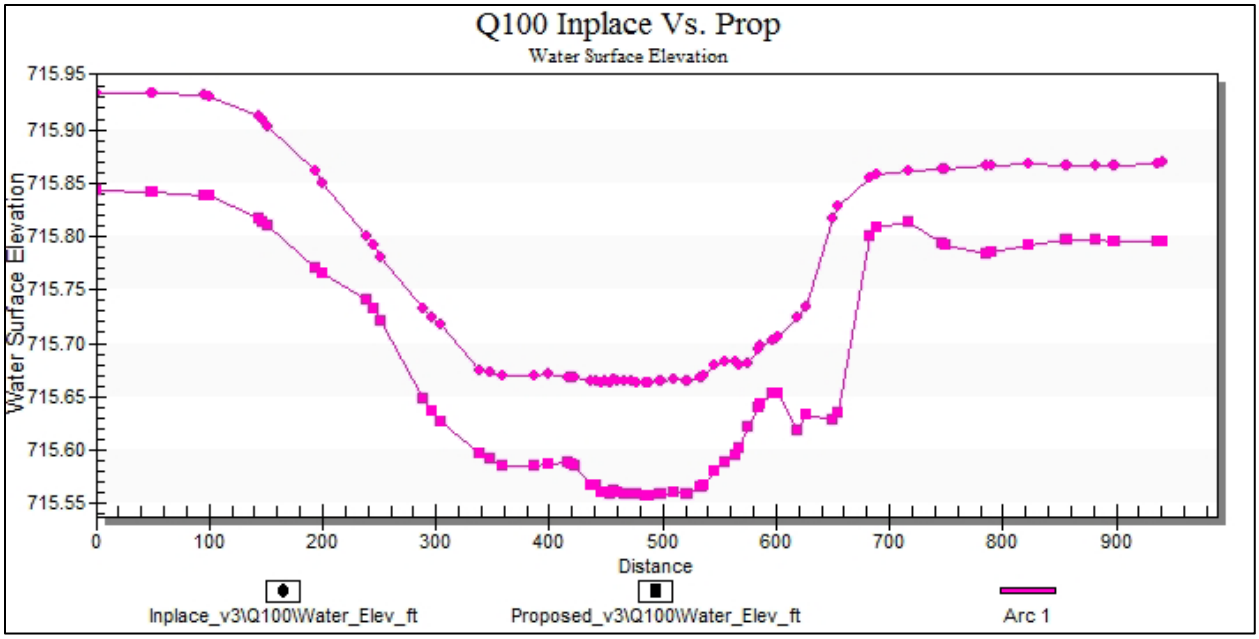


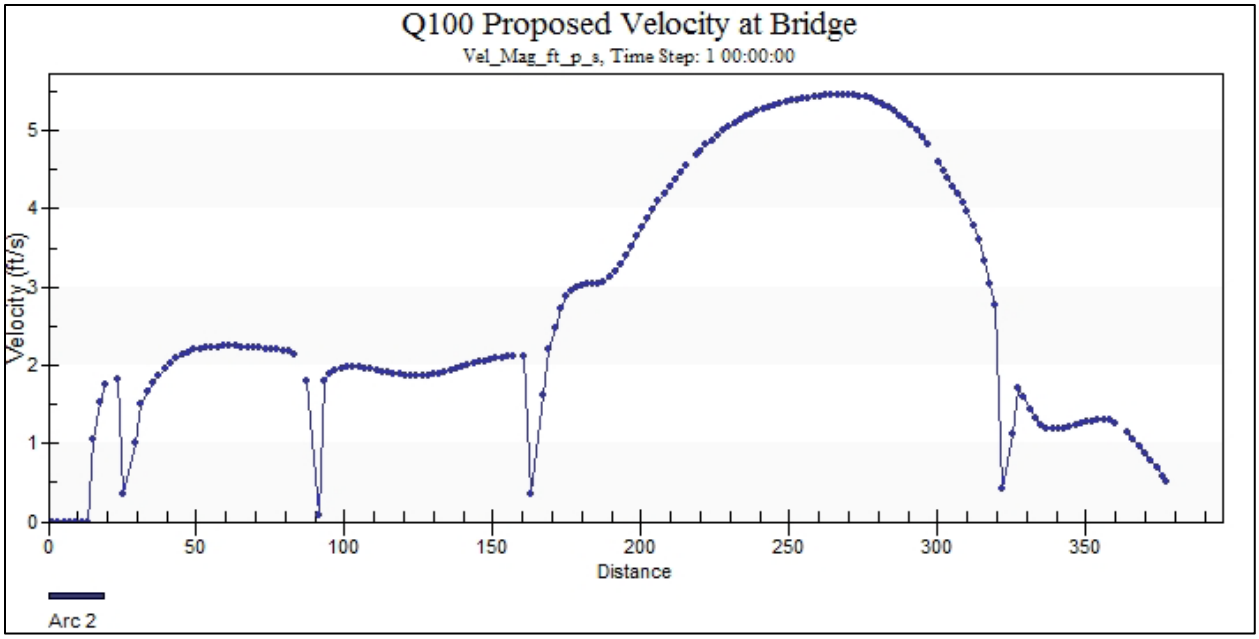
*"Temporary" is defined as less than one year

