



US 169 and Belgrade Ave Study

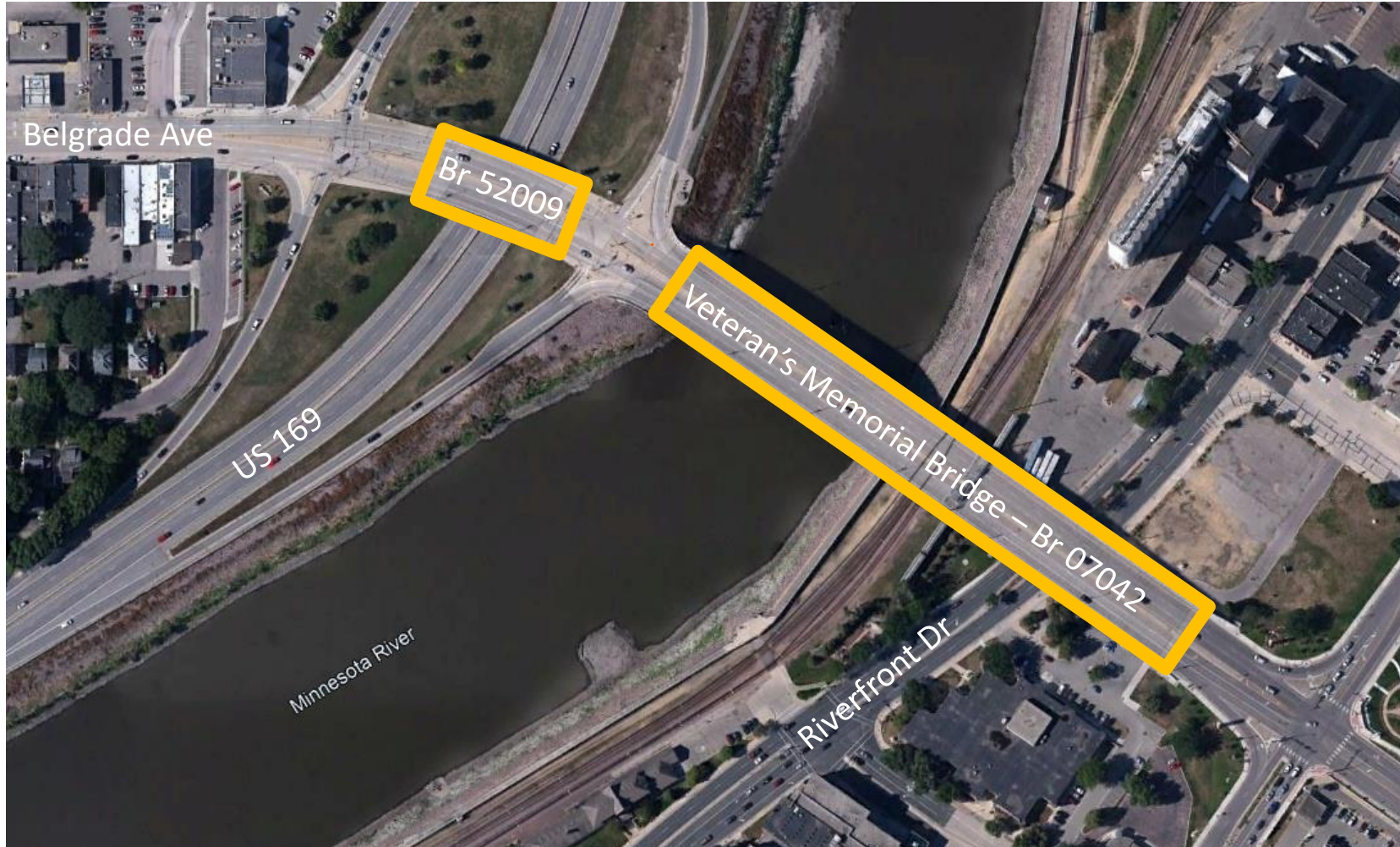
Nicklaus Ollrich, PE | Traffic Engineer

Glen Coudron, PE | Project Manager

City Council Work Session Goals

- Share information on the US 169 and Belgrade Ave Study
- Seek City Council support for the recommendations that have been developed by MnDOT and City of North Mankato Staff
- Discuss potential cost participation – MnDOT and City of North Mankato

Background – SP 5212-35



- Rehabilitation of Veteran's Memorial Bridge over MN River between Mankato and North Mankato.
- Concrete delaminating from underside of the bridge deck.
- Construction planned for 2025 to remove and replace the concrete bridge deck.
- Bridge planned to be closed during construction.
- Opportunity to complete work at the interchange.

Background – SP 5212-35

- SP 5212-35 Veteran's Memorial Bridge Rehabilitation
 - Project Scoping 2020-2021
 - MnDOT Project Planning and Outreach meetings for the Veteran's Memorial Bridge
 - Meetings with City of Mankato and North Mankato staff October 2020
 - City of North Mankato staff identified Belgrade Ave Study
 - City considering 3-lane section and traffic calming opportunities as part of a future project
 - Veteran's Memorial Bridge expected to be closed during construction
 - Opportunity to complete additional scoping of the US 169 and Belgrade Ave interchange
 - Evaluate existing pavement and intersection control within the US 169 and Belgrade Ave interchange

Background – Previous Studies

- Belgrade Avenue Corridor Study – July 2017
 - MAPO, City of North Mankato, and MnDOT
 - Recommended further study of the interchange, include the possibility of a roundabout at the US 169 Southbound Ramp intersection
- Highway 169 Corridor Study – December 2021
 - MAPO, City of North Mankato, City of Mankato, Blue Earth County, Nicollet County, and MnDOT
 - Recommended further study of the interchange, include the possibility of a roundabout at the US 169 Southbound Ramp intersection and tighter radii on channelized right turn lanes

