MAJOR PROJECT SCOPING REPORT
PRIME S.P. 5080-170 (ROUTE I-90)

☐ Draft for Review	☒ Final for Signature	☐ Scope Amendment

Project Limits	
Verbal Location Description	I-90 Bridges in Austin: MN 105 over I-90, CSAH 45/4th St. over I-90, I-90 EB and WB over Cedar River, I-90 EB and WB over 6th St. NE, TH 218/21st St. over I-90
Reference Points	From 175+00.637 to 180+00.523 (I-90)
Project Length	4.9 miles (I-90 length)

General Project Information	
Type of Fix	Bridge Replacement/Bridge Rehabilitation
Work Type	BRPC (Bridge Replacement or New Bridge)
Program Category	BR (Bridge Replacement)
City or Cities	Austin
County or Counties	Mower
Additional Control Sections	5007, 5008

Schedule (see baseline schedule in P6 for details)	
Proposed Letting Date	1/27/2023

Total Project Cost Estimate

CHIP (7/18/2019): $30,360,000 | $8.8 M 2023, $12.12 M AC 2024, $9.44 M AC 2025

Construction Estimate:	$30,400,000
Other Construction Estimate:	$2,400,000
Right of Way Estimate:	$100,500
Engineering Estimate:	$4,400,000

Total Cost Estimate: $37,300,500 (TPCE)

RECOMMENDED BY:

Jai Kalsy, Project Manager — Date: 2/6/2020

APPROVED BY:

Gregory Paulson, Project Sponsor — Date: 2/6/2020

NEED STATEMENT FOR PROJECT:

The need for this project was studied with a pre-scoping corridor study for the I-90 bridges in Austin. A copy of that study is available in the links section at the end of the report.

The existing bridges were built from 1958 to 1959. The 4th St Bridge is Functionally Obsolete with poor deck condition and geometry and the 218/21st St. Bridge is Structurally Deficient. Both of these bridges have insufficient vertical clearance over the Interstate. The Cedar River Bridges both have significant scour conditions at the pier. The MN 105/Oakland Ave. Bridge also has vertical clearance, deck geometry and structural condition issues. The 6th St. bridges are in better condition than some of the others and are a lower priority for replacement.

Operational and safety issues were also identified as part of the traffic analysis portion of the corridor study. Intersections of concern were identified at westbound I-90 and 4th Street, with significant crash history related to the offset ramps, and both ramp terminal intersections at 21st Street, with the narrow bridge and guardrail limiting sight lines. The westbound I-90 4th Street off ramp was also found to have a queuing problem related to the offset intersections, one of which is signalized, the other uncontrolled, where traffic backups disrupt operations at both intersections.

PURPOSE STATEMENT OF PROJECT:

This project will address the bridge condition issues for the seven bridges identified. Of the eleven bridges studied as part of that pre-scoping effort, five were packaged together as part of a central corridor with the anticipation that traffic staging would be connected for these bridges (4th St., Cedar River bridges and the 6th St. Bridges). Because of similar condition, the MN 105 and US 218 east-junction bridges were packaged together with this project as well.

Of the seven bridges, five structures were recommended for replacement: the bridges at MN 105, 4th St., MN 218/21St, and the Cedar River bridges. The preferred alternative for the interchange at 4th St. is to convert to a tight diamond, eliminating the offset ramp condition while working within constraints created by the cemetery in the NE quadrant. The 6th St. Bridges are recommended for rehabilitation to extend the useful life of those structures.

PROJECT LOCATION:

Bridge No. (old)	Bridge No. (new)	RP	Facility Carried	Feature Crossed	Work Proposed
6868	50813	178+00.396	I-90 WB	Cedar River	Replacement
6869	50812	178+00.405	I-90 EB	Cedar River	Replacement
9178		178+00.782	I-90 WB	6th St. NE	Repair
9179		178+00.785	I-90 EB	6th St. NE	Repair
9180	50014	178+00.160	4th St. / CSAH 45	I-90	Replacement
9183	50013	013+00.616	MN 105	I-90	Replacement
9201	50012	012+00.194	US 218 / 21st St	I-90	Replacement

PROPOSED CONSTRUCTION ELEMENTS:

STANDARDS

Standards to follow in design: ☒ Preservation ☒ New Construction/Reconstruction
☒ NHS ☐ Non-NHS

DRIVING LANES & PAVEMENT

Because the primary purpose of the project is to address the condition of the bridges, changes to existing pavement will be minimal and mostly limited to tying into existing pavement after a grade-raise to address vertical-clearance deficiencies of the bridges being replaced.

Pavement replacement will be needed to re-configure the 4th Street interchange and address operational issues by adding additional lanes on the 4th Street bridge and approach pavement. The current bridge has one through lane in each direction as well as a left turn lane for each direction. The new bridge will maintain the left turn lanes as well adding an additional through lane for each direction along with a separate right turn lane for accessing ramps prior to the bridge.

Some mainline I-90 pavement will need to be replaced at 4th Street because the narrow section will require removing the inside lane of pavement in each direction to accommodate construction of the new pier.

Consideration should be given when determining the vertical profile of the new bridges to a potential mill and overlay or unbonded overlay on the I-90 mainline pavement. A minimum clearance of 16'-6" to satisfy Oversize - Overweight Superload criteria is being assumed.

SHOULDERS, TURN LANES, & RAMPS

Ramps are in poor condition and there is some desire to replace ramp pavement beyond what is needed for tying in the new bridge pavement. However, the ramp work fits better with the mainline paving and will be completed with those projects.

At TH 105, the limits should be coordinated with SP 2482-77, a 2020 unbonded overlay on I-90 west of Austin that ends at TH 105.

ROADSIDE (including bikeways and pedestrian accessibility)

Conceptual layouts developed as part of scoping include pedestrian and multi-use facilities as part of the new bridges over I-90. These will provide critical connections for pedestrian and bicycle traffic crossing I-90.

- A 10 ft. multi-use trail (12 ft. on the bridge) on the south side of TH 105
- 5 ft. sidewalks (7 ft. on the bridge) on both the east and west sides of 4th St.

- A 6 ft. sidewalk (8 ft. on the bridge) on the west side of the TH 218 bridge

The City of Austin has a strong commitment to developing bicycle infrastructure as indicated in the city's comprehensive plan. Layouts from the pre-scoping study show bicycle facilities on the 4th Street and TH 218/21st Street bridges. The decision to replace the TH 105 Bridge that was made after the completion of the scoping report also facilitates an opportunity to add pedestrian/bicycle infrastructure.

Current and planned infrastructure shown in the City's trail map:

http://www.ci.austin.mn.us/wp-content/uploads/2105-Bike-Trails.pdf

Currently, a potential exists for widening the 4th St. Bridge from its current concept to accommodate the need to maintain three lanes of traffic during each stage of half-at-a-time construction. This additional width could be used to increase one or both of the sidewalk widths or convert one to a trail. This will be looked at during preliminary design and discussed with stakeholders and the public.

BRIDGE

The project includes replacement of five bridges and repairs to two others. Bridge locations and work

Seven bridges are a part of this project. All were identified during the pre-scoping study and a preferred alternative was provided. Since that study was completed, the Bridge Office has provided some additional recommendations including replacing Bridge 9183. The work type and new bridge numbers are documented in the table below with additional discussion on alternatives to be reviewed during scoping.

Currently, there is a need to study further doing an overlay or a full re-deck at the 6th Street Bridges. The Bridge Office will need to do load rating to determine if the piers need to be strengthened, which may justify doing a re-deck, to a get a longer life out of the initial investment. Some investigative work needs to be done below the deck as well to estimate the amount of Type III repair if an overlay was done. District bridge recommendation is to purse an overlay if possible.

HYDRAULICS

Cedar River bridges likely have established Base Flood elevations in the vicinity, and this project should not change the BFE's either upstream or downstream. Scoping efforts should verify floodplain mapping limits in the area.

MATERIALS

Because pavement replacement is expected to be minimal relative to other parts of the project, replacing existing pavement in-kind to match existing infrastructure is the likely preferred pavement type. Mainline pavement will be overlaid with an assumed heavy bituminous overlay in 2028.

UTILITIES

Typical utility coordination will be required on this project. Based on Minnesota Statute for Interstate Right of Way, MnDOT will be responsible for costs incurred to relocate utilities within I-90 (access controlled) right-of-way.

RAILROAD

There is one railroad located in the vicinity of the project. A branch of the Dakota, Minnesota & Eastern (DME) Railroad crosses overhead I-90 (FRA crossing # 380234A) approximately 1800 ft. east of the 6th St bridges (9178, 9179). It is not expected that construction will impact the railroad in any way. The rail office will be notified of the project via the Early Notification Memo.

DETOUR

A scoping traffic study was completed to determine the effects of construction on traffic throughout the corridor and to evaluate a potential staging sequence. A link to that study is included below.

Crossovers will be used to shift I-90 mainline traffic so that the EB and WB Cedar River and 6th bridges can be completed under full closure.

OTHER

Visual Quality:

A visual quality manual for the corridor was developed by MnDOT with the assistance of a Visual Quality Advisory Committee. That report is available in the links section at the end of this report.

Landscaping:

Landscaping is a component of the overall visual quality. Previously scoped bridge projects have both contained landscaping plans and intended for landscaping to be completed with a separate project after construction. Because of the size and complexity of this project, a separate landscaping plan encompassing the entire corridor will be let after construction has been completed.

CONSTRUCTION ITEMS CONSIDERED BUT REJECTED:

The pre-scoping study looked at several alternatives for reconfiguration of the 4th Street interchange including only partial reconstruction of the interchange, a folding diamond and roundabout interchange concept. The final recommendation selected the tight-diamond concept.

The pre-scoping study also looked potentially eliminating some ramp movements and replacing with frontage links to adjacent interchanges, especially at closely spaced interchanges. These alternatives were not part of the final recommendation.

PROPOSED PROJECT DELIVERY ELEMENTS:

STAKEHOLDER INVOLVEMENT

Municipal Consent Required: ☒ Yes ☐ No
Business Liaison: Mike Dougherty and Project Manager

Stakeholder Involvement Plans:
A group of stakeholders was identified during the pre-scoping study and is included in that report. As part of the Project Management plan, that list will need to be updated and modified as relevant to this portion of the corridor. The Project team will need to ensure that the Stakeholder Group is a representative cross-section of the community. Public involvement that is done during previous projects SP 5080-166 and SP 5009-34 will be considered during public outreach on this project.

ENVIRONMENTAL CLEARANCE

Environmental Document: ☐ Exempt ☒ Categorical Exclusion (type: Non-Programmatic)
☐ EA/EAW ☐ EIS (☐ Re-evaluation) (☐ Supplemental)

A Non-Programmatic Categorical Exclusion is the anticipated environmental document because of the likelihood that the project exceeds "Attachment B" thresholds for Noise and Threatened and Endangered Species.

Other Environmental Documents, Studies & Permits:

Bridges 6868 and 6869 over the Cedar River have swallow nests and evidence of bats present noted in the most recent inspection report.

A Section 7 Threatened and Endangered Species Determination will need to be completed

PRELIMINARY DESIGN

The preferred delivery method for preliminary and final roadway as well and preliminary bridge design is a combined consultant contract.

PLANS, SPECS & ESTIMATES

Plans Process: ☐ Process A ☐ Process B ☒ Complex Process B

Because of an assumed need to acquire Right of Way for construction of the 4th St. Bridge, Complex Process B is being selected as the Plan Delivery Process.

RIGHT OF WAY

Conceptual Construction limits do not indicate a need for right of way acquisition. However, to accommodate maintaining three lanes of traffic during construction of the 4th St. Bridge, as recommended during the scoping traffic study, the alignment of the new bridge will need to be shifted by as much as 6 ft. This shift is anticipated to require acquisition of new right of way.

LETTING

☒ Design-Bid-Build ☐ Design-Build ☐ CMGC ☐ Other:

Traditional Design-Bid-Build will be used to deliver this project.

An alternative delivery workshop was held on May 14, 2018 at the District 6 office in Rochester. The outcome of that discussion was inconclusive as questions about whether the entire project funding could be made available at the start of construction limited the benefit of using Design-Build. Also, the group saw a need to further study traffic staging, which was viewed as the most complex part of the project, to determine if using CMGC or Design-Build would have a significant enough benefit to justify additional costs. Further study of traffic staging and decisions about how to fund the project ultimately led to Design-Bid-Build being selected for delivery.

Notes from the Alternative Delivery workshop can be found in the links section at the end of this report.

CONSTRUCTION MANAGEMENT

PROJECT MANAGEMENT

Project Team:

Project Manager: Jai Kalsy
Assistant PM: Mark Harle
Roadway Technical Lead: Jake Gasper
Bridge Technical Lead: Dan Prather / Arielle Ehrlich
Project Design Team: Consultant
Construction Engineer: Jim Roberts

REPORT APPENDICES:

Appendix A: Project Locations Map

Appendix B: Typical Sections

Appendix C: Total Project Cost Estimate

Appendix D: Detailed Construction Cost Estimates

Appendix E: Scoping Worksheet Responses

Appendix F: Risk Register

Appendix G: Environmental Document Decision Tree

Appendix H: Work Breakdown Structure

LINKS:

Project Charter

Pre-Scoping Study

Project Delivery Selection Workshop I90 Austin.docx

Bridge Office Scoping Form B Responses

Scoping Traffic Study

Scoping Mapbook

Visual Quality Manual

Conceptual Layout: 4th St. and Cedar River

Conceptual Layout: TH 105

Conceptual Layout: TH 218

APPENDIX A: PROJECT LOCATION MAP

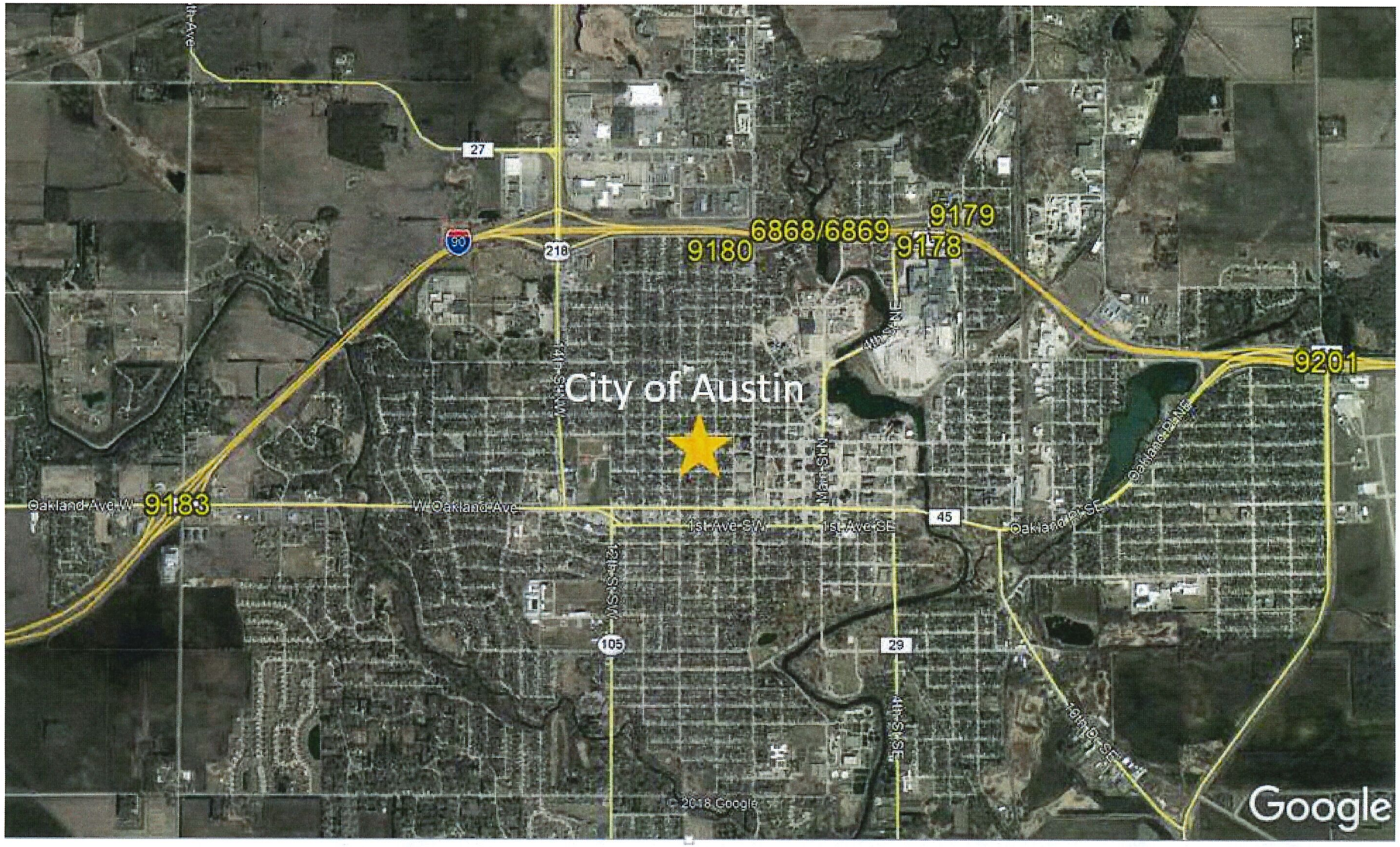


Figure 1: Project Location

APPENDIX B: LAYOUT/TYPICAL SECTION

Bridge Office Form B typical sections as well as existing typical section for the 6th St. Bridge rehabilitation are shown below:

Bridge 50813

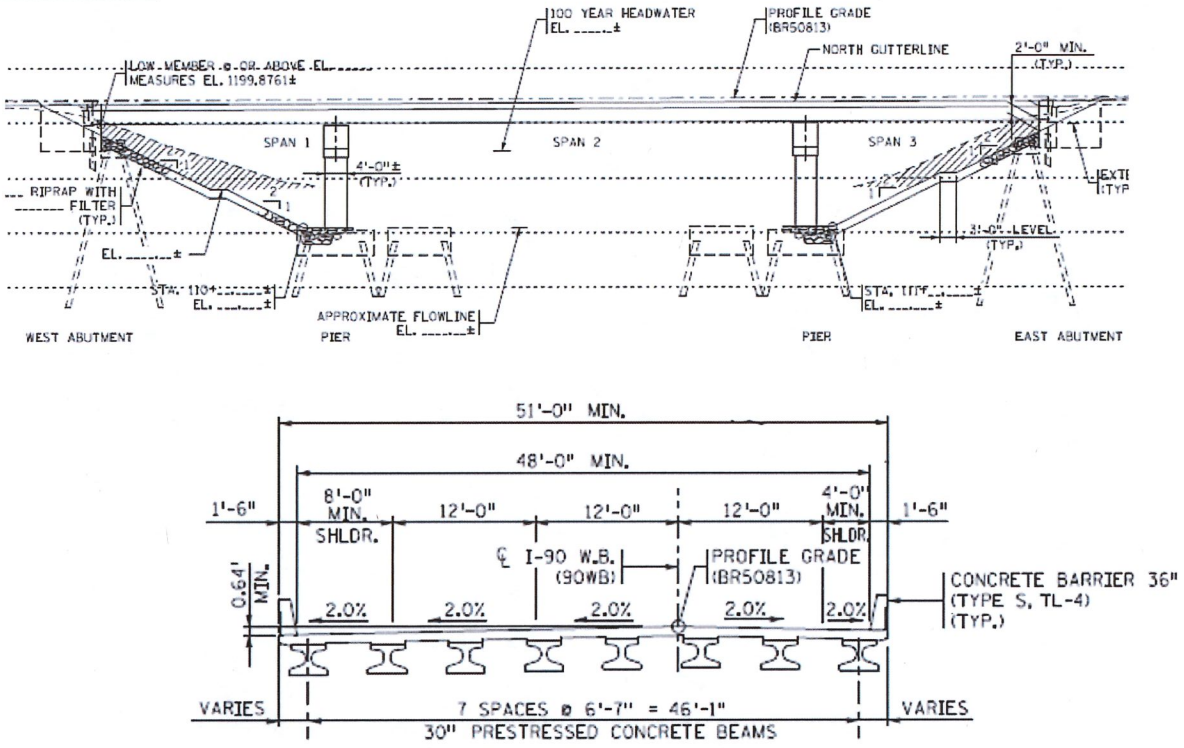


Figure 2: Elevation and Typical Section Bridge 50813

Bridge 50812

Elevation and section for Bridge 50812 similar to Bridge 50813

Bridge 9178

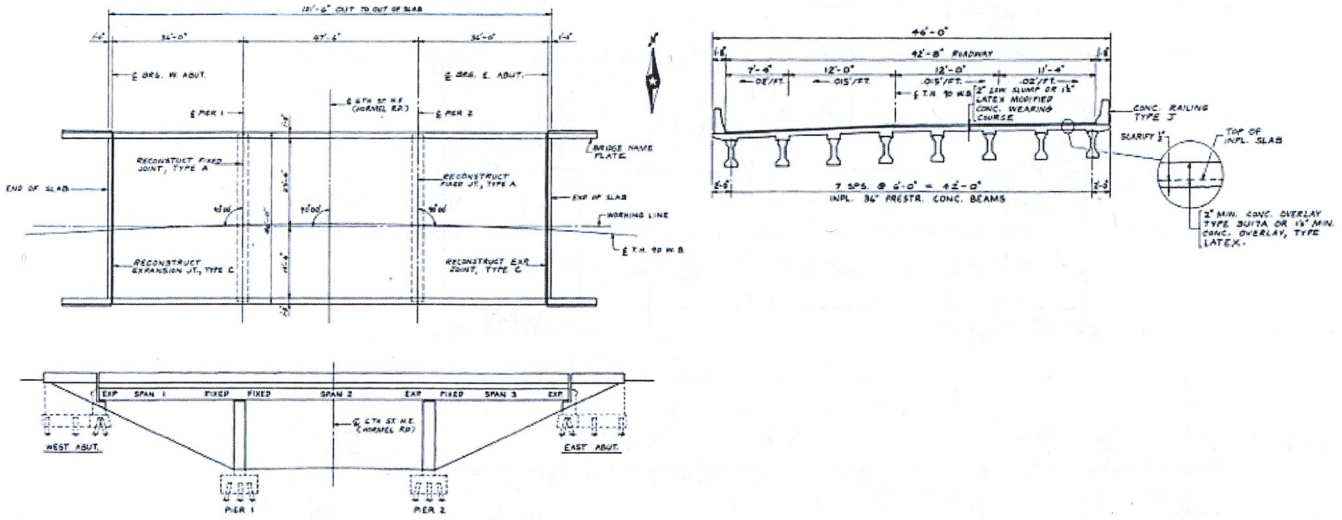


Figure 3: Plan, Elevation and Section View Bridge 9178

Bridge 9179

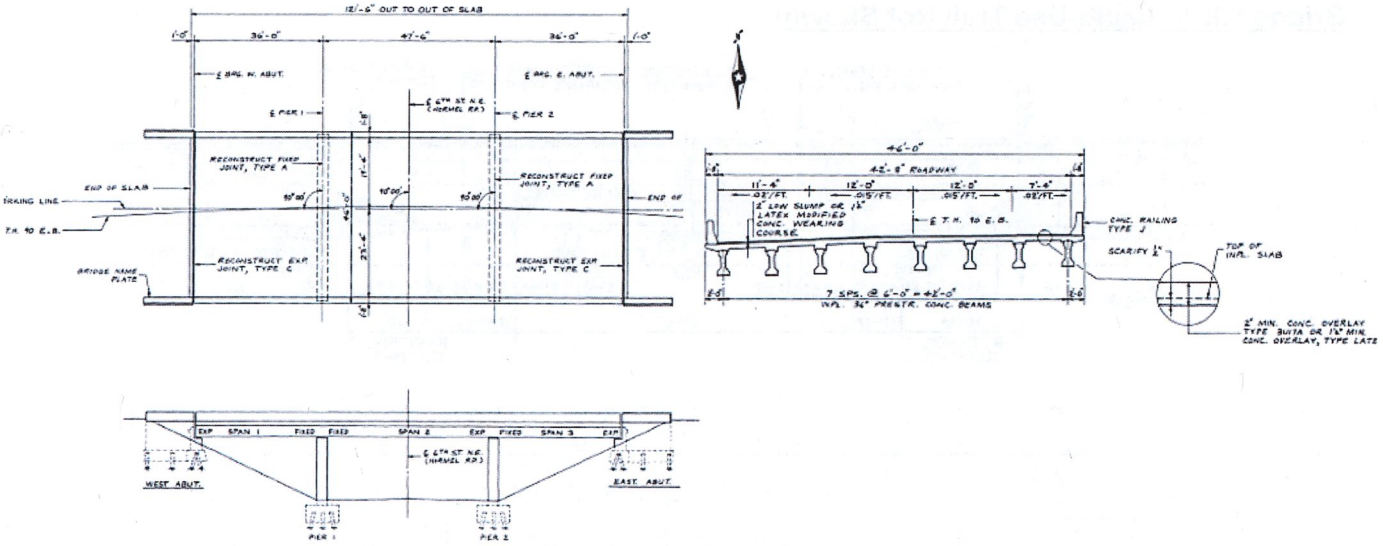


Figure 4: Plan, Elevation and Section View Bridge 9179

Bridge 50014

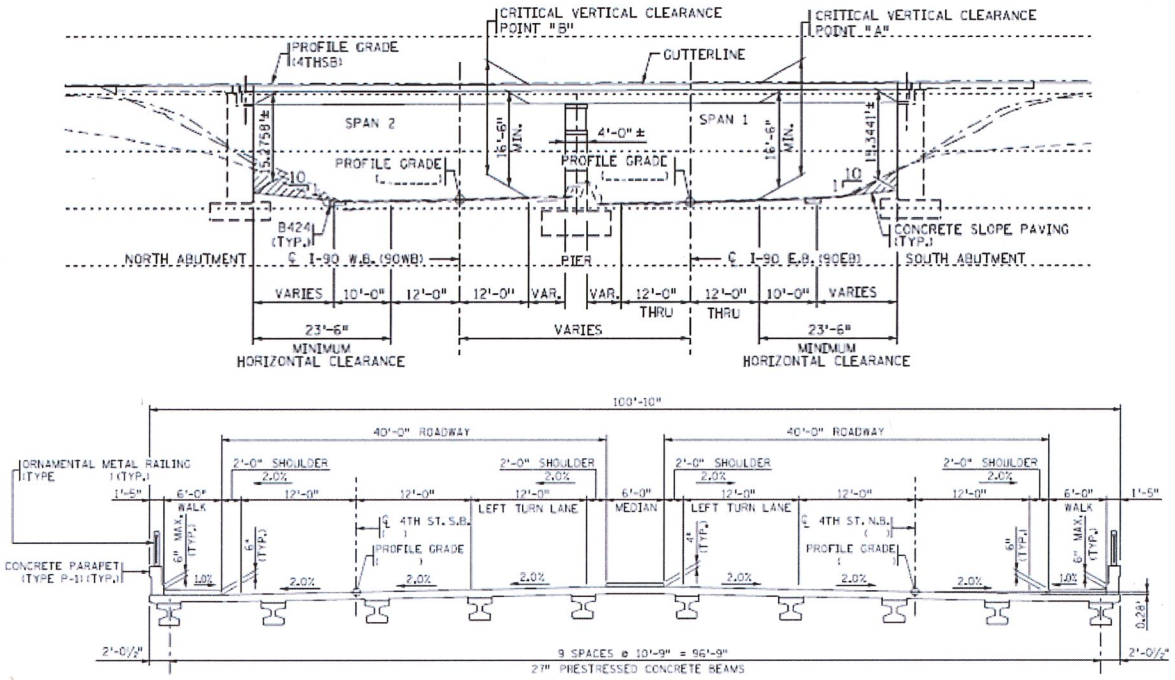


Figure 5: Elevation and Typical Section Bridge 50014

Bridge 50013 (Multi-Use Trail Not Shown)

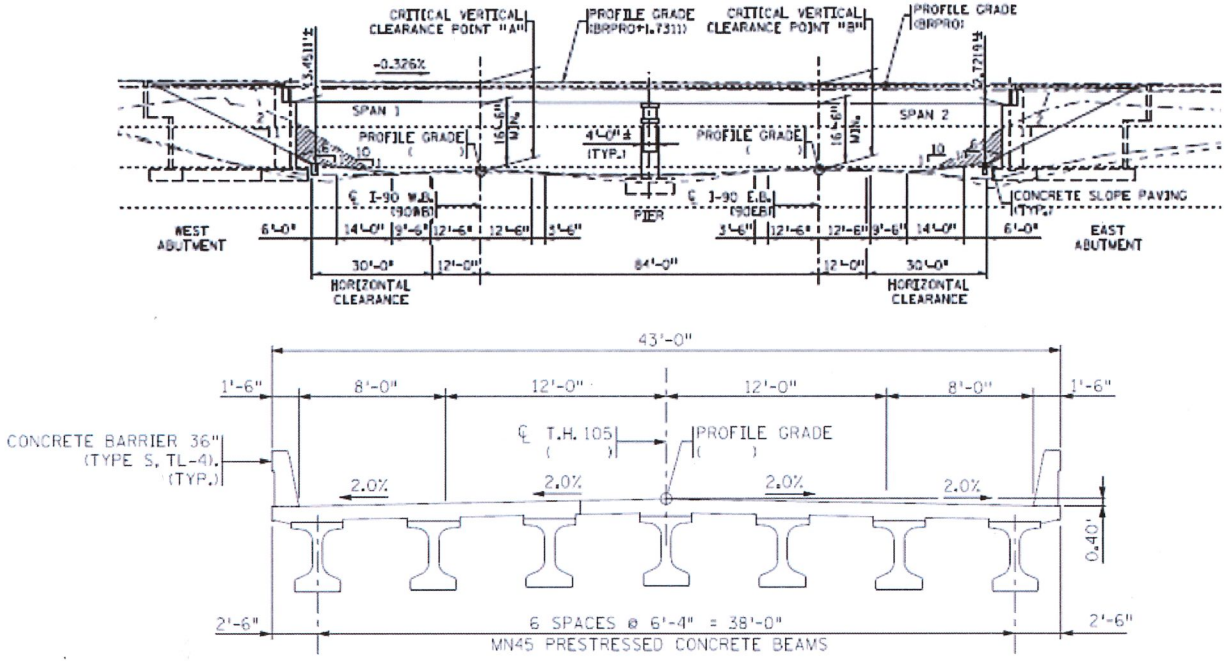


Figure 6: Elevation and Typical Section Bridge 50013

Bridge 50012

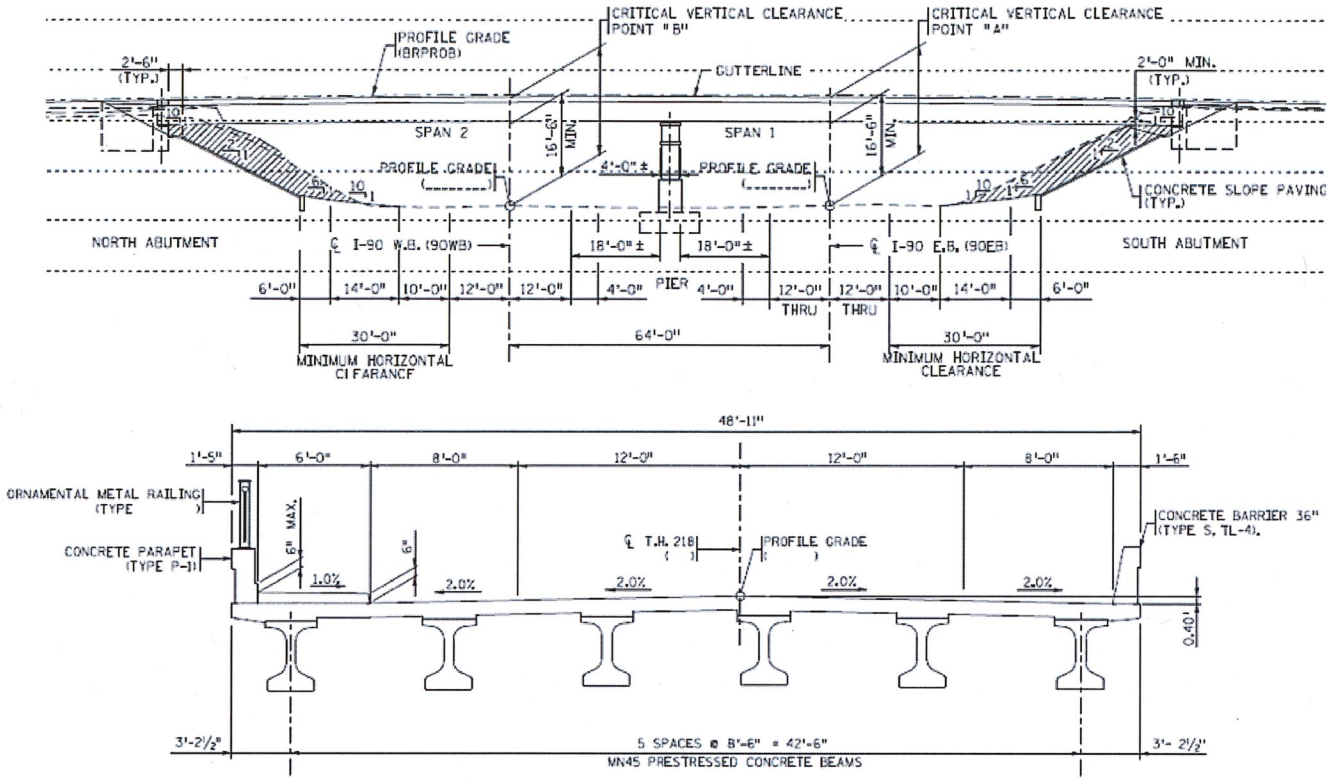


Figure 7: Elevation and Typical Section Bridge 50012

TOTAL PROJECT COST ESTIMATE — DESIGN-BID-BUILD

Project Infomration					
SP :	5080-170	Route:	I-90	Estimate Reporting Date:	5/23/2019
District :	6	Prime Element ID :		Letting Date:	1/27/2023
Project Length:	4.886	Project Description:	**SPP**AC** AUSTIN REPL BR 6868 I90 WB OV CEDAR R., REPLACE BR 6869 I90 EB OV CEDAR R., REHAB BR 9178 I90 WB OV 6TH ST NE, REHAB BR 9179 I90 EB OV 6TH ST NE, REPL BRIDGE 9180 CSAH 45 OV I 90, REHAB BR 9183 MN 105 OV I90, REPLACE BR 9201 US 218 S OV I90 **(SCOPE ESTIMATE)**		

DIVISION	GROUP (I)	CATEGORY (II)	DETAILS (III)	BASE ESTIMATE (IV)	CONTINGENCY (V)	TOTAL (VI)	MID-POINT OF CONSTRUCTION YEAR DOLLAR (WITH REMAINING EXPENSES & CONTINGENCY INFLATED) (VII)	ROUNDED AMOUNT (VIII)
Construction Letting (STIP)	INVESTMENT GROUPS		Contingency %		10.0%			
	Asset Management	PC	Roadway + Other Categories	$9,229,133.84	$922,913	$10,152,047	$12,182,456	
		40.13%				$0	$0	
		BC	Br(s) 50012, 50013, 50014, 50812, 50813, 9178, 9179 + Ret. Walls	$13,770,016	$1,377,002	$15,147,018	$18,176,421	
		59.87%				$0	$0	
		RIC				$0	$0	
		0.00%				$0	$0	
						$0	$0	
	Traveler Safety	TS				$0	$0	
		0.00%				$0	$0	
						$0	$0	
	Critical Connections	BI				$0	$0	
		0.00%				$0	$0	
		District 6 Accessible Pedestrian Infrastructure				$0	$0	
		ADA Group Accessible Pedestrian Infrastructure				$0	$0	
		0.00%				$0	$0	
		100.00%						
			Construction Letting (A)	$22,999,150	$2,299,915	$25,299,065	$30,358,878	$30,400,000
Other Construction Total (STIP SETASIDE $)	AGREEMENTS							
		Cooperative			$0	$0	$0	
		Utilities	3rd Party Relocation (Interstate)	$850,000	$85,000	$935,000	$1,122,000	
		RR			$0	$0	$0	
		Detour			$0	$0	$0	
		Other			$0	$0	$0	
			Preconstruction Cost (B)	$850,000	$85,000	$935,000	$1,122,000	
	CONSTRUCTION							
		SA/CO/Overruns	4.00%	$919,966	$91,997	$1,011,963	$1,214,355	
						$0	$0	
		Incentives	0.00%	$0	$0	$0	$0	
						$0	$0	
		Other	0.00%	$0	$0	$0	$0	
						$0	$0	
			Post Letting Cost (C)	$919,966	$91,997	$1,011,963	$1,214,355	
	OTHER CONTRACTS					$0	$0	
		Landscape		$0	$0	$0	$0	
		Turnback		$0	$0	$0	$0	
		Environmental Mitigation		$0	$0	$0	$0	
		Environmental Cleanup		$0	$0	$0	$0	
		Early Procurement		$0	$0	$0	$0	
		Other		$0	$0	$0	$0	
			Post Construction Cost (D)	$0	$0	$0	$0	
			Non-Letting ("Other") Construction Elements (E)=B+C+D	$1,769,966	$176,997	$1,946,963	$2,336,355	$2,400,000
			CONSTRUCTION TOTAL (F)= A+B+C+D	$24,769,116	$2,476,912	$27,246,027	$32,695,233	$32,800,000
Engineering	PRE-LETTING							
		Environmental Studies				$0		
			Internal			$0		
			External			$0		
		Predesign/Scoping	8.00%	$1,981,529	$198,153	$2,179,682		
			Internal			$0		
			External			$0		
		Detailed Design				$0		
			Internal			$0		
			External			$0		
		Traffic Management				$0		
			Internal			$0		
			External			$0		
		Comm/Public Involvement				$0		
			Internal			$0		
			External			$0		
		Contamination Investigation				$0		
			Internal			$0		
			External			$0		
		R/W Engineering				$0		
			Internal			$0		
			External			$0		
		(12% of Construction Total)		$1,981,529	$198,153	$2,179,682		
	CONSTRUCTION							
		Administration				$0		
						$0		
						$0		
		Traffic Management				$0		
			Internal			$0		
			External			$0		
		(8% of Construction Total)		$1,981,529	$198,153	$2,179,682		
	ENGINEERING COST (20 % of Construction Total If no cost entered)			$3,963,059	$396,306	$4,359,364		
			ENGINEERING TOTAL (G)	$3,963,059	$396,306	$4,359,364		$4,400,000
Right of Way							If Transfer total cost from Right of Way Estimation Tool, Please put the rounded cost information below which overwrites the calculation from cell H94:	
	Standard Real Estate Purchase		Contingency %		50.0%			
		Total Takes	Estimate for Scoping	$67,000	$33,500	$100,500		
						$0		
		Partial Takes			$0	$0		
	Relocation Costs					$0		
		Residential			$0	$0		
			ROW TOTAL (H)	$67,000	$33,500	$100,500	$100,500	$100,500
			Total Base Cost	$28,799,174				
			Contingency		$2,906,718			
			Total Project Cost Estimate (I)			$31,705,892	$37,155,097	$37,300,500

Cumulative Inflation Factor Used	1.20
Mid-Point of Construction year	2024
Historical Baseline Fiscal Year	2019

**AVERAGE WEIGHED OVER 2 YEARS **

Estimator: SAM MUENCH

Project Manager: MARK HARLE

Approval By: Gregory S Paulson

Print Name: Gregory S. Paulson

Title: ADE- Program Delivery

Date: 2/4/2020

Form Template Updated Inflation Rate 2016-2025

QUICK BRIDGE SCOPING PROJECT ESTIMATOR

5/23/19

SP 5080-170 (I-90) = AUSTIN BRIDGE REPLACEMENT SCOPING ESTIMATE

			BRIDGE OFFICE NUMBERS							
BR NO.	OLD BR. NO AND DESCRIPTION	FY	CONSTRUCTION	REMOVAL	TOTAL	AVG BRIDGE COST	ROUNDED AVG COST	VARIANCE	DELTA	AVERAGE PROJECT COST (UNINFLATED)
50012	REPLACE BR. 9201, E. JCT TH 218 OVER I-90	2023	$ 1,452,000.00	$ 80,000.00	$ 1,532,000.00	$ 1,331,613.16	$ 1,331,700.00	$ (200,386.84)	-13.08%	$ 2,035,257.89
50013	REPLACE BR. 9183, TH 105, W JCT, OVER I-90, FULL DETOUR (OPTION 1)	2023	$ 2,735,000.00	$ 145,000.00	$ 2,880,000.00	$ 2,544,160.00	$ 2,544,200.00	$ (335,840.00)	-11.66%	$ 3,887,989.47
50014	REPLACE BR. 9180, CSAH 45 (4TH ST) OVER I-90, STAGE CONSTRUCTION (OPTION 2)	2023	$ 3,261,000.00	$ 126,000.00	$ 3,387,000.00	$ 2,987,940.00	$ 2,988,000.00	$ (399,060.00)	-11.78%	$ 9,840,705.26
50812	REPLACE BR. 6869, I-90 WB OVER CEDAR RIVER	2023	$ 2,080,000.00	$ 165,000.00	$ 2,245,000.00	$ 1,981,140.00	$ 1,981,200.00	$ (263,860.00)	-11.75%	$ 3,027,584.21
50813	REPLACE BR. 6868, I-90 EB OVER CEDAR RIVER	2023	$ 2,080,000.00	$ 165,000.00	$ 2,245,000.00	$ 1,981,140.00	$ 1,981,200.00	$ (263,860.00)	-11.75%	$ 3,027,584.21
9178	BR. 9178, I90 WB OVER 6TH ST	2023	$ 397,191.00	$ -	$ 397,191.00	$ 397,191.00	$ 397,200.00	$ -	0.00%	$ 496,488.75
9179	BR. 9179, I90 EB OVER 6TH ST	2023	$ 546,832.00	$ -	$ 546,832.00	$ 546,832.00	$ 546,900.00	$ -	0.00%	$ 683,540.00
PROJECT TOTALS					$ 13,233,023.00					$ 22,999,149.80

BRIDGE NO.	BRIDGE		ROADWAY	
50012	$ 1,331,613.16	65.43%	$ 703,644.74	34.57%
50013	$ 2,544,160.00	65.44%	$ 1,343,829.47	34.56%
50014	$ 2,987,940.00	30.36%	$ 6,852,765.26	69.64%
50812	$ 1,981,140.00	65.44%	$ 1,046,444.21	34.56%
50813	$ 1,981,140.00	65.44%	$ 1,046,444.21	34.56%
9178	$ 397,191.00	80.00%	$ 99,297.75	20.00%
9179	$ 546,832.00	80.00%	$ 136,708.00	20.00%
TOTAL	$ 11,770,016.16	51%	$ 11,229,133.64	49%

*COST OFFSET IN ROADWAY TO ACCOUNT FOR RETAINING WALLS

CONSTRUCTION COST FROM ABOVE		$ 22,999,149.80
CONTINGENCY	10%	$ 2,299,914.98
COST PLUS CONTING.		$ 25,299,064.78
FY23 INFLATION FACTOR (WEIGHTED OVER 2 YRS)	1.20	
INFLATED PROJECT COST		$ 30,358,877.74
ROUNDED COST ESTIMATE		$ 30,400,000.00
CHIP AMOUNT (3/4/19)		$ 30,360,000.00
VARIANCE		$ (40,000.00)
DELTA %		-0.13%

The purpose of the Project Scoping Worksheets is to provide functional groups with a tool to investigate and record potential items that could be included in the scope of the project.

Distribution of Scoping Worksheets — District 6

Scoping worksheets are to be completed by functional groups responsible for each area. Below is a recommendation for distribution of each of the attached scoping worksheets.

Worksheet	Title	*Name*	Date Completed
Project Manager Scoping Worksheet	Project Manager	Mark Harle	1/25/19
Business Impact Assessment Scoping Worksheet	Project Manager /Public Affair Coordinator	Mike Dougherty	9/21/18
Planning Section Scoping Worksheet	District Planning Director	Kurt Wayne/Heather Lukes	10/17/18
State Aid Scoping Worksheet	District State Aid/Agreements Office	Joe Denny/Rhonda Prestegard	9/25/18
Land Management Scoping Worksheet	District Land Management Engineer	Brian Veronen/ Mark Trogstad-Isaacson	10/24/18
Surveys Scoping Worksheet	District Principal Surveyor	Keith Kallin	9/21/18
Environmental Documentation Scoping Worksheet	Environmental Coordinator	Nathan Gregor	
Access Management Scoping Worksheet	Chair of district Access Management Committee	Heather Lukes	
Bridge Scoping Worksheet	District Bridge Engineer	Gary Lovelace / Jeff Bunch	
Construction Scoping Worksheet	District Construction Engineer	Jim Roberts	
Design Scoping Worksheet	District Design Engineer	Mike Kempinger	
Hydraulics Scoping Worksheet	District Hydraulic Engineer	Kris Langlie	
Maintenance Scoping Worksheet	Area Maintenance Engineer	T. Zierden / D. Crews	10/10/18
Materials Scoping Worksheet	District Materials Engineer	Tom Meath	10/22/18
Traffic Scoping Working	District Traffic Engineer	C. Hanson / A. Wellner	10/23/18
Geotechnical_Worksheet	Project Manager/District Traffic Engineer/District Materials Engineer	M. Harle/C. Hanson /T. Meath	1/25/19

In general, the scoping worksheets should be sent to the person that oversees each functional area (principal engineer or above). In many districts, multiple worksheets may be sent to one person, since they may oversee more then one functional area. District should complete the above table with the name of the person that will receive each worksheet so that it is done consistently across the district. The person that completes each worksheet should fill in the "Date Completed" box when it is finished.

Most items have check boxes associated with them in the worksheets. Below is guidance to aid in determining how to complete the checkboxes.

"**Yes**" – There is a known issue that needs to be addressed

"**No**" – As the project currently stands, the item is not an issue

"**Not Needed**" – The task is not needed

"**Maybe**" – The potential for an issue exists, but more information is needed to determine specifics

"**Need**" – The item is required because it currently does not meet standards, is required by law, must be included to accomplish purpose of the project, etc…

"**Want**" – The item is not required, but it would be ideal to address as part of the project

"**Not**" – The item is not applicable to this project

The list of items in the worksheets is not an exhaustive list, but merely guidance to help functional groups scope individual projects. Districts should feel free to make changes to the scoping worksheets as they see fit.

SP 5080-170 I90 Prj Mgr: M. Harle Prj. Lim.: Bridges 6868, 6869, 9178, 9179, 9180, 9183, 9201

PROJECT MANAGER SCOPING WORKSHEET

The purpose of this form is to record notes on issues that may affect the scope of the project.

Project Managers should utilize the principles of Context Sensitive Solutions (CSS) by including a full range of stakeholders with transportation officials in the scoping phase in order to clearly define the project purpose and develop consensus on the scope before proceeding. Thus, potential stakeholders should be contacted for input into the scope of the project.

ITEM	YES	NOT NEEDED	If Yes, Describe (or see below)
Coordination on Context Sensitive Solutions with CSS Director	☒	☐	Pre-Scoping Study encompassed much of this work.
Public Information Plan	☒	☐	
Coordination with city, county, townships	☒	☐	Have had meetings with City of Austin, Mower County.
Coordination with other external and likely stakeholder groups	☒	☐	
Coordination with FHWA	☒	☐	
Coordination with permitting agencies	☒	☐	
Coordination with utilities	☒	☐	
Coordination with CO Rail office	☐	☒	
Coordination with Aeronautics office	☒	☐	Will be notified during ENM process
Coordination with CO Bikes & Peds section	☒	☐	Will be notified during ENM process
Coordination with Transit Agencies	☐	☒	
Coordination with Bridge Office	☒	☐	
Coordination on Business Impacts (see scoping worksheet)	☒	☐	
CIMS Outlook	☐	☐	
	☐	☐	

Comments and Risk Identification:

RETURN FORM TO PROJECT MANAGER BY: 10/22/18
Project Charge ID: T6F010

SP 5080-170 I90 Prj Mgr: M. Harle Prj. Lim.: Bridges 6868, 6869, 9178, 9179, 9180, 9183, 9201
Person completing this form: M. Dougherty Date: 9/21/18

BUSINESS IMPACT ASSESSMENT SCOPING WORKSHEET

To 'check' in the check boxes, double click and click on 'checked' in the Default value box

The purpose of this form is to record notes on potential business impacts associated with the project Refer to the HPDP for additional project scoping guidance on assessment of business impacts: http://dotapp7.dot.state.mn.us/edms/download?docId=857394. A project map showing the location of construction and businesses identified as potentially impacted is also helpful.

	YES	NO	MAYBE	If Yes, Describe (or see below)
Are Business Impacts Anticipated?	☒	☐	☐	
Is Business Impacts Mitigation Required?	☐	☐	☒	
Potential Business Impacts				**Duration of Impact (# days)/Comments**
Access*	☐	☐	☒	
Parking*	☐	☒	☐	
Visibility*	☐	☐	☒	
Increased Congestion	☐	☐	☒	
Lane or Street Closures	☒	☐	☐	
Detour	☒	☐	☐	
Right-of-way Acquisition	☐	☐	☒	
Noise	☒	☐	☐	
Dust or Vibration	☒	☐	☐	
Sidewalks/Trails/ADA Facilities	☐	☐	☒	
Other	☐	☐	☐	

*Effective August 1, 2009, Minnesota Statute 160.165 requires the identification of businesses whose access, parking, or visibility is impaired for a minimum of one month as a result of project construction work. An individual must be identified as a Business Liaison to work with those businesses.

If checked "Yes" or "Maybe", then describe, identify any risks, and document recommended scope items:

The replacement of five bridges and two rehabilitations will result in impacts to businesses when ramps or bridges are closed and detoured.

We will need to do public engagement work in advance with businesses, neighborhoods and others affected, and then plan communications work that will keep everyone informed about the project. The contractor should also have an access manager, who can address issues during the project.

RETURN FORM TO PROJECT MANAGER BY: 10/22/18
Project Charge ID: T6F010

S.P. (TH) #: 5080-170 **Project Mgr:** M. Harle

Project Limits:

Person completing this form: Kurt Wayne Date: 10/17/18

PLANNING SECTION SCOPING WORKSHEET

(The purpose of this form is to record notes on items that inform the scope of the project)

Consult the **Planning Scoping Worksheet Guide** for questions and assistance in filling out this worksheet

Project Coordination		**Yes**	**No**	**If yes, describe**
Programmed projects (City/Twp, County, MnDOT) within or adjacent to the project?		☐	☐	
Stakeholders / Plans	**Needs**	**Wants**	**N/A**	**Describe**
City or Township	☐	☒	☐	
County	☐	☐	☒	
Regional/MPO	☐	☐	☒	
Tribal Nations	☐	☐	☒	
State/Federal	☐	☒	☐	
Business	☐	☐	☒	
Developer	☐	☒	☐	
Land Owners	☐	☐	☒	
Airports	☐	☐	☐	
User Groups	**Needs**	**Wants**	**N/A**	**Describe**
Pedestrian – Across[1]	☒	☐	☐	
Pedestrian – Along[2]	☐	☐	☒	
ADA – Across	☒	☐	☐	
ADA – Along	☐	☐	☒	
Bike – Across	☐	☒	☐	
Bike – Along	☒	☐	☐	
Bike – Parking	☐	☐	☒	
Freight – Across	☐	☒	☐	
Freight – Along	☐	☒	☐	
Freight – Parking / Loading Zones	☐	☐	☒	
Transit – Across	☐	☒	☐	
Transit – Along	☐	☐	☒	
Transit – Park & Ride	☐	☐	☒	
Railway – Across	☐	☐	☒	
Railway – Along	☐	☐	☒	
Motor Vehicle – Across	☒	☐	☐	
Motor Vehicle – Along	☒	☐	☐	
Motor Vehicle – Parking	☐	☐	☒	
Other – Across	☐	☒	☐	
Other – Along	☐	☐	☒	
Comments				

[1] Across: Roadways, paths, and other transportation routes that intersect the project

[2] Along: All transportation routes along the project corridor

S.P. (TH) #: 5080-170 **Project Mgr:** M. Harle
Project Limits:

Programmed projects (City/Twp, County, MnDOT) within or adjacent to the project?
Austin:

Stakeholders/Plans
City Plans:
Austin has recently annexed land to the west of the MN 105 bridge, north of Oakland Ave. Austin has another annexation planned north of the 218 bridge to be rehabbed in 2021.
Please consult with the 2020 Vision Group concerning the 4th St NW bridge as it is part of the Gateway to Austin plan
Public Utilities:
Businesses:
Hormel would be significantly impacted by the bridge design and construction schedule for the 6th St NE bridges
Developers:
A new distribution center is likely to be built west of the MN 105 interchange with I-90. This will produce significant changes for traffic in this area for all modes.

User Groups		Describe
Pedestrian	Across[3]	More pedestrian traffic is anticipated across the MN 105 bridge with the city expansion to the west. There is already bike traffic across this bridge connecting residences to the rest of town.
	Along[4]	
ADA	Across	Pedestrian facilities already exist across the 4th St NW bridge. The new interchange needs to accommodate pedestrians through the interchange, not just across the bridge.
	Along	
Bike	Across	New bicycle traffic is anticipated across the MN 105 bridge with the city expansion to the west. There is already bike traffic across this bridge connecting residences to the rest of town.
	Along	The D6 Bicycle Plan indicates priority bike routes crossing I-90 at 28th St NE, 4th St NW, and possibly at MN 105. Austin's trail map indicates these same crossings plus additional potential ones. Austin has a bicycle advisory group – planning has not tried to contact them as of yet.
	Parking	
Freight	Across	MPS interview data – 4th St NW exit – needs better signage or routing to determine where the truck route is.
	Along	The city may want ramp/access changes from MN 105 to I-90 as part of the major new development adjacent to the interchange. City staff indicated there would be an EIS that details this further.
	Parking / Loading Zones	

[3] Across: Roadways, paths, and other transportation routes that intersect the project
[4] Along: All transportation routes along the project corridor

S.P. (TH) #: 5080-170 **Project Mgr:** M. Harle

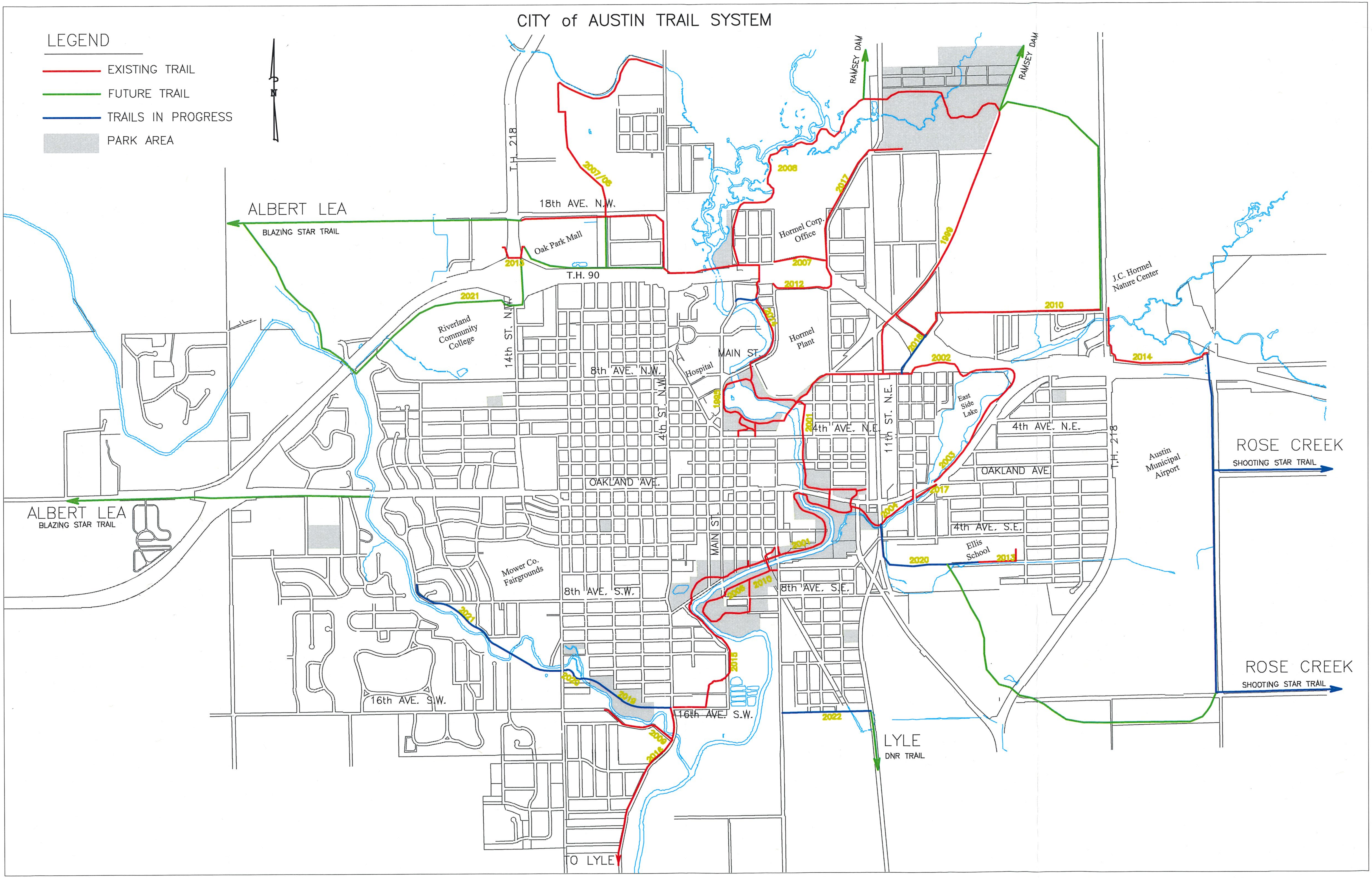
Project Limits:

Transit	Across	Deviated route transit uses the 4th St bridge as part of a regular route. Work with SMART (transit) if any detours are needed.
	Along	
	Park & Ride	
Railway	Across	
	Along	
Motor Vehicle	Across	4th St NW bridge will also include a new interchange. The desire is to construct the interchange so that traffic flows much better than it does now – current issues regarding waiting behind turning cars and staggered freeway entrance/exit points are confusing to drivers.
	Along	Austin staff mentioned sight line concerns due to the elevation changes in current bridge arcs. Desire is for bridge replacements to address these concerns. I-90 at the Oakland Pl exit is listed in the D6 Mobility Study as a relatively congested portion of the NHS system. Funding may be available for small-scale congestion mitigation projects there for FY 22-23.
	Parking	
Other	Across	Airport is adjacent to the 218 SB at I-90 bridge. Review airport influence zones for all bridges.
	Along	

City Festivals/Scheduling:

4th of July celebrations

County fair – 1st week of August – fairground are abutting MN 105


CITY of AUSTIN TRAIL SYSTEM
LEGEND
EXISTING TRAIL
FUTURE TRAIL
TRAILS IN PROGRESS
PARK AREA
N
ALBERT LEA
BLAZING STAR TRAIL
ALBERT LEA
BLAZING STAR TRAIL
ROSE CREEK
SHOOTING STAR TRAIL
ROSE CREEK
SHOOTING STAR TRAIL
LYLE
DNR TRAIL
TO LYLE
RAMSEY DAM
RAMSEY DAM
T.H. 218
T.H. 218
T.H. 90
18th AVE. N.W.
8th AVE. N.W.
14th ST. N.W.
4th ST. N.W.
MAIN ST.
MAIN ST.
11th ST. N.E.
4th AVE. N.E.
4th AVE. N.E.
OAKLAND AVE.
OAKLAND AVE.
4th AVE. S.E.
8th AVE. S.W.
8th AVE. S.E.
16th AVE. S.W.
16th AVE. S.W.
Oak Park Mall
Riverland Community College
Hormel Corp. Office
Hormel Plant
Hospital
East Side Lake
J.C. Hormel Nature Center
Austin Municipal Airport
Ellis School
Mower Co. Fairgrounds
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2015
2022

S.P. (TH) #: 5080-170 **Project Mgr:** M. Harle
Project Limits:

Person completing this form: Joe Denny Date: 9-25-18

STATE AID SCOPING WORKSHEET

To 'check' in the check boxes, double click and click on 'checked' in the Default value box

The purpose of this form is to record notes on issues that may affect the scope of the project.

ITEM	YES	NO	If Yes, Describe (or see below)
City Issues	☒	☐	Detour agreements if/when Main Line is detoured
Mower County Issues	☒	☐	Detour agreements if/when Main Line is detoured
Turn Back Issues	☐	☒	
Access Issues	☐	☒	
Business Issues	☐	☒	
Developer Issues	☐	☒	
Land Owners Issues	☐	☒	
Utility Issues	☒	☐	Ask about utility needs… lighting, anything under our bridges? Abandoned utilities on the bridge?
Locally administered TH project	☐	☒	
Local Projects Planned	☐	☒	
Cooperative Project Program	☒	☐	Ask about aesthetics? Ornamental lighting, ornamental railing, ornamental fencing, and bridge looks. May require local cost share agreement for aesthetics.
Fed. Aid Project Program	☐	☒	
	☐	☐	

Comments and Risk Identification:

Anything that is above our standard (i.e. lighting, sidewalk width/depth, colored concrete walk/median, bridge width) is at their cost and we need a cost share agreement.

4th St Bridge- Why the extra width of the bridge on a local road over TH90? MnDOT or local choice? Maintenance of the side walk will be local responsibility. Two new signals will be eligible for state aid dollars and require a cost share agreement (north side is pre-existing). What Local Funding Sources used? STATE AID dollars on the north side CSAH 45 (state aid SAP#) and Local MSA 135/4th Street on the south side (local project MSA# & or SAP#).

21st Street/CR 61 Bridge- Maintenance of the side walk will be local responsibility. CR 61 on the north side and TH 218 on the south side.

Scoping Worksheet - Right of Way

Directions

Check box(es) if present / completed and fill in blanks

Project Information

SP 5080-170 TH 90

Letting Date: FY 2023

Project Manager: Jai Kalsy

Project Limits: TH105 to US 218S (21st St.)