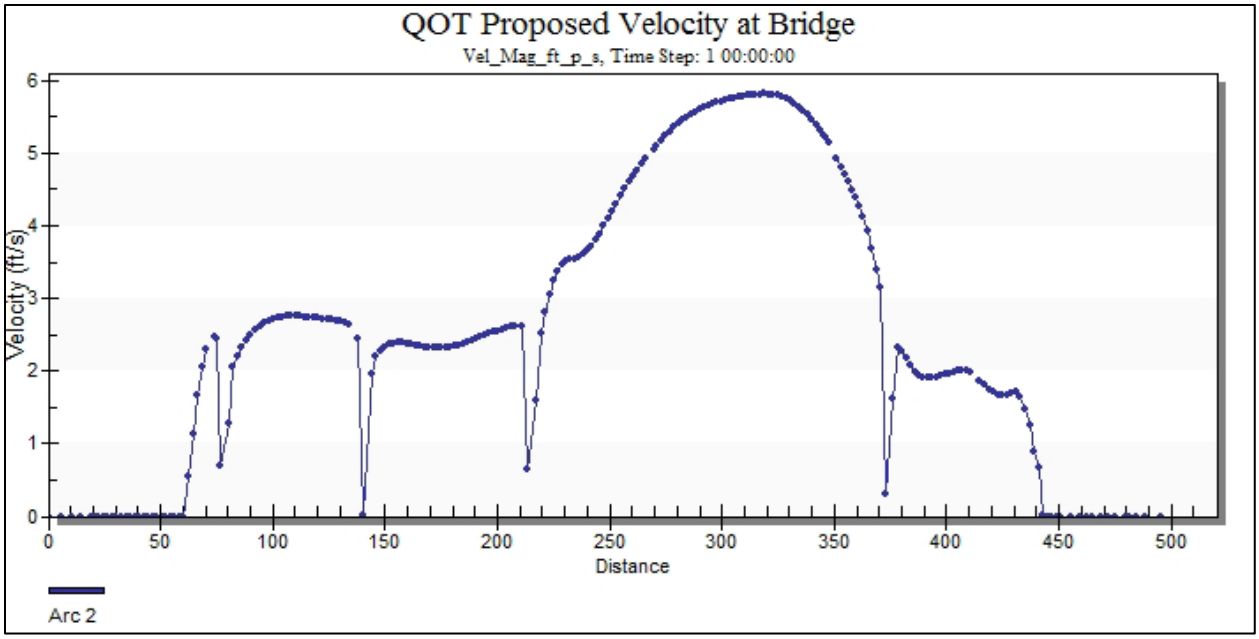
MN DNR Waters – CCS 2/9/2009 Revision

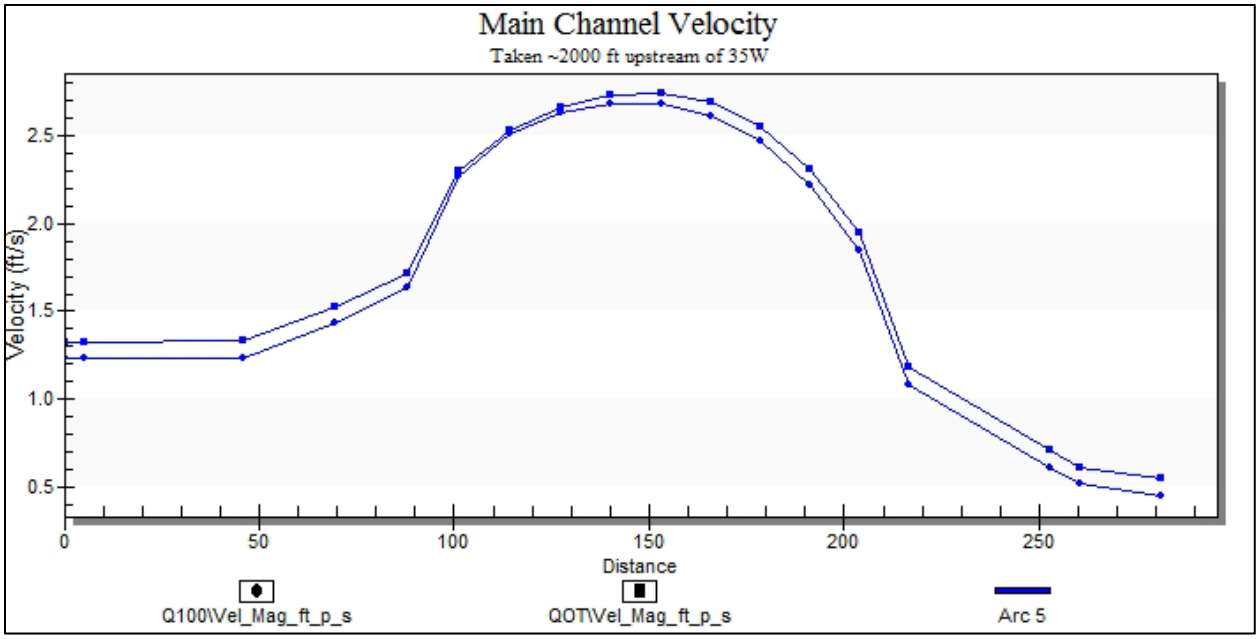
Appendix 4

SRH2D Model Output


Q100 Inplace Vs. Prop
Water Surface Elevation
Water Surface Elevation
715.95
715.90
715.85
715.80
715.75
715.70
715.65
715.60
715.55
0
100
200
300
400
500
600
700
800
900
Distance
Inplace_v3\Q100\Water_Elev_ft
Proposed_v3\Q100\Water_Elev_ft
Arc 1


Q100 Proposed Velocity at Bridge
Vel_Mag_ft_p_s, Time Step: 1 00:00:00
Velocity (ft/s)
0
1
2
3
4
5
0
50
100
150
200
250
300
350
Distance
Arc 2


QOT Proposed Velocity at Bridge
Vel_Mag_ft_p_s, Time Step: 1 00:00:00
Velocity (ft/s)
0
1
2
3
4
5
6
0
50
100
150
200
250
300
350
400
450
500
Distance
Arc 2


Main Channel Velocity
Taken ~2000 ft upstream of 35W
Velocity (ft/s)
2.5
2.0
1.5
1.0
0.5
0
50
100
150
200
250
Distance
Q100\Vel_Mag_ft_p_s
QOT\Vel_Mag_ft_p_s
Arc 5

Appendix 5

USCG River Elevation Information

From: Prather, Daniel (DOT)
To: Pedersen, Scott (DOT); Bartelt, Nicole (DOT); Crisp, Casey (DOT)
Subject: FW: SP1981-124; Minnesota River Bridge; Mile 10.8; 16591.1/10.8 MIN; TH35W over MN River at Hennepin and Dakota County line; Datum Conversion **FINAL**
Date: Wednesday, June 17, 2015 12:59:28 PM

A lot of emails were being relayed concerning this topic, so here is a clean resultant.

Daniel T. Prather
MnDOT Preliminary Bridge Plans Engineer
(651) 366-4457

From: Orzechowski, David A CIV [mailto:David.A.Orzechowski@uscg.mil]
Sent: Wednesday, June 17, 2015 12:24 PM
To: Prather, Daniel (DOT)
Subject: RE: SP1981-124; Minnesota River Bridge; Mile 10.8; 16591.1/10.8 MIN; TH35W over MN River at Hennepin and Dakota County line; Datum Conversion **FINAL**

Concur.

David

From: Prather, Daniel (DOT) [mailto:dan.prather@state.mn.us]
Sent: Wednesday, June 17, 2015 11:26 AM
To: Orzechowski, David A CIV
Subject: SP1981-124; Minnesota River Bridge; Mile 10.8; 16591.1/10.8 MIN; TH35W over MN River at Hennepin and Dakota County line; Datum Conversion **FINAL**

Mr. Orzechowski –

A discussed, here are the agreed upon datum conversions and design elevations for the I35W bridge over the Minnesota River.

- MSL 1912 – 0.465ft = NGVD29;
- NGVD29 + 0.182 = NAVD88;
- MSL 1912 – 0.283 = NAVD88

	MSL1912	NGVD29	NAVD88
Normal Pool	687.665	687.2	687.382
2% Flow Line	704.865	704.4	704.582
100YR Event	715.665	715.2	715.382
Pier Removal	673.065	672.6	672.782

There are no other recipients to this message, so please validate with USACE and provide concurrence.

Thank You.

Daniel T. Prather, P.E.
MnDOT Preliminary Bridge Plans Engineer
3485 Hadley Avenue North
Oakdale, MN 55128
W: (651) 366-4457
dan.prather@state.mn.us

Appendix J

Section 4(f) Involvement

Exhibit J1. DNR Letter (Page 1 of 6) (November 28, 2016)

Minnesota Department of Transportation
Metro District - 1500 W. County Road B-2
Roseville, MN 55113-3174

November 28, 2016

Ms. Rachel Hintzman
Area 3B Supervisor
Minnesota DNR Division of Parks and Trails
1200 Warner Road
St. Paul, MN 55106

Subject: State Project (S.P.) 1981-124
I-35W Bridge over the Minnesota River
MnDOT Bridge No. 5983 (Existing)
MnDOT Bridge No. 27W38 and MnDOT Bridge No. 27W39 (Proposed)
I-35W from 106th Street in Bloomington, Hennepin County, Minnesota to Cliff Road in Burnsville, Dakota County, Minnesota
Section 4(f) Temporary Occupancy of the Minnesota River State Water Trail

Dear Ms. Hintzman:

The Minnesota Department of Transportation (MnDOT) Metro District is preparing plans for reconstruction of the Interstate 35W (I-35W) Bridge over the Minnesota River (MnDOT Bridge No. 5983) in the cities of Bloomington and Burnsville, Hennepin and Dakota counties. See the attached map for the general project location. The proposed project includes replacement of the existing I-35W Minnesota River Bridge (MnDOT Bridge No. 5983) with two parallel steel girder bridges. Proposed MnDOT Bridge No. 27W38 (northbound I-35W) and proposed MnDOT Bridge No. 27W39 (southbound I-35W) would be constructed on a shifted alignment to the east of the existing bridge. On northbound I-35W, MnDOT proposes an extension of the existing northbound truck climbing lane from the Cliff Road entrance ramp to south of 106th Street. Additional project elements include drainage improvements, retaining walls, and trail construction. Construction of the proposed project would require temporary closures of the Minnesota River State Water Trail to boat and canoe traffic under the I-35W Minnesota River Bridge (River Mile 10.8(L)).

