



# Red Wing Bridge Project



Project Advisory  
Committee (PAC)  
Meeting #3  
September 20, 2012

*Your Destination...Our Priority*





# Agenda

- Public Outreach Update
- Alternatives Analysis
  - Roadway Tasks
  - Bridge Tasks
- Update on Other Technical Studies
- Next Steps





# Public Outreach Update

- Listening Session #2 – today at 3:30pm
- Bluff Neighborhood Open House – today at 4:30pm
- Project Presentation Opportunities
- Project Website: <http://www.dot.state.mn.us/d6/projects/redwing-bridge/index.html>
- Next Open House – Fall 2012



# RED WING BRIDGE ALTERNATIVES ANALYSIS & EVALUATION PROCESS

## PRIORITY 1

### Bridge Concepts

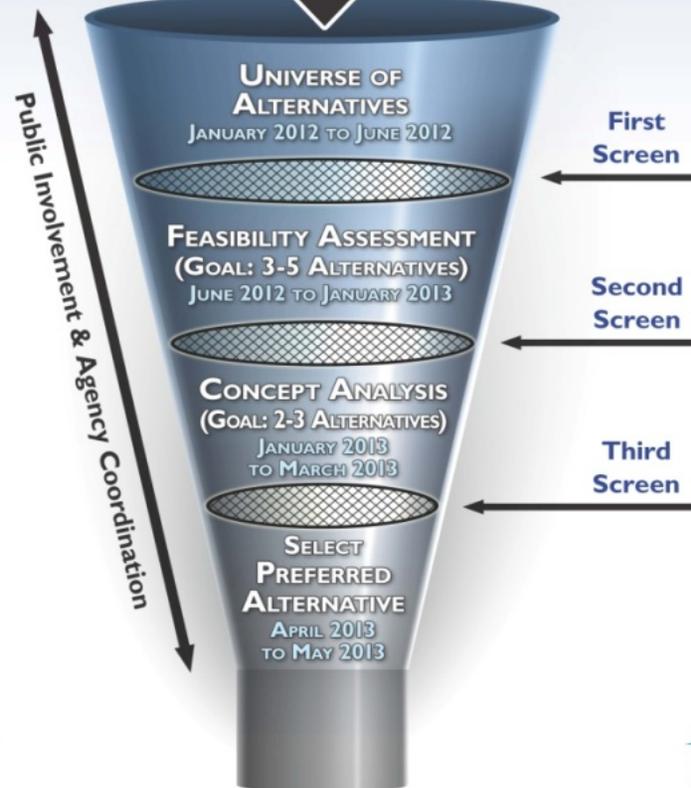
*River Bridge & Hwy 61 Overpass*

- Rehabilitation
- Replacement

## PRIORITY 2

### Roadway Concepts

- Maintain Existing Connection
- At-Grade Hwy 61 Connection
- New Grade-Separated Hwy 61 Connection



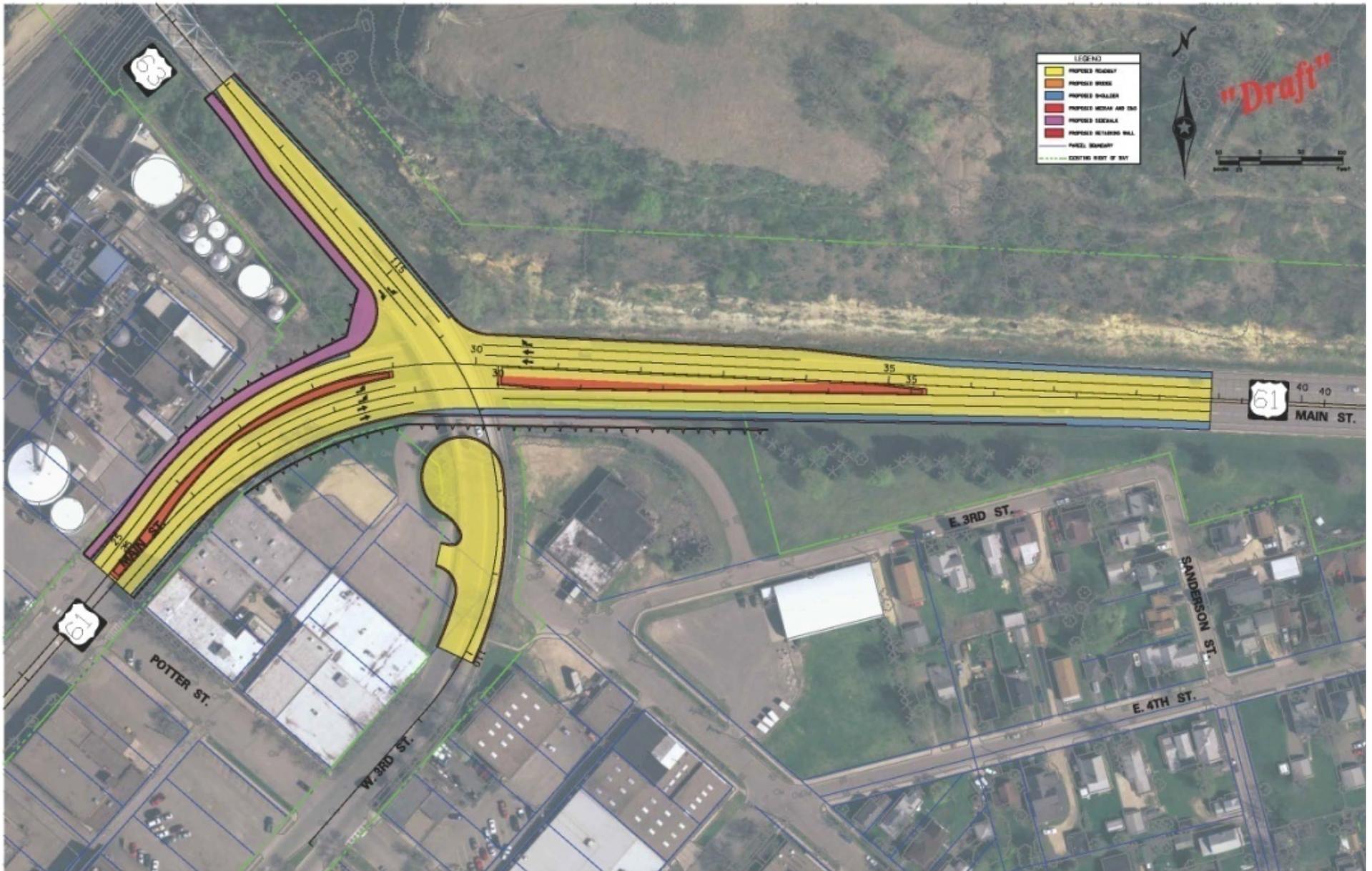


# Concept 1



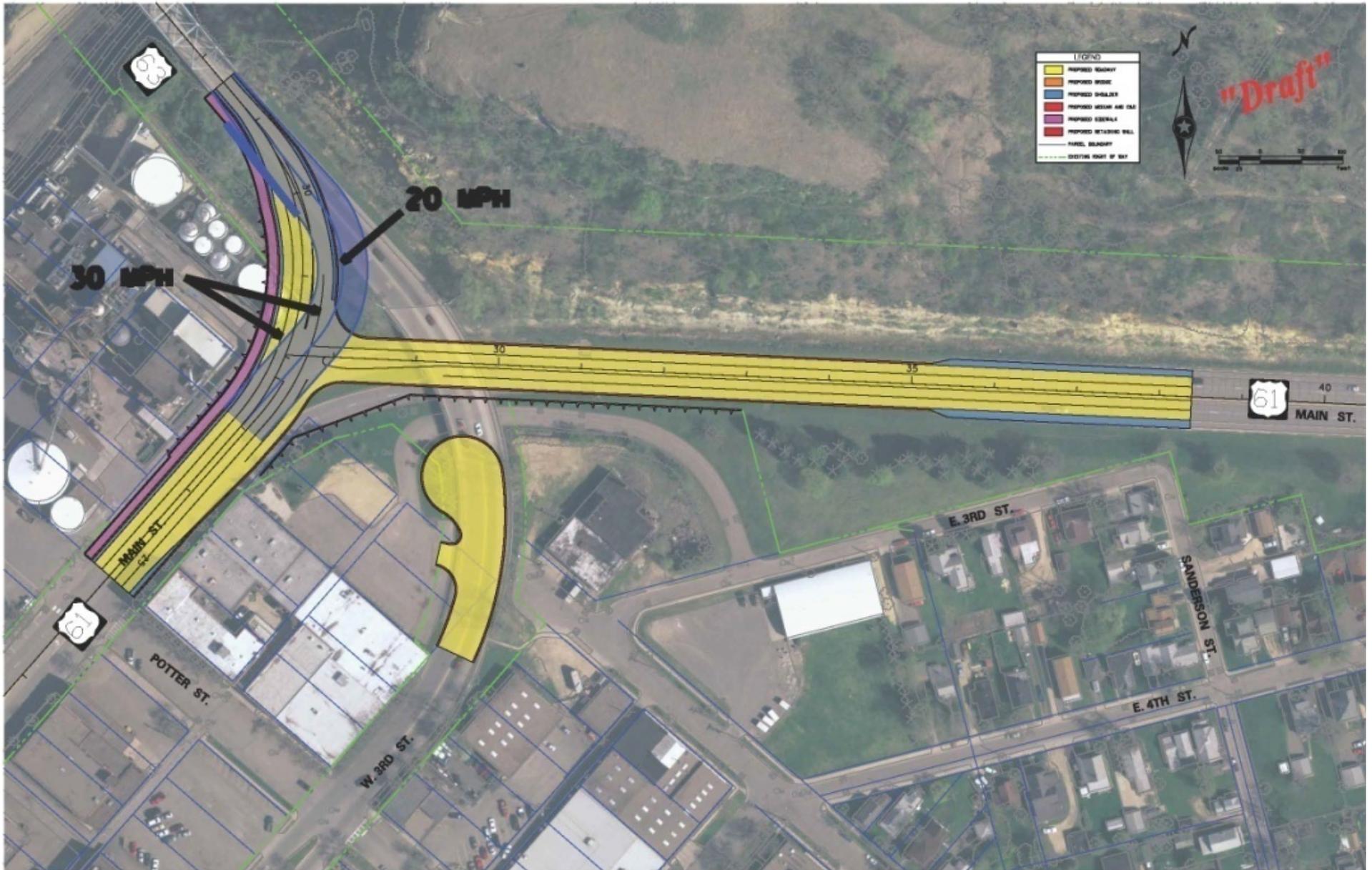


# Concept 2





# Concept 3





# Concept 4



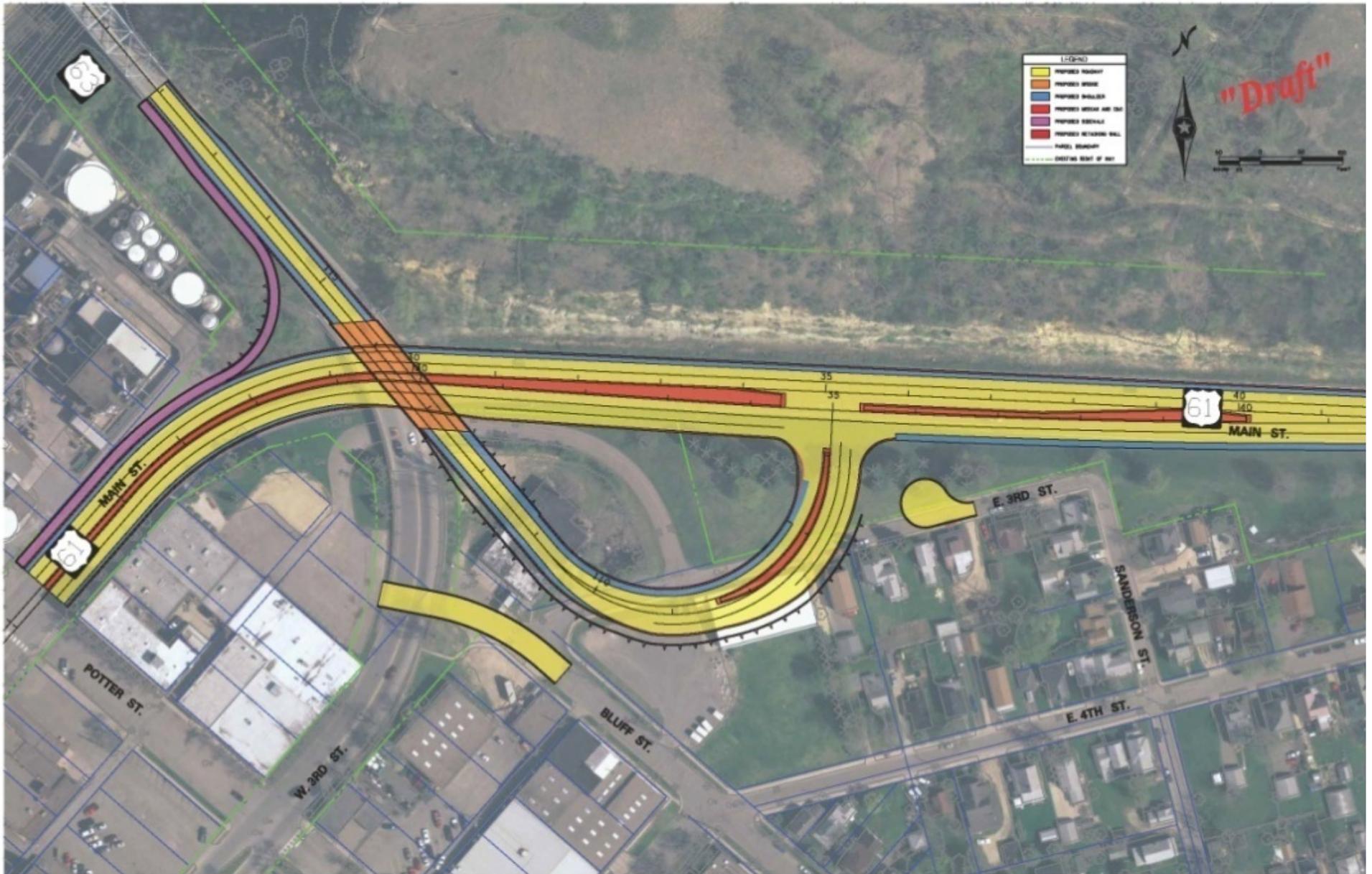


# Concept 5



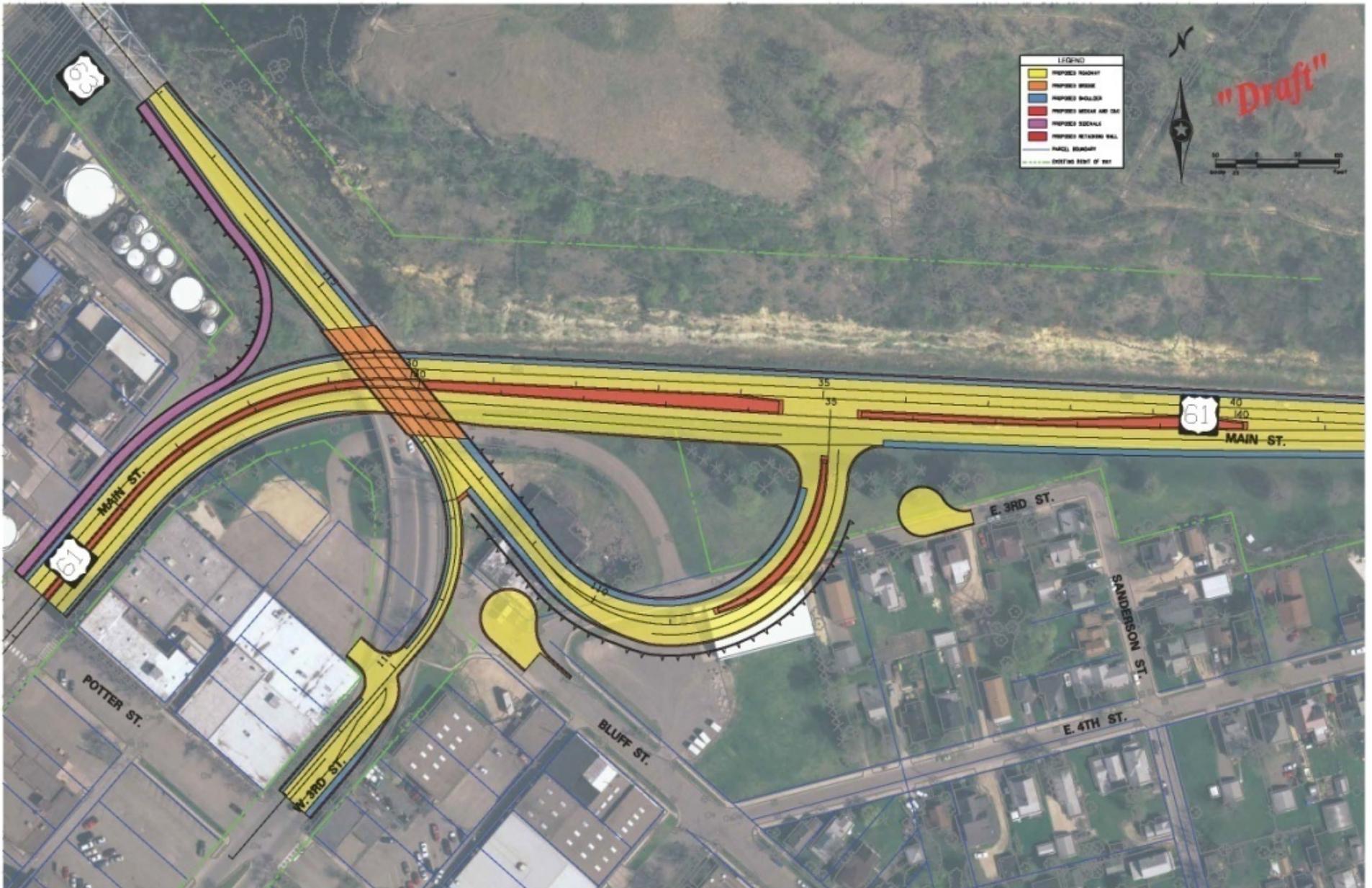


# Concept 6



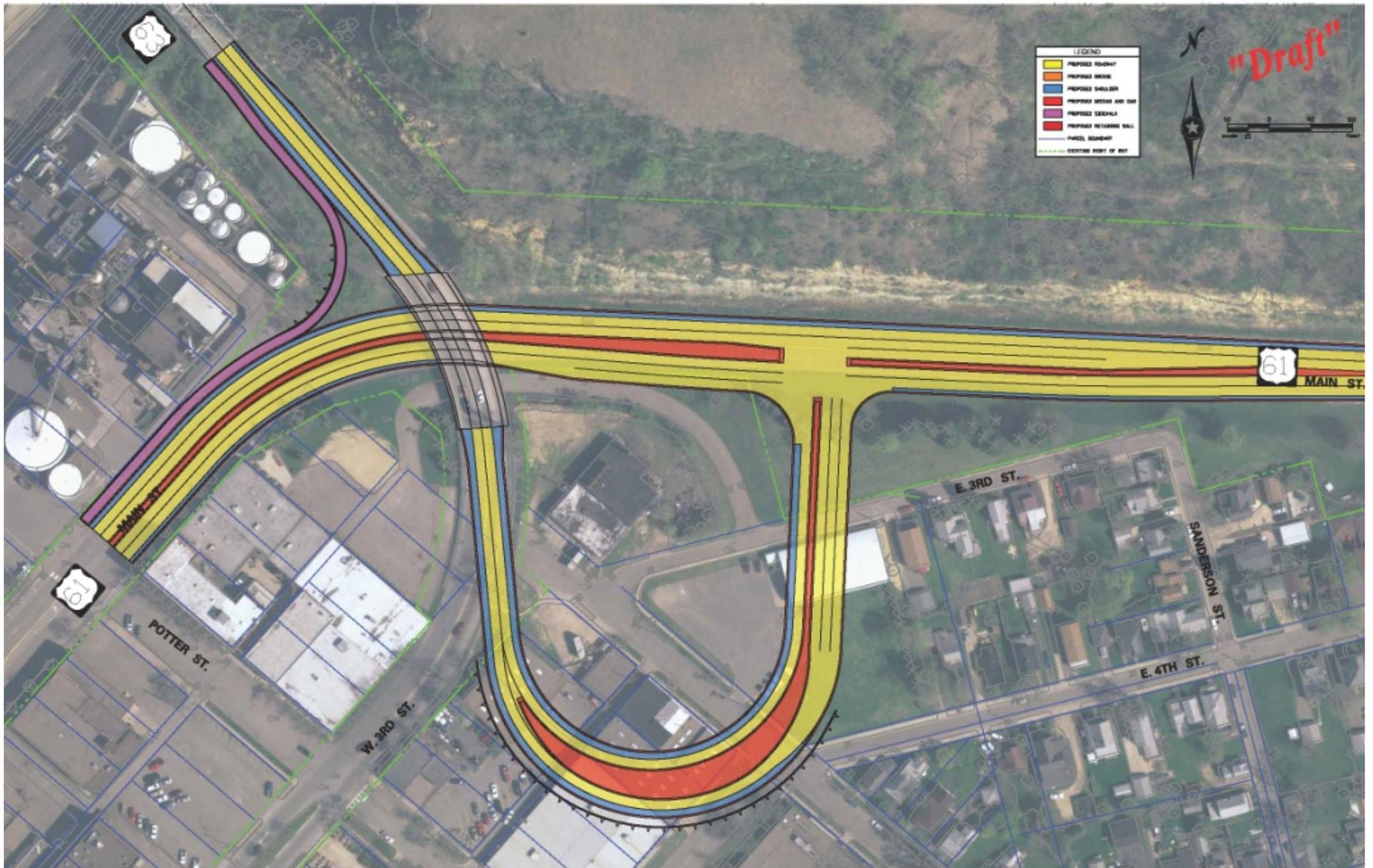


# Concept 7





# Concept 8





# Concept 9





# Concept 10







# Traffic Analysis Summary

- Concepts 1 and 2 have poor traffic operations
- Concept 3 was not analyzed because of design flaws
- Concept 4 with a two lane river bridge has poor traffic operations
- Concept 4 with a four lane river bridge and Concepts 5 through 8 have acceptable traffic operations



Approach Roadway Concepts Evaluation Matrix

Evaluation Criteria	Concept 1 Existing Configuration/ Rehabilitate #9103	Concept 2 Three-Leg At Grade Intersection	Concept 3 Three-Leg At Grade Intersection (US 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 #9103 Rehabilitation
<b>Traffic Operations</b> <ul style="list-style-type: none"> <li>TH 63</li> <li>TH 61</li> <li>Downtown Red Wing</li> <li>Access for Local Businesses</li> </ul>	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 Shoe access reconfigured Reduces traffic congestion at 3 <sup>rd</sup> /Plum Increased traffic at US 61/Plum & US 61/Bush	Directs TH 63 traffic out of downtown Promotes primary river crossing movement Red Wing Shoe access reconfigured Reduces traffic congestion at 3 <sup>rd</sup> /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 <sup>rd</sup> /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 Does not accommodate oversize vehicles Greater impact to Red Wing Shoe access Reduces traffic congestion at 3 <sup>rd</sup> /Plum	Acceptable 2042 traffic operations, however queuing problems at Main/Plum Directs TH 63 traffic out of downtown Red Wing Shoe access reconfigured Reduces traffic congestion at 3 <sup>rd</sup> /Plum Increased traffic at US 61/Plum & US 61/Bush	Most favorable year 2042 traffic operations Directs portion of TH 63 traffic out of downtown Red Wing Shoe access reconfigured Reduces congestion at 3 <sup>rd</sup> /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 <sup>rd</sup> /Plum
<b>Safety</b> <ul style="list-style-type: none"> <li>Driver Expectancy</li> </ul>	As currently exists	Standard intersection Reduced intersection sight distance	Standard intersection Reduced intersection sight distance Intersection on curve	Standard 4-Leg intersection	Roundabout	Controlled intersection	Controlled intersection	Controlled intersection
<b>Environmental Impacts</b> <ul style="list-style-type: none"> <li>Section 106</li> <li>Section 4(f)</li> <li>Soil Conditions (Geotech/Contamination)</li> </ul>	No additional	Bridge 9103 removal (Section 106 and 4f) TH 61 grade raise may require fill next to Barn Bluff	Bridge 9103 removal (Section 106 and 4f) TH 61 grade raise may require fill next to Barn Bluff	Bridge 9103 removal (Section 106 and 4f) TH 61 grade raise may require fill next to Barn Bluff Potential contaminated site impacts	Bridge 9103 removal (Section 106 and 4f) TH 61 alignment pulled away from Barn Bluff; TH 63 alignment shifted closer	Bridge 9103 removal (Section 106 and 4f) Minimal Potential contaminated site impacts	Bridge 9103 removal (Section 106 and 4f) Minimal Potential contaminated site impacts	Major impacts to historic eligibility of Bridge 9103 Potential contaminated site impacts
<b>Right-of-Way Impacts</b> <ul style="list-style-type: none"> <li>Proximity to Housing</li> <li>Visual/Noise</li> <li>Access</li> </ul>	Minimal/As currently exists	Staging would likely require acquisition of warehouse building Visual/aesthetic impacts to downtown from raising Hwy 61	Major impacts to ADM Visual/aesthetic impacts to downtown from raising Hwy 61	Staging would likely require acquisition of warehouse building Visual/aesthetic impacts to downtown from raising Hwy 61	Visual/aesthetic impacts to downtown from raising Hwy 61	Closer to residential development with extensive R/W acquisition	Closer to residential development with extensive R/W acquisition	Significant impacts to business properties along W 4 <sup>th</sup> St and Bluff St
<b>Design Standards</b>	As currently met	Meets 30 mph design	Meets 30 mph design	Meets 30 mph design	Meets 30 mph design	Meets 30 mph design/Loop meets 25 mph design	Meets 30 mph design/Loop meets 25 mph design	Meets 30 mph design/Loop is 20-25 mph design
<b>Construction Complexity and MOT</b>	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 – 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
<b>Compatibility with Parallel River Bridge</b>	Compatible – walls required	Compatible – walls required	Non-compatible without extensive R/W impacts	Compatible – walls required	Compatible – walls required	Incompatible – would require wider bridge over TH 61	Incompatible – would require wider bridge over TH 61	Compatible – would likely require exception on bridge over TH 61
<b>Recommendation: Retain or Dismiss</b>	Retain – No-Build is carried through environmental process	Dismiss – very poor traffic operations and substantial downtown impacts given grade requirements	Dismiss – Major ADM impacts	Dismiss – substantial impacts to downtown given roadway grade requirements	Dismiss – substantial impacts to downtown and truck operation concerns	Retain – acceptable traffic operations	Retain – most favorable traffic operations	Dismiss – significant right of way impacts and effects Bridge 9103 historic eligibility



# CONCEPTS DISMISSED - MN



#2 – Three-Leg At-Grade Intersection



#3 – Three-Leg At-Grade Intersection with US 63 Direct Connection



#4 – Four-Leg At-Grade Intersection



# CONCEPTS DISMISSED - MN



**#5 – Four-Leg At-Grade with Roundabout**



**#8 – Buttonhook with Rehabilitated Bridge 9103**



# CONCEPTS RETAINED - MN



#1 – Existing Configuration/ Rehabilitate Bridge 9103



#6 – Buttonhook Intersection



#7 – Buttonhook Intersection with Slip Ramp



# CONCEPTS RETAINED - WI



ALL  
CONCEPTS  
APPLY TO  
FOUR-LANE  
RIVER  
CROSSING  
ONLY

#9 – Right-in/Right-out Access



#10 – Northbound Left Turn Lane



#11 – Jug-Handle Intersection



# River Crossing Alternatives

- Rehabilitate Existing Bridge
  - Sub-option: add cantilevered sidewalk on both sides
- New Two Lane Bridge
- Rehabilitate Existing Bridge and Construct New Parallel Bridge
- New Four Lane Bridge







# Status of Bridge 9040 Rehab Study

- Member analysis is complete for four rehab alternatives
  - With conventional deck system or lightweight deck system
  - With or without cantilevered sidewalks
- Repair and strengthening recommendations have been developed for each alternative based on analysis
- Base Cost Estimates have been developed for the alternatives
- Construction delays and cost increases are being assessed for four staging scenarios







# Bridge 9040 New Structure Studies

- Preparing initial screening of feasible structure types
  - Tied Arch Structures
  - Single Span or Three Span Trusses
  - Cable-Supported Structures
  - Concrete Girder Bridges
  - Steel Girder Bridges
- Main River Span Piers are constrained between Canadian Pacific Railway tracks and Mississippi River navigational requirements
- Parallel Roadway alignment is constrained by ADM and Barn Bluff
- Studying approach span replacement alternatives in conjunction







# Bridge 9103 Condition Assessment

- Field Inspection
  - Visual Inspection
  - Hammer sounding for areas of delamination
  - Infrared Thermography
  - Exposed reinforcing outside of spalled areas
- Performed Load Ratings
- Other Considerations
  - Vertical Clearance over TH 61
  - Bridge Railing





# Bridge 9103 Rehabilitation Study

- Developed a Range of Alternatives:
  - Replacing just a strip of the deck along the entire length, patching and repairing substructures, replacing joints and repairing slope paving
  - Repairing or Replacing Bridge Railing
  - Replacing entire concrete deck
  - Lowering TH 61 or raising TH 63
- Determine if there is a Feasible and Prudent rehabilitation alternative





# Next Steps

- Listening Session #2 and Bluff Neighborhood Meeting
- Finish Bridge Rehabilitation and Replacement Studies
- Fall 2012 Public Open House
- Next PAC Meeting
  - Thursday, December 20<sup>th</sup>
  - 1 – 3 p.m
  - Red Wing Public Library – Foot Room





# Questions / Comments



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