Scoping Charge ID: T6F010 (Use source code 1003 for scoping)

R/W Charge ID:

Signature & Date: Ethan Ihlenfeld 8//18

Type of Work

- [x] Mill / Overlay
- [ ] Reconstruction
- [x] Bridge
- [ ] ADA
- [ ] Hydraulic / Culvert
- [ ] Other

Existing Ownership

State	Location
[x] Fee	
[ ] Permanent Easement	
[ ] Temporary Easement	
[ ] Prescriptive	
[x] Access Control	
[ ] Other	
[ ] Turn Backs	

R/W Width: 265' to 430' total width

Property Owner	Location
[ ] Cattle Pass	
[ ] Possible Drain Tile	
[ ] Other	

Other Governmental Agency

[ ] Judicial / County Ditch	TBD
[ ] City / County Roadway	
[ ] City / County Trail	TBD
[ ] DNR, Fish/Wildlife, etc.	TBD
[ ] Other	

Rail Road

- [ ] Company
- [ ] Agreement(s)
- [ ] Order parcel files (RR & Control Section)

Maps and Plans

R/W Map(s) #: 18-32, 18-33, 14-38, 2-49

Plat(s) #: NA

Past Construction Plan(s) #:

- [ ] Order Parcel Files

Existing Property Management

- [ ] **Lease #** 50002
  - Expiration/Renewal Date: 11/30/2021
  - Termination Clause:
- [ ] **Limited Use Permit #** 5080-006, 0008, 0007
  - Expiration/Renewal Date: 10/1/27, 5/23/23, 5/21/22
  - Termination Clause:
- [ ] **Encroachment** TBD
  - Location:
- [ ] **Permit #**
  - Location:
  - End Date:
- [ ] **Other**

Additional Information

Storm water sewer Right of way at Sta. 73+50 the NorthWest corner of I-90 & TH105 intersection. 100' wide continuing to river (map 18-32). Chicago Milwaukee St. Paul & Pacific RR bridge at Sta. 52+00 (map 18-32). Turtle creek at Sta. 115+50. Cedar river at Sta. 111+50. Dobbins creek at Sta. 88+00. (map 18-32)

Resources

- [x] Project Charter
- [x] ProjectWise Folder
- [ ] Existing R/W Maps / Plats / Plans
- [x] REALMS
- [x] Control Section File
- [x] Commissioner's Orders
- [ ] Google Earth / StreetView / RoadLog
- [x] Agency GIS / Property Information Online
- [ ] In-Field Inspection
- [ ] Parcel / Condemnation Files

Acquisition

Lead Agency:

- ☐ State
- ☐ County
- ☐ City

Acquisition By:

- ☐ State
- ☐ Consultant
- ☐ Local Agency

Property Rights

- ☐ Fee
- ☐ Permanent Easement
- ☐ Temporary Easement
  Expires _____
- ☐ Underlying Fee Whole Project
- ☐ Underlying Fee Affected Parcel Only
- ☐ Underlying Fee of TE Only Parcels
- ☐ Define Prescriptive Use
- ☐ Access Control
- ☐ Other _____

☐ **Estimated # of Parcels** _____

Private Property Impacts

- ☐ Extinguish Cattle Pass
- ☐ Access Closure / Relocation
- ☐ Drain Tile Reconnections
- ☐ Other _____

Other Governmental Agency

- ☐ Judicial / County Ditch
- ☐ City / County Roadway
- ☐ City or County Trail
- ☐ DNR, Fish/Wildlife, etc.
- ☐ Other _____

Need:

- Board Resolution
- Commissioner's Orders
- Limited Use Permit
- Agreement / License

Rail Road

- ☐ Real Estate Purchase Agreement
- ☐ Access / Flagging Agreement

*OFCVO - Rail Administration will prepare agreement for flagging / temporary easement / access. If need temporary easement, still need to submit autho map / parcel sketches to OLM for approval. Like TRC process but OFCVO Rail will handle agreement process (for $0). If activity is permanent, an easment is obtained by Mn/DOT's standard acquisition process.

*Source: Railroads - HPDP/Scoping/Subject Guidance; MNDOT

Directions

Check box(es) of needed and fill in blanks

Process

- ☐ Fee Acquisition Process
- ☐ Temporary Right to Construct Process
  (Cannot use if permanent / fee taking is needed. If owner doesn't sign, remove parcel from project)
- ☐ Hybrid - Fee & TRC Process

Permits

- ☐ Temporary Permit to Construct
- ☐ Right of Entry (Environmental)

Potential Relocation

- ☐ Residential ☐ Commercial
- ☐ Other _____

P6 Packages / Schedule

- ☐ Environmental Due Diligence
- ☐ Fee (Hybrid follows Fee package)
- ☐ Temporary Right to Construct
- ☐ Commissioner's Orders
- ☐ Public Ditch Hearing
- ☐ Baseline - Date Reviewed _____

Additional Information / Identified Risks

- ☐ Potential Business Impacts _____
- ☐ Access Issues _____
- ☐ Plats Needed _____
- ☐ Other _____

Budget

Post-Letting Activities

Scoping Worksheet - Right of Way

Existing R/W Information

Directions

Check box(es) if present / completed and fill in blanks

Project Information

SP 5080-170 TH 90

Letting Date: FY 2023

Project Manager: Jai Kalsy

Project Limits: TH105 to US 218S (21st St.)

Scoping Charge ID: T6F010 (Use source code 1003 for scoping)

R/W Charge ID:

Signature & Date: Ethan Ihlenfeld 8//18

Type of Work

- [x] Mill / Overlay
- [ ] Reconstruction
- [x] Bridge
- [ ] ADA
- [ ] Hydraulic / Culvert
- [ ] Other

Existing Ownership

State	Location
[x] Fee	
[ ] Permanent Easement	
[ ] Temporary Easement	
[ ] Prescriptive	
[x] Access Control	
[ ] Other	
[ ] Turn Backs	

R/W Width: 265' to 430' total width

Property Owner	Location
[ ] Cattle Pass	
[ ] Possible Drain Tile	
[ ] Other	

Other Governmental Agency

[ ] Judicial / County Ditch	
[ ] City / County Roadway	
[ ] City / County Trail	TBD
[ ] DNR, Fish/Wildlife, etc.	TBD
[ ] Other	

Rail Road

- [ ] Company
- [ ] Agreement(s)
- [ ] Order parcel files (RR & Control Section)

Maps and Plans

R/W Map(s) #: 18-32, 18-33, 14-38, 2-49

Plat(s) #: NA

Past Construction Plan(s) #:

- [ ] Order Parcel Files

Existing Property Management

- [ ] **Lease #**: 50002
  - Expiration/Renewal Date: 11/30/2021
  - Termination Clause:
- [ ] **Limited Use Permit #**: 5080-006, 0008, 0007
  - Expiration/Renewal Date: 10/1/27, 5/23/23, 5/21/22
  - Termination Clause:
- [ ] **Encroachment**: TBD
  - Location:
- [ ] **Permit #**:
  - Location:
  - End Date:
- [ ] **Other**:

Additional Information

Storm water Right of way at Sta. 73+50 the NorthWest corner of I-90 & TH105 intersection. 100' wide continuing to river (map 18-32). Chicago Milwaukee St. Paul & Pacific RR bridge at Sta. 52+00 (map 18-32). Turtle creek at Sta. 115+50. Cedar river at Sta. 111+50. Dobbins creek at Sta. 88+00. (map 18-32)

Resources

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- [x] Commissioner's Orders
- [ ] Google Earth / StreetView / RoadLog
- [x] Agency GIS / Property Information Online
- [ ] In-Field Inspection
- [ ] Parcel / Condemnation Files

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Lead Agency:

- ☐ State
- ☐ County
- ☐ City

Acquisition By:

- ☐ State
- ☐ Consultant
- ☐ Local Agency

Property Rights

- ☐ Fee
- ☐ Permanent Easement
- ☐ Temporary Easement
  Expires _____
- ☐ Underlying Fee Whole Project
- ☐ Underlying Fee Affected Parcel Only
- ☐ Underlying Fee of TE Only Parcels
- ☐ Define Prescriptive Use
- ☐ Access Control
- ☐ Other _____

☐ **Estimated # of Parcels** _____

Private Property Impacts

- ☐ Extinguish Cattle Pass
- ☐ Access Closure / Relocation
- ☐ Drain Tile Reconnections
- ☐ Other _____

Other Governmental Agency

- ☐ Judicial / County Ditch
- ☐ City / County Roadway
- ☐ City or County Trail
- ☐ DNR, Fish/Wildlife, etc.
- ☐ Other _____

Need:

- Board Resolution
- Commissioner's Orders
- Limited Use Permit
- Agreement / License

Rail Road

- ☐ Real Estate Purchase Agreement
- ☐ Access / Flagging Agreement

*OFCVO - Rail Administration will prepare agreement for flagging / temporary easement / access. If need temporary easement, still need to submit autho map / parcel sketches to OLM for approval. Like TRC process but OFCVO Rail will handle agreement process (for $0). If activity is permanent, an easment is obtained by Mn/DOT's standard acquisition process.

*Source: Railroads - HPDP/Scoping/Subject Guidance; MNDOT

Directions

Check box(es) of needed and fill in blanks

Process

- ☐ Fee Acquisition Process
- ☐ Temporary Right to Construct Process
  (Cannot use if permanent / fee taking is needed.
  If owner doesn't sign, remove parcel from project)
- ☐ Hybrid - Fee & TRC Process

Permits

- ☐ Temporary Permit to Construct
- ☐ Right of Entry (Environmental)

Potential Relocation

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- ☐ Commercial
- ☐ Other _____

P6 Packages / Schedule

- ☐ Environmental Due Diligence
- ☐ Fee (Hybrid follows Fee package)
- ☐ Temporary Right to Construct
- ☐ Commissioner's Orders
- ☐ Public Ditch Hearing
- ☐ Baseline - Date Reviewed _____

Additional Information / Identified Risks

- ☐ Potential Business Impacts _____
- ☐ Access Issues _____
- ☐ Plats Needed _____
- ☐ Other _____

Budget

Post-Letting Activities

Scoping Worksheet - Right of Way

Existing R/W Information

Directions

Check box(es) if present / completed and fill in blanks

Project Information

SP 5080-170 TH 90

Letting Date: FY 2023

Project Manager: Jai Kalsy

Project Limits: Bridge 9183

Scoping Charge ID: T6F010 (Use source code 1003 for scoping)

R/W Charge ID:

Signature & Date: Ethan Ihlenfeld 8//18

Type of Work

- [ ] Mill / Overlay
- [ ] Reconstruction
- [x] Bridge
- [ ] ADA
- [ ] Hydraulic / Culvert
- [ ] Other

Existing Ownership

State — Location

- [x] Fee
- [ ] Permanent Easement
- [ ] Temporary Easement
- [ ] Prescriptive
- [x] Access Control
- [ ] Other
- [ ] Turn Backs

R/W Width: 265' to 430' total width

Property Owner — Location

- [ ] Cattle Pass
- [ ] Possible Drain Tile
- [ ] Other

Other Governmental Agency

- [ ] Judicial / County Ditch
- [ ] City / County Roadway
- [ ] City / County Trail: TBD
- [ ] DNR, Fish/Wildlife, etc.: TBD
- [ ] Other

Rail Road

- [ ] Company
- [ ] Agreement(s)
- [ ] Order parcel files (RR & Control Section)

Maps and Plans

R/W Map(s) #: 18-32, 18-33, 14-38, 2-49

Plat(s) #: NA

Past Construction Plan(s) #:

- [ ] Order Parcel Files

Existing Property Management

- [ ] **Lease #**: 50002
  - Expiration/Renewal Date: 11/30/2021
  - Termination Clause:
- [ ] **Limited Use Permit #**: 5080-006, 0008, 0007
  - Expiration/Renewal Date: 10/1/27, 5/23/23, 5/21/22
  - Termination Clause:
- [ ] **Encroachment**: TBD
  - Location:
- [ ] **Permit #**:
  - Location:
  - End Date:
- [ ] **Other**:

Additional Information

Storm water Right of way at Sta. 73+50 the NorthWest corner of I-90 & TH105 intersection 100' wide continuing to river (map 18-32).

Resources

- [x] Project Charter
- [x] ProjectWise Folder
- [ ] Existing R/W Maps / Plats / Plans
- [x] REALMS
- [x] Control Section File
- [x] Commissioner's Orders
- [ ] Google Earth / StreetView / RoadLog
- [x] Agency GIS / Property Information Online
- [ ] In-Field Inspection
- [ ] Parcel / Condemnation Files

Acquisition

Lead Agency:
- ☐ State
- ☐ County
- ☐ City

Acquisition By:
- ☐ State
- ☐ Consultant
- ☐ Local Agency

Property Rights
- ☐ Fee
- ☐ Permanent Easement
- ☐ Temporary Easement
  Expires _____
- ☐ Underlying Fee Whole Project
- ☐ Underlying Fee Affected Parcel Only
- ☐ Underlying Fee of TE Only Parcels
- ☐ Define Prescriptive Use
- ☐ Access Control
- ☐ Other _____

☐ **Estimated # of Parcels** _____

Private Property Impacts
- ☐ Extinguish Cattle Pass
- ☐ Access Closure / Relocation
- ☐ Drain Tile Reconnections
- ☐ Other _____

Other Governmental Agency — **Need:**
- ☐ Judicial / County Ditch — Board Resolution
- ☐ City / County Roadway — Commissioner's Orders
- ☐ City or County Trail — Limited Use Permit
- ☐ DNR, Fish/Wildlife, etc. — Agreement / License
- ☐ Other _____

Rail Road
- ☐ Real Estate Purchase Agreement
- ☐ Access / Flagging Agreement

*OFCVO - Rail Administration will prepare agreement for flagging / temporary easement / access. If need temporary easement, still need to submit autho map / parcel sketches to OLM for approval. Like TRC process but OFCVO Rail will handle agreement process (for $0). If activity is permanent, an easment is obtained by Mn/DOT's standard acquisition process.

*Source: Railroads - HPDP/Scoping/Subject Guidance; MNDOT

Directions

Check box(es) of needed and fill in blanks

Process
- ☐ Fee Acquisition Process
- ☐ Temporary Right to Construct Process
  (Cannot use if permanent / fee taking is needed. If owner doesn't sign, remove parcel from project)
- ☐ Hybrid - Fee & TRC Process

Permits
- ☐ Temporary Permit to Construct
- ☐ Right of Entry (Environmental)

Potential Relocation
- ☐ Residential
- ☐ Commercial
- ☐ Other _____

P6 Packages / Schedule
- ☐ Environmental Due Diligence
- ☐ Fee (Hybrid follows Fee package)
- ☐ Temporary Right to Construct
- ☐ Commissioner's Orders
- ☐ Public Ditch Hearing
- ☐ Baseline - Date Reviewed _____

Additional Information / Identified Risks
- ☐ Potential Business Impacts _____
- ☐ Access Issues _____
- ☐ Plats Needed _____
- ☐ Other _____

Budget

Post-Letting Activities

Scoping Worksheet - Right of Way

Existing R/W Information

Directions

Check box(es) if present / completed and fill in blanks

Project Information

SP 5080-170 TH 90

Letting Date: FY 2023

Project Manager: Jai Kalsy

Project Limits: TH105 to US 218S (21st St.)

Scoping Charge ID: T6F010 (Use source code 1003 for scoping)

R/W Charge ID:

Signature & Date: Ethan Ihlenfeld 8//18

Type of Work

- [x] Mill / Overlay
- [ ] Reconstruction
- [x] Bridge
- [ ] ADA
- [ ] Hydraulic / Culvert
- [ ] Other

Existing Ownership

State	Location
[x] Fee	
[ ] Permanent Easement	
[ ] Temporary Easement	
[ ] Prescriptive	
[x] Access Control	
[ ] Other	
[ ] Turn Backs	

R/W Width: 265' to 430' total width

Property Owner	Location
[ ] Cattle Pass	
[ ] Possible Drain Tile	
[ ] Other	

Other Governmental Agency

[ ] Judicial / County Ditch	
[ ] City / County Roadway	
[ ] City / County Trail	TBD
[ ] DNR, Fish/Wildlife, etc.	TBD
[ ] Other	

Rail Road

- [ ] Company
- [ ] Agreement(s)
- [ ] Order parcel files (RR & Control Section)

Maps and Plans

R/W Map(s) #: 18-32, 18-33, 14-38, 2-49

Plat(s) #: NA

Past Construction Plan(s) #:

- [ ] Order Parcel Files

Existing Property Management

- [ ] **Lease #**: 50002
  - Expiration/Renewal Date: 11/30/2021
  - Termination Clause:
- [ ] **Limited Use Permit #**: 5080-006, 0008, 0007
  - Expiration/Renewal Date: 10/1/27, 5/23/23, 5/21/22
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- [ ] **Permit #**:
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- [ ] **Other**:

Additional Information

Storm water Right of way at Sta. 73+50 the NorthWest corner of I-90 & TH105 intersection. 100' wide continuing to river (map 18-32). Chicago Milwaukee St. Paul & Pacific RR bridge at Sta. 52+00 (map 18-32). Turtle creek at Sta. 115+50. Cedar river at Sta. 111+50. Dobbins creek at Sta. 88+00. (map 18-32)

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Lead Agency:
- ☐ State
- ☐ County
- ☐ City

Acquisition By:
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Property Rights
- ☐ Fee
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- ☐ **Estimated # of Parcels** _____

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- ☐ Extinguish Cattle Pass
- ☐ Access Closure / Relocation
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Other Governmental Agency

	Need:
☐ Judicial / County Ditch	Board Resolution
☐ City / County Roadway	Commissioner's Orders
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*Source: Railroads - HPDP/Scoping/Subject Guidance; MNDOT

Directions

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Process
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- ☐ Hybrid - Fee & TRC Process

Permits
- ☐ Temporary Permit to Construct
- ☐ Right of Entry (Environmental)

Potential Relocation
- ☐ Residential
- ☐ Commercial
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P6 Packages / Schedule
- ☐ Environmental Due Diligence
- ☐ Fee (Hybrid follows Fee package)
- ☐ Temporary Right to Construct
- ☐ Commissioner's Orders
- ☐ Public Ditch Hearing
- ☐ Baseline - Date Reviewed _____

Additional Information / Identified Risks
- ☐ Potential Business Impacts _____
- ☐ Access Issues _____
- ☐ Plats Needed _____
- ☐ Other _____

Budget

Post-Letting Activities

Scoping Worksheet - Right of Way

Existing R/W Information

Directions

Check box(es) if present / completed and fill in blanks

Project Information

SP 5080-170 TH 90

Letting Date: FY 2023

Project Manager: Jai Kalsy

Project Limits: TH105 to US 218S (21st St.)

Scoping Charge ID: T6F010 (Use source code 1003 for scoping)

R/W Charge ID:

Signature & Date: Ethan Ihlenfeld 8//18

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- [x] Mill / Overlay
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[x] Access Control	
[ ] Other	
[ ] Turn Backs	

R/W Width: 265' to 430' total width

Property Owner	Location
[ ] Cattle Pass	
[ ] Possible Drain Tile	
[ ] Other	

Other Governmental Agency

[ ] Judicial / County Ditch	
[ ] City / County Roadway	
[ ] City / County Trail	TBD
[ ] DNR, Fish/Wildlife, etc.	TBD
[ ] Other	

Rail Road

[ ] Company	
[ ] Agreement(s)	
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Maps and Plans

R/W Map(s) #: 18-32, 18-33, 14-38, 2-49

Plat(s) #: NA

Past Construction Plan(s) #:

[ ] Order Parcel Files

Existing Property Management

- [ ] **Lease #**: 50002
  - Expiration/Renewal Date: 11/30/2021
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Lead Agency:

- ☐ State
- ☐ County
- ☐ City

Acquisition By:

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- ☐ Local Agency

Property Rights

- ☐ Fee
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- ☐ Underlying Fee Whole Project
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- ☐ Judicial / County Ditch
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- ☐ Other _____

Need:

- Board Resolution
- Commissioner's Orders
- Limited Use Permit
- Agreement / License

Rail Road

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*Source: Railroads - HPDP/Scoping/Subject Guidance; MNDOT

Directions

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Permits

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Potential Relocation

- ☐ Residential
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P6 Packages / Schedule

- ☐ Environmental Due Diligence
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- ☐ Temporary Right to Construct
- ☐ Commissioner's Orders
- ☐ Public Ditch Hearing
- ☐ Baseline - Date Reviewed _____

Additional Information / Identified Risks

- ☐ Potential Business Impacts _____
- ☐ Access Issues _____
- ☐ Plats Needed _____
- ☐ Other _____

Budget

Post-Letting Activities

SP 5080-170 I90 Prj Mgr: M. Harle Prj. Lim.: Bridges 6868, 6869, 9178, 9179, 9180, 9183, 9201
Person completing this form: Keith Kallin Date: 9-21-18

SURVEYS SCOPING WORKSHEET

To 'check' in the check boxes, double click and click on 'checked' in the Default value box
The purpose of this form is to record notes on existing conditions for Surveys and R/W to determine what will be needed to deliver the project. Maps would be useful.

ITEM	YES	NO	If Yes, Describe (or see below)
Existing Photos	☒	☐	See below
Existing Mapping	☒	☐	See below
Existing Surveys	☒	☐	See below
As-Builts Available	☐	☒	
Use Contractor Staking	☐	☒	
	☐	☐	
	☐	☐	
	☐	☐	
	☐	☐	

Comments and Risk Identification:

Alignment = s5080146_ali.dgn
R/W = Nothing
Mapping = CPH5080150A_01PLN.DGN

RETURN FORM TO PROJECT MANAGER BY: 10/22/18
Project Charge ID: T6F010

S.P. (TH) #: 5080-170 **Project Mgr:** M. Harle

Project Limits:

Person completing this form: Derrick Crews Date: 10/10/2018

MAINTENANCE SCOPING WORKSHEET

To 'check' in the check boxes, double click and click on 'checked' in the Default value box

The purpose of this form is to record notes on issues that may affect the scope of the project.

ITEM	ITEM NEEDED			NOTES (or see below) (Location, Quantity/Cost estimate and other comments)
	Need	Want	Not	
Striping	☐	☐	☐	
Signing	☐	☐	☐	
Lighting	☐	☐	☐	
Curb & Gutter	☐	☐	☒	If you can avoid curbing around radius for snow plowing
Low gravel shoulder correction	☐	☐	☐	
Guard Rail Repair	☒	☐	☐	Replace all turn down
Fencing	☐	☐	☐	
Noisewall	☐	☐	☐	
Drainage Repair	☒	☐	☐	Replace culverts in the median
Erosion Area Correction	☐	☐	☐	
Flooding Area Correction	☐	☐	☐	
Snow Trap, Storage, Icing Correction	☐	☐	☐	
RWIS	☐	☐	☐	
Anti-Icing System	☐	☐	☐	
Frost Heave Correction	☐	☐	☐	
Rest Area Work	☐	☐	☐	
Landscaping	☐	☐	☒	Trees and shrubs, unless Austin Park and Rec. is going to maintain them
Millings needed	☐	☐	☐	
Other salvage items	☐	☐	☐	
	☐	☐	☐	

any out-of-the ordinary major quantity item needs a quantity and cost estimate

Comments and Risk Identification:

S.P. (TH) #: 5080-170 **Project Mgr:** M. Harle

Project Limits:

Person completing this form: Tom Meath Date: 10/22/18

MATERIALS SCOPING WORKSHEET

To 'check' in the check boxes, double click and click on 'checked' in the Default value box

Have borings been done? ☐ Yes ☒ No

The purpose of this form is to record notes on issues that may affect the scope of the project.

Proposed Fix[1] [Attach typical section(s)]	Alternate Fixes[1]:
MDR will contain	NA 1. 2.

ITEM		ITEM NEEDED			Approx. RP		NOTES (or see below) (Quantity/Cost estimate and other comments)
		Need	Want	Not	From	To	
Bituminous	Paving	☒	☐	☐			*(include lane width)*
	Reclamation[a]	☐	☐	☒			
	Pavement Milling	☐	☐	☒			
	Millings re-use[a]	☐	☐	☒			
		☐	☐	☐			
Concrete	Paving	☐	☐	☒			*(include lane width)*
	Joint Repairs	☐	☐	☒			
	Dowel Bars	☐	☐	☒			
	Planing	☐	☐	☒			
	Major CPR	☐	☐	☒			
	Minor CPR	☐	☐	☒			
		☐	☐	☐			
Sub-surface	Base Repairs	☒	☐	☐			
	Grading	☒	☐	☐			
	Muck, groundwater, rock	☐	☐	☒			
Shl-der	Shoulder Work	☒	☐	☐			*(include shoulder width)*
		☐	☐	☐			
Edge Drains	Edge Drain Video Insp.[a]	☐	☐	☒			
	Edge Drain Flushing[a]	☐	☐	☒			
	New Edge Drains	☐	☐	☒			

[1] Materials should provide proposed fix and alternates

[a] these items and any other out-of-the ordinary major quantity item needs a quantity and cost estimate

Comments and Risk Identification:

Replace pavement on I-90 in kind w/ Bit. deep strength. I-90 EB & WB From T.H 105 to CSAH 46 will get a 4.5" overlay over concrete in 2026. I-90 WB From CSAH 46 to Dexter ~~Retrim, get a 4.5" overlay in 2026.~~ I-90 EB From CSAH 46 to Dexter will get a

Project Charge ID: T6F010

SP 5080-170 (TH 90)
Project Limits: RP to

Project Manager: Mark Harle
Form Completed By: Adam Wellner
Date: October 23, 2018

TRAFFIC SCOPING WORKSHEET

Project issues, concerns, & history:

Safety and operations:

Safety and operations were studied by SEH in a pre-scoping study. Various issues were identified, and no major changes have occurred since the study, see the pre-scoping study for details.

Signing: Bridge mounted signs will be impacted. Due to space constraints ground mounting of the signs is not feasible. Due to the age (~2006) replacement is recommended. All other signing work to be based on impacts of other work, replace or S&I based on age and condition of the individual sign.

Lighting:
All lighting within the area is near or past the useful service life. Underground lighting cable issues are becoming more common. Full replacement of lighting is recommended.

Traffic signals:
As per the pre-scoping study signals are recommended at both ramps of the 4th ST interchange. Due to the new configuration and age/condition of the existing signal at 4th ST, signal replacement is recommended.

Pavement markings:
Ground-in wet reflective Multi-component and Poly-preform markings are recommended. Final pavement determination may result in a change in this recommendation.

Rumblestrips:
No rumblestrips in this project

Cable median barrier:
No CMB in this project

Guardrail:
No guardrail other than as required by standards is recommended.

Turn lanes:
Lane configurations were studied in the pre-scoping study, see the pre-scoping study for turn lanes.

Intersection improvements:
See the pre-scoping study for proposed intersection improvements.

Access control:
I-90 is an access controlled freeway. Per the pre-scoping study, while there are a high density of interchanges in the project area, due in part to low volumes on I-90 crash rates have remained low. Due to the limited parallel connectivity no additional access control is recommended.

Clear zone issues:

SP 5080-170 (TH 90)
Project Limits: RP to

Project Manager: Mark Harle
Form Completed By: Adam Wellner
Date: October 23, 2018

No know clear zone issues.

Traffic control:

Traffic control and staging is currently being studied by Alliant Engineering. The results of the Alliant study should be incorporated as the proposed staging.

TMP Type Needed:

☐ None ☐ Temporary Traffic Control Plan ☐ Basic TMP ☒ TMP with traffic analysis

ITS Systems Engineering Required:

☒ Yes ☐ No

Recommendations:

S.P. (TH) #: **Project Mgr:** click here for Project Manager

Project Limits:

Person completing this form: Mark Harle Date: 1/25/19

GEOTECHNICAL SCOPING WORKSHEET

To 'check' in the check boxes, double click and click on 'checked' in the Default value box

Use this form to record any notes on items that may affect the geotechnical aspects of the project. Please include any attachments that may be helpful.

Item	Item Needed			Notes (Location, quantity/cost estimate, and other comments)
	Yes[1]	No	Maybe[1]	
Retaining Walls Concrete cast in-place MSE[a] Other types (soil nail, sheeting, RSS)	☒	☐	☐	Walls needed at 4th Street bridge. Cost will be included.
Noise walls	☐	☐	☒	This will be reviewed with the ENM, whether a Noise Analysis resulting from change in vertical and horizontal alignment is needed. Would expect a low chance of needing Noise Walls.
Overhead signs	☐	☐	☒	Limited space for overhead sign placement. Will likely need to replace existing bridge mounted signs in-kind.
High-tension cable guardrail	☐	☒	☐	
High mast light tower	☐	☐	☒	Interchange lighting to be replaced with this project.
New signals with long mast arms[b]	☐	☐	☒	Signals to be replaced at 4th Street.
Poor foundation soils[c]	☐	☒	☐	
Tall embankments	☐	☒	☐	
New alignment or widening through swamp	☐	☒	☐	
Slope failures/landslides	☐	☒	☐	
Bump or dip in roadway	☐	☒	☐	
Groundwater issues	☐	☒	☐	
Rock cuts/rock falls/Karst	☐	☐	☐	
Pond investigations	☐	☐	☒	
Large culverts (wo numbers)	☐	☒	☐	
Construction vibration concerns	☐	☐	☒	
Buildings/rest areas	☐	☒	☐	
Other	☐	☐	☐	

[1]If you check any boxes in these columns, please coordinate with the Geotechnical Section Manager.

[a]MSE = mechanically stabilized earth walls, including gravity walls, modular block walls, and precast panels with a minimum wall hieight of 5 feet

[b]Long mast arms = Arms that are 45 feet long or longer

[c]Review these items with the District Soils or Materials Engineer to determine if these geotechnical features exist on the project.

Please identify any potential risks and add any other comments here:

RETURN FORM TO PROJECT MANAGER BY: 10/22/18

Project Charge ID: T6F010

RISK REGISTER

Prime S.P. 5080-170
Route IH 90
Project Name: Austn Corridor Bridge Replacement Project
Project Manager: Jai Kalsy

Probability	Cost	Schedule
5 - H (>60%)	5 - H (>$2000000)	5 - H (>120d)
4 - M (>40%)	4 - M (>$1000000)	4 - M (>60d)
3 - L (>20%)	3 - L (>$500000)	3 - L (>25d)
2 - VL (>10%)	2 - VL (>$250000)	2 - VL (>15d)
1 - EL (<=10%)	1 - EL (<=$250000)	1 - EL (<=5d)

Risk Identification				Risk Assessment					Risk Response				Risk Monitoring	
Risk ID	Risk Name	Status	Description	Probability	Cost Impact	Schedule Impact	Overall Rating	Risk Exposure	Response Type	Response Action	Responsible Person	Contingency	Last Updated / Comments	Next Review Date
1	Unexpected utility relocation	Active	Project Encounters unanticipated utility move(s), which are reimbursable	4 - M (>40%)	1 - EL (<=$250000)	2 - VL (>15d)	8	87500	MITIGATE	conduct SUE	Consultant	85000	2.04.2020	11.01.2020
2	City wants wider sidewalks	Active	Bridge costs may increase	4 - M (>40%)	3 - L (>$500000)	3 - L (>25d)	12	375000	SHARE	discuss w/ City early	MnDOT	500000	2.04.20	11.01.2020
3	Mainline overlay is advanced	Active	Planned overlay for 2026(?) on I-90 is advanced into this plan set	3 - L (>20%)	2 - VL (>$250000)	2 - VL (>15d)	6	112500	AVOID	keep overlay on separate path	MnDOT	0	2.04.2020	2.04.2021

Following this decision tree indicated Non-Programmatatic CATEX as the environmental document to be used. Will confirm with ENM.

MnDOT Trunk Highway Environmental Document Decision Tree

Purpose: The purpose of this document is to give guidance for selecting the appropriate environmental documentation for a project.

When to use the Decision Tree: Use the Decision Tree when you are:

- Scoping a project,
- Creating the P6 project schedule, or
- Discover environmental impacts that may require changing the type of environmental document you planned to write.

Who should use the Decision Tree? Project managers and those involved in choosing the appropriate environmental documentation for a project.

How do I confirm and document my decision regarding the appropriate environmental document? Use the Early Notification Memo (ENM) to state the anticipated environmental document type based on the Decision Tree. The Decision Tree is largely a general rule-of-thumb based upon a combination of regulation, agreements in place, and past experience. The lead federal agency has discretion on the appropriate class of NEPA document on a project-by-project basis.

Where do I get a copy of the Decision Tree? The Decision Tree is posted on MnDOT's HPDP website at: http://dotapp7.dot.state.mn.us/eDIGS_guest/DMResultSet/download?docId=620602

Note: the phrase Categorical Exclusion is abbreviated as CatEx and CE in this document. CatEx is the common abbreviation used in MnDOT. CE is the abbreviation used in federal regulation.

Is FHWA involved in the Project?

1. **Is the project a FHWA undertaking or is it possible that it will become a FHWA undertaking?**
   - **If yes, go to Step 2.** YES
   - **If no, skip to Step 6.**

What is an FHWA undertaking?
An FHWA undertaking is a project, activity, or program meeting one of the following:

- funded in whole or in part under the direct or indirect jurisdiction of FHWA, including those carried out on behalf of FHWA;
- carried out with FHWA financial assistance; or
- requiring a FHWA permit, license or approval. This includes situations where an approval is taken on behalf of FHWA by MnDOT (e.g. Interstate Access Request) via delegation OR FHWA must take an approval action on an IAR.

Federal EIS?

2. **Is the project similar to examples below of actions that require an EIS under 23 CFR 771.115(a), or exceed a mandatory EIS threshold at Minnesota Rules 4410.4400?**
   - **If yes, it is likely that the required document is an EIS, contact OES and FHWA to confirm. In the ENM, under General Project Information, Environmental Document, mark according to OES direction. A federal EIS will meet state EIS requirements. END – consult OES and FHWA**
   - **If no, go to step 3.** No

What are the examples of actions that require an EIS under 23 CFR 771.115(a)?
Class I (EISs). Actions that significantly affect the environment require an EIS (40 CFR 1508.27). The following are examples of actions that normally required an EIS:

(1) A new controlled access freeway.
(2) A highway project of four or more lanes on a new location.
(3) Construction or extension of a fixed transit facility (e.g., rapid rail, light rail, commuter rail, bus rapid transit) that will not be located within an existing transportation right-of-way.
(4) New construction or extension of a separate roadway for buses or high occupancy vehicles not located within an existing highway facility.

Federal Categorical Exclusion document?

3. **Does the project have unusual circumstances under 23 CFR 771.117(b)?**

   - **If yes, or if the impact significance is unclear, an EA or EIS may be the appropriate class of NEPA document; consult with OES and FHWA. END – consult OES and FHWA**
   - **If no, in the ENM, under General Project Information, Environmental Document, mark "CatEx". Continue on in this Decision Tree to determine the type of CatEx document and to determine the state requirements. Go to Step 4. For more detail about determining if the type of CatEx document, refer to the *Programmatic Categorical Exclusion (PCE) Decision-Making Guide*.**

No

What are unusual circumstances under 23 CFR 771.117(b)?
Any action which normally would be classified as a CE but could involve unusual circumstances will require the FHWA, in cooperation with the applicant, to conduct appropriate environmental studies to determine if the CE classification is proper. Such **unusual circumstances *include***:

(1) Significant environmental impacts;
(2) Substantial controversy on environmental grounds;
(3) Significant impact on properties protected by section 4(f) of the DOT Act or section 106 of the National Historic Preservation Act; or
(4) Inconsistencies with any Federal, State, or local law, requirement or administrative determination relating to the environmental aspects of the action.

See Appendix D – "Significance" of Environmental Effects under NEPA for considerations in determining "significance".

While not "unusual circumstances" as defined by 23 CRF 771.117(b), there are occasions when an FHWA undertaking also requires another federal agency to issue a NEPA decision document. Examples include Forest Service involvement in a federally-funded MnDOT project through Forest Service lands or Federal Aviation Administration involvement in a federally-funded MnDOT project in an airport area. In instances such as these, it is recommended that project manager contact OES to discuss options for best addressing NEPA requirements. (Note that this recommendation is not meant for projects where the involvement of other federal agencies is limited to the typical Federal permits and approvals (e.g. Section 404, Section 10, Section 6(f), Section 7) and related coordination.)

Federal regulations require formal public review of only EIS (Class I) and EA (Class III) document. However, public involvement is tailored to the needs of every project, regardless of NEPA class of action. These public involvement processes should be well documented.

4. **Does the project fall under 23 CFR 771.117(c) OR 23 CFR 771.117 (d)?**
   - If yes, **go to Step 5.**
   - If no, **END – consult OES and FHWA.**

YES - **23 CFR 771.117(c) - (28)**

23 CFR 771.117 describes FHWA categorical exclusions. Categorical exclusions (CEs) are actions, based on past experience with similar actions that do not involve significant environmental impacts. they are actions which: do not induce significant impacts to planned growth or land use for the area; do not require the relocation of significant numbers of people; do not have a significant impact on any natural, cultural, recreational, historic or other resource; do not involve significant air, noise, or water quality impacts; do not have significant impacts on travel patterns; or do not otherwise, either individually or cumulatively, have any significant environmental impacts.

23 CFR 771 prescribes the policies and procedures of the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) for implementing the National Environmental Policy Act of 1969 as amended (NEPA).

WHAT IS 23 CFR 771.117(c)?
23 CFR 771.117(c) is a regulation section of the Federal environmental regulation within the Code of Federal Regulations (CFR).

The actions listed under 23 CFR 771.117(c) are commonly referred to as 'c-list CEs'.

23 CFR 771.117(c) lists actions that normally do not require any further NEPA approvals by the FHWA.
Documentation of the Categorical Exclusion is still required by, completing as a minimum, a short-form CE.

23 CFR 771.117(c) lists actions that normally do not require any further NEPA approvals by the FHWA. A listed CE merely means that the actions listed tend to be CEs. An EA or EIS is still possible for the circumstances of a project. All laws (wetlands, section 4f, section 106, endangered species act, etc.) still apply and must be fulfilled by the process that includes producing a NEPA document. All state and federal agencies retain their approval authority and are responsible for their respective approval actions (not just permits).

What projects fall under 23 CFR 771.117 (c)?

SEE Appendix B – 23 CFR 771.117 (d) FOR A LIST OF THESE ACTIONS.

What is 23 CFR 771.117(d)?
23 CFR 771.117(d) is a regulation section of the Federal environmental regulation within the Code of Federal Regulations (CFR).

Actions listed under 23 CFR 771.117(d) are commonly referred to as 'd-list CEs'.

If a project is not a CE under 23 CFR771.117(c), it may be processed as a CE if it is an action listed under 23 CFR 771.117(d) and shown to meet the CE criteria through documentation, which is reviewed and approved by FHWA, **UNLESS** it is listed in the *Programmatic Categorical Exclusion Agreement between MnDOT and FHWA* (the *Programmatic Agreement* test is in step 8, so first check to see if the project is listed in CFR 771.117(d), then go to step 8).

What projects fall under 23 CFR 771.117 (d)?

SEE Appendix B – 23 CFR 771.117 (d) FOR A LIST OF THESE ACTIONS.

5. **Does the project exceed any threshold in Attachment B of the *2017 Programmatic CATEX Agreement Between FHWA and MnDOT?* Refer to the *Programmatic Categorical Exclusion (PCE) Decision-Making Guide* for detail on applying the thresholds.**

   - **If yes, the project likely requires a Non-Programmatic CatEx document using the long-form. Contact OES to confirm FHWA approval. END**

     YES - Likely Type 1 Noise and/or exceeds Threatened and Endangered Species

   - **If no, the project qualifies as a Programmatic CatEx d**
     - **A long-form may be used by the project proposer in any CatEx situation.**
     - **A long-form is also appropriate on a project that requires detailed information to explain SEE impacts, mitigation, or tell the story of balancing competing impacts (e.g. Section 106 vs. R/W) to arrive at preferred alternative.**
   - **In either case, go to step 6 to determine state process requirements.**

What is the *2017 Programmatic CATEX Agreement Between FHWA and MnDOT*?
This agreement allows MnDOT to act in place of the FHWA in determining that federal environmental requirements are met on the types of categorical exclusion actions identified in the agreement.

What is Attachment B?
Attachment B is attached to the *Programmatic Agreement*, and lists environmental conditions and criteria that must be met before MnDOT can act for FHWA. FHWA concurred, on a programmatic basis, with MnDOT's determination that those types of actions satisfying conditions and criteria in Attachment "B" will not result in significant environmental impacts, either individually or cumulatively, and are therefore categorical exclusions and satisfy the requirements of Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations".

What is the *Programmatic Categorical Exclusion (PCE) Decision-Making Guide*?
The guide is a companion to the Environmental Document Decision Tree and provides additional detail for the steps that project staff can follow to determine (1) if a project can be processed as PCE and (2) how to document the PCE.

State Exemption?

6. **Is the project exempt according to Minn. Rule 4410.4600?**
   - **If yes, complete an ENM Summary Table memo and attach all of the ENM review responses. Mark the ENM documentation section accordingly.**
   - **If no, go to Step 7.**

What is an exemption according to Minn. Rule 4410.4600?
Exempt projects do not require state environmental review documents. Common exemptions for highway projects are listed below:

- Subpart 2 – Standard exemptions
- Subpart 14 – Highway projects
  - A. Highway safety improvement projects are exempt.
  - B. Installation of traffic control devices, individual noise barriers, bus shelters and bays, loading zones, and access and egress lanes for transit and paratransit vehicles is exempt.
  - C. Modernization of an existing roadway or bridge by resurfacing, restoration, or rehabilitation that may involve the acquisition of minimal amounts of right-of-way is exempt.
  - D. Roadway landscaping, construction of bicycle and pedestrian lanes, paths, and facilities within existing right-of-way are exempt.
  - E. Any stream diversion or channelization within the right-of-way of an existing public roadway associated with bridge or culvert replacement is exempt.
  - F. Reconstruction or modification of an existing bridge structure on essentially the same alignment or location that may involve the acquisition of minimal amounts of right-of-way is exempt.
- Subpart 26 – Governmental activities

Check if other exemptions apply to your project at Minn. Rule **4410.4600**.

Where do I find the ENM Summary Table template?
The ENM Summary Table memo can be found in the HPDP Guidance page under the "Forms" section.
The ENM Summary Table is designed to be used for state funded only projects and is intended to document that no EAW is needed. If a NEPA document is prepared for the project, the ENM Summary need not be completed.

State EIS?

7. **Does the project likely exceed a threshold for an EIS under Minn. Rule 4410.4400?**
   - **If yes, END - consult with OES to prepare an EIS. In the ENM, under General Project Information, Environmental Document, mark "EIS" per OES direction.**
   - **If no, go to step 8**

Minn. Rule 4410.4400 has 28 subparts listing various types of projects, dealing with items from nuclear fuels and nuclear waste to genetically engineered wild rice. Highway projects requiring a mandatory state EIS are listed under subpart 16.

> Subp. 16. Highway projects. For construction of a road on a new location which is four or more lanes in width and two or more miles in length, the DOT or local government unit shall be the RGU.

State EAW?

8. **Does the project likely exceed a threshold for a mandatory EAW under Minn. Rule 4410.4300?**
   - **If yes, END - consult with OES to prepare an EAW. In the ENM, under General Project Information, Environmental Document, mark "EAW".**
   - **If no, go to step 9.**

EAWs for federal projects are most often done as part of a combined EA/EAW however there are circumstances where a project requires a federal CatEx document and a state EAW.

Minn. Rule 4410.4300 has 37 subparts listing various types of projects, dealing with items from nuclear fuels and nuclear waste to genetically engineered wild rice. Highway projects requiring a mandatory state EAW are listed under subpart 22.

SEE Appendix B -- Minn. Rule 4410.4300 FOR A LIST OF MANDATORY EAW THRESHOLDS MOST COMMONLY AFFECTING HIGHWAY PROJECTS.

According to Minn. Rule 4410.4300

Subpart 1. Threshold test. An **EAW must be prepared for projects that meet or exceed the threshold of any of subparts 2 to 37**, unless the project meets or exceeds any thresholds of part 4410.4400, in which case an EIS must be prepared.

Minn. Rule 4410.4300 has 37 subparts listing various types of projects, dealing with items from nuclear fuels and nuclear waste to recreational trails. Highway projects requiring a mandatory state EAW are listed under subpart 22.

Subp. 22. Highway projects. Items A to C designate the RGU for the type of project listed:

A. For construction of a road on a new location over one mile in length that will function as a collector roadway, the DOT or local government unit shall be the RGU.
B. For construction of additional travel lanes on an existing road for a length of one or more miles, the DOT or local government unit shall be the RGU.
C. For the addition of one or more new interchanges to a completed limited access highway, the DOT or local government unit shall be the RGU.

Multiple projects and multiple stages of a single project that are connected actions or phased actions must be considered in total when comparing the project or projects to the thresholds of this part and part 4410.4400.

Under 4410.0200, subp. 9c, two projects are "**connected actions**" if:

A. One project would directly induce the other;
B. One is a prerequisite for the other and the prerequisite project is not justified by itself; or
C. Neither project is justified by itself.

Under 4410.0200, subp. 60, "**phased actions**" mean two or more projects to be undertaken by the same proposer that:

A. Will have environmental effects on the same geographical area; and
B. Are substantially certain to be undertaken sequentially over a limited period of time.

The "3-year look back rule" is an extension of the phased action concept found in the second paragraph under 4410.4300, subp. 1:

If the proposed project is an **expansion or additional stage of an existing project**, the cumulative total of the proposed project and any existing stages or components of the existing project must be included when determining if a threshold is met or exceeded if construction was begun within three years before the date of application for a permit or approval from a governmental unit for the expansion or additional stage but after April 21, 1997, except that any existing stage or component that was reviewed under a previously completed EAW or EIS need not be included.

9. **Does the project approach an EAW threshold in Minn. Rule 4410.4300 for an EAW or have circumstances that may warrant a voluntary EAW?**
   - **If yes, consult with OES to decide whether to prepare a voluntary EAW or an ENM Summary Table. In the ENM, under General Project Information, Environmental Document, mark according to OES direction.**
   - **If no, complete an ENM Summary Table. In the ENM, under General Project Information, Environmental Document, if no CatEx, EAW, EA/EAW or EIS, mark "None".**

Unless specifically exempted by Minn. Rule 4410.4600, a discretionary or voluntary EAW can be done for projects that ***may*** have the potential for significant environmental effects, individually or cumulatively. The following examples illustrate circumstances that warrant further discussion with OES:

- When a new road or an additional lane approaches the mandatory threshold and there is known potential for controversy on environmental grounds.
- Projects that separately do not exceed a mandatory threshold for an EAW but are geographically located near each other and together, could potentially create a significant impact. One of the projects may be proposed by a local governmental unit.
- When there is strong opposition from organized groups and/or agencies.

Appendix A – 23 CFR 771.117(c)

(c) The following actions meet the criteria for CEs in the CEQ regulations (40 CFR 1508.4) and §771.117(a) and normally do not require any further NEPA approvals by the FHWA:*

(1) Activities which do not involve or lead directly to construction, such as planning and research activities; grants for training; engineering to define the elements of a proposed action or alternatives so that social, economic, and environmental effects can be assessed; and Federal-aid system revisions which establish classes of highways on the Federal-aid highway system.

(2) Approval of utility installations along or across a transportation facility.

(3) Construction of bicycle and pedestrian lanes, paths, and facilities.

(4) Activities included in the State's highway safety plan under 23 U.S.C. 402.

(5) Transfer of Federal lands pursuant to 23 U.S.C. 107(d) and/or 23 U.S.C. 317 when the land transfer is in support of an action that is not otherwise subject to FHWA review under NEPA.

(6) The installation of noise barriers or alterations to existing publicly owned buildings to provide for noise reduction.

(7) Landscaping.

(8) Installation of fencing, signs, pavement markings, small passenger shelters, traffic signals, and railroad warning devices where no substantial land acquisition or traffic disruption will occur.

(9) The following actions for transportation facilities damaged by an incident resulting in an emergency declared by the Governor of the State and concurred in by the Secretary, or a disaster or emergency declared by the President pursuant to the Robert T. Stafford Act (42 U.S.C. 5121):

> (i) Emergency repairs under 23 U.S.C. 125; and
>
> (ii) The repair, reconstruction, restoration, retrofitting, or replacement of any road, highway, bridge, tunnel, or transit facility (such as a ferry dock or bus transfer station), including ancillary transportation facilities (such as pedestrian/bicycle paths and bike lanes), that is in operation or under construction when damaged and the action:
>
> > (A) Occurs within the existing right-of-way and in a manner that substantially conforms to the preexisting design, function, and location as the original (which may include upgrades to meet existing codes and standards as well as upgrades warranted to address conditions that have changed since the original construction); and
> >
> > (B) Is commenced within a 2-year period beginning on the date of the declaration.

(10) Acquisition of scenic easements.

*This text was taken from 23 CFR 771.117(c) at: http://www.ecfr.gov

(11) Determination of payback under 23 U.S.C. 156 for property previously acquired with Federal-aid participation.

(12) Improvements to existing rest areas and truck weigh stations.

(13) Ridesharing activities.

(14) Bus and rail car rehabilitation.

(15) Alterations to facilities or vehicles in order to make them accessible for elderly and handicapped persons.

(16) Program administration, technical assistance activities, and operating assistance to transit authorities to continue existing service or increase service to meet routine changes in demand.

(17) The purchase of vehicles by the applicant where the use of these vehicles can be accommodated by existing facilities or by new facilities which themselves are within a CE.

(18) Track and railbed maintenance and improvements when carried out within the existing right-of-way.

(19) Purchase and installation of operating or maintenance equipment to be located within the transit facility and with no significant impacts off the site.

(20) Promulgation of rules, regulations, and directives.

(21) Deployment of electronics, photonics, communications, or information processing used singly or in combination, or as components of a fully integrated system, to improve the efficiency or safety of a surface transportation system or to enhance security or passenger convenience. Examples include, but are not limited to, traffic control and detector devices, lane management systems, electronic payment equipment, automatic vehicle locaters, automated passenger counters, computer-aided dispatching systems, radio communications systems, dynamic message signs, and security equipment including surveillance and detection cameras on roadways and in transit facilities and on buses.

(22) Projects, as defined in 23 U.S.C. 101,that would take place entirely within the existing operational right-of-way. Existing operational right-of-way refers to right-of-way that has been disturbed for an existing transportation facility or is maintained for a transportation purpose. This area includes the features associated with the physical footprint of the transportation facility (including the roadway, bridges, interchanges, culverts, drainage, fixed guideways, mitigation areas, etc.) and other areas maintained for transportation purposes such as clear zone, traffic control signage, landscaping, any rest areas with direct access to a controlled access highway, areas maintained for safety and security of a transportation facility, parking facilities with direct access to an existing transportation facility, transit power substations, transit venting structures, and transit maintenance facilities. Portions of the right-of-way that have not been disturbed or that are not maintained for transportation purposes are not in the existing operational right-of-way.

(23) Federally-funded projects:

(i) That receive less than $5,000,000 of Federal funds; or

(ii) With a total estimated cost of not more than $30,000,000 and Federal funds comprising less than 15 percent of the total estimated project cost.

(24) Localized geotechnical and other investigation to provide information for preliminary design and for environmental analyses and permitting purposes, such as drilling test bores for soil sampling; archeological investigations for archeology resources assessment or similar survey; and wetland surveys.

(25) Environmental restoration and pollution abatement actions to minimize or mitigate the impacts of any existing transportation facility (including retrofitting and construction of stormwater treatment systems to meet Federal and State requirements under sections 401 and 402 of the Federal Water Pollution Control Act (33 U.S.C. 1341; 1342)) carried out to address water pollution or environmental degradation.

(26) Modernization of a highway by resurfacing, restoration, rehabilitation, reconstruction, adding shoulders, or adding auxiliary lanes (including parking, weaving, turning, and climbing lanes), if the action meets the constraints in paragraph (e) of this section.

(27) Highway safety or traffic operations improvement projects, including the installation of ramp metering control devices and lighting, if the project meets the constraints in paragraph (e) of this section.

(28) Bridge rehabilitation, reconstruction, or replacement or the construction of grade separation to replace existing at-grade railroad crossings, if the actions meet the constraints in paragraph (e) of this section.

(29) Purchase, construction, replacement, or rehabilitation of ferry vessels (including improvements to ferry vessel safety, navigation, and security systems) that would not require a change in the function of the ferry terminals and can be accommodated by existing facilities or by new facilities which themselves are within a CE.

(30) Rehabilitation or reconstruction of existing ferry facilities that occupy substantially the same geographic footprint, do not result in a change in their functional use, and do not result in a substantial increase in the existing facility's capacity. Example actions include work on pedestrian and vehicle transfer structures and associated utilities, buildings, and terminals.

Appendix B – 23 CFR 771.117 (d)

(d)) Additional actions which meet the criteria for a CE in the CEQ regulations (40 CFR 1508.4) and paragraph (a) of this section may be designated as CEs only after Administration approval unless otherwise authorized under an executed agreement pursuant to paragraph (g) of this section. The applicant shall submit documentation which demonstrates that the specific conditions or criteria for these CEs are satisfied and that significant environmental effects will not result. Examples of such actions include but are not limited to:

(1)-(3) [Reserved]

(4) Transportation corridor fringe parking facilities.

(5) Construction of new truck weigh stations or rest areas.

(6) Approvals for disposal of excess right-of-way or for joint or limited use of right-of-way, where the proposed use does not have significant adverse impacts.

(7) Approvals for changes in access control.

(8) Construction of new bus storage and maintenance facilities in areas used predominantly for industrial or transportation purposes where such construction is not inconsistent with existing zoning and located on or near a street with adequate capacity to handle anticipated bus and support vehicle traffic.

(9) Rehabilitation or reconstruction of existing rail and bus buildings and ancillary facilities where only minor amounts of additional land are required and there is not a substantial increase in the number of users.

(10) Construction of bus transfer facilities (an open area consisting of passenger shelters, boarding areas, kiosks and related street improvements) when located in a commercial area or other high activity center in which there is adequate street capacity for projected bus traffic.

(11) Construction of rail storage and maintenance facilities in areas used predominantly for industrial or transportation purposes where such construction is not inconsistent with existing zoning and where there is no significant noise impact on the surrounding community.

(12) Acquisition of land for hardship or protective purposes. Hardship and protective buying will be permitted only for a particular parcel or a limited number of parcels. These types of land acquisition qualify for a CE only where the acquisition will not limit the evaluation of alternatives, including shifts in alignment for planned construction projects, which may be required in the NEPA process. No project development on such land may proceed until the NEPA process has been completed.

> (i) Hardship acquisition is early acquisition of property by the applicant at the property owner's request to alleviate particular hardship to the owner, in contrast to others, because of an inability to sell his property. This is justified when the property owner can document on the basis of health, safety or financial reasons that remaining in the property poses an undue hardship compared to others.
>
> (ii) Protective acquisition is done to prevent imminent development of a parcel which may be needed for a proposed transportation corridor or site. Documentation must clearly demonstrate that development of the land would preclude future transportation use and that such

development is imminent. Advance acquisition is not permitted for the sole purpose of reducing the cost of property for a proposed project.

(13)) Actions described in paragraphs (c)(26), (c)(27), and (c)(28) of this section that do not meet the constraints in paragraph (e) of this section.

(e) Actions described in (c)(26), (c)(27), and (c)(28) of this section may not be processed as CEs under paragraph (c) if they involve:

(1) An acquisition of more than a minor amount of right-of-way or that would result in any residential or non-residential displacements;

(2) An action that needs a bridge permit from the U.S. Coast Guard, or an action that does not meet the terms and conditions of a U.S. Army Corps of Engineers nationwide or general permit under section 404 of the Clean Water Act and/or section 10 of the Rivers and Harbors Act of 1899;

(3) A finding of "adverse effect" to historic properties under the National Historic Preservation Act, the use of a resource protected under 23 U.S.C. 138 or 49 U.S.C. 303 (section 4(f)) except for actions resulting in de minimis impacts, or a finding of "may affect, likely to adversely affect" threatened or endangered species or critical habitat under the Endangered Species Act;

(4) Construction of temporary access, or the closure of existing road, bridge, or ramps, that would result in major traffic disruptions;

(5) Changes in access control;

(6) A floodplain encroachment other than functionally dependent uses (e.g., bridges, wetlands) or actions that facilitate open space use (e.g., recreational trails, bicycle and pedestrian paths); or construction activities in, across or adjacent to a river component designated or proposed for inclusion in the National System of Wild and Scenic Rivers.

Appendix C – Minn. Rule 4410.4300

Subparts for Mandatory EAW Thresholds Most Commonly Affecting MnDOT Highway Projects.

Subp. 22. Highway Projects.

A. Construction of a road on a new location over one mile in length that will function as a collector roadway.

B. Construction of additional travel lanes on an existing road for a length of one or more miles.

C. Addition of one or more new interchanges to a completed limited access highway.

Subp.26. Streams and Ditches: Diversion, realignment or channelization of any designated trout stream, or affecting greater than 500 feet of natural watercourse with a total drainage area of ten or more square miles*

Subp. 27. Wetlands and Public Waters

A. Projects that will change or diminish the course, current or cross-section of one acre or more of any public water or public waters wetland.*

B. Projects that will change or diminish the course, current or cross-section of 40 percent or more or five or more acres of types 3 through 8 wetland of 2.5 acres or more, excluding public waters wetlands, if any part of the wetland is within a shoreland area, delineated flood plain, a state or federally designated wild and scenic rivers district, the Minnesota River Project Riverbend area, or the Mississippi headwaters area.

Subp 31. Historical Places: Destruction, in whole or part, or the moving of a property that is listed on the National Register of Historic Places or State Register of Historic Places.*†

Minn. Rule 4410.4300 has 37 subparts listing various types of projects, dealing with items from nuclear fuels and nuclear waste to recreational trails. The subparts above are the most applicable to MnDOT projects, however all subparts should be reviewed to ensure no mandatory thresholds apply due to unusual circumstances (e.g. airports (4410.4300 Subp. 21); barge fleeting (4410.4300 Subp. 23); forest clear cutting (4410.4300 Subp. 28(B); national/state parkland encroachment (4410.4300 Subp. 30), land use conversion (4410.4300 Subp. 36 and 36a), and recreational trail construction (4410.4300 Subp. 37).

Mandatory EAW threshold categories are also listed in Chapter 7 of the Minnesota Environmental Quality Board (EQB) **Guide to Minnesota Environmental Review Rules.** https://www.eqb.state.mn.us/sites/default/files/documents/Guide%20to%20MN%20ER%20Rules-May%202010.pdf

* *Minnesota Rule 4410.4300 provides exceptions to this threshold, not listed here due to space considerations. If the proposed project does exceed this threshold, review the applicable Subpart to determine if project is an exception to the threshold.*

† *This threshold only applies to properties that are actually listed on the NRHP; it does not apply to properties that are only eligible for listing on the NHRP as is the case for federal Section 106/NEPA review.*

Appendix D – "Significance" of Environmental Effects under NEPA

Under NEPA, a Categorical Exclusion (CE) is issued for an action that does not individually or cumulatively have a significant effect on the environment. An Environmental Assessment (EA) is prepared for actions in which the significance of the environmental impact is not clearly established. An Environmental Impact Statement (EIS) is prepared for an action that has a significant effect on the environment.

The following is from the FHWA Environmental Review Toolkit:

According to the Council on Environmental Quality (CEQ) regulations (40 CFR §§ 1500-1508), the determination of a significant impact is a function of both *context* and *intensity*.

Context: This means that the significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality. Significance varies with the setting of the proposed action. For instance, in the case of a site-specific action, significance would usually depend upon the effects in the locale rather than in the world as a whole. Both short- and long-term effects are relevant.

Intensity: This refers to the severity of impact. Responsible officials must bear in mind that more than one agency may make decisions about partial aspects of a major action. The following should be considered in evaluating intensity:

1. Impacts that may be both beneficial and adverse. A significant effect may exist even if the Federal agency believes that on balance the effect will be beneficial.
2. The degree to which the proposed action affects public health or safety.
3. Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.
4. The degree to which the effects on the quality of the human environment are likely to be highly controversial.
5. The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.
6. The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.
7. Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.
8. The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.
9. The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.
10. Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.

-- 40 CFR 1508.27

Programmatic Categorical Exclusions: Attachment "B" Checklist

Draft May 9,2017

S.P. 5080-170 TH. I-90

Project Name: ****Scoping Draft Checklist****Replace Bridges 6868, 6869, 9180, 9183, and 9201. Rehab Bridges 9178, 9179.

To qualify as a Programmatic Categorical Exclusion, at least one of the statements provided for each topic below must be true. If for any topic, no provided statement can be checked off, the project may exceed that threshold in Attachment "B" of the Programmatic Categorical Exclusion Agreement between FHWA and MnDOT.