As per the Federal Register Rules and Regulations 23 CFR 774.13(d), this temporary closure of the Minnesota River State Water Trail may be considered a temporary occupancy of Section 4(f) lands. A temporary occupancy may not constitute a Section 4(f) use when all of the conditions are listed below are satisfied:

- The duration of the occupancy will be temporary in nature (i.e., less than the time needed for the construction of the project). *Construction of the I-35W Minnesota River Project is expected to last three years. Short duration closures of the Minnesota River State Water Trail at the I-35W Minnesota River Bridge are expected to allow for safe construction (i.e., erection of the steel superstructure).*

An Equal Opportunity Employer

Exhibit J1. DNR Letter (Page 2 of 6) (November 28, 2016)

Short duration closures are anticipated for the erection of the steel superstructure. No closures are anticipated for construction of the foundations and bridge piers. Approximately six to eight closures are likely during each construction season. Each closure is anticipated to last for approximately two days.

- There will be no change in ownership of the land. *No permanent right of way will be acquired from the DNR as part of the I-35W Minnesota River Bridge Project.*

- The scope of work to be performed will be minor (i.e., both the nature and magnitude of the changes to the Section 4(f) property are minimal). *There will be no changes to the Minnesota River State Water Trail as part of the I-35W Minnesota River Bridge Project.*

- There are no anticipated permanent adverse physical impacts nor will there be any interference with the activities or purposes of the property, on either a permanent or temporary basis. *MnDOT is proposing construction of two new bridges: one bridge for northbound I-35W and a second bridge for southbound I-35W. The existing I-35W Minnesota River Bridge piers would be removed from the Minnesota River. New bridge piers would be constructed along the right and left banks of the Minnesota River (see attached preliminary bridge plan).*

  Passage under the I-35W Minnesota River Bridge for recreational users would be temporarily prohibited during certain phases of the project as described above. MnDOT will coordinate with the DNR to identify locations for posting state water trail closure signs upstream and downstream of the I-35W Minnesota River Bridge (e.g., Russell A. Sorenson Landing). Information regarding timing and duration of closures will be provided to the DNR during construction for posting to the DNR's Minnesota River State Water Trail website at http://www.dnr.state.mn.us/watertrails/minnesotariver/index.html. Navigation along the Minnesota River State Water Trail upstream and downstream of the I-35W Minnesota River Bridge would be unaffected by the proposed project.

- The land being used will be fully restored to a condition that is at least as good as the condition that existed prior to the project. *MnDOT will remove the existing I-35W Minnesota River Bridge piers from the Minnesota River and restore the river bottom after the piers have been removed. All equipment and excess materials/soils will be removed and the river channel and adjacent shoreland areas will be restored prior to the end of construction. The proposed northbound and southbound I-35W bridges would span the Minnesota River, maintaining commercial and recreational navigation along the Minnesota River.*

Exhibit J1. DNR Letter (Page 3 of 6) (November 28, 2016)

Please review the attached figures and indicated your concurrence with the work proposed by signing below. Please forward the signed original back to me for our records. MnDOT will forward this information to the Federal Highway Administration (FHWA)-Minnesota Division for consideration with their Section 4(f) determination.

If you have any questions regarding this matter, please contact me at your earliest convenience at (651)234-7726. Thank you.

Sincerely,

Scott Pedersen, P.E.
Project Manager
MnDOT Metro District

I concur with the assessment of proposed impacts to the Minnesota River State Water Trail as described above.

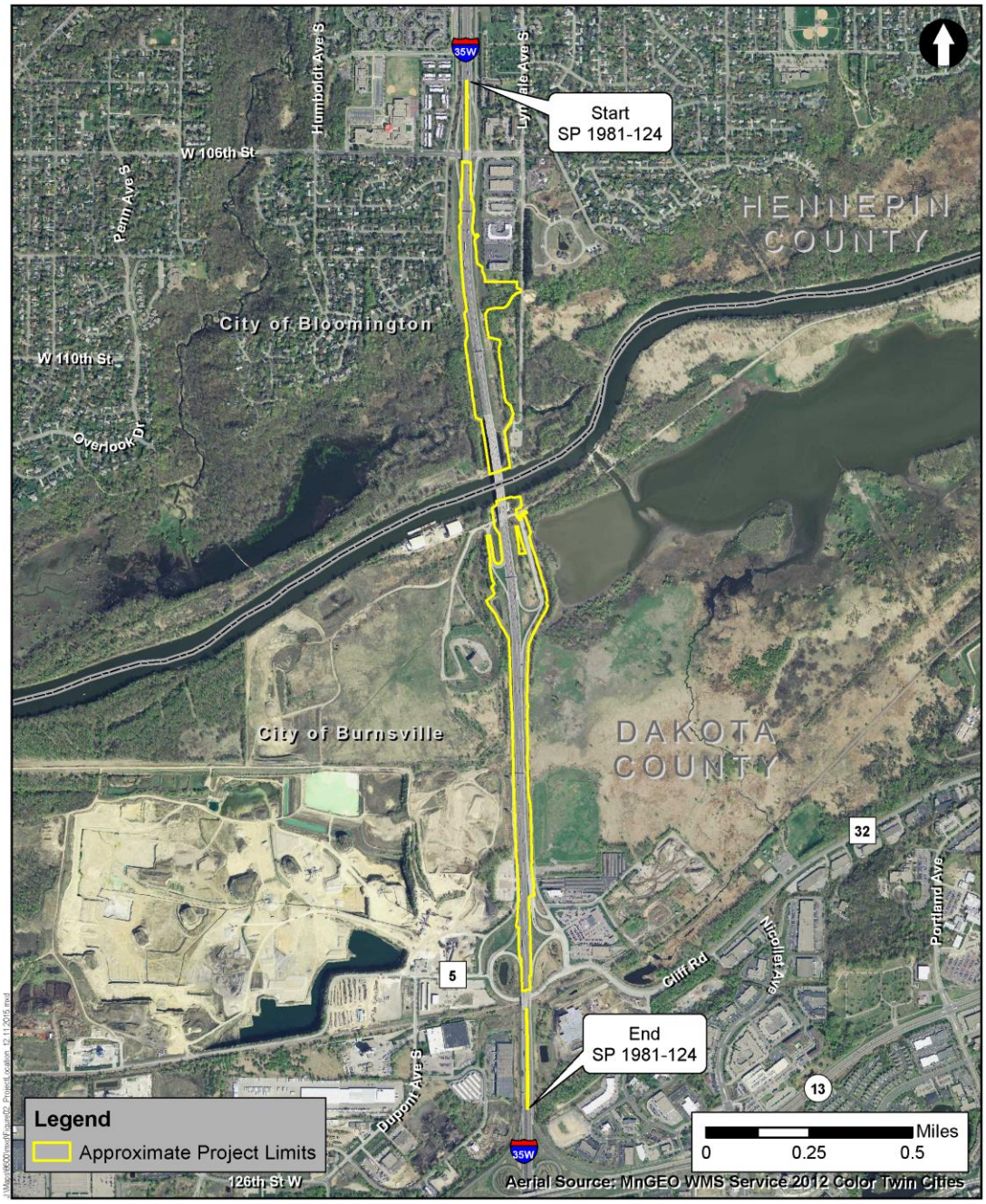
Rachel Hintzman
Area 3B Supervisor
Division of Parks and Trails

12/9/16
Date

Attachments: Project Location Map
Preliminary Bridge Plan (Sheet 1 of 10)
Minnesota River State Water Trail Map

cc: Kent Skaar, DNR Parks and Trails, Acquisition and Development
Erik Wrede, DNR Parks and Trails, Water Trails Coordinator
Peter Leete, Transportation Hydrologist, DNR-MnDOT Liaison
Rick Dalton, MnDOT Metro District
Deb Moynihan, MnDOT Office of Environmental Stewardship
Abbi Ginsburg, Federal Highway Administration

Exhibit J1. DNR Letter (Page 4 of 6) (November 28, 2016)



Project Location

I-35W Minnesota River Bridge
SP 1981-124
MnDOT

Figure A.2

Exhibit J1. DNR Letter (Page 5 of 6) (November 28, 2016)

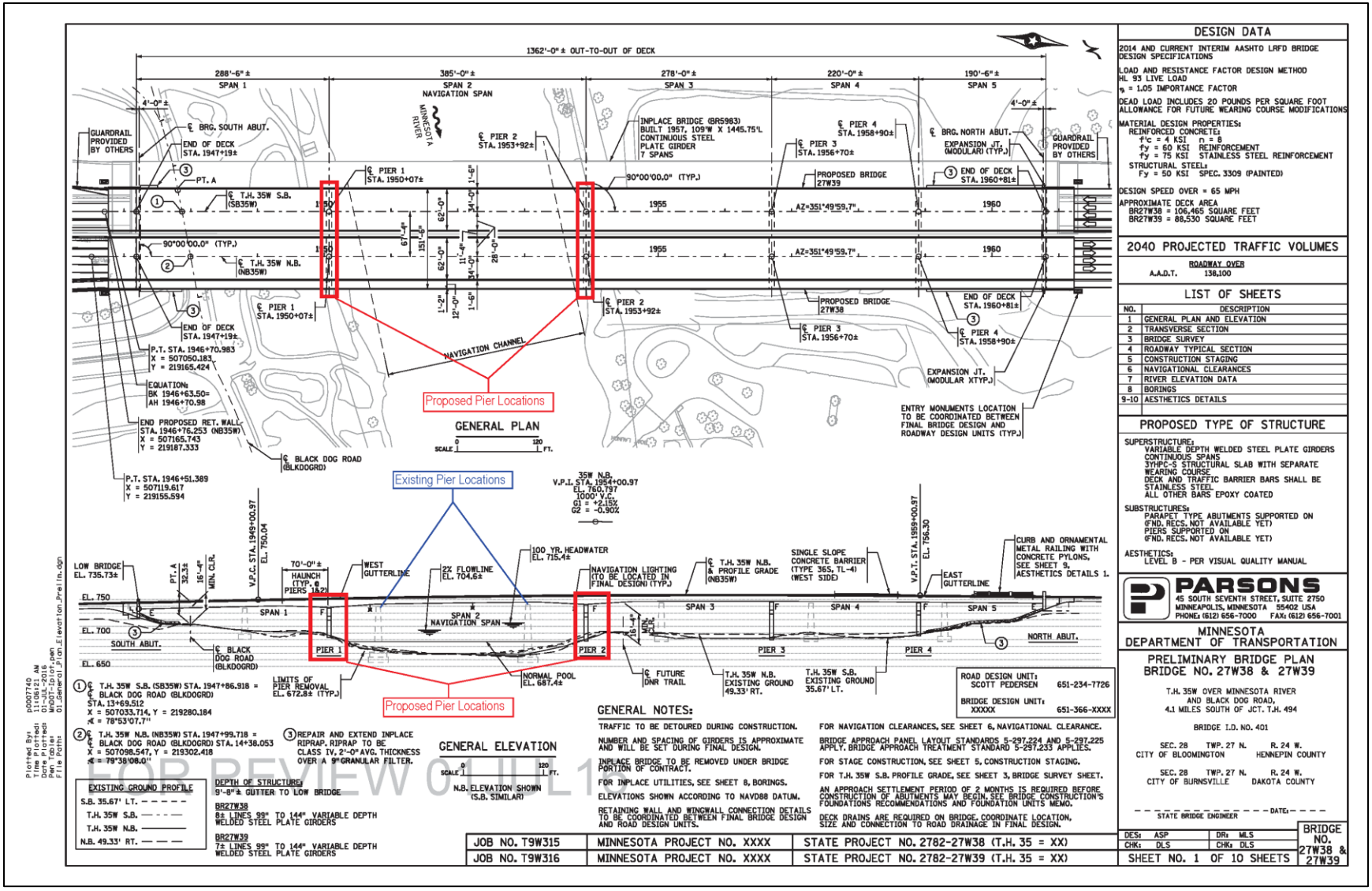


Exhibit J1. DNR Letter (Page 6 of 6) (November 28, 2016)

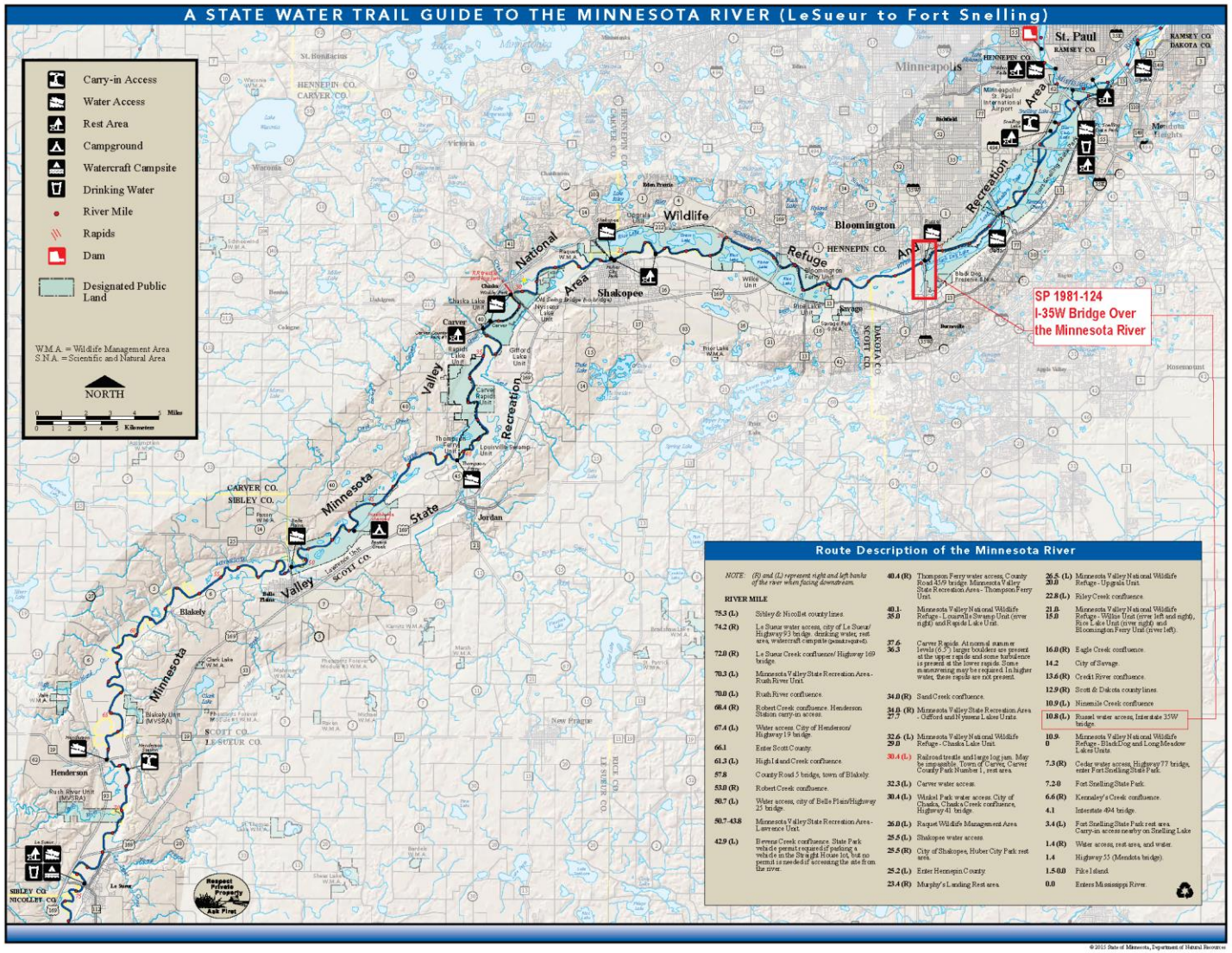


Exhibit J2. City of Bloomington Letter (Page 1 of 5) (October 17, 2016)

Minnesota Department of Transportation
Metro District - 1500 W. County Road B-2
Roseville, MN 55113-3174

October 17, 2016

Ms. Diann Kirby
Community Services Director
City of Bloomington
1800 West Old Shakopee Road
Bloomington, MN 55431

Subject: State Project (S.P.) 1981-124
I-35W Bridge over the Minnesota River
MnDOT Bridge No. 5983 (Existing)
MnDOT Bridge No. 27W38 and MnDOT Bridge No. 27W39 (Proposed)
On I-35W from 106th Street in Bloomington, Hennepin County, Minnesota to Cliff Road in Burnsville, Dakota County, Minnesota
Section 4(f) Temporary Occupancy of the City of Bloomington Trail

Dear Ms. Kirby:

The Minnesota Department of Transportation (MnDOT) Metro District is preparing plans for reconstruction of the Interstate 35W (I-35W) Bridge over the Minnesota River (MnDOT Bridge No. 5983). The existing I-35W Minnesota River Bridge would be removed and replaced with two new structures on an alignment shifted to the east of the existing bridge. On northbound I-35W, MnDOT is also proposing an extension of the existing northbound truck climbing lane from the Cliff Road entrance ramp in Burnsville to south of 106th Street in Bloomington. Additional project elements include drainage improvements, retaining walls, and trail construction.

The City of Bloomington maintains and operates an existing off-road unpaved trail that crosses through MnDOT right of way under the I-35W Minnesota River Bridge along the north bank of the Minnesota River. Removal of the existing I-35W Minnesota River Bridge and construction of the new northbound and southbound I-35W Minnesota River bridges would require a temporary closure of the City's trail. The Russell A. Sorenson landing and trailhead facility east of the I-35W Minnesota River Bridge will remain open throughout project construction.

As per the Federal Register Rules and Regulations 23 CFR 774.13(d), this temporary closure of the City of Bloomington Trail may be considered a temporary occupancy of Section 4(f) lands. A temporary occupancy may not constitute a Section 4(f) use when all of the conditions are listed below are satisfied:

An Equal Opportunity Employer

Exhibit J2. City of Bloomington Letter (Page 2 of 5) (October 17, 2016)

- The duration of the occupancy will be temporary in nature (i.e., less than the time needed for the construction of the project). *Construction of the I-35W Minnesota River Project is expected to last three years. The City of Bloomington Trail crossing through I-35W right of way under the new Minnesota River bridges will be opened prior to the end of project construction.*

- There will be no change in ownership of the land. *No permanent right of way will be acquired from the City of Bloomington Trail facility as part of the I-35W Minnesota River Bridge Project.*

- The scope of work to be performed will be minor (i.e., both the nature and magnitude of the changes to the Section 4(f) property are minimal). *There will be no changes to the City of Bloomington Trail alignment through I-35W right of way.*

- There are no anticipated permanent adverse physical impacts nor will there be any interference with the activities or purposes of the property, on either a permanent or temporary basis. *MnDOT is proposing to keep the trail open during project construction by utilizing a trail detour (see attached). Signs notifying trail users of the closure and detour route will be provided during project construction. A final detour route will be identified during final design in consultation with the City of Bloomington.*

- The land being used will be fully restored to a condition that is at least as good as the condition that existed prior to the project. *The City of Bloomington Trail will be fully restored to its existing condition.*

Please review the attached figures and indicate your concurrence with the work proposed by signing below. Please forward the signed original back to me for our records. MnDOT will forward this information to the Federal Highway Administration (FHWA)-Minnesota Division for consideration with their Section 4(f) determination.

If you have any questions regarding this matter, please contact me at your earliest convenience at (651)234-7726. Thank you.

Sincerely,

Scott Pedersen, P.E.
Project Manager
MnDOT Metro District

Exhibit J2. City of Bloomington Letter (Page 3 of 5) (October 17, 2016)

I concur with the assessment of proposed impacts to the City of Bloomington trail under the I-35W Minnesota River Bridge as described above.

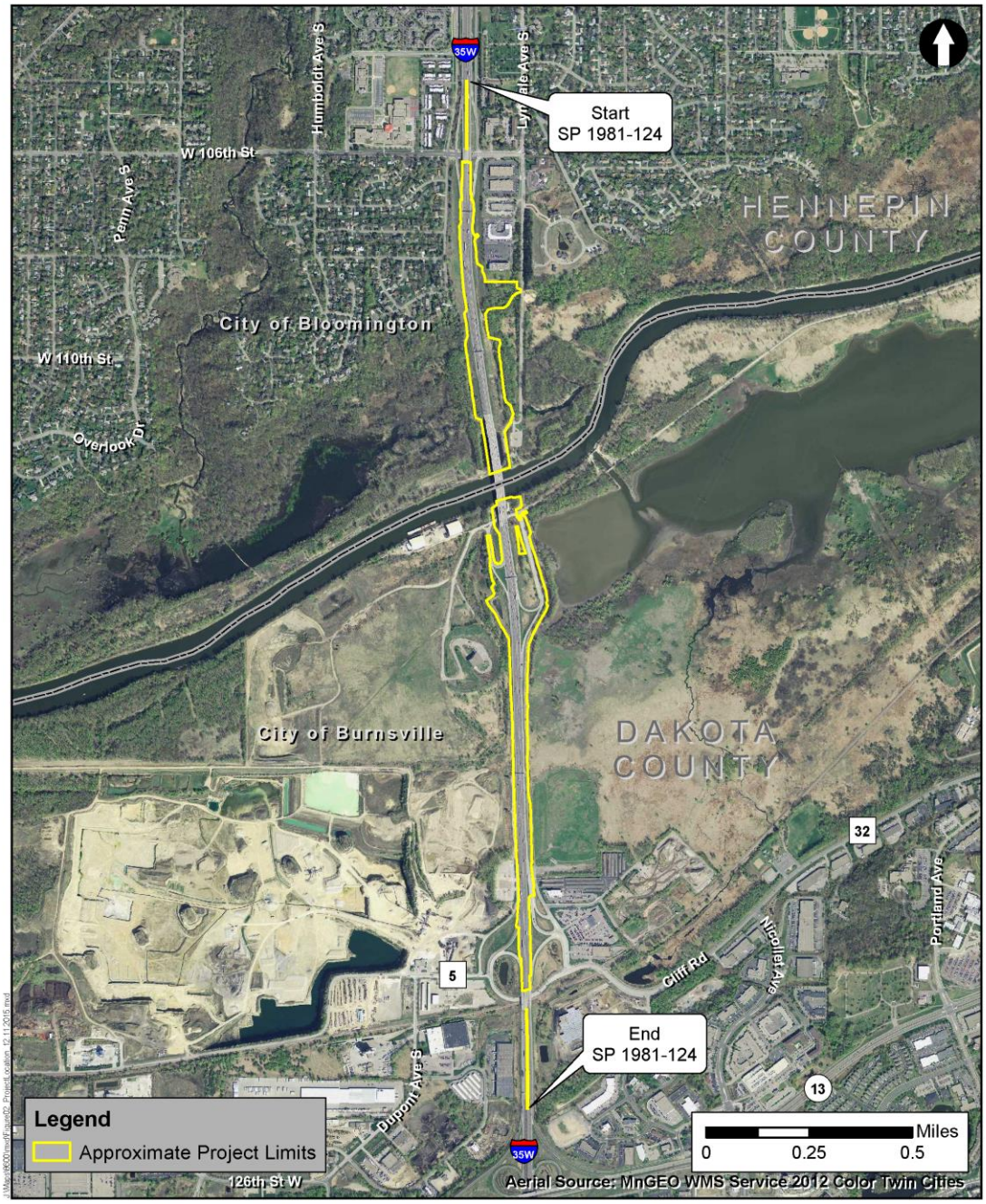
Diann Kirby
Community Services Director
City of Bloomington

12-30-16
Date

Attachments: Project Location Map
City of Bloomington. Active Living Biking and Hiking Guide.

cc: Shelly Hanson, Engineer, City of Bloomington
Rick Dalton, MnDOT Metro District
Deb Moynihan, MnDOT Office of Environmental Stewardship
Abbi Ginsburg, Federal Highway Administration

Exhibit J2. City of Bloomington Letter (Page 4 of 5) (October 17, 2016)



Project Location

I-35W Minnesota River Bridge
SP 1981-124
MnDOT

Figure A.2

Exhibit J2. City of Bloomington Letter (Page 5 of 5) (October 17, 2016)

Appendix K

Wetland Impact Assessment and Two-Part Finding

Office of Environmental Stewardship
395 John Ireland Blvd.
St. Paul, MN 55155

June 2017

Wetland Impact Assessment & Two Part Finding Form

S.P. Number: 1981-124
Project Name: I-35W Over the Minnesota River

Counties: Dakota and Hennepin
Watershed: Minnesota River - Shakopee

Wetland Assessment

The Interstate 35W (I-35W) Over the Minnesota River Project is in the City of Burnsville, Dakota County and the City of Bloomington, Hennepin County, Minnesota. The project begins at the I-35W/Cliff Road interchange and ends at the I-35W/West 106th Street interchange. See attached Project Location Map.

The primary purpose of the project is to provide a structurally sound bridge crossing of the Minnesota River in the I-35W corridor between the cities of Burnsville and Bloomington, Minnesota, In addition, the project needs to provide a structurally sound crossing of West 106th Street, maintain traffic to the maximum extent possible during construction, be capable of accommodating additional capacity on the I-35W Minnesota River Bridge in the future, address traffic operations and safety needs on northbound I-35W, and accommodate non-motorized connections across the Minnesota River.

The primary need for the project is to provide structurally sound bridge crossing over the Minnesota River within the I-35W corridor. The existing I-35W Minnesota River Bridge was constructed in 1957. At 60 years old, the I-35W Minnesota River Bridge is reaching the end of its useful life. In addition to the I-35W Minnesota River crossing needs, MnDOT has identified several secondary needs for the project, including:

- Provide a structurally sound bridge crossing over West 106th Street within the I-35W corridor;
- Maximize maintenance of traffic during construction;
- Not preclude future river crossing capacity (beyond year 2040);
- Improve safety and traffic operations on northbound I-35W during the morning peak period;
- Improve non-motorized (pedestrian and bicycle) connectivity across the Minnesota River; and
- Address roadway flood hazard conditions.

The proposed project would replace the existing I-35W Minnesota River Bridge with two new parallel, steel girder bridges (one for northbound I-35W and one for southbound I-35W). The two new bridges would be constructed on an alignment shifted to the east of the existing bridge. The project includes construction of a trail along the east side of the northbound I-35W Bridge with connections to Black Dog Road and Lyndale Avenue South.

The proposed project would reconstruct I-35W south of the Minnesota River Bridge, raising the roadway grade and providing approximately two feet of freeboard above the 100-year flood elevation. Raising the roadway grade reduces the susceptibility of I-35W to Minnesota River flood events. An additional lane would be constructed on northbound I-35W between Cliff Road and the existing truck climbing lane south of West 106th Street. The existing I-35W bridges over West 106th Street in Blooming would be replaced with a new single structure that would span West 106th Street, and the south ramps at the I-35W/West 106th Street interchange would be reconstructed.

A wetland delineation was completed for the project in July and August 2016. A total of 24 aquatic resources or portions thereof were identified in the investigation area, including 12 wetlands. The attached Wetland Map illustrates the location of wetlands in the project area.

On this project, most impacts to wetlands would occur where I-35W is shifted to the east to accommodate construction of the new Minnesota River Bridge. Other aquatic resources (Minnesota River, stormwater basins) would also be temporarily impacted during construction the new bridge over the Minnesota River.

See Table 1. Wetland Assessment

See attached Wetland Map

Part 1: Avoidance Alternatives

No- Build Alternative

This alternative would avoid all wetland impacts (except those due to routine maintenance), but would fail to meet the project purpose and need. It was therefore rejected from further consideration.

Alternatives Considered

The I-35W project corridor is in the Minnesota River Valley. The Minnesota River Valley National Wildlife Refuge, including the Russell A. Sorenson landing, is on the east side of I-35W north and south of the Minnesota River. The City of Bloomington's Minnesota River Valley Park is on the west side of I-35W, north of the Minnesota River. South of the Minnesota River, I-35W crosses through Minnesota River floodway and floodplain. The Freeway Sanitary Landfill, a superfund site with active remediation and known groundwater contamination, is on the west side of I-35W south of the Minnesota River. Wetlands are located adjacent to the existing roadway alignment and the I-35W right of way limits.

Because of these constraints, there are no practicable alternatives to relocate or realign the roadway to avoid wetland impacts. Relocating the roadway alignment outside of MnDOT right of way to the east would impact the Minnesota Valley National Wildlife Refuge and associated wetlands. Relocating the roadway alignment outside

of MnDOT right of way to the west would place the roadway in the Freeway Sanitary Landfill, a property with contaminated soils and groundwater. Shifting the roadway alignment to avoid wetland impacts on one side of the roadway would result in wetland impacts on the other side of the roadway. Therefore, there is no practicable alternative to avoid wetland impacts.

Two alignment alternatives within existing MnDOT right of way were evaluated for the project: on existing alignment and east shifted alignment. Both alignment alternatives would result in wetland impacts. The east shifted alignment alternative was identified as the preferred alternative for the project, in part because this alternative would result in fewer wetland impacts. The alternatives evaluation process is described in Chapter 4 of the Environmental Assessment.

Wetland Impacts of Preferred Alternative

Table 1 below identifies the anticipated wetland impacts for the preferred alternative concept. Anticipated impacts are based on the preliminary construction limits for the preferred alternative. The preferred alternative preliminary construction limits reflect design refinements since completion of the alternatives evaluation described in Chapter 4 of the Environmental Assessment. Table 1 also identifies other aquatic resource impacts (e.g., tributary, wet ditch) for the preferred alternative concept that have been quantified since completion of the alternatives evaluation. The preferred alternative is anticipated to result in approximately 0.61 acres of permanent aquatic resource impacts, including: 0.30 acres of wetland impacts, 0.15 acres of tributary impacts, and 0.16 acres of wet ditch impacts. Temporary impacts to other aquatic resources (e.g., Minnesota River, stormwater basins) would be identified as part of the final design process.

Table 1. Wetland Assessment

	Wetlands and Other Aquatic Resources Located within and adjacent to MnDOT Right of Way		**Wetland and Other Aquatic Resource Impacts of the Preferred Alternative**		
Wetland ID	**Classification [1]** (Type of wetland)	**Approximate Basin Size** (Acres)	**Impact Duration** Permanent(P) Temporary (T)[2]	**Type of Impact** (fill, excavate, drain, remove vegetation, no impact)	**Size of Impact [3]** (Acres)
1	Wetland	12.11	N/A	No Impact	0
1	Tributary	0.14	N/A	No Impact	0
2	Wetland	2.45	N/A	No Impact	0
2	Tributary	0.12	N/A	No Impact	0
3	Wetland	0.18	N/A	No Impact	0

	Wetlands and Other Aquatic Resources Located within and adjacent to MnDOT Right of Way		Wetland and Other Aquatic Resource Impacts of the Preferred Alternative		
Wetland ID	**Classification** [1] (Type of wetland)	**Approximate Basin Size** (Acres)	**Impact Duration** Permanent(P) Temporary (T)[2]	**Type of Impact** (fill, excavate, drain, remove vegetation, no impact)	**Size of Impact** [3] (Acres)
3	Tributary	3.30	N/A	No Impact	0
4	Wetland	0.10	N/A	No Impact	0
4	Tributary	0.11	P	Fill	16 sf
5	Wetland	0.27	N/A	No Impact	0
5	Tributary	0.15	P	Fill	0.15
6	Wetland	6.33	P	Fill	0.04
7	Wetland	0.09	N/A	No Impact	0
8	Wetland	0.35	P	Fill	0.13
9	Wetland	1.07	P	Fill	0.06
10	Wetland	319.60	N/A	No Impact	0
11	Wetland	335.50	P	Fill	0.07
12	Wetland	159.33	N/A	No Impact	0
Ditch 1	Wet Ditch	0.16	P	Fill	0.16
Minnesota River	Tributary	56.77	T	Fill	To Be Determined
Unknown (SP 2782-250	Stormwater Basin	2.91	T	Fill	To Be Determined

	Wetlands and Other Aquatic Resources Located within and adjacent to MnDOT Right of Way		Wetland and Other Aquatic Resource Impacts of the Preferred Alternative		
Wetland ID	**Classification** [1] (Type of wetland)	**Approximate Basin Size** (Acres)	**Impact Duration** Permanent(P) Temporary (T)[2]	**Type of Impact** (fill, excavate, drain, remove vegetation, no impact)	**Size of Impact** [3] (Acres)
Unknown (SP 2782-250	Stormwater Basin	2.91	P	Excavate	To Be Determined
Mud Pond (SP 1981-108)	Stormwater Basin	0.27	P	Excavate	To Be Determined
Black Dog Pond (SP 1981-114)	Stormwater Basin	0.73	P	Excavate	To Be Determined
Unknown (City Pond)	Stormwater Basin	1.09	N/A	No Impact	0
Unknown (SP 1981-97)	Stormwater Basin	0.37	N/A	No Impact	0
				Total Permanent Impacts:	**0.61**

[1] Denote if a wet-ditch
[2] Temporary impacts typically last between 90 and 180 days.
[3] Impacts less than 0.01 acre should be reported in square feet. Impacts greater than 0.01 acre should be reported as acres and rounded to the nearest 0.01 acre.

PART 2: WETLAND MINIMIZATION MEASURES

Minimization Measures

It was not feasible to completely avoid all wetland impacts/encroachments resulting from this roadway improvement. Wetland impacts/encroachments that are unavoidable have been minimized to the extent practicable without compromising safety. The preferred alternative design refinement process, which included measures to minimize wetland impacts/encroachments, is described in detail in Chapter 4 of the Environmental Assessment. The following design measures were used to minimize wetland impacts. The overall wetland impact from this project has been reduced from approximately 5 acres (before minimization measures) to approximately 0.6 acres (with minimization measures).

- Steeper inslopes (1:4 or steeper)
- Narrow inside shoulders and lane widths
- Retaining walls
- Adjusting trail alignments
- Locating proposed pretreatment pond and filtration basin in an upland area along the Minnesota River bluff

Compensation (Replacement/Enhancements)

Application for wetland permits will be made to the appropriate agencies with wetland jurisdiction. Wetland mitigation is an on-going development during early stages of project design, and therefore subject to change. The preferred method of wetland replacement is to use established, federally and state approved wetland bank credits. Efforts will be made to replace wetland losses within the bank service area of the wetland impact. It is anticipated that wetlands will be replaced at a 2:1 ratio within Bank Service Area 9 (BSA 9). The specific wetland bank credits will be determined through consultation with the Army Corps of Engineers and the Office of Environmental Stewardship (OES).

Conclusion

In accordance with Executive Order 11990, based upon the above factors and considerations, it is determined that there is no practicable alternative to the proposed construction in the identified wetlands, and that the proposed action includes all practicable measures to minimize harm to the wetlands.

Based on the findings of 0.30 acres of permanent wetland impacts, 0.16 wet ditch impacts, and 0.15 tributary impacts, it is anticipated that the project qualifies for the following Army Corps of Engineers permit category Regional General Permit-RPG-004. However, this finding is subject to change as continued coordination occurs with the US Army Corps of Engineers as the permitting processes proceeds.

ATTACHMENTS

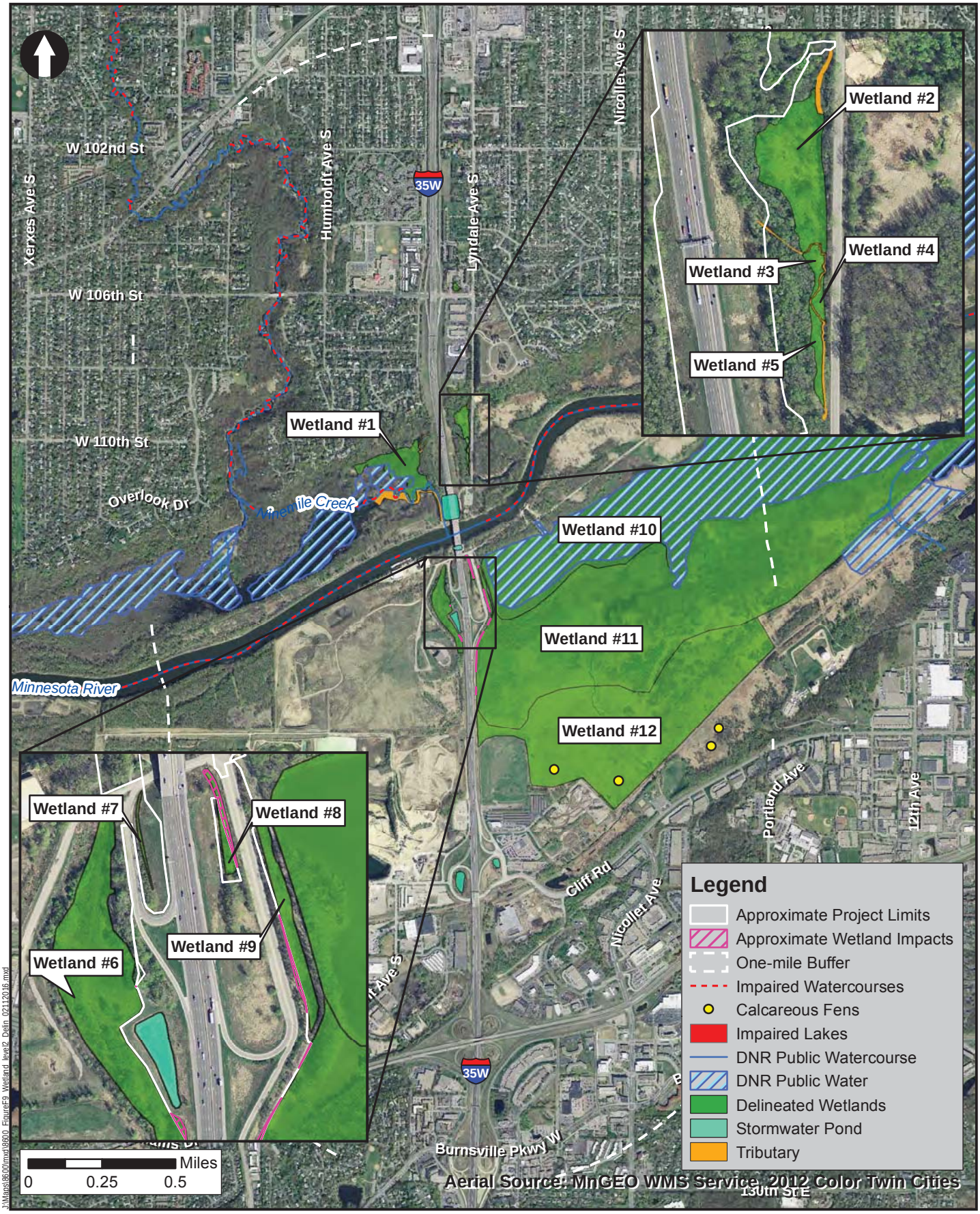
Project Location Map

Wetland Map

Project Location

I-35W over the Minnesota River
SP 1981-124
MnDOT

Figure 1



Wetland Review

I-35W over the Minnesota River
SP 1981-124
MnDOT

Figure 2

Appendix L

List of Commitments

Table L.1 List of Commitments (Standard Mitigation Measures)

Mitigation Measure	MnDOT Standard Specification	Status Update Description	Status Update Date	Completion Date	Signed Off By
Utilities					
Provide early notice to utility operators and facilitate coordination.	2545				
Water Resources					
Erosion control/ construction BMPs. Redundant erosion control measures as required by NPDES Permit and DNR Public Waters Work Permit.	2573				
Turbidity controls during construction.	2573				
Stormwater conveyance/treatment and spill containment provisions.	2503				
Comply with NPDES permit for construction activity.	2573				
Fish, Wildlife, Plant Communities, and Sensitive Ecological Resources					
Incorporate fish spawning restriction dates (i.e., no in water activity between March 15 and June 15) into the construction schedule.	Not applicable				
Follow DNR's Best Practices for Meeting	Not applicable				

Mitigation Measure	MnDOT Standard Specification	Status Update Description	Status Update Date	Completion Date	Signed Off By
General Public Waters Work Permit (GP 2004-0001).					
Noise					
Follow standard MnDOT construction noise practices.	2422				
Vegetation					
Re-vegetation and stabilization of disturbed areas.	2575				
Air Quality					
Implement dust control BMPs.	2130				
Contamination and Hazardous Materials					
Handle regulated materials/wastes per management plan, special provisions, and MnDOT guidance documents.	2103				
Removal and disposal of regulated materials. Regulated materials managed according to 2104 of special provisions.	2104				
Accessibility					
Design and construct all trail facilities following MnDOT accessibility guidelines.	Not applicable				

Table L.2 List of Commitments (Project-Specific Mitigation Measures)

Mitigation Measure	Status Update Description	Status Update Date	Completion Date	Signed Off By
Drainage Spread				
Modify I-35W Concept of Operations. Use dynamic message signs (DMS) on northbound and southbound I-35W to indicate closures on Minnesota River Bridge when spread encroaches into the adjacent MnPASS lanes and the MnPASS lanes are not available.				
Aquatic Resources				
Implement wetland minimization measures: • Steeper inslopes (1:4 or steeper). • Narrow inside shoulders and lane widths. • Retaining walls. • Trail alignments. • Locate pretreatment pond and filtration basin in upland area along Minnesota River bluff.				
Purchase USACE approved bank credits. If credits are not available in the impact Bank Service Area (BSA), credits from another BSA will be used.				
Follow conditions set forth in wetland permits issued by USACE and WCA LGU.				

Mitigation Measure	Status Update Description	Status Update Date	Completion Date	Signed Off By
Fish, Wildlife, Plant Communities, and Sensitive Ecological Resources				
Label identified Areas of Environmental Sensitivity (AES) on all project plans.				
Implement measures to protect Areas of Environmental Sensitivity (AES) near I-35W: • Label identified AES on all plans. • No disposal of excess materials in AES. • Prevent stormwater runoff during construction from reaching AES, including installation of redundant erosion control measures. • Re-vegetate disturbed areas with native vegetation suitable to the local habitat.				
Provide the DNR's Blanding's Turtle Fact Sheet to all contractors working on site.				
Blanchard's cricket frog. Limit staging equipment and materials west of the I-35W Minnesota River Bridge. Review dewatering plans with DNR nongame wildlife staff and incorporate restriction dates into the project construction schedule.				
Design and construct wildlife passage benches under I-35W bridge following MnDOT standards plans and DNR guidance:				

Mitigation Measure	Status Update Description	Status Update Date	Completion Date	Signed Off By
• South side of the I-35W bridge between Black Dog Road and Minnesota River. • North side of the I-35W bridge between the abutment and north side of stormwater pond.				
Before construction, remove or slice expansion joint gaskets/ glands, between November 1 and January 31, to increase airflow and moisture entering the expansion joint to reduce the likelihood bats will use the bridge during construction.				
Before construction, coordinate with the City of Bloomington or the Service to place a single Rocket Box Bat House adjacent to bridge structure.				
Winter tree removal. Tree removal to be completed between November 1 to March 31, inclusive.				
Before construction, survey project area for bald eagle nests. Protect any nests following USFWS recommendations to avoid a non-purposeful take of bald eagles or their young.				
Implement standard MnDOT practices to prevent birds from nesting on bridges prior to start of construction.				

Mitigation Measure	Status Update Description	Status Update Date	Completion Date	Signed Off By
Rolled erosion control products shall be limited to 'bio-netting', 'natural netting' (category 3N or 4N) or woven type products. Welded plastic mesh netting shall not be allowed.				
Coordinate with the DNR to identify compensatory mitigation for mussel impacts (to be completed as part of DNR mussel takings permit).				
Lighting on I-35W, Minnesota River Bridge, and entry monuments shall be directed downwards towards the road and bridge deck. Follow MnDOT lighting standards. Use full cutoff luminaire lighting heads.				
Contamination and Hazardous Materials				
Complete a methane gas survey within one year of the beginning of construction.				
Visual				
Design and construct the project following the recommendations and guidelines identified in the Visual Quality Manual (VQM)				
Traffic Noise				
Construct a 20-foot tall noise wall in northeast quadrant of the I-35W/West 106th Street interchange (to be determined pending the outcome of the noise wall solicitation process).				

Mitigation Measure	Status Update Description	Status Update Date	Completion Date	Signed Off By
Minnesota River State Water Trail (Section 4(f) Resource)				
Post state water trail closure signs upstream and downstream of I-35W Minnesota River Bridge. Locations for signs to be determined in consultation with DNR.				
Provide dates and durations of closures to DNR for posting on Minnesota River State Water Trail webpage.				
Remove existing I-35W Minnesota River Bridge piers from the water and restore the river bottom after piers have been removed.				
Remove all equipment and excess material/soils. Restore Minnesota River channel and adjacent shoreland areas before the end of construction.				
City of Bloomington Trail (Section 4(f) Resource)				
Open City of Bloomington trail crossing under I-35W Minnesota River Bridge prior to the end of construction.				
Identify a trail detour route for use during construction.				
Provide trail detour route signing during construction.				

Mitigation Measure	Status Update Description	Status Update Date	Completion Date	Signed Off By
Restore trail crossing under I-35W Minnesota River Bridge to a condition at least as good as the trail condition prior to the project.				
Russell A. Sorenson Landing (Section 4(f) Resource)				
Maintain vehicular access to the Russell A. Sorenson Landing during construction.				
Maintain access to the Minnesota River at the Russell A. Sorenson Landing during construction.				
Minnesota Valley State Trail (Section 4(f) Resource)				
Accommodate the future Minnesota Valley State Trail crossing under the I-35W Minnesota River Bridge: • Maintain the causeway along the north shoreline of the river. • Maintain the existing causeway profile and elevation. • Accommodate a 20-foot wide gravel access road and 10-foot wide trail typical section on the causeway and east side of the bridge, connecting to the Russell A. Sorenson Landing.				
Cultural Resources				
Install fencing surrounding Site 21HE497 before construction begins to avoid any impacts to the site.				

Mitigation Measure	Status Update Description	Status Update Date	Completion Date	Signed Off By
Install fencing along the right of way limits north of the proposed pond site in Bloomington. Fencing shall be installed before construction begins to prevent any impacts to a possible mound site north of the construction area.				
MnDOT CRU staff to inspect placement of fencing prior to the start of construction.				
Traffic During Construction				
Notify the USCG, the USACE, and local barge operators of temporary disruptions to commercial river traffic during bridge construction.				
The I-35W Minnesota River crossing shall remain open during construction.				
Restriction of I-35W to five lanes during construction will be allowed. During the period for the five-lane configuration, two general purpose lanes with a reversible MnPASS lane during the peak period/peak direction shall be provided.				
Minimize duration of five-lane configuration during construction.				
For period where I-35W is not restricted to five lanes, a minimum of six lanes shall be provided. Six lane configuration will provide two general purpose lanes and one MnPASS lane in each direction.				

Mitigation Measure	Status Update Description	Status Update Date	Completion Date	Signed Off By
Entrance ramp from Cliff Road to northbound I-35W and exit ramp from southbound I-35W to Cliff Road allowed for a period not to exceed 90 days.				
Maintain access to I-35W at Black Dog Road and West 106th Street at all times during construction.				
Implement measures identified in Transportation Management Plan (TMP).				
Complete outreach with affected stakeholders during development of maintenance of traffic plan (cities, commuters, local businesses, emergency service providers, schools, school bus services, transit providers, neighborhoods).				
Coordinate with transit providers during construction.				
Provide public information regarding transit routes, schedules, delays, etc. during construction.				