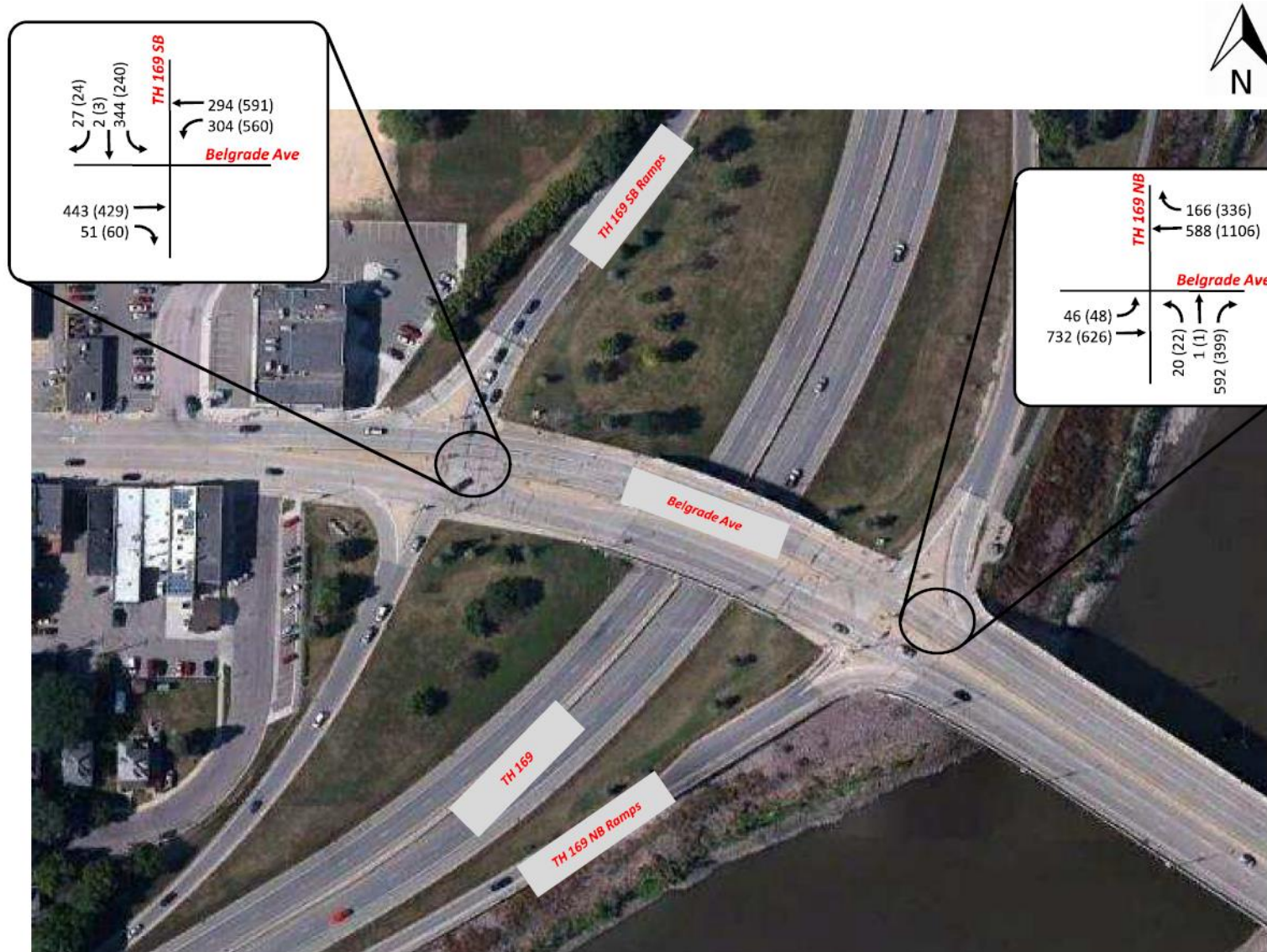
Background – This Study

- Initiated based on previous studies and SP 5212-35 project scoping
- Started in May 2021
- Consultant: HR Green
- Meetings with City of North Mankato Staff
 - June 18, 2021; August 30, 2021; October 27, 2021
 - Topics: background, project funding, issues/opportunities, existing conditions, evaluation criteria, possible alternatives, purpose and need, public engagement, review of alternatives, etc.
- Detailed engineering analysis