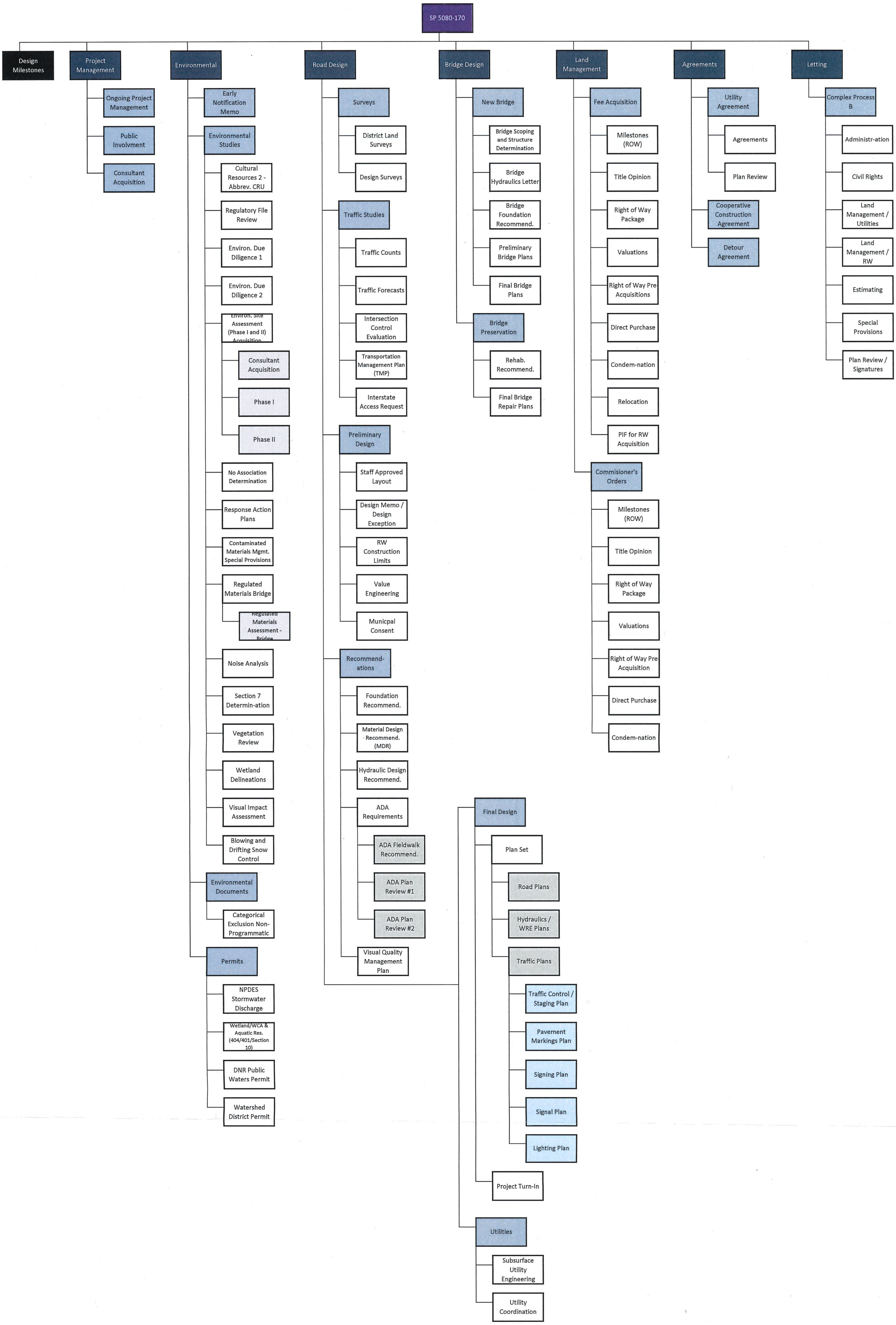
Section 4(f)		☑	The project does not use Section 4(f) lands or properties.
	or	☐	The project is an independent bikeway/walkway covered by the FHWA Section 4(f) Statement and Determination for Independent Bikeways or Walkways (Negative Declaration statement) dated May 23, 1977.
	and / or	☐	The project meets temporary occupancy conditions that do not constitute a Section 4(f) use per 23 CFR 774.13(d).
Section 6(f)		☑	The project requires no acquisition of real property interest subject to Section 6(f) or encumbered by similar public-use funding that restricts conversion to other uses.
Historic/ Archeological		☑	The provisions of the National Historic Preservation Act have been satisfied by a Section 106 finding of *no properties*.
	or	☐	For NRHP-listed or eligible properties other than historic bridges, the provisions of the National Historic Preservation Act have been satisfied by a Section 106 finding of *no effect* or *no adverse effect* per the current Programmatic Agreement (PA) among FHWA, the Minnesota Historic Preservation Office (MnHPO), the Advisory Council on Historic Preservation (ACHP), the United States Army Corps of Engineers (USACE) and MnDOT.
	and (if applicable)	☐	For NRHP-listed or eligible historic bridges, the provisions of the National Historic Preservation Act have been satisfied by a Section 106 finding of *no effect* per the current PA among FHWA, SHPO, ACHP, USACE and MnDOT.
	and	☐	No Section 106 Agreement (i.e. Memorandum of Agreement or Programmatic Agreement) or known post-NEPA plan review by CRU and the MnHPO or a Tribal Historic Preservation Office (THPO) is deemed appropriate by MnDOT and FHWA.
Threatened and Endangered Species - Federal		☐	The provisions of the Endangered Species Act (ESA) have been satisfied by a Section 7 determination of *no effect* to threatened or endangered species or critical habitat.
	or	☐	The provisions of the ESA have been satisfied by a Section 7 determination, per written correspondence with the USFWS, of *may affect, not likely to adversely affect* threatened or endangered species or critical habitat, or *may affect but will not cause prohibited take* of the Northern Long-eared Bat (NLEB).
	or	☐	The provisions of the ESA have been satisfied by a Section 7 determination of *no jeopardy* for any species proposed for listing under the ESA.
Right of Way		☐	The project does not require any new right of way, permanent easement, or temporary easement.
	or	☑	The project requires only minor amounts of new right of way, permanent easement or temporary easement, defined as
	or	☐	*-Up to 5 acres per linear mile (absolute, not average), but total permanent not more than 25 acres plus total temporary not more than 40 acres.*
	or	☑	*-Up to 10 acres (permanent plus temporary) for spot improvements (such as bridge replacement).*
	and	☑	The project requires no relocations of residences or businesses.
	and	☑	Change in direct access to property is minor.
	and	☑	Property acquisition or change in access to property required for the project will not affect the use of the property.
Highway Access Change		☑	The project does not add or remove a ramp on an existing expressway or freeway interchange.
	and	☑	The project does not add an interchange to an expressway or freeway.
Pedestrian/ Bicycle Access Change		☑	The project does not permanently remove existing pedestrian, bicycle, or transit facilities.
	and	☑	The project does not permanently impede safe and reasonable access to existing pedestrian, bicycle or transit facilities.
Traffic Disruption		☐	The project does not involve construction of temporary access or closure of an existing road, bridge or ramp.
	or	☑	The project does involve construction of temporary access or closure of an existing road, bridge or ramp, but the following conditions are met:
		☑	For projects outside of the boundaries of a metropolitan planning organization (MPO), temporary access would not last for more than one construction season and road, bridge or ramp closure would not result in a detour that would last for more than one construction season or increase (one-way, out-of-direction) travel distance greater than 5 miles in an urban area or 25 miles in a rural area.
		☐	For projects within the boundaries of an MPO, the project either: • would not require a full traffic management plan (TMP) per the Minnesota Work Zone Safety and Mobility Policy (or subsequent replacement policy) or • the required full TMP will maintain the number of pre-project through lanes during a.m. and p.m. weekday peak periods for the duration of the project.

Contamination Hazards		☑	The project does not have a high risk of causing direct or indirect impacts to human health or sensitive environmental resources due to encountering contamination or hazardous materials.
Farmland		☑	The Farmland Protection Policy Act (FPPA) does not apply.
	or	☐	The project will not involve acquisition of farmland.
	or	☐	Form AD-1006 or Form NRCS-CPA-106 has been completed and provided to NRCS.
Section 404		☐	The project does not involve placement of fill into Waters of the U.S.
	or	☑	The project is anticipated to be covered by a USACE Section 404 Nationwide or Regional General Permit.
	and	☑	The project is anticipated to have no more than 10 acres of permanent wetland impacts.
Floodplains		☐	The project does not encroach into a floodplain.
	or	☑	Floodplain encroachment will not have a significant impact, as defined in 23 CFR 650.105 and E.O. 11988 and documented by a Floodplain Assessment including Hydraulic Analysis and Risk Assessment.
Wetlands		☐	The project does not impact or encroach into wetlands.
	or	☑	Wetland encroachment(s) are all of the following:
		and ☑	Not greater than 10 acres of permanent impacts
		and ☑	Not significant, as documented by a 2-Part Wetland Finding, demonstrating (1) no practical avoidance and (2) all measures to minimize harm are incorporated when avoidance is not practical.
Coast Guard Permit		☑	The project does not require a Coast Guard bridge permit.
Sole Source Aquifer		☑	No portion of the project is located within Crow Wing, Aitkin, Mille Lacs, or Morrison Counties.
	or	☐	Portions of the project are within Crow Wing, Aitkin, Mille Lacs, or Morrison Counties but the entire project is located outside of the Sole Source Aquifer (SSA) project review area designated by the US Environmental Protection Agency (USEPA) for any Minnesota SSA.
	or	☐	The project in part or in whole, is within the project review area designated by the USEPA for a Minnesota SSA but does not require a detailed groundwater impact assessment to be submitted to USEPA for review.
Wild and Scenic Rivers		☑	The project does not require construction in, across, or adjacent to the boundaries a river designated as a component of, or proposed for inclusion in, the National System of Wild and Scenic Rivers.
Noise		☐	The project is not a Type I noise project as defined by 23 CFR 772(e.g. construction of a highway on a new location which significantly changes either the horizontal or vertical alignment or changes the number of through-traffic lanes). In Minnesota, if a project is not a Type I noise project, then it is a Type III project.
Air		☑	The project conforms to the state implementation plan.
	and	☑	The project does not add significant capacity to urban highways with design year average daily traffic of 140,000 or more (i.e. does not need a quantitative mobile source air toxics [MSAT] analysis).
Tribal		☑	The project's anticipated construction limits will be entirely outside the federally-recognized reservation boundaries and any exterior trust lands of a Federally-recognized tribe
	or	☐	The project is located, in part or as a whole, within federally-recognized reservation boundaries or exterior trust lands, will not involve temporary or permanent work (including any ground disturbing activities) outside of the transportation facility's existing right-of-way or easement boundaries AND neither the tribe, MnDOT nor the project proposer has expressed a desire for a more direct sovereign-nation-to-Federal-government relationship.
	and	☐	Consultation with the tribe has not identified any tribal interests within the anticipated construction limits.
International		☑	The project is not an international project.
Controversy		☑	The project is not anticipated to be controversial.

Based upon the above, it is determined that the project does not exceed the thresholds in Attachment "B" of the Programmatic Categorical Exclusion Agreement between FHWA and MnDOT, dated April 13, 2017.

Signature:

Name, Title Date


SP 5080-170
Design Milestones
Project Management
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Public Involvment
Consultant Acquisition
Environmental
Early Notification Memo
Environmental Studies
Cultural Resources 2 - Abbrev. CRU
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Watershed District Permit
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Preliminary Design
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Design Memo / Design Exception
RW Construction Limits
Value Engineering
Municpal Consent
Recommend-ations
Foundation Recommend.
Material Design Recommend. (MDR)
Hydraulic Design Recommend.
ADA Requirements
ADA Fieldwalk Recommend.
ADA Plan Review #1
ADA Plan Review #2
Visual Quality Management Plan
Final Design
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Signing Plan
Signal Plan
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Valuations
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Title Opinion
Right of Way Package
Valuations
Right of Way Pre Acquisition
Direct Purchase
Condem-nation
Agreements
Utility Agreement
Agreements
Plan Review
Cooperative Construction Agreement
Detour Agreement
Letting
Complex Process B
Administr-ation
Civil Rights
Land Management / Utilities
Land Management / RW
Estimating
Special Provisions
Plan Review / Signatures

TRANSPORTATION PROJECT CHARTER
S.P. 5080-170 (ROUTE: I-90, US218, MN105)

Project Manager Names: Jai Kalsy & Mark Harle		
Complexity and Risk Scale: Moderate	**Proposed FY Letting:** 2023	**T#**

Context Settings, Systems & Activities	**Setting:** Primarily suburban residential, with some suburban commercial and industrial/warehouse adjacent to the freeway. **Systems & Activities:** Interstate Functional Classification; Access Management Category 1F (High-Priority IRC, Interstate)
Location & Approximate Termini	I-90 Bridges 6868 (RP 178+00.396), 6869 (RP 178+00.405), 9178 (RP 178+00.782) and 9179 (RP 178+00.785). Bridges 9183 (RP 175+00.781), 9180 (RP178+00.161), and 9201 (RP 180+00.357) over I-90.
Need (i.e., Problem) Statement & Supporting Data	**Need:** Bridge condition: Bridges 6868, 6869, 9180 & 9201 are nearing the end of their service life and are due for replacement. Rehabilitation of bridges 9178, 9179 and 9183 is needed to extend the service life of the structures. Bridges meeting design standards: Multiple bridges of or over I-90 do not meet current standards for width. In those cases, bridge replacement provides the best opportunity to meet these standards. **Bridge Condition:** Sufficiency Ratings **6868:** 79.8 **6869:** 79.8 **9180:** 60.1 **9201:** 67.9 **9178:** 93.3 **9179:** 93.3 **9183:** 77.5 **Traffic Volumes:** Bridge 9183: 6000 AADT, 170 HCAADT (TH-105, 2016 Data) Bridge 9180: 14300 AADT (CSAH 45, 2016 Data) Bridge 6868 & 6869: 23700 AADT, 2100 HCAADT (I-90, 2016 Data) Bridge 9178 & 9179: 20300 AADT, 1950 HCAADT (I-90, 2016 Data) Bridge 9201: 6200 AADT, 510 HCAADT (US-218, 2016 Data) **ADA:** Existing non-compliant curb ramps and sidewalk through bridge 9180 interchange. No other bridges presently accommodate pedestrians. **Pedestrian and bicycle:** Bike trail crossing planned by Mower county for Bridge 9201 location. **Freight/trucking:** I-90 is an Oversized/Overweight Super Load Corridor with "Numerous Vertical Restrictions". **Shoulders/widths and turn lanes:** Put any non-standard shoulder widths here… **Roadside rest areas, park and rides, other:** N/A **Flooding vulnerability:** The D6 Vulnerability Assessment lists the I-90 bridges over the Cedar River (6868 and 6869) as a high vulnerability bridges, susceptible to damage from flooding events. **Transit:** SMART Transit is the County-Wide transit provider. Private providers that use this route include Land to Air Express and Rochester city lines. **Utilities:** Unknown

Purpose (i.e., Project Goals) Statement	Replace bridges 6868, 6869, 9180 & 9201 with new spans that meet current design standards and the needs of the trunk highway corridor. Rehabilitate bridges 9178, 9179 & 9183 to restore the bridge deck and extend their service life.
Preliminary Project Scope	Bridge Replacement and Bridge Rehabilitation. Interchange reconfiguration is needed at the 4th St NW interchange only.
Possible Risks & Other Issues	The multi-year staging of this project presents project delivery risks. Detouring during construction including bridge closures will be challenging to organize and creates risks to the total project timeline.
Preliminary Construction Cost Estimate Range	**CHIP Estimate:** $28,400,000 (September 19, 2018)
Project Manager Responsibilities	Project manager's responsibilities include: • Being the primary contact for the project; • Preparing project management plans (i.e. scope, schedule, budget, etc.) and obtaining management's approval of those plans; • Directing and managing the project team to deliver the project within scope, on time, within budget, and to a high degree of quality; • Monitoring project performance and taking corrective actions when necessary; and • Periodically reporting project status to stakeholders and management. Project manager has the authority to: • Make scope, schedule, and budget decisions within the approved baselines; • Elevate issues requiring higher authority resolution and specifying reasonable deadlines for decisions.

The information in this project charter reflects baseline information in the project area. The District 6 Planning Section attests to the accuracy of this information during the timeframe it was collected. The Department should proceed with project scoping using this information.

_____ _____

Kurt Wayne, D6 Principal Planner Date

I-90 Austin Corridor Study

July 2017

DEPARTMENT OF TRANSPORTATION

SEH

S.P. 2305-29 Project Location Map

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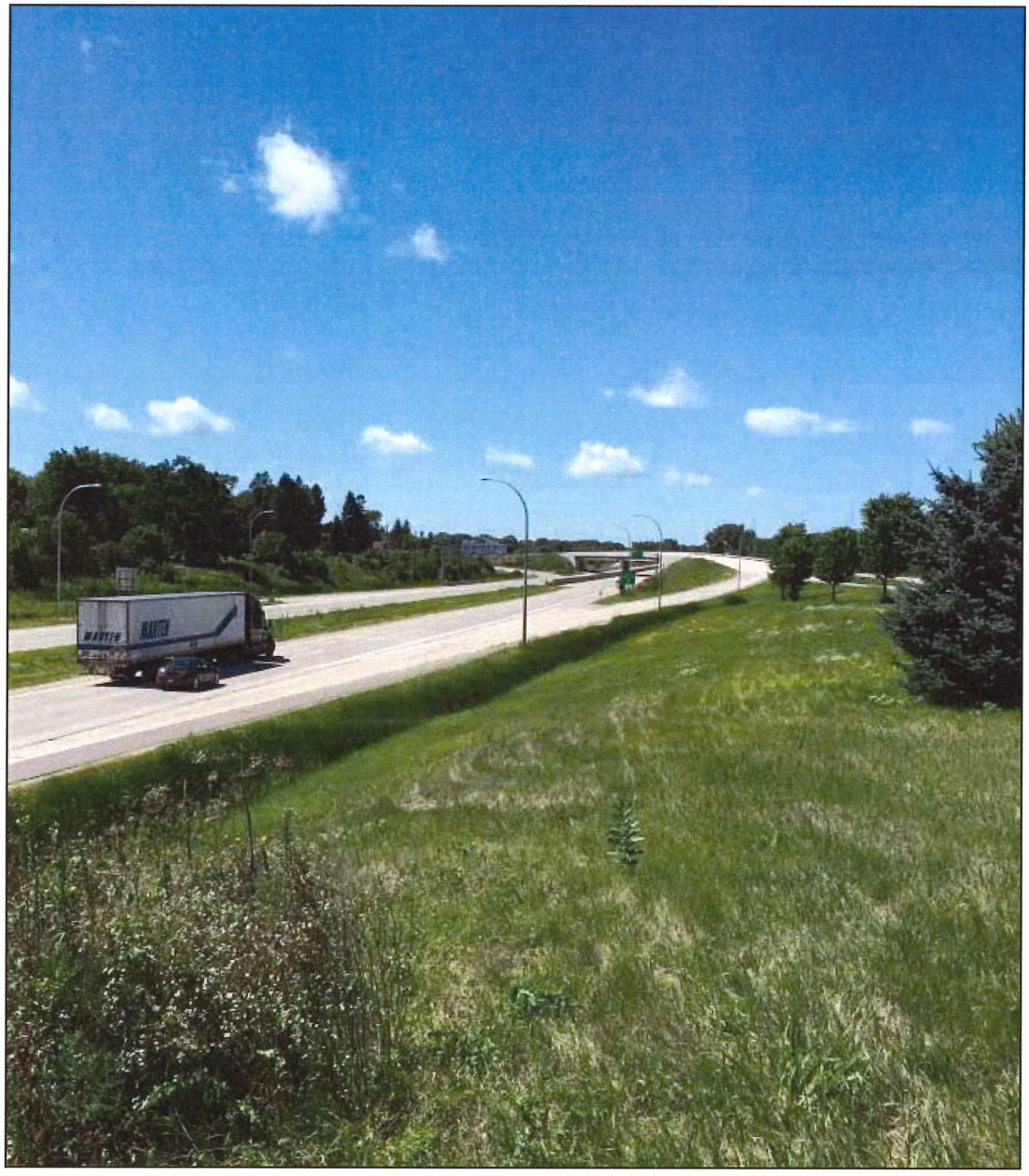
1.0 Study Purpose and Process



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1.1 Study Purpose

I-90 through Austin was constructed in the late 1950s and was the first section of I-90 constructed in Minnesota. The bridges and interchanges which are the focus of this study are all at least 50 years old and as a result need to be programmed for either rehabilitation or replacement in the coming years. MnDOT has anticipated this need and has begun planning for a series of improvements to occur between 2021 and 2025.

Given the age of the infrastructure, the close proximity of the interchanges, and the relative uncertainty regarding the amount and timing of funding, MnDOT determined it would be prudent to conduct this planning study to comprehensively address the needs along the I-90 corridor through Austin and set the framework for an efficient and effective approach to implement the necessary improvements within the existing constrained funding plan.

The purpose of this planning study is to:

- Identify the existing and forecast traffic conditions and issues
- Document the condition of existing bridges and determine the relative need for replacement or rehabilitation
- Develop and evaluate improvement concepts as appropriate at each study area interchange
- Prepare a preferred concept improvement plan for the study area and document the study results for use in future stages of project development

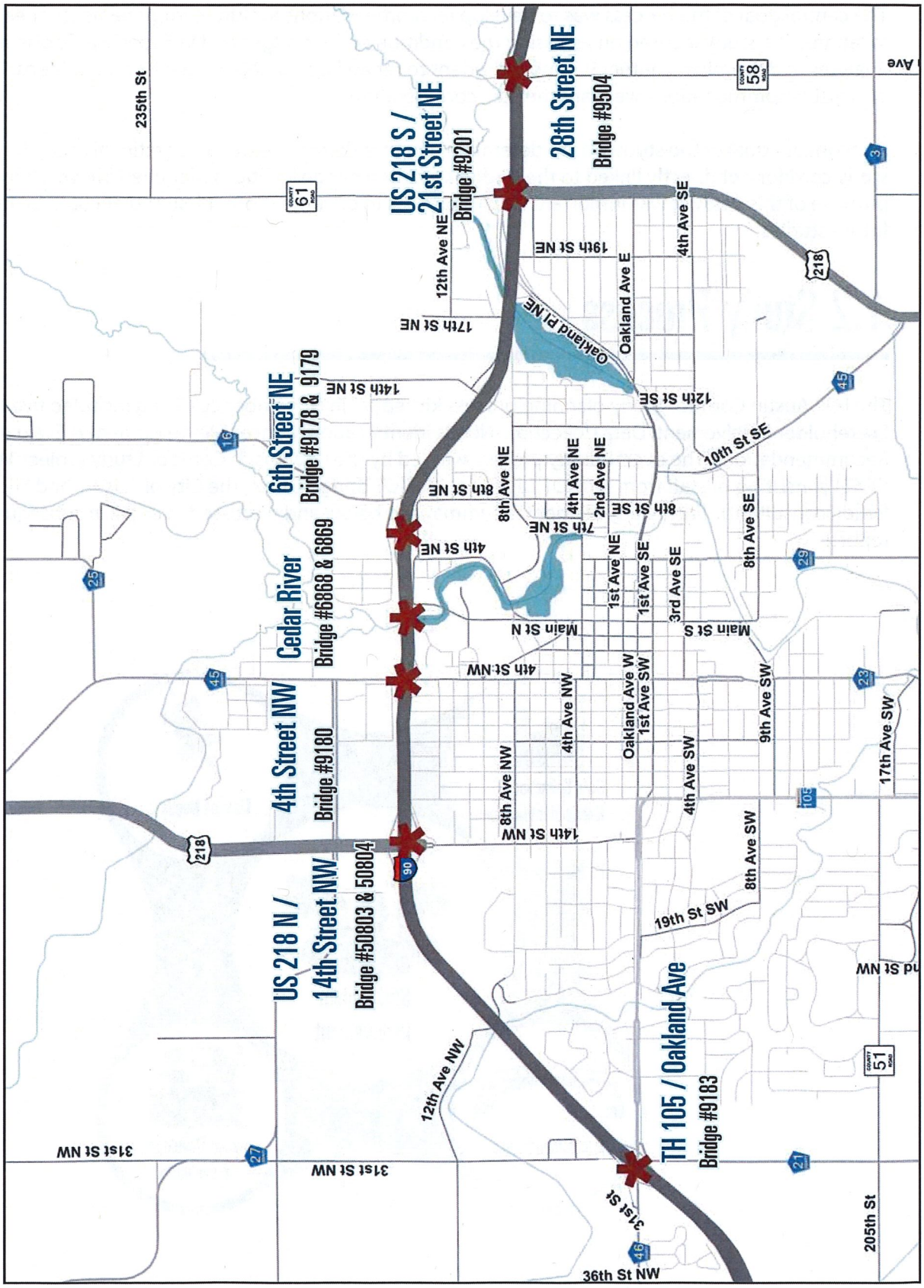
The primary focus of this study is a series of interchanges and bridges along the I-90 corridor through the Austin area. The interchanges and bridges include:

- Bridge #9183
  (TH 105/Oakland Avenue interchange)
- Bridges #50803 and #50804
  (TH 218 North/14th Street NW interchange)
- Bridge #9180 (4th Street NW interchange)
- Bridges #6868 and #6869 over the Cedar River
- Bridges #9178 and #9179
  (6th Street NE interchange)
- Bridge #9201
  (TH 218 South/21st Street NE interchange)
- Bridge #9504 (28th Street NE interchange)

The study area and the study locations identified above are shown in Figure 1 on the following page.

Study Area

Figure 1



The central goal of the process was to develop recommendations for future improvements at each of the study locations. The study focused on assessing the condition of the bridges and included traffic operations and safety analyses to determine whether it is more prudent to rehabilitate or replace each of the bridges. Pedestrian and bicyclist accommodations were another key consideration.

A secondary goal of the study was to determine whether there were other operational and safety issues along the I-90 study corridor not directly linked to the bridge and interchange locations identified above. Though outside the core purpose of this study, it was important for this process to document other issues that could be further addressed in future studies.

1.2 Study Process

The I-90 Austin Corridor Study planning process kicked off in November 2015 and included five key elements: Stakeholder Involvement, Data Collection, Needs Identification, Concept Development & Evaluation, and Recommendations. The overall study process was led by the I-90 Austin Corridor Study Project Management Team (PMT) consisting of staff from MnDOT District 6, MnDOT Bridge Office, the City of Austin, and Short Elliott Hendrickson (study consultant). Each study element is summarized below and discussed in detail in subsequent sections of this report.

Stakeholder Involvement

MnDOT recognizes the vital role stakeholder engagement serves in the development, evolution, and implementation of transportation projects. For the I-90 Austin Corridor Study, MnDOT wanted to engage a cross-section of community and business interests to assist in the process of identifying issues and priorities, generating improvement concepts, evaluating the concepts, and ultimately providing feedback on the study's technical recommendations.

In response to this priority, a Stakeholder Group was assembled consisting of community and business interests. The Group was engaged throughout the process and played a vital role in helping to develop the study recommendations.

Data Collection

During this phase of the study process the consultant team collected a substantial amount of new data including I-90 mainline tube counts and turning movement counts at numerous intersections. Other data compiled included historical traffic counts, crash statistics, and bridge condition information. Site visits were also conducted to review existing operations, verify traffic control and intersection geometry, and conduct visual inspections of each study area bridge.

Needs Identification

Following the data collection activities, the process centered on identifying the key study area issues and needs. An existing traffic conditions assessment was conducted followed by a future no-build traffic conditions analysis. Collectively, the existing and forecast information provided the basis for identifying the key issues and needs in the study area illustrated in Figure 1.

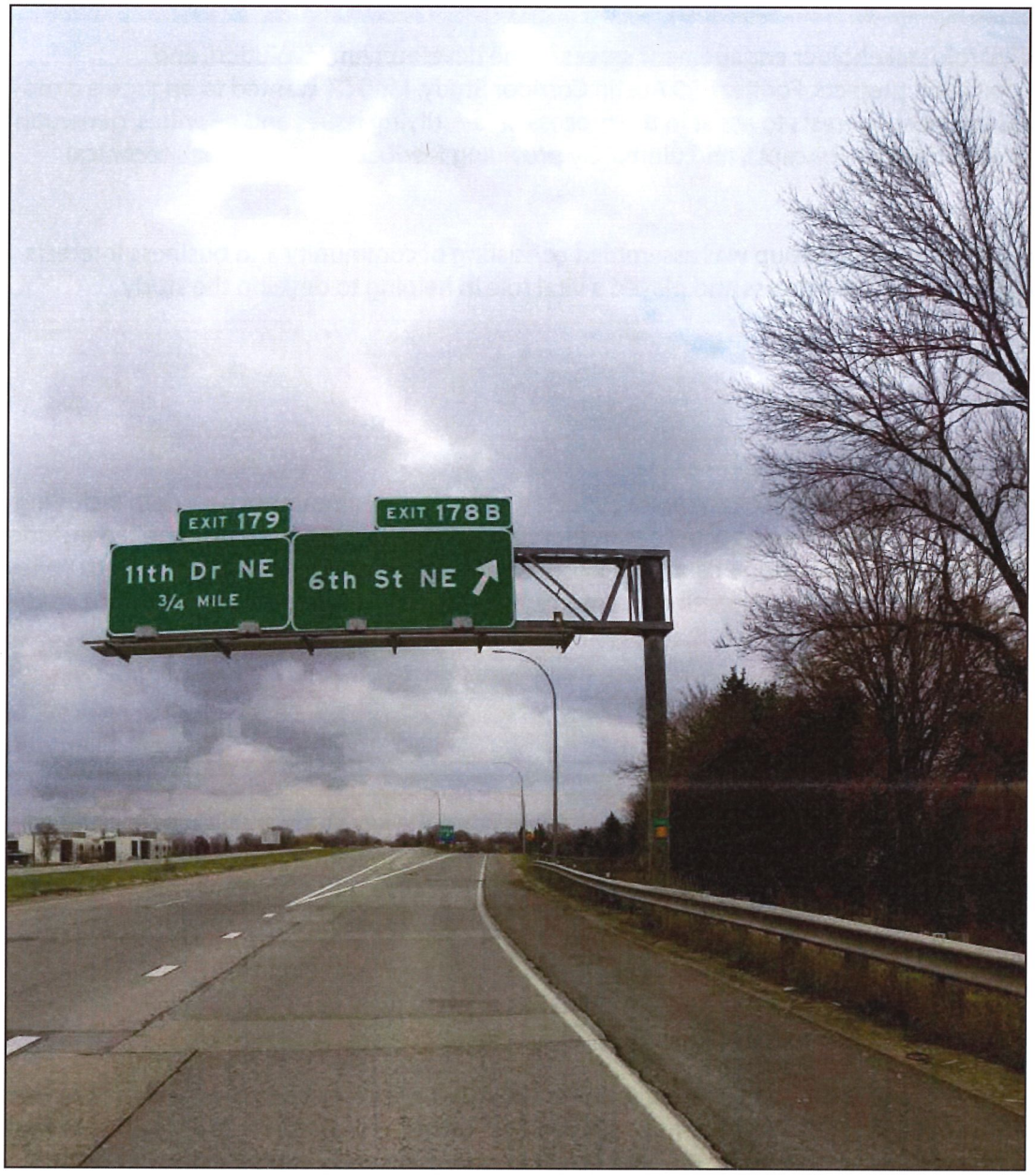
Concept Development and Evaluation

During the Concept Development and Evaluation Phase a series of sub-areas were identified that became the focus for developing and evaluating potential infrastructure improvements. In certain sub-areas, multiple concepts were developed and evaluated. The concept layouts reflected a range of capacity and safety improvements as well as pedestrian and bicyclist enhancements. Ultimately, the identified concepts were evaluated against a set of technical criteria and to a preferred recommendation for each of the study locations was identified.

Recommendations

The information developed and refined during the Conceptual Development and Evaluation Phase along with feedback received from the Stakeholder Group was used to finalize the study recommendations and prepare planning level cost estimates. The recommendations from this study process and presented in this study report are expected to be utilized by MnDOT to set the stage for more detailed analysis as subsequent stages of project development are initiated.

2.0 Stakeholder Involvement



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2.1 Stakeholder Group

MnDOT recognizes the vital role stakeholder engagement serves in the development, evolution, and implementation of transportation projects. For the I-90 Austin Corridor Study, MnDOT wanted to engage a cross-section of community and business interests to assist in the process of identifying issues and priorities, generating improvement concepts, evaluating the concepts, and ultimately providing feedback on the study's technical recommendations.

At the onset of the study process a Stakeholder Group was assembled consisting of community and business interests. The group membership was established based on input provided from City of Austin staff. Each of the Group's members and their affiliation is provided below:

- Geoff Baker – Macfarland Truck Lines
- Craig Clark – City of Austin, City Administrator
- Paul Eickhoff – Hormel Foods Corporate Services Senior Engineer
- Jon Erichson – Housing and Redevelopment Executive Director
- Sandy Forstner – Chamber of Commerce Executive Director
- John Gray – Vision 2020 Gateway to Austin Committee
- Mike Hanson – Mower County Engineer
- Chris Hiniker – SEH Project Manager
- Jai Kalsy – MnDOT Project Manager
- Steve Kime – Vision 2020 Bike/Walk Committee Chair
- Steven Lang – City of Austin, Public Works Director
- Joe Maccani – Hormel Foods Manager of Corporate Properties
- Greg Paulson – MnDOT Assistant District Engineer
- Chuck Peterson – Hormel Foods Shipping Manager
- Larry Rehaume – Hormel Foods Plant Manager
- Nancy Schnable – Convention and Visitors Bureau Executive Director
- AJ Shute – Hormel Livestock Manager

The Stakeholder Group's role was to: represent the broader interests of the greater Austin community; review and provide feedback on the technical information developed through the study process; and communicate issues, ideas, and opportunities to the entire Group. The Stakeholder Group met three times at key phases of the study process. The first meeting was held early in the process. This meeting focused on communicating the study goals, scope, and schedule and to solicit key issues and concerns from the Group members. The second meeting was held after the range of preliminary improvement concepts were developed. The Group was asked to provide feedback on the concepts and offer additional ideas for potential consideration. The third meeting was held toward the end of the study process. MnDOT presented the results of the technical evaluation process as well as the preliminary improvement recommendations.

At the end of the study process, MnDOT indicated to the Group that stakeholder engagement will be a continuing priority as individual improvement projects are programmed and project development activities are initiated.

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3.0 Data Collection & Needs Identification

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3.1 Study Area

As noted in Section 1, the primary focus of this study is a series of interchanges and bridges along the I-90 corridor extending from the TH 105/Oakdale Avenue Interchange on the west, to the 28th Street NE interchange on the east. In order to provide a clear understanding of the study area scope, the interchanges and bridges included in the study scope are described in detail below. It should be noted that the 11th Drive NE interchange was not included in this study because it is already scheduled for reconstruction in 2017.

TH 105/Oakland Avenue Interchange - Bridge #9183

The existing interchange, see Figure 2, is a diamond type configuration with stop control at the ramp intersection approaches. The bridge has two traffic lanes and narrow shoulders with no pedestrian facilities. The westbound I-90 off-ramp has separate left and right turn lanes, while the eastbound I-90 off-ramp is a single lane approach with enough space for a right turning vehicle to maneuver around a queued left turning vehicle.

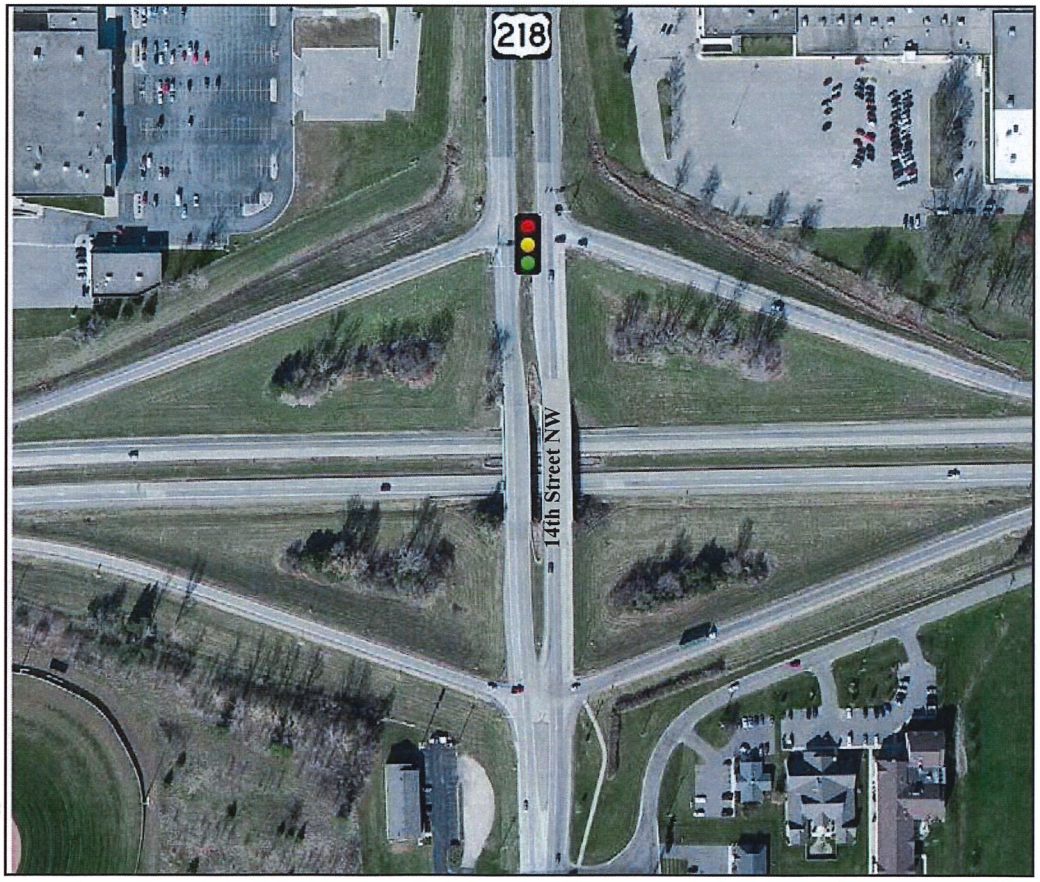
Figure 2. TH 105/Oakland Avenue Interchange - Bridge #9183

US 218 North/14th Street NW Interchange - Bridge #50803 and 50804

The existing interchange, see Figure 3, is a diamond type configuration with a traffic signal at the north ramp intersection. The south ramp intersection includes stop control for the eastbound I-90 off-ramp approach. US 218/14th Street NW traffic travels over I-90 on two bridges that carry two lanes in each direction plus left turn lanes.

In addition, the northbound bridge has an existing raised sidewalk while the southbound bridge has no sidewalk and a very narrow outside shoulder. The westbound I-90 off-ramp has separate left and right turn lanes at the signal, while the eastbound I-90 off-ramp is a single lane approach with enough space for a right turning vehicle to maneuver around a queued left turning vehicle.

Figure 3. US 218 North/14th Street NW Interchange - Bridge #50803 and 50804



4th Street NW Interchange - Bridge #9180

The existing interchange, see Figure 4, is a diamond type configuration with a traffic signal for the westbound I-90 off-ramp. The eastbound I-90 off-ramp approach operates under stop control. The westbound I-90 on-ramp is offset from the westbound I-90 off-ramp and is uncontrolled.

The existing bridge includes one through lane in each direction on the outside and a left turn lane in each direction on the inside between the ramp terminal intersections. There is a narrow sidewalk provided for pedestrians on both sides of the bridge. The eastbound I-90 off-ramp has separate left and right turn lanes, while the westbound I-90 off-ramp is a single lane approach with enough space for a right turning vehicle to maneuver around a queued left turning vehicle.

Figure 4. 4th Street NW Interchange - Bridge #9180

Cedar River Bridges - Bridge #6868 and 6869

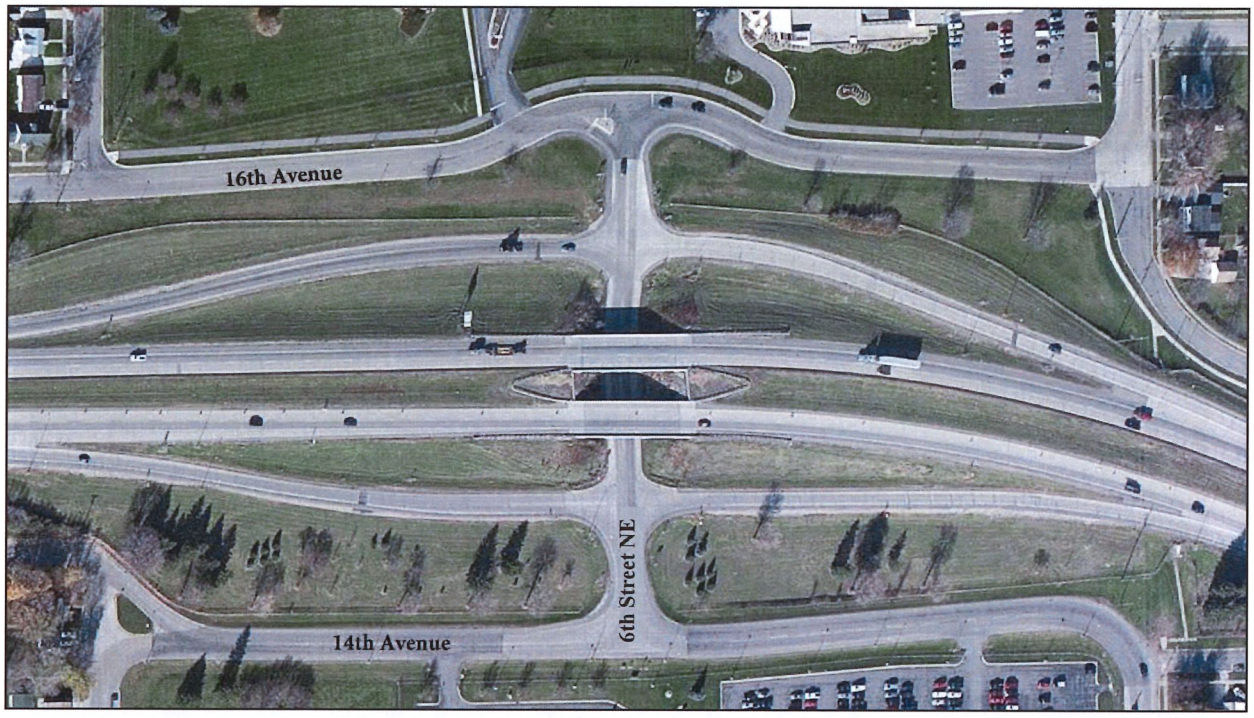
The Cedar River flows under I-90 immediately east of the 4th Street NW interchange (see Figure 5). There are two bridges, one carries eastbound I-90 traffic lanes and the other carries westbound I-90 traffic lanes.

Figure 5. Cedar River Bridges - Bridge #6868 and 6869

6th Street NE Interchange - Bridge #9178 and 9179

The existing interchange, see Figure 6, is a diamond type configuration with the ramp approaches at 6th Street NE operating under stop control. I-90 has two bridge structures over 6th Street NE with bridge piers directly abutting the roadway and there are no pedestrian facilities. Both I-90 off-ramps have separate left and right turn lanes. Sight lines from the ramp approaches looking towards the bridges are substandard due to the bridge pier placement.

Figure 6. 6th Street NE Interchange - Bridge 9178 and 9179

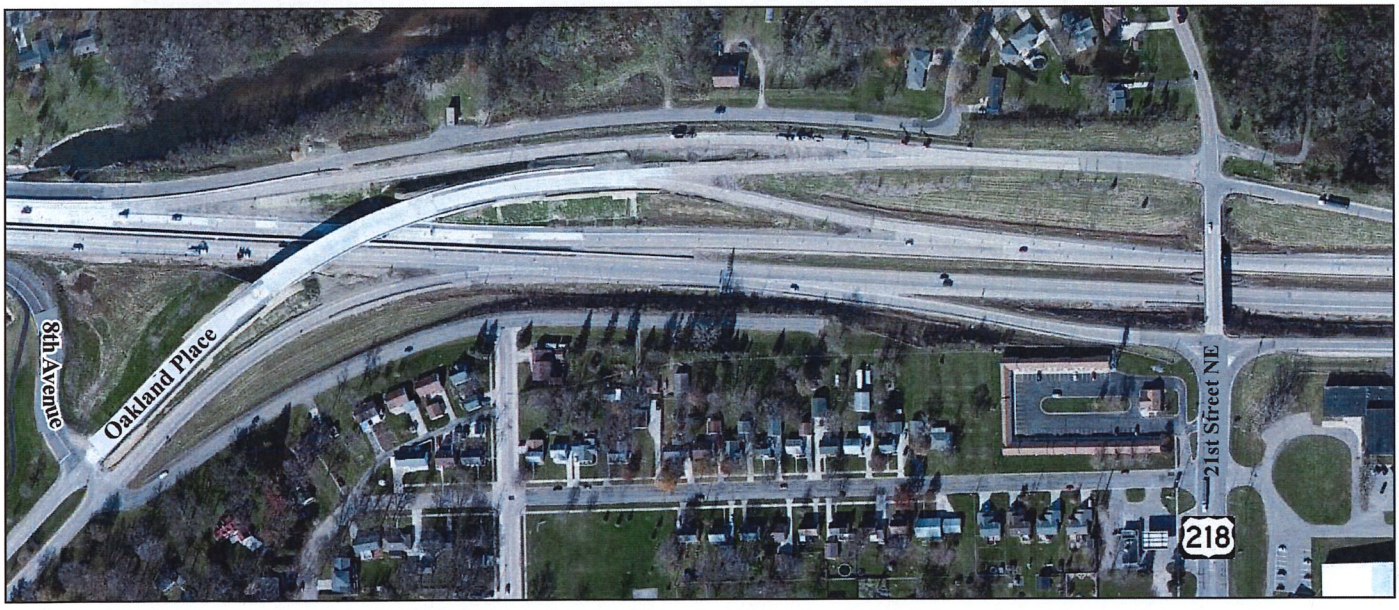


US 218 South/21st Street NE/Oakland Place Interchange - Bridge #9201

The existing interchange, see Figure 7, is a diamond type configuration with the ramp approaches operating under stop control. The Oakland Place westbound ramp is connected to the 21st Street NE interchange via a slip ramp as shown in Figure 7. The existing 21st Street NE bridge has two lanes with no turn lanes or pedestrian facilities. The eastbound I-90 off-ramp has separate left and right turn lanes, while the westbound I-90 off-ramp is a single lane approach with enough space for a right turning vehicle to maneuver around a queued left turning vehicle.

Oakland Place is located immediately west of the US 218 South/21st Street NE interchange. The I-90 eastbound entrance ramp from Oakland Place merges onto I-90 prior to the 21st Street exit ramp, creating a short weaving section. To westbound Oakland Place, vehicles can exit westbound I-90 directly or from the 21st Street NE slip ramp connection. The intersection of Oakland Place and 8th Avenue essentially operates as a ramp terminal intersection for I-90 traffic.

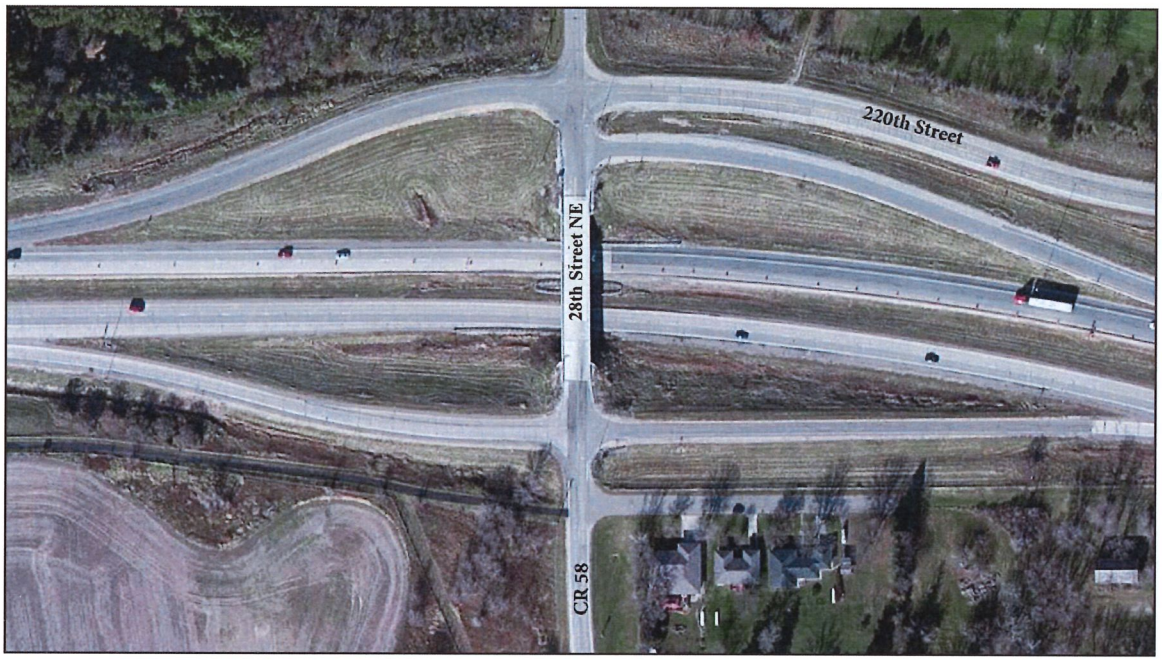
Figure 7. US 218 South/21st Street NE/Oakland Place Interchange - Bridge #9201



28th Street NE Interchange - Bridge #9504

The existing interchange, see Figure 8, is a diamond type configuration with the ramp approaches operating under stop control. The existing bridge has two lanes with no turn lanes or pedestrian facilities. The eastbound I-90 off-ramp has separate left and right turn lanes, while the westbound I-90 off-ramp is a single lane approach with enough space for a right turning vehicle to maneuver around a queued left turning vehicle. The I-90 westbound on-ramp is offset from the I-90 westbound off-ramp and shares an intersection with 220th Street.

Figure 8. 28th Street NE Interchange - Bridge #9504



3.2 Data Collection

At the onset of the study process a substantial amount of data collection was conducted to provide the information needed to complete the traffic analysis tasks, assist with identifying issues, and help with defining and evaluating potential improvement concepts. The data collected included the following:

- Intersection turning movements
- I-90 mainline tube counts
- Available crash data
- Bridge condition statistics
- Field inspection of study area bridges

Detailed documentation of the data collection efforts as well as the subsequent traffic analyses are provided in the *Existing and Forecast Traffic Conditions Technical Memorandum*, dated January 2016. This document is available upon request from MnDOT.

3.3 Needs Identification

As noted above, the collected traffic and bridge data served as a basis for conducting a comprehensive traffic analysis and completing an assessment of bridge conditions in the study area. The results of this analysis highlighted the primary needs that would in turn set the stage for identifying and evaluating potential improvement concepts. The remainder of this section presents the results of the traffic analysis and bridge condition assessment.

Existing and Forecasted Traffic Operations and Safety Analysis

The comprehensive traffic analysis, which is detailed in the above referenced technical memorandum, included the following components: a freeway system plan, crash history, existing traffic conditions, and future traffic conditions. Each component is described below.

Freeway System Plan

The freeway system plan assessed major design features of the I-90 corridor to be able to isolate issues that contribute to traffic congestion and safety issues. The primary design features considered included:

- **Basic Number of Lanes -** The basic number of lanes is defined as a minimum number of lanes designated and maintained over a significant length of a corridor, regardless of changes in traffic volumes and lane-balance. An assessment of basic lane needs is an indicator of minimum capacity requirements. I-90 meets the basic lane needs for the current traffic conditions. The existing demands are well below the basic capacity of the freeway lanes provided, with all demands below the capacity of a single freeway lane.

- **Lane Balance -** The concept of lane balance is intended to smooth traffic flow through and beyond interchanges. Lane balance is satisfied along I-90 through the project area and all entrance ramp merges fully satisfy established criteria. In addition, all exit ramp diverges meet the criteria when including the exception for closely spaced interchanges.

- **Route Continuity –** This evaluation is used to determine if any forced lane changes are required to continue along a highway. A forced lane change occurs when either an established through lane is dropped or when an auxiliary lane is added to the left side of the roadway and the through traffic must change lanes in order to continue. Route continuity is maintained for both eastbound and westbound I-90 through the project area as each direction has two continuous lanes for the entire stretch of roadway.

- **Interchange Spacing -** In urban areas, the minimum recommended interchange spacing is one mile. There are seven interchanges in the five-mile study segment through the Austin area which exceeds current interchange spacing standards. The only current spacing that meets the criteria is the 1.7 miles between the TH 105/Oakland Avenue and US 218 North/14th Street NW interchanges. All other interchanges have spacing that ranges between 0.3 miles to 0.7 miles. This close interchange spacing results in multiple locations where spacing between entrance and exit ramps of adjacent interchanges is below standards. In total, there are ten entrances to exit ramp segments on I-90 below the 1,500-foot minimum recommended standard. Three of these ten segments are less than 400 feet.

- **Interchange Type -** Uniformity of interchange types along a freeway corridor has the potential to reduce congestion and safety problems. Uniformity allows drivers to anticipate lane changing, merging, and exiting maneuvers between interchanges. Through the study area I-90 has good interchange uniformity with the exception of the Oakland Place interchange which is a partial access semi-directional interchange adjacent to the 21st Street NE diamond interchange.

Crash History

The crash assessment was based on data covering the years 2005 through 2014 obtained from MnDOT. During this 10-year period there were a total of 438 crashes along the five-mile segment of I-90, including the study intersections included in the analysis. More specifically, there were 195 crashes at the study intersections and 243 along I-90.

The type and severity of the crashes were reviewed and crash and severity rates were calculated for each intersection and freeway segment. The rates were compared to the calculated critical rates for each intersection or segment.

Crash rates at intersections are expressed as number of crashes per million entering vehicles at the intersection. Crash rates along highway segments are expressed as number of crashes per million vehicle miles traveled. In addition, crash severity comprises five separate types including fatal, incapacitating injury (Severity A), non-incapacitating injury (Severity B), possible injury (Severity C), and property damage crash.

The critical crash rate is a statistical value that is unique to each intersection or segment based on vehicle exposure and the MnDOT statewide average crash rate for similar type facilities. An intersection or segment with a crash or severity rate higher than the critical rates indicates a sustained crash problem. The following sections expand on both intersection and freeway crash history.

Intersection Crashes

Based on the data, there have been four incapacitating injury crashes (Severity A) at the intersections and there have been no fatal crashes. The majority of the intersections are below the calculated critical rates, however the following intersections have crash rates that are above the critical rates:

- Westbound I-90 off-ramp at 4th Street NW
- Eastbound I-90 off-ramp at 21st Street NW
- Westbound I-90 off-ramp at 21st Street NW
- Oakland Place at 8th Avenue

At westbound I-90 and 4th Street, the two closely spaced, offset ramp intersections create driver confusion and assignment of right-of-way issues that result in a high number of left turn related crashes.

At 21st Street, both ramp terminal intersections have a high percentage of left turn related crashes. The narrow bridge width, continuous bridge railing and guard railing create limited sight lines for the two off ramp approaches. Some of the westbound ramp crashes to 21st Street involved through vehicles trying to bypass a left turning vehicle in the single ramp approach lane.

At Oakland Place, there is a high percentage of right-angle crashes that are likely due to higher than posted speeds along Oakland Place due to the proximity to the freeway system.

Freeway Crashes

Based on the 10-year data, one fatality occurred along westbound I-90, but there were no incapacitating injury crashes (Severity A). Evaluating the 10-year data indicates a crash rate in both directions of I-90 above the critical crash rates.

The assessment shows crashes along eastbound I-90 included a high number of single vehicle type collisions; of the 120 crashes, 84 were single vehicle and 37 percent involved poor weather conditions. Four of the existing weaving segments and one exit ramp location all have a sustained crash problem based on the critical rate being exceeded.

The areas of concern that are above the critical rates include:

- 14th Street to 4th Street (weaving)
- 4th Street to 6th Street (weaving)
- Oakland Avenue to 21st Street (weaving)
- 21st Street to 28th Street (weaving)
- Oakland Avenue/TH 105 Exit Ramp

The majority of the crashes that occurred within the eastbound weaving segments are single vehicle ran-off-road crashes or crashes coded as "other/unknown". While the majority involve only a single vehicle, the cause of the crash is difficult to interpret based on the crash data as they could be the result of vehicle interaction in the weaving segments. Approximately 37 percent of the crashes in the four weaving segments were either rear-end or side-swipe collision.

Crashes along westbound I-90 included a high number of single vehicle type collisions; of the 123 total crashes, 86 were single vehicle and 43 percent involved poor weather conditions. The highest concentration of crashes was between the 11th Drive NE exit ramp and the 6th Street NE entrance ramp where 46 crashes occurred. This segment of roadway has closely spaced ramps, two high speed curves, and also transitions from an urban freeway design (concrete barrier in median) to a rural freeway design (grass median). The 46 crashes are spread out over 1 mile in length, which is why the critical rate is not surpassed. However, the actual crash rates are within about 15 percent or less of the critical rate, so the 11th Drive NE exit ramp and 6th street NE entrance ramps are approaching the critical, and are also above the statewide averages. None of these crashes were impacted by the railroad bridge.

The only segment that is impacted by the narrow bridge is the weaving segment between 11th Drive entrance and 6th Street exit where eighteen crashes occurred over the approximate 1500-foot length; this segment includes all of the tapers and guardrails between the painted ramp gores. Fourteen of the eighteen crashes involved single vehicle crashes. Road conditions (e.g. ice/slush or wet pavement) and unsafe speeds were contributing factors in those fourteen crashes.

Existing Conditions

This section summarizes the existing freeway operations and intersection operations evaluated for the project area. In summary, the I-90 mainline and the majority of the ramp terminal intersections operate with acceptable conditions throughout the project area.

Heavy Vehicles

I-90 is an Interregional Corridor (IRC) that connects regional trade centers in Minnesota and surrounding states and carries a high volume of truck traffic. MnDOT's Heavy Commercial Annual Average Daily Traffic (HCAADT) ranges between 5 percent and 14 percent of the total daily traffic volume. The 48-hour counts collected in November 2015 as part of this project indicated that approximately 13 percent to 16 percent of the daily traffic demands are heavy vehicles. Based on the turning movement data, all of the interchanges between 14th Street NW and 21st Street NE have significant truck demands that range up to 24 percent of the total ramp traffic during the peak hour. The 11th Drive NE interchange experiences the highest truck demands which is consistent with it being designated as the main access to the Hormel Plant.

Freeway Operations

Freeway traffic operations analyses were conducted to determine the level of service (LOS) along I-90 through the project area. LOS is a qualitative rating system used to describe the efficiency of traffic operations at an intersection designated by an A through F grading system. LOS A represents the best operating conditions (no congestion), and LOS F represents the worst operating conditions (severe congestion). For the study intersections it was assumed that LOS D or better represents acceptable operating conditions.

Based on evaluation methodologies in the Highway Capacity Manual, the analysis concluded that all freeway mainline segments, ramp merge/diverge connections, and weaving segments would operate at a LOS B or better through the 2045 forecast year. Due to the relatively low peak period traffic demands, the analysis does not result in any operational problems along the corridor.

Intersection Operations

Intersection traffic operations analyses were conducted to determine the LOS, delay, and queuing information for the AM and PM peak hour conditions.

The analysis indicated that all intersections have acceptable LOS. The only exception is the eastbound I-90 exit ramp to 14th Street NW which operates with an undesirable LOS E; however the queue does not impact freeway operations.

The only intersection queuing problem occurred at the westbound I-90 off-ramp/on-ramp at 4th Street NW. These intersections are offset with less than 100 feet of vehicle storage between the two intersections. The westbound off-ramp is signalized while the westbound on-ramp is uncontrolled. Queuing for southbound 4th Street NW at the traffic signal spills through the uncontrolled on-ramp intersection which blocks northbound vehicles from accessing the I-90 on-ramp. This can then spill the northbound left turn queue into the traffic signal and disrupt operations and safety at the I-90 off-ramp intersection.

Future Traffic Conditions

A key part of the study process was assessing future traffic conditions in order to understand key operational and safety issues that are anticipated within the forecast period. The expected timeline for implementing improvements is 2021-2025; as a result, the year 2045 was set as the planning period forecast year. This information provides the basis for developing and evaluating potential improvement concepts.

Traffic forecasts for I-90 and the intersecting roadways were developed using a regression analysis of historical AADT data. Historical AADT data for the project was obtained from MnDOT for the 20-year period of 1994 to 2014. The growth rates derived from the daily traffic forecasts were utilized to factor the AM and PM peak hour turning movement and freeway data to develop the 2045 traffic demands. For the purposes of this study, the minimum growth rate was 1percent per year based on a number of factors; all growth higher than 1percent per year was maintained. Based on the resulting traffic forecasts, operations analyses were completed for study area intersections and the I-90 mainline.

2045 Intersection Operations

The majority of intersections have acceptable LOS. The exceptions are the eastbound I-90 exit ramp to 14th Street NW and the eastbound I-90 exit ramp to 4th Street NW. Both of these intersections have severe delays on the ramp approach to the stop sign; the 14th Street NW ramp has delays of over 10 minutes per vehicle which would likely result in traffic rerouting and might introduce issues associated with existing I-90 traffic slowing down on the I-90 mainline as it approaches the queue at the off-ramp. In addition, the analysis indicates that the existing queuing at 4th Street NW between the westbound I-90 off-ramp and westbound I-90 on-ramp gets substantially worse with the increased traffic demands.

2045 Freeway Operations

A freeway traffic operations analyses were conducted to determine the LOS along I-90 through the project area with the forecasted 2045 demands. Given modest growth anticipated in the project area, all of the freeway analysis resulted in LOS B or better.

SUMMARY OF TRAFFIC ANALYSIS FINDINGS

The following key findings have been compiled from the traffic analysis described above:

- I-90 through the study area does not meet current interchange spacing guidelines.
- By 2045 the eastbound exit ramp intersections at both 14th Street NW and 4th Street NW will have significant operational problems in the PM peak periods assuming the existing geometry and traffic control.
- By 2045, queuing for the eastbound off-ramp to 14th Street NW will begin to impact freeway operations and create increased safety issues.
- By 2045, the offset ramp intersection for westbound I-90 at 4th Street NW will have increased queuing problems that will create major operational and safety concerns.
- While intersection ramp terminal operations are acceptable at most of the interchanges, safety is a major concern based on the historical crash data. Four intersections are above the critical rates indicating a sustained crash problem.
- While freeway operations along I-90 are acceptable through 2045, safety is a major concern based on the historical crash data and substandard designs. A more detailed evaluation indicated crash hot spots along eastbound I-90 including areas where ramp spacing is substandard. While westbound I-90 does not have any critical rates exceeded, it does have a few high crash frequency locations that are approaching the critical crash rates.

Bridge Condition Assessment

The study process involved completing a condition assessment for each bridge included in the project scope. The assessment included researching available records, completing a field review, and coordinating with MnDOT District 6 bridge staff and MnDOT Bridge Office staff. The process concluded with a prioritized list indicating which bridges should be priorities for replacement as opposed to rehabilitation. The ranked bridge replacement listing follows:

1. Cedar River Bridges - Bridge #6868 and 6869

- Replacement is a priority due to river scour, poor substructures, and poor deck conditions.
- Because of scour conditions, piers need to be replaced; therefore, rehabilitation is not an option.

2. 4th Street NW Bridge - Bridge #9180

- The existing bridge is functionally obsolete, which means it does not meet some or all of existing design standards related to shoulder width, sight distance, pedestrian/bicyclist accommodations, and vertical or horizontal clearances.
- Replacement is recommended due to poor substructures, poor deck condition, inadequate geometry, and poor substandard vertical clearance.
- Because of higher traffic volumes, inadequate pedestrian/bicyclist accommodations, and poor interchange functionality a total replacement is recommended.

3. US 218 South/21st Street NE Bridge - Bridge #9201

- The existing bridge is functionally obsolete.
- Replacement is preferred due to steel girder fatigue, spalling substructures, poor deck condition, poor deck geometry, and substandard vertical clearance.
- The existing bridge is a replacement priority over the 28th Street NE bridge due to it being a Trunk Highway bridge with higher traffic volumes.

4. 28th Street NE Bridge - Bridge #9504

- The existing bridge is functionally obsolete.
- If adequate funding was available, replacement would best address steel girder fatigue, steel corrosion, spalling substructures, poor deck geometry, and substandard vertical clearance.
- Existing bridge would need to be replaced with a wider structure in order to fully accommodate the Shooting Star Trail which will cross I-90 at this location.

5. TH 105/Oakland Avenue Bridge - Bridge #9183

- Replacement would address steel girder fatigue, spalling substructures, poor deck geometry, and substandard vertical clearance.
- Given overall condition and relatively lower traffic volumes this bridge is a lower replacement priority.

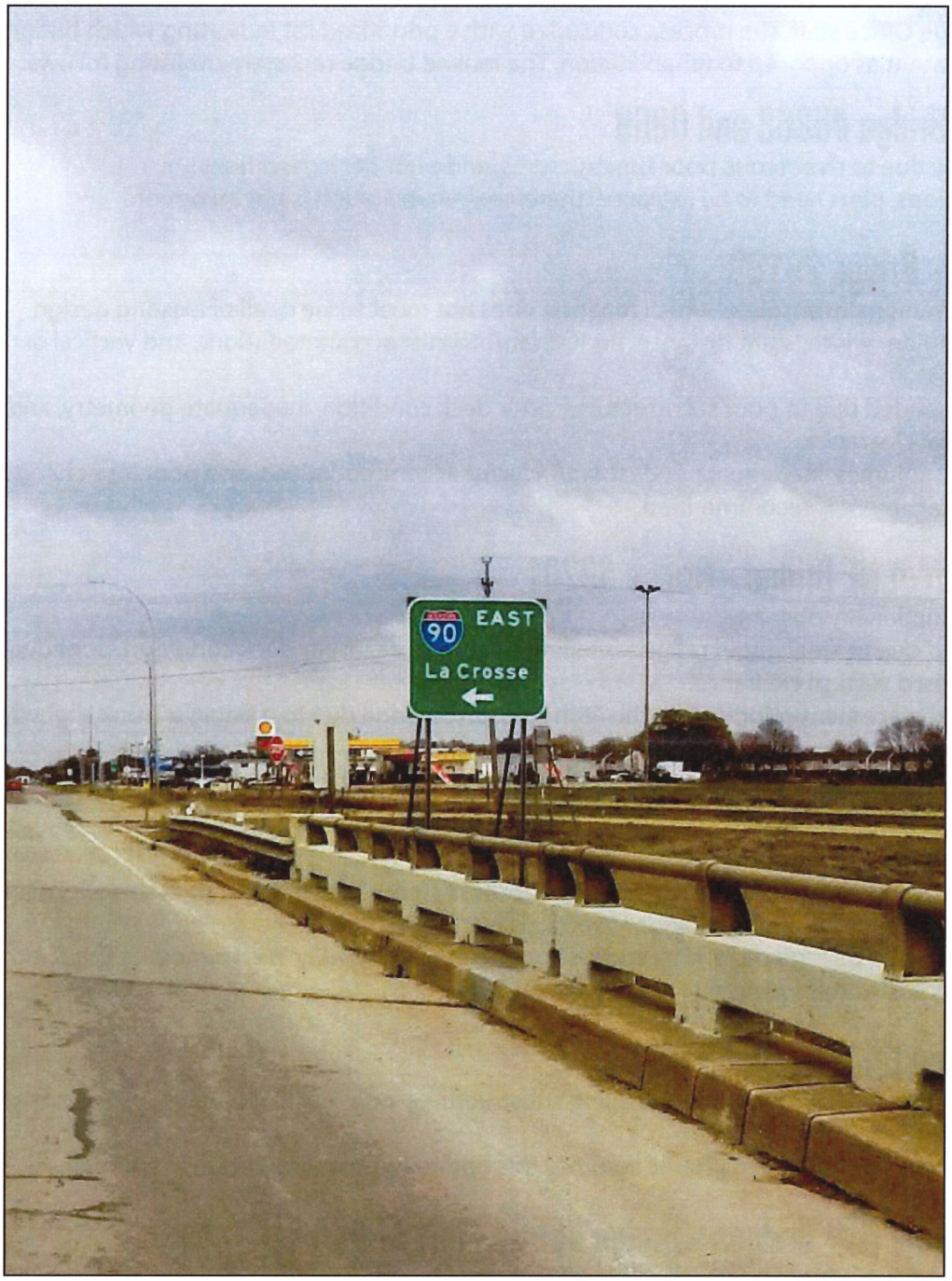
6. US 218 North/14th Street NW Bridges - Bridge #50803 and 50804

- The southbound (west) bridge is functionally obsolete.
- If adequate funding was available replacement would address spalling substructures, poor deck condition, and overweight truck issues.
- Given overall condition these bridges are a lower replacement priority.
- *Following completion of the technical analysis conducted for this study and assembling the Draft Corridor Study Report, MnDOT conducted additional investigations of Bridges 50803 and 50804. These inspections identified additional issues. as a result, MnDOT determined that replacement of both bridges is a priority.*

7. 6th Street NE Bridges - Bridge #9178 and 9179

- Given overall condition these bridges are a lower replacement priority.

4.0 Concept Development & Evaluation



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The needs identified through the traffic operations and safety analysis along with the information generated from the bridge condition assessment provided the basis for determining the potential scope and scale of improvement concepts at each of the study locations. The data also provided the framework for establishing the technical evaluation criteria against which the improvement concepts would be assessed.

This section has been structured to present the alternatives development process for each interchange in the study area. As noted in the text, in some cases, subareas were established to address potential improvements not directly tied to an interchange location.

4.1 Alternatives Development Process

The process for developing improvement concepts was defined and driven by the study area issues and needs detailed in Section 3.0. Input from the Stakeholder Group was essential in helping establish the relative priority of some of the needs and issues identified. This input was especially helpful in facilitating the alternatives evaluation process described later in this section. The improvement concepts are presented west to east through the study area beginning with the TH 105/Oakland Avenue Interchange.

TH 105/Oakland Avenue Interchange

Key Issues

The primary issues at the TH 105/Oakland Avenue interchange identified through the technical analysis and Stakeholder Group input included the following:

- Bridge is experiencing steel girder fatigue, steel corrosion, and concrete spalling.
- Existing geometry and clearances are substandard.
- Sight distance issues for westbound I-90 exiting traffic at TH 105.
- No pedestrian or bicyclist accommodations. Austin staff indicated there is pedestrian demand from residential development west of I-90.

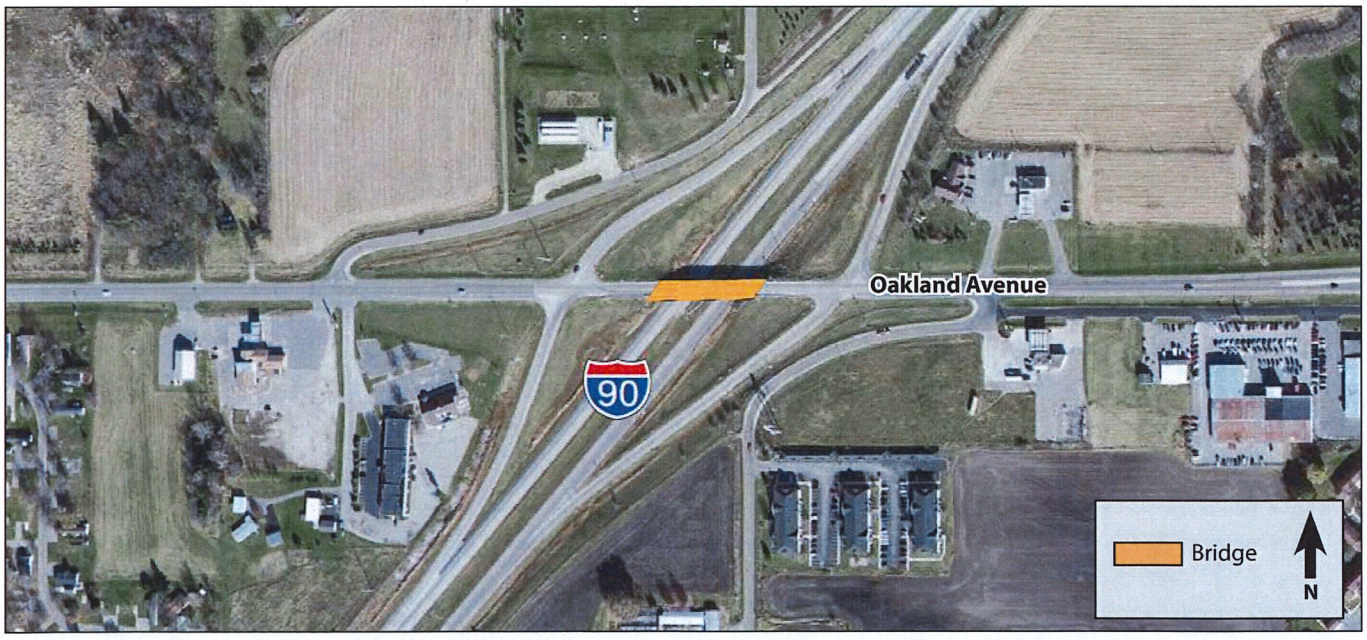
Improvement Concepts

Based on this information, two base concepts were developed for consideration. One concept assumed bridge replacement (see Figure 9) and the second assumed bridge rehabilitation (see Figure 10).

The bridge replacement concept indicated in Figure 9 includes a designated sidewalk on the south side of the bridge and provides space at the ramp terminals for left and right turn lanes. In addition, the wider replacement bridge would improve existing sight distance issues. The improvements illustrated in Figure 10 include rehabilitating the existing bridge to address the bridge condition issues and reconfiguring use on the bridge deck to provide a 4 to 6-foot shoulder on the south side to improve conditions for pedestrians and bicyclists.

Figure 9. TH 105/Oakland Avenue Interchange Bridge Replacement Concept

Figure 10. TH 105/Oakland Avenue Interchange Bridge Rehabilitation Concept



US 218 North/14th Street NW Interchange

Key Issues

The primary issues identified through the technical analysis and Stakeholder Group input at the US 218 North/14th Street NW interchange included the following:

- Primary condition issues include spalling substructures, poor deck condition, and overweight truck issues
- Bridges are functionally obsolete
- No pedestrian or bicyclist accommodations on southbound bridge

Improvement Concepts

Based on this information, four concepts were developed for consideration. The first two concepts assumed retaining the existing interchange configuration (Figure 11).

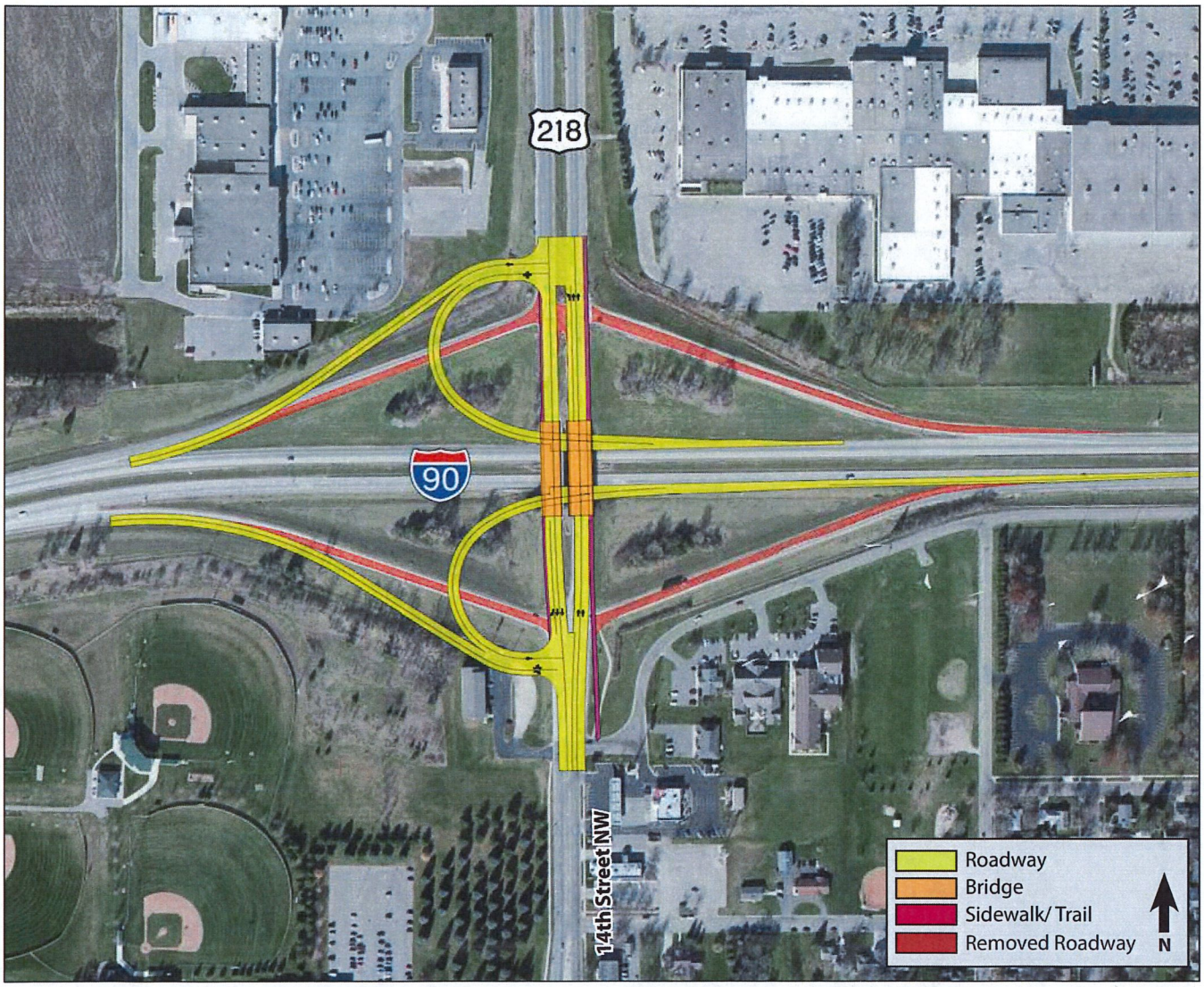
The rehabilitation concept assumes rehabilitating both bridges. The existing raised 8-foot sidewalk on the northbound bridge would be widened to 10 feet. In addition, the eastbound I-90 off-ramp would be widened to provide space for separate left and right turn lanes.

The replacement concept assumes two new bridges along with the eastbound I-90 off-ramp widening. the new northbound bridge would include a 10-foot trail and the southbound bridge would include a six-foot wide outside shoulder.

Figure 11. US 218 North/14th Street NW Interchange Rehabilitation and Replacement Concepts

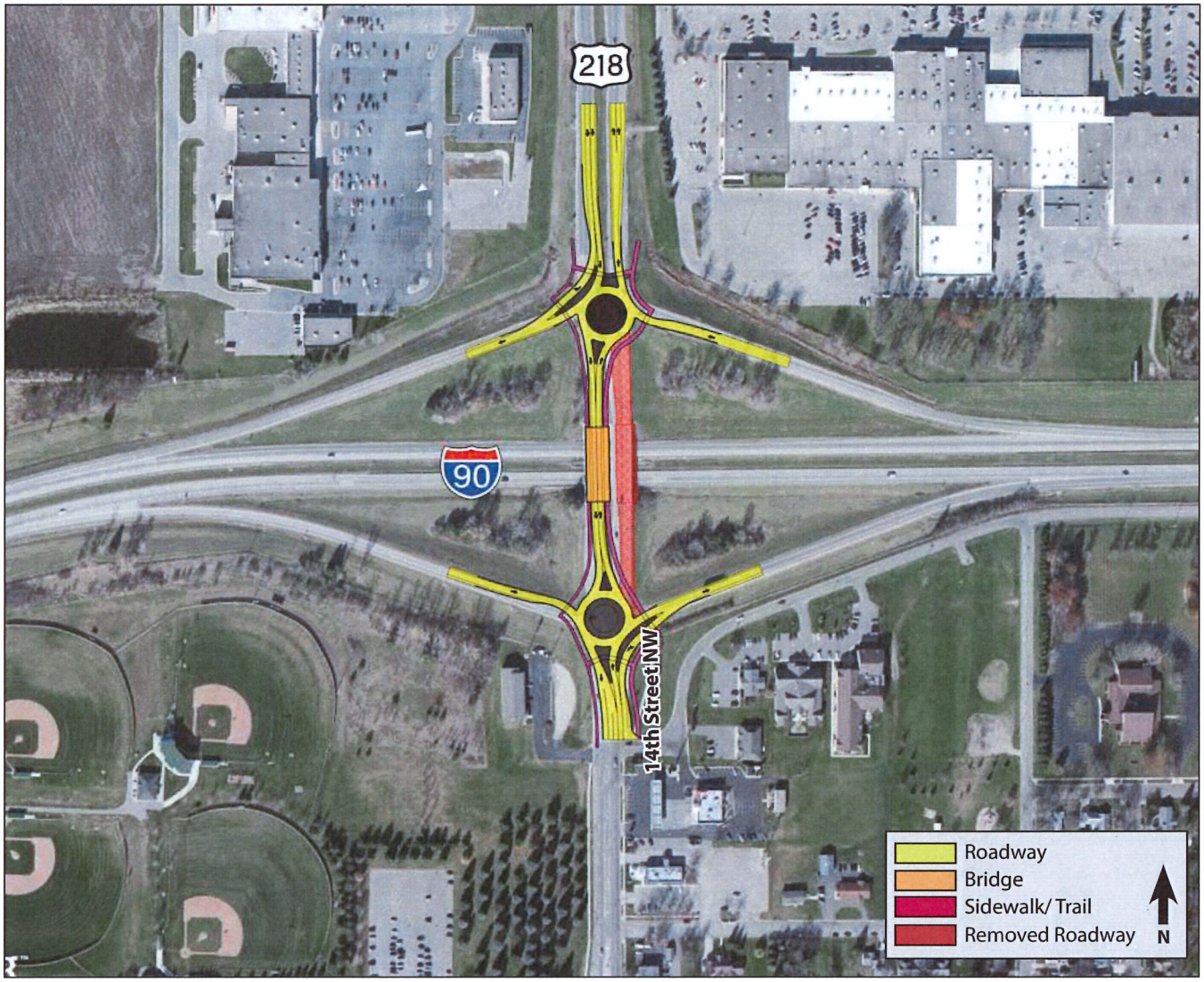
The third concept (see Figure 12) assumed reconstructing the interchange to a folded-diamond configuration. This concept addresses the identified issues and also improves the substandard weaving distance on I-90 between the US 218 North/14th Street NW and 4th Street NW interchanges.

Figure 12. US 218 North/14th Street NW Interchange Folded Diamond Concept



The fourth concept includes reconfiguring the existing interchange to a roundabout design (Figure 13). This concept would address all of the identified issues.

Figure 13. US 218 North/14th Street NW Interchange Roundabout Concept



4th Street NW Interchange

Key Issues

The primary issues identified through the technical analysis and Stakeholder Group input at the 4th Street NW interchange included the following:

- Primary condition issues include poor substructures, poor deck, inadequate geometry, and poor vertical clearance
- Bridge is functionally obsolete
- Traffic operational and safety issues, especially at the north ramp terminal intersection
- The I-90 westbound off-ramp and on-ramp intersections are offset resulting in traffic queues through intersections, safety issues, and travel delay
- Substandard pedestrian and bicyclist accommodations

Improvement Concepts

Four concepts were developed for consideration. The first assumed maintaining much of the existing interchange configuration (Figure 14). This concept includes realigning the interchange ramps to remove the off-set intersection at the north ramps and the skewed intersection at the south ramps. The concept addresses all the identified traffic, bridge condition, and functionality issues. Given the pedestrian and bicyclist demand at this location the concept includes sidewalks/trails on both sides of the bridge. The concept might require some right-of-way acquisition in the northwest and southwest quadrants. The potential of right-of-way impacts would be determined in future design phases.

Figure 14. 4th Street NW Interchange Reconstructed Diamond Concept

Similar to the diamond interchange in Figure 14, the partial diamond concept illustrated in Figure 15 addresses all the identified traffic, bridge condition, and functionality issues. Given the pedestrian and bicyclist demand at this location the concept includes sidewalks/trails on both sides of the bridge. The primary difference from the diamond concept is this design assumes removal of the northwest interchange ramp that provides access to westbound I-90. Removing this ramp would simplify traffic operations but require traffic destined to westbound I-90 to access the freeway via the US 218 North/14th Street NW interchange ½ mile to the west.

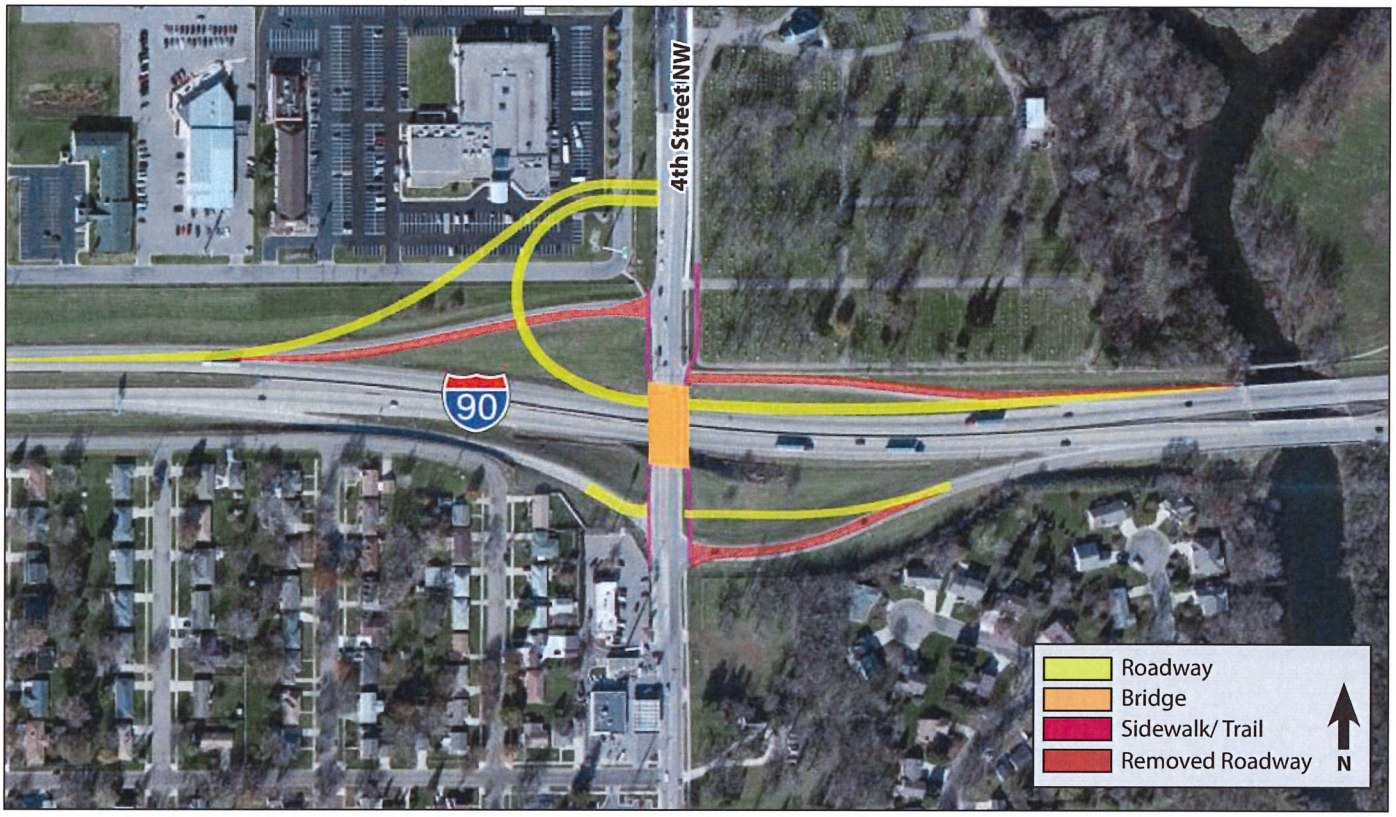
Figure 15. 4th Street NW Interchange Partial Diamond Concept

The roundabout concept illustrated in Figure 16 includes realigning the interchange ramps and combining them into a single elongated roundabout that would require two bridges over I-90 given the space constraints. The concept addresses all the identified traffic, bridge condition, and functionality issues. The concept includes sidewalks/trails on both sides of the bridge.

Figure 16. 4th Street NW Interchange Roundabout Concept

The concept illustrated in Figure 17 includes a folded loop in the northwest quadrant of the interchange to accommodate exiting westbound I-90 traffic. Similar to the other concepts, this design addresses all the identified traffic, bridge condition, and functionality issues.

Figure 17. 4th Street NW Interchange Folded Loop Concept



14th Street NW to 4th Street NW Frontage Road Link

It was noted earlier in this report that through the process of assessing study area issues and developing potential improvement concepts that some "subareas" outside the immediate study area interchanges were identified that warranted consideration. The segment of I-90 between 14th Street NW and 4th Street NW was one of these locations. This segment was of particular interest because the two interchanges are only ½ mile apart and the weaving distance between the respective interchange ramps are substandard. Understanding these challenges, a concept was developed that provided for a continuous frontage road link between 14th Street NW and 4th Street NW (see Figure 18). This concept would allow the removal of the I-90 eastbound off-ramp at 4th Street NW, thereby eliminating the most problematic traffic weaving issue in this portion of the study area.

Figure 18. 14th Street NW to 4th Street NW Frontage Road Concept

6th Street NE Interchange

Key Issues

The primary issues identified through the technical analysis and Stakeholder Group input at the 4th Street NW interchange included the following:

- Sight distance issues for exiting I-90 traffic at 6th Street NE given the location of the I-90 bridge piers
- Substandard pedestrian and bicyclist accommodations

Improvement Concept

The only concept developed at 6th Street NE assumed rehabilitating the existing eastbound and westbound I-90 bridges (see Figure 19). No improvements are proposed beyond rehabilitating the two bridges because the traffic analysis and safety assessment did not indicate any major issues and the bridges are in relatively good condition.

Figure 19. 6th Street NE Interchange Rehabilitation Concept

US 218 South/21st Street NE and 28th Street NE Interchange Area

As the alternatives identification process was initiated in the eastern end of the study area, it became evident given the close proximity of Oakland Place, 21st Street NE, and 28th Street NE that improvement concepts should be developed that account for the operational relationship between the interchanges. With this in mind, the alternatives development process focused on the following:

- Identify concepts that could "connect" 21st Street NE and 28th Street NE
- Identify concepts that address 21st Street NE and 28th Street NE as "stand-alone" interchanges
- Identify concepts that address the close proximity of Oakland Place to 21st Street NE and associated traffic issues on Oakland Place

Key Issues

The primary issues identified through the technical analysis and Stakeholder Group input in the US 218 South/21st Street NE and 28th Street NE interchange area included the following:

- Condition issues at both the 21st Street NE and 28th Street NE bridges include poor substructures, poor deck, inadequate geometry, and substandard vertical clearance
- Both bridges are functionally obsolete
- Both bridges have substandard pedestrian and bicyclist accommodations
- Traffic safety issues at the 21st Street NE interchange, likely due to poor site lines across the narrow bridge for both ramp approaches.
- Highly substandard weaving conditions that result in traffic safety issues between Oakland Place and 21st Street NE as well as between 21st Street NE and 28th Street NE
- Traffic safety issues at the Oakland Place/8th Avenue intersection

Improvement Concepts

The initial concepts that were developed addressed the potential to connect the 21st Street NE and 28th Street NE interchanges to reduce the number of ramps that connect to I-90 and in turn create weaving issues between entering and exiting I-90 traffic.

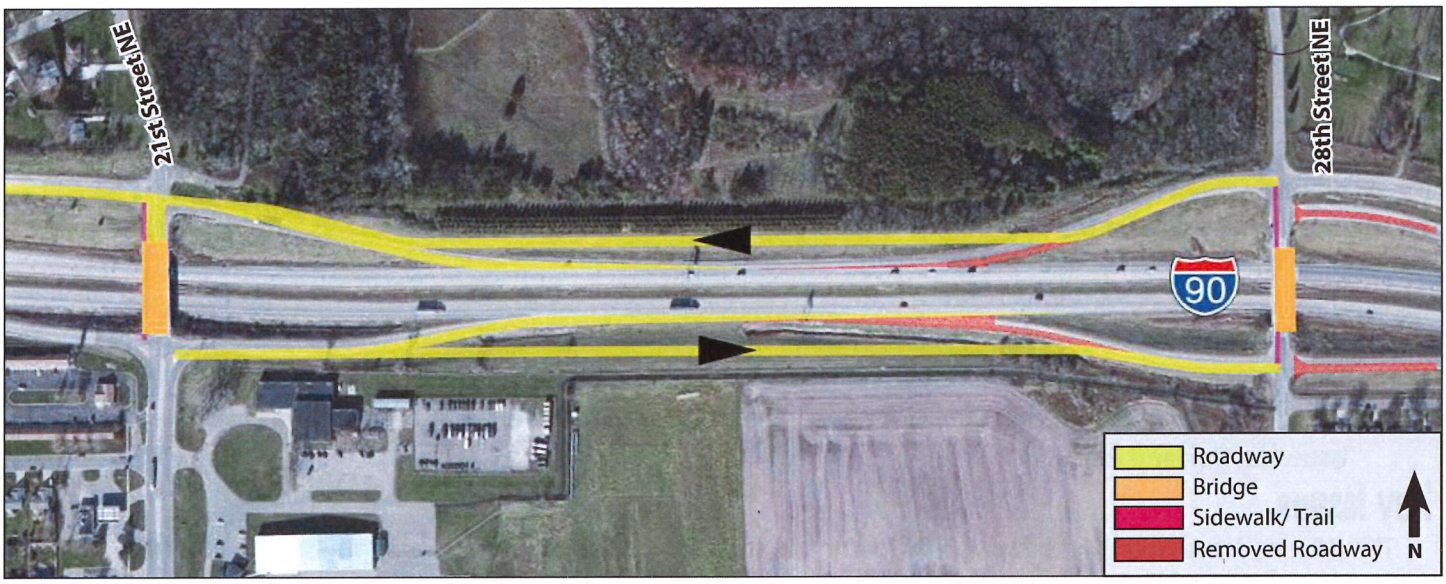
Concepts Connecting 21st Street NE and 28th Street NE

One-Way Pair Frontage Road Interchange

Figure 20 illustrates the concept of establishing a one-way pair frontage road system linking 21st Street NE and 28th Street NE. In this concept, all ramps at 28th Street NE would be removed and traffic would be redirected via the one-way frontage roads to the 21st Street NE interchange.

This concept would remove the substandard weaving condition between the two interchanges and retain full access to I-90 at the US 218 South/21st Street NE interchange which has substantially higher traffic demand than 28th Street NE.

Figure 20. 21st Street NE and 28th Street NE Interchanges: One-way Frontage Road Concept



Split-Diamond Interchange

A second concept for connecting 21st Street NE and 28th Street NE was developed that would create a "split-diamond" design. This concept would remove the I-90 eastbound on-ramp and westbound off-ramp at 21st Street NE and the westbound on-ramp and eastbound off-ramp at 28th Street NE (see Figure 21).

Similar to the one-way pair concept, this design would remove the substandard weaving condition between the two interchanges.

After developing improvement concepts that would connect the 21st Street NE and 28th Street NE interchanges, efforts focused on identifying concepts that would retain full access at each location.

Figure 21. 21st Street NE and 28th Street NE Interchanges: Split-Diamond Interchange Concept

21st Street NE Interchange Concepts

At 21st Street NE the concepts include either replacing or rehabilitating the existing bridge. Figure 22 illustrates the bridge replacement concept at 21st Street NE and Figure 23 illustrates the rehabilitation concept.

The bridge replacement concept depicted in Figure 22 includes a designated sidewalk on the west side of the bridge and provides space at the ramp terminals for left and right turn lanes. The improvements illustrated in Figure 23 include rehabilitating the existing bridge to address the bridge condition issues and reconfiguring use on the bridge deck to provide an approximate 6-foot shoulder on the west side for pedestrians and bicyclists.

Figure 22. 21st Street NE Interchange Bridge Replacement Concept

Figure 23. 21st Street NE Interchange Bridge Rehabilitation Concept

28th Street NE Interchange Concepts

Similar to the 21st Street NE interchange, the 28th Street NE improvement concepts include either replacing or rehabilitating the existing bridge. Figure 24 illustrates the bridge replacement concept at 28th Street NE and Figure 25 illustrates the rehabilitation concept.

The bridge replacement concept depicted in Figure 24 includes a 12-foot designated trail. This provision is to accommodate the planned extension of the Shooting Star Trail across I-90. The improvements illustrated in Figure 25 include rehabilitating the existing bridge to address the bridge condition issues and reconfiguring use on the bridge deck to provide an approximate 6-foot shoulder on the west side for pedestrians and bicyclists (including Shooting Star Trail users).

Figure 24. 28th Street NE Interchange Bridge Replacement Concept

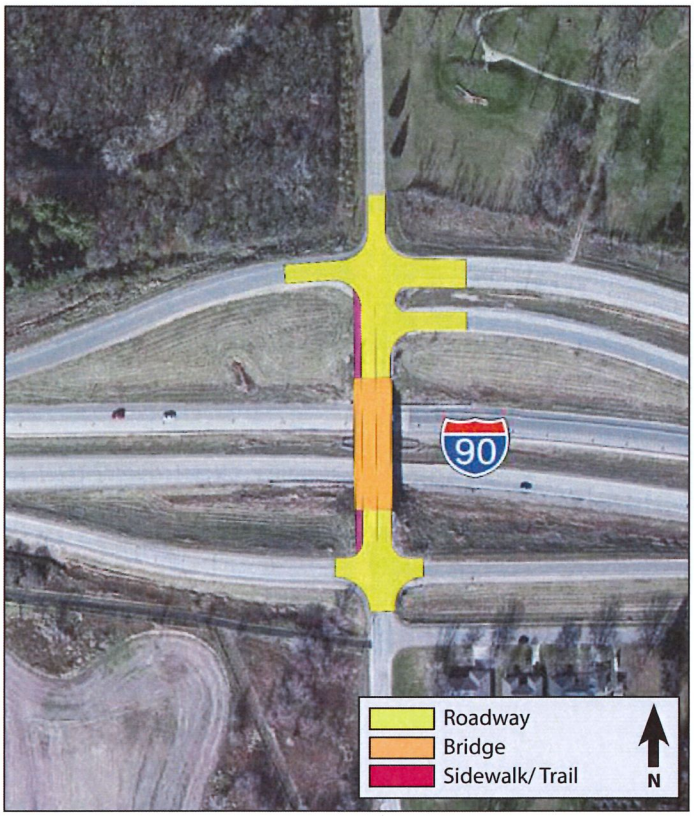


Figure 25. 28th Street NE Interchange Bridge Rehabilitation Concept

Oakland Place Sub-Area

As noted previously the close proximity of the Oakland Place interchange to the 21st Street NE interchange results in a very short weaving distance (approximately 300 feet) for traffic entering I-90 eastbound from Oakland Place and exiting eastbound I-90 at 21st Street NE. In addition, the traffic operations and safety analysis indicated a crash rate above the critical rate at the Oakland Place/8th Avenue intersection. Given these conditions, concepts to address the issues in the Oakland Place interchange area were developed.

In order to address the short weaving distance between Oakland Place and 21st Street NE a concept was developed that redirected eastbound Oakland Place traffic through the 21st Street intersection prior to accessing I-90 eastbound. This concept would remove a very substandard weaving section along eastbound I-90 and provide more deceleration length for traffic exiting I-90 to 21st Street. The additional traffic through the 21st Street ramp terminal intersection does not create any adverse operational problems at the ramp terminal intersection. However, the design would significantly change traffic demands near the new Oakland Place and 19th Street intersection.

Figure 26 illustrates this reconfiguration concept.

This concept originally included the concept of removing the westbound I-90 off-ramp to Oakland Place. This idea was removed from consideration because it offered little benefit and would divert more traffic through to the north ramp intersection at the 21st Street NE interchange.

Figure 26. Oakland Place Interchange Reconfiguration Concept

The referenced safety issue at the Oakland Place/8th Avenue intersection, located immediately south of I-90, was assessed to determine concepts for mitigating the documented crash history. Two potential improvement concepts were developed, both of which involved modifying the existing median crossing for 8th Avenue.

Figure 27 illustrates a ¾ access intersection concept.

In this design 8th Avenue traffic is prohibited from crossing over or turning left onto Oakland Place. This design significantly reduces the number of traffic conflict points at the intersection.

The second intersection concept involves closing the existing median opening at 8th Avenue (see Figure 28). This "right-in/right-out" design eliminates all 8th Avenue traffic that currently crosses over and turns left onto Oakland Place. In addition northbound Oakland Place traffic could not access westbound 8th Avenue and southbound Oakland Place traffic could not access eastbound 8th Avenue.

Figure 27. Oakland Place/8th Avenue ¾ Access Intersection Concept

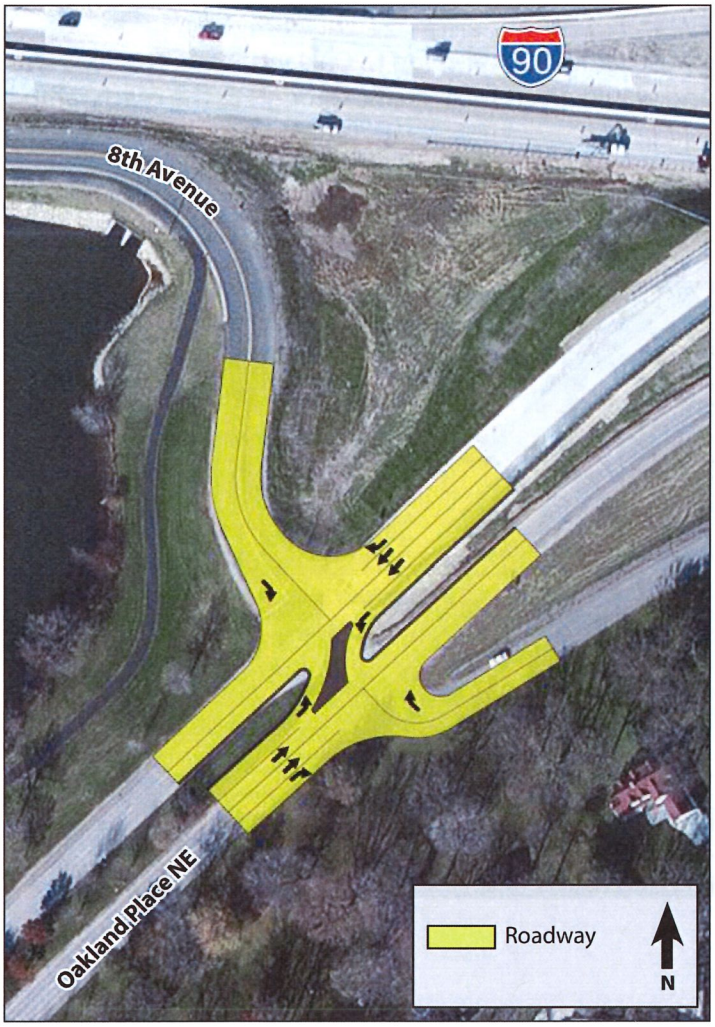
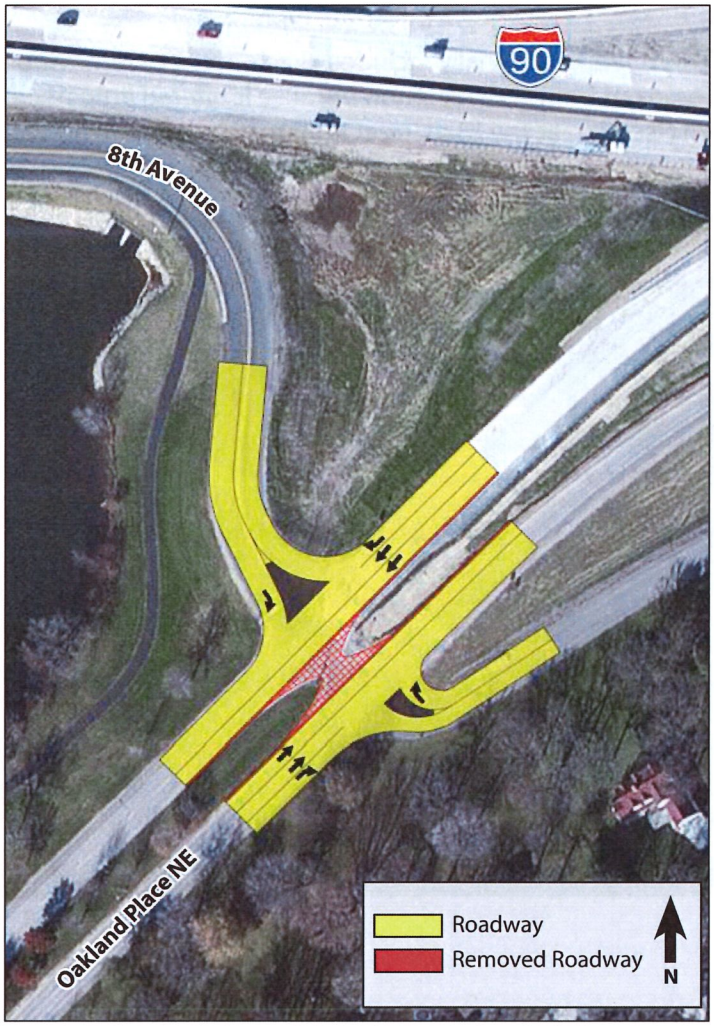


Figure 28. Oakland Place/8th Avenue Right-in/Right-out Concept



Stakeholder Group Input and Review

Following the development of the improvement concepts, the various concepts were presented to the Stakeholder Group to gather feedback prior to conducting the technical evaluation process. A summary of the provided input is summarized by location below:

Oakland Avenue/TH 105 Interchange

- Constructing a new bridge would be preferable to better address sight distance issues
- Improved pedestrian and bicyclist accommodations are needed

US 218 North/14th Street NW Interchange

- Concerns regarding truck movements on loop ramps (folded diamond concept)
- Concerns about truck movements through roundabouts
- Mixed input regarding need for pedestrian and bicyclist accommodations on both bridges
- Would like a traffic signal at south ramp intersection

14th Street NW to 4th Street NW Frontage Road

- Concerns about increasing traffic on an existing residential street
- Concerns about increasing traffic noise

4th Street NW Interchange

- This location has the most substantial traffic issues and is a key hub for visitors
- Regardless of the concept selected, need to minimize construction period delays and closures
- Roundabout concept appears to be very expensive
- Concerned about loss of freeway access with the partial diamond concept

6th Street NE Interchange

- The sight distance issues are a safety concern
- Need to improve lighting

US 218 South/21st Street NE and 28th Street NE Interchange Area

- 8th Avenue is used by Hormel delivery trucks although they are directed to 11th Drive NE
- Consider restricting access at 8th Avenue
- The northbound left turn lane from 21st Street NE to westbound I-90 is very tight
- Widening the 28th Street NE bridge would be preferred in order to accommodate the Shooting Star Trail crossing I-90

The feedback provided by the Stakeholder Group was carried into the evaluation process discussed in Section 4.2.

4.2 Concept Evaluation Process

The process for evaluating the range of improvement concepts presented in the previous section was completed in two phases. Phase 1 included a qualitative "feasibility" screening conducted by the Project Management Team (PMT). This screening considered the general feasibility and constructibility of the initial concepts with the goal of eliminating concepts that were significantly more expensive or introduced the potential for significant issues. Phase 2 included developing technical criteria to apply to the remaining concepts to assist in determining the technical merits of each concept.

Phase 1 Screening-Initial Feasibility

The initial screening focused on the following locations with multiple design concepts:

- US 218 North/14th Street NW Interchange
- 4th Street NW Interchange (including the 14th Street NW to 4th Street NW Frontage Road Concept)
- 21st Street NE and 28th Street NE Interchange Area

US 218 North/14th Street NW Interchange

Four concepts were identified at US 218 North/14th Street NW. They included retaining the existing interchange and either rehabilitating or replacing the two bridges, reconstructing as a folded diamond interchange, and reconstructing with roundabout intersections on 14th Street NW. The PMT concluded that given the trade-off in benefits and challenges with each concept, each should be carried forward for more detailed evaluation.

4th Street NW Interchange

Four improvement concepts were developed for the 4th Street NW interchange. They included: 1) reconstructed diamond design, 2) partial diamond, 3) a diamond design with roundabout intersections on 4th Street NW, and 4) a diamond concept with a loop in the northwest interchange quadrant.

In reviewing the four concepts, the PMT concluded that the roundabout intersection should be removed from further consideration because of extraordinary construction costs and that the diamond with a loop design should be screened because of substantial right-of-way impacts.

US 218/14th Street NW to 4th Street NW Frontage Road

This concept was included in the initial feasibility assessment because it directly affects the options at 14th Street NW and 4th Street NW, given it would require closing the I-90 eastbound on-ramp at 14th Street NW and the I-90 eastbound off-ramp at 4th Street NW. In reviewing this concept the PMT concluded it should not be carried forward into the detailed technical evaluation because it would substantially increase traffic volumes on an existing residential street, impact neighborhood traffic circulation, and impact access at the 14th Street NW and 4th Street NW interchanges.

21st Street NE and 28th Street NE Interchange Area

The PMT assessed the range of concepts in this portion of the study area and concluded that both the one-way pair and split diamond had to be removed from further consideration because both would require new roadways within the runway protection zone (RPZ) for the Austin Airport. Federal Aviation Administration (FAA) rules prohibit new roadways within RPZs except for extraordinary circumstances. Given there are reasonable concepts that avoid the RPZ, the one-way pair and split diamond concepts would not be approved by the FAA. Furthermore, both concepts would require construction within the Hormel Nature Center and there are specific federal laws that prohibit new roadways within parklands unless no other reasonable and prudent alternative exists.

As noted at the beginning of this report, the purpose of this study was to assess specific interchanges and bridges within the study area which have been identified by MnDOT for some level of improvement beginning in 2021. Given the concepts developed at the Oakland Place Interchange and Oakland Place/8th Avenue intersection are outside the scope of what MnDOT has planned for funding, the PMT concluded they should be set aside for potential consideration by MnDOT and/or the City of Austin in future studies. It is important to note that even though these concepts will not be advanced as recommendations in this study report, the analysis completed as part of the process did conclude there would be safety and operational benefits associated with the improvements.

Phase 2 Screening-Technical Evaluation

The second screening phase was based on a set of evaluating criteria defined by the PMT (see Table A).

At the onset of the Phase 2 screening process it was decided to defer the decision on whether to rehabilitate or replace bridges until the remainder of the technical screening was complete and the number of design concepts was reduced to one at each interchange location. This direction enabled the technical evaluation to focus on identifying a preferred design concept at each study location and set the stage for making the final decision on whether to rehabilitate or replace bridges based on anticipated funding and implementation priorities.

The study locations that included multiple design concepts entering the Phase 2 screening included US 218 North/14th Street NW, 4th Street NW, and the Oakland Place interchange area. Moving into the Phase 2 evaluation, the goal was to identify a single preferred design concept at each of these locations.

The technical analysis proceeded with the focus on assembling the data to address each of the evaluation criteria listed in Table A. The technical information was compiled into an evaluation matrix for those locations with multiple design concepts to provide an assessment of how the concepts compared to each other.

The evaluation matrix is presented in Table B.

Table A. Technical Evaluation Criteria

1. Traffic Safety (year 2045 conditions)
   - Estimated annual crashes
   - Percent crash reduction
   - Total intersection conflict points
   - Number of access points eliminated
2. Traffic Mobility (year 2045) conditions
   - Level of service
   - Total travel delay
3. Construction cost (year 2016 dollars)
4. Right-of-way impacts
   - Total acquisitions
   - Partial acquisitions
5. Pedestrian and bicyclist accommodations (compared to existing conditions)

Phase 2 Screening-Conclusions

The results of the Phase 2 screening process are summarized by study location below.

US 218 North/14th Street NW Interchange

The analysis concluded that compared to Concept 3 and 4, Concepts 1 and 2 have lower construction costs, less construction period traffic impacts, and no right-of-way impacts. Concept 1 does not provide the same level of pedestrian and bicyclist accommodations as Concepts 2, 3 or 4.

Technical Finding – Advance Concepts 1 and 2

4th Street NW Interchange

The Phase 2 evaluation concluded there are no substantial differences between Concept 1 (diamond) and Concept 2 (partial diamond). However, based on input from the Stakeholder Group, there were significant concerns about the adverse impacts associated with closing the access to westbound I-90 as assumed with Concept 2.

Technical Finding – Advance Concept 1 (Diamond Interchange Concept)

Table B. Technical Evaluation of Study Locations With Multiple Design Concepts

			US 218 North/14th Street NW Bridges 50803 & 50804			4th Street NE Bridge 9180	
		Concept 1- Rehabilitation	Concept 2- Replacement	Concept 3- Folded Diamond	Concept 4- Roundabout	Concept 1- Diamond	Concept 2- Partial Diamond
Criteria							
Safety (Year 4045)	**Annual Crash Estimation**	5.6	5.6	7.6	7.6	8.2	8.2
	Pct. Crash Reduction	+8%	+8%	+46%	+46%	20%	20%
	Total Conflict Points	26	26	18	16	26	17
	Access Points	0	0	0	0	0	0
Mobility (Year 4045)	**LOS (AM/PM)**	B/A	B/A	A/A	A/B	B/B	A/A
	Total Delay	<10 sec	<10 sec	<7 sec	<15 sec	< 15 sec	<10 sec
Construction Costs (2016)		$1,830,000	$5,600,000	$9,000,000-$11,000,000	$4,500,000-$5,500,000	$9,460,000	$7,900,000-$9,000,000
Construction Traffic Impacts		Low	Low	Medium	Medium	High	High
ROW- Total Acquisitions (parcels)	**Residential**	0	0	0	0	0	0
	Commercial	0	0	1	0	0	0
	Undeveloped	0	0	0	0	0	0
ROW- Partial Acquisitions (parcels)	**Residential**	0	0	0	0	0	0
	Commercial	0	0	1	1	2	2
	Undeveloped	0	0	1	0	0	0
Pedestrian and Bicycle Accommodations		Widen existing 8-foot raised sidewalk on east bridge to 10-feet.	Provides 10-foot trail on east bridge. Outside shoulder on west bridge would be 6-feet wide compared to 2-foot shoulder on existing bridge (Concept 1)	Adds sidewalk on west bridge. Removes ramp intersection conflicts on east bridge.	Provides sidewalk on west side and trail on east side of new bridge.	Provides sidewalk on west side of bridge and trail on east side of bridge.	Same as Concept 1 and further improves safety by removing NW ramp.

5.0 Recommendations

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5.1 Recommended Concepts

The two-phased evaluation process documented in the previous section generated technical information which led to the identification of concepts to carry forward for further consideration. The purpose of this section is to present the process used to assess the remaining concepts and identify the recommended improvement concept at each study location.

The following improvement concepts remained based on the conclusions of the Phase 1 and Phase 2 assessments:

Oakland Avenue/TH 105 Interchange
1. Bridge replacement
2. Bridge rehabilitation

US 218 North/14th Street NW Interchange
1. Rehabilitate existing bridges and widen eastbound I-90 off-ramp
2. Replace existing bridges and widen eastbound I-90 off-ramp.

4th Street NW
1. Replace bridge and construct new diamond interchange

Cedar River Bridges
1. Replace bridges

6th Street NE Interchange
1. Replace bridges
2. Rehabilitate bridges

US 218 South/21st Street NE Interchange
1. Bridge replacement
2. Bridge rehabilitation

28th Street NE Interchange
1. Bridge replacement
2. Bridge rehabilitation

As noted in Section 4, the evaluation process was structured to focus on identifying a preferred concept design at each study location. With the preferred concepts identified, the final step was to determine which bridges are recommended for replacement and which for rehabilitation. Though replacement is generally preferred over rehabilitation because it provides a longer term solution, MnDOT has limited financial resources so the final recommendations will need to include a mix of replacement projects (generally more expensive) and rehabilitation projects (generally less expensive).

The decision whether to replace or rehabilitate existing bridges has already been made for two of the seven study locations listed above; 4th Street NW (replace) and the Cedar River Bridges (replace).

- The preferred design concept at 4th Street NW requires bridge replacement in order to accommodate the additional traffic lanes over I-90. Rehabilitation was not a feasible option given the existing bridges condition and no practical means to widen the bridge to accommodate the required additional traffic lanes.

- Regarding the Cedar River Bridges, as noted in Section 4, based on bridge condition data the District Bridge Engineer and the Consultant Bridge Engineer concluded the existing bridges need to be replaced.

To make the replacement or rehabilitation decision at the five remaining locations, (Oakland Place/TH 105, US 218 North/14th Street NW, 6th Street NE, US 218 South/21st Street NE, and 28th Street NE), the PMT considered the following factors:

- Anticipated funding available for all improvements in the study area
- Replacement cost
- Rehabilitation cost
- Difference in cost between replacement and rehabilitation
- Existing bridge condition (are there locations where replacement is a higher priority)
- Traffic volume served

Table C summarizes the estimated replacement and rehabilitation construction costs. The table indicates rehabilitation costs between $450,000 and $810,000 and replacement costs from $2,630,000 to $3,550,000.

Table C. Replacement and Rehabilitation Construction Cost Comparison

		Oakland Place/ TH 105 Interchange	US 218 North / 14th Street NW	6th Street NE Interchange	US 218 South / 21st St NE Interchange	28th St NE Interchange
Construction Costs	Rehabilitation	$630,000	$1,830,000	$810,000	$450,000	$475,000
	Replacement	$3,550,000	$5,600,000	$2,630,000	$2,590,000	$2,670,0000

After reviewing all the factors listed above, the PMT concluded the following at each of the four remaining locations:

Oakland Place/TH 105 Interchange – Assume rehabilitation given the bridge ranked 5th (out of the seven) in replacement priority, rehabilitation costs are less than one-fifth the replacement costs, and Oakland Place has relatively light traffic volumes.

US 218 North / 14th Street NW – Assume replacement given spring 2107 bridge condition inspections conducted by MnDOT indicated both bridges have more substantial issues than originally understood at the beginning of this study process.

6th Street NE Interchange – Assume rehabilitation given the bridges ranked 7th (out of the seven) in replacement priority and rehabilitation costs are less than one-third the replacement costs.

US 218 South/21st Street NE Interchange – Assume replacement given the bridge ranked 3rd (out of seven) in replacement priority, US 218 South carries relatively higher traffic volumes, and the interchange connects an interstate freeway with a US highway.

28th Street NE Interchange – Assume replacement given the bridge ranked 4th (out of the seven) in replacement priority and a wider bridge is required to fully accommodate the Shooting Star Trail.

5.2 Summary of Recommendations and Implementation Priorities

To assist in defining the implementation sequence for the recommended projects, MnDOT requested input from City of Austin staff to better understand the City's relative priorities. The City indicated that the 4th Street NW interchange is their number one priority, followed by 28th Street NE, 21st Street NE, 14th Street NW, Oakland Avenue, and 6th Street NE.

After considering the City input, the PMT established an implementation priority ranking list. It is important to note that the implementation priorities identified through this study process reflect priorities based on bridge condition, traffic issues, and stakeholder preferences. These recommendations are subject to change given uncertainty in funding levels and timing as well as other unanticipated factors that could arise following completion of this study.

Table D provides a summary of the preliminary study recommendations, including implementation priority.

Table D. Preliminary Study Recommendations

	Design Concept	Replace or Rehabilitate Existing Bridges	Cost ($2016)	Implementation Priority
Oakland Avenue/ TH 105 Interchange - Bridge #9183	Retain existing diamond	Rehabilitate	$630,000	6
US 218 North/14th Street NW - Bridge #50803 and 50804	Retain existing diamond with widened I-90 eastbound off-ramp	Replace	$5,600,000	5
4th Street NW - Bridge # 9180	Tight-diamond	Replace	$9,500,000	2
Cedar River Bridges - Bridge #6868 and 6869	NA	Replace	$5,100,000	1
6th Street NE - Bridge #9178 and 9179	Retain existing diamond	Rehabilitate	$810,000	7
US 218 South/21st Street NE - Bridge #9201	Retain existing diamond	Replace	$2,590,000	3
28th Street NE - Bridge #9504	Retain existing diamond	Replace	$2,670,000	4

The recommendations outlined in Table D were presented to the Stakeholder Group for review and input. The Stakeholder Group inquired about the ability to incorporate recommendations from the I-90/Austin Visual Quality Manual (VQM) completed by MnDOT in January 2016. The VQM, which was developed in close coordination with the City of Austin and other local stakeholders, generated a series of ideas for aesthetic enhancements along the I-90 corridor through Austin. MnDOT indicated some of the aesthetic recommendations in the VQM could be more difficult to incorporate into bridges recommended for rehabilitation as opposed to replacement. However, it is anticipated that some of the VQM recommendations could be applied. The actual aesthetic elements applied at each location will be dependent on funding commitments and will be determined during future project development phases.

The Stakeholder Group members also emphasized the importance of minimizing construction duration and related detours. They encouraged attempting to package projects together to reduce the total amount of time that construction activities will be occurring during the 2021 to 2025 timeframe. The Group concurred with the proposed implementation priority defined by the PMT. However it was noted that even though Oakland Avenue/TH 105 is the 6th priority, providing some improvements for pedestrian and bicyclists is very important at that location given observations of existing demand, and that this interchange is a likely location for the future Blazing Star Trail that is planned to extend from Albert Lea to Austin to cross I-90.

Based on input from the Stakeholder Group no changes were made to the preliminary recommendations listed in Table D. Figure 29 combines all the improvements onto a study area-wide map. This graphic provides additional context regarding the close proximity of many of the recommendations.

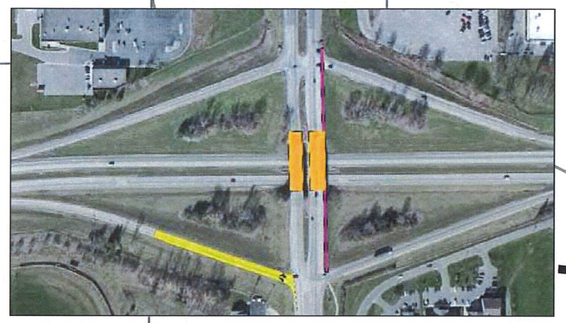
5.3 Additional Study Findings

As documented in Section 4, a series of improvement concepts were developed in an attempt to address traffic safety issues identified at the Oakland Place interchange. One concept included redirecting eastbound Oakland Place traffic destined to I-90 through the 21st Street NE interchange. This design modification would eliminate a substandard weaving condition for Oakland Place traffic entering eastbound I-90 and eastbound I-90 traffic exiting at 21st Street NE (see Figure 26). In addition, two intersection modification concepts were developed to address the documented crash history at the Oakland Place/8th Avenue intersection (see Figures 27 and 28). Even though these concepts are not being advanced as recommendations in this study report, the analysis did conclude there would be safety and operational benefits associated with the improvements.

Figure 29. Recommended Improvement Concepts

N

US 218 N / 14th Street NW
Replace Bridges



4th Street NW
Replace Bridge

6th Street NE
Rehabilitate Bridges

218

90

TH 105 / Oakland Avenue
Rehabilitate Bridge

Cedar River
Replace Bridges

US 218 S / 21st Street NE
Replace Bridge

28th Street NE
Replace Bridge

5.4 Risk Assessment

As noted at the beginning of this report, the purpose of this corridor study was to address the needs along the I-90 corridor through Austin and set the framework for an approach to implement the necessary improvements within a constrained funding plan. This process represents a proactive effort by MnDOT to assess issues along the entire I-90 corridor in Austin in advance of proceeding with project development activities at individual interchange and bridge locations. Understanding the preliminary nature of these study recommendations and the uncertainties related to funding, it is important to acknowledge and document risks that need to be managed as this study process concludes.

Risk 1 - Funding

MnDOT has identified funding for improvements along I-90 in Austin for the years 2021 to 2025. There is significant risk that the amount of funding currently planned could change over the coming years. In addition, the years in which funding becomes available could also change. These factors make it difficult to determine whether the recommendations included in this report will be able to be implemented in the priority order noted in Table D.

To mitigate this risk, MnDOT will need to revisit the study recommendations annually and make adjustments as necessary to best match projects with the available funding.

Risk 2 - 4th Street Interchange Cost

The recommended tight-diamond interchange at 4th Street NW has an estimated 2016 construction cost of $9,500,000. This estimate is approximately double the funding currently identified in MnDOT's preliminary funding plan. As a result, significant additional funding will be required to be able to proceed with project development. Because of the funding shortfall, this improvement which is identified as the second implementation priority could be delayed until additional funding is secured.

To mitigate this risk, MnDOT should work with the City of Austin to identify potential funding opportunities.

Risk 3 - Bridge Condition Changes

Section 3 of this report provides a list of bridge replacement priorities. The potential exists that the current replacement priorities could change over the coming years if the condition of any bridge(s) deteriorate faster or slower than currently anticipated. These developments could in turn result in the need to modify the current implementation priorities.

To mitigate this risk, MnDOT should regularly review the condition of the study area bridges to determine whether unanticipated changes in bridge conditions are occurring.

Risk 4 - "Project Packaging" Could Lead to Changes in Current Implementation Priorities

As the recommendations were identified and implementation priorities were being considered, the PMT discussed concepts for "packaging" various improvements to potentially save money and/or reduce construction-related impacts. Some of the packaging scenarios relate to the proximity of improvements and construction staging concepts, while others result from the potential to save money by letting two or more projects simultaneously to gain efficiencies.

To mitigate this risk, MnDOT should continue to investigate opportunities to package multiple improvements with the objective to save money and reduce traffic and business access issues associated with construction activities. Implementation priorities should be adjusted accordingly and communicated to the City of Austin.

What's Next?

This report defines a series of recommendations related to interchange and bridge improvements along I-90 through the City of Austin. These recommendations in turn provide a framework for MnDOT to initiate more detailed project development activities in the coming years as funding levels and timing become more clear. These efforts will provide substantial opportunity for the public and other stakeholders to be engaged and provide input as the concepts presented in this report are refined and designed.

Project Delivery Method Selection Workshop

Project Name: SP 5080-170 I-90
Project Workshop Date: 5/14/18
Workshop Location: Rochester
Facilitator: Peter Davich
Delivery Methods Considered: All
Delivery Method Selected: Need to Study Further

Selection Team Member	Email
Jai Kalsy	Jai.Kalsy@state.mn.us
Tony Wagner	Anthony.Wagner@state.mn.us
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Minnesota DOT

Project Delivery Selection Matrix

Overview

This document provides a formal approach for selecting project delivery methods for MnDOT projects. The document describes the project delivery methods and provides an outline of the process, instructions, and evaluation worksheets for use by MnDOT staff and project team members. By using these forms, a brief Project Delivery Selection Report can be generated for each individual project. The primary objectives of this tool are:

- Present a structured approach to assist MnDOT in making project delivery decisions;
- Assist MnDOT in determining if there is a dominant or optimal choice of a delivery method; and
- Provide documentation of the selection decision.

Background

A project delivery method is the process by which a construction project is comprehensively designed and constructed including project scope definition, organization of designers, constructors and various consultants, sequencing of design and construction operations, execution of design and construction, and closeout and start-up. Thus, the different project delivery methods are distinguished by the manner in which contracts between MnDOT, designers, and builders are formed and the technical relationships that evolve between each party in those contracts. Currently, there are several project delivery systems available for publicly funded transportation projects. The most common methods are Design-Bid-Build (DBB), Design-Build (DB), and Construction Manager/General Contractor (CMGC). No single project delivery method is appropriate for every project. Each project must be examined individually to determine how the project goals and characteristics align with the attributes of each available delivery method.

Primary Delivery Methods

DBB is the traditional project delivery method in which MnDOT designs, or retains a designer to furnish complete design services, and then advertises and awards a separate construction contract based on the designer's completed construction documents. In DBB, MnDOT "owns" the details of design during construction and as a result, is responsible for the cost of any errors or omissions encountered in construction.

DB is a project delivery method in which MnDOT procures both design and construction services in the same contract from a single, legal entity referred to as the design-builder. The method typically uses Request for Qualifications (RFQ)/Request for Proposals (RFP) procedures rather than the DBB Invitation for Bids procedures. The design-builder controls the details of design and is responsible for the cost of any errors or omissions encountered in construction.

CMGC is a project delivery method in which MnDOT contracts separately with a designer and a construction manager. MnDOT can perform design or contract with an engineering firm to provide a facility design. MnDOT selects a construction manager to perform construction management services and construction works. The significant characteristic of this delivery method is a contract between MnDOT and a construction manager who will be at risk for the final cost and time of construction. Unlike DBB, CMGC brings the builder into the design process at a stage where definitive input can have a positive impact on the project. CMGC is particularly valuable for new non-standard types of designs where it is difficult for MnDOT to develop the technical requirements that would be necessary for DB procurement without industry input.

Overview of the Project Delivery Selection Process

The text and flowchart that follow describe the project delivery method selection process.. It consists of the following activities:

I. Project Delivery Method Selection Approach

A. Describe the project and set the project goals
B. Determine and review project constraints
C. Assess the primary factors (these factors most often determine the selection).
    1. Delivery Schedule
    2. Complexity & Innovation
    3. Level of Design (at the time of the project delivery procurement)
    4. Cost
    5. Initial Risk Assessment
D. If the primary factors indicate there is a clear choice of the delivery method, then perform a pass/fail analysis of the secondary factors. If there is not a clear determination, preform a full evaluation of the secondary factors.
    6. Staff Experience/Availability
    7. Level of Oversight and Control
    8. Competition and Contractor Experience
E. If steps B, C & D do not result in clear determination of the method of delivery, then perform a more rigorous evaluation of all eight factors against the three potential methods of delivery (DBB, DB and CMGC).

NOTE: The selection process can typically be completed in a 2 – 4 hour workshop, depending upon project size and complexity. Prior to the selection workshop, the facilitator should complete the project description, project goals, and project constraints documents. Ideally, each member will review these documents prior to the workshop as well. Analysis of the factors should not begin until there is alignment on the project goals and constraints.

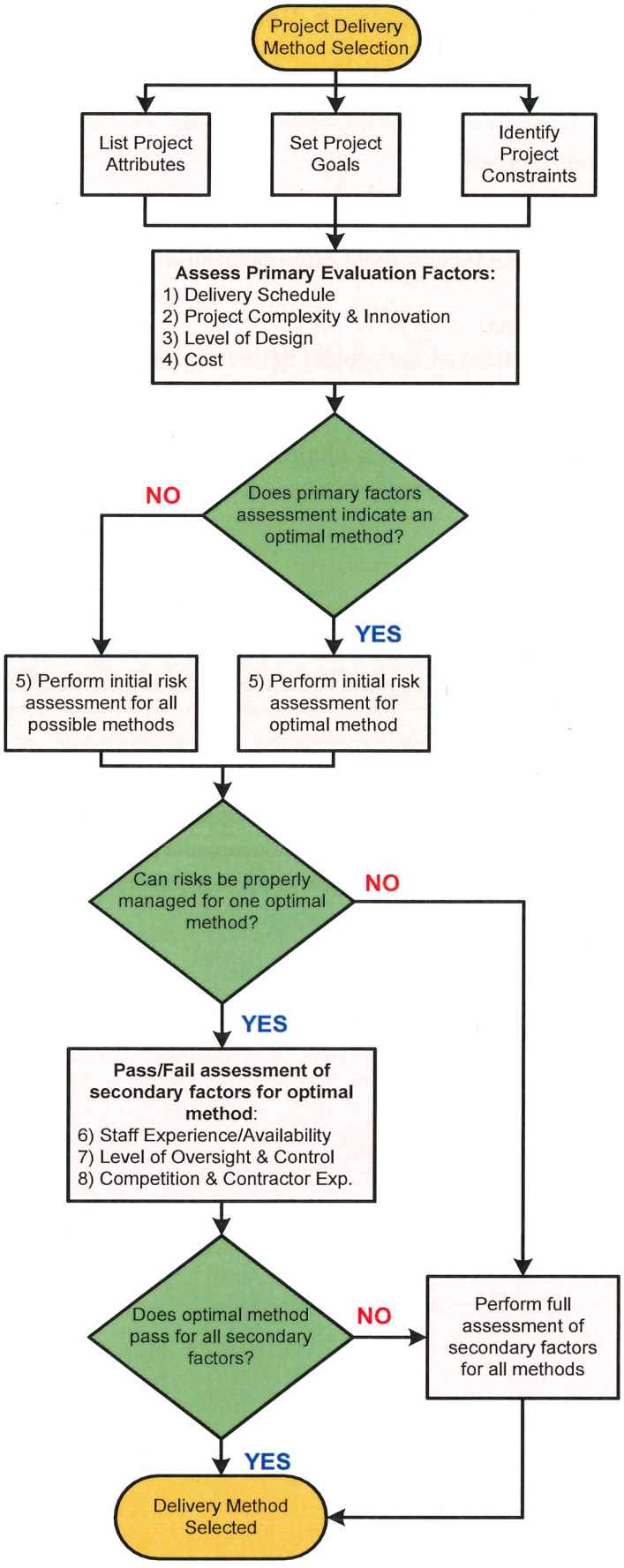

Figure 1 - Flowchart of the PDSM process

Worksheets & Forms

The following forms and appendices are included to facilitate this process.

Project description

Provide information on the project that is using this tool. This includes location, budget, funding, milestones, major obstacles and risks, etc. All information should be developed for the specific project prior to the workshop for efficiency.

Project Goals worksheet

List a concise set of project goals. A shared understanding of project goals is critical for the project delivery selection process and overall project success.

Project Constraints worksheet

Carefully review all possible constraints to the project. These constraints can potentially eliminate a project delivery method before the evaluation process begins.

Project Delivery Selection Summary

The Project Delivery Selection Summary summarizes the assessment of the eight evaluation factors for the three delivery methods. The form is qualitatively scored using the ratings provided in Table 1 below.

Table 1 - Factor Evaluation Rating Key

++	Most appropriate delivery method
+	Appropriate delivery method
–	Least appropriate delivery method
X	Fatal Flaw (discontinue evaluation of this method)
NA	Factor not applicable or not relevant to the selection

The form also includes a section for comments and conclusions. The completed Project Delivery Selection Summary should provide an executive summary of the key reasons for the selection of the method of delivery.

Workshop Blank Form

This form provides space for the project team to document the process. In particular, it can be used to elaborate on Evaluation Factor 5, *Initial Project Risk Assessment*.

Project Delivery Methods Evaluation Factor Opportunity/Obstacle Summary

These forms provide space to summarize the project team assessments of the opportunities and obstacles associated with each delivery method relative to each of the eight evaluation factors. The bottom of each form allows for a qualitative conclusion using the same notation as described above. Those conclusions then are transferred to the Project Delivery Selection Summary.

Project Delivery Methods Opportunity/Obstacles Checklists

These forms, located in Appendix B, provide the project team with suggestions concerning typical delivery method opportunities and obstacles. However, these checklists include general information and are not an all-inclusive checklist. Use the checklists as a supplement to developing project specific opportunities and obstacles through a brainstorming and discussion process.

Initial Risk Assessment Guidance

Because of the unique nature of Evaluation Factor 5, "Initial Project Risk Assessment", this guidance section provides the project team with additional assistance for evaluation of the risk factor including: Typical Transportation Project Risks; a General Project Risks Checklist; and a Risk Opportunities/Obstacles Checklist.

Project Description

Complete the following items to provide a concise description of the project. Add other items if they influence the project delivery decision. Relevant documents can be added as appendices to the final summary report if needed.

Project Attributes
Project Name: Austin I-90 Bridges
Location: I-90 in Austin from TH 105/Oakland Ave. Interchange to TH 218 S Interchange
Estimated Budget: $28.4 Million – STIP Total
Estimated Project Delivery Period: 2021 - 2023
Required Delivery Date (if applicable): Letting in FY 2023
Source(s) of Project Funding: Federal and State Funds, AC Paybacks in FY 2024 and FY 2025
Project Corridor: I-90 through Austin
Major Features of Work – pavement, bridge, sound barriers, etc.: Replace four bridges (6868, 6869, 9180, 9201), Rehabilitate three bridges (9178, 9179, 9183)
Major Schedule Milestones: Project Development: Layout Approval; Environmental Document Approval/Negative Declaration; Letting Held. Construction: Letting Held; Mainline I-90 bridge Removals, Mainline I-90 Bridge Completion; TH 218 Closure and Completion; Substantial Completion of Project.
Major Project Stakeholders: City of Austin, Major area business – including Hormel Foods, potential business development west on TH 105.
Major Obstacles (as applicable) Public involvement with a major area business
With Right of Way, Utilities, and/or Environmental Approvals: Work expected to completed in existing Right of Way but would significantly impact the schedule if that is not the case
During Construction Phase: Maintenance of Traffic and Staging, with a significant number of interchanges in a tight urban corridor, how traffic is maintained represents a significant challenge.
Main Identified Sources of Risk: TBD
Safety Issues: Tight urban corridor restricts space for contractor to work, could present safety concerns.
Sustainable Design and Construction Requirements: None currently identified.

Project Goals

An understanding of project goals is essential to selecting an appropriate project delivery method. Typically, the project goals can be defined in three to five items. Example goals are provided in Appendix A, but the report should include project-specific goals. Ideally, these goals should remain consistent over the life of the project.

Project-Specific Goals
Goal #1: Minimize negative impacts to traveling public during construction
Goal #2: Significantly address condition and safety issues with new bridges and bridge rehabs.
Goal #3: Complete the project within budget
Goal #4: Reduce time to construct the entire project
Goal #5: Adhere to the corridor-wide visual quality goals identified by the committee

Project Constraints

There are potential aspects of a project that can eliminate the need to evaluate one or more of the possible delivery methods. A list of general constraints can be found in Appendix A and should be referred to after completing this worksheet.

General Constraints
Source of Funding: Federal Funds being used
Schedule constraints: Expected 2023 letting – construction 2023-2025
Federal, state, and local laws:
Third party agreements with railroads, ROW, etc:
Procurement Specific Constraints
Procurement constraint #1:
Procurement constraint #2:
Procurement constraint #3:
Procurement constraint #4:
Procurement constraint #5:

Project Delivery Selection Summary

Determine the factors that should be considered in the project delivery selection, discuss the opportunities and obstacles related to each factor, and document the discussion on the following pages. Then complete the summary below.

PROJECT DELIVERY METHOD OPPORTUNITY/OBSTACLE SUMMARY			
	DBB	DB	CMGC
Primary Evaluation Factors			
1. Delivery Schedule	+	++	++
2. Project Complexity & Innovation	+	++	+++
3. Compatibility with Funding	+	-	++
4. Cost	++	+	+
5. Perform Initial Risk Assessment	+	+	+
Secondary Evaluation Factors			
6. Staff Experience/Availability (MnDOT)			
7.Level of Oversight and Control			
8. Competition and Contractor Experience			

+ +	Most appropriate delivery method	**+**	Appropriate delivery method
–	Least appropriate delivery method	**X**	Fatal Flaw (discontinue evaluation of this method)
NA	Factor not applicable or not relevant to the selection		

Project Delivery Selection Summary Conclusions and Comments:

This project is similar in scope to some other recent district 6 Design-Build projects, namely Bridges of Mower County and the Steele County bridges projects. For this particular project, up to 11 bridges will be constructed in and around Austin Minnesota. The district was initially leaning towards a Design-Build letting given the similarity to their past DB projects and some potential innovation the Design-Builder may be able to add to the traffic control on the project. However, through the team's discussions it became clear that the number of bridges may vary depending on the project funding and the final package may or may not have a scope complicated enough to necessitate alternative delivery.

CMGC was felt to be a good method to deal with any and all project challenges. However, there was not felt to be any particular aspect of the project complicated enough (or risky enough involving third parties) to necessitate the CMGC delivery method with its two notable downside: negotiated prices and additional management efforts. Regarding Design-Build, there was general agreement that the method could add value to the project if the interchanges and traffic control became complicated, but it was not clear that enough of those designs would be open to changes to allow a Design-Builder to add value. When Design-Builders cannot add value through design processes (i.e. for a project that isn't particularly complicated) total project costs can rise in comparison to Design-Bid-Build delivery, and this was felt to be a risk for the I-90 project.

In summary, the group did not make a final decision at the meeting and all three delivery methods scored similarly in the informal plus/minus assignment. That said, there was general agreement that the project would be best suited for Design-Bid-Build delivery if the project funding ultimately causes the bridges to be let in separate years and/or no particularly complicated design elements were identified. Alternatively, Design-Build was felt to be the most appropriate delivery method if the bridges are bundled together and some complexity related to the traffic control or other designs is noted.

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Primary Evaluation Factors

1) Delivery Schedule

Delivery schedule is the overall project schedule from scoping through design, construction, and opening to the public. Assess time considerations for starting the project or receiving dedicated funding and assess project completion importance.

DESIGN-BID-BUILD - Requires time to perform sequential design and procurement, but if design time is available has the shortest procurement time after the design is complete.

Opportunities	Obstacles	Rating
Can meet letting date (may be multiple packages)	If multiple projects in corridor, more impacts, but more likely to be one project	+
Permitting/etc schedule drivers not notably complicated here		

DESIGN-BUILD - Ability to get project under construction before completing design. Parallel process of design and construction can accelerate project delivery schedule; however, procurement time can be lengthy due to the time necessary to develop an adequate RFP, evaluate proposals and provide for a fair, transparent selection process.

Opportunities	Obstacles	Rating
Contractor involvement in development of MOT/staging; minimize closure timeframes or other optimization		++
Can meet letting date		
IF ABC needed, contractor involvement helps		

CMGC - Quickly gets contractor under contract and under construction to meet funding obligations before completing design. Parallel process of development of contract requirements, design, procurements, and construction can accelerate project schedule. However, schedule can be slowed down by coordinating design-related issues between the CM and designer and by the process of reaching a reasonable Guaranteed Maximum Price (GMP).

Opportunities	Obstacles	Rating
Contractor involvement in development of MOT/staging; minimize closure timeframes or other optimization		++
Can meet letting date (may be multiple packages)		
IF ABC needed, contractor involvement helps		

Delivery Schedule Summary

	DBB	DB	CMGC
Delivery Schedule			

Notes and Comments:

2) Project Complexity and Innovation

Project complexity and innovation is the potential applicability of new designs or processes to resolve complex technical issues.

DESIGN-BID-BUILD - Allows MnDOT to fully resolve complex design issues and qualitatively evaluate designs before procurement of the general contractor. Innovation is provided by MnDOT/Consultant expertise and through traditional owner directed processes such as VE studies and contractor bid alternatives.

Opportunities	Obstacles	Rating
MnDOT should be able to complete the majority of the design without issue	Staging design rather difficult	+
BV DBB and DBB ATCs are possibilities		

DESIGN-BUILD - Incorporates design-builder input into design process through best value selection and contractor proposed Alternate Technical Concepts (ATCs) – which are a cost oriented approach to providing complex and innovative designs. Requires that desired solutions to complex projects be well defined through contract requirements.

Opportunities	Obstacles	Rating
Some ability to adapt scope to fit budget/goals to greater degree than DBB	Contractors may choose 'cheap' rehab scope if not controlled	++
IF ABC needed, contractor involvement helps	Less control	
Some additional innovation possible at 4th St…or possibly elsewhere (multi-team design competition nice)		
Contractor involvement in development of MOT/staging; minimize closure timeframes or other optimization		

CMGC - Allows independent selection of designer and contractor based on qualifications and other factors to jointly address complex innovative designs through three party collaboration of MnDOT, designer and Contractor. Allows for a qualitative (non-price oriented) design but requires agreement on GMP.

Opportunities	Obstacles	Rating
Honest contractor input figuring out rehab scope and durations	One contractor (as opposed to more design competition)	+++
Some ability to adapt scope to fit budget/goals to greater degree than DBB		
IF ABC needed, contractor involvement helps		
Some additional innovation possible at 4th St…or possibly elsewhere		
Contractor involvement in development of MOT/staging; minimize closure timeframes or other optimization		

Project Complexity and Innovation Summary

	DBB	DB	CMGC
Complexity and Innovation			

Notes and Comments:

3) Compatibility with Funding

Level of design is the percentage of design completion at the time of the project delivery procurement.

DESIGN-BID-BUILD - 100% design by MnDOT or contracted design team, with MnDOT having complete control over the design.

Opportunities	Obstacles	Rating
Multiple projects could be let as funding is ready	Multiple projects fits funding…but perhaps not scope/MOT	+

DESIGN-BUILD - Design advanced by MnDOT to the level necessary to precisely define contract requirements and properly allocate risk (typically 30% or less).

Opportunities	Obstacles	Rating
If funded in one large lump; no issues	Payout curves complicated, contractors don't like to give "loans"	-
	FHWA acceptance of multiple funding packages?	

CMGC - Can utilize a lower level of design prior to procurement of the CMGC and then joint collaboration of MnDOT, designer, and CMGC in the further development of the design. Iterative nature of design process risks extending the project schedule.

Opportunities	Obstacles	Rating
Multiple work packages as needed	Cost knowledge helpful, but may add difficulties to third party discussions if not well explained/managed	++
Early cost insight helps funding resolution, maybe…and if contractor onboard early		

Level of Design Summary

	DBB	DB	CMGC
Level of Design			

Notes and Comments:

4) Cost

Project cost is the financial process related to meeting budget restrictions, early and precise cost estimation, and control of project costs.

DESIGN-BID-BUILD - Competitive bidding provides a low cost construction for a fully defined scope of work. Costs accuracy limited until design is completed. More likelihood of cost change orders due to contractor having no design responsibility.

Opportunities	Obstacles	Rating
Not too complicated outside of MOT, should have good cost		++
DBB ATCs?		
Lane rental, A+B, etc		

DESIGN-BUILD - Designer-builder collaboration and ATCs can provide a cost-efficient response to project goals. Costs are determined with design-build proposal, early in design process. Allows a variable scope bid to match a fixed budget. Poor risk allocation can result in high contingencies.

Opportunities	Obstacles	Rating
Contractor 'value engineering', multiple teams	Additional management/etc costs	+
Budget 'optimization'		

CMGC - MnDOT/designer/contractor collaboration to reduce risk pricing can provide a low cost project however non-competitive negotiated GMP introduces price risk. Good flexibility to design to a budget.

Opportunities	Obstacles	Rating
Can understand and control MnDOT versus local costs (for MOT or other) to a larger degree	Non-competitive bids	+
Budget 'optimization'		
Contractor 'value engineering'		

Cost Summary

	DBB	DB	CMGC
Cost			

Notes and Comments:

5) Initial Risk Assessment

Risk is an uncertain event or condition that, if it occurs, has an effect on a project's objectives. Risk allocation is the assignment of unknown events or conditions to the party that can best manage them. An initial assessment of project risks is important to ensure the selection of the delivery method that can properly address them. An approach that focuses on a fair allocation of risk will be most successful.

DESIGN-BID-BUILD - Risk allocation for design-bid-build best is understood by the industry, but requires that most design-related risks and third party risks be resolved prior to procurement to avoid costly contractor contingency pricing and change orders and claims.

Opportunities	Obstacles	Rating
		+

DESIGN-BUILD - Provides opportunity to properly allocate risks to the party best able to manage them, but requires risks allocated to design-builder to be well defined to minimize contractor contingency pricing of risks.

Opportunities	Obstacles	Rating
	Risk of post-letting local or other opposition to design	
		+

CMGC - Provides opportunity for MnDOT, designer, and contractor to collectively identify and minimize project risks, and allocate risk to appropriate party. Has potential to minimize contractor contingency pricing of risk, but can lose the element of competition in pricing.

Opportunities	Obstacles	Rating
Contractor help with permitting/etc issues		
		+

Risk Assessment Summary

	DBB	DB	CMGC
Risk Assessment			

Notes and Comments:

Secondary Evaluation Factors

6) Staff Experience and Availability

MnDOT staff experience and availability as it relates to the project delivery methods in question.

DESIGN-BID-BUILD - Technical and management resources necessary to perform the design and plan development. Resource needs can be more spread out.

Opportunities	Obstacles	Rating

DESIGN-BUILD - Technical and management resources and expertise necessary to develop the RFQ and RFP and administrate the procurement. Concurrent need for both design and construction resources to oversee the implementation.

Opportunities	Obstacles	Rating

CMGC - Strong, committed MnDOT project management resources are important for success of the CMGC process. Resource needs are similar to DBB except MnDOT must coordinate CM's input with the project designer and be prepared for GMP negotiations.

Opportunities	Obstacles	Rating

Staff Experience and Availability Summary

	DBB	DB	CMGC
Staff Experience/Availability			

Notes and Comments:

7) Level of Oversight and Control

Level of oversight involves the amount of MnDOT staff required to monitor the design or construction, and amount of MnDOT control over the delivery process

DESIGN-BID-BUILD - Full control over a linear design and construction process.

Opportunities	Obstacles	Rating

DESIGN-BUILD - Less control over the design (design desires must be written into the RFP contract requirements). Generally less control over the construction process (design-builder often has QA responsibilities).

Opportunities	Obstacles	Rating

CMGC - Most control by MnDOT over both the design, and construction, and control over a collaborative MnDOT/designer/contractor project team.

Opportunities	Obstacles	Rating

Level of Oversight and Control Summary

	DBB	DB	CMGC
Level of Oversight and Control			

Notes and Comments:

8) Competition and Contractor Experience

Competition and availability refers to the level of competition, experience and availability in the market place and its capacity for the project.

DESIGN-BID-BUILD - High level of competition, but GC selection is based solely on low price. High level of marketplace experience.

Opportunities	Obstacles	Rating

DESIGN-BUILD - Allows for a balance of price and non-price factors in the selection process. Medium level of marketplace experience.

Opportunities	Obstacles	Rating

CMGC - Allows for the selection of the single most qualified contractor, but GMP can limit price competition. Low level of marketplace experience.

Opportunities	Obstacles	Rating

Competition and Contractor Experience Summary

	DBB	DB	CMGC
Competition/Contractor Experience			

Notes and Comments:

APPENDIX A: General Project Goals and Constraints

General Project Goals

Schedule

- Minimize project delivery time
- Complete the project on schedule
- Accelerate start of project revenue

Cost

- Minimize project cost
- Maximize project budget
- Complete the project on budget
- Maximize the project scope and improvements within the project budget

Quality

- Meet or exceed project requirements
- Select the best team
- Provide a high quality design and construction constraints
- Provide an aesthetically pleasing project

Functional

- Maximize the life cycle performance of the project
- Maximize capacity and mobility improvements
- Minimize inconvenience to the traveling public during construction
- Maximize safety of workers and traveling public during construction

General Project Constraints

Schedule

- Utilize federal funding by a certain date
- Complete the project on schedule
- Weather and/or environmental impact

Cost

- Project must not exceed a specific amount
- Minimal changes will be accepted
- Some funding may be utilized for specific type of work (bridges, drainage, etc.)

Quality

- Must adhere to standards proposed by MnDOT
- High quality design and construction constraints
- Adhere to local and federal codes

Functional

- Traveling public must not be disrupted during construction
- Hazardous site where safety is a concern
- Return area surrounding project to existing conditions

APPENDIX B: Project Delivery Opportunity and Obstacle Checklists

(With Project Risk Assessment Discussion and Checklists)

1) Delivery Schedule Project Delivery Checklist

DESIGN-BID-BUILD	
Opportunities	**Obstacles**
☐ Schedule is more predictable and more manageable ☐ Milestones can be easier to define ☐ Projects can more easily be "shelved" ☐ Shortest procurement period ☐ Elements of design can be advanced prior to permitting, construction, etc. ☐ Time to communicate/discuss design with stakeholders	☐ Requires time to perform a linear design-bid-construction process ☐ Design and construction schedules can be unrealistic due to lack industry input ☐ Errors in design lead to change orders and schedule delays ☐ Low bid selection may lead to potential delays and other adverse outcomes.
DESIGN-BUILD	
Opportunities	**Obstacles**
☐ Potential to accelerate schedule through parallel design-build process ☐ Shifting schedule risk to DB team ☐ Encumbers construction funds more quickly ☐ Industry input into design and schedule ☐ Fewer chances for disputes between MnDOT and design-builders ☐ More efficient procurement of long-lead items ☐ Ability to start construction before entire design, ROW, etc. is complete (i.e., phased design) ☐ Allows innovation in resource loading and scheduling by DB team	☐ Request for proposal development and procurement can be intensive ☐ Undefined events or conditions found after procurement, but during design can impact schedule and cost ☐ Time required to define technical requirements and expectations through RFP development can be intensive ☐ Time required to gain acceptance of quality program ☐ Requires MnDOT and stakeholder commitments to an expeditious review of design
CMGC	
Opportunities	**Obstacles**
☐ Ability to start construction before entire design, ROW, etc. is complete (i.e., phased design) ☐ More efficient procurement of long-lead items ☐ Early identification and resolution of design and construction issues (e.g., utility, ROW, and earthwork) ☐ Can provide a shorter procurement schedule than DB ☐ Team involvement for schedule optimization ☐ Continuous constructability review and VE ☐ Maintenance of Traffic improves with contractor inputs ☐ Contractor input for phasing, constructability and traffic control may reduce overall schedule	☐ Potential for not reaching GMP and substantially delaying schedule ☐ GMP negotiation can delay the schedule ☐ Designer-contractor-MnDOT disagreements can add delays ☐ Strong MnDOT management is required to control schedule

2) Project Complexity & Innovation Project Delivery Checklist

DESIGN-BID-BUILD	
Opportunities	**Obstacles**
☐ MnDOT can have more control of design of complex projects ☐ MnDOT and consultant expertise can select innovation independently of contractor abilities ☐ Opportunities for value engineering studies during design, more time for design solutions ☐ Aids in consistency and maintainability ☐ Full control in selection of design expertise ☐ Complex design can be resolved and competitively bid	☐ Innovations can add cost or time and restrain contractor's benefits ☐ No contractor input to optimize costs ☐ Limited flexibility for integrated design and construction solutions (limited to constructability) ☐ Difficult to assess construction time and cost due to innovation

DESIGN-BUILD	
Opportunities	**Obstacles**
☐ Designer and contractor collaborate to optimize means and methods and enhance innovation ☐ Opportunity for innovation through draft RFP, best value and ATC processes ☐ Can use best-value procurement to select design-builder with best qualifications ☐ Constructability and VE inherent in process ☐ Early team integration ☐ Sole point of responsibility	☐ Requires desired solutions to complex designs to be well defined through technical requirements (difficult to do) ☐ Qualitative designs are difficult to define (example. aesthetics) ☐ Risk of time or cost constraints on designer inhibiting innovation ☐ Some design solutions might be too innovative or unacceptable ☐ Quality assurance for innovative processes are difficult to define in RFP

CMGC	
Opportunities	**Obstacles**
☐ Highly innovative process through 3 party collaboration ☐ Allows MnDOT the control of a designer/contractor process for developing innovative solutions ☐ Allows for an independent selection of the best qualified designer and best qualified contractor ☐ VE inherent in process and enhanced constructability ☐ Risk of innovation can be better defined and minimized and allocated ☐ Can take to market for bidding as contingency	☐ Process depends on designer/CM relationship ☐ No contractual relationship between designer/CM ☐ Innovations can add cost or time ☐ Scope additions can be difficult to manage ☐ Preconstruction services fees for contractor involvement ☐ Cost competitiveness – single source negotiated GMP

3) Level of Design Project Delivery Checklist

DESIGN-BID-BUILD	
Opportunities	**Obstacles**
☐ 100% design by MnDOT ☐ MnDOT has complete control over the design (can be beneficial when there is one specific solution for a project) ☐ Project/scope can be developed through design ☐ The scope of the project is well defined through complete plans and contract documents ☐ Well-known process to the industry	☐ MnDOT design errors can result in a higher number of change orders, claims, etc. ☐ Minimizes competitive innovation opportunities ☐ Can reduce the level of constructability since the contractor is not bought into the project until after the design is complete

DESIGN-BUILD	
Opportunities	**Obstacles**
☐ Design advanced by MnDOT to level necessary to precisely define the contract requirements and properly allocate risk ☐ Does not require much design to be completed before awarding project to the design-builder (between ~ 10% - 30% complete) ☐ Contractor involvement in early design, which improves constructability and innovation ☐ Plans do not have to be as detailed because the design-builder is bought into the project early in the process and will accept design responsibility	☐ Must have very clear definitions and requirements in the RFP because it is the basis for the contract ☐ If design is too far advanced it will limit the advantages of design-build ☐ Potential for lacking or missing scope definition if RFP not carefully developed ☐ Over utilizing performance specifications to enhance innovation can risk quality through reduced technical requirements ☐ Less MnDOT control over the design

CMGC	
Opportunities	**Obstacles**
☐ Can utilize a lower level of design prior to selecting a contractor then collaboratively advance design with MnDOT, designer and contractor ☐ Contractor involvement in early design improves constructability ☐ MnDOT controls design ☐ Design can be used for DBB if the price is not successfully negotiated ☐ Design can be responsive to risk minimization	☐ Teaming and communicating concerning design can cause disputes ☐ Three-party process can slow progression of design ☐ If design is too far advanced it will limit the advantages of CMGC or could require design backtracking

4) Cost Project Delivery Checklist

DESIGN-BID-BUILD	
Opportunities	**Obstacles**
☐ Competitive bidding provides a low cost construction to a fully defined scope of work ☐ Increase certainty about cost estimates ☐ Construction costs are contractually set before construction begins	☐ Cost accuracy is limited until design is completed ☐ Construction costs are not locked in until design is 100% complete ☐ Cost reductions due to contractor innovation and constructability is difficult to obtain ☐ More potential of cost change orders due to MnDOT design responsibility
DESIGN-BUILD	
Opportunities	**Obstacles**
☐ Contractor input into design should moderate cost ☐ Design-builder collaboration and ATCs can provide a cost-efficient response to project goals ☐ Costs are contractually set early in design process with design-build proposal ☐ Allows a variable scope bid to match a fixed budget ☐ Potential lower average cost growth ☐ Funding can be obligated in a very short timeframe	☐ Risks related to design-build, lump sum cost without 100% design complete, can compromise financial success of the project
CMGC	
Opportunities	**Obstacles**
☐ MnDOT/designer/contractor collaboration to reduce project risk can result in lowest project costs ☐ Early contractor involvement can result in cost savings through VE and constructability ☐ Cost will be known earlier when compared to DBB ☐ Integrated design/construction process can provide a cost efficient strategies to project goals ☐ Can provide a cost efficient response to the project goals	☐ Non-competitive negotiated GMP introduces price risk ☐ Difficulty in GMP negotiation introduces some risk that GMP will not be successfully executed requiring aborting the CMGC process ☐ Paying for contractors involvement in the design phase may increase total cost

5) Initial Risk Assessment Guidance

Three sets of risk assessment checklists are provided to assist in an initial risk assessment relative to the selection of the delivery method:

A. Typical Transportation Project Risks
B. General Project Risks Checklist
C. Opportunities/Obstacles Checklist (relative to each delivery method)

It is important to recognize that the initial risk assessment is to only ensure the selected delivery method can properly address the project risks. A more detailed level of risk assessment should be performed concurrently with the development of the procurement documents to ensure that project risks are properly allocated, managed, and minimized through the procurement and implementation of the project.

5A) Typical Transportation Project Risks

Following is a list of project risks that are frequently encountered on transportation projects and a discussion on how the risks are resolved through the different delivery methods.

A.1: Site Conditions and Investigations

How unknown site conditions are resolved. For additional information on site conditions, refer to 23 CFR 635.109(a) at the following link:
http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=91468e48c87a547c3497a5c19d640172&rgn=div5&view=text&node=23:1.0.1.7.23&idno=23#23:1.0.1.7.23.1.1.9

DESIGN-BID-BUILD

Site condition risks are generally best identified and mitigated during the design process prior to procurement to minimize the potential for change orders and claims when the schedule allows.

DESIGN-BUILD

Certain site condition responsibilities can be allocated to the design-builder provided they are well defined and associated third party approval processes are well defined. Caution should be used as unreasonable allocation of site condition risk will result in high contingencies during bidding. MnDOT should perform site investigations in advance of procurement to define conditions and avoid duplication of effort by proposers. At a minimum, MnDOT should perform the following investigations:

1) Basic design surveys
2) Hazardous materials investigations to characterize the nature of soil and groundwater contamination
3) Geotechnical baseline report to allow design-builders to perform proposal design without extensive additional geotechnical investigations

CMGC

MnDOT, the designer, and the contractor can collectively assess site condition risks, identify the need to perform site investigations in order to reduce risks, and properly allocate risk prior to GMP.

A.2: Utilities

DESIGN-BID-BUILD

Utility risks are best allocated to MnDOT, and mostly addressed prior to procurement to minimize potential for claims when the schedule allows.

DESIGN-BUILD

Utilities responsibilities need to be clearly defined in contract requirements, and appropriately allocated to both design-builder and MnDOT:

Private utilities (major electrical, gas, communication transmission facilities): Need to define coordination and schedule risks, as they are difficult for design-builder to price. Best to have utilities agreements before procurement. Note – by state regulation, private utilities have schedule liability in design-build projects, but they need to be made aware of their responsibilities.

Public Utilities: Design and construction risks can be allocated to the design-builder, if properly incorporated into the contract requirements.

CMGC

Can utilize a lower level of design prior to contracting and joint collaboration of MnDOT, designer, and contractor in the further development of the design.

A.3: Railroads (if applicable)

DESIGN-BID-BUILD

Railroad risks are best resolved prior to procurement and relocation designs included in the project requirements when the schedule allows.

DESIGN-BUILD

Railroad coordination and schedule risks should be well understood to be properly allocated and are often best assumed by MnDOT. Railroad design risks can be allocated to the designer if well defined. Best to obtain an agreement with railroad defining responsibilities prior to procurement

CMGC

Railroad impacts and processes can be resolved collaboratively by MnDOT, designer, and contractor. A lengthy resolution process can delay the GMP negotiations.

A.4: Drainage/Water Quality Best Management Practices (construction and permanent)

Both drainage and water quality often involve third party coordination that needs to be carefully assessed with regard to risk allocation. Water quality in particular is not currently well defined, complicating the development of technical requirements for projects.

Important questions to assess:

1) Do criteria exist for compatibility with third party offsite system (such as an OSP (Outfall System Plan))?
2) Is there an existing cross-drainage undersized by design Criteria?
3) Can water quality requirements be precisely defined? Is right-of-way adequate?

DESIGN-BID-BUILD

Drainage and water quality risks are best designed prior to procurement to minimize potential for claims when the schedule allows.

DESIGN-BUILD

Generally, MnDOT is in the best position to manage the risks associated with third party approvals regarding compatibility with offsite systems, and should pursue agreements to define requirements for the design-builder.

CMGC

MnDOT, the designer, and the contractor can collectively assess drainage risks and coordination and approval requirements, and minimize and define requirements and allocate risks prior to GMP.

A.5: Environmental

Meeting environmental document commitments and requirements, noise, 4(f) and historic, wetlands, endangered species, etc.

DESIGN-BID-BUILD

Risk is best mitigated through design prior to procurement when the schedule allows.

DESIGN-BUILD

Certain environmental approvals and processes that can be fully defined can be allocated to the design-builder. Agreements or MOUs with approval agencies prior to procurement is best to minimize risks.

CMGC

Environmental risks and responsibilities can be collectively identified, minimized, and allocated by MnDOT, the designer, and the contractor prior to GMP.

A.6: Third Party Involvement

Timeliness and impact of third party involvement (funding partners, adjacent municipalities, adjacent property owners, project stakeholders, FHWA, PUC).

DESIGN-BID-BUILD

Third party risk is best mitigated through design process prior to procurement to minimize potential for change orders and claims when the schedule allows.

DESIGN-BUILD

Third party approvals and processes that can be fully defined can be allocated to the design-builder. Agreements or MOUs with approval agencies prior to procurement is best to minimize risks.

CMGC

Third party approvals can be resolved collaboratively by MnDOT, designer, and contractor.

5B) General Project Risk Checklist (Items to consider when assessing risk)

Environmental Risks	External Risks
☐ Delay in review of environmental documentation ☐ Challenge in appropriate environmental documentation ☐ Defined and non-defined hazardous waste ☐ Environmental regulation changes ☐ Environmental impact statement (EIS) required ☐ NEPA/404 Merger Process required ☐ Environmental analysis on new alignments required	☐ Stakeholders request late changes ☐ Influential stakeholders request additional needs to serve their own commercial purposes ☐ Local communities pose objections ☐ Community relations ☐ Conformance with regulations/guidelines/ design criteria ☐ Intergovernmental agreements and jurisdiction
Third-Party Risks	**Geotechnical and Hazmat Risks**
☐ Unforeseen delays due to utility owner and third-party ☐ Encounter unexpected utilities during construction ☐ Cost sharing with utilities not as planned ☐ Utility integration with project not as planned ☐ Third-party delays during construction ☐ Coordination with other projects ☐ Coordination with other government agencies	☐ Unexpected geotechnical issues ☐ Surveys late and/or in error ☐ Hazardous waste site analysis incomplete or in error ☐ Inadequate geotechnical investigations ☐ Adverse groundwater conditions ☐ Other general geotechnical risks
Right-of-Way/ Real Estate Risks	**Design Risks**
☐ Railroad involvement ☐ Objections to ROW appraisal take more time and/or money ☐ Excessive relocation or demolition ☐ Acquisition ROW problems ☐ Difficult or additional condemnation ☐ Accelerating pace of development in project corridor ☐ Additional ROW purchase due to alignment change	☐ Design is incomplete/ Design exceptions ☐ Scope definition is poor or incomplete ☐ Project purpose and need are poorly defined ☐ Communication breakdown with project team ☐ Pressure to delivery project on an accelerated schedule ☐ Constructability of design issues ☐ Project complexity - scope, schedule, objectives, cost, and deliverables - are not clearly understood
Organizational Risks	**Construction Risks**
☐ Inexperienced staff assigned ☐ Losing critical staff at crucial point of the project ☐ Functional units not available or overloaded ☐ No control over staff priorities ☐ Lack of coordination/ communication ☐ Local MnDOT issues ☐ Internal red tape causes delay getting approvals, decisions ☐ Too many projects/new priority project inserted into program	☐ Pressure to delivery project on an accelerated schedule. ☐ Inaccurate contract time estimates ☐ Construction QC/QA issues ☐ Unclear contract documents ☐ Problem with construction sequencing/staging/phasing ☐ Maintenance of Traffic/Work Zone Traffic Control

5C) Risk Opportunities/Obstacles Checklist (relative to each delivery method)

DESIGN-BID-BUILD	
Opportunities	**Obstacles**
☐ Risks managed separately through design, bid, build is expected to be easier ☐ Risk allocation is most widely understood/used ☐ Opportunity to avoid or mitigate risk through complete design ☐ Risks related to environmental, railroads, & third party involvement are best resolved before procurement ☐ Utilities and ROW best allocated to MnDOT and mostly addressed prior to procurement to minimize potential for claim ☐ Project can be shelved while resolving risks	☐ MnDOT accepts risks associated with project complexity (the inability of designer to be all-knowing about construction) and project unknowns ☐ Low-bid related risks ☐ Potential for misplaced risk through prescriptive specifications ☐ Innovative risk allocation is difficult to obtain ☐ Limited industry input in contract risk allocation ☐ Change order risks can be greater ☐ Contractor may avoid risks

DESIGN-BUILD	
Opportunities	**Obstacles**
☐ Performance specifications can allow for alternative risk allocations to the design builder ☐ Risk-reward structure can be better defined ☐ Innovative opportunities to allocate risks to different parties (e.g., schedule, means and methods, phasing) ☐ Opportunity for industry review of risk allocation (draft RFP, ATC processes) ☐ Avoid low-bid risk in procurement ☐ Contractor will help identify risks related to environmental, railroads, ROW, and utilities ☐ Designers and contractors can work toward innovative solutions to, or avoidance of, unknowns	☐ Need a detailed project scope, description etc., for the RFP to get accurate/comprehensive responses to the RFP (Increased RFP costs may limit bidders) ☐ Limited time to resolve risks ☐ Additional risks allocated to designers for errors and omissions, claims for change orders ☐ Unknowns and associated risks need to be carefully allocated through a well-defined scope and contract ☐ Risks associated with agreements when design is not completed ☐ Poorly defined risks are expensive ☐ Contractor may avoid risks or drive consultant to decrease cost at risk to quality

CMGC	
Opportunities	**Obstacles**
☐ Contractor can have a better understanding of the unknown conditions as design progresses ☐ Innovative opportunities to allocate risks to different parties (e.g., schedule, means and methods, phasing) ☐ Opportunities to manage costs risks through CMGC involvement ☐ Contractor will help identify and manage risk ☐ MnDOT still has considerable involvement with third parties to deal with risks ☐ Avoids low-bid risk in procurement ☐ More flexibility and innovation available to deal with unknowns early in design process	☐ Lack of motivation to manage small quantity costs ☐ Increase costs for non-proposal items ☐ Disagreement among Designer-Contractor-MnDOT can put the process at risk ☐ If GMP cannot be reached, additional low-bid risks appear ☐ Limited to risk capabilities of CMGC ☐ Designer-contractor-MnDOT disagreements can add delays ☐ Strong MnDOT management is required to negotiate/optimize risks ☐ Discovery of unknown conditions can drive up GMP, which can be compounded in phased construction

6) Staff Experience and Availability Project Delivery Checklist

DESIGN-BID-BUILD	
Opportunities	**Obstacles**
☐ MnDOT, contractors and consultants have high level of experience with the traditional system ☐ Designers can be more interchangeable between projects	☐ Can require a high level of MnDOT staffing of technical resources ☐ MnDOT staff's responsibilities are spread out over a longer design period ☐ Can require staff to have full breadth of technical expertise
DESIGN-BUILD	
Opportunities	**Obstacles**
☐ Less MnDOT staff required due to the sole source nature of DB ☐ Opportunity to grow MnDOT staff by learning a new process	☐ Limitation of availability of MnDOT staff with skills, knowledge, and personality to manage DB projects ☐ Existing MnDOT staff may need additional training to address their changing roles ☐ Need to "mass" MnDOT management and technical resources at critical points in process (i.e., RFP development, design reviews, etc.)
CMGC	
Opportunities	**Obstacles**
☐ MnDOT can improve efficiencies by having more project managers on staff rather than specialized experts ☐ Smaller number of technical staff required through use of consultant designer	☐ Strong, committed MnDOT project management is important to success ☐ Limitation of availability of MnDOT staff with skills, knowledge, and personality to manage CMGC projects ☐ Existing MnDOT staff may need additional training to address their changing roles ☐ MnDOT must learn how to negotiate GMP projects

7) Level of Oversight and Control Project Delivery Checklist

DESIGN-BID-BUILD	
Opportunities	**Obstacles**
☐ Full MnDOT control over a linear design and construction process ☐ Oversight roles are well understood ☐ Contract documents are typically completed in a single package before construction begins ☐ Multiple checking points through three linear phases: design-bid-build ☐ Maximum control over design	☐ Requires a high-level of oversight ☐ Increased likelihood of claims due to MnDOT design responsibility
DESIGN-BUILD	
Opportunities	**Obstacles**
☐ A single entity responsibility during project design and construction ☐ Continuous execution of design and build ☐ Getting input from construction to enhance constructability and innovation ☐ Overall project planning and scheduling is established by one entity	☐ Can require high level of design oversight ☐ Can require high level of quality assurance oversight ☐ Limitation on staff with DB oversight experience ☐ Less control by MnDOT over design ☐ Control over design relies on proper development of technical requirements
CMGC	
Opportunities	**Obstacles**
☐ Preconstruction services are provided by the construction manager ☐ Getting input from construction to enhance constructability and innovation ☐ Provides MnDOT control over an integrated design/construction process	☐ MnDOT must have experienced staff to oversee the CMGC ☐ Higher level of cost oversight required

Bridge Scoping and Cost Estimating Assessment
Bridge Replacement or Major Rehabilitation

Date:1/8/19

Trunk Highway(s): T.H. 218	**S.P.:** 5008-33	**S.A.P:** N.A.	**Letting Date: 1/1/23**
County(s): Mower	**City(s):** Austin		**District(s):** 6
Location: T.H. 218 Over I-90, at the East Junction of T.H. 218 in Austin, MN.			

Proposed Bridge Information: Date of Assessment:1/8/19

Work Type:01	Number of Bridges in Project:5	Proposed Bridge No:50012	Inplace Bridge No: 9201	
Feature Crossed: I-90	Bridge Type: 501	Deck Area: 10,050 Sq. Ft.	Bridge Length: 205.44 Lin. Ft.	Bridge Width :48.92 Lin. Ft.
No. of Spans: 2	No. of Lanes on Proposed Bridge 2	Inside Shoulder Width 8.0 Lin. Ft.	Outside Shoulder Width 8.0 Lin. Ft.	
Type of Barrier:Type S & Type P-1	No. of Barriers:1 of each	Median Width N.A. Lin. Ft.		
Sidewalk Width 6.0 Lin. Ft. ☒ One Side ☐ Both Sides		Trail Width N.A. Lin. Ft. ☐ One Side ☐ Both Sides		
Abutment Type: : ☐ Tall Parapet ☐ Medium Parapet ☐ Low Parapet ☒ Integral		Pier Type: : ☐ Wall ☒ Column ☒ w / Strut ☐ Encased Pile		
Design Organization: ☒ Mn/DOT ☐ Consultant ☐ Partnership ☐ State Aid ☐ By Others ☐ Border Bridge ☐ Design Build				
Comments: Staged replacement of the inplace structure would be difficult due to the inplace pier column type (two rectangular columns at each pier).				

Bridge Estimating Unit: (All Estimated Costs in Year of Estimate Dollars) Year of Estimate: 2019

Estimated Proposed Structure Cost: $1,452,000.00	Estimate Includes : ☒ Mobility ☒ Aesthetics ☐ Staging
Inplace Structure Removal Cost : $80,000.00	Type (Level) of Estimate :☐ Planning Level ☒ Scoping Level
Foundations: ☐Borings ☒ Inplace Structure ☐ None Available	
Estimator: L.G.A.	Date: 01/08/19
Comments:$1,452,000.00 + $80,000.00 = $1,532,000.00. No Traffic Control costs, no Approach Panels costs, no Staged Construction costs are included.	

Bridge Hydraulics Unit:

New Bridge ☐ Yes ☐ No		New Culvert: ☐ Yes ☐ No	
Bridge Survey Available: ☐ Yes ☐ No	Structure Skew Angle Degrees	High Water of Record Elevation Feet ☐ Not Available	
Low Bridge Elevation Feet ☐ Not Available		Flow Line Elevation Feet ☐ Not Available	
Approximate Sq. Ft. of Waterway Available Below Feet ☐ Not Available			
Rip Rap Type: : ☐ Yes ☐ No Class	Rip Rap Thickness: Inches	Granular Filter: ☐ Yes ☐ No Inches	
Comments:N. A.			

Bridge Office Contact:

Name: Lawrence Aamodt
Title: Engineering Specialist enior
Address: 3485 Hadley Ave. N.
Oakdale, MN 55128-3307
Phone: 651-366-4661
Fax: 651-366-4497
Email: larry.aamodt@state.mn.us

List of Attachments:

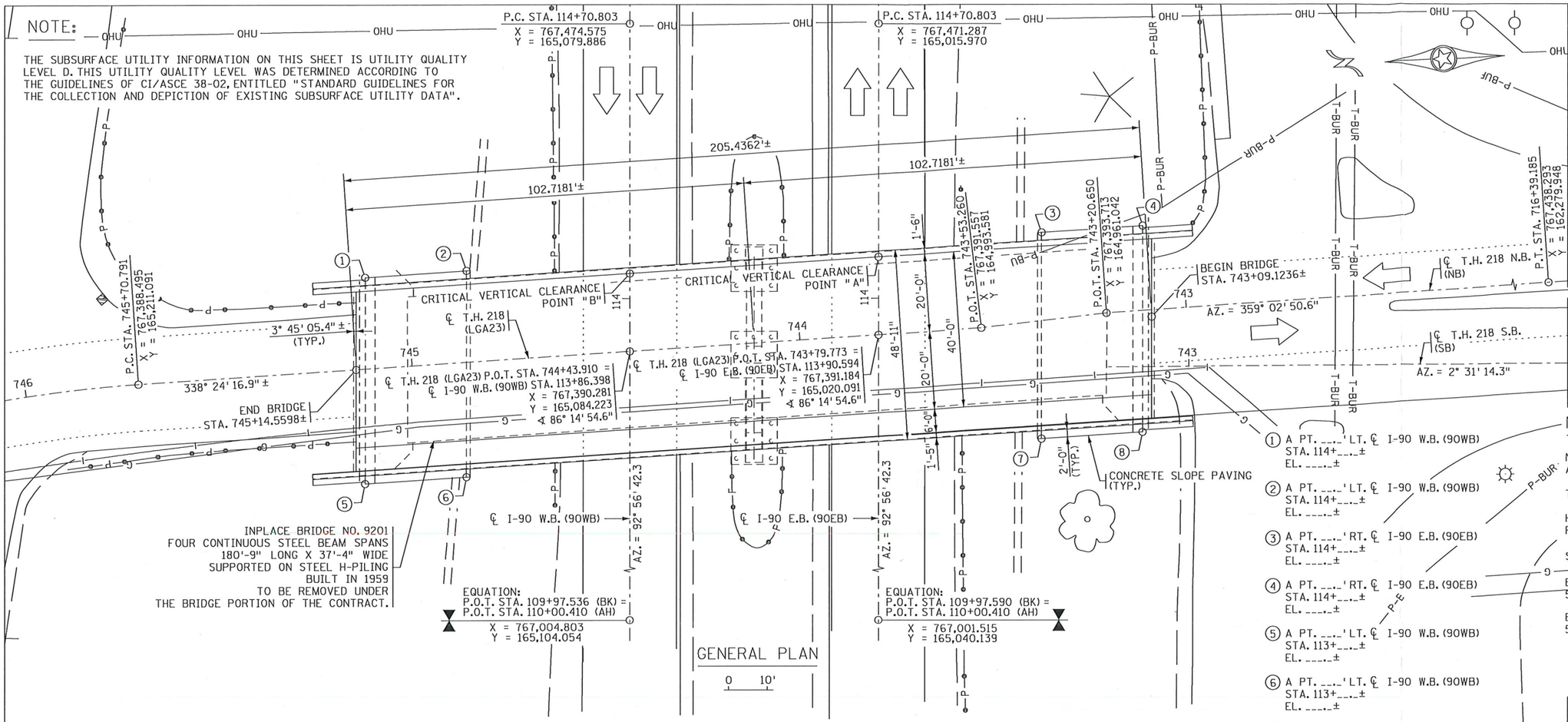
☐ Preliminary Waterway Analysis
Preliminary Sketches: ☐ Attached ☒ Not Available
L.R.F.D. Design Tables:
Other Attachments: Conceptual Sketches.

Assessment Information Distribution List:

Name: Mark Harle	Name: Daniel Prather	Name: Jeffrey Southward
Title: Senior Project Manager	Title: Preliminary Bridge Plans Engineer	Title: Programs and Estimates Supervisor
Address: 2900 48th St. N.W. Rochester, MN 55901-5848	Address: 3485 Hadley Ave. N. Oakdale, MN 55128-3307	Address: 3485 Hadley Ave. N. Oakdale, MN 55128-3307
Phone: 507-286-7556	Phone: 651-366-4457	Phone: 651-366-4452
Fax: 507-285-7355	Fax: 651-366-4497	Fax: 651-366-4497
Email: mark.harle@state.mn.us	Email: dan.prather@state.mn.us	Email: jeff.southward@state.mn.us

NOTE:

THE SUBSURFACE UTILITY INFORMATION ON THIS SHEET IS UTILITY QUALITY LEVEL D. THIS UTILITY QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA".



GENERAL PLAN

0 10'

DESIGN DATA

DESIGNED IN ACCORDANCE WITH 20__
AND CURRENT INTERIM AASHTO
LRFD BRIDGE DESIGN SPECIFICATIONS.
HL-93 LIVE LOAD.
DEAD LOAD INCLUDES 20 POUNDS PER SQUARE
FOOT ALLOWANCE FOR FUTURE
WEARING COURSE MODIFICATIONS.
MATERIAL DESIGN PROPERTIES:
REINFORCED CONCRETE:
f'c = 4 KSI CONCRETE
fy = 60 KSI PLAIN AND EPOXY COATED BARS
fy = 75 KSI STAINLESS STEEL BARS
n = 8 FOR REINFORCEMENT BARS
PRETENSIONED CONCRETE:
f'c = __ KSI CONCRETE (MAX.)
fpu = 270 KSI LOW RELAXATION STRANDS
n = 1 FOR PRETENSIONING STRANDS
0.75 fpu FOR INITIAL PRESTRESS
DESIGN SPEED:
OVER = 40 M.P.H. UNDER = M.P.H.
APPROXIMATE DECK AREA 10,050 SQ. FT.

20 PROJECTED TRAFFIC VOLUMES

ROADWAY OVER	ROADWAY UNDER
A.A.D.T.	
D.H.V.	
H.C.A.D.T.T.	

NOTES:

NUMBER AND SPACING OF BEAMS IS APPROXIMATE AND WILL BE SET IN FINAL DESIGN.

TRAFFIC TO BE DETOURED DURING CONSTRUCTION.

HATCHED AREA TO BE REMOVED UNDER GRADING PORTION OF CONTRACT.

SEE SHEET __ FOR INPLACE UTILITIES.

BRIDGE APPROACH TREATMENT STANDARD 5-297.234 APPLIES.

BRIDGE APPROACH PANEL LAYOUT STANDARDS 5-297.224 AND 5-297.225 APPLY.

① A PT. ___.' LT. ℄ I-90 W.B. (90WB)
STA. 114+___.± EL. ___.±

② A PT. ___.' LT. ℄ I-90 W.B. (90WB)
STA. 114+___.± EL. ___.±

③ A PT. ___.' RT. ℄ I-90 E.B. (90EB)
STA. 114+___.± EL. ___.±

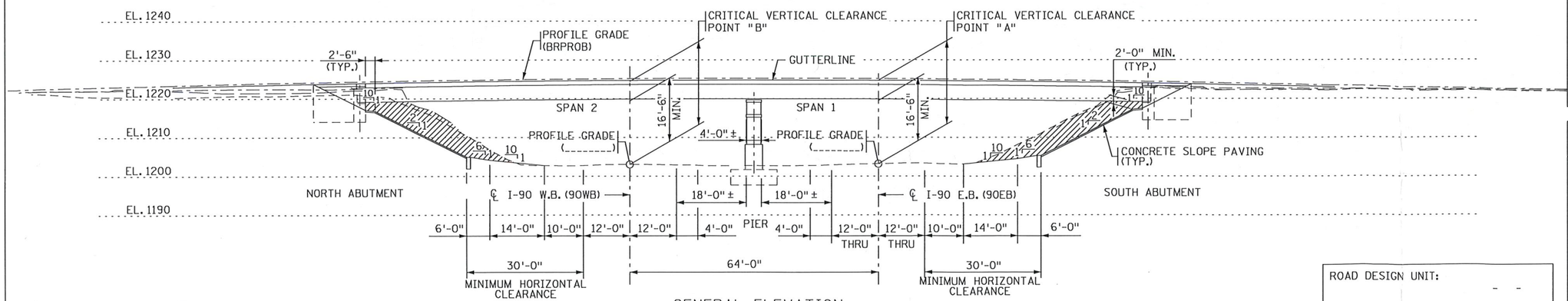
④ A PT. ___.' RT. ℄ I-90 E.B. (90EB)
STA. 114+___.± EL. ___.±

⑤ A PT. ___.' LT. ℄ I-90 W.B. (90WB)
STA. 113+___.± EL. ___.±

⑥ A PT. ___.' LT. ℄ I-90 W.B. (90WB)
STA. 113+___.± EL. ___.±

⑦ A PT. ___.' RT. ℄ I-90 E.B. (90EB)
STA. 113+___.± EL. ___.±

⑧ A PT. ___.' RT. ℄ I-90 E.B. (90EB)
STA. 113+___.± EL. ___.±



GENERAL ELEVATION

0 10'

EXISTING GROUND PROFILE
28' LT. – – – – –
℄ T.H. 218 — · — · —
22' RT. — — — —

DEPTH OF STRUCTURE:
4'-10" GUTTER TO LOW BRIDGE
MN45 P.C.B. 6± BEAM LINES

PROPOSED TYPE OF STRUCTURE

DECK:
MN45 PRESTRESSED CONCRETE BEAMS
NO SEPARATE CONCRETE WEARING COURSE
ALL BARS EPOXY COATED
SIMPLE SPANS

SUBSTRUCTURE:
INTEGRAL ABUTMENTS SUPPORTED ON

PIER SUPPORTED ON

AESTHETICS:
LEVEL

MINNESOTA
DEPARTMENT OF TRANSPORTATION

CONCEPTUAL SKETCH
BRIDGE NO. 50012

T.H. 218 OVER I-90
AT THE EAST JUNCTION OF T.H. 218
IN AUSTIN

SEC. 36 TWP. 103 N. R. 18 W.

CITY OF AUSTIN MOWER CO.

DATE: _____

NOT FINAL

STATE BRIDGE ENGINEER

ROAD DESIGN UNIT: - -

RESIDENT ENGINEER: - -

BRIDGE DESIGN UNIT: 651-366-

JOB NO. T6C969 MINNESOTA PROJECT NO. - STATE PROJECT NO. 5008-50012 (T.H. 218 = 040) SHEET NO. 1 OF 3 SHEETS 50012 L.G.A.

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PLOTTED : 1/8/2019
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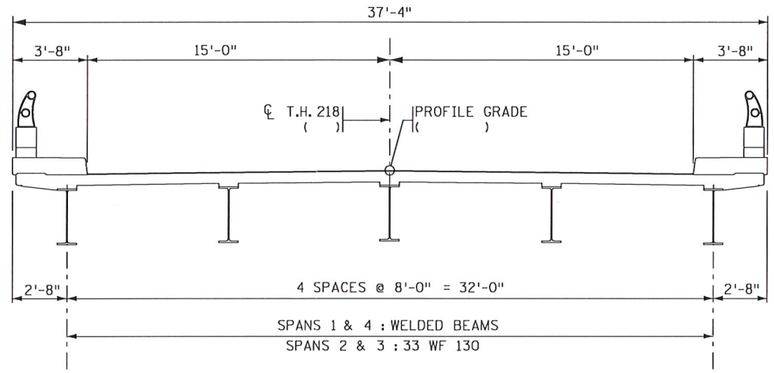
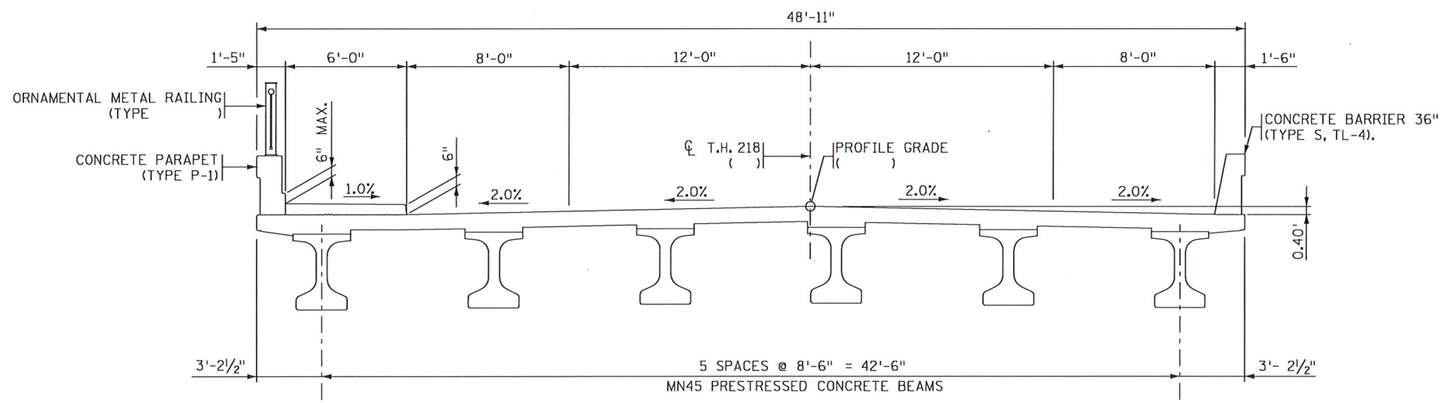


INPLACE TRANSVERSE SECTION



PROPOSED TRANSVERSE SECTION

NOT FINAL

TRANSVERSE SECTIONS	DR: L.G.A.	CHK:	BRIDGE NO. 50012
STATE PROJECT NO. 5008-50012 (T.H. 218 = 040)	SHEET NO. 2 OF 3 SHEETS		

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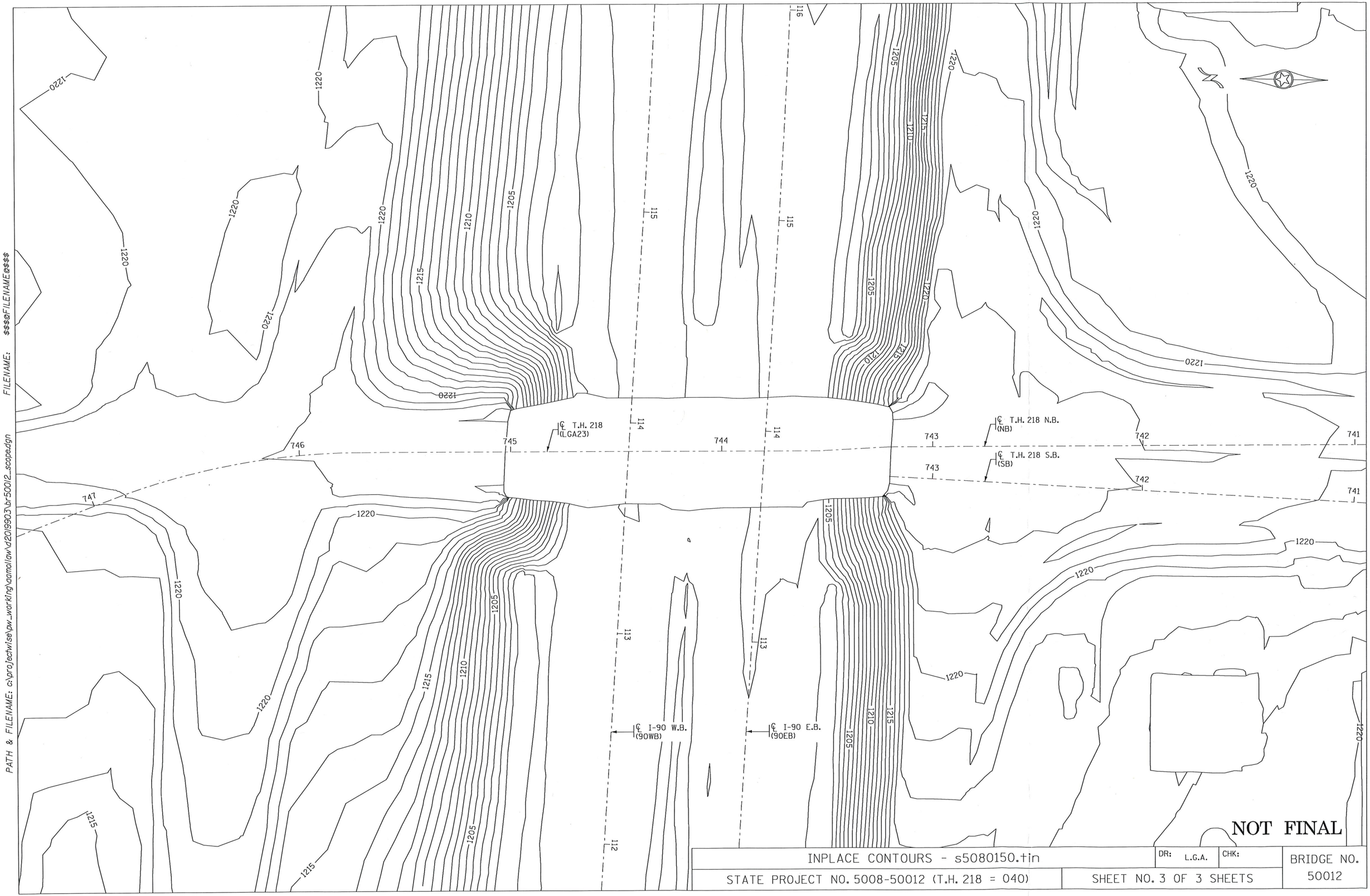

NOT FINAL

INPLACE CONTOURS - s5080150.tin	DR: L.G.A.	CHK:	BRIDGE NO. 50012
STATE PROJECT NO. 5008-50012 (T.H. 218 = 040)	SHEET NO. 3 OF 3 SHEETS		

Bridge Scoping and Cost Estimating Assessment
Bridge Replacement or Major Rehabilitation

Date:1/8/19

Trunk Highway(s): I-90	**S.P.:** 5080-170	**S.A.P:** N.A.	**Letting Date: 1/1/23**
County(s): Mower	**City(s):** Austin	**District(s):** 6	
Location: i-90 Under C.S.A.H. 45 (4th St.) 0.7 Miles East of the West Junction of T.H. 218 in Austin, MN.			

Proposed Bridge Information: Date of Assessment:1/8/19

Work Type:01	Number of Bridges in Project:5	Proposed Bridge No:50014	Inplace Bridge No: 9180	
Feature Crossed: I-90	Bridge Type: 501	Deck Area: 12,160 Sq. Ft.	Bridge Length: 120.63 Lin. Ft.	Bridge Width :100.83 Lin. Ft.
No. of Spans: 2	No. of Lanes on Proposed Bridge 6	Inside Shoulder Width 2.0 Lin. Ft.	Outside Shoulder Width 2.0 Lin. Ft.	
Type of Barrier:P-1	No. of Barriers:2	Median Width 6.0 Lin. Ft.		
Sidewalk Width 6.0 Lin. Ft. ☐ One Side ☒ Both Sides		Trail Width N.A. Lin. Ft. ☐ One Side ☐ Both Sides		
Abutment Type: : ☒ Tall Parapet ☐ Medium Parapet ☐ Low Parapet ☐ Integral		Pier Type: : ☐ Wall ☒ Column ☒ w / Strut ☐ Encased Pile		
Design Organization: ☐ Mn/DOT ☐ Consultant ☐ Partnership ☐ State Aid ☐ By Others ☐ Border Bridge ☐ Design Build				
Comments: Considerations could be made to follow to the recommended clear zones for I-90 eastbound and westbound of 28 feet to 30 feet for a Design Speed of 70 M.P.H. with a Design A.D.T. of over 6,000 reflected in "Table 3-1. Suggested Clear-Zone Distances in Feet from Edge of Through Traveled Lane (6)" page 3-3 of the Roadside Design Guide 4th Edition 2011. See attached.				

Bridge Estimating Unit: (All Estimated Costs in Year of Estimate Dollars) Year of Estimate: 2019

Estimated Proposed Structure Cost: $2,970,000.00	Estimate Includes : ☒ Mobility ☒ Aesthetics ☒ Staging
Inplace Structure Removal Cost : $105,000.00	Type (Level) of Estimate :☐ Planning Level ☒ Scoping Level
Foundations: ☐Borings ☒ Inplace Structure ☐ None Available	
Estimator: Lawrence Aamodt	Date: 01/08/19
Comments: Option 1: Detoured Traffic - $2,970,000.00 + $105,000.00 = $3,075,000.00. Option 2: Staged Construction - $3,261,000.00 + $126,000.00 = $3,387,000.00.	

Bridge Hydraulics Unit:

New Bridge ☐ Yes ☐ No		New Culvert: ☐ Yes ☐ No	
Bridge Survey Available: ☐ Yes ☐ No	Structure Skew Angle Degrees	High Water of Record Elevation Feet ☐ Not Available	
Low Bridge Elevation Feet ☐ Not Available		Flow Line Elevation Feet ☐ Not Available	
Approximate Sq. Ft. of Waterway Available Below Feet ☐ Not Available			
Rip Rap Type: : ☐ Yes ☐ No Class	Rip Rap Thickness: Inches	Granular Filter: ☐ Yes ☐ No Inches	
Comments:N. A.			

Bridge Office Contact:	**List of Attachments:**
Name: Lawrence Aamodt	☐ Preliminary Waterway Analysis
Title: Engineering Specialist Senior	Preliminary Sketches: ☐ Attached ☒ Not Available
Address: 3485 Hadley Ave. N. Oakdale, MN 55128-3307	L.R.F.D. Design Tables:
Phone: 651-366-4461	Other Attachments: Conceptual Sketches.
Fax: 651-366-4497	
Email: larry.aamodt@state.mn.us	

Assessment Information Distribution List:		
Name: Mark Harle	Name: Daniel Prather	Name: Jeffrey Southward
Title: Senior Project Manager	Title: Preliminary Bridge Plans Engineer	Title: Programs and Estimates Supervisor
Address: 2900 48th St. N.W. Rochester, MN 55901-5848	Address: 3485 Hadley Ave. N. Oakdale, MN 55128-3307	Address: 3485 Hadley Ave. N. Oakdale, MN 55128-3307
Phone: 507-286-7556	Phone: 651-366-4457	Phone: 651-366-4452
Fax:	Fax: 651-366-4497	Fax: 651-366-4497
Email: mark.harle@state.mn.us	Email: dan.prather@state.mn.us	Email: jeff.southward@state.mn.us

INPLACE BRIDGE NO. 9180
FOUR PRESTRESSED CONCRETE GIRDER SPANS
143'-0" LONG X 64'-4" WIDE
SUPPORTED ON TREATED TIMBER PILING
BUILT IN 1959
TO BE REMOVED UNDER THE
BRIDGE PORTION OF THE CONTRACT.

CS STA. 106+23.011
X = 757,455.189
Y = 167,321.246

CS STA. 104+30.786
X = 757,266.834
Y = 167,269.281

END OF WINGWALL
STA. 99+_____±
OFFSET _____'± LT.

END OF WINGWALL
STA. 99+_____±
OFFSET _____'± RT.

120.6284'±
60.4633'±
60.1651'±
R. = 3,819.719'
R. = 3,821.352'
2'-0" (TYP.)
1'-5"

℄ N.E. RAMP (4THNERAMP)
℄ S.E. RAMP (4THSERAMP)

P.T. STA. 105+83.435
X = 756,721.860
Y = 167,088.720

BEGIN BRIDGE
STA. 107+39.4876±

℄ C.S.A.H. 45 N.B. (4TH ST.)
(4THNB)
AZ. = 359° 24' 50.6"

END BRIDGE
STA. 108+60.1161±

SC STA. 98+76.532
X = 756,709.912
Y = 167,325.951

SC STA. 98+67.441
X = 756,704.257
Y = 167,286.346

14'-0"
40'-0"
26'-0"
58'-0"
100'-10"
6'-10"

BEGIN BRIDGE
STA. 107+49.1045±

P.T. STA. 107+48.898
X = 756,662.199
Y = 167,250.816

P.C. STA. 109+70.389
X = 756,717.903
Y = 167,475.654

P.C. STA. 106+32.528
X = 756,671.636
Y = 167,134.928

R. = 819.000'

℄ C.S.A.H. 45 S.B. (4TH ST.)
(4THSB)

CRITICAL VERTICAL CLEARANCE
POINT "A"

CRITICAL VERTICAL CLEARANCE
POINT "B"

END BRIDGE
STA. 108+69.7328±
AZ. 359° 24' 50.6"

℄ I-90 W.B. (90WB)
℄ I-90 E.B. (90EB)

P.C. STA. 109+77.304
X = 756,659.863
Y = 167,479.210

℄ N.W. RAMP (4THNWRAMP)

CONCRETE SLOPE PAVING
(TYP.)

END OF WINGWALL
STA. 97+_____±
OFFSET _____'± LT.

TS STA. 97+26.532
X = 756,560.943
Y = 167,343.478

TS STA. 97+17.441
X = 756,555.287
Y = 167,303.873

END OF WINGWALL
STA. 97+_____±
OFFSET _____'± RT.

℄ S.W. RAMP (4THSWRAMP)

GENERAL PLAN
0 10'

NOTE:
THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D. THIS UTILITY QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA".

EL. 1230
EL. 1220
EL. 1210
EL. 1200
EL. 1190

PROFILE GRADE (4THSB)
CRITICAL VERTICAL CLEARANCE POINT "B"
CRITICAL VERTICAL CLEARANCE POINT "A"
GUTTERLINE
SPAN 2
SPAN 1
15.2758'±
16'-6" MIN.
4'-0"±
18.3441'±
PROFILE GRADE (_____)
10
B424 (TYP.)
CONCRETE SLOPE PAVING (TYP.)
NORTH ABUTMENT
℄ I-90 W.B. (90WB)
PIER
℄ I-90 E.B. (90EB)
SOUTH ABUTMENT

VARIES	10'-0"	12'-0"	12'-0"	VAR.	VAR.	12'-0" THRU	12'-0" THRU	10'-0"	VARIES

23'-6" MINIMUM HORIZONTAL CLEARANCE
VARIES
23'-6" MINIMUM HORIZONTAL CLEARANCE

GENERAL ELEVATION
0 10'

EXISTING GROUND PROFILE
22' LT. – – – – –
℄ C.S.A.H. 45 S.B. — · — · —
80' RT. — — —

DEPTH OF STRUCTURE:
3'-4" GUTTER TO LOW BRIDGE
27" P.C.B. 10± BEAM LINES

DESIGN DATA

DESIGNED IN ACCORDANCE WITH 20__
AND CURRENT INTERIM AASHTO
LRFD BRIDGE DESIGN SPECIFICATIONS.
HL-93 LIVE LOAD.
DEAD LOAD INCLUDES 20 POUNDS PER SQUARE FOOT ALLOWANCE FOR FUTURE WEARING COURSE MODIFICATIONS.
MATERIAL DESIGN PROPERTIES:
REINFORCED CONCRETE:
f'c = 4 KSI CONCRETE
fy = 60 KSI PLAIN AND EPOXY COATED BARS
fy = 75 KSI STAINLESS STEEL BARS
n = 8 FOR REINFORCEMENT BARS
PRETENSIONED CONCRETE:
f'c = __ KSI CONCRETE (MAX.)
fpu = 270 KSI LOW RELAXATION STRANDS
n = 1 FOR PRETENSIONING STRANDS
0.75 fpu FOR INITIAL PRESTRESS
DESIGN SPEED:
OVER = 30 M.P.H. UNDER = M.P.H.
APPROXIMATE DECK AREA 12,160 SQ. FT.

20 PROJECTED TRAFFIC VOLUMES

ROADWAY OVER	ROADWAY UNDER
A.A.D.T.	
D.H.V.	
H.C.A.D.T.T.	

NOTES:

NUMBER AND SPACING OF BEAMS IS APPROXIMATE AND WILL BE SET IN FINAL DESIGN.

TRAFFIC TO BE _____ DURING CONSTRUCTION.

HATCHED AREA TO BE REMOVED UNDER GRADING PORTION OF CONTRACT.

SEE SHEET __ FOR INPLACE UTILITIES.

ALL SUBSTRUCTURES SET PARALLEL AT AZ. 96° 09' 02.0" ±.

BRIDGE APPROACH PANEL LAYOUT STANDARDS 5-297.222 AND 5-297.223 APPLY.

BRIDGE APPROACH TREATMENT STANDARD 5-297.233 APPLIES.

RETAINING WALL AND WINGWALL CONNECTION DETAILS TO BE COORDINATED BETWEEN FINAL BRIDGE DESIGN AND ROAD DESIGN UNITS.

① ℄ ℄ C.S.A.H. 45 N.B. (4TH ST.) (4THNB) P.O.T. STA. 108+19.695 =
℄ ℄ I-90 W.B. (90WB) P.O.S. 98+86.114
X = 756,719.444
Y = 167,324.968
∢ 83° 35' 51.0"

② ℄ ℄ C.S.A.H. 45 N.B. (4TH ST.) (4THNB) P.O.T. STA. 107+79.475 =
℄ ℄ I-90 E.B. (90EB) P.O.S. 98+83.120
X = 756,719.855
Y = 167,284.750
∢ 83° 41' 18.2"

③ ℄ ℄ C.S.A.H. 45 S.B. (4TH ST.) (4THSB) P.O.T. STA. 108+29.385 =
℄ ℄ I-90 W.B. (90WB) P.O.S. 98+27.703
X = 756,661.376
Y = 167,331.298
∢ 82° 50' 26.0"

④ ℄ ℄ C.S.A.H. 45 S.B. (4TH ST.) (4THSB) P.O.T. STA. 107+89.082 =
℄ ℄ I-90 E.B. (90EB) P.O.S. 98+24.718
X = 756,661.788
Y = 167,290.998
∢ 82° 54' 14.2"

PROPOSED TYPE OF STRUCTURE

DECK:
27" PRESTRESSED CONCRETE BEAMS
NO SEPARATE CONCRETE WEARING COURSE
ALL BARS EPOXY COATED
SIMPLE SPANS

SUBSTRUCTURE:
PARAPET ABUTMENT SUPPORTED ON
COLUMN PIER SUPPORTED ON

AESTHETICS:
LEVEL

⑤ A PT. ___' LT. ℄ I-90 W.B. (90WB) STA. 99+___± EL. ____.±
AN AESTHETIC DESIGN GUIDE FOR THE I-90 CORRIDOR HAS BEEN PREPARED.

⑥ A PT. ___' LT. ℄ I-90 W.B. (90WB) STA. 99+___± EL. ____.±
ALLOW FOR 2" FORM LINER IN THE ABUTMENT FACE AND WINGWALLS.

⑦ A PT. ___' RT. ℄ I-90 E.B. (90EB) STA. 99+___± EL. ____.±

⑧ A PT. ___' RT. ℄ I-90 E.B. (90EB) STA. 99+___± EL. ____.±

⑨ A PT. ___' LT. ℄ I-90 W.B. (90WB) STA. 98+___± EL. ____.±

⑩ A PT. ___' LT. ℄ I-90 W.B. (90WB) STA. 98+___± EL. ____.±

⑪ A PT. ___' RT. ℄ I-90 E.B. (90EB) STA. 98+___± EL. ____.±

⑫ A PT. ___' RT. ℄ I-90 E.B. (90EB) STA. 99+___± EL. ____.±

MINNESOTA
DEPARTMENT OF TRANSPORTATION

CONCEPTUAL SKETCH
BRIDGE NO. 50014

I-90 UNDER C.S.A.H. 45 (4TH ST.)
0.7 MILES EAST OF THE WEST JUNCTION OF T.H. 218 IN AUSTIN

SEC. 34 TWP. 103 N. R. 18 W.
CITY OF AUSTIN MOWER CO.

DATE: _____

NOT FINAL

_____
STATE BRIDGE ENGINEER

ROAD DESIGN UNIT: - -
RESIDENT ENGINEER: - -
BRIDGE DESIGN UNIT: 651-366-

JOB NO. T6C967 MINNESOTA PROJECT NO. - STATE PROJECT NO. 5080-50014 (T.H. 90 = 009) SHEET NO. 1 OF 10 SHEETS 50014 L.G.A.

FILENAME: $$$@FILENAME@$$$
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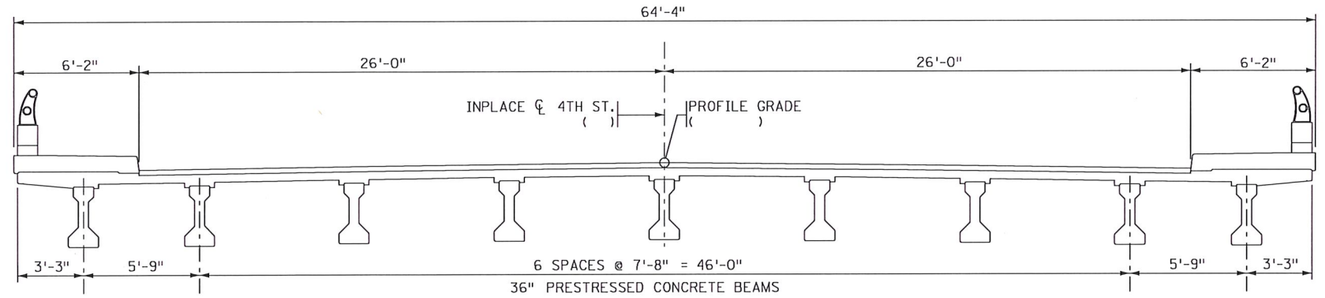

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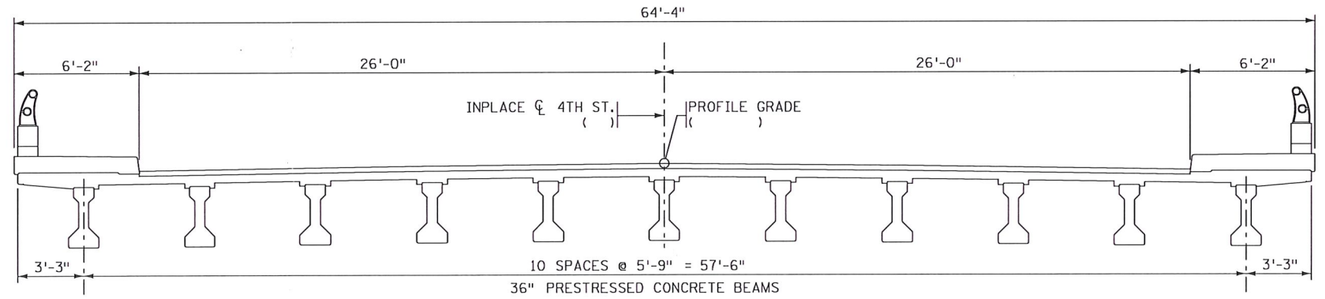
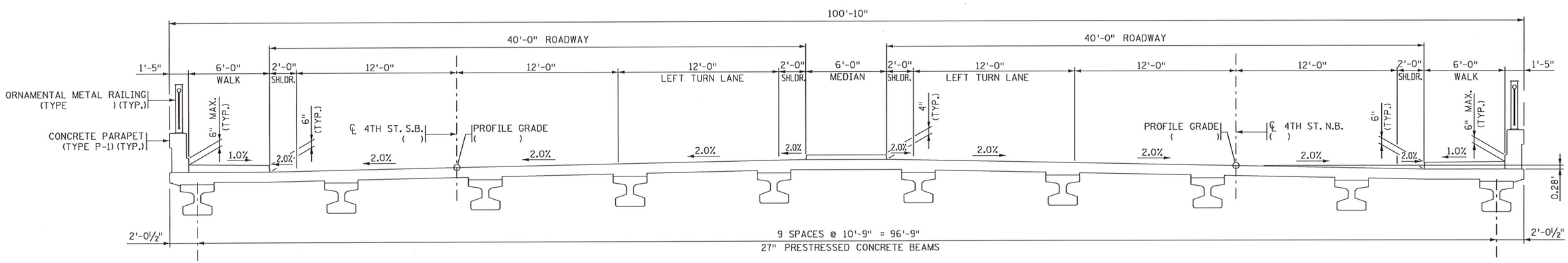
(SPANS 1 AND 4)



INPLACE TRANSVERSE SECTION

(SPANS 2 AND 3)



PROPOSED TRANSVERSE SECTION

NOT FINAL

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STATE PROJECT NO. 5080-50014 (T.H. 90 = 009)	SHEET NO. 2 OF 10 SHEETS		

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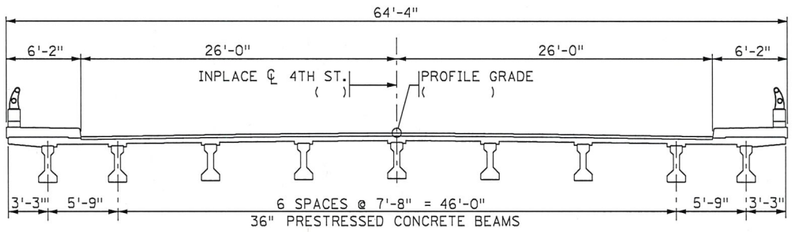
NOTES:

DENOTES REMOVAL.



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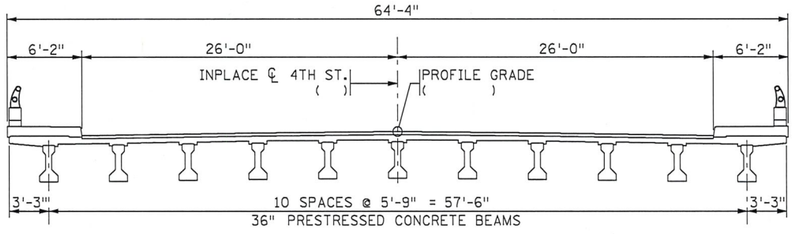
(SPANS 1 AND 4)



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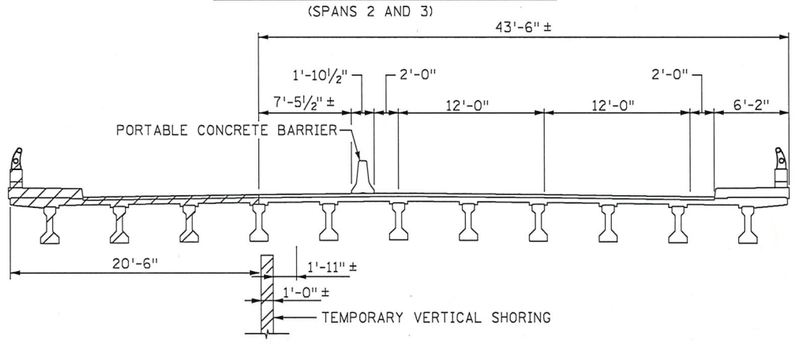
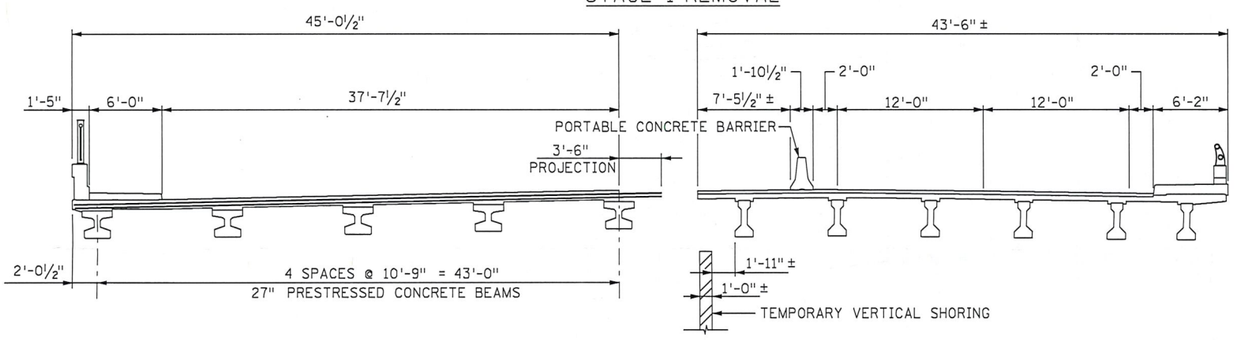
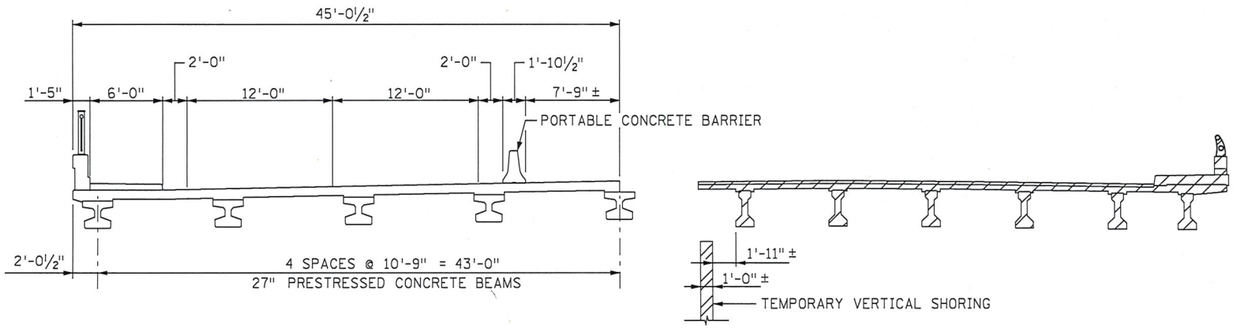
(SPANS 2 AND 3)



STAGE 1 REMOVAL



STAGE 1 CONSTRUCTION



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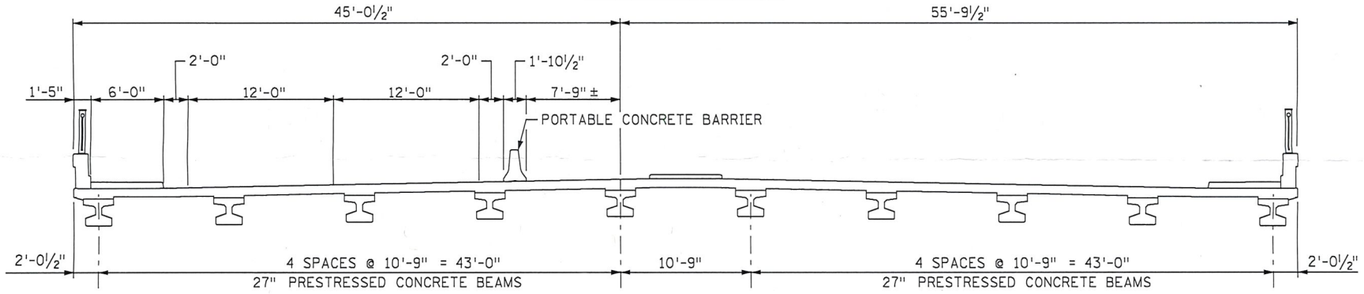
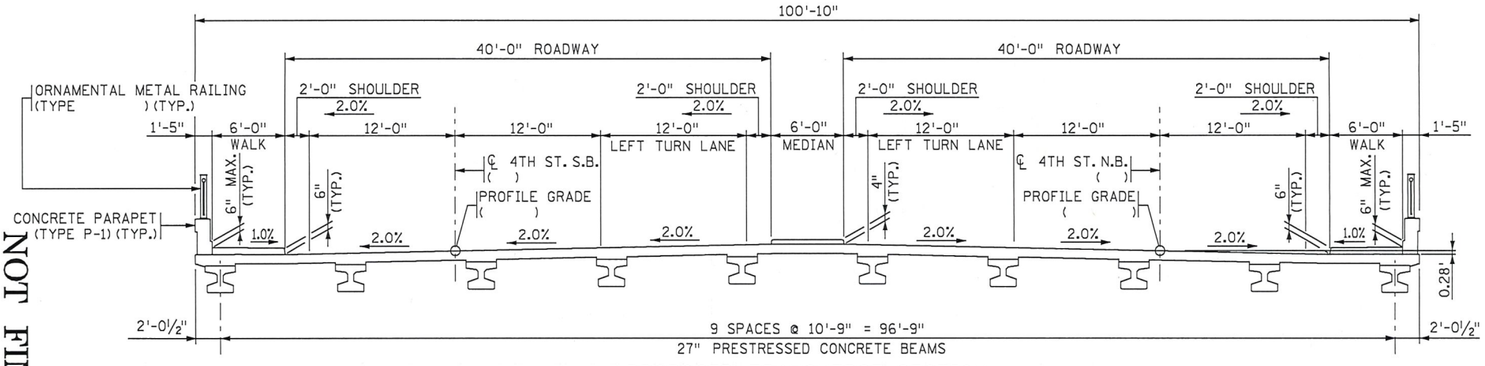


STAGE 2 CONSTRUCTION



PROPOSED TRANSVERSE SECTION

NOT FINAL

STATE PROJECT NO. 5080-50014 (T.H. 90 = 009)

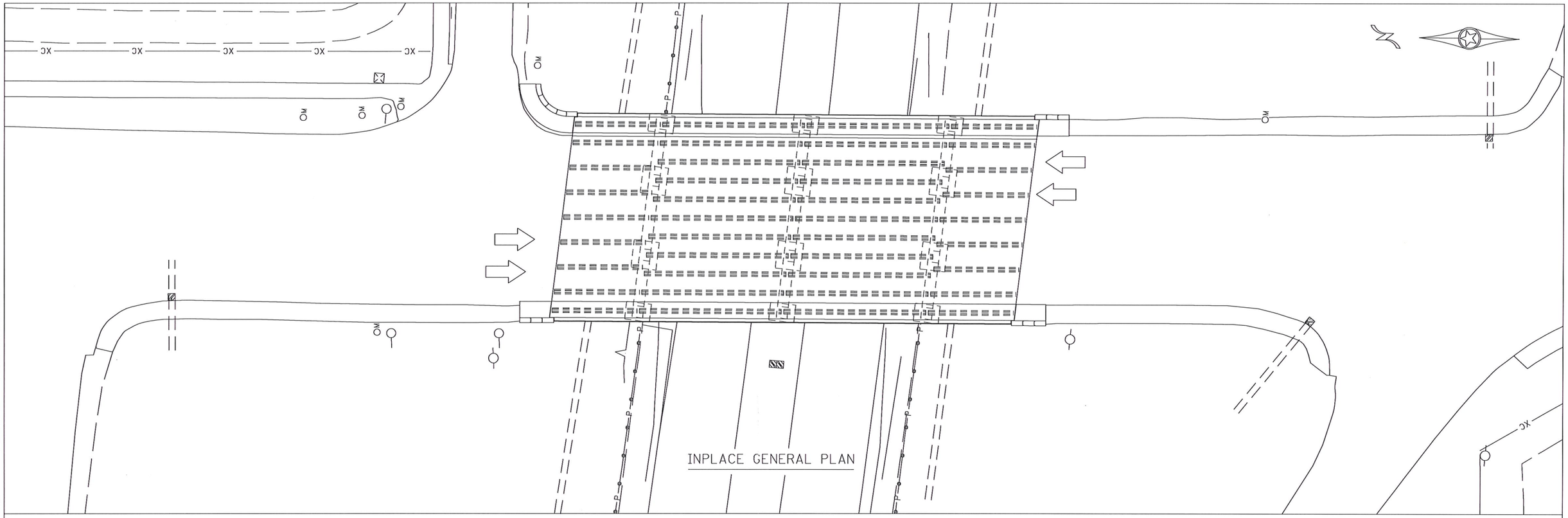
STAGING

SHEET NO. 3 OF 10 SHEETS

DR: L.G.A.

CHK:

BRIDGE NO. 50014



NOT FINAL

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STATE PROJECT NO. 5080-50014 (T.H. 90 = 009)	SHEET NO. 4 OF 10 SHEETS		

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PORTABLE CONCRETE BARRIER

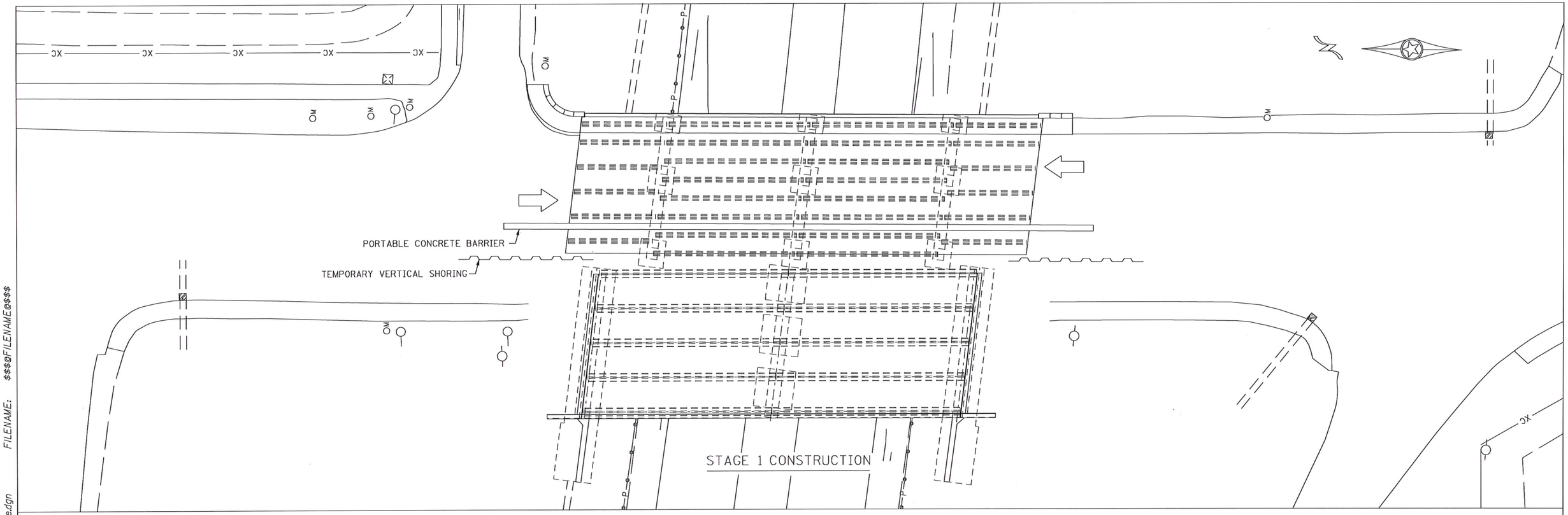
NOTES:

DENOTES REMOVAL.

STAGE 1 REMOVAL

NOT FINAL

STAGING	DR: L.G.A.	CHK:	BRIDGE NO. 50014
STATE PROJECT NO. 5080-50014 (T.H. 90 = 009)	SHEET NO. 5 OF 10 SHEETS		



NOT FINAL

STAGING	DR: L.G.A.	CHK:	BRIDGE NO. 50014
STATE PROJECT NO. 5080-50014 (T.H. 90 = 009)	SHEET NO. 6 OF 10 SHEETS		

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PLOTTED : 1/8/2019
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TEMPORARY VERTICAL SHORING

PORTABLE CONCRETE BARRIER

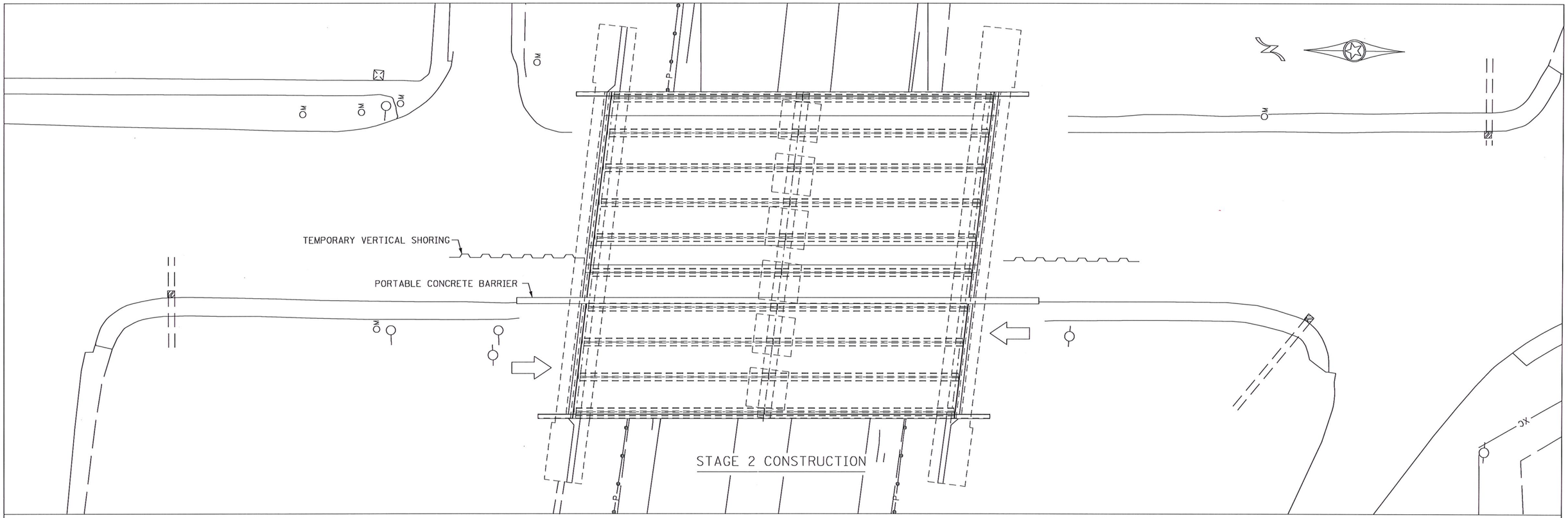
STAGE 2 REMOVAL

NOTES:

DENOTES REMOVAL.

NOT FINAL

STAGING	DR: L.G.A.	CHK:	BRIDGE NO. 50014
STATE PROJECT NO. 5080-50014 (T.H. 90 = 009)	SHEET NO. 7 OF 10 SHEETS		



NOT FINAL

STAGING	DR: L.G.A.	CHK:	BRIDGE NO. 50014
STATE PROJECT NO. 5080-50014 (T.H. 90 = 009)	SHEET NO. 8 OF 10 SHEETS		

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℄ C.S.A.H. 45 N.B. (4TH ST.)
(4THNB)

℄ C.S.A.H. 45 S.B. (4TH ST.)
(4THSB)

109
108
107
99
98
308
208

PROPOSED GENERAL PLAN

NOT FINAL

STAGING	DR: L.G.A.	CHK:	BRIDGE NO. 50014
STATE PROJECT NO. 5080-50014 (T.H. 90 = 009)	SHEET NO. 9 OF 10 SHEETS		

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℄ I-90 W.B. (90WB)

℄ I-90 E.B. (90EB)

℄ 4TH ST. N.B. (4THNB)

℄ 4TH ST. S.B. (4THSB)

NOT FINAL

INPLACE CONTOURS - s5080150.tin	DR: L.G.A.	CHK:	BRIDGE NO. 50014
STATE PROJECT NO. 5080-50014 (T.H. 90 = 009)	SHEET NO. 10 OF 10 SHEETS		

Name: Mark Harle	Name: Daniel Prather	Name: Jeffrey Southward
Title: Senior Project Manager	Title: Preliminary Bridge Plans Engineer	Title: Programs and Estimates Supervisor
Address: 2900 48th St. N.W. Rochester, mn 55901-5848	Address: 3485 Hadley Ave. N. Oakdale, MN 55128-3307	Address: 3485 Hadley Ave. N. Oakdale, MN 55128-3307
Phone: 507-286-7556	Phone: 651-366-4457	Phone: 651-366-4452
Fax: 507-285-7355	Fax: 651-366-4497	Fax: 651-366-4497
Email: mark. harle@state.mn.us	Email: dan.prather@state.mn.us	Email: jeff.southward@state.mn.us

of errant vehicles. The clear zone includes shoulders, bike lanes, and auxiliary lanes, except those auxiliary lanes that function like through lanes. Many obstacles located within this clear-zone distance were removed, relocated, redesigned, or shielded by traffic barriers or crash cushions. It soon became apparent, however, that in some limited situations in which the embankment sloped significantly downward, a vehicle could encroach farther from the through traveled way and a 9-m [30-ft] clear zone might not be adequate. Conversely, on most low-volume, urban, or low-speed facilities, a 9-m [30-ft] clear-zone distance was considered excessive and seldom could be justified for engineering, environmental, or economic reasons.

The 1977 AASHTO *Guide for Selecting, Locating, and Designing Traffic Barriers (1)* modified the earlier clear-zone concept by introducing variable clear-zone distances based on traffic volumes, speeds, and roadside geometry. Table 3-1 can be used to determine the suggested clear-zone distance for selected traffic volumes and speeds. However, Table 3-1 provides only a general approximation of the needed clear-zone distance. These data are based on limited empirical data that were extrapolated to provide information for a wide range of conditions. The designer should keep in mind site-specific conditions, design speeds, rural versus urban locations, and practicality. The distances obtained from Table 3-1 should suggest only the approximate center of a range to be considered and not a precise distance to be held as absolute. For roadways with low traffic volumes, it may not be practical to apply even the minimum values found in Table 3-1. Refer to Chapter 12 for additional considerations for low-volume roadways and Chapter 10 for additional guidance for urban applications.

Table 3-1. Suggested Clear-Zone Distances in Meters (Feet) from Edge of Through Traveled Lane *(6)*

Metric Units

Design Speed (km/h)	Design ADT	Foreslopes			Backslopes		
		1V:6H or flatter	1V:5H to 1V:4H	1V:3H	1V:3H	1V:5H to 1V:4H	1V:6H or flatter
≤ 60	UNDER 750[c]	2.0–3.0	2.0–3.0	[d]	2.0–3.0	2.0–3.0	2.0–3.0
	750–1500	3.0–3.5	3.5–4.5	"	3.0–3.5	3.0–3.5	3.0–3.5
	1500–6000	3.5–4.5	4.5–5.0	"	3.5–4.5	3.5–4.5	3.5–4.5
	OVER 6000	4.5–5.0	5.0–5.5	"	4.5–5.0	4.5–5.0	4.5–5.0
70–80	UNDER 750[c]	3.0–3.5	3.5–4.5	"	2.5–3.0	2.5–3.0	3.0–3.5
	750–1500	4.5–5.0	5.0–6.0	"	3.0–3.5	3.5–4.5	4.5–5.0
	1500–6000	5.0–5.5	6.0–8.0	"	3.5–4.5	4.5–5.0	5.0–5.5
	OVER 6000	6.0–6.5	7.5–8.5	"	4.5–5.0	5.5–6.0	6.0–6.5
90	UNDER 750[c]	3.5–4.5	4.5–5.5	"	2.5–3.0	3.0–3.5	3.0–3.5
	750–1500	5.0–6.5	6.0–7.5	"	3.0–3.5	4.5–5.0	5.0–5.5
	1500–6000	6.0–6.5	7.5–9.0	"	4.5–5.0	5.0–6.5	6.0–6.5
	OVER 6000	6.5–7.5	8.0–10.0[e]	"	5.0–6.5	6.0–6.5	6.5–7.5
100	UNDER 750[c]	3.0–6.5	6.0–7.5	"	3.0–3.5	3.5–4.5	4.5–5.0
	750–1500	6.0–7.5	8.0–10.0[e]	"	3.5–4.5	5.0–5.5	6.0–6.5
	1500–6000	8.0–9.0	10.0–12.0[e]	"	4.5–5.5	5.5–6.5	7.5–8.0
	OVER 6000	9.0–10.0[e]	11.0–13.5[e]	"	6.0–6.5	7.5–8.0	8.0–8.5
110[e]	UNDER 750[c]	5.5–6.0	6.0–8.0	"	3.0–3.5	4.5–5.0	4.5–5.0
	750–1500	7.5–8.0	8.5–11.0[e]	"	3.5–5.0	5.5–6.0	6.0–6.5
	1500–6000	8.5–10.0[e]	10.5–13.0[e]	"	5.0–6.0	6.5–7.5	8.0–8.5
	OVER 6000	9.0–10.5[e]	11.5–14.0[e]	"	6.5–7.5	8.0–9.0	8.5–9.0

Notes:

a) When a site-specific investigation indicates a high probability of continuing crashes or when such occurrences are indicated by crash history, the designer may provide clear-zone distances greater than the clear zone shown in Table 3-1. Clear zones may be limited to 9 m for practicality and to provide a consistent roadway template if previous experience with similar projects or designs indicates satisfactory performance.

b) Because recovery is less likely on the unshielded, traversable 1V:3H foreslope on a fill section, fixed objects should not be present in the vicinity of the toe of these slopes. Recovery of high-speed vehicles that encroach beyond the edge of the shoulder may be expected to occur beyond the toe of slope. Determination of the width of the recovery area at the toe of slope should consider right-of-way availability, environmental concerns, economic factors, safety needs, and crash histories. Also, the distance between the edge of the through traveled lane and the beginning of the 1V:3H slope should influence the recovery area provided at the toe of slope. While the application may be limited by several factors, the foreslope parameters that may enter into determining a maximum desirable recovery area are illustrated in Figure 3-2. A 3-m recovery area at the toe of slope should be provided for all traversable, non-recoverable fill slopes.

c) For roadways with low volumes, it may not be practical to apply even the minimum values found in Table 3-1. Refer to Chapter 12 for additional considerations for low-volume roadways and Chapter 10 for additional guidance for urban applications.

d) When design speeds are greater than the values provided, the designer may provide clear-zone distances greater than those shown in Table 3-1.

U.S. Customary Units

Design Speed (mph)	Design ADT	Foreslopes			Backslopes		
		1V:6H or flatter	1V:5H to 1V:4H	1V:3H	1V:3H	1V:5H to 1V:4H	1V:6H or flatter
≤40	UNDER 750[c]	7–10	7–10	[d]	7–10	7–10	7–10
	750–1500	10–12	12–14	"	10–12	12–14	10–12
	1500–6000	12–14	14–16	"	12–14	14–16	12–14
	OVER 6000	14–16	16–18	"	14–16	16–18	14–16
45–50	UNDER 750[c]	10–12	12–14	"	8–10	8–10	10–12
	750–1500	14–16	16–20	"	10–12	12–14	14–16
	1500–6000	16–18	20–26	"	12–14	14–16	16–18
	OVER 6000	20–22	24–28	"	14–16	18–20	20–22
55	UNDER 750[c]	12–14	14–18	"	8–10	10–12	10–12
	750–1500	16–18	20–24	"	10–12	14–16	16–18
	1500–6000	20–22	24–30	"	14–16	16–18	20–22
	OVER 6000	22–24	26–32[e]	"	16–18	20–22	22–24
60	UNDER 750[c]	16–18	20–24	"	10–12	12–14	14–16
	750–1500	20–24	26–32[e]	"	12–14	16–18	20–22
	1500–6000	26–30	32–40[e]	"	14–18	18–22	24–26
	OVER 6000	30–32[e]	36–44[e]	"	20–22	24–26	26–28
65–70[e]	UNDER 750[c]	18–20	20–26	"	10–12	14–16	14–16
	750–1500	24–26	28–36[e]	"	12–16	18–20	20–22
	1500–6000	28–32[e]	34–42[e]	"	16–20	22–24	26–28
	OVER 6000	30–34[e]	38–46[e]	"	22–24	26–30	28–30

Notes:

a) When a site-specific investigation indicates a high probability of continuing crashes or when such occurrences are indicated by crash history, the designer may provide clear-zone distances greater than the clear zone shown in Table 3-1. Clear zones may be limited to 30 ft for practicality and to provide a consistent roadway template if previous experience with similar projects or designs indicates satisfactory performance.

b) Because recovery is less likely on the unshielded, traversable 1V:3H fill slopes, fixed objects should not be present in the vicinity of the toe of these slopes. Recovery of high-speed vehicles that encroach beyond the edge of the shoulder may be expected to occur beyond the toe of slope. Determination of the width of the recovery area at the toe of slope should consider right-of-way availability, environmental concerns, economic factors, safety needs, and crash histories. Also, the distance between the edge of the through traveled lane and the beginning of the 1V:3H slope should influence the recovery area provided at the toe of slope. While the application may be limited by several factors, the foreslope parameters that may enter into determining a maximum desirable recovery area are illustrated in Figure 3-2. A 10-ft recovery area at the toe of slope should be provided for all traversable, non recoverable fill slopes.

c) For roadways with low volumes it may not be practical to apply even the minimum values found in Table 3-1. Refer to Chapter 12 for additional considerations for low-volume roadways and Chapter 10 for additional guidance for urban applications.

d) When design speeds are greater than the values provided, the designer may provide clear-zone distances greater than those shown in Table 3-1.

The designer may choose to modify the clear-zone distances in Table 3-1 with adjustment factors to account for horizontal curvature, as shown in Table 3-2. These modifications normally are considered only when crash histories indicate such a need, when a specific site investigation shows a definitive crash potential that could be significantly lessened by increasing the clear zone width, and when such increases are cost-effective. Horizontal curves, particularly for high-speed facilities, are usually superelevated to increase safety and provide a more comfortable ride. Increased banking on curves where the superelevation is inadequate is an alternate method of increasing roadway safety within a horizontal curve, except where snow and ice conditions limit the use of increased superelevation.

Bridge Scoping and Cost Estimating Assessment
Bridge Replacement or Major Rehabilitation

Date:1/17/19

Trunk Highway(s): T.H. 105	**S.P.:** 5007-33	**S.A.P:** N.A.	**Letting Date: 1/1/23**
County(s): Mower	**City(s):** N.A.		**District(s):** 6
Location: T.H. 105 over I-90, at the Junction of T.H. 105			

Proposed Bridge Information: Date of Assessment:1/17/19

Work Type:01	Number of Bridges in Project: 5	Proposed Bridge No:50013			Inplace Bridge No: 9183
Feature Crossed: I-90	Bridge Type: 501	Deck Area: Sq. Ft.		Bridge Length: Lin. Ft.	Bridge Width :43.0 Lin. Ft.
No. of Spans: 2	No. of Lanes on Proposed Bridge 2	Inside Shoulder Width 8.0 Lin. Ft.			Outside Shoulder Width 8.0 Lin. Ft.
Type of Barrier:Type S	No. of Barriers:2	Median Width N.A. Lin. Ft.			
Sidewalk Width N.A. Lin. Ft. ☐ One Side ☐ Both Sides		Trail Width N.A. Lin. Ft. ☐ One Side ☐ Both Sides			
Abutment Type: : ☒ Tall Parapet ☐ Medium Parapet ☐ Low Parapet ☐ Integral		Pier Type: : ☐ Wall ☒ Column ☐ w / Strut ☐ Encased Pile			
Design Organization: ☒ Mn/DOT ☐ Consultant ☐ Partnership ☐ State Aid ☐ By Others ☐ Border Bridge ☐ Design Build					

Comments: 1.) Moving from a MN45 P.C.B. to the new 40MH would result in an approxiamate 5" reduction in anticipated T.H. 105 profile increase and an approximate reduction of 6'-0" in lateral horizontal clearance from I-90.
2.) Moving from a MN45 P.C.B. to the new 35MH would result in an approxiamate 10" reduction in anticipated T.H. 105 profile increase and an approxiamte reduction of 16'-0" in lateral horizontal clearance from I-90.

Bridge Estimating Unit: (All Estimated Costs in Year of Estimate Dollars) Year of Estimate: 2019

Estimated Proposed Structure Cost: $2,735,000.00	Estimate Includes : ☒ Mobility ☒ Aesthetics ☐ Staging
Inplace Structure Removal Cost : $145,000.00	Type (Level) of Estimate :☐ Planning Level ☒ Scoping Level
Foundations: ☐Borings ☒ Inplace Structure ☐ None Available	
Estimator: L.G.A & J.C.S..	Date: 01/17/19

Comments:Option 1: Detoured Traffic - $2,735,000.00 + $145,000.00 = $2,880,000.00.
Option 2: Staged Construction - $2,840,000.00 + $155,000.00 = $2,995,000.00.
No Traffic Control. No Approach Panels.

Bridge Hydraulics Unit:

New Bridge ☐ Yes ☐ No		New Culvert: ☐ Yes ☐ No	
Bridge Survey Available: ☐ Yes ☐ No	Structure Skew Angle Degrees	High Water of Record Elevation Feet ☐ Not Available	
Low Bridge Elevation Feet ☐ Not Available	Flow Line Elevation Feet ☐ Not Available		
Approximate Sq. Ft. of Waterway Available Below Feet ☐ Not Available			
Rip Rap Type: : ☐ Yes ☐ No Class	Rip Rap Thickness: Inches	Granular Filter: ☐ Yes ☐ No Inches	

Comments:N. A.

Bridge Office Contact:	**List of Attachments:**
Name: Lawrence Aamodt	☐ Preliminary Waterway Analysis
Title: Engineer Specialist Senior	Preliminary Sketches: ☐ Attached ☒ Not Available
Address: 3485 Hadley Ave. N. Oakdale, MN 55128-3307	L.R.F.D. Design Tables:
Phone: 651-366-4461	Other Attachments: Conceptual Sketches.
Fax: 651-366-4497	
Email: larry.aamodt@state.mn.us	

Assessment Information Distribution List:

NOTE:

THE SUBSURFACE UTILITY INFORMATION ON THIS SHEET IS UTILITY QUALITY LEVEL D. THIS UTILITY QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA".

INPLACE BRIDGE NO. 9183
FOUR CONTINUOUS STEEL BEAM SPANS
264'-6" LONG X 35'-4" WIDE
SUPPORTED ON STEEL H- PILING
BUILT IN 1959
TO BE REMOVED UNDER THE
BRIDGE PORTION OF THE CONTRACT.

EQUATION:
P.O.T. STA. 76+40.344 (BK) =
P.C. STA. 76+40.250 (AH)
X = 746,313.838
Y = 162,465.845

EQUATION:
P.C. STA. 76+40.250 (BK) =
P.O.T. STA. 76+48.970 (AH)
X = 746,378.765
Y = 162,412.548

℄ I-90 E.B. (90EB)

℄ I-90 W.B. (90WB)

AZ. = 39° 18' 53.8"

241.5800'±

120.7900'±

CRITICAL VERTICAL CLEARANCE POINT "B"

CRITICAL VERTICAL CLEARANCE POINT "A"

P.O.T. STA. 920+65.597
X = 746,198.150
Y = 162,136.848

AZ. = 88° 59' 29.7"

921

END BRIDGE STA. 920+85.7143±

P.O.T. STA. 927+99.995
X = 746,932.435
Y = 162,149.773

EQUATION:
P.O.T. STA. 1709+97.604 (BK) =
P.O.T. STA. 72+83.030 (AH)
X = 746,152.436
Y = 162,136.176

920

43'-0"

20'-0"

1'-6"

EQUATION:
P.O.T. STA. 1709+26.731 (BK) =
P.O.T. STA. 72+12.150 (AH)
X = 746,042.541
Y = 162,134.562

919

1709

CONCRETE SLOPE PAVING (TYP.)

BEGIN BRIDGE STA. 918+44.1543±

P.O.T. STA. 910+32.040
X = 745,164.705
Y = 162,121.663

AZ. = 89° 09' 29.5"

918

2'-0" (TYP.)

EQUATION:
ST STA. 1694+38.274 (BK) =
P.O.T. STA. 1695+72.240 (AH)
X = 745,184.359
Y = 161,086.626

EQUATION:
ST STA. 1691+39.150 (BK) =
P.O.T. STA. 1691+38.270 (AH)
X = 744,974.394
Y = 160,697.656

GENERAL PLAN
0 10'

① ℄ T.H. 105 (TH105INP) P.O.T. STA. 919+09.971 =
℄ I-90 W.B. (90WB) P.O.T. STA. 1709+26.731
X = 746,042.541
Y = 162,134.562

② ℄ T.H. 105 (TH105INP) P.O.T. STA. 920+19.878 =
℄ I-90 E.B. (90EB) P.O.T. STA. 1709+97.604
X = 746,152.436
Y = 162,136.176

③ A PT. ___.'LT. ℄ I-90 W.B. (90WB)
STA. _+___.±
EL. ___.±

④ A PT. ___.'LT. ℄ I-90 W.B. (90WB)
STA. _+___.±
EL. ___.±

⑤ A PT. ___.'RT. ℄ I-90 E.B. (90EB)
STA. _+___.±
EL. ___.±

⑥ A PT. ___.'RT. ℄ I-90 E.B. (90EB)
STA. _+___.±
EL. ___.±

⑦ A PT. ___.'LT. ℄ I-90 W.B. (90WB)
STA. _+___.±
EL. ___.±

⑧ A PT. ___.'LT. ℄ I-90 W.B. (90WB)
STA. _+___.±
EL. ___.±

⑨ A PT. ___.'RT. ℄ I-90 E.B. (90EB)
STA. _+___.±
EL. ___.±

⑩ A PT. ___.'RT. ℄ I-90 E.B. (90EB)
STA. _+___.±
EL. ___.±

CRITICAL VERTICAL CLEARANCE POINT "A"
PROFILE GRADE (BRPRO+1.7311)
CRITICAL VERTICAL CLEARANCE POINT "B"
PROFILE GRADE (BRPRO)
13.4511'±
-0.326%
2.7219'±
EL. 1240
EL. 1230
EL. 1220
EL. 1210
SPAN 1
SPAN 2
PROFILE GRADE ( )
16'-6" MIN.
4'-0"± (TYP.)
℄ I-90 W.B. (90WB)
℄ I-90 E.B. (90EB)
PIER
CONCRETE SLOPE PAVING (TYP.)
WEST ABUTMENT
EAST ABUTMENT
6'-0" 14'-0" 9'-6" 12'-6" 12'-6" 3'-6" 3'-6" 12'-6" 12'-6" 9'-6" 14'-0" 6'-0"
30'-0" HORIZONTAL CLEARANCE
12'-0"
84'-0"
12'-0"
30'-0" HORIZONTAL CLEARANCE

GENERAL ELEVATION
0 10'

EXISTING GROUND SECTIONS
SECTION A-A
SECTION B-B
SECTION C-C
SECTION D-D

DEPTH OF STRUCTURE:
4'-10" GUTTER TO LOW BRIDGE
MN45 P.C.B. 7± BEAM LINES

ASSUMES 1'-9"+- GRADE RAISE

DESIGN DATA

DESIGNED IN ACCORDANCE WITH 20__
AND CURRENT INTERIM AASHTO
LRFD BRIDGE DESIGN SPECIFICATIONS.
HL-93 LIVE LOAD.
DEAD LOAD INCLUDES 20 POUNDS PER SQUARE FOOT ALLOWANCE FOR FUTURE WEARING COURSE MODIFICATIONS.
MATERIAL DESIGN PROPERTIES:
REINFORCED CONCRETE:
f'c = 4 KSI CONCRETE
fy = 60 KSI PLAIN AND EPOXY COATED BARS
fy = 75 KSI STAINLESS STEEL BARS
n = 8 FOR REINFORCEMENT BARS
PRETENSIONED CONCRETE:
f'c = __ KSI CONCRETE (MAX.)
fpu = 270 KSI LOW RELAXATION STRANDS
n = 1 FOR PRETENSIONING STRANDS
0.75 fpu FOR INITIAL PRESTRESS
DESIGN SPEED:
OVER = 50 M.P.H. UNDER = M.P.H.
APPROXIMATE DECK AREA 10,390 SQ. FT.

20 PROJECTED TRAFFIC VOLUMES

ROADWAY OVER	ROADWAY UNDER
	A.A.D.T.
	D.H.V.
	H.C.A.D.T.T.

NOTES:

NUMBER AND SPACING OF BEAMS IS APPROXIMATE AND WILL BE SET IN FINAL DESIGN.

TRAFFIC TO BE DURING CONSTRUCTION.

HATCHED AREA TO BE REMOVED UNDER GRADING PORTION OF CONTRACT.

SEE SHEET __ FOR INPLACE UTILITIES.

BRIDGE APPROACH TREATMENT STANDARD 5-297.233 APPLIES.

BRIDGE APPROACH PANEL LAYOUT STANDARDS 5-297.224 AND 5-297.225 APPLY.

ALL SUBSTRUCTURES SET PARALLEL AT AZ. 39° 18' 53.8".

SEE SHEET NO. 8 FOR SECTION A-A, B-B, C-C AND D-D LOCATIONS

PROPOSED TYPE OF STRUCTURE

DECK:
MN45 PRESTRESSED CONCRETE BEAMS
NO SEPARATE CONCRETE WEARING COURSE
ALL BARS EPOXY COATED
SIMPLE SPANS

SUBSTRUCTURE:
PARAPET TYPE ABUTMENTS

COLUMN PIERS SUPPORTED ON

AESTHETICS:
LEVEL

MINNESOTA
DEPARTMENT OF TRANSPORTATION

CONCEPTUAL SKETCH
BRIDGE NO. 50013

T.H. 105 OVER I-90
AT THE JUNCTION OF T.H. 105

SEC. 5 TWP. 102 N. R. 18 W.
AUSTIN TWP. MOWER CO.

DATE: _____

NOT FINAL
STATE BRIDGE ENGINEER

ROAD DESIGN UNIT: - -
RESIDENT ENGINEER: - -
BRIDGE DESIGN UNIT: 651-366-

JOB NO. T6C968 MINNESOTA PROJECT NO. - STATE PROJECT NO. 5007-50013 (T.H. 105 = 199) SHEET NO. 1 OF 8 SHEETS 50013 L.G.A.

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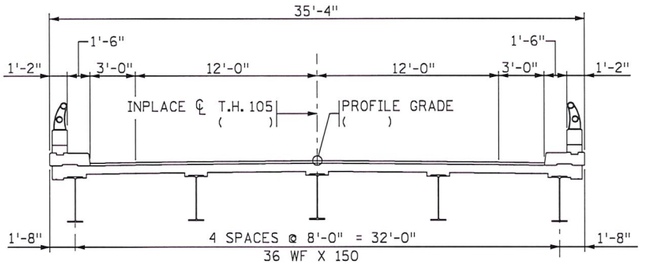
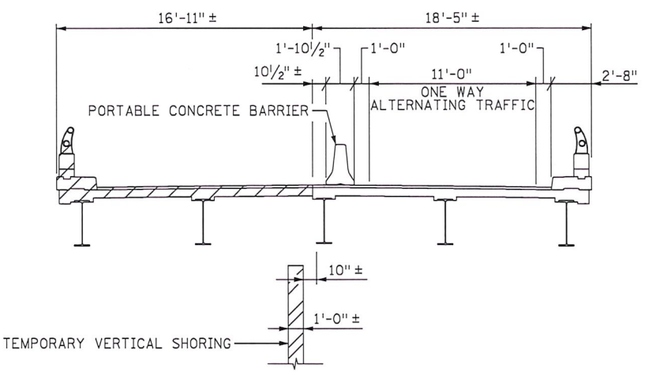


INPLACE TRANSVERSE SECTION

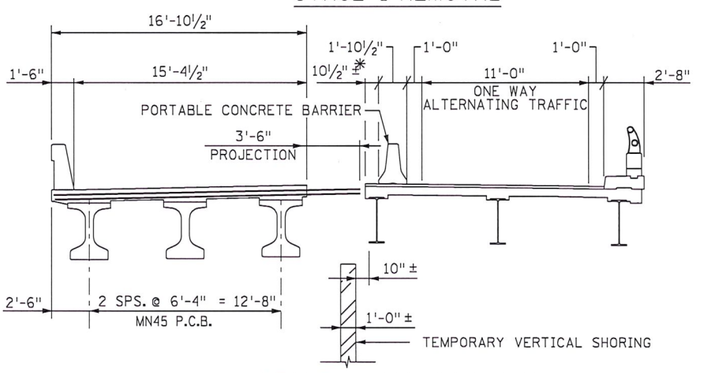
NOTES:

* MINIMUM DISTANCE IS BASED ON LRFD MEMO NO. 2011-03 ANCHORED TEMPORARY BARRIER WITH A DESIGN SPEED OF 35 M.P.H. OR LESS.

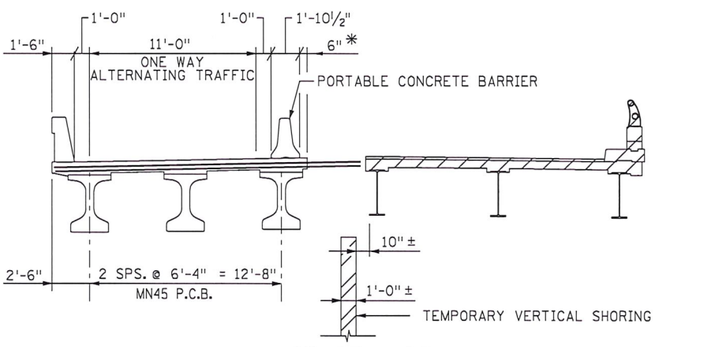
DENOTES REMOVAL.



STAGE 1 REMOVAL



STAGE 1 CONSTRUCTION



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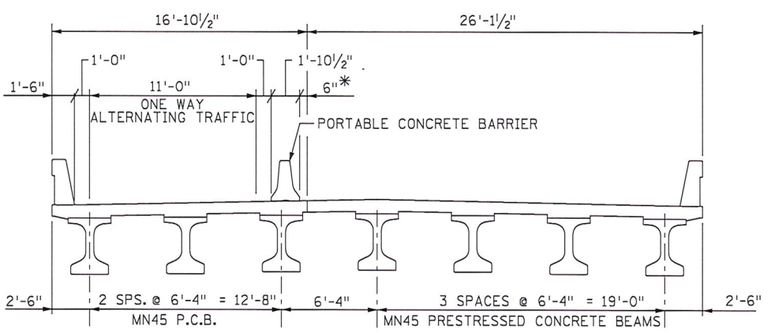
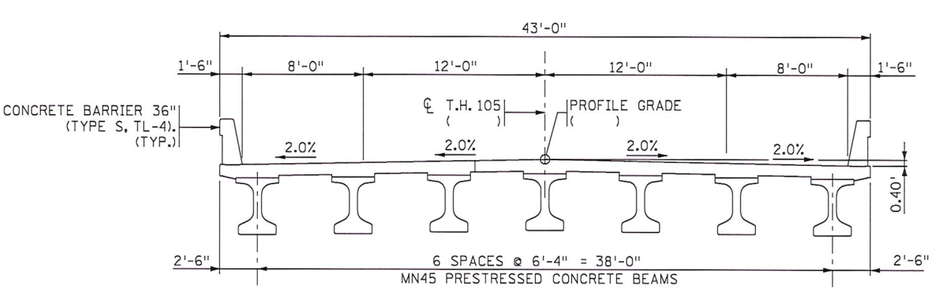


STAGE 2 CONSTRUCTION



PROPOSED TRANSVERSE SECTION

STAGING

STATE PROJECT NO. 5008-50013 (T.H. 105 = 199)

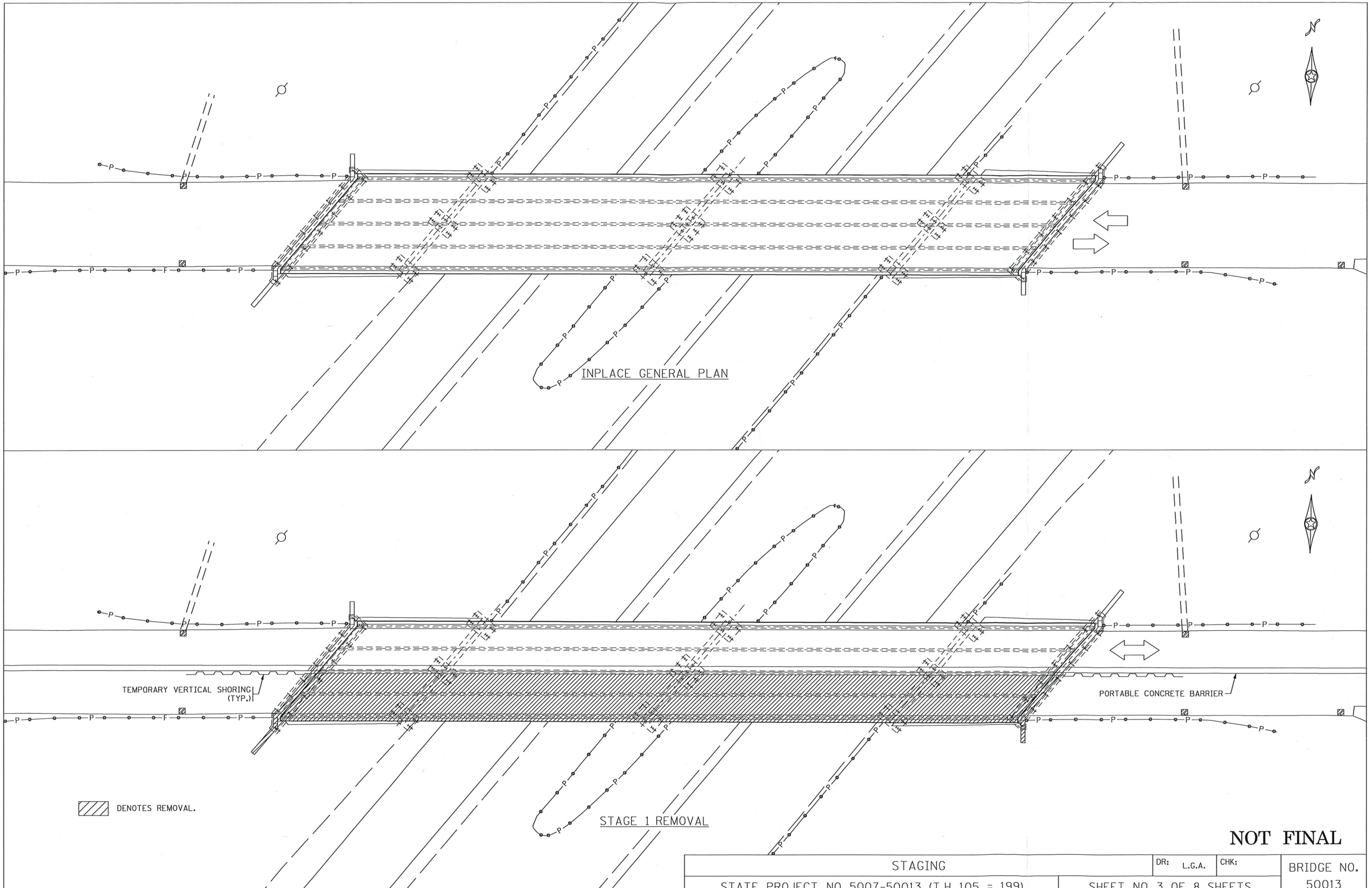
SHEET NO. 2 OF 8 SHEETS

DR: L.G.A.

CHK:

BRIDGE NO. 50013

NOT FINAL



NOT FINAL

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STATE PROJECT NO. 5007-50013 (T.H. 105 = 199)	SHEET NO. 3 OF 8 SHEETS		

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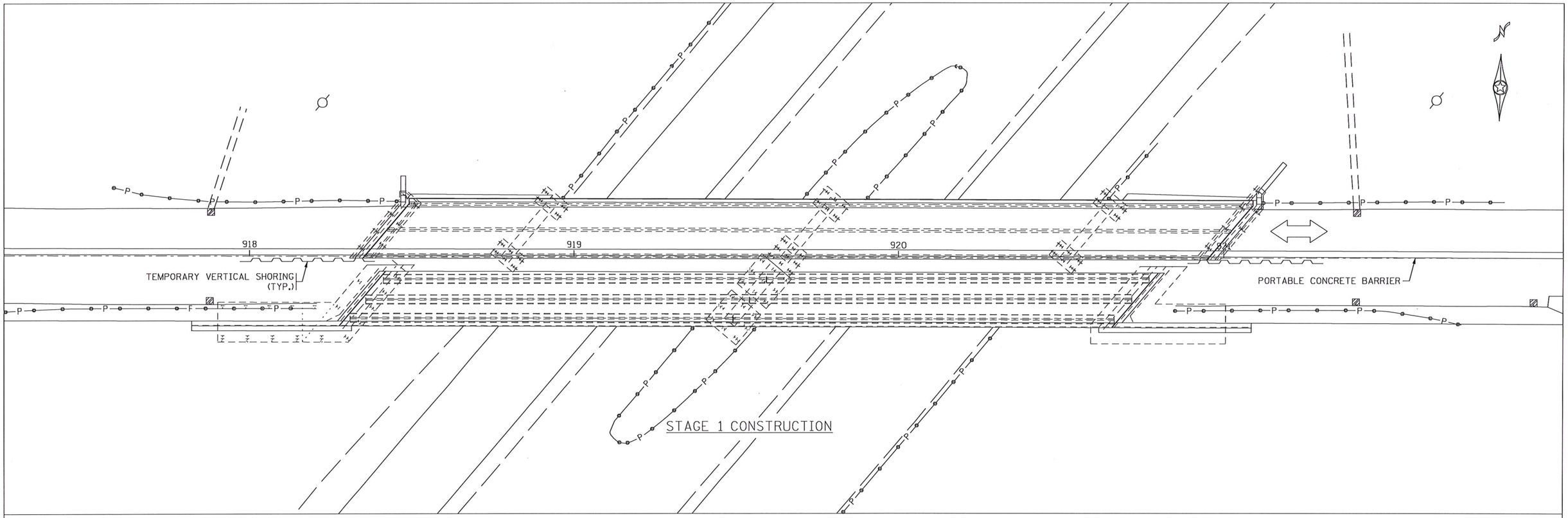

NOT FINAL

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STATE PROJECT NO. 5007-50013 (T.H. 105 = 199)	SHEET NO. 4 OF 8 SHEETS		

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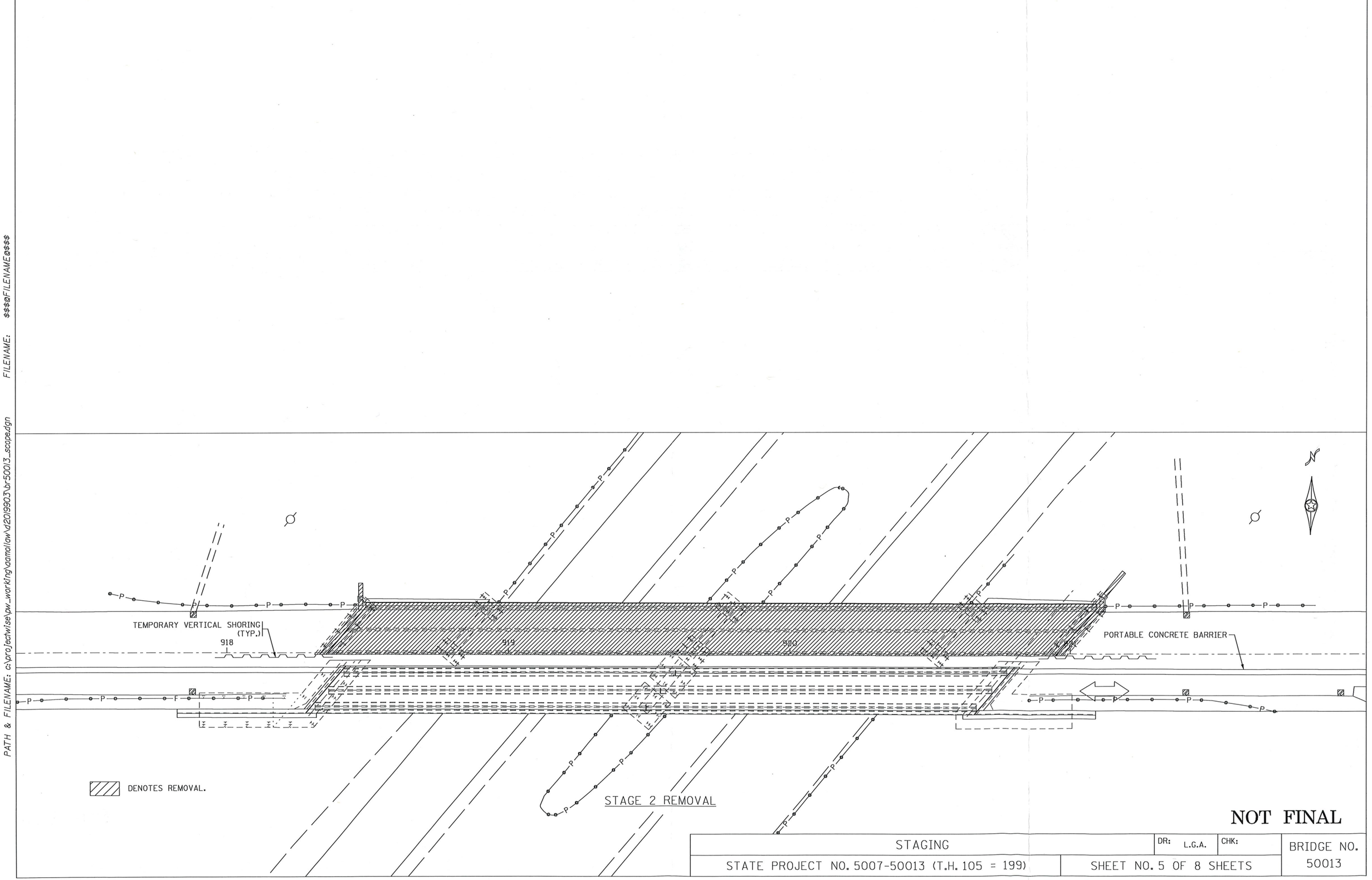

NOT FINAL

STAGING	DR: L.G.A.	CHK:	BRIDGE NO. 50013
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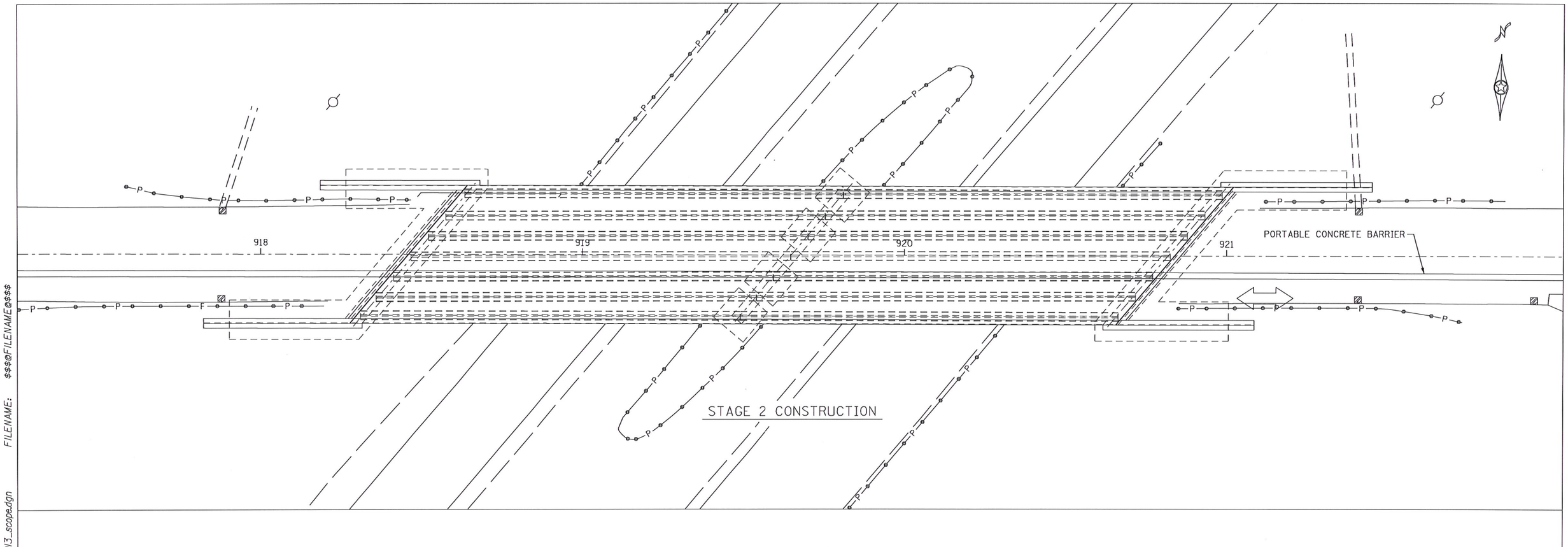

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NOT FINAL

STAGING	DR: L.G.A.	CHK:	BRIDGE NO. 50013
STATE PROJECT NO. 5007-50013 (T.H. 105 = 199)	SHEET NO. 6 OF 8 SHEETS		

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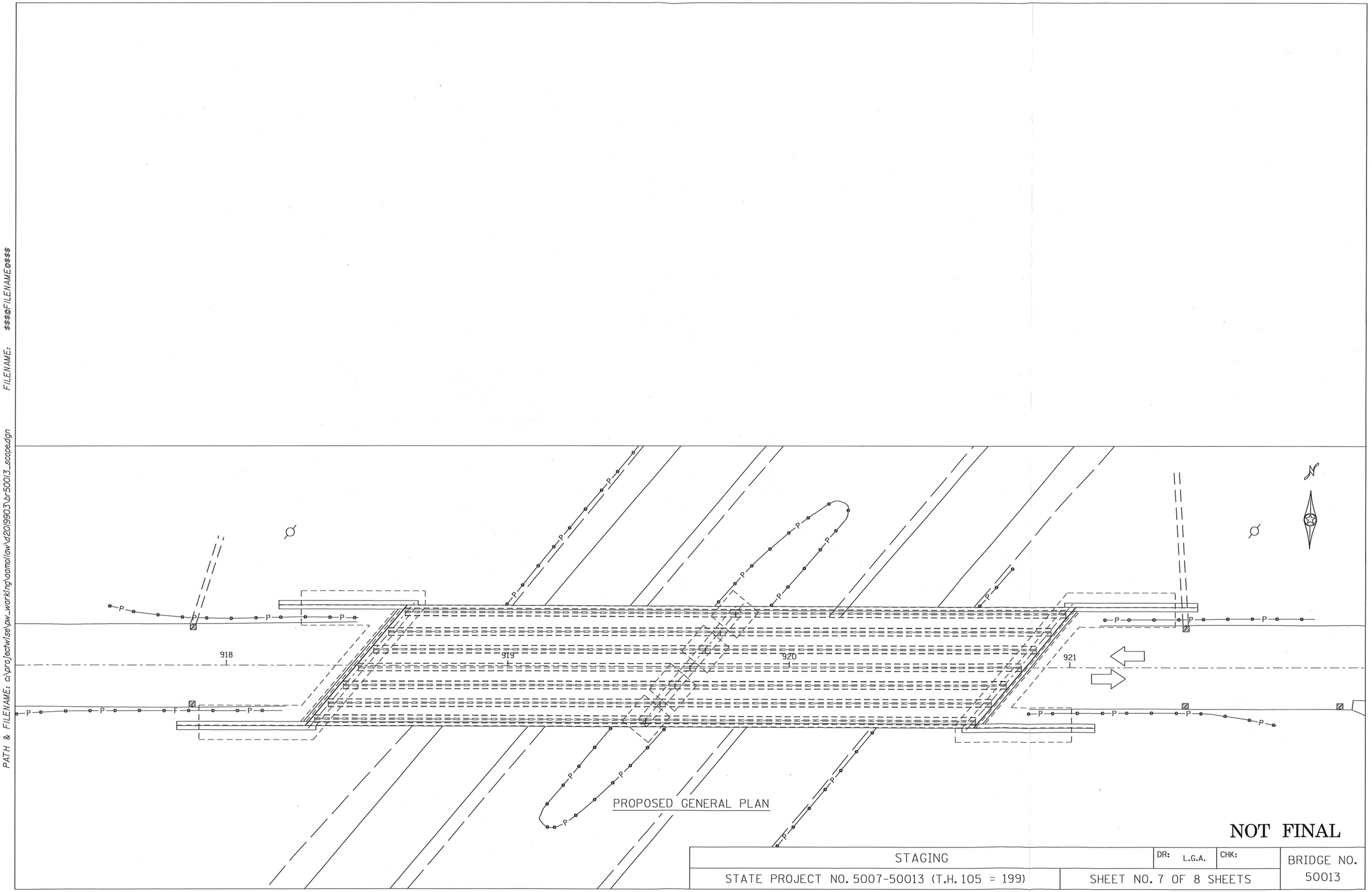
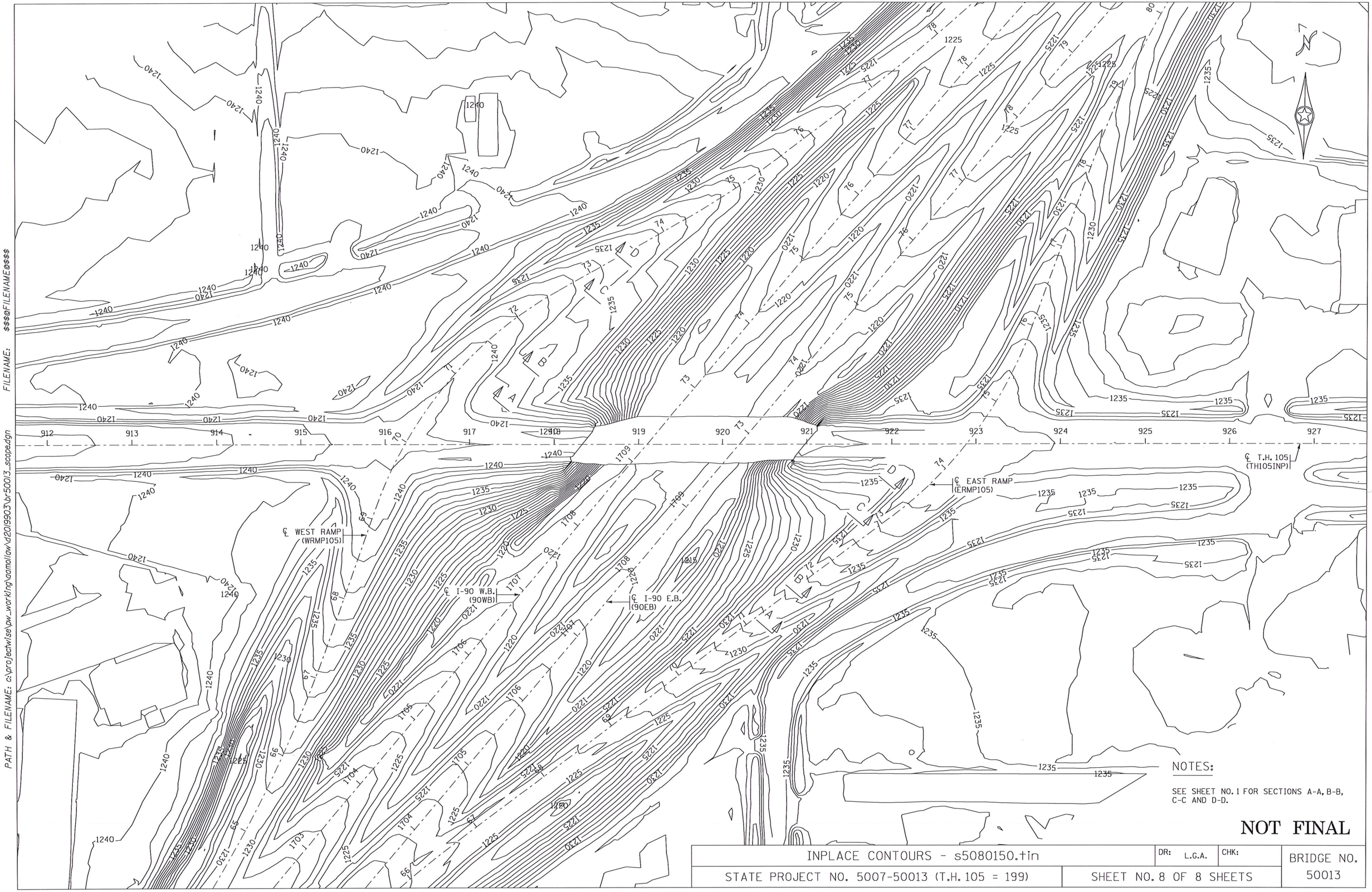


PROPOSED GENERAL PLAN

NOT FINAL

STAGING	DR: L.G.A.	CHK:	BRIDGE NO. 50013
STATE PROJECT NO. 5007-50013 (T.H. 105 = 199)	SHEET NO. 7 OF 8 SHEETS		



NOTES:

SEE SHEET NO. 1 FOR SECTIONS A-A, B-B, C-C AND D-D.

NOT FINAL

INPLACE CONTOURS - s5080150.tin	DR: L.G.A.	CHK:	BRIDGE NO. 50013
STATE PROJECT NO. 5007-50013 (T.H. 105 = 199)	SHEET NO. 8 OF 8 SHEETS		

Bridge Scoping and Cost Estimating Assessment
Bridge Replacement or Major Rehabilitation

Date:1/30/19

Trunk Highway(s): I-90 E.B.	**S.P.:** 5080-170	**S.A.P:** N.A.	**Letting Date: 1/1/23**
County(s): Mower	**City(s):** Austin		**District(s):** 6
Location: I-90 W.B. Over Cedar River, 0.8 Miles East of the West Junction of T.H. 218			

Proposed Bridge Information: Date of Assessment:1/30/19

Work Type:01	Number of Bridges in Project:5	Proposed Bridge No:50812		Inplace Bridge No: 6869
Feature Crossed: Cedar River	Bridge Type: 501	Deck Area: 9,310 Sq. Ft.	Bridge Length: 182.60 Lin. Ft.	Bridge Width :51.0 Lin. Ft.
No. of Spans: 3	No. of Lanes on Proposed Bridge 3	Inside Shoulder Width 4.0 Lin. Ft.		Outside Shoulder Width 8.0 Lin. Ft.
Type of Barrier:Type S	No. of Barriers:2	Median Width N.A. Lin. Ft.		
Sidewalk Width N.A. Lin. Ft. ☐ One Side ☐ Both Sides		Trail Width N.A. Lin. Ft. ☐ One Side ☐ Both Sides		
Abutment Type: : ☐ Tall Parapet ☐ Medium Parapet ☐ Low Parapet ☒ Integral		Pier Type: : ☐ Wall ☒ Column ☐ w / Strut ☐ Encased Pile		
Design Organization: ☒ Mn/DOT ☐ Consultant ☐ Partnership ☐ State Aid ☐ By Others ☐ Border Bridge ☐ Design Build				
Comments: Assumes 1 1/2 " grade raise to I-90 E.B.				

Bridge Estimating Unit: (All Estimated Costs in Year of Estimate Dollars) Year of Estimate: 2019

Estimated Proposed Structure Cost: $2,080,000.00	Estimate Includes : ☒ Mobility ☒ Aesthetics ☐ Staging
Inplace Structure Removal Cost : $160,000.00	Type (Level) of Estimate :☐ Planning Level ☒ Scoping Level
Foundations: ☐Borings ☒ Inplace Structure ☐ None Available	
Estimator: L.G.A. & J.C.S.	Date: 01/30/19
Comments:$2,080,000.00 + $165,000.00 = $2,245,000.00.	

Bridge Hydraulics Unit:

New Bridge ☒ Yes ☐ No		New Culvert: ☐ Yes ☒ No	
Bridge Survey Available: ☐ Yes ☒ No	Structure Skew Angle Degrees	High Water of Record Elevation Feet ☐ Not Available	
Low Bridge Elevation Feet ☐ Not Available	Flow Line Elevation Feet ☐ Not Available		
Approximate Sq. Ft. of Waterway Available Below Feet ☐ Not Available			
Rip Rap Type: : ☐ Yes ☐ No Class	Rip Rap Thickness: Inches	Granular Filter: ☐ Yes ☐ No Inches	

Comments:Crossing located in a FEMA flood zone AE (City of Austin FIS). FIS report shows 1199.4 ft WSEL for the 100-yr flood just upstream of the bridge. Existing bridge has a 3 span with a low beam is approximately 1200', whichis close to the 100-yr flood WSEL. There is also history of pier scour. Proposed bridge should at least maintain similar waterway area and low member.

Bridge Office Contact:

Name: Lawrence Aamodt
Title: Engineering Specialist Senior
Address: 3485 Hadley Ave. N.
Oakdale, MN 55128-3307
Phone: 651-366-4461
Fax: 651-366-4497
Email: larry.aamodt@state.mn.us

List of Attachments:

☐ Preliminary Waterway Analysis
Preliminary Sketches: ☐ Attached ☒ Not Available
L.R.F.D. Design Tables:
Other Attachments: None.

Assessment Information Distribution List:

Name: Mark Harle	Name: Daniel Prather	Name: Jeffrey Southward
Title: Senior Project Manger	Title: Preliminary Bridge Plans Engineer	Title: Programs and Estimates Supervisor
Address: 2900 48th St. N.W. Rochester, MN 55901-5848	Address: 3485 Hadley Ave. N. Oakdale, MN 55128-3307	Address: 3485 Hadley Ave. N. Oakdale, MN 55128-3307
Phone: 507-286-7556	Phone: 651-366-4457	Phone: 651-366-4452
Fax: 507-285-7355	Fax: 651-366-4497	Fax: 651-366-4497
Email: mark.harle@state.mn.us	Email: dan.prather@state.mn.us	Email: jeff.southward@state.mn.us

Bridge Scoping and Cost Estimating Assessment
Bridge Replacement or Major Rehabilitation

Date:1/30/19

Trunk Highway(s): I-90 W.B.	**S.P.:** 5080-170	**S.A.P:** N.A.	**Letting Date: 1/1/23**
County(s): Mower	**City(s):** Austin		**District(s):** 6
Location: I-90 W.B. Over Cedar River, 0.8 Miles East of the West Junction of T.H. 218			

Proposed Bridge Information: Date of Assessment:1/30/19

Work Type:01	Number of Bridges in Project:5	Proposed Bridge No:50813		Inplace Bridge No: 6868
Feature Crossed: Cedar River	Bridge Type: 501	Deck Area: 9,310 Sq. Ft.	Bridge Length: 182.60 Lin. Ft.	Bridge Width :51.0 Lin. Ft.
No. of Spans: 3	No. of Lanes on Proposed Bridge 3	Inside Shoulder Width 4.0 Lin. Ft.		Outside Shoulder Width 8.0 Lin. Ft.
Type of Barrier:Type S	No. of Barriers:2	Median Width N.A. Lin. Ft.		
Sidewalk Width N.A. Lin. Ft. ☐ One Side ☐ Both Sides		Trail Width N.A. Lin. Ft. ☐ One Side ☐ Both Sides		
Abutment Type: : ☐ Tall Parapet ☐ Medium Parapet ☐ Low Parapet ☒ Integral		Pier Type: : ☐ Wall ☒ Column ☐ w / Strut ☐ Encased Pile		
Design Organization: ☒ Mn/DOT ☐ Consultant ☐ Partnership ☐ State Aid ☐ By Others ☐ Border Bridge ☐ Design Build				
Comments: Assumes 1 1/2 " grade raise to I-90 W.B.				

Bridge Estimating Unit: (All Estimated Costs in Year of Estimate Dollars) Year of Estimate: 2019

Estimated Proposed Structure Cost: $2,080,000.00	Estimate Includes : ☒ Mobility ☒ Aesthetics ☐ Staging
Inplace Structure Removal Cost : $160,000.00	Type (Level) of Estimate :☐ Planning Level ☒ Scoping Level
Foundations: ☐Borings ☒ Inplace Structure ☐ None Available	
Estimator: L.G.A. & J.C.S.	Date: 01/30/19
Comments:$2,080,000.00 + $165,000.00 = $2,245,000.00.	

Bridge Hydraulics Unit:

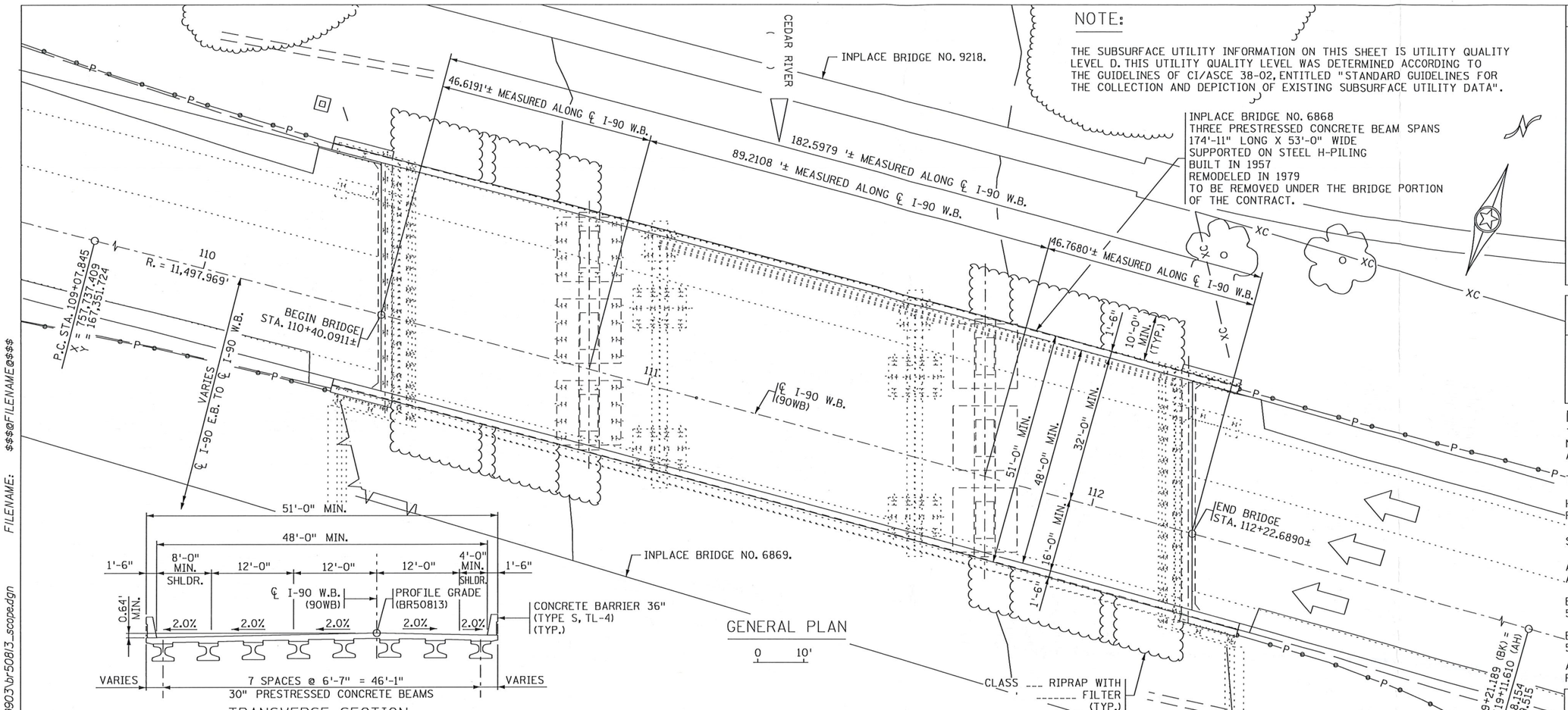
New Bridge ☒ Yes ☐ No		New Culvert: ☐ Yes ☒ No	
Bridge Survey Available: ☐ Yes ☒ No	Structure Skew Angle Degrees	High Water of Record Elevation Feet ☐ Not Available	
Low Bridge Elevation Feet ☐ Not Available		Flow Line Elevation Feet ☐ Not Available	
Approximate Sq. Ft. of Waterway Available Below Feet ☐ Not Available			
Rip Rap Type: : ☐ Yes ☐ No Class	Rip Rap Thickness: Inches	Granular Filter: ☐ Yes ☐ No Inches	

Comments:Crossing located in a FEMA flood zone AE (City of Austin FIS). FIS report shows 1199.4 ft WSEL for the 100-yr flood just upstream of the bridge. Existing bridge has a 3 span with a low beam is approximately 1200', whichis close to the 100-yr flood WSEL. There is also history of pier scour. Proposed bridge should at least maintain similar waterway area and low member.

Bridge Office Contact:	**List of Attachments:**
Name: Lawrence Aamodt	☐ Preliminary Waterway Analysis
Title: Engineering Specialist Senior	Preliminary Sketches: ☐ Attached ☒ Not Available
Address: 3485 Hadley Ave. N. Oakdale, MN 55128-3307	L.R.F.D. Design Tables:
Phone: 651-366-4461	Other Attachments: Conceptual Sketches.
Fax: 651-366-4497	
Email: larry.aamodt@state.mn.us	

Assessment Information Distribution List:

Name: Mark Harle	Name: Daniel Prather	Name: Jeffrey Southward
Title: Senior Project Manger	Title: Preliminary Bridge Plans Engineer	Title: Programs and Estimates Supervisor
Address: 2900 48th St. N.W. Rochester, MN 55901-5848	Address: 3485 Hadley Ave. N. Oakdale, MN 55128-3307	Address: 3485 Hadley Ave. N. Oakdale, MN 55128-3307
Phone: 507-286-7556	Phone: 651-366-4457	Phone: 651-366-4452
Fax: 507-285-7355	Fax: 651-366-4497	Fax: 651-366-4497
Email: mark.harle@state.mn.us	Email: dan.prather@state.mn.us	Email: jeff.southward@state.mn.us



NOTE:

THE SUBSURFACE UTILITY INFORMATION ON THIS SHEET IS UTILITY QUALITY LEVEL D. THIS UTILITY QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA".

DESIGN DATA

DESIGNED IN ACCORDANCE WITH 20__
AND CURRENT INTERIM AASHTO
LRFD BRIDGE DESIGN SPECIFICATIONS.
HL-93 LIVE LOAD.
DEAD LOAD INCLUDES 20 POUNDS PER SQUARE FOOT ALLOWANCE FOR FUTURE WEARING COURSE MODIFICATIONS.
MATERIAL DESIGN PROPERTIES:
REINFORCED CONCRETE:
f'c = 4 KSI CONCRETE
fy = 60 KSI PLAIN AND EPOXY COATED BARS
fy = 75 KSI STAINLESS STEEL BARS
n = 8 FOR REINFORCEMENT BARS
PRETENSIONED CONCRETE:
f'c = __ KSI CONCRETE (MAX.)
fpu = 270 KSI LOW RELAXATION STRANDS
n = 1 FOR PRETENSIONING STRANDS
0.75 fpu FOR INITIAL PRESTRESS
DESIGN SPEED:
OVER = 70 M.P.H. UNDER = N.A. M.P.H.
APPROXIMATE DECK AREA 9,310 SQ. FT.

20__ PROJECTED TRAFFIC VOLUMES

ROADWAY OVER	ROADWAY UNDER
A.A.D.T.	N.A.
D.H.V.	N.A.
H.C.A.D.T.T.	N.A.

NOTES:

NUMBER AND SPACING OF BEAMS IS APPROXIMATE AND WILL BE SET IN FINAL DESIGN.

TRAFFIC TO BE DETOURED DURING CONSTRUCTION.

HATCHED AREA TO BE REMOVED UNDER GRADING PORTION OF CONTRACT.

SEE SHEET __ FOR INPLACE UTILITIES.

APPROXIMATELY ___ SQ. FT. OF WATERWAY IS AVAILABLE BELOW EL. _____.

BRIDGE APPROACH PANEL LAYOUT STANDARDS 5-297.224 AND 5-297.225 APPLY.

BRIDGE APPROACH TREATMENT STANDARD 5-297.234 APPLIES.

ALL SUBSTRUCTURES SET PARALLEL AT AZ.

PROPOSED TYPE OF STRUCTURE

DECK:
30" PRESTRESSED CONCRETE BEAMS
NO SEPARATE CONCRETE WEARING COURSE
ALL BARS EPOXY COATED
SIMPLE SPANS

SUBSTRUCTURE:
INTEGRAL ABUTMENTS SUPPORTED ON

INTEGRAL PIER SUPPORTED ON

AESTHETICS:
LEVEL

EXISTING GROUND PROFILE
38' LT. – – – – –
℄ I-90 W.B. — – — – —
20' RT. — — — —

DEPTH OF STRUCTURE:
3'-7" GUTTER TO LOW BRIDGE
30" P.C.B. 8± BEAM LINES

MINNESOTA
DEPARTMENT OF TRANSPORTATION

CONCEPTUAL SKETCH
BRIDGE NO. 50813

I-90 W.B. OVER THE CEDAR CREEK
0.8 MILES EAST OF THE WEST JUNCTION OF T.H. 218 IN AUSTIN

SEC. 34 TWP. 103 N. R. 18 W.

CITY OF AUSTIN MOWER CO.

DATE: _____

NOT FINAL

STATE BRIDGE ENGINEER

ROAD DESIGN UNIT: - -

RESIDENT ENGINEER: - -

BRIDGE DESIGN UNIT: 651-366-

ASSUME 1 1/2"+- GRADE RAISE REQUIRED

JOB NO. T6C877	MINNESOTA PROJECT NO. - STATE PROJECT NO. 5080-50813 (T.H. 90 = 009)	SHEET NO. 1 OF SHEETS	50813		L.G.A.

PATH & FILENAME: c:\projectwise\pw_working\damollow\d2019903\br50813_scope.dgn
PLOTTED : 1/30/2019
TIME : 1:54:00 PM
FILENAME: $$$$@FILENAME@$$$$

FILENAME: $$$$@FILENAME@$$$$

TIME : 1:54:38 PM
PLOTTED : 1/30/2019
PATH & FILENAME: c:\projectwise\pw_working\camol\aw\d20\9903\br50813_scope.dgn

EQUATION:
ST.STA.107+73.011 (BK) =
P.O.T. STA.107+73.980 (AH)
X = 757,604.368
Y = 167,336.891

P.C. STA.109+07.845
X = 757,737.409
Y = 167,351.724

℄ I-90 W.B.
(90WB)

℄ I-90 E.B.
(90EB)

P.C. STA.115+09.974
X = 759,341.717
Y = 167,336.118

NOT FINAL

INPLACE CONTOURS - s5080150.tin	DR: L.G.A.	CHK:	BRIDGE NOS. 50812 50813
STATE PROJECT NO. 5080-50813 (T.H. 90 = 009)	SHEET NO. OF SHEETS		

ALLIANT

Memorandum

DATE: December 21, 2018

TO: Adam Wellner, PE

FROM: Yilun Xu, PE
Bob Green, PE, PTOE

SUBJECT: I-90 Construction Diversion Traffic Operation Analysis Memo DRAFT

This memorandum documents the operation analysis assumptions and results of traffic diversion due to upcoming I-90 construction in Austin, MN. Based on discussions with MnDOT District 6, the construction that may affect local street traffic operations are:

- NW 4th Street bridge over I-90
- W Oakland Avenue bridge over I-90
- NE 21st Street bridge over I-90

The preferred traffic detour routes developed for each of these bridges are included in **Appendix A**. Key local intersections affected are identified as below:

- W Oakland Avenue and I-90 ramp terminals
- NW 14th Street and I-90 ramp terminals
- NW 4th Street and I-90 ramp terminals
- NE 6th Street and I-90 ramp terminals
- NE 11th Drive and I-90 ramp terminals
- NE 21st Street and I-90 ramp terminals
- NE 28th Street and I-90 ramp terminals
- NW 18th Avenue and NW 14th Street
- NW 18th Avenue and NW 4th Street

The traffic volumes at these intersections were obtained from a prior project and recent data collection efforts. For this traffic operation analysis, AM/PM peak hour traffic volumes are grown to the estimated year of construction, 2020, with a conservative annual growth rate of 1.1%, which is consistent with the prior project. Traffic volumes for the base (No Build) and detour scenarios are shown in **Appendix B**.

733 Marquette Ave Ste 700
Minneapolis, MN 55402
612.758.3080 MAIN
612.758.3099 FAX
www.alliant-inc.com

1. Traffic Operation Analysis Results

Traffic operations of the base (No Build) and detour scenarios are modeled by Synchro/SimTraffic. Intersection delay and Level of Service (LOS) are used to compare the traffic operation performance between the scenarios and identify potential mitigation strategies.

Table 1 below summarizes the intersection delay and LOS for each key intersection under the 2020 Base (No Build) scenario. The results reveal than PM is a higher peak hour than AM and all intersections operate at LOS C or above.

Table 1 Intersection Delay and LOS under Base (No Build) Scenario

MOE Comparison NO BUILD	Traffic Control	2020 AM		2020 PM	
		Intersection Delay / LOS	Total Entering Volume	Intersection Delay / LOS	Total Entering Volume
W Oakland Ave & I-90 SB Ramp (West)	Thru/stop	2.1 / A	408	3.7 / A	668
W Oakland Ave & I-90 NB Ramp (East)	Thru/stop	2.1 / A	581	2.3 / A	771
NW 14th St & I-90 WB Ramp (North)	Signal	9.0 / A	876	10.0 / B	1,510
NW 14th St & I-90 EB Ramp (South)	Thru/stop	2.3 / A	954	3.7 / A	1,426
NW 4th St & I-90 WB Exit Ramp (North)	Signal	8.9 / A	1,021	16.1 / B	1,968
NW 4th St & I-90 WB Entrance Ramp (North)	NA	2.2 / A	880	5.1 / A	1,869
NW 4th St & I-90 EB Ramp (South)	Thru/stop	2.6 / A	1,143	5.2 / A	1,804
NE 6th St & I-90 WB Ramp (North)	Thru/stop	3.0 / A	686	3.2 / A	729
NE 6th St & I-90 EB Ramp (South)	Thru/stop	4.4 / A	699	2.4 / A	733
NE 11th Dr & I-90 WB Ramp (North)	Thru/stop	2.0 / A	525	2.1 / A	625
NE 11th Dr & I-90 EB Ramp (South)	Thru/stop	2.2 / A	497	2.4 / A	680
NE 21st St & I-90 WB Ramp (North)	Thru/stop	2.8 / A	386	2.6 / A	367
NE 21st St & I-90 EB Ramp (South)	Thru/stop	1.3 / A	612	1.7 / A	676
NE 28th St & I-90 WB Entrance Ramp (North)	Thru/stop	2.2 / A	144	1.5 / A	181
NE 28th St & I-90 WB Exit Ramp (North)	Thru/stop	1.1 / A	85	1.6 / A	86
NE 28th St & I-90 EB Ramp (South)	Thru/stop	2.9 / A	91	3.4 / A	102
NW 14th St & NW 18th Ave	Signal	16.1 / B	815	20.0 / C	1,561
NW 4th St & NW 18th Ave	Signal	9.6 / A	881	12.3 / B	1,703

1.1 Construction Staging Analysis - NW 4th Street Bridge over I-90

Two options were reviewed for staging construction of the NW 4th Street bridge. "Plan 1" assumes that 4th Street is closed, and the bridge is constructed all at the same time. "Plan 2" assumes that the bridge would be constructed half at a time to maintain traffic on 4th Street over I-90. Discussions with District staff indicated that maintaining access on 4th Street is preferred. Therefore, this analysis focuses on Plan 2, constructing the bridge half at a time.

Table 2 below indicates that 4th Street and I-90 Eastbound Ramp intersection may experience LOS E in 2020 PM under the 4th Street "Plan 2 Phase 1" detour scenario if the existing thru/stop traffic control is maintained, and 4th Street is reduced to one lane each direction. Plan 2, Phase 1 is construction of the west half of the 4th Street Bridge while the north ramps are closed.

Table 2 Intersection Delay and LOS under 4th Street "Plan 2 Phase 1" and Base (No Build) Scenarios

MOE Comparison 2020 AM Peak	Traffic Control	NO BUILD		4TH ST 2-1	
		Intersection Delay / LOS	Total Entering Volume	Intersection Delay / LOS	Total Entering Volume
NW 14th St & I-90 WB Ramp (North)	Signal	9.0 / A	876	11.4 / B	1,196
NW 14th St & I-90 EB Ramp (South)	Thru/stop	2.3 / A	954	4.6 / A	1,116
NW 4th St & I-90 EB Ramp (South)	Thru/stop	2.6 / A	1,143	5.1 / A	1,141
NE 6th St & I-90 WB Ramp (North)	Thru/stop	3.0 / A	686	3.8 / A	736
NE 6th St & I-90 EB Ramp (South)	Thru/stop	4.4 / A	699	5.2 / A	736
NW 14th St & NW 18th Ave	Signal	16.1 / B	815	14.2 / B	976
NW 4th St & NW 18th Ave	Signal	9.6 / A	881	11.9 / B	1,063

MOE Comparison 2020 PM Peak	Traffic Control	NO BUILD		4TH ST 2-1	
		Intersection Delay / LOS	Total Entering Volume	Intersection Delay / LOS	Total Entering Volume
NW 14th St & I-90 WB Ramp (North)	Signal	10.0 / B	1,510	15.6 / B	2,071
NW 14th St & I-90 EB Ramp (South)	Thru/stop	3.7 / A	1,426	10.1 / B	1,608
NW 4th St & I-90 EB Ramp (South)	Thru/stop	5.2 / A	1,804	43.1 / E	1,848
NE 6th St & I-90 WB Ramp (North)	Thru/stop	3.2 / A	729	4.8 / A	854
NE 6th St & I-90 EB Ramp (South)	Thru/stop	2.4 / A	733	4.3 / A	878
NW 14th St & NW 18th Ave	Signal	20.0 / C	1,561	19.4 / B	1,985
NW 4th St & NW 18th Ave	Signal	12.3 / B	1,703	29.6 / C	2,041

Table 3 below indicates that both 4th Street / I-90 Westbound Ramp (signal) and 14th Street / I-90 Eastbound Ramp (thru/stop) intersections are approaching capacity (LOS E/F) in 2020 PM under the "Plan 2 Phase 2" scenario if the existing traffic controls and one lane each direction on 4th Street is maintained. Plan 2, Phase 2 is construction of the east half of the 4th Street Bridge while the south ramps are closed.

Table 3 Intersection Delay and LOS under 4th Street "Plan 2 Phase 2" and Base (No Build) Scenarios

MOE Comparison 2020 AM Peak	Traffic Control	NO BUILD		4TH ST 2-2	
		Intersection Delay / LOS	Total Entering Volume	Intersection Delay / LOS	Total Entering Volume
NW 14th St & I-90 WB Ramp (North)	Signal	9.0 / A	876	12.7 / B	1,126
NW 14th St & I-90 EB Ramp (South)	Thru/stop	2.3 / A	954	7.0 / A	1,209
NW 4th St & I-90 WB Exit Ramp (North)	Signal	8.9 / A	1,021	30.4 / C	1,349
NE 6th St & I-90 WB Ramp (North)	Thru/stop	3.0 / A	686	5.5 / A	843
NE 6th St & I-90 EB Ramp (South)	Thru/stop	4.4 / A	699	8.7 / A	844

MOE Comparison 2020 PM Peak	Traffic Control	NO BUILD		4TH ST 2-2	
		Intersection Delay / LOS	Total Entering Volume	Intersection Delay / LOS	Total Entering Volume
NW 14th St & I-90 WB Ramp (North)	Signal	10.0 / B	1,510	18.1 / B	1,887
NW 14th St & I-90 EB Ramp (South)	Thru/stop	3.7 / A	1,426	52.8 / F	1,796
NW 4th St & I-90 WB Exit Ramp (North)	Signal	16.1 / B	1,968	63.2 / E	1,680
NE 6th St & I-90 WB Ramp (North)	Thru/stop	3.2 / A	729	3.9 / A	776
NE 6th St & I-90 EB Ramp (South)	Thru/stop	2.4 / A	733	3.3 / A	808

To mitigate these potential traffic congestions, several traffic control and lane geometry modifications (bundled as Alternative 1) are proposed:

1. Provide temporary signal control for the 4th Street and I-90 Eastbound Ramp intersection during the "Plan 2 Phase 1" detour. Maintain traffic signal control to 4th Street and I-90 Westbound Ramp intersection during the "Plan 2 Phase 2" detour. Provide leading protective-permissive left turn phases from 4th Street to I-90 entrance ramps.
2. Provide temporary signal control for the 14th Street and I-90 Eastbound Ramp intersection during the "Plan 2 Phase 2" detour. Provide leading protective-permissive left turn phase from southbound 14th Street to eastbound I-90 entrance ramp.
3. Add a left turn lane on 4th Street for both the westbound and eastbound ramps for the entire duration of 4th Street bridge construction, resulting in a three lane (instead of the two lane) section on the bridge.

Table 4 and **Table 5** show the results of the proposed mitigations. The traffic operations improve to LOS D or above with the proposed modifications (Alternative 1).

Table 4 Intersection Delay and LOS Comparison (with traffic control and lane geometry modifications) under 4th Street "Plan 2 Phase 1" Scenario

MOE Comparison 2020 AM Peak	Traffic Control	4TH ST 2-1 ALT 1	
		Intersection Delay / LOS	Total Entering Volume
NW 14th St & I-90 WB Ramp (North)	Signal	12.4 (+1.0) / B	1,197
NW 14th St & I-90 EB Ramp (South)	Signal	9.0 (+4.4) / A	1,126
NW 4th St & I-90 EB Ramp (South)	Signal	11.6 (+6.6) / B	1,158
NE 6th St & I-90 WB Ramp (North)	Thru/stop	3.7 (-0.2) / A	740
NE 6th St & I-90 EB Ramp (South)	Thru/stop	5.3 (+0.0) / A	739
NW 14th St & NW 18th Ave	Signal	14.9 (+0.7) / B	976
NW 4th St & NW 18th Ave	Signal	11.4 (-0.5) / B	1,035

MOE Comparison 2020 PM Peak	Traffic Control	4TH ST 2-1 ALT 1	
		Intersection Delay / LOS	Total Entering Volume
NW 14th St & I-90 WB Ramp (North)	Signal	16.0 (+0.4) / B	2,040
NW 14th St & I-90 EB Ramp (South)	Signal	11.8 (+1.6) / B	1,566
NW 4th St & I-90 EB Ramp (South)	Signal	24.4 (-18.7) / C	1,712
NE 6th St & I-90 WB Ramp (North)	Thru/stop	4.5 (-0.3) / A	833
NE 6th St & I-90 EB Ramp (South)	Thru/stop	4.0 (-0.3) / A	868
NW 14th St & NW 18th Ave	Signal	19.4 (-0.1) / B	1,956
NW 4th St & NW 18th Ave	Signal	26.6 (-3.0) / C	2,063

Table 5 Intersection Delay and LOS Comparison (with traffic control and lane geometry modifications) under 4th Street "Plan 2 Phase 2" Scenario

MOE Comparison 2020 AM Peak	Traffic Control	4TH ST 2-2 ALT 1	
		Intersection Delay / LOS	Total Entering Volume
NW 14th St & I-90 WB Ramp (North)	Signal	13.7 (+1.0) / B	1,112
NW 14th St & I-90 EB Ramp (South)	Signal	9.4 (+2.4) / A	1,207
NW 4th St & I-90 WB Exit Ramp (North)	Signal	20.0 (-10.4) / C	1,365
NE 6th St & I-90 WB Ramp (North)	Thru/stop	5.8 (+0.3) / A	833
NE 6th St & I-90 EB Ramp (South)	Thru/stop	9.7 (+1.1) / A	827

MOE Comparison 2020 PM Peak	Traffic Control	4TH ST 2-2 ALT 1	
		Intersection Delay / LOS	Total Entering Volume
NW 14th St & I-90 WB Ramp (North)	Signal	18.4 (+0.3) / B	1,945
NW 14th St & I-90 EB Ramp (South)	Signal	17.3 (-35.5) / B	1,846
NW 4th St & I-90 WB Exit Ramp (North)	Signal	40.5 (-22.7) / D	2,205
NE 6th St & I-90 WB Ramp (North)	Thru/stop	4.2 (+0.3) / A	805
NE 6th St & I-90 EB Ramp (South)	Thru/stop	3.4 (+0.0) / A	821

1.2 Construction Staging Analysis - W Oakland Avenue Bridge over I-90

The Oakland Avenue Bridge will be constructed in one phase. Traffic will be detoured to the 14th Street Interchange. Oakland Avenue bridge is assumed to be constructed before or after 4th Street bridge.

Table 6 below indicates that 14th Street and I-90 Eastbound Ramp intersection may experience LOS F in 2020 PM under the Oakland Avenue detour scenario if the existing thru/stop traffic control is maintained.

Table 6 Intersection Delay and LOS under Oakland Avenue Detour

MOE Comparison 2020 AM Peak	Traffic Control	NO BUILD		OAKLAND AVE	
		Intersection Delay / LOS	Total Entering Volume	Intersection Delay / LOS	Total Entering Volume
W Oakland Ave & I-90 SB Ramp (West)	Thru/stop	2.1 / A	408	1.2 / A	286
W Oakland Ave & I-90 NB Ramp (East)	Thru/stop	2.1 / A	581	3.1 / A	426
NW 14th St & I-90 WB Ramp (North)	Signal	9.0 / A	876	12.2 / B	1,055
NW 14th St & I-90 EB Ramp (South)	Thru/stop	2.3 / A	954	5.4 / A	1,145

MOE Comparison 2020 PM Peak	Traffic Control	NO BUILD		OAKLAND AVE	
		Intersection Delay / LOS	Total Entering Volume	Intersection Delay / LOS	Total Entering Volume
W Oakland Ave & I-90 SB Ramp (West)	Thru/stop	3.7 / A	668	1.7 / A	412
W Oakland Ave & I-90 NB Ramp (East)	Thru/stop	2.3 / A	771	3.3 / A	544
NW 14th St & I-90 WB Ramp (North)	Signal	10.0 / B	1,510	15.4 / B	1,809
NW 14th St & I-90 EB Ramp (South)	Thru/stop	3.7 / A	1,426	56.3 / F	1,731

This can be mitigated by providing a temporary signal control at this intersection (Alternative 1). As shown by **Table 7**, intersection operation is much improved (LOS B) with this modification.

Table 7 Intersection Delay and LOS Comparison (with traffic control modification) under Oakland Avenue Detour

MOE Comparison 2020 AM Peak	Traffic Control	OAKLAND AVE ALT 1	
		Intersection Delay / LOS	Total Entering Volume
W Oakland Ave & I-90 SB Ramp (West)	Thru/stop	1.2 (+0.0) / A	284
W Oakland Ave & I-90 NB Ramp (East)	Thru/stop	3.1 (-0.1) / A	436
NW 14th St & I-90 WB Ramp (North)	Signal	12.8 (+0.6) / B	1,055
NW 14th St & I-90 EB Ramp (South)	Thru/stop	9.6 (+4.2) / A	1,136

MOE Comparison 2020 PM Peak	Traffic Control	OAKLAND AVE ALT 1	
		Intersection Delay / LOS	Total Entering Volume
W Oakland Ave & I-90 SB Ramp (West)	Thru/stop	1.9 (+0.1) / A	419
W Oakland Ave & I-90 NB Ramp (East)	Thru/stop	3.2 (-0.1) / A	524
NW 14th St & I-90 WB Ramp (North)	Signal	17.0 (+1.6) / B	1,889
NW 14th St & I-90 EB Ramp (South)	Thru/stop	13.4 (-42.9) / B	1,796

If the Oakland Avenue bridge is constructed while the 4th Street bridge detour is active, heavier traffic volume (with both detours) is expected for the 14th Avenue and I-90 Ramps intersections. **Table 8** below indicates that the proposed temporary signal at the 14th Street and I-90 Eastbound Ramp intersection, as well as the existing traffic signal at the 14th Street and I-90 Westbound Ramp intersection, will operate at acceptable LOS (D or above) even if Oakland Ave and 4th Street bridge detours overlap. It's noted that in these scenarios the two signals need to be coordinated during peak hours along 14th Street.

Table 8 Intersection Delay and LOS (with traffic control modification) with Both Oakland Avenue and 4th Street Detours

MOE Comparison OAKLAND & 4TH ST 2-1	Traffic Control	2020 AM Peak		2020 PM Peak	
		Intersection Delay / LOS	Total Entering Volume	Intersection Delay / LOS	Total Entering Volume
NW 14th St & I-90 WB Ramp (North)	Existing Signal	16.9 / B	1,398	24.5 / C	2,387
NW 14th St & I-90 EB Ramp (South)	Temporary Signal	12.3 / B	1,312	16.3 / B	1,955

MOE Comparison OAKLAND & 4TH ST 2-2	Traffic Control	2020 AM Peak		2020 PM Peak	
		Intersection Delay / LOS	Total Entering Volume	Intersection Delay / LOS	Total Entering Volume
NW 14th St & I-90 WB Ramp (North)	Existing Signal	20.4 / C	1,310	40.2 / D	2,338
NW 14th St & I-90 EB Ramp (South)	Temporary Signal	14.1 / B	1,405	27.3 / C	2,257

1.3 Construction Staging Analysis - NE 21st Street Bridge over I-90

The 21st Street bridge will be constructed in three phases. The first phase (Phase 1) replaces 21st Street bridge and reconstructs the center piece (2-lanes' width) of 21st Street just south of the bridge; the second phase (Phase 2A) replaces the ramps on the north side; the third phase (Phase 2B) replaces the ramps on the south side.

Table 9, 10 and 11 below indicate that the traffic diversions due to 21st Street bridge construction can be accommodated with the existing traffic control devices and lane geometry at adjacent intersections with LOS A.

Table 9 Intersection Delay and LOS under 21st Street "Plan 1 Phase 1" Scenario

MOE Comparison 2020 AM Peak	Traffic Control	NO BUILD		21ST ST 1-1	
		Intersection Delay / LOS	Total Entering Volume	Intersection Delay / LOS	Total Entering Volume
NE 11th Dr & I-90 WB Ramp (North)	Thru/stop	2.0 / A	525	3.2 / A	630
NE 11th Dr & I-90 EB Ramp (South)	Thru/stop	2.2 / A	497	2.8 / A	594
NE 21st St & I-90 WB Ramp (North)	Thru/stop	2.8 / A	386	1.1 / A	130
NE 21st St & I-90 EB Ramp (South)	Thru/stop	1.3 / A	612	2.8 / A	624
NE 28th St & I-90 WB Entrance Ramp (North)	Thru/stop	2.2 / A	144	1.7 / A	398
NE 28th St & I-90 WB Exit Ramp (North)	Thru/stop	1.1 / A	85	2.7 / A	342
NE 28th St & I-90 EB Ramp (South)	Thru/stop	2.9 / A	91	5.9 / A	349

MOE Comparison 2020 PM Peak	Traffic Control	NO BUILD		21ST ST 1-1	
		Intersection Delay / LOS	Total Entering Volume	Intersection Delay / LOS	Total Entering Volume
NE 11th Dr & I-90 WB Ramp (North)	Thru/stop	2.1 / A	625	3.4 / A	719
NE 11th Dr & I-90 EB Ramp (South)	Thru/stop	2.4 / A	680	3.0 / A	768
NE 21st St & I-90 WB Ramp (North)	Thru/stop	2.6 / A	367	1.5 / A	133
NE 21st St & I-90 EB Ramp (South)	Thru/stop	1.7 / A	676	2.7 / A	640
NE 28th St & I-90 WB Entrance Ramp (North)	Thru/stop	1.5 / A	181	1.5 / A	412
NE 28th St & I-90 WB Exit Ramp (North)	Thru/stop	1.6 / A	86	2.5 / A	307
NE 28th St & I-90 EB Ramp (South)	Thru/stop	3.4 / A	102	5.3 / A	327

Table 10 Intersection Delay and LOS under 21st Street "Plan 1 Phase 2a" Scenario

MOE Comparison 2020 AM Peak	Traffic Control	NO BUILD		21ST ST 1-2A	
		Intersection Delay / LOS	Total Entering Volume	Intersection Delay / LOS	Total Entering Volume
NE 11th Dr & I-90 WB Ramp (North)	Thru/stop	2.0 / A	525	2.6 / A	592
NE 11th Dr & I-90 EB Ramp (South)	Thru/stop	2.2 / A	497	2.5 / A	577
NE 21st St & I-90 WB Ramp (North)	Thru/stop	2.8 / A	386	0.2 / A	130
NE 21st St & I-90 EB Ramp (South)	Thru/stop	1.3 / A	612	2.5 / A	665
NE 28th St & I-90 WB Entrance Ramp (North)	Thru/stop	2.2 / A	144	1.7 / A	397
NE 28th St & I-90 WB Exit Ramp (North)	Thru/stop	1.1 / A	85	2.6 / A	331
NE 28th St & I-90 EB Ramp (South)	Thru/stop	2.9 / A	91	5.4 / A	340

MOE Comparison 2020 PM Peak	Traffic Control	NO BUILD		21ST ST 1-2A	
		Intersection Delay / LOS	Total Entering Volume	Intersection Delay / LOS	Total Entering Volume
NE 11th Dr & I-90 WB Ramp (North)	Thru/stop	2.1 / A	625	2.8 / A	694
NE 11th Dr & I-90 EB Ramp (South)	Thru/stop	2.4 / A	680	2.9 / A	735
NE 21st St & I-90 WB Ramp (North)	Thru/stop	2.6 / A	367	0.2 / A	129
NE 21st St & I-90 EB Ramp (South)	Thru/stop	1.7 / A	676	2.6 / A	705
NE 28th St & I-90 WB Entrance Ramp (North)	Thru/stop	1.5 / A	181	1.4 / A	399
NE 28th St & I-90 WB Exit Ramp (North)	Thru/stop	1.6 / A	86	2.5 / A	304
NE 28th St & I-90 EB Ramp (South)	Thru/stop	3.4 / A	102	5.1 / A	321

Table 11 Intersection Delay and LOS under 21st Street "Plan 1 Phase 2b" Scenario

MOE Comparison 2020 AM Peak	Traffic Control	NO BUILD		21ST ST 1-2B	
		Intersection Delay / LOS	Total Entering Volume	Intersection Delay / LOS	Total Entering Volume
NE 11th Dr & I-90 WB Ramp (North)	Thru/stop	2.0 / A	525	3.4 / A	623
NE 11th Dr & I-90 EB Ramp (South)	Thru/stop	2.2 / A	497	2.9 / A	605
NE 21st St & I-90 WB Ramp (North)	Thru/stop	2.8 / A	386	7.6 / A	658
NE 21st St & I-90 EB Ramp (South)	Thru/stop	1.3 / A	612	0.6 / A	598
NE 28th St & I-90 WB Entrance Ramp (North)	Thru/stop	2.2 / A	144	1.8 / A	330
NE 28th St & I-90 WB Exit Ramp (North)	Thru/stop	1.1 / A	85	2.5 / A	263
NE 28th St & I-90 EB Ramp (South)	Thru/stop	2.9 / A	91	4.9 / A	267

MOE Comparison 2020 PM Peak	Traffic Control	NO BUILD		21ST ST 1-2B	
		Intersection Delay / LOS	Total Entering Volume	Intersection Delay / LOS	Total Entering Volume
NE 11th Dr & I-90 WB Ramp (North)	Thru/stop	2.1 / A	625	3.1 / A	695
NE 11th Dr & I-90 EB Ramp (South)	Thru/stop	2.4 / A	680	2.7 / A	745
NE 21st St & I-90 WB Ramp (North)	Thru/stop	2.6 / A	367	9.8 / A	720
NE 21st St & I-90 EB Ramp (South)	Thru/stop	1.7 / A	676	0.6 / A	651
NE 28th St & I-90 WB Entrance Ramp (North)	Thru/stop	1.5 / A	181	1.3 / A	490
NE 28th St & I-90 WB Exit Ramp (North)	Thru/stop	1.6 / A	86	2.8 / A	395
NE 28th St & I-90 EB Ramp (South)	Thru/stop	3.4 / A	102	5.8 / A	411

2. Peak Hour Warrant Analysis Results

The peak hour signal warrant analysis is conducted for intersections with proposed temporary traffic signals. As shown by **Table 12**, the peak hour warrants are generally met under a variety of detour cases at 14th Street / I-90 Eastbound Ramp and 4th Street / I-90 Eastbound Ramp intersections (both currently controlled by thru/stop).

Table 12 Peak Hour Warrant Analysis Results for Proposed Temporary Traffic Signals

Intersection	Scenario		Main Street	Side Street	Peak Hour Warrant Met?
NW 14th St & I-90 EB Ramp (South) - 2 Lanes on Main Street	Oakland	AM	846	195	No
		PM	1416	315	Yes
	4th 2-1	AM	935	93	No
		PM	1381	127	No
	4th 2-2	AM	1014	93	No
		PM	1660	127	Yes
	4th 2-1 & Oakland	AM	999	195	No
		PM	1548	315	Yes
	4th 2-2 & Oakland	AM	1078	195	No
		PM	1827	315	Yes
NW 4th St & I-90 EB Ramp (South) - 1 Lane on Main Street	4th 2-1	AM	766	303	Yes
		PM	1547	207	Yes

3. Recommendation

Based on the traffic operation and warrant analysis above, several traffic control and lane geometry modifications are recommended:

1. Provide temporary signal control for the 4th Street and I-90 Eastbound Ramp intersection during the 4th Street "Plan 2 Phase 1" detour. Maintain traffic signal control to 4th Street and I-90 Westbound Ramp intersection during the 4th Street "Plan 2 Phase 2" detour. Provide leading protective-permissive left turn phases from 4th Street to I-90 entrance ramps.
2. Provide temporary signal control for the 14th Street and I-90 Eastbound Ramp intersection during the 4th Street "Plan 2 Phase 2" and Oakland Avenue detours. Provide leading protective-permissive left turn phase from southbound 14th Street to eastbound I-90 entrance ramp.
    a. If these detours overlap, signal coordination are critical between the 14th Street / I-90 Eastbound Ramp and 14th Street / I-90 Westbound Ramp intersections during the peak hours.
3. Add a left turn lane on 4th Street for westbound and eastbound ramp movements for the entire duration of 4th Street bridge construction, resulting in a three-lane section on the bridge.
4. Review and adjust signal timing parameters to accommodate AM/PM peak hour detour traffic at the key intersections impacted by the bridge constructions.

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Appendix A: Traffic Detour Plans and Key Intersections

733 Marquette Ave Ste 700
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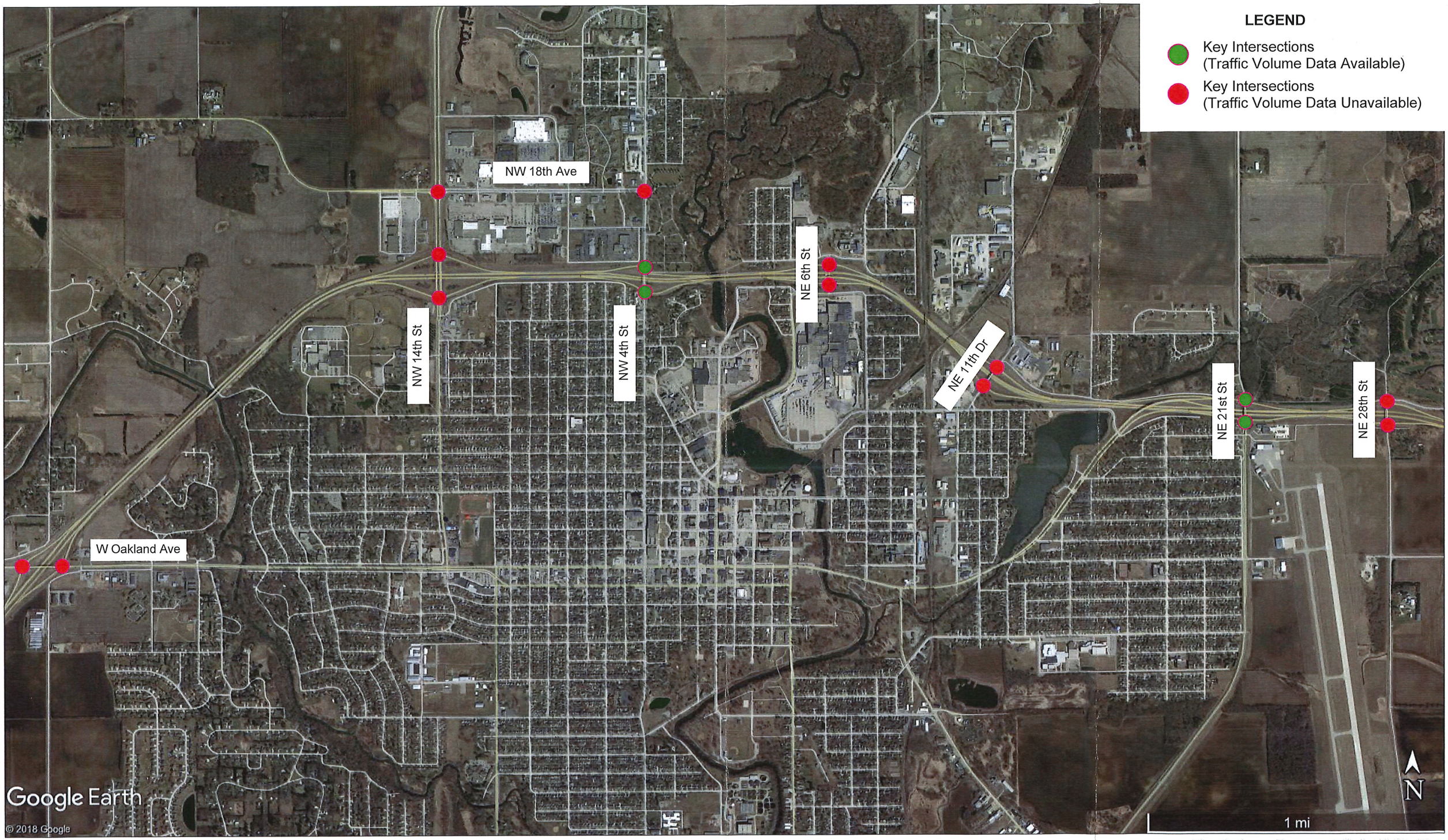

I-90 Bridges (Austin, MN) Traffic Diversion

Key Intersections and Data Collection

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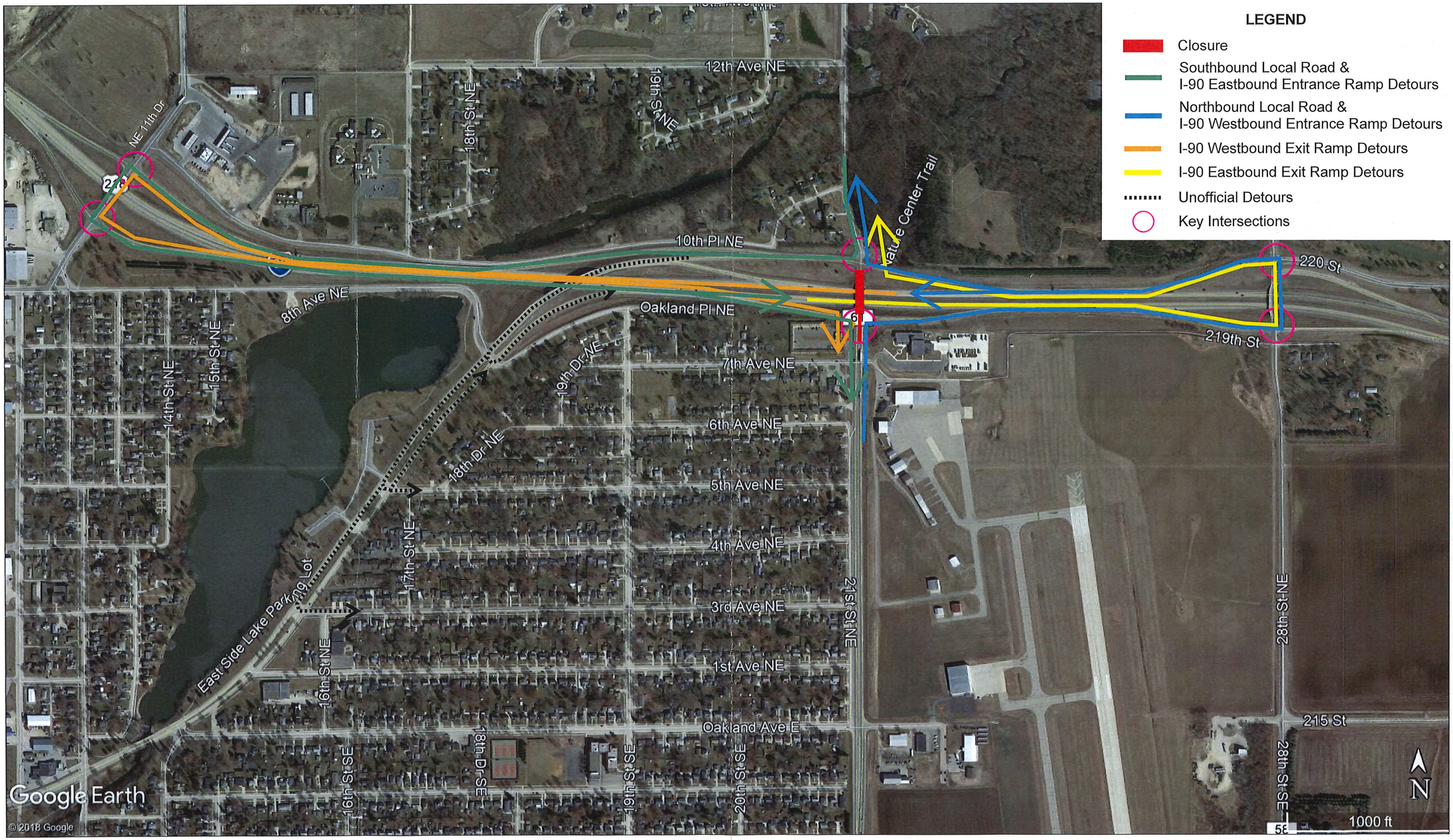

I-90 Bridges (Austin, MN) Traffic Diversion

ALLIANT ENGINEERING

NE 21st Street Interchange
Bridge Replacement and Traffic Diversion

Plan 1: Multi-phase Road Closure
Phase 1: Bridge Closure

LEGEND

- Closure
- Eastbound Local Road & I-90 Northbound Entrance Ramp Detours
- Westbound Local Road & I-90 Southbound Entrance Ramp Detours
- I-90 Westbound Exit Ramp Detours
- I-90 Eastbound Exit Ramp Detours
- Unofficial Detours
- Key Intersections

2016 AADT: 1,800

3000 ft

I-90 Bridges (Austin, MN) Traffic Diversion

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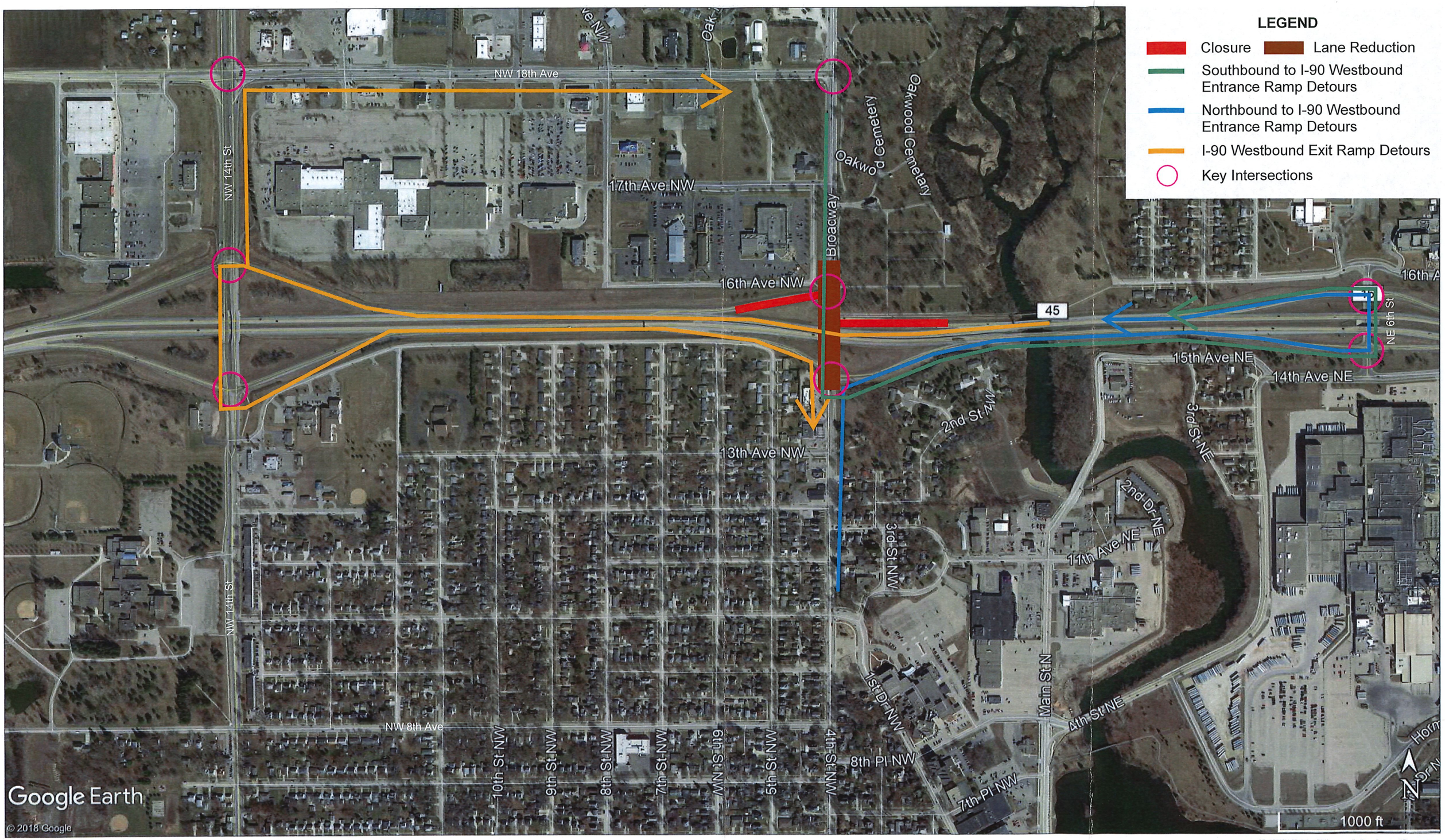
TH 105 / W Oakland Avenue Interchange
Bridge Rehabilitation and Traffic Diversion



I-90 Bridges (Austin, MN) Traffic Diversion

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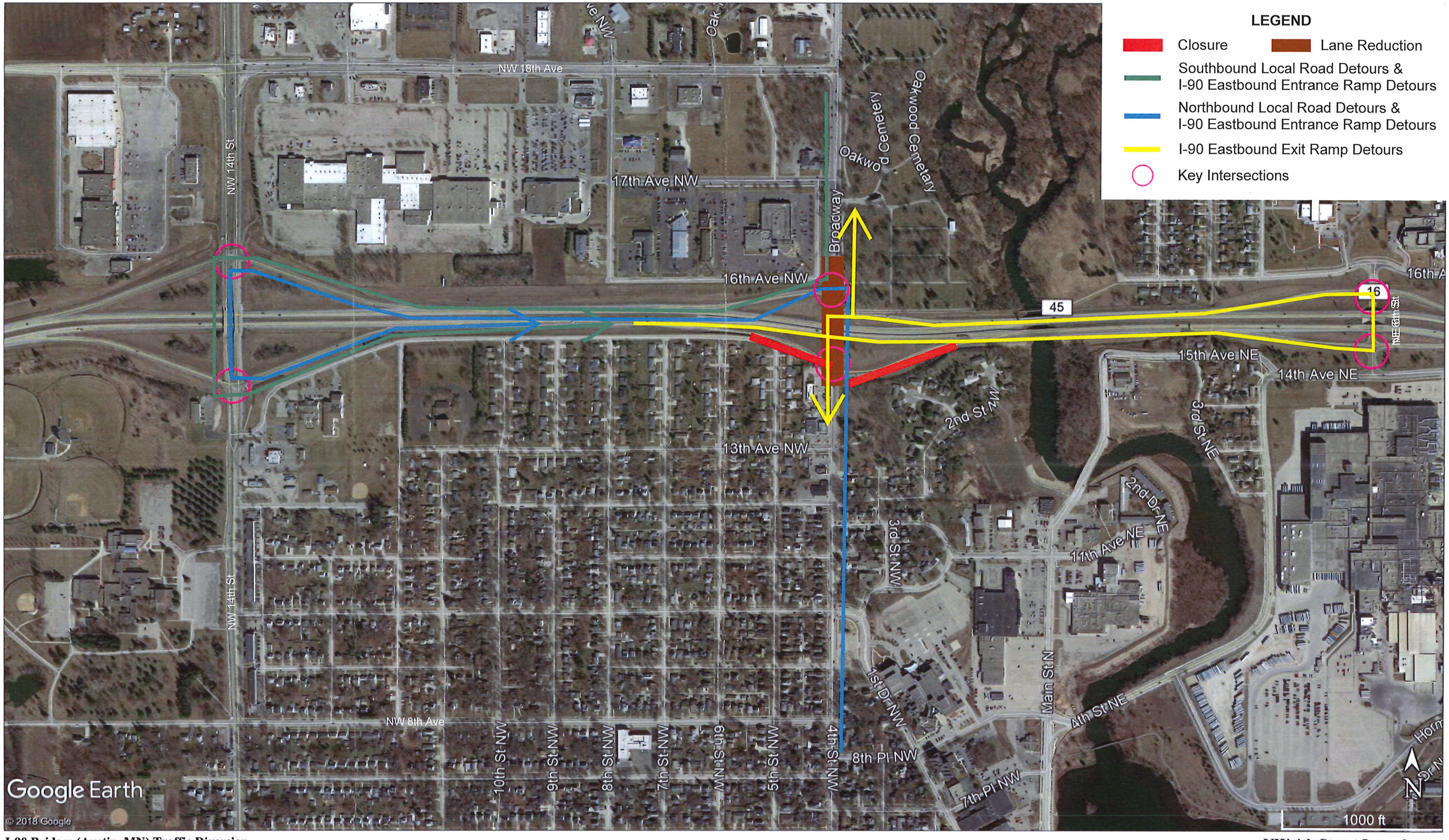
NW 4th Street Interchange
Bridge Replacement and Traffic Diversion

Plan 2: Two-phase Bridge Construction
Phase 1: North Side Ramps Closure



I-90 Bridges (Austin, MN) Traffic Diversion

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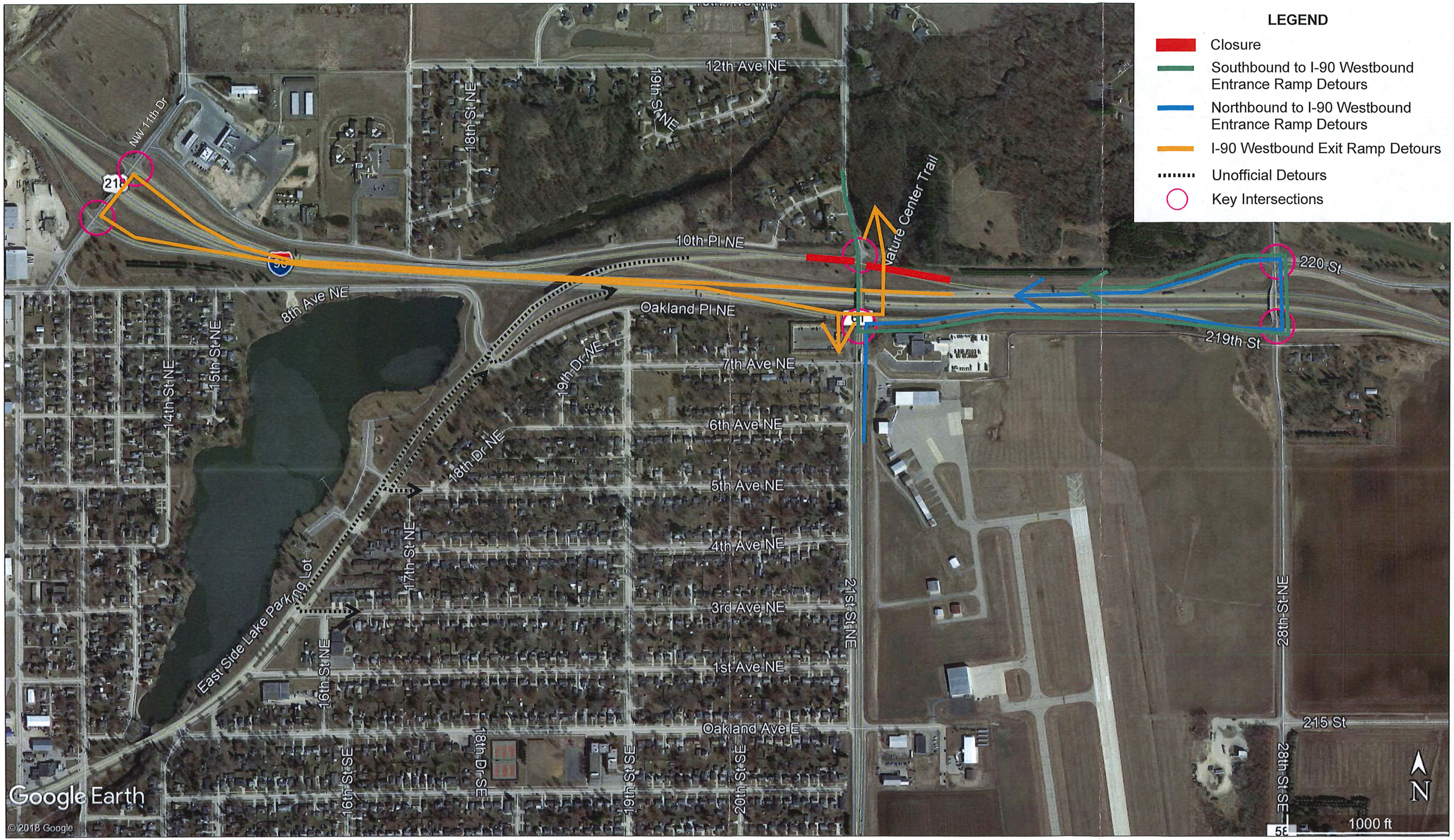
NW 4th Street Interchange
Bridge Replacement and Traffic Diversion

Plan 2: Two-phase Bridge Construction
Phase 2: South Side Ramps Closure



I-90 Bridges (Austin, MN) Traffic Diversion

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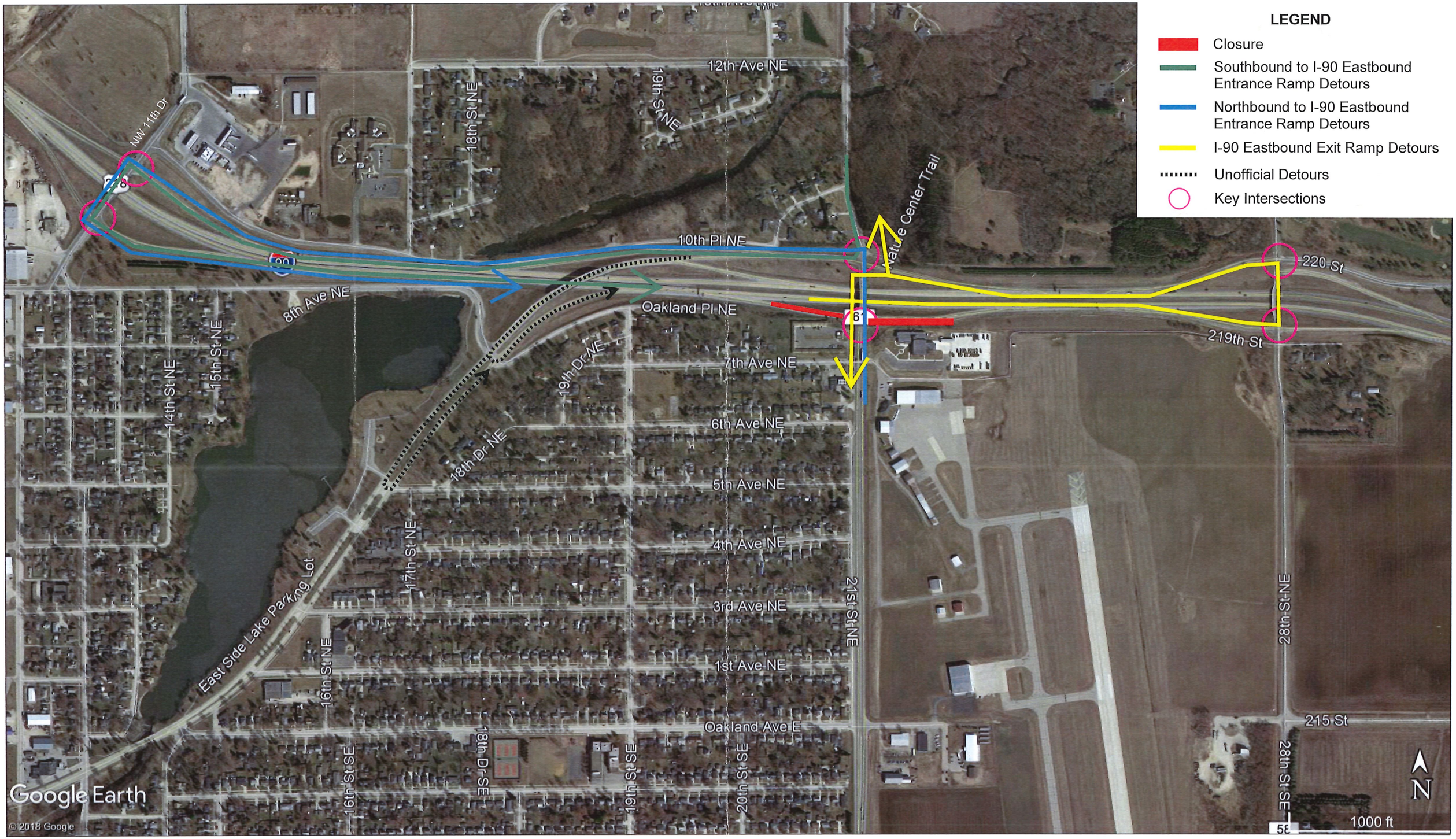
NE 21st Street Interchange
Bridge Replacement and Traffic Diversion

Plan 1: Multi-phase Road Closure
Phase 2A: North Ramps Closure



I-90 Bridges (Austin, MN) Traffic Diversion

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NE 21st Street Interchange
Bridge Replacement and Traffic Diversion

Plan 1: Multi-phase Road Closure
Phase 2B: South Ramps Closure

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Appendix B: 2020 Forecast Traffic Volumes by Detour Plan

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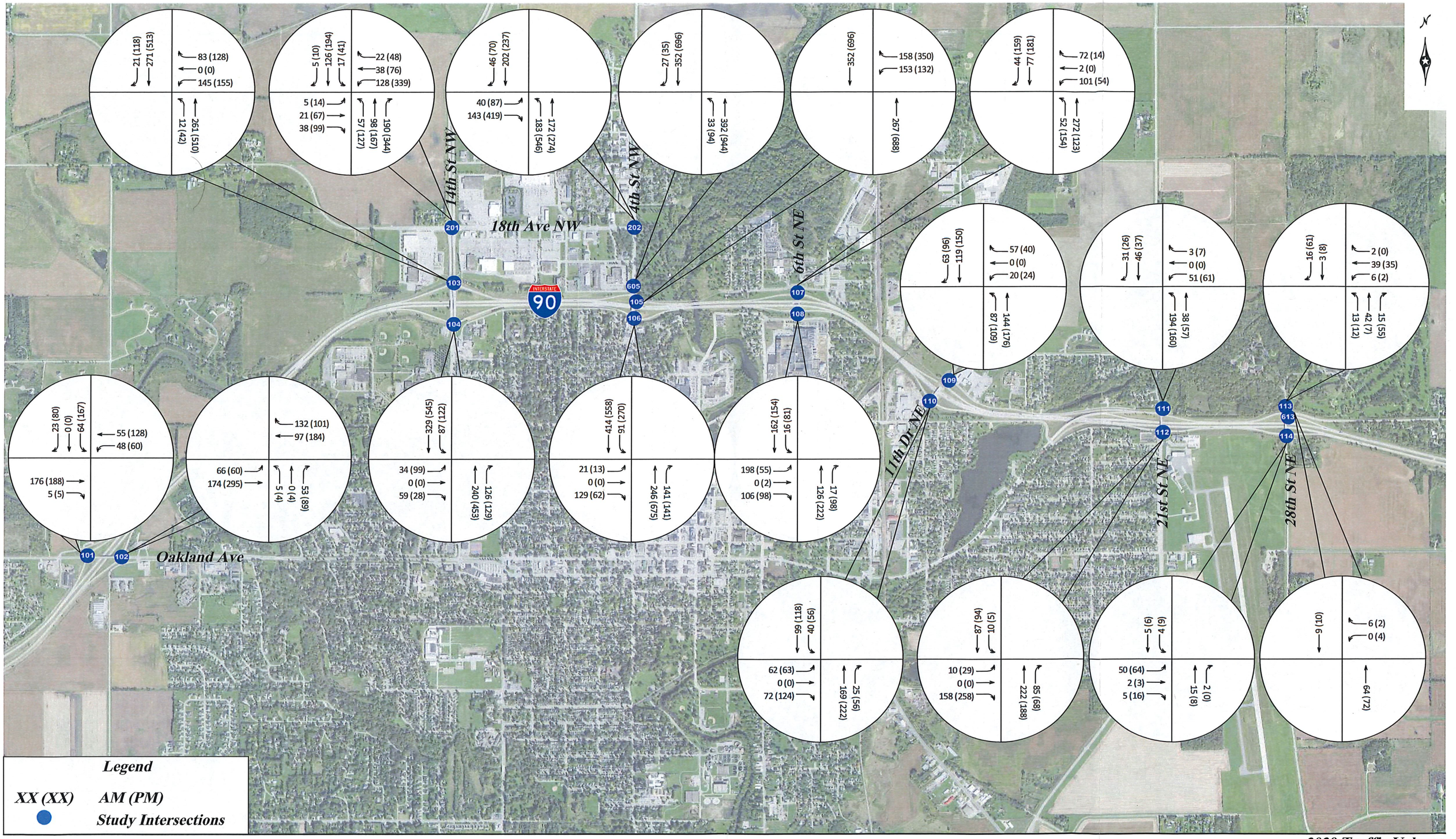

I-90 Bridges (Austin, MN) Traffic Diversion

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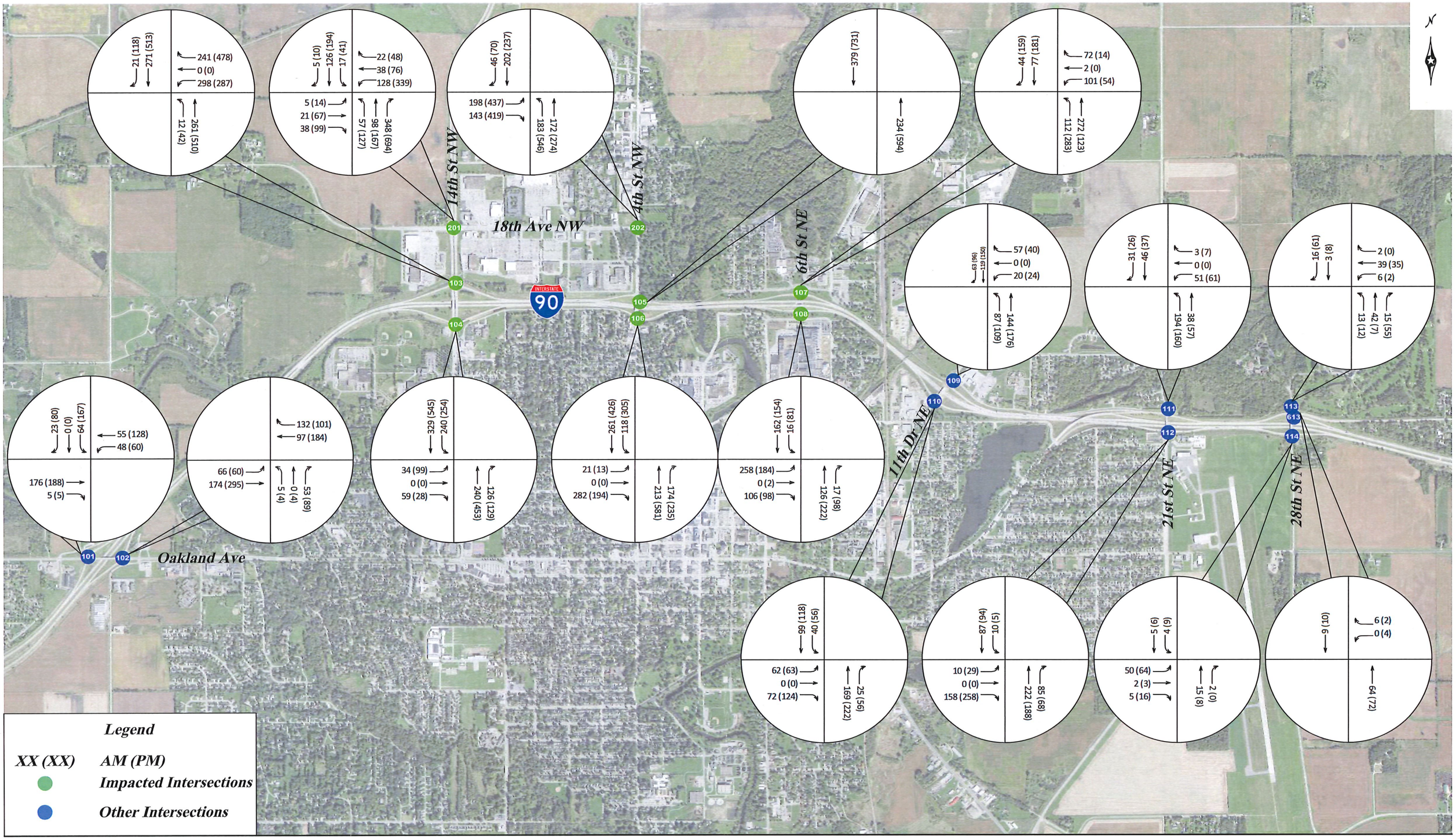
2020 Traffic Volume
Base Scenario



I-90 Bridges (Austin, MN) Traffic Diversion

2020 Traffic Volume
4st Street Plan 2 Phase 1 Scenario

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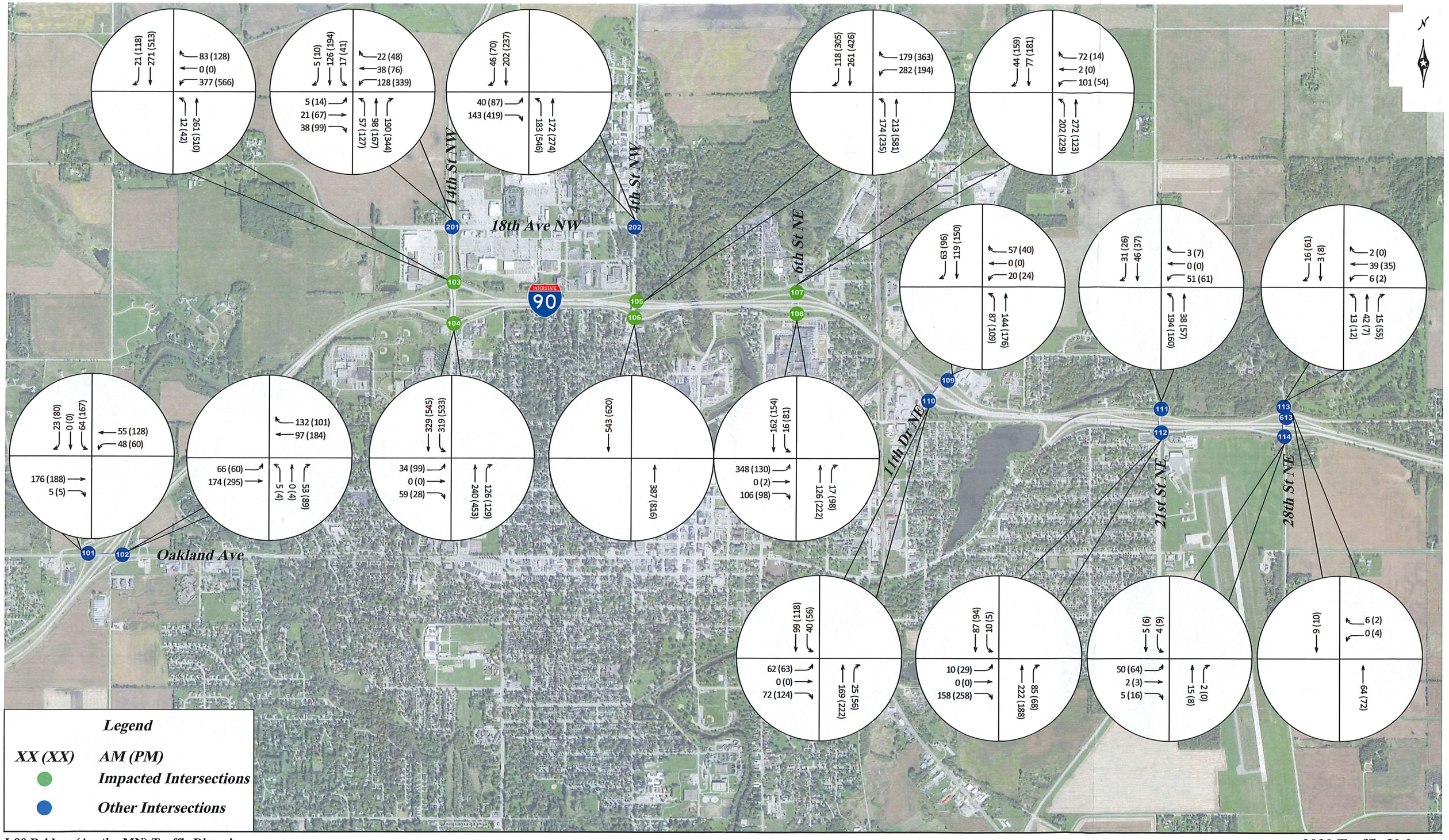

I-90 Bridges (Austin, MN) Traffic Diversion

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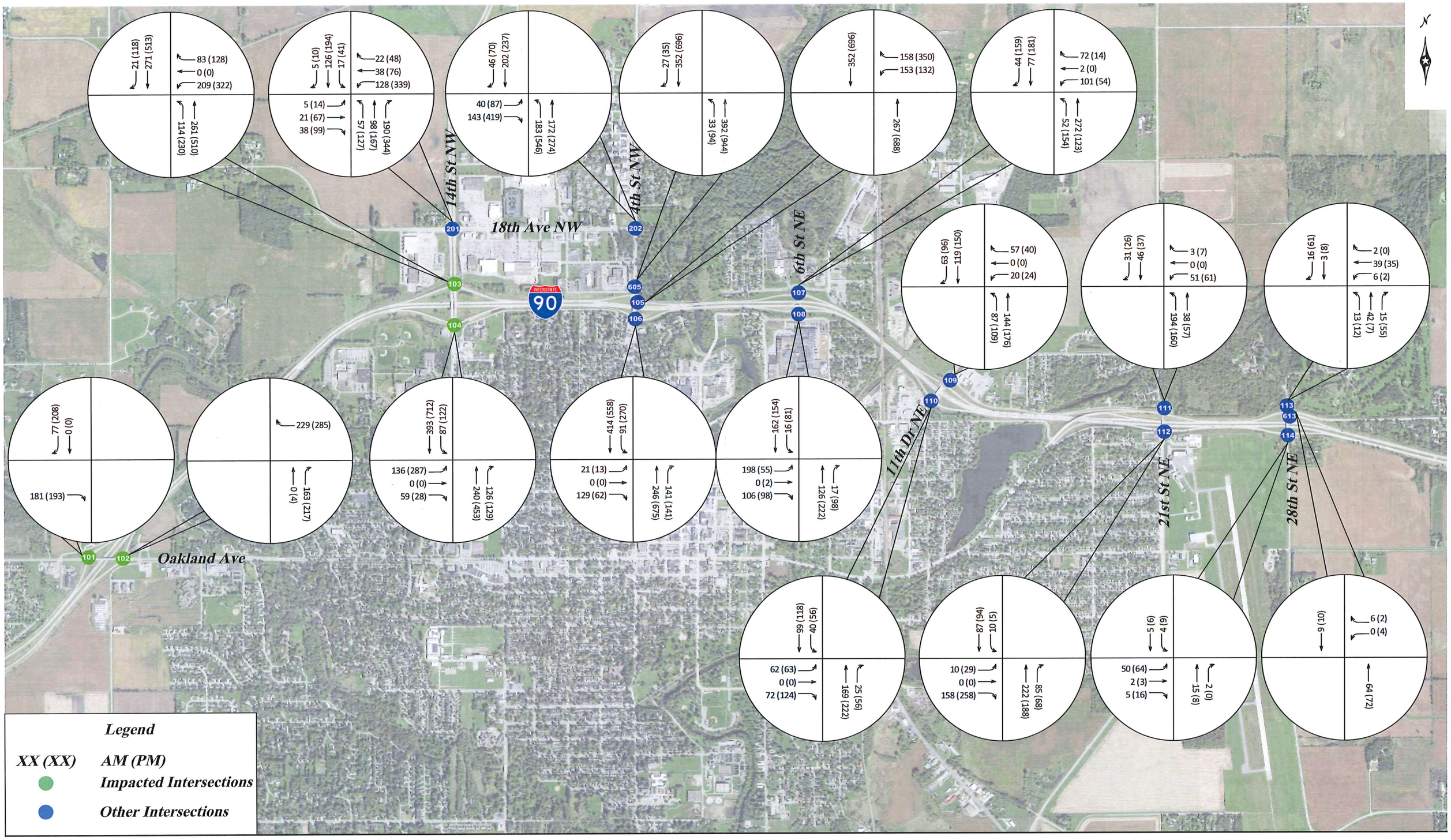
2020 Traffic Volume
4st Street Plan 2 Phase 2 Scenario



I-90 Bridges (Austin, MN) Traffic Diversion

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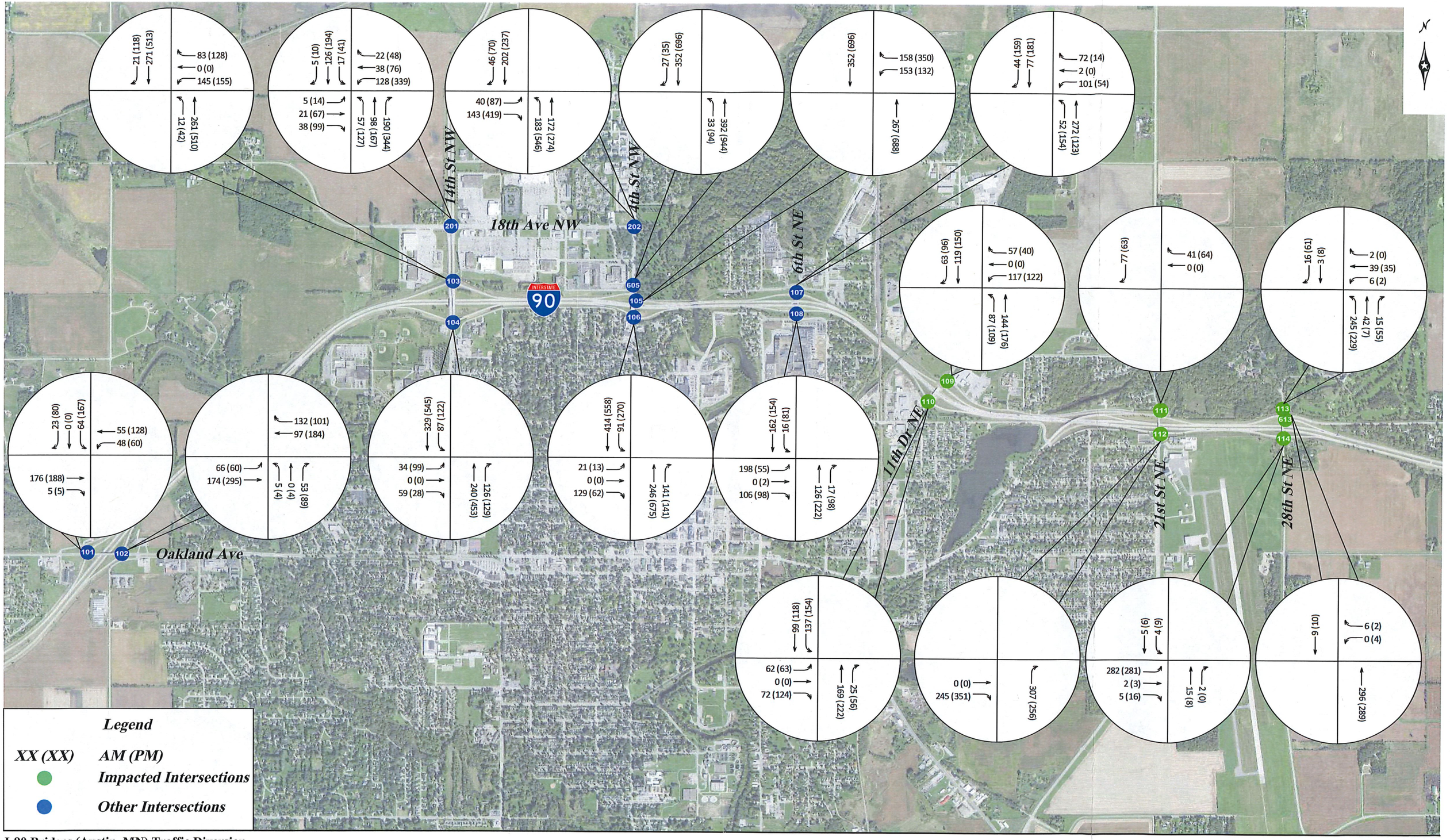
2020 Traffic Volume
Oakland Avenue Scenario



I-90 Bridges (Austin, MN) Traffic Diversion

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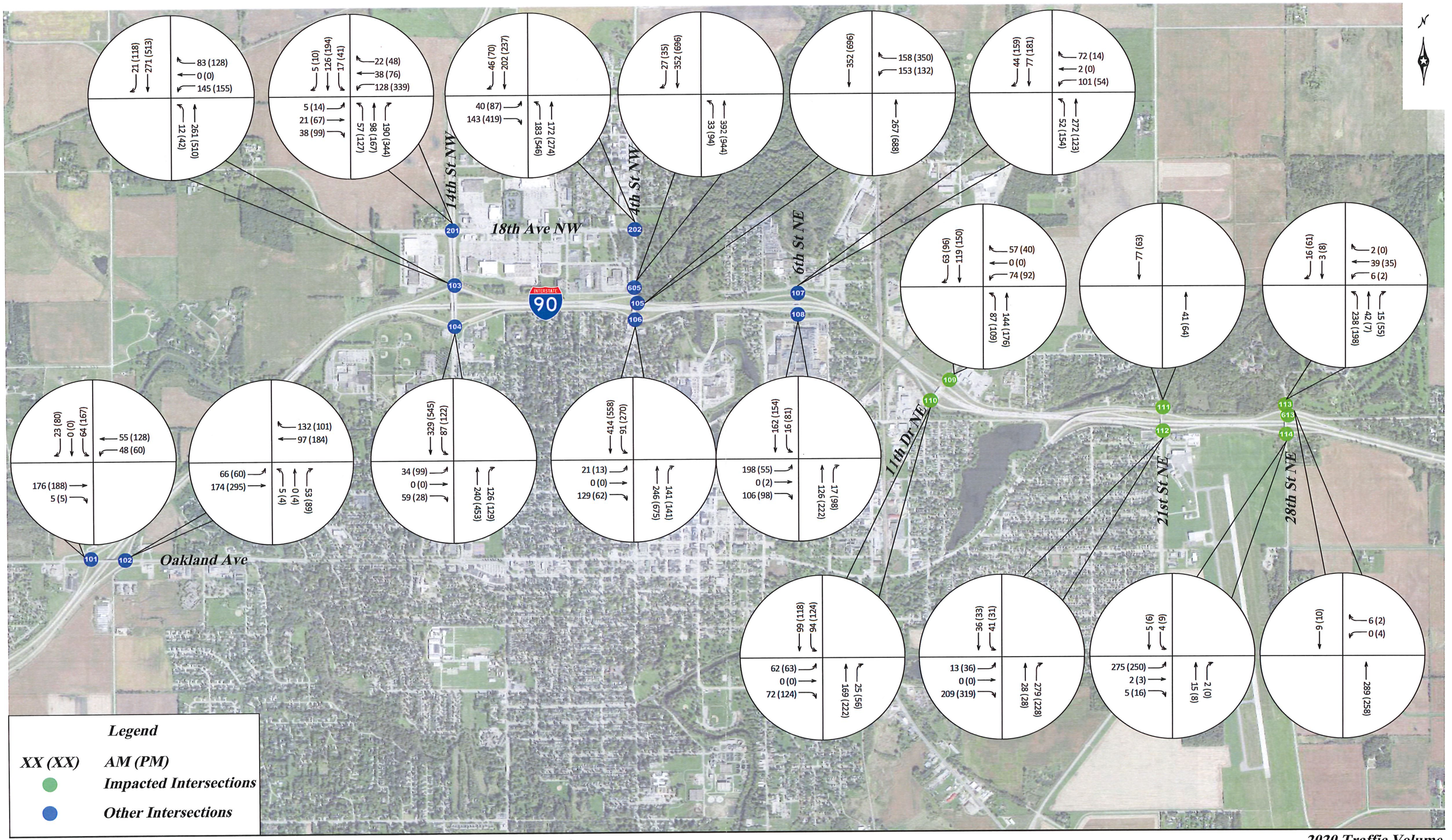
2020 Traffic Volume
21st Street Plan 1 Phase 1 Scenario



I-90 Bridges (Austin, MN) Traffic Diversion

2020 Traffic Volume
21st Street Plan 1 Phase 2A Scenario

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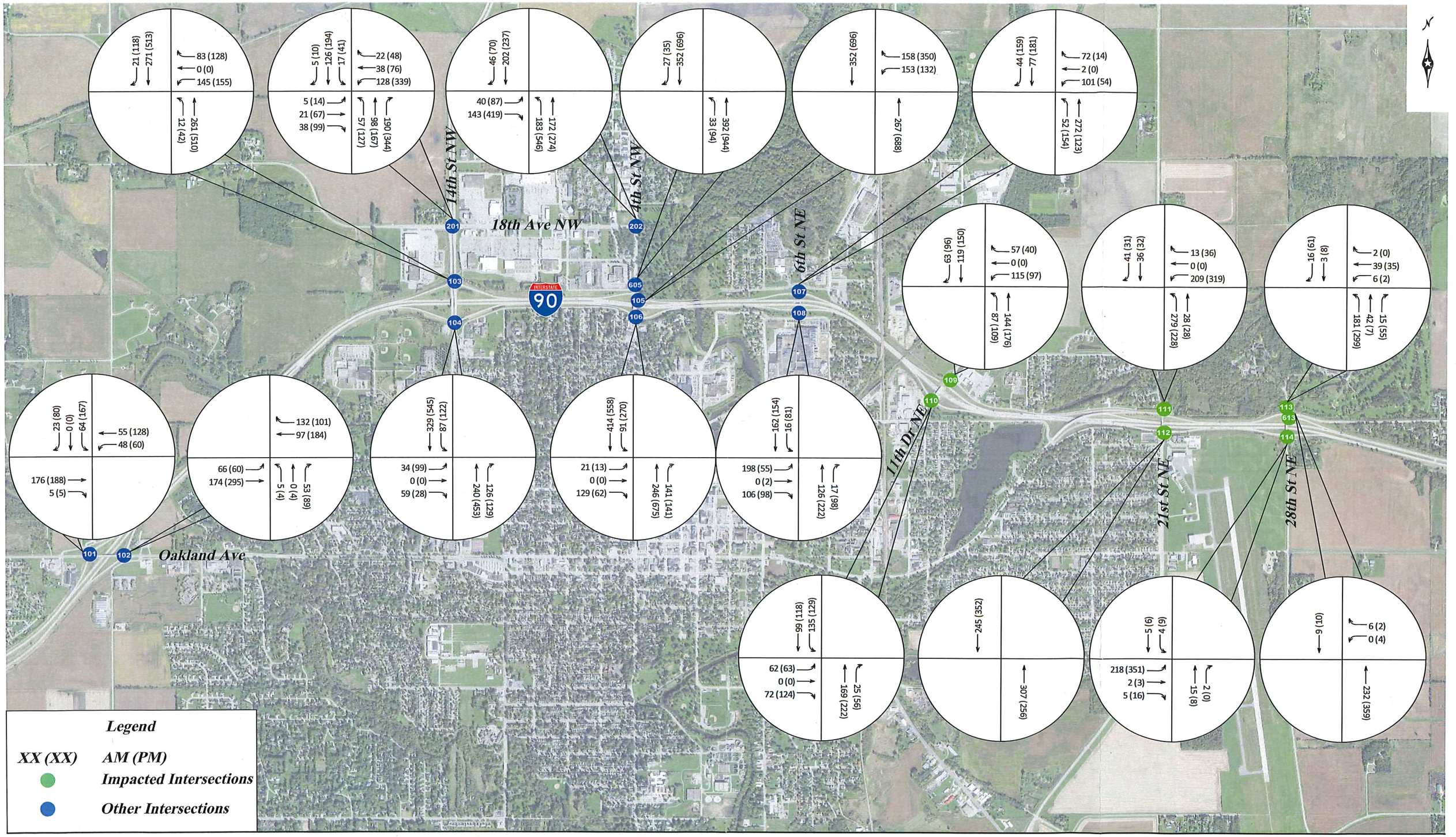

I-90 Bridges (Austin, MN) Traffic Diversion

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2020 Traffic Volume
21st Street Plan 1 Phase 2B Scenario