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MEMORANDUM

TO: Chad Hanson, MnDOT

FROM: Chris Hiniker, AICP

DATE: September 8, 2014

RE: Red Wing Bridge Project
Minnesota Approach Alternatives Identification, Evaluation, and Screening
SEH No. MNT06 119112 14.00

The purpose of this memorandum is to document the rationale followed to identify, evaluate, and screen the range of Minnesota Approach alternatives considered as part of the Red Wing River Bridge Project. The Minnesota Approach is the last segment of the larger project to be defined. The other primary project components already defined include:

- River Crossing: Replace the existing river bridge with a two-lane steel box girder bridge immediately upstream from the current crossing;
- Wisconsin Approach: Construct a “jug-handle” intersection at 825th Street. This design provides a four-legged intersection with a median on US 63.

The remainder of this memorandum details the process that was used to develop, evaluate and screen alternatives to identify the most feasible, practical, and responsive Minnesota roadway approach option(s). Central to the process were multiple meetings involving MnDOT and FHWA staff, as well as meetings with project stakeholders, City staff, Project Advisory Committee (PAC) and listening sessions). The meetings were held at regular intervals as the process advanced. The memo is structured to follow the iterative process that was applied and included the following major steps:

- Developed Purpose and Need Statement;
- Identified Initial Minnesota Approach Concepts;
- Conducted Initial Feasibility Assessment;
- Refined Minnesota Approach Alternatives;
- Updated Purpose and Need Statement;
- Reviewed Range of Minnesota Approach Alternatives;
- Conducted Alternatives Evaluation and Screening.

PURPOSE AND NEED STATEMENT

The Red Wing Bridge Project is being developed in accordance with the National Environmental Policy Act (NEPA). Developing a project's purpose and need statement is an important element of the NEPA process. Early in the Red Wing Bridge project development process, MnDOT and WisDOT worked closely with FHWA to define the project's purpose and need. As with many projects, the purpose and need has been a working document which has evolved as new/more detailed information became available as the project has progressed. The original purpose and need was dated August 15, 2012 and was updated on October 16, 2013. It included the following key elements:

Concept 2 - Three Leg At-Grade Signalized Intersection

This concept would remove the existing U.S. 63 Bridge (Bridge 9103) over U.S. 61 and create an at-grade T-intersection at the junction. The concept provides approximately 500 feet between the new intersection and Potter Street. The new intersection would require dual left turn lanes from U.S. 61 to U.S. 63. All other intersections would remain unchanged from the No Build conditions.

Concept 2



Concept 3 - Three Leg At-Grade Signalized Intersection (U.S. 63 Direct Connection)

This build alternative would remove Bridge 9103 over U.S. 61 and create an at-grade T-intersection at the junction; U.S. 63 would become the major movement with the east leg of U.S. 61 becoming the minor approach. This alternative provides approximately 500 feet between the new intersection and Potter Street.

Concept 3



Concept 4 - Four Leg At-Grade Signalized Intersection

This concept would remove the Bridge 9103 over U.S. 61 and create an at-grade four-leg signalized intersection. This alternative provides approximately 500 feet between the new intersection and Potter Street.

Concept 4



This concept is comparable to the Concept 2 except it retains the connection to and from 3rd Street. All other intersections would remain unchanged from the No Build conditions.

Concept 5 - Four Leg At-Grade Roundabout Intersection

This concept would remove the Bridge 9103 over U.S. 61 and create an at-grade four-leg roundabout at the new junction of U.S. 61 and U.S. 63.

Concept 5



This concept provides approximately 600 feet between the new intersection and Potter Street and is comparable to Concept 4 described earlier except the intersection control is a roundabout rather than a traffic signal. All other intersections would remain unchanged from the No Build conditions.

Concept 6 - Buttonhook Signalized Intersection

This concept would replace the Bridge 9103 over U.S. 61 and create a new at-grade signalized intersection east of downtown. It provides approximately 1,100 feet between the new intersection and Potter Street.

Concept 6

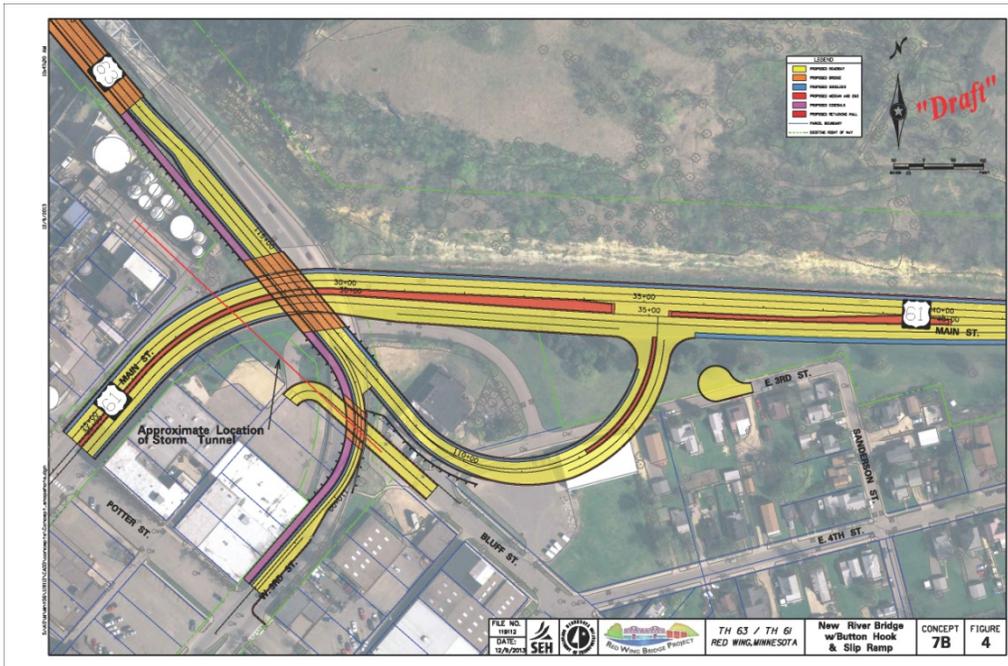


With this concept all river crossing traffic would flow through the new signalized intersection east of existing Bridge 9103. All other trunk highway intersections would remain unchanged from the No Build conditions.

Concept 7 - Buttonhook Signalized Intersection with Slip Ramp

This concept would replace the Bridge 9103 over U.S. 61 and create a new at-grade intersection east of downtown. In addition, the concept allows southbound U.S. 63 traffic to access downtown and MN 58 along a new one-way slip ramp to 3rd Street. This concept provides approximately 1,100 feet between the new intersection and Potter Street.

Concept 7



All other intersections would remain unchanged from the No Build conditions.

Concept 8 - Buttonhook Intersection (Roundabout) Retain Bridge 9103

This concept would retain Bridge 9103 over U.S. 61 and create a new at-grade intersection east of downtown. This intersection could either be a roundabout (as shown) or a signalized intersection. This alternative provides approximately 1,100 feet between the new intersection and Potter Street. This alternative is comparable to Concept 6 described earlier except the intersection control is a roundabout and the design assumes retaining Bridge 9103.

Concept 8



FEASIBILITY ASSESSMENT OF CONCEPTS

With the concepts defined each were analyzed with respect to traffic operations, safety, key environmental considerations, right-of-way impacts, design standards, estimated costs, complexity, and compatibility with a potential future parallel river crossing bridge. Table 1 presents the evaluation results reflecting these criteria.

A summary of the conclusions drawn from the evaluation are listed below. It is important to note that this evaluation was conducted in 2012. Since then additional analysis has been completed and decisions have been made. One key decision is that the river crossing will be a two lane facility.

- Concept 1: Rehabilitate Bridge 9103
 - Retains Bridge 9103 (eligible for National Register)
 - Poorest traffic operations of all concepts
 - Minimal right-of-way and environmental effects
 - Recommendation – retain for further consideration.
- Concept 2: Three Leg At Grade Intersection (U.S. 61 Direct Connection)
 - Poor traffic operations
 - U.S. 61 grade raise might require fill next to Barn Bluff
 - Would require a four-lane U.S. 63 Bridge
 - Recommendation – remove from consideration because of very poor traffic operations and it requires a four-lane river crossing.
- Concept 3: Three Leg At Grade Intersection (U.S. 63 Direct Connection)
 - Major impacts to ADM facility
 - U.S. 61 grade raise might require fill next to Barn Bluff
 - Recommendation – remove from consideration given substantial right-of-way impacts and poor geometry.
- Concept 4: Four Leg At Grade Intersection
 - Good traffic operations (assuming a four-lane river crossing)
 - U.S. 61 grade raise might require fill next to Barn Bluff
 - 3rd Street connection improves downtown operations
 - Would require four-lane U.S. 63 Bridge
 - Recommendation – remove from consideration because it requires a four lane river crossing.
- Concept 5: Four Leg At Grade Intersection – Roundabout
 - Good traffic operations
 - Does not accommodate large trucks
 - Requires extensive right-of-way acquisition
 - Would require four-lane U.S. 63 Bridge
 - Recommendation – remove from consideration because it requires a four lane river crossing and does not accommodate large trucks.
- Concept 6: Button Hook Intersection
 - Improved traffic operations compared to over No-Build

- U.S. 61 at Plum Street Intersection still congested
- Works with either two-lane or four-lane U.S. 63 Bridge
- Recommendation – remove from consideration in lieu of Concept 7 which has much better traffic operations and retains more favorable access to MN 58 and downtown.

- Concept 7: Button Hook Intersection with Slip Ramp
 - Best traffic operations
 - 3rd Street connection improves downtown operations
 - Works with either two-lane or four-lane U.S. 63 Bridge
 - Recommendation – retain for further consideration.

- Concept 8: Button Hook Intersection – Roundabout
 - Decent traffic operations
 - U.S. 61 at Plum Street Intersection still congested
 - Does not accommodate large trucks
 - Works with either two-lane or four-lane U.S. 63 Bridge
 - Recommendation – remove from consideration because of substantial right-of-way impacts and it does not accommodate large trucks.

In summary, based on this initial assessment and stakeholder input, the following concepts were identified to be carried forward for further consideration:

- Concept 1 – Rehabilitate Bridge 9103
- Concept 7 – Button Hook Intersection with Slip Ramp

REFINED MINNESOTA APPROACH ALTERNATIVES

Moving forward with the recommended concepts, additional design work was completed and coordination between MnDOT and FHWA staff was conducted. Much of these efforts focused on ensuring a full consideration of concepts that would enable Bridge 9103 to be retained given its National Register status. The additional sub-options to Concept 1 include:

Sub-Option A

This concept was developed as an attempt to better address the downtown commercial historic district traffic issues while avoiding substantial right-of-way impacts. It includes signal timing modifications as well as capacity improvements including turn lane modifications, removal of some on-street parking, some sidewalk narrowing, curb radii modifications, and additional through lanes through restriping (Figure 1 - attached).

Sub-Option B

This concept builds from Sub-Option A and attempts to more fully address the network related traffic issues referenced above. It includes even more substantial modifications to the downtown street network including additional through lanes and longer turn lanes. These modifications would require removal of additional on-street parking, further sidewalk impacts, and impact Dankers Park in the southeast quadrant of the Plum Street/3rd Street intersection. (Figure 2 - attached).

Sub-Option C

Given Sub-Options A and B do not fully address the issues associated with the overlapping trunk highway system in downtown Red Wing, even more substantial changes to the downtown street network were considered. It was concluded the only effective solution to address all of the issues would be to redirect the majority of traffic from Main Street to 3rd Street. This would be accomplished by constructing a new

road segment from Main Street to 3rd Street between Dakota Street and West Avenue. In turn, Main Street would be realigned near West Avenue to connect with the newly realigned Main Street to 3rd Street connection (Figure 3 - attached). With this modification 3rd Street through downtown would become Highway 63 and traffic destined to the river crossing and Highway 58 south, would use 3rd Street rather than Main Street.

MnDOT and FHWA staff concluded that Sub-Option A was the only potentially viable sub-option to carry forward given the substantial right-of-way impacts and increased social, economic, and environmental (SEE) impacts to the downtown commercial historic district associated with Sub-Options B and C.

As a result of the extensive refinement efforts, five Minnesota Approach alternatives were defined for more detailed evaluation.

The alternatives are illustrated in Figures 47 (attached) and defined in detail as follows:

- Alternative MN-1 (former Concept 1): This alternative involves rehabilitating Bridge 9103 as documented in the Bridge 9103 Rehabilitation Study, August 2013. For purposes of this evaluation it is assumed this alternative includes cathodic protection and installation of a TL-2 railing. Cathodic protection is assumed because it is necessary to extend the service life of the rehabilitation project to the 20 year planning horizon. The TL-2 railing is assumed because it does not affect the historic eligibility of Bridge 9103, is relatively low cost, and represents a substantial safety benefit.
- Alternative MN-1A (former Concept 1 with Sub-Option A): This alternative includes rehabilitating Bridge 9103 as documented in the Bridge 9103 Rehabilitation Study, August 2013. For purposes of this evaluation it is assumed this alternative includes cathodic protection and the TL-2 railing. This alternative also includes modifications to the downtown Red Wing street network proposed to retain reasonable traffic operations through the 2042 forecast year (see Figures 4 and 5). The improvements identified in Figure 2 reflect a balance between maximizing opportunities to improve traffic flow and minimizing right-of-way, parking, and sidewalk impacts. The proposed improvements were defined through an iterative process which involved developing incremental changes and testing their effectiveness using the detailed traffic model developed for the overall project. This iterative process resulted in the improvements reflected in Figure 5.

The collective adjustments to lane configurations and on-street parking, as well as the curb and sidewalk modifications illustrated in Figure 5, do improve existing and forecast traffic operations. However, substantial roadway network issues associated with the tight urban grid pattern and overlapping trunk highway system result in substantial queuing, conflicting turning movements, congestion, and delays.

- Alternative MN-2 (new alternative, not studied in feasibility concepts): This is an additional alternative that allows retaining the existing roadway network, minimizing most environmental impacts, but removing Bridge 9103 and replacing it with a new bridge structure (see Figure 3). This alternative was added to allow for comparison of costs between Alternative MN-1 (rehabilitation of Bridge 9103) and a new bridge [with longer service life and lower on-going maintenance costs].
- Alternative MN-2A: Similar to Alternative 2, this option involves replacement of Bridge 9103 with a new bridge that maintains the existing approach roadway system with US 63 connecting into downtown Red Wing via 3rd Street. This alternative also includes modifications to the downtown Red Wing street network proposed to retain reasonable traffic operations through the 2042 forecast year (see Figures 5 and 6). The identified downtown street improvements are the same as Alternative MN-1A.
- Alternative MN-3 (former Concept 7): This alternative includes replacing Bridge 9103 with a new structure and button-hook ramp configuration that reorients the connection of US 63 to US 61 immediately east of downtown Red Wing. This alternative also includes a one-way slip-ramp which provides an option for southbound US 63 traffic to continue to have a direct access to downtown Red Wing and MN 58 via 3rd Street (see Figure 7).

UPDATED PURPOSE AND NEED STATEMENT

Since completing the original project purpose and need statement in 2012, additional traffic studies performed as part of the concept/feasibility analysis highlighted more substantial traffic mobility issues than what was initially evident from the analysis completed in 2011 and 2012. The more recent traffic analyses showed that operational issues were more of a network mobility problem rather than an intersection problem, as previously documented. The shift in focus from an intersection perspective to a network perspective was important because it highlighted that the primary traffic issues were tied to the trunk highway network in the downtown area, not a specific intersection or intersections. Building from the expanded technical analysis, MNDOT met with City of Red Wing staff to ensure the community's perspectives and concerns were clearly understood. Through this coordination, City staff indicated that in addition to the motorized traffic issues, that nonmotorized travel is a major challenge in the downtown area. In particular the trunk highway segments (Main Street, Plum Street) are major challenges for pedestrian and bicyclist circulation.

Thorough review of this information led to discussions centered on refining the purpose and need to better account for motorized and non-motorized mobility issues along the trunk highway segments that extend through downtown Red Wing and connect to the river crossing. In addition, the mobility issues and concerns identified in the technical studies were consistent with public input received through the project's public engagement process. Given this information, MnDOT and FHWA concurred that "Need to Improve Motorized and Non-motorized Traffic Mobility on Trunk Highways within the Downtown Red Wing Commercial/Historic District" should become a primary need. Project stakeholders were given an opportunity to comment on these changes to the purpose and need through ongoing public engagement efforts. Stakeholders were supportive of mobility being designated as a primary need.

The major elements of the refined/updated purpose and need are as follows (additions are in italics and deletions are strike-through text):

Primary Needs:

- Need for Structurally Sound Crossing of the Mississippi River Main Channel at Red Wing
- Need for Structurally Sound Crossing of US 61
- *Need to Improve Motorized and Non-Motorized Traffic Mobility on Trunk Highways within the Downtown Red Wing Commercial/Historic District*

Secondary Needs:

- Need for Continuity of US 63
- Need for Connection to US 61 and MN 58
- Need for Adequate Bridge Capacity
- ~~Need for Acceptable Traffic Operations and Safe Design~~
- Need for Maximum Maintenance of Traffic
- Need for Access to Trenton Island
- Need to Maintain or Improve Pedestrian/Bicycle Facilities *on the US 63 River Bridge and US 61 Overpass*

Other Considerations:

- Structural Redundancy
- Wisconsin Corridors 2030 Plan
- Geometrics
- Economic development
- Parking

- Regulatory Requirements
- Property Impacts

REVIEW RANGE OF MINNESOTA APPROACH ALTERNATIVES

Following the update of the purpose and need, it was necessary to determine whether the alternatives defined previously should be modified and/or if additional alternatives needed to be considered. This step included a review of the technical information and reaching out to the public to provide an opportunity to review the refined purpose and need and potentially suggest new alternatives. The revised purpose and need was presented at a project listening session on May 27, 2014 and attendees were provided the opportunity to suggest different alternatives.

No written public input was received at the listening session regarding the refined purpose and need and no additional Minnesota approach alternatives were identified for consideration.

In addition, a separate meeting was held with City planning/engineering staff to discuss mobility issues downtown, including options the City has considered to address non-motorized traffic mobility, to determine if additional non-motorized alternative elements should be considered. Two concepts for potential improving pedestrian mobility were reviewed with City staff: 1) restricting pedestrian crossing opportunities [i.e., identifying 1 or 2 legs at the intersection as 'no ped crossing'] at high volume intersections, to decrease turning conflicts and 2) posting high volume intersections as 'No Turn on Red' for motor vehicles. City staff indicated that these options had been considered by the City before and rejected as not being feasible or effective. Therefore, these were not considered further for the Minnesota approach alternatives.

Since no new/additional feasible alternatives were identified in this review process, the five alternatives documented earlier in this memorandum were retained and carried forward for evaluation and screening. The alternatives include:

- MN-1
- MN-1A
- MN-2
- MN-2A
- MN-3

ALTERNATIVES EVALUATION AND SCREENING

The alternatives evaluation and screening process centered on assembling a comprehensive list of evaluation criteria and applying the criteria to the Minnesota approach alternatives discussed above. The criteria were developed to account for and reflect the purpose and need statement, social, economic, and environmental (SEE) factors, and cost considerations. The evaluation criteria and five approach alternatives were organized into a comprehensive evaluation matrix to facilitate the evaluation and screening process (see Table 2 - attached).

MnDOT and FHWA staff met several times to review the matrix and discuss the screening process and results. The outcomes of these discussions are summarized below.

Alternatives Not Carried Forward for Further Consideration After Screening

It was concluded that Alternatives MN-1A and MN-2A should be eliminated from further consideration after initial screening because:

- They would introduce a Section 106 adverse effect (and a resulting Section 4(f) use) to the Downtown Commercial/Historic District;

- They would introduce a Section 4(f) impact to Dankers Park in Downtown Red Wing;
- The alternatives were originally developed in an effort to address the operational 'needs' related to geometrics (i.e., turning radii and turn lanes); however, the subsequent traffic analysis concluded they do not adequately address the overall trunk highway network mobility needs through the year 2042 forecast period. This, plus the identified Section 106 and 4(f) impacts with no other potential SEE benefits that would warrant retaining these alternatives, were the basis for dismissing these alternatives.

MnDOT and FHWA staff also concluded given full consideration of the purpose and need, SEE impacts, and cost factors included in the evaluation matrix that Alternative MN-2 should be removed from further consideration because it does not meet the primary need related to mobility, and results in removal of Bridge 9103, which would result in an adverse effect under Section 106 and result in a Section 4(f) use.

Alternatives to be Carried Forward for Further Documentation Following Screening

Following screening, only MN-1 and MN-3 remained as potential Minnesota approach alternatives. Staff discussed in great detail the relative trade-offs between the alternatives, which can be summarized as follows:

- MN-1
 - Positive attributes (compared to MN-3):
 - Retains Bridge 9103, thereby avoiding a Section 106 adverse effect and Section 4(f) impact;
 - Fewer right-of-way impacts;
 - No substantial changes in noise levels anticipated;
 - Lower capital cost
 - Negative attributes (compared to MN-3):
 - Greater motorized traffic mobility issues (network delay, longer queuing, longer travel times); Does not address mobility issues related to traffic volumes and pedestrian circulation/safety in the downtown commercial/historic district – therefore, this alternative does not meet the primary need to address mobility issues. Mobility issues are discussed in greater detail in the March 25, 2014 Traffic Analysis Report; also,
 - Higher on-going bridge maintenance costs; and
 - Shorter bridge service life
- MN-3
 - Positive attributes (compared to MN-1):
 - Improved mobility issues (reduced network delay, shorter queues, shorter travel times); the only alternative that meets the primary needs and fully addresses mobility issues related to traffic volumes and pedestrian circulation/safety in the commercial/historic district. Figure 8 illustrates the mobility benefits of MN-3, including the reduction in traffic volumes on Plum Street (MN 58) between U.S. 61 and 3rd Street (nearly 50% in the AM peak hour and 30% in the PM peak hour respectively). Mobility issues are discussed in greater detail in the March 25, 2014 Traffic Analysis Report;
 - Lower on-going bridge maintenance costs;
 - Longer bridge service life
 - Negative attributes (compared to MN-3):
 - Removes Bridge 9103 (a Section 106 adverse effect and Section 4(f) impact);
 - Greater right-of-way impacts;

- Potential increase in noise levels at residences adjacent to button hook loop;
- Higher capital cost;

Reflecting on these trade-offs, staff concurred with the following recommendations:

- Advance MN-3 as the recommended alternative, because it is the only alternative that addresses all of the primary purpose and need elements;
- Obtain input from SHPO and other Section 106 process stakeholders;
- Complete the Section 4(f) evaluation/decision-making and documentation process, including detailed consideration of Alternative MN-1, since it is the Section 4(f) avoidance alternative;
- Provide detailed documentation of the alternatives evaluation and decision-making process in the Environmental Assessment document

ah

Attachments:

Table 1 - Red Wing Roadway Initial Concepts Matrix

Figure 1 – Sub-Option A

Figure 2 – Sub-Option B

Figure 3 – Sub-Option C

Figure 4 - Concept MN-1

Figure 5 - Downtown Red Wing Street Network Improvements

Figure 6 - Concept MN-2

Figure 7 - Concept MN-3

Table 2 - Minnesota Approach Alternatives Evaluation Matrix

Figure 8 – Change in Traffic Demand Alternative 1 and 2 vs. Alternative 3

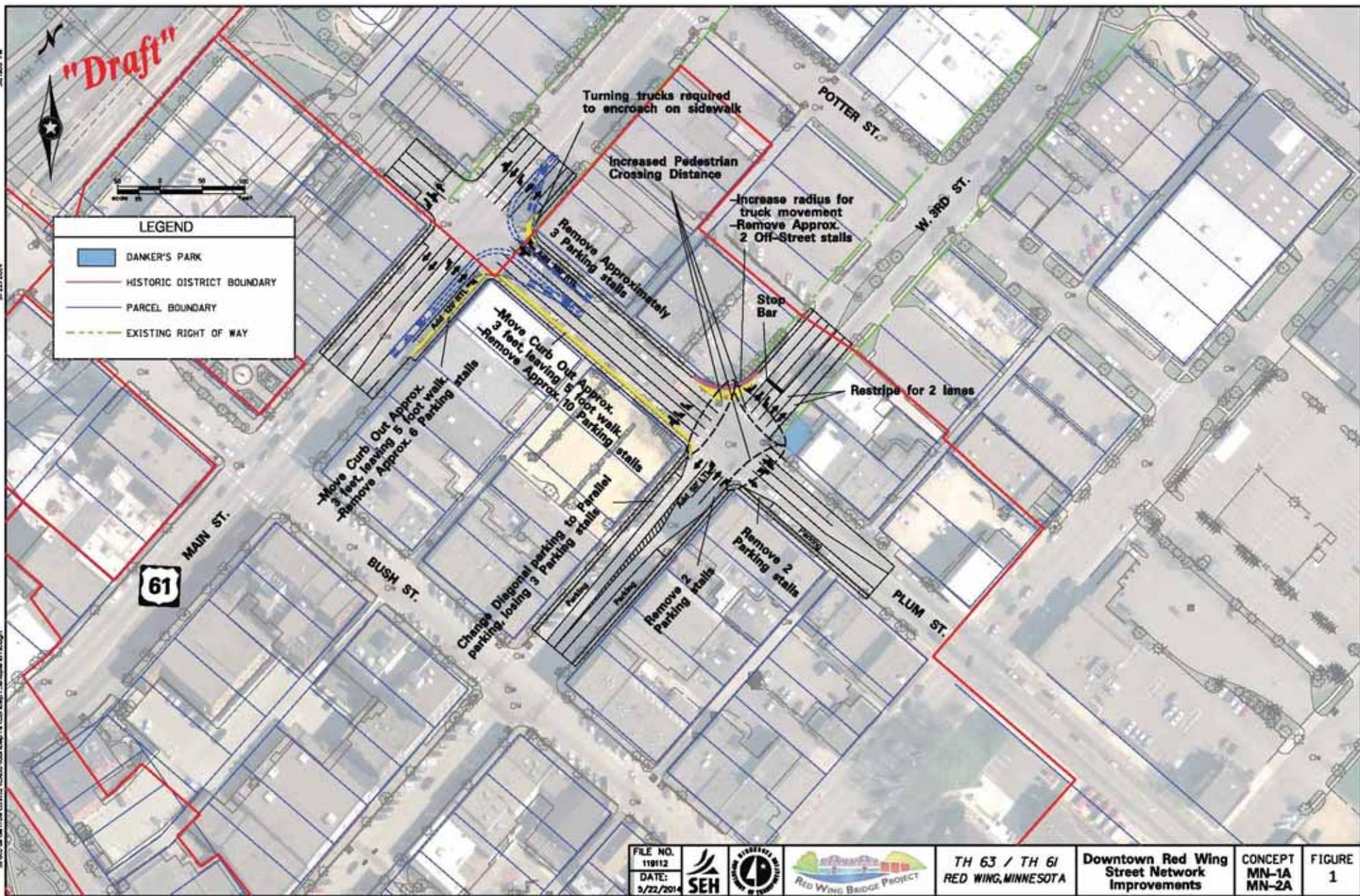
Table 1 - Red Wing Bridge Project Approach Roadway Concept Alternative Evaluation Matrix – 7/11/12

Evaluation Criteria	Concept 1 Rehabilitate Bridge 9103	Concept 2 Three-Leg At Grade Intersection	Concept 3 Three-Leg At Grade Intersection (63 Direct Connection)	Concept 4 Four-Leg At Grade	Concept 5 Four-Leg At Grade with Roundabout	Concept 6 Buttonhook Intersection	Concept 7 Buttonhook Intersection with Slip Ramp	Concept 8 Buttonhook Intersection with Roundabout
Traffic Operations/Mobility <ul style="list-style-type: none"> TH 63 TH 61 Downtown Red Wing Access for Local Businesses 	Poorest traffic operations in year 2042	Poor operations in year 2042. Does not work with two-lane river crossing. Directs TH 63 traffic out of downtown Red Wing Shore access reconfigured Reduces traffic congestion at 3 rd /Plum Increased traffic at US 61/Plum	Directs TH 63 traffic out of downtown Promotes primary river crossing movement Red Wing Shoe access reconfigured Reduces traffic congestion at 3 rd /Plum Increased traffic at US 61/Plum	More favorable year 2042 traffic operations assuming a four lane river crossing Greater impact to Red Wing Shoe access Reduces traffic congestion at 3 rd /Plum More direct connection to TH 58 compared to Concepts 2 and 3	Favorable year 2042 traffic operations Truck path overlap between lanes might reduce capacity Greater impact to Red Wing Shoe access Reduces traffic congestion at 3 rd /Plum	Acceptable 2042 traffic operations, though queuing problems exist Directs TH 63 traffic out of downtown Red Wing Shoe access reconfigured Reduces traffic congestion at 3 rd /Plum Increased traffic at US 61/Plum	Most favorable year 2042 traffic operations Directs portion of TH 63 traffic out of downtown Red Wing Shoe access reconfigured Reduces congestion at 3 rd /Plum More direct connection to TH 58 compared to Concept 6	Favorable year 2042 traffic operations Truck path overlap between lanes might reduce capacity Directs TH 63 traffic out of downtown Greater impact to Red Wing Shoe access Reduces traffic congestion at 3 rd /Plum
Safety <ul style="list-style-type: none"> Driver Expectancy Pedestrian/Bicycle Friendliness 	As currently exists	Standard intersection Sidewalk/Trail provided	Standard intersection Sidewalk/Trail provided	Standard 4-Leg intersection Sidewalk/Trail provided	Roundabout Sidewalk/Trail provided	Controlled intersection Sidewalk/Trail provided	Controlled intersection Sidewalk/Trail provided	Controlled intersection Sidewalk/Trail provided
Environmental Impacts <ul style="list-style-type: none"> Section 106 Section 4(f) Soil Conditions (Geotech/Contamination) 	Minimal	Bridge 9103 removal (Section 106 and 4f) TH 61 grade raise may require fill next to Barn Bluff Unknown soil conditions at warehouse building site	Bridge 9103 removal (Section 106 and 4f) TH 61 grade raise may require fill next to Barn Bluff Unknown soil conditions at warehouse building site	Bridge 9103 removal (Section 106 and 4f) TH 61 grade raise may require fill next to Barn Bluff Unknown soil conditions at warehouse building site	Bridge 9103 removal (Section 106 and 4f) TH 61 alignment pulled away from Barn Bluff; TH 63 alignment shifted closer Unknown soil conditions at warehouse building site	Bridge 9103 removal (Section 106 and 4f) Minimal Unknown soil conditions at warehouse building site	Bridge 9103 removal (Section 106 and 4f) Minimal Unknown soil conditions at warehouse building site	Able to maintain Bridge 9103 Minimal Unknown soil conditions at warehouse building site
Right-of-Way/Property Impacts <ul style="list-style-type: none"> Proximity to Housing Visual/Noise Access Acquisitions 	Minimal/As currently exists	Staging would likely require acquisition of warehouse building	Major impacts to ADM	Staging would likely require acquisition of warehouse building	Extensive R/W acquisition	Closer to residential development with extensive R/W acquisition	Closer to residential development with extensive R/W acquisition	Closer to residential development with R/W acquisition
Design Standards	As currently met	Meets 30 mph design	Meets 30 mph design	Meets 30 mph design	Meets 30 mph design	Meets 30 mph design	Meets 30 mph design	Meets 30 mph design
Estimated Construction Cost (not TPC)	TBD	\$3.6M	\$3.4M	\$4.3M	\$4.0M	\$6.4M	\$6.6M	\$3.9M
Construction Staging and Complexity/MOT	Minor impact for Bridge Rehab	Divert TH 61 via temp alignment/Construct TH 63 in halves	Construct TH 61 in halves/under traffic	Divert TH 61 via temp alignment/Construct TH 63 in halves	Complex – non-closure requires shifted roundabout; several stages	Moderate – buttonhook constructed off-line and bridge in halves	Moderate – buttonhook constructed off-line and bridge in halves	Moderate – buttonhook constructed off-line and bridge in halves
Compatibility with Parallel Bridge	Compatible – walls required	Compatible – walls required	Non-compatible without extensive R/W impacts	Compatible – walls required	Compatible – walls required	Less compatible – would require wider bridge over TH 61	Less compatible – would require wider bridge over TH 61	Compatible – would likely require exception on bridge over TH 61

3/15/2014

3/23/2014

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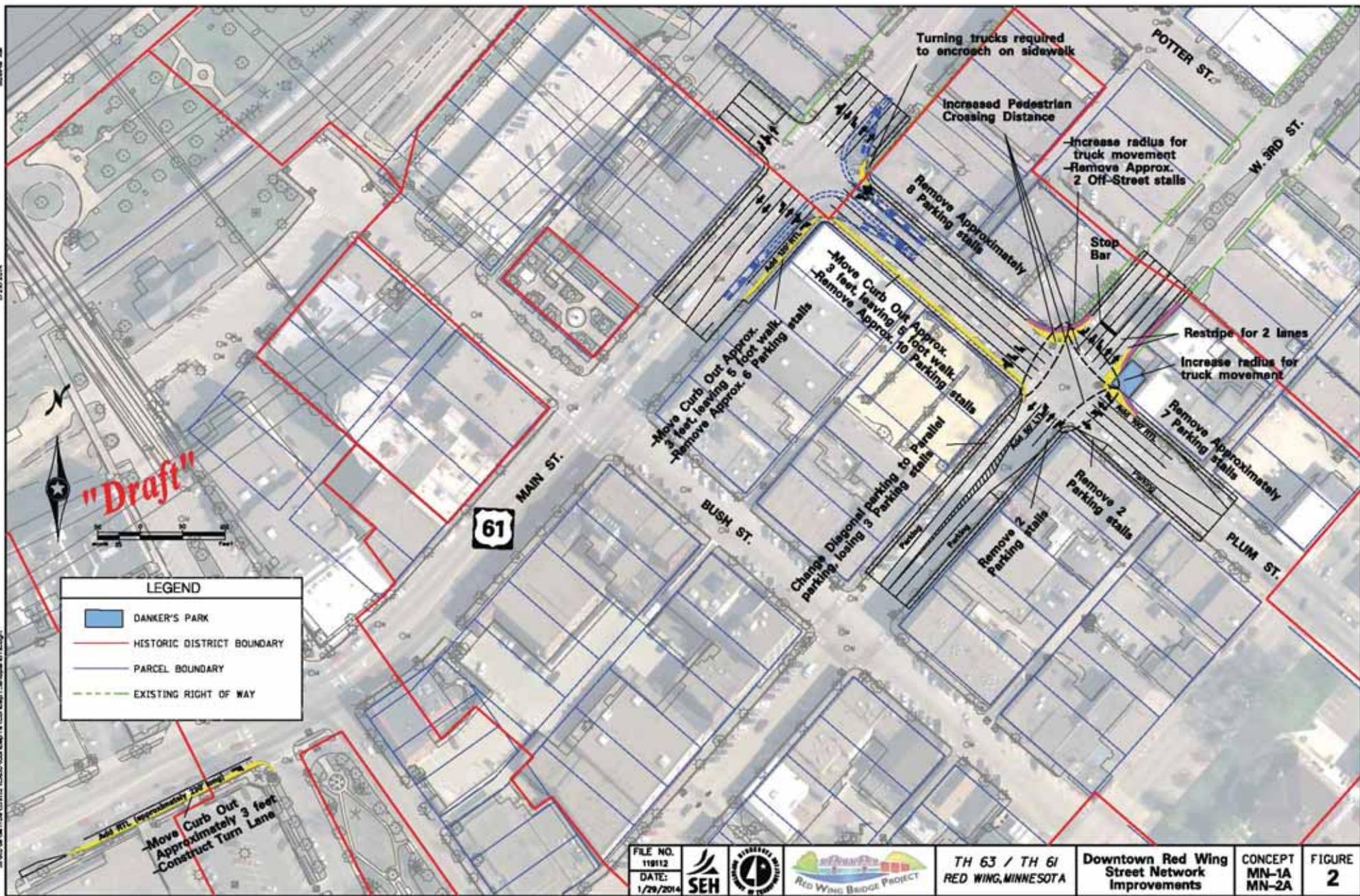
LEGEND

- DANKER'S PARK
- HISTORIC DISTRICT BOUNDARY
- PARCEL BOUNDARY
- EXISTING RIGHT OF WAY

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LEGEND	
	DANKER'S PARK
	HISTORIC DISTRICT BOUNDARY
	PARCEL BOUNDARY
	EXISTING RIGHT OF WAY

FILE NO. 118112
DATE: 1/29/2014



TH 63 / TH 61
RED WING, MINNESOTA

Downtown Red Wing
Street Network
Improvements

CONCEPT
MN-1A
MN-2A

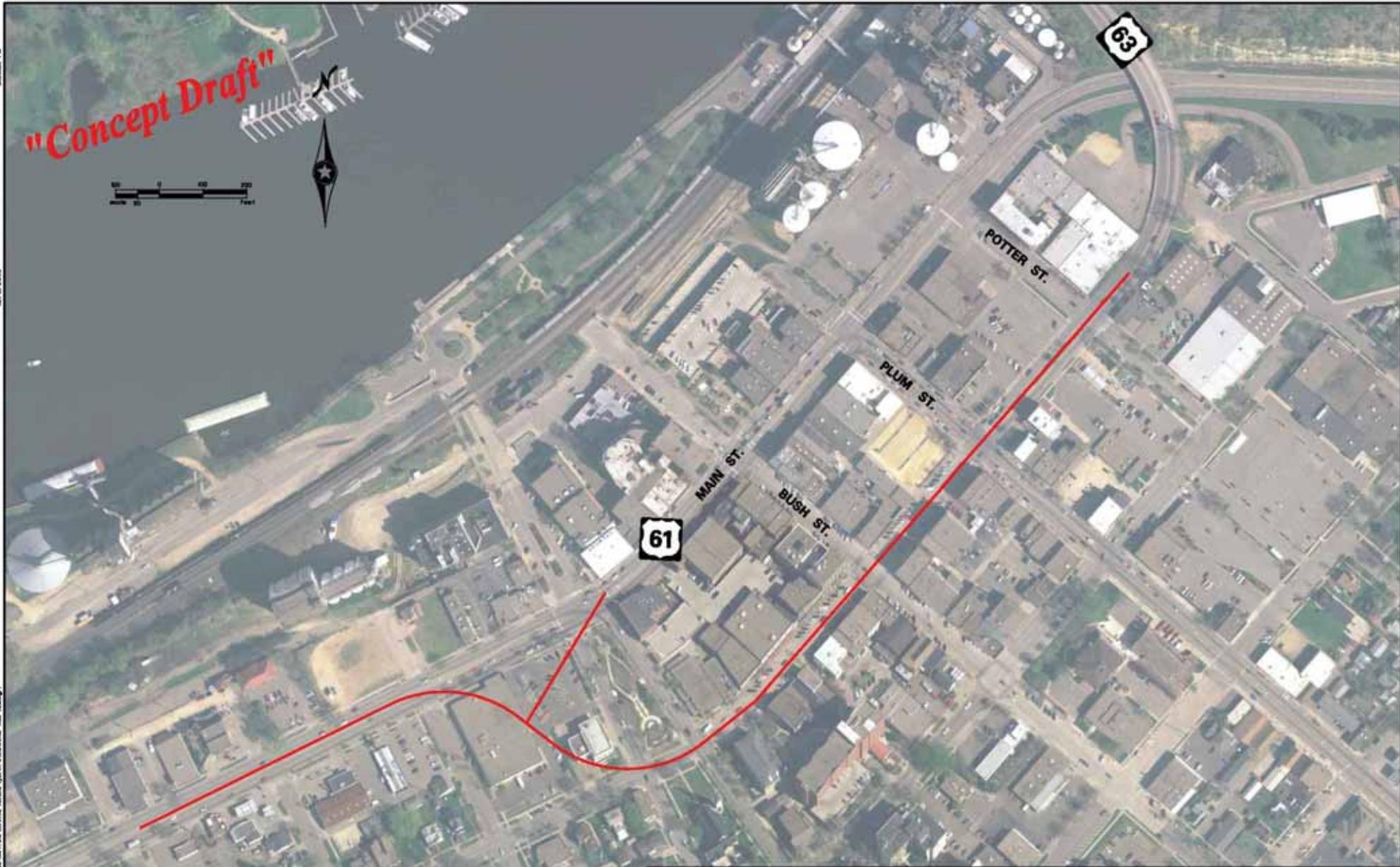
FIGURE
2

SCALE IN

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"Concept Draft"



FILE NO.
118112
DATE:
12/3/2013



TH 63 / TH 61
RED WING, MINNESOTA

Required Downtown Street
Realignment to Address
Trunk Highway Network Issues

FIGURE
3

3/11/2024 PM

3/22/2024

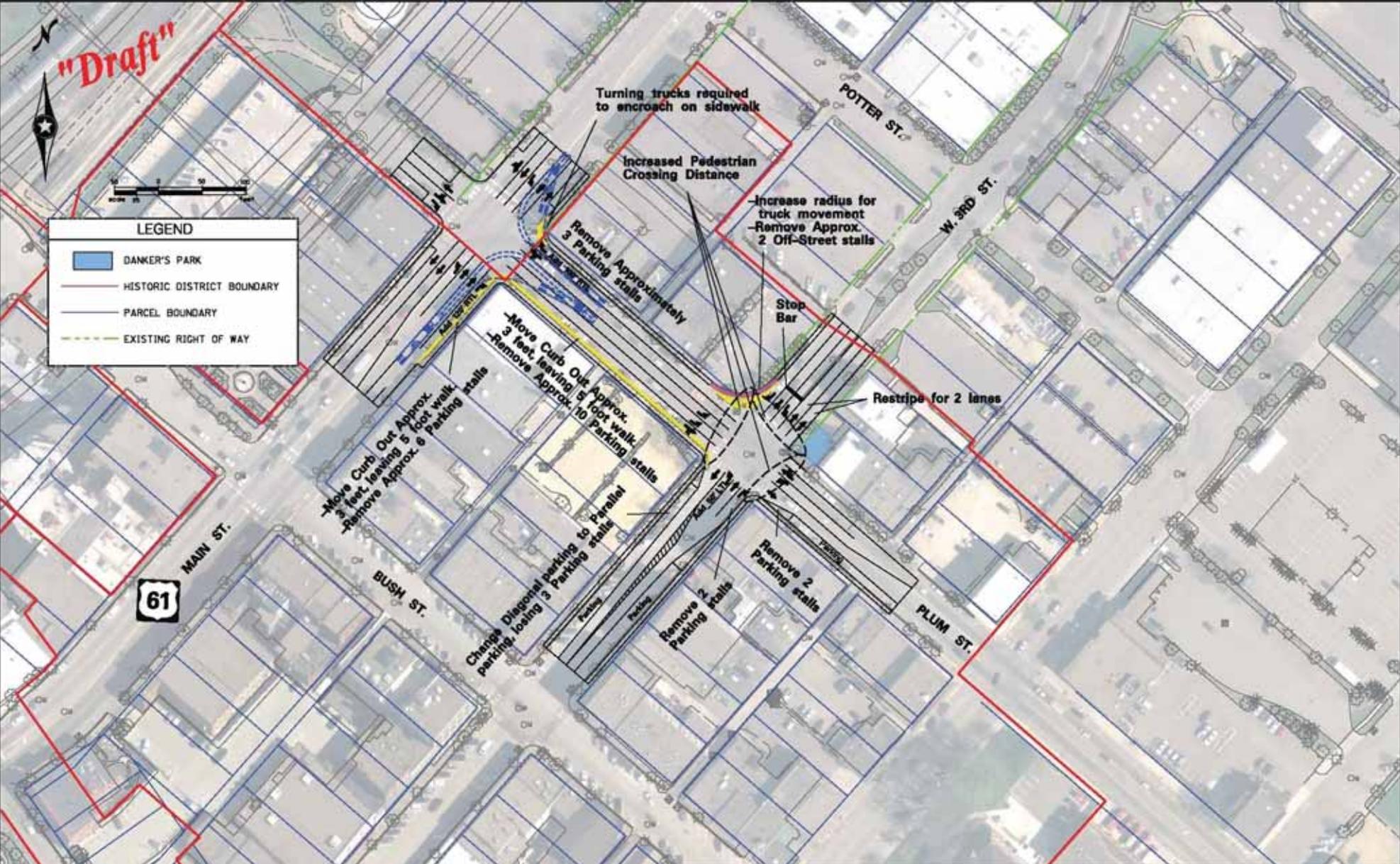
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LEGEND

- DANKER'S PARK
- HISTORIC DISTRICT BOUNDARY
- PARCEL BOUNDARY
- EXISTING RIGHT OF WAY



FILE NO.
118112
DATE:
3/22/2024



TH 63 / TH 61
RED WING, MINNESOTA

**Downtown Red Wing
Street Network
Improvements**

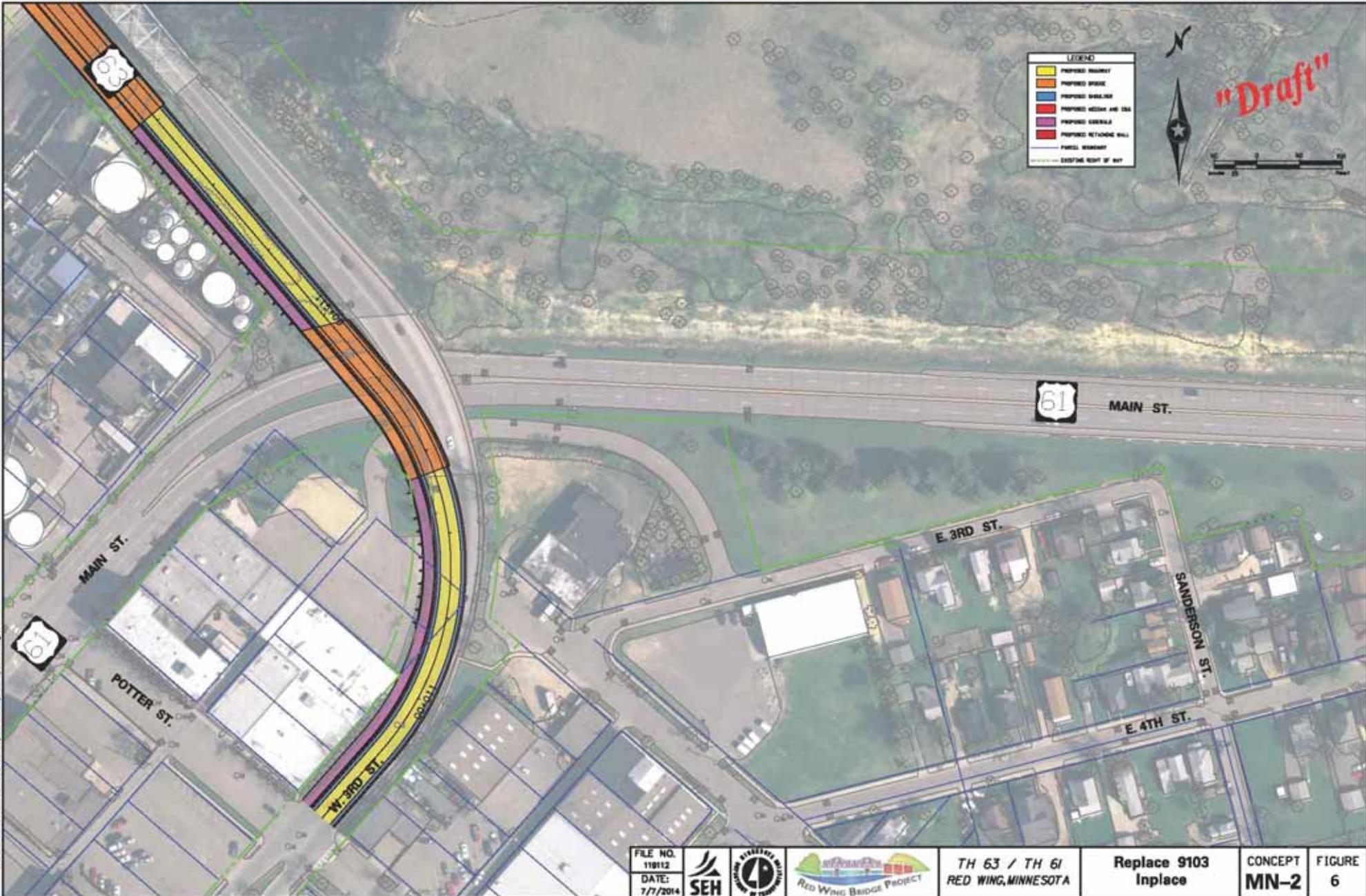
CONCEPT
MN-1A
MN-2A

FIGURE
5

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FILE NO. 110112
DATE: 7/7/2014



TH 63 / TH 61
RED WING, MINNESOTA

Replace 9103
Inplace

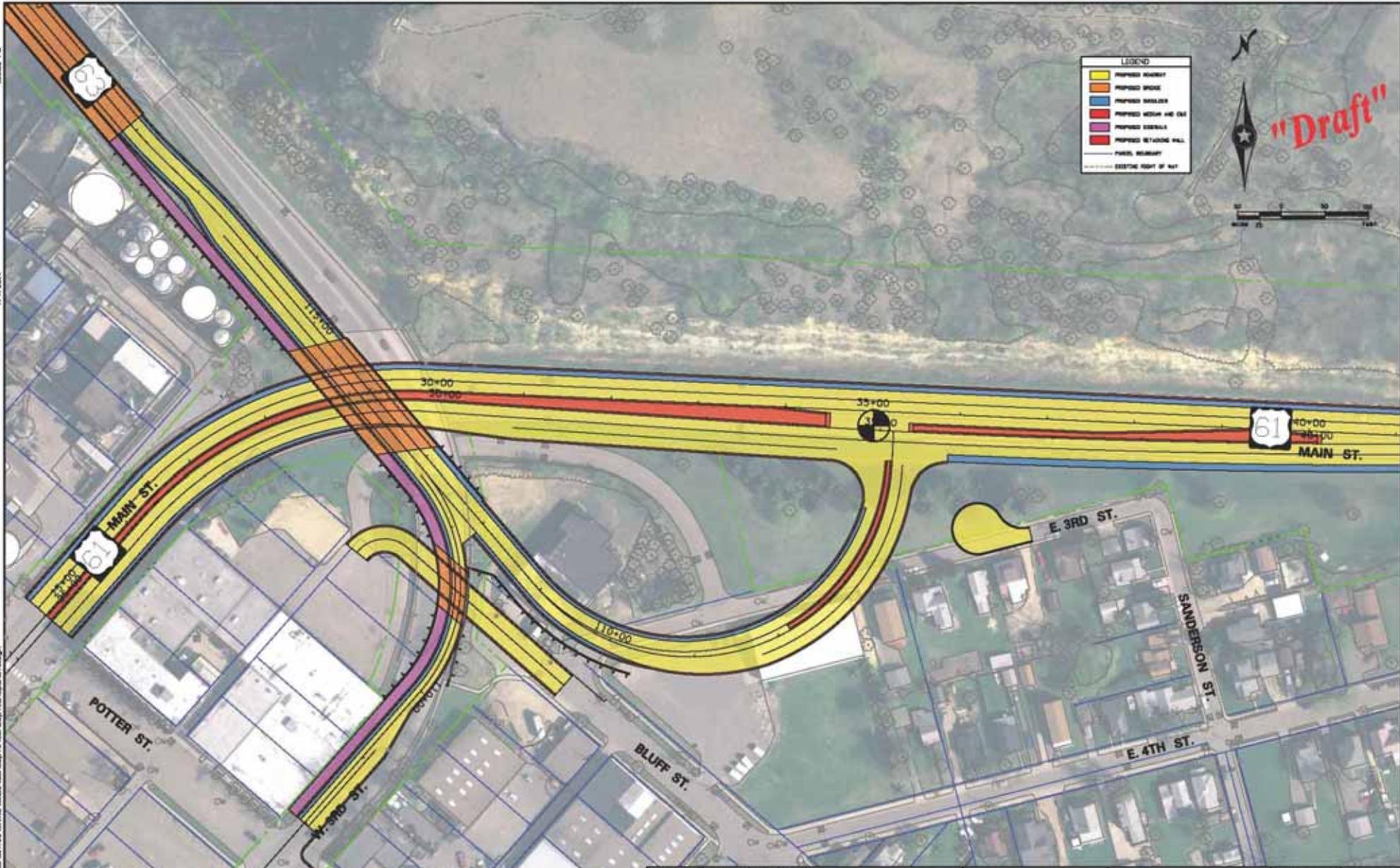
CONCEPT
MN-2

FIGURE
6

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LEGEND

Yellow	PROPOSED BRIDGE
Orange	PROPOSED SHOULDER
Blue	PROPOSED SHOULDER
Green	PROPOSED MEDIAN AND C&G
Purple	PROPOSED SIDEWALK
Red	PROPOSED RETAINING WALL
Black	PAVING BOUNDARY
Dashed	EXISTING RIGHT OF WAY



FILE NO.
110812
DATE:
7/7/2014



TH 63 / TH 61
RED WING, MINNESOTA

Button Hook

CONCEPT
MN-3

FIGURE
7

Table 2 - Red Wing Bridge Project - Minnesota Approach Alternatives Evaluation Matrix

EVALUATION CRITERIA		MN-1 - Rehab Bridge 9103 (includes cathodic protection & TL-2 railing)	MN-1A - Rehab Bridge 9103 with CBD Street modifications	MN-2 - Replace Bridge 9103 In-Place	MN-2A - Replace Bridge 9103 In-Place with CBD Street Modifications	MN-3 - Replace Bridge 9103 plus Button-hook with Slip-Ramp
PRIMARY NEEDS						
Structurally sound crossing of the Mississippi River	Ability to meet structural requirements	NA to MN approach alternatives	NA to MN approach alternatives	NA to MN approach alternatives	NA to MN approach alternatives	NA to MN approach alternatives
Structurally sound crossing of US 61	Ability to meet structural requirements	Yes	Yes	Yes	Yes	Yes
Improve motorized and non-motorized traffic mobility on THs in downtown commercial/historic district	Year 2042 trunk highway network delay	564 hours; NOTE: Estimated delay is underestimated, due to limitations in model's ability to reflect adverse effects of grid street network, tight geometrics, & pedestrian conflicts.	133 hours; NOTE: Estimated delay is underestimated, due to limitations in model's ability to reflect adverse effects of grid street network, tight geometrics, & pedestrian conflicts.	564 hours; NOTE: Estimated delay is underestimated, due to limitations in model's ability to reflect adverse effects of grid street network, tight geometrics, & pedestrian conflicts.	133 hours; NOTE: Estimated delay is underestimated, due to limitations in model's ability to reflect adverse effects of grid street network, tight geometrics, & pedestrian conflicts.	84 hours
	Network motor vehicle traffic queue lengths; 2042 PM peak hour maximum queues at the seven analyzed intersections	8,795 feet;	6,163 feet; NOTE: reduction in queues at critical approaches is muted by the collective queue length of all intersection approaches	8,795 feet;	6,163 feet; NOTE: reduction in queues at critical approaches is muted by the collective queue length of all intersection approaches	5,361 feet; NOTE: reduction in queues at critical approaches is muted by reporting total queue length on all intersection approaches. Queues on trunk highways show a substantial reduction.
	Year 2042 total trunk highway network travel time	643 hours; NOTE: Estimated travel time is underestimated, due to limitations in model's ability to reflect adverse effects of grid street network	227 hours; NOTE: Estimated travel time is underestimated, due to limitations in model's ability to reflect adverse effects of grid street network	643 hours; NOTE: Estimated travel time is underestimated, due to limitations in model's ability to reflect adverse effects of grid street network	227 hours; NOTE: reduction in travel time exaggerated by limitations in model to reflect adverse effects of grid street network	173 hours
	Year 2042 PM peak hour travel time for a representative trip between the River Bridge and US 61/Broad Street	- River Bridge to US 61/Broad Street = 2 mins, 25 secs - US 61/Broad Street to River Bridge = 21 mins, 31 secs	- River Bridge to US 61/Broad Street = 1 min, 19 secs - US 61/Broad Street to River Bridge = 3 mins, 50 secs	- River Bridge to US 61/Broad Street = 2 mins, 25 secs - US 61/Broad Street to River Bridge = 21 mins, 31 secs	- River Bridge to US 61/Broad Street = 1 min, 19 secs - US 61/Broad Street to River Bridge = 3 mins, 50 secs	- River Bridge to US 61/Broad Street = 1 min, 15 secs - US 61/Broad Street to River Bridge = 1 min, 24 secs
	Change in trunk highway volumes on roadway segments within commercial/historic district, compared to No-Build	No Change	No Change	No Change	No Change	3rd Street between Plum and Potter, approximately 70% Reduction; Plum Street between Main and 3rd, 30% to 50% Reduction
	Turning movement volumes compared to No-build at key intersections (US 61/MN 58 and MN 58/3rd Street)	No Change	No Change	No Change	No Change	Main at Plum, 30% to 50% reduction; 3rd at Plum, 35% to 45% Reduction
	Change in peak hour truck right turn volumes compared to No-Build at key intersections with inadequate RT radii: US 61/MN 58 and MN 58/3rd Street	No Change	No Change	No Change	No Change	Main/Plum = 63% AM and 68% PM reduction; Plum/3rd = 93% AM and 96% PM reduction
	Pedestrian level of service (HCM analysis)	LOS B	LOS D	LOS B	LOS D	LOS B
	Pedestrian crossing delay at US 61/MN 58 and MN 58/3rd Street	No Change	No Change	No Change	No Change	Reduction in vehicle traffic enables changing signal cycles to increase pedestrian crossing times; Removal of SB LT phase at MN 58/3rd will increase the east side crossing time by up to 30 seconds per cycle.
	Change in intersection width for ped crossing compared to No Build	No Change	Increased walking distance for peds crossing the south leg of the US 61 at MN 58 intersection; and crossing the south, north, and east legs of the MN 58 at 3rd Street intersection	No Change	Increased walking distance for peds crossing the south leg of the US 61 at MN 58 intersection; and crossing the south, north, and east legs of the MN 58 at 3rd Street intersection	No change
	Change in number of traffic lanes crossed by pedestrians, compared to No Build	No Change	Increased number of approach lanes on the west and south legs of the US 61 & MN 58 intersection and at the east and north legs at the MN 58 & 3rd Street intersection increase ped exposure	No Change	Increased number of approach lanes on the west and south legs of the US 61 & MN 58 intersection and at the east and north legs at the MN 58 & 3rd Street intersection increase ped exposure	Reduction in vehicle traffic enables changes in lane striping which will decrease the number of approach lanes on the east and north legs of the MN 58 & 3rd Street intersection, reducing ped exposure
	Other changes in pedestrian and bicyclist 'quality of experience' (qualitative assessment)	No Change	1) Removal of on-street parking stalls eliminates "buffer" effect between pedestrians and vehicular traffic; 2) Narrower sidewalks reduce walkability & separation distance between motorized and non-motorized traffic.	No Change	1) Removal of on-street parking stalls eliminates "buffer" effect between pedestrians and vehicular traffic; 2) Narrower sidewalks reduce walkability & separation distance between motorized and non-motorized traffic.	Reduced turning traffic volumes decreases pedestrian/vehicle conflict potential and enhances pedestrian environment and walkability in commercial/historic district.

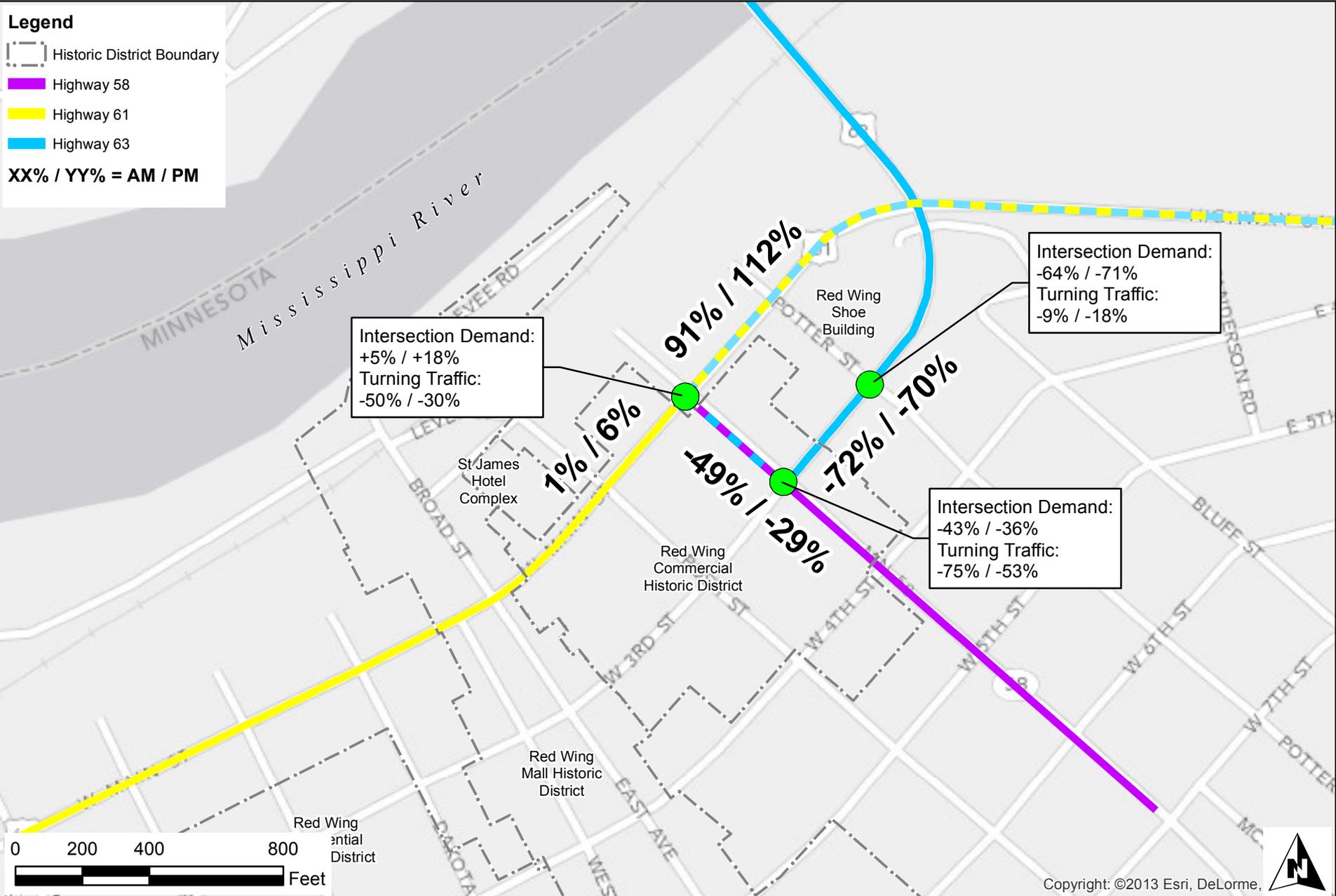
SECONDARY NEEDS						
Continuity of US 63	Ability to maintain continuity	Maintains continuity	Maintains continuity	Maintains continuity	Maintains continuity	Maintains continuity
US 63 connection to US 61 and TH 58	Ability to provide connection of US 63 to US 61	US 63 connection overlaps with MN 58	US 63 connection overlaps with MN 58	US 63 connection overlaps with MN 58	US 63 connection overlaps with MN 58	Improved by providing direct US 63 connection to US 61
	Ability to provide connection to MN 58	NB/SB connection provided via 3rd St.	NB/SB connection provided via 3rd St.	NB/SB connection provided via 3rd St.	NB/SB connection provided via 3rd St.	SB connection provided via 3rd St.; NB connection provided via US 61
Adequate Bridge Capacity	Ability to accommodate forecast year traffic volumes	Yes	Yes	Yes	Yes	Yes
Maximum maintenance of traffic	Duration of full closure of US 63	No full closure required	No full closure required	No full closure required	No full closure required	No full closure required
Access to Trenton Island	Ability to maintain access to Trenton Island	NA to MN approach alternatives	NA to MN approach alternatives	NA to MN approach alternatives	NA to MN approach alternatives	NA to MN approach alternatives
Maintain or improve pedestrian/bicycle facilities on US 63 River Bridge and US 61 Overpass	Ability to maintain or improve pedestrian/bicycle facilities	Widens west side curb to a five foot sidewalk. 12 foot river crossing trail needs to be reduced to five feet at Bridge 9103. No separated bicycle facility. Maintains narrow right shoulder (used by bicyclists) on SB US 61 below Bridge 9103.	Widens west side curb to a five foot sidewalk. 12 foot river crossing trail needs to be reduced to five feet at Bridge 9103. No separated bicycle facility. Maintains narrow right shoulder (used by bicyclists) on SB US 61 below Bridge 9103.	Provides 12 foot separated multi-use trail at US 63 MN approach. Right shoulder (used by bicyclists) on SB US 61 below bridge can be widened to current standards.	Provides 12 foot separated multi-use trail at US 63 MN approach. Right shoulder (used by bicyclists) on SB US 61 below bridge can be widened to current standards.	Provides 12 foot separated multi-use trail at US 63 MN approach. Right shoulder (used by bicyclists) on SB US 61 below bridge can be widened to current standards.
OTHER CONSIDERATIONS						
Structural redundancy	Provide a structurally redundant river crossing	NA to MN approach alternatives	NA to MN approach alternatives	NA to MN approach alternatives	NA to MN approach alternatives	NA to MN approach alternatives
Wisconsin Corridors 2030 Plan	Ability to meet stated LOS D or better objective	NA to MN approach alternatives	NA to MN approach alternatives	NA to MN approach alternatives	NA to MN approach alternatives	NA to MN approach alternatives
Geometrics	Ability to accommodate truck turning paths	No improvement to the substandard turning radii at US 61/Plum Street and Plum Street/3rd Street	No major improvements to the substandard turning radii at US 61/Plum Street and Plum Street/3rd Street	No improvement to the substandard turning radii at US 61/Plum Street and Plum Street/3rd Street	Minor improvements to the substandard turning radii at US 61/Plum Street and Plum Street/3rd Street	Substantial improvement associated with reduction in turning truck traffic at the problem intersections
Economic development	Ability to maintain or improve traffic flow, based on City's goals/recommendations for promoting economic development	Continued degradation of downtown traffic flow and pedestrian environment not consistent with City's plans for economic development	Continued degradation of pedestrian environment, however, less degradation of motorized mobility compared to MN-1	Continued degradation of downtown traffic flow and pedestrian environment not consistent with City's plans for economic development	Continued degradation of pedestrian environment, however, less degradation of motorized mobility compared to MN-2	Reduction of truck and commuter traffic through downtown provides greater improvement in motorized and non-motorized mobility, consistent with City's plans for enhancing economic development
Parking	Increase or reduction of parking spaces	No change	Loss of 38 on-street stalls	No change	Loss of 38 on-street stalls	No change
Regulatory Requirements:						
Section 106	Potential for adverse effects on historic properties	No likely adverse effects identified.	Avoids impact to Bridge 9103. Likely adverse effect to Commercial Historic District from modifications to curbs and sidewalks (i.e., affect 'grid' that is character-defining feature).	Removes Bridge 9103 = Likely adverse effect.	Removes Bridge 9103 = Likely adverse effect. Likely adverse effect to Commercial Historic District from modifications to curbs and sidewalks (i.e., affect 'grid' that is character-defining feature).	Removes Bridge 9103 = Likely adverse effect.
\	Section 4(f) impacts	No impacts	Section 4(f) Impacts: 1) Requires acquisition of a portion of Dankers Park at Plum Street and 3rd Street (section 4(f) use); 2) adverse effect on Commercial Historic District would be a Section 4(f) use.	Section 4(f) Impacts: Requires removal of Bridge 9103 = adverse effect would be a Section 4(f) use.	Section 4(f) Impacts: 1) Requires removal of Bridge 9103 = adverse effect would be a Section 4(f) use; 2) adverse effect on Commercial Historic District would be a Section 4(f) use; 3) Requires acquisition of a portion of Dankers Park at Plum Street and 3rd Street (section 4(f) use).	Section 4(f) Impacts: Requires removal of Bridge 9103 = adverse effect would be a Section 4(f) use
Navigational channel	Ability to maintain navigational clearance requirements	NA to MN approach alternatives	NA to MN approach alternatives	NA to MN approach alternatives	NA to MN approach alternatives	NA to MN approach alternatives
Section 404 water quality requirements	Accommodations to treat storm water runoff and meet required practices	No accommodations required to treat runoff from Bridge 9103, however new ponding will be required to address Bridge 9040 runoff.	No accommodations required to treat runoff from Bridge 9103, however new ponding will be required to address Bridge 9040 runoff.	Yes	Yes	Yes

SOCIAL, ECONOMIC AND ENVIRONMENTAL IMPACTS						
	Number of parcels impacted	1 (for stormwater pond)	1 (for stormwater pond)	1 (for stormwater pond)	1 (for stormwater pond)	3 (for stormwater pond and button-hook)
Right-of-way impacts	Number of structures impacted; Number of relocations	1 (for stormwater pond); 0 relocations	1 (for stormwater pond); 0 relocations	1 (for stormwater pond); 0 relocations	1 (for stormwater pond); 0 relocations	3 (for stormwater pond and button-hook); 1 residential relocation
Social and Community	Cohesion [1] changes in street configurations; 2)connectivity within city]	1) No changes in street configurations. 2) Connectivity: No change to existing TH's looping through the downtown commercial historic district that City staff indicate 'sever' pedestrian access within downtown and between some residential neighborhoods and downtown.	1) No changes in street configurations. 2) Connectivity: No change to existing TH's looping through the downtown commercial historic district that City staff indicate 'sever' pedestrian access within downtown and between some residential neighborhoods and downtown.	1) No changes in street configurations. 2) Connectivity: No change to existing TH's looping through the downtown commercial historic district that City staff indicate 'sever' pedestrian access within downtown and between some residential neighborhoods and downtown.	1) No changes in street configurations. 2) Connectivity: No change to existing TH's looping through the downtown commercial historic district that City staff indicate 'sever' pedestrian access within downtown and between some residential neighborhoods and downtown.	1) Street configuration change: Requires severing East 3rd Street connection to Bluff Street. Similar level of access to Bluff Street from the neighborhood will be retained via 4th Street. 2) Connectivity: Beneficial change from decreases in TH traffic through downtown commercial historic district, decreasing the 'severing' effect identified by City staff.
	Community facilities impacted	No impacts	No impacts	No impacts	No impacts	May impact Bluff Community Garden.
Environmental Justice	Any disproportionate high and adverse impacts to minority or low income populations	No impacts	No impacts	No impacts	No impacts	City has identified the Bluff neighborhood as having a higher concentration of low income individuals as compared to the entire City. One residential acquisition identified in this neighborhood would not be a 'significant' impact. The EA will conduct a detailed assessment to determine whether any impacts, direct or indirect, (e.g., noise) are disproportionately high and adverse.
Economic	Potential loss of property tax revenue from property acquisitions	No impacts	No impacts	No impacts	No impacts	Minor loss of property tax collection due to removal of one residential property and a former warehouse now used for storage.
Floodplains	Impact to existing floodplains	No impacts	No impacts	No impacts	No impacts	No impacts
Natural resources	Wetlands	No impacts	No impacts	No impacts	No impacts	No impacts
	Mussels	No impacts	No impacts	No impacts	No impacts	No impacts
	Threatened & Endangered Species	No impacts	No impacts	No impacts	No impacts	No impacts
Hazardous Materials/Contamination	Contaminated materials impacts	Acquisition of a moderate to low risk contaminated parcel may be required for stormwater ponding	Acquisition of a moderate to low risk contaminated parcel may be required for stormwater ponding	Acquisition of a moderate to low risk contaminated parcel may be required for stormwater ponding	Acquisition of a moderate to low risk contaminated parcel may be required for stormwater ponding	Acquisition of a moderate to low risk contaminated parcel will be required
Noise	Potential change in noise levels at adjacent receptors	No change in proximity to noise receptors. No substantial changes in noise levels are anticipated.	No change in proximity to noise receptors. No substantial changes in noise levels are anticipated.	No change in proximity to noise receptors. No substantial changes in noise levels are anticipated.	No change in proximity to noise receptors. No substantial changes in noise levels are anticipated.	Includes new roadway segment in closer proximity to residential receptors. May result in increased noise levels for these receptors. Reduction in traffic levels in downtown may reduce noise levels for downtown receptors, including Dankers Park.
Air Quality	Impacts to adjacent receptors	No differentiating impacts anticipated	No differentiating impacts anticipated	No differentiating impacts anticipated	No differentiating impacts anticipated	No differentiating impacts anticipated
Visual Quality	Change in visual environment/change in views	No change	No change	Minor change given new US 61 overpass	Minor change given new US 61 overpass	More substantial change with new buttonhook and slip ramp to 3rd Street.
Cumulative Effects	Incremental SEE impacts from alternative plus foreseeable future actions	No cumulative SEE impacts anticipated, beyond the direct SEE impacts of the proposed alternative.	No cumulative SEE impacts anticipated, beyond the direct SEE impacts of the proposed alternative.	No cumulative SEE impacts anticipated, beyond the direct SEE impacts of the proposed alternative.	No cumulative SEE impacts anticipated, beyond the direct SEE impacts of the proposed alternative.	No cumulative SEE impacts anticipated, beyond the direct SEE impacts of the proposed alternative.
Relationship to Other Proposed Transportation Improvements	Relationship to Year 2015 Main Street Reconstruction Project	No substantive positive or negative impacts.	Negative impacts to pedestrian traffic would result from MN-1A increasing corner radii and narrowing sidewalks at the US 61/MN 58 intersection, which would lengthen ped crossings and be contrary to the improvements being made as a part of the US 61 Reconstruction project (year 2015). This conflicts with one of the goals of the project, which is to improve pedestrian mobility and safety by shortening ped crossing distances and reducing pedestrian exposure to motorized traffic.	No substantive positive or negative impacts.	Negative impacts to pedestrian traffic would result from MN-2A increasing corner radii and narrowing sidewalks at the US 61/MN 58 intersection, which would lengthen ped crossings and be contrary to the improvements being made as a part of the US 61 Reconstruction project (year 2015). This conflicts with one of the goals of the project, which is to improve pedestrian mobility and safety by shortening ped crossing distances and reducing pedestrian exposure to motorized traffic.	This alternative plus the Main Street project provide complementary benefits by MN-3 shifting traffic volumes at the US 61/MN 58 intersection from approach legs where bump-outs/ped crossing improvements are not being made to legs where bump-outs are being constructed as part of the Main Street Reconstruction project (year 2015). Traffic volumes due to MN-3 alternative would increase on US 61 east of Plum Street, which is outside of the downtown commercial historic district and outside the area where pedestrian improvements are being made with the Main Street reconstruction project. The two projects together would result in additive benefits to pedestrian traffic in the downtown commercial historic district.
COST						
Construction Cost Estimate 1/	2018\$	\$7,700,000	\$7,900,000	\$8,300,000	\$8,500,000	\$25,875,000
On-going Maintenance (20 years)	2018\$	\$3,500,000-\$4,100,000	\$3,500,000-\$4,100,000	\$1,300,000-\$1,500,000	\$1,300,000-\$1,500,000	\$1,300,000-\$1,500,000
Bridge Service Life	Number of years until major rehabilitation would be required	10 to 15 years, increased to 20 with cathodic protection 20 years	10 to 15 years, increased to 20 with cathodic protection 20 years	75	75	75

Notes
1/ Cost estimate reflects Minnesota approach improvements (to Minnesota-side river bridge abutment), right-of-way and contamination clean-up

Legend

-  Historic District Boundary
 -  Highway 58
 -  Highway 61
 -  Highway 63
- XX% / YY% = AM / PM**



Path: S:\KODM\mnt06\119112\GIS\MXD\ChangeInTrafficDemand\Alt1and2VS3_85x11.mxd



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Project: MNT06 119112
Print Date: 03/26/2014
Map by: shack
Projection: Goodhue County NAD83ft
Source: Goodhue County, MnDNR,
City of Red Wing, MnGEO

RED WING BRIDGE PROJECT
Change in Traffic Demand Alternative 1 and 2 vs. Alternative 3

Figure 8

This map is neither a legally recorded map nor a survey map and is not intended to be used as one. This map is a compilation of records, information, and data gathered from various sources listed on this map and is to be used for reference purposes only. SEH does not warrant that the Geographic Information System (GIS) Data used to prepare this map are error free, and SEH does not represent that the GIS Data can be used for navigational, tracking, or any other purpose requiring exacting measurement of distance or direction or precision in the depiction of geographic features. The user of this map acknowledges that SEH shall not be liable for any damages which arise out of the user's access or use of data provided.