Existing Conditions – Traffic Volumes

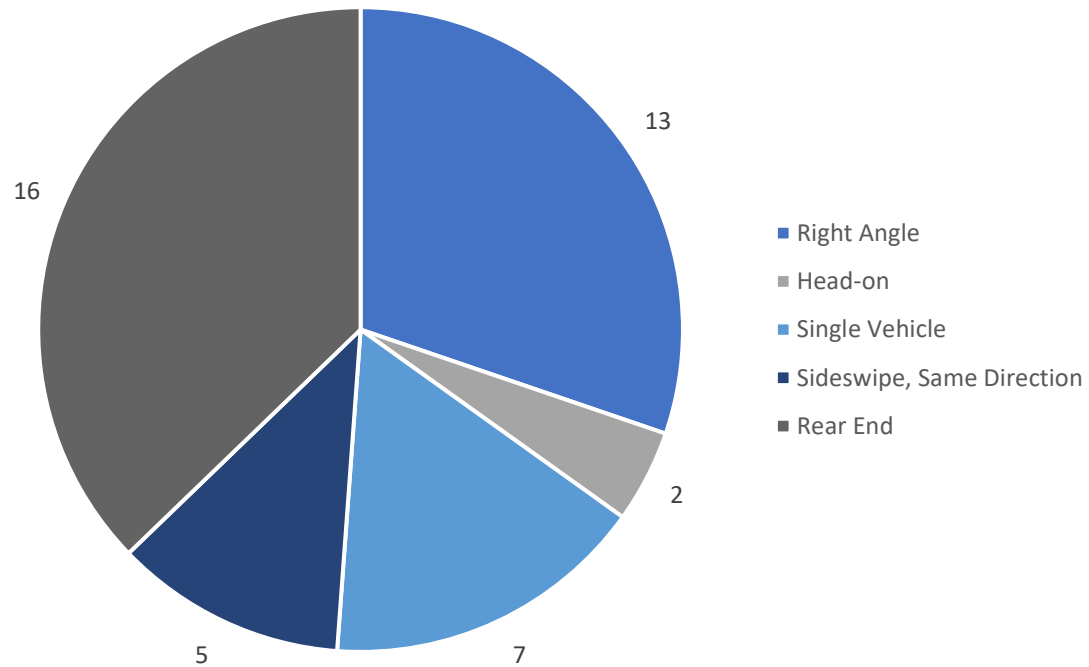
Pedestrian Crossings

Daily:	50
AM Peak:	1
PM Peak:	7

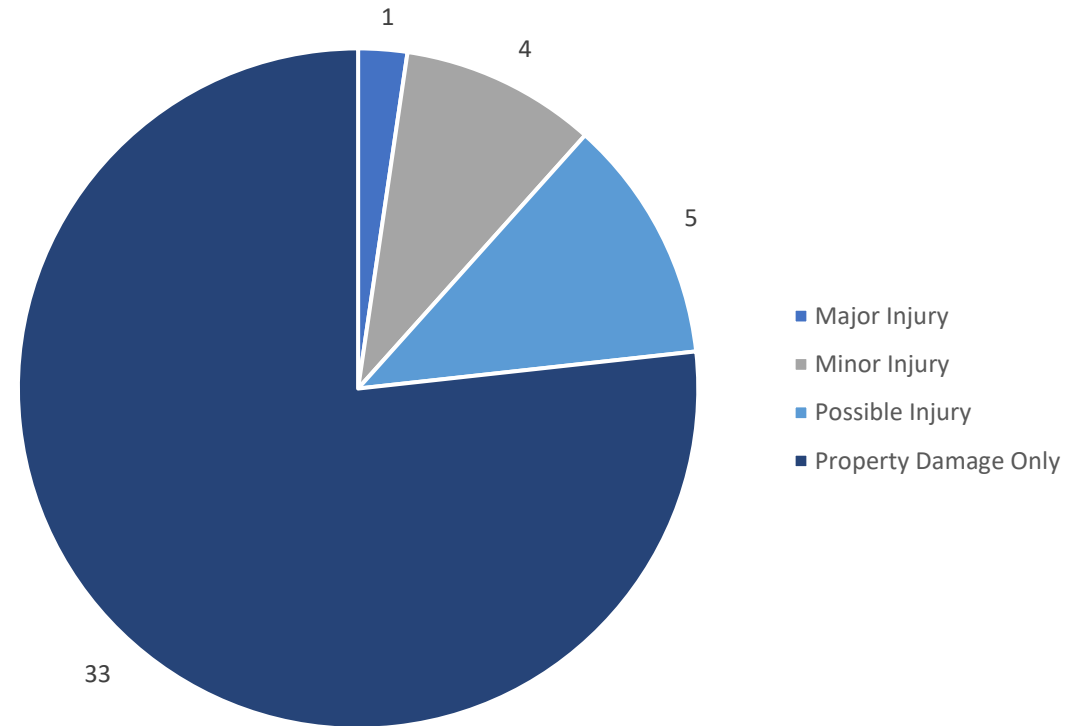


Existing Conditions – Crash Data (01/2011 to 05/2021)

US 169 SB Ramps/Belgrade Ave
Manner of Collision

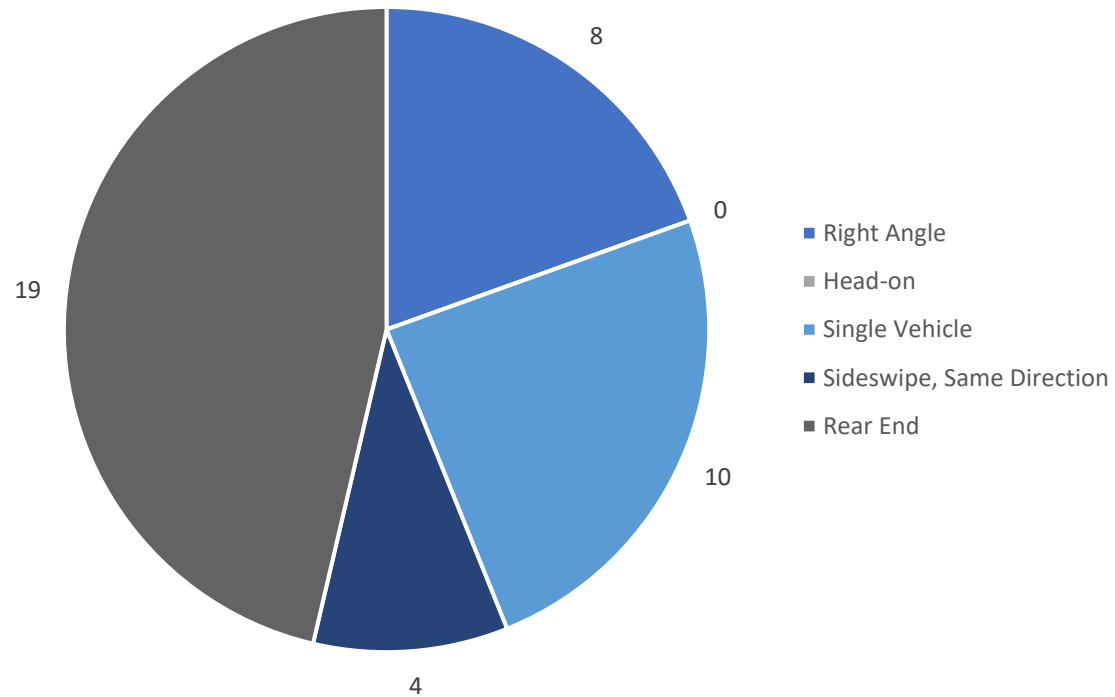


US 169 SB Ramps/Belgrade Ave
Severity

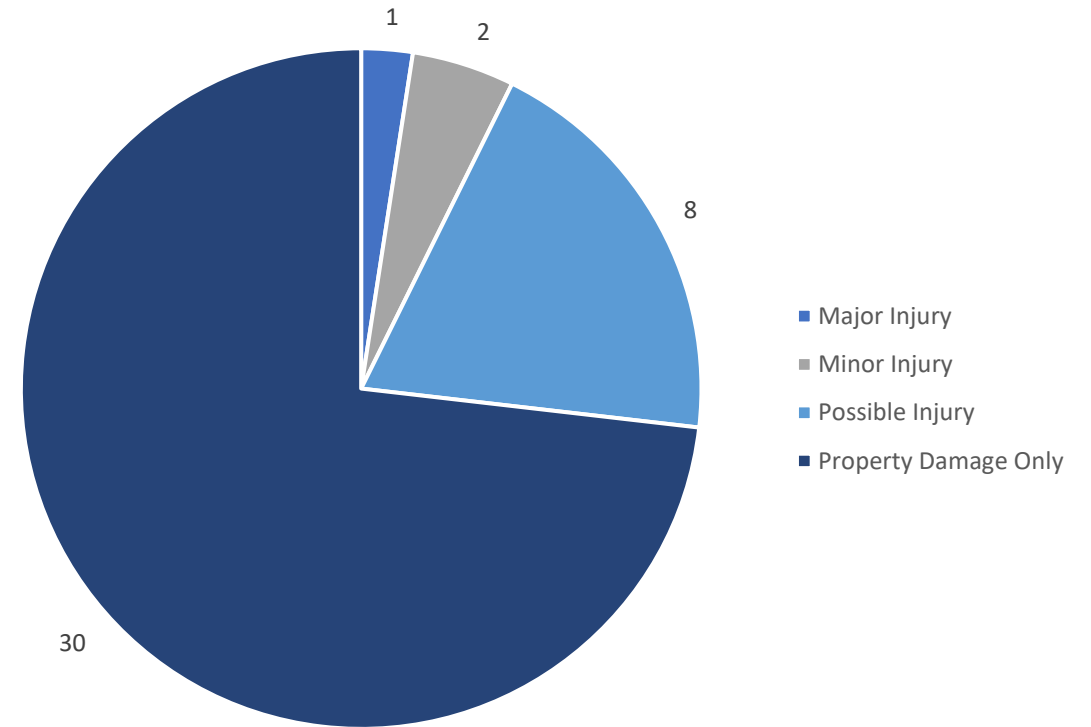


Existing Conditions – Crash Data (01/2011 to 05/2021)

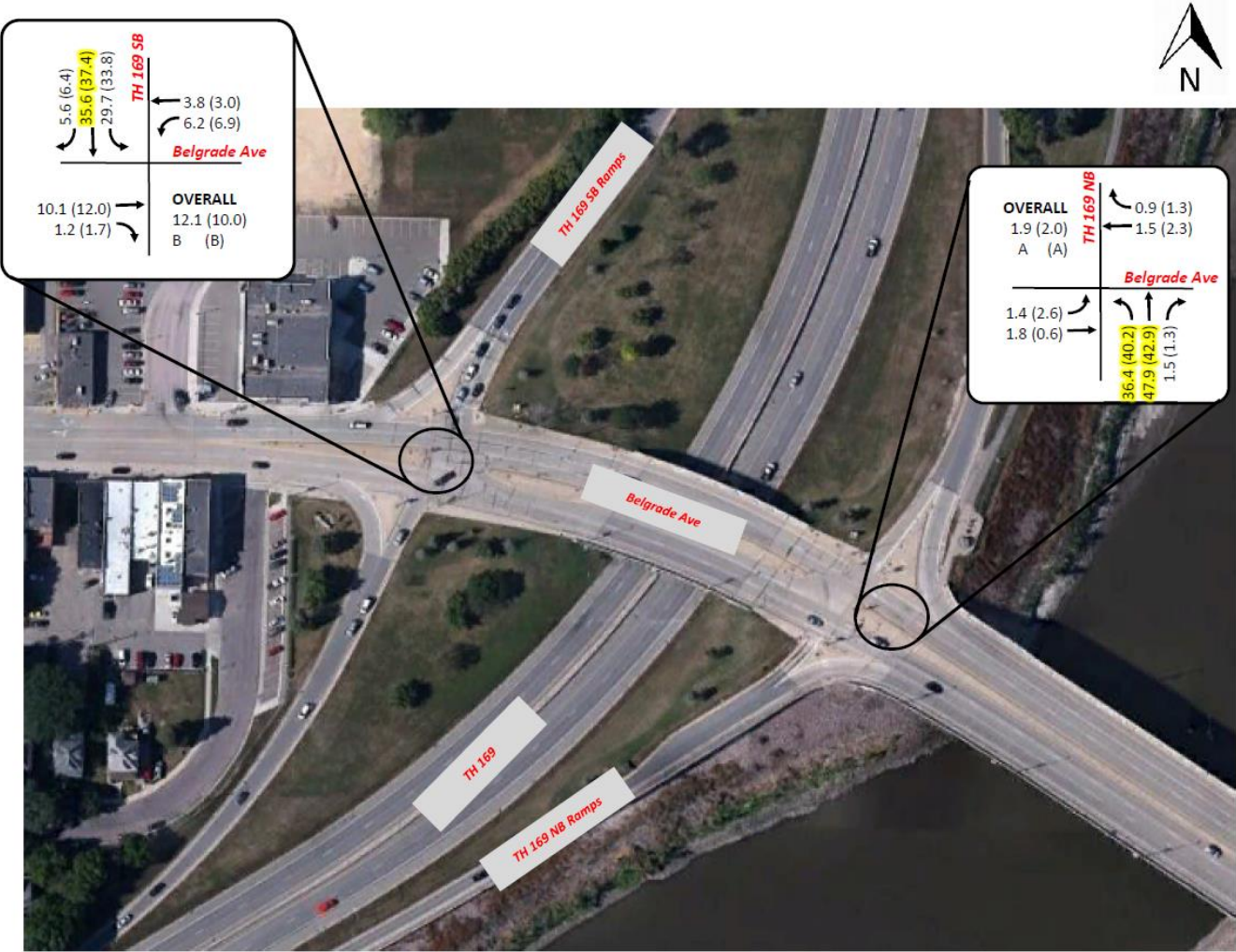
US 169 NB Ramps/Belgrade Ave
Manner of Collision



US 169 NB Ramps/Belgrade Ave
Severity



Existing Conditions – Operations Analysis



LEGEND

AM Peak Delay (sec)
PM Peak Delay (sec)

xx(xx)

Level of Service

A B C D E F

Signalized Delay

- A ≤ 10 s
- B > 10 and ≤ 20 s
- C > 20 and ≤ 35 s
- D > 35 and ≤ 55 s
- E > 55 and ≤ 80 s

95th % Queue Length (feet)													
Intersection Name	Peak Hour	Southbound Approach			Westbound Approach			Northbound Approach			Eastbound Approach		
	AM/PM	SBL	SBI	SBR	WBL	WBI	WBR	NBL	NBI	NBR	EBL	EBI	EBR
Southbound Ramp Terminal	AM	154	154	61	135	74						133	0
	PM	124	124	57	274	100						144	0
Northbound Ramp Terminal	AM					106	11	48	48	0	13	140	
	PM					202	9	59	59	0	14	57	

Issues/Opportunities → Purpose & Need → Evaluation Criteria

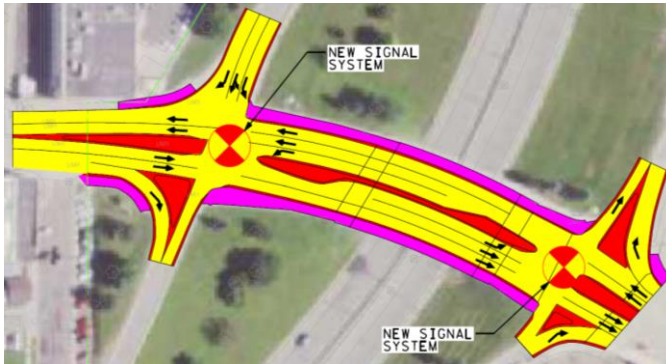
Roadway	Community/ Environmental	Structures	Construction/Cost Effectiveness
<ul style="list-style-type: none">• US 169 Operations¹• Belgrade Ave Operations¹• Safety¹• Access Management• Geometrics/Pavement¹	<ul style="list-style-type: none">• Multimodal²• Aesthetics/Visibility²• Socio-economic²• Utilities	<ul style="list-style-type: none">• Utilize/Optimize Existing¹• Risk for Additional Infrastructure	<ul style="list-style-type: none">• Constructability• Staging²• Right of Way• Maintenance• Cost

Notes:

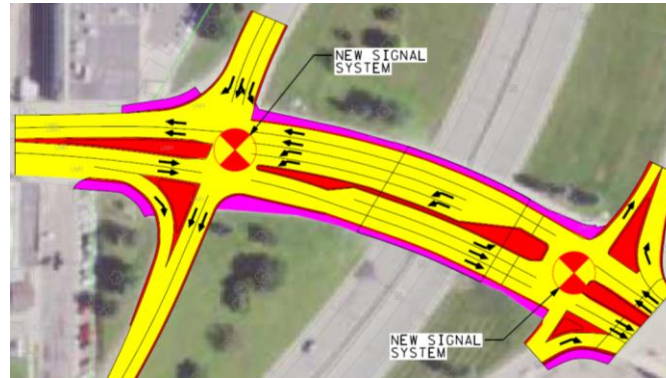
1. Primary needs from purpose and needs
2. Secondary needs from purpose and needs

Alternatives

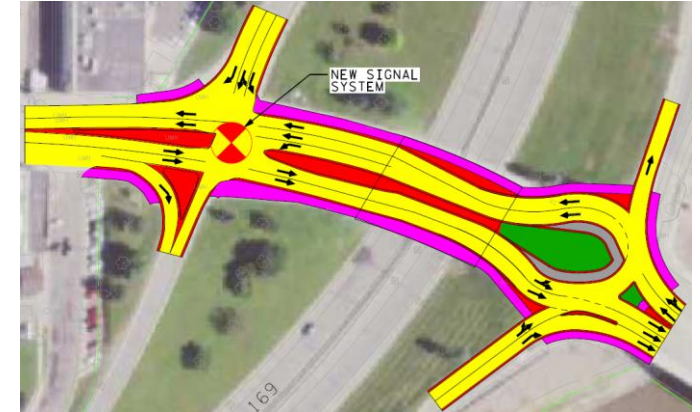
Two Traffic Signals



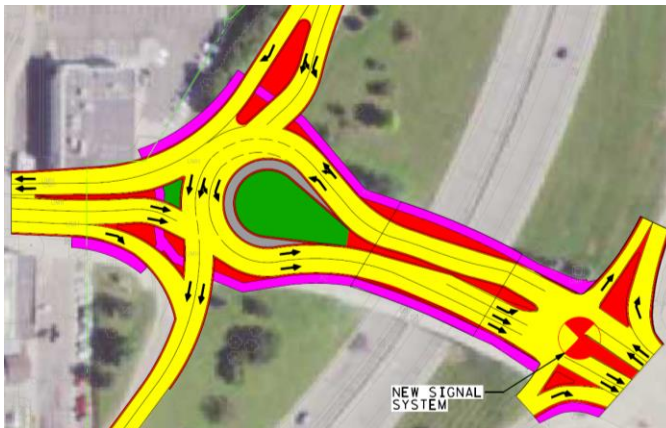
Signals and WB Dual Left



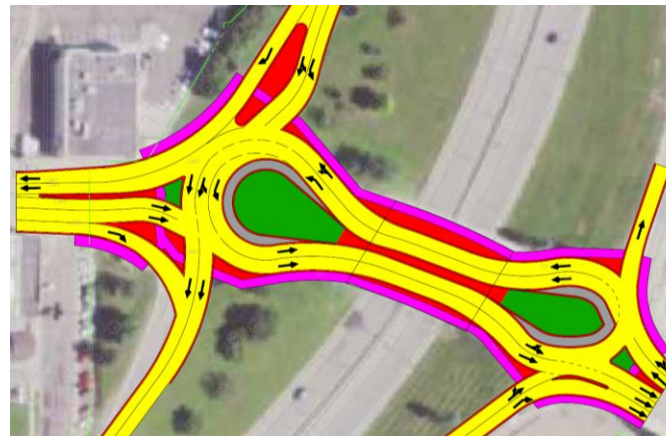
Signal and Roundabout



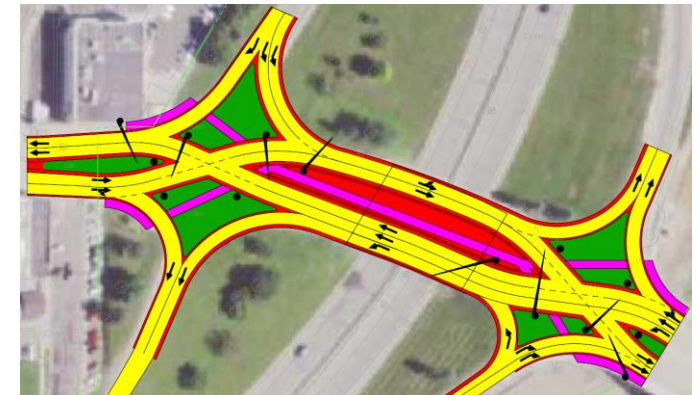
Roundabout and Signal



Two Roundabouts



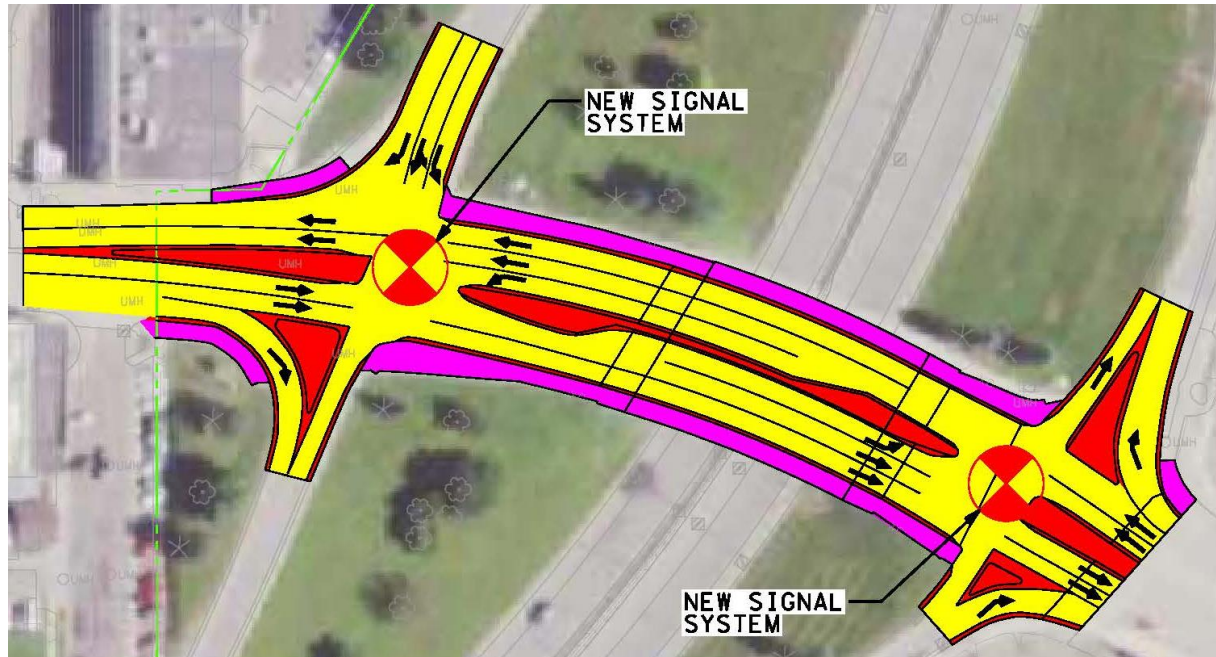
Diverging Diamond (DDI)



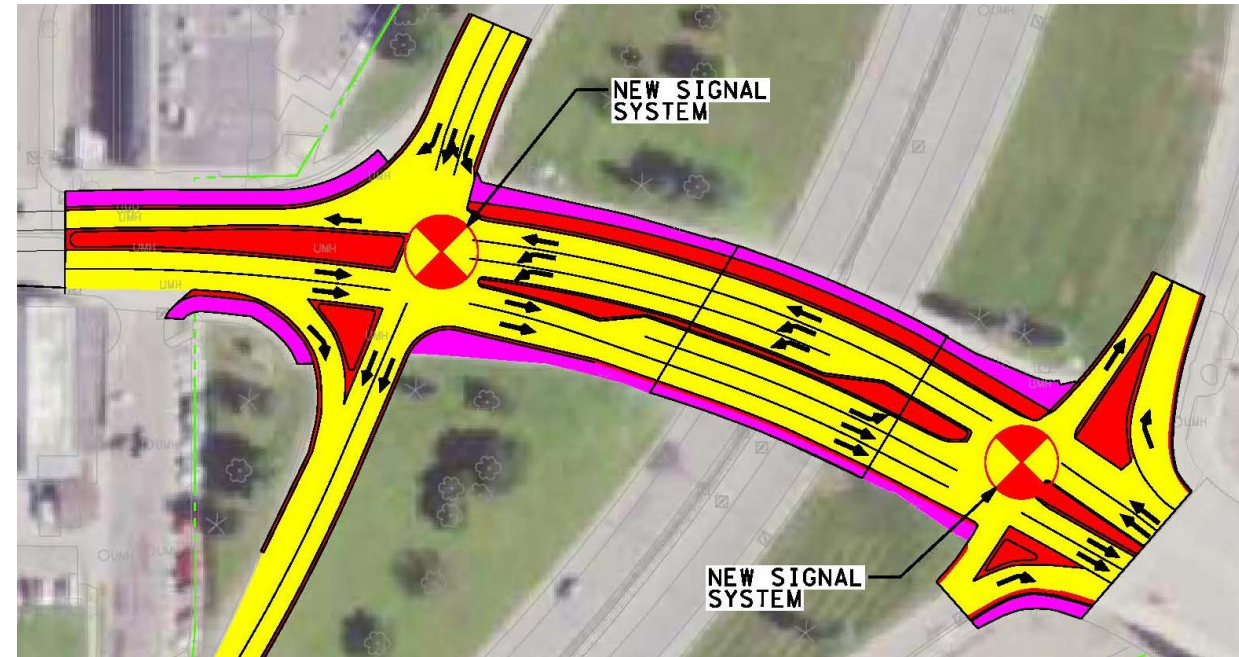
- Safety Analysis
- Operations Analysis
- Cost Comparison
- Impacts
- 4-Lane and 3-Lane Section on Belgrade Ave

Staff Preferred Alternative(s)

Two Traffic Signals: 4-Lane
Belgrade Ave Option



Signals and WB Dual Left:
3-Lane Belgrade Ave Option



Questions?

- MnDOT
 - Update and finalize the US 169 and Belgrade Ave Study
 - 5212-35 Project Development and Scope/Funding Update
 - Support City of North Mankato with information for items below
- City of North Mankato
 - City Council support for the US 169 and Belgrade Ave ICE Study recommendation and follow-up City Resolution
 - Provide direction on 3-lane vs. 4-lane section for Belgrade Ave
 - Seek funding for City of North Mankato cost participation

Thank You!

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TH 169/ BELGRADE AVE
SIGNAL AND PAVEMENT
REPLACEMENT

ALTERNATIVE 1

SUMMARY

OPERATIONS:
SB INTERSECTION LOS B/B
NB INTERSECTION LOS A/A
LONGEST DELAYS FOR NB-WB
LEFT TURN THRU (41 SEC) AND
SB-EB LEFT TURN (35 SEC)

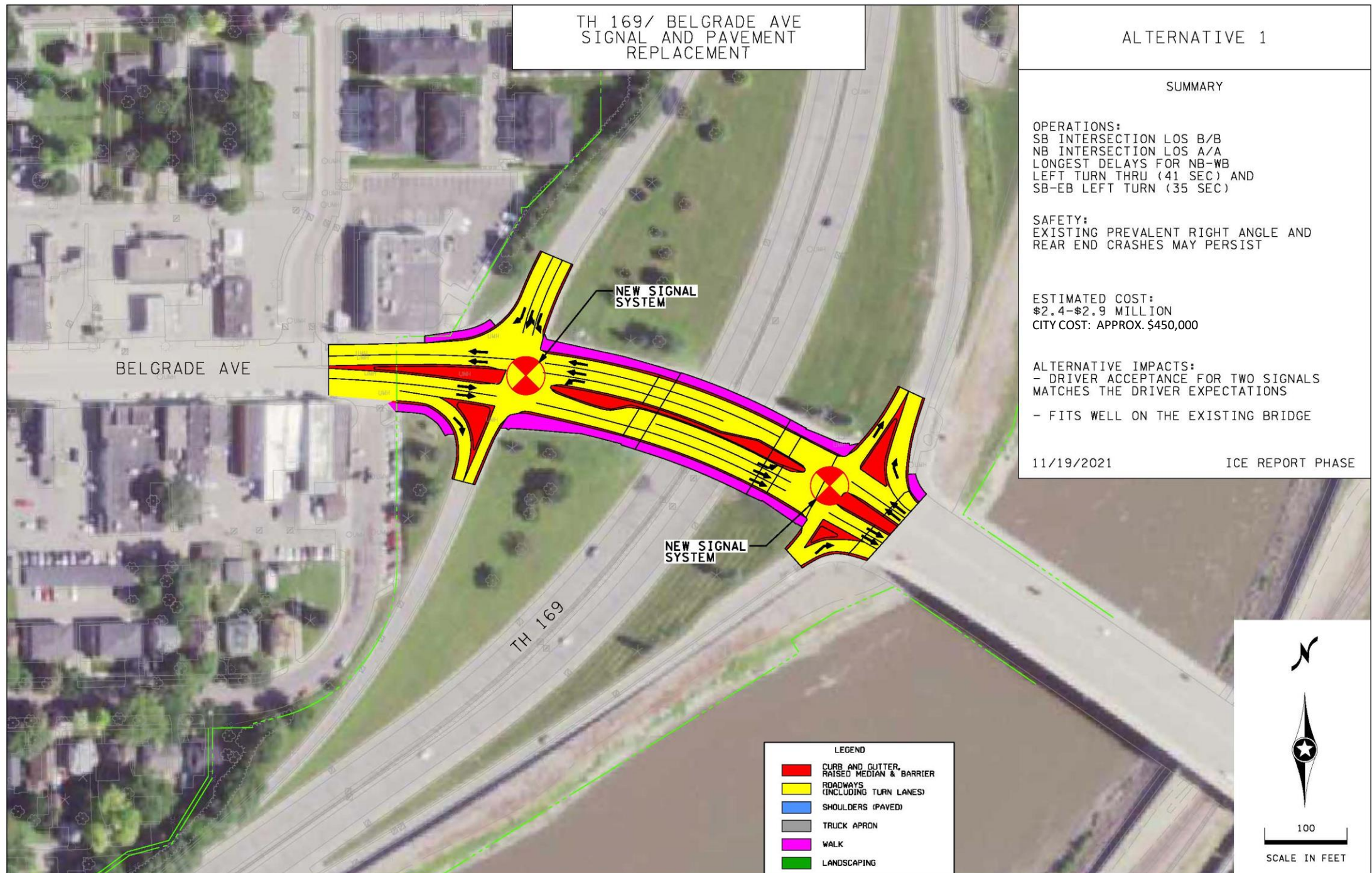
SAFETY:
EXISTING PREVALENT RIGHT ANGLE AND
REAR END CRASHES MAY PERSIST

ESTIMATED COST:
\$2.4-\$2.9 MILLION
CITY COST: APPROX. \$450,000

ALTERNATIVE IMPACTS:
- DRIVER ACCEPTANCE FOR TWO SIGNALS
MATCHES THE DRIVER EXPECTATIONS
- FITS WELL ON THE EXISTING BRIDGE

11/19/2021

ICE REPORT PHASE



TH 169/ BELGRADE AVE
SIGNAL & PAVEMENT
REPLACEMENT WITH
ADDED DUAL LEFT

ALTERNATIVE 2

SUMMARY

OPERATIONS:

SB INTERSECTION LOS B/B
NB INTERSECTION LOS A/A
LONGEST DELAYS FOR NB-WB LEFT TURN
(41 SEC) AND SB-EB LEFT TURN (36 SEC)

SAFETY:

REAR END CRASHES MAY PERSIST
REDUCTION OF LEFT TURN / ANGLE CRASHES
WITH PROTECTING PHASING FOR DUAL LEFTS

ESTIMATED COST:

\$2.5-\$3.0 MILLION

CITY COST: APPROX. \$450,000

ALTERNATIVE IMPACTS:

- DRIVER ACCEPTANCE FOR TWO SIGNALS
MATCHES THE DRIVER EXPECTATIONS

- FITS WELL ON THE EXISTING BRIDGE

11/19/2021

ICE REPORT PHASE

BELGRADE AVE

NEW SIGNAL
SYSTEM

NEW SIGNAL
SYSTEM

TH 169

LEGEND

- CURB AND GUTTER,
RAISED MEDIAN & BARRIER
- ROADWAYS
(INCLUDING TURN LANES)
- SHOULDERS (PAVED)
- TRUCK APRON
- WALK
- LANDSCAPING



100

SCALE IN FEET

TH 169/ BELGRADE AVE
NB ROUNDABOUT - SB SIGNAL

ALTERNATIVE 3

SUMMARY

OPERATIONS:

SB INTERSECTION LOS C/C
NB INTERSECTION LOS A/B
LONGEST DELAYS FOR WB-SB
LEFT TURN (29 SEC) AND SB-EB
LEFT TURN (29 SEC)
WB APPROACH AT NB INTERSECTION
BACKS UP ACROSS THE VET'S BRIDGE

SAFETY:

REDUCTION IN ANGLE CRASHES AT NB
INTERSECTION

ESTIMATED COST:

\$2.4-\$2.9 MILLION

CITY COST: APPROX. \$450,000

ALTERNATIVE IMPACTS:

- GEOMETRY FOR NB ROUNDABOUT IS A TIGHT
FIT ON THE BRIDGE

- ELIPSE GEOMETRY FOR NB INTERSECTION
ROUNDABOUT TO AVOID IMPACT TO DNR
RETAINING WALL IN SE QUADRANT

- STEEP SLOPES IN RAMP INFIELDS, GRADING
TO TH 169 SHOULDER

- DRIVER EXPECTATION FOR A ROUNDABOUT
WILL BE LOW FOR THE NB INTERSECTION

11/19/2021

ICE REPORT PHASE

BELGRADE AVE

NEW SIGNAL
SYSTEM

TH 169

LEGEND

- CURB AND GUTTER,
RAISED MEDIAN & BARRIER
- ROADWAYS
(INCLUDING TURN LANES)
- SHOULDERS (PAVED)
- TRUCK APRON
- WALK
- LANDSCAPING



100

SCALE IN FEET

TH 169/ BELGRADE AVE
SB ROUNDABOUT - NB SIGNAL

ALTERNATIVE 4

SUMMARY

OPERATIONS:

SB INTERSECTION LOS A/B
NB INTERSECTION LOS A/A
LONGEST DELAYS FOR SB-EB
THRU (45 SEC),
SB-EB LEFT TURN (45 SEC),
AND NB-WB LEFT TURN (41 SEC)

SAFETY:

REDUCTION IN ANGLE CRASHES AT SB
INTERSECTION

ESTIMATED COST:

\$3.0-\$3.5 MILLION

CITY COST: APPROX. \$600,000

ALTERNATIVE IMPACTS:

- SPIRAL GEOMETRY TO ACCOMMODATE
CONSECUTIVE DUAL LEFT TURNS

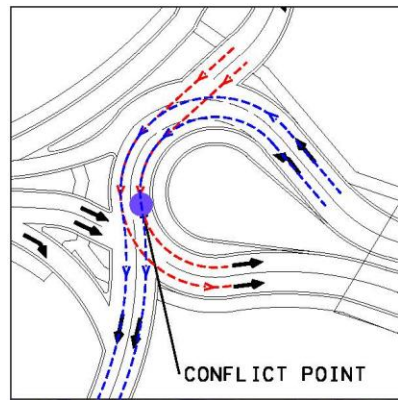
- ROW IMPACTS AT SB EXIT RTL

- ROUNDABOUT INFIELD AREA MAY OFFER
OPPORTUNITY FOR CITY-FUNDED AESTHIC
TREATMENTS/GATEWAY FEATURES

- SB RAMP INFIELDS ARE VERY FLAT,
MINIMAL GRADING IMPACTS

11/19/2021

ICE REPORT PHASE



BELGRADE AVE

TH 169

NEW SIGNAL
SYSTEM

LEGEND

- CURB AND GUTTER,
RAISED MEDIAN & BARRIER
- ROADWAYS
(INCLUDING TURN LANES)
- SHOULDERS (PAVED)
- TRUCK APRON
- WALK
- LANDSCAPING



TH 169/ BELGRADE AVE
ROUNDAABOUT - ROUNDAABOUT

ALTERNATIVE 5

SUMMARY

OPERATIONS:
SB INTERSECTION LOS A/C
NB INTERSECTION LOS B/B
LONGEST DELAYS FOR SB-EB
LEFT TURN (93 SEC) AND WB RTL (27 SEC)
WB APPROACH AT NB INTERSECTION
BACKS UP ACROSS THE VET'S BRIDGE

SAFETY:
REDUCTION IN ANGLE CRASHES AT
BOTH INTERSECTION

ESTIMATED COST:
\$3.2-\$3.7 MILLION
CITY COST: APPROX. \$600,000

ALTERNATIVE IMPACTS:

- SPIRAL GEOMETRY TO ACCOMMODATE CONSECUTIVE DUAL LEFT TURNS
- ROW IMPACTS AT SB EXIT RTL
- ROUNDAABOUT INFIELD AREA MAY OFFER OPPORTUNITY FOR CITY-FUNDED AESTHIC TREATMENTS/GATEWAY FEATURES
- SB RAMP INFIELDS ARE VERY FLAT, MINIMAL GRADING IMPACTS
- GEOMETRY FOR NB ROUNDAABOUT IS A TIGHT FIT ON THE BRIDGE

11/19/2021

ICE REPORT PHASE

BELGRADE AVE

TH 169

LEGEND

- CURB AND GUTTER, RAISED MEDIAN & BARRIER
- ROADWAYS (INCLUDING TURN LANES)
- SHOULDERS (PAVED)
- TRUCK APRON
- WALK
- LANDSCAPING



TH 169/ BELGRADE AVE
DIVERGING DIAMOND INTERCHANGE

ALTERNATIVE 6

SUMMARY

OPERATIONS:

SB INTERSECTION LOS B/B

NB INTERSECTION LOS B/B

LONGEST DELAYS FOR NB-WB

LEFT TURN (39 SEC) AND WB THRU (24 SEC)

SAFETY:

HIGHEST REDUCTION IN OVERALL CRASHES

REDUCTION IN LEFT ANGLE CRASHES

ESTIMATED COST:

\$3.7-\$4.2 MILLION

CITY COST: APPROX. \$700,000

ALTERNATIVE IMPACTS:

- GREATER ABILITY TO SUPPORT LONG-TERM
ECONOMIC GROWTH OR REDEVELOPMENT

- CHANGE IN PEDESTRIAN ROUTE, PROTECTED
CENTER MEDIAN AND ADDED CROSSING

- LARGE MEDIAN AREA OFFERS OPPORTUNITY
FOR CITY-FUNDED TREATMENT

- SIGNAL TIMING OPTIMIZATION FOR SIGNAL
SYSTEM AFTER CONSTRUCTION

11/19/2021

ICE REPORT PHASE

BELGRADE AVE

TH 169

LEGEND

- PEDESTAL
- MAST ARM
- CURB AND GUTTER,
RAISED MEDIAN & BARRIER
- ROADWAYS
(INCLUDING TURN LANES)
- SHOULDERS (PAVED)
- TRUCK APRON
- WALK
- LANDSCAPING



100

SCALE IN FEET

TH 169/ BELGRADE AVE
SIGNAL & PAVEMENT
REPLACEMENT

ALTERNATIVE 1B

SUMMARY

OPERATIONS:

SB INTERSECTION LOS C/D

NB INTERSECTION LOS A/C

LONGEST DELAYS FOR EB THRU (85 SEC) AND
WB THRU (57 SEC)

SAFETY:

EXISTING PREVALENT RIGHT ANGLE AND
REAR END CRASHES MAY PERSIST

ESTIMATED COST:

\$2.4-\$2.9 MILLION

CITY COST: APPROX. \$450,000

ALTERNATIVE IMPACTS:

- DRIVER ACCEPTANCE FOR TWO SIGNALS
MATCHES THE DRIVER EXPECTATIONS

- FITS WELL ON THE EXISTING BRIDGE

11/19/2021

ICE REPORT PHASE

BELGRADE AVE

NEW SIGNAL
SYSTEM

NEW SIGNAL
SYSTEM

TH 169

LEGEND

- CURB AND GUTTER,
RAISED MEDIAN & BARRIER
- ROADWAYS
(INCLUDING TURN LANES)
- SHOULDERS (PAVED)
- TRUCK APRON
- WALK
- LANDSCAPING



100
SCALE IN FEET

TH 169/ BELGRADE AVE
SIGNAL & PAVEMENT
REPLACEMENT WITH
ADDED DUAL LEFT

ALTERNATIVE 2B

SUMMARY

OPERATIONS:

SB INTERSECTION LOS C/C
NB INTERSECTION LOS A/A
LONGEST DELAYS FOR EB THRU (59 SEC)
AND WB-SB LEFT TURN (43 SEC)

SAFETY:

REAR END CRASHES MAY PERSIST
REDUCTION OF LEFT TURN / ANGLE CRASHES
WITH PROTECTING PHASING FOR DUAL LEFTS

ESTIMATED COST:

\$2.5-\$3.0 MILLION
CITY COST: APPROX. \$450,000

ALTERNATIVE IMPACTS:

- DRIVER ACCEPTANCE FOR TWO SIGNALS
MATCHES THE DRIVER EXPECTATIONS
- FITS WELL ON THE EXISTING BRIDGE

11/19/2021

ICE REPORT PHASE

BELGRADE AVE

NEW SIGNAL
SYSTEM

NEW SIGNAL
SYSTEM

TH 169

LEGEND

- CURB AND GUTTER,
RAISED MEDIAN & BARRIER
- ROADWAYS
(INCLUDING TURN LANES)
- SHOULDERS (PAVED)
- TRUCK APRON
- WALK
- LANDSCAPING



100

SCALE IN FEET

TH 169/ BELGRADE AVE
NB ROUNDABOUT - SB SIGNAL

ALTERNATIVE 3B

SUMMARY

OPERATIONS:

SB INTERSECTION LOS C/C
NB INTERSECTION LOS A/D
LONGEST DELAYS FOR WB-SB
LEFT TURN (43 SEC) AND WB
THRU (53 SEC)

WB-SB LEFT TURN QUEUE LIKELY
TO IMPACT NB RAMP ROUNDABOUT,
CAUSING LONGER WB DELAYS AND QUEUES

SAFETY:

REDUCTION IN ANGLE CRASHES AT NB
INTERSECTION

ESTIMATED COST:

\$2.6-\$3.1 MILLION

CITY COST: APPROX. \$450,000

ALTERNATIVE IMPACTS:

- GEOMETRY FOR NB ROUNDABOUT IS A TIGHT
FIT ON THE BRIDGE

- ELIPSE GEOMETRY FOR NB INTERSECTION
ROUNDABOUT TO AVOID IMPACT TO DNR
RETAINING WALL IN SE QUADRANT

- STEEP SLOPES IN RAMP INFIELDS, GRADING
TO TH 169 SHOULDER

- DRIVER EXPECTATION FOR A ROUNDABOUT
WILL BE LOW FOR THE NB INTERSECTION

11/19/2021

ICE REPORT PHASE

NEW SIGNAL
SYSTEM

BELGRADE AVE

TH 169

LEGEND

- CURB AND GUTTER,
RAISED MEDIAN & BARRIER
- ROADWAYS
(INCLUDING TURN LANES)
- SHOULDERS (PAVED)
- TRUCK APRON
- WALK
- LANDSCAPING



100
SCALE IN FEET

TH 169/ BELGRADE AVE
SB ROUNDABOUT - NB SIGNAL

ALTERNATIVE 4B

SUMMARY

OPERATIONS:

SB INTERSECTION LOS A/E
NB INTERSECTION LOS A/A
LONGEST DELAYS FOR EB THRU (195 SEC),
SB-EB THRU (57 SEC),
SB-EB LEFT TURN (37 SEC),
AND NB-WB LEFT TURN (41 SEC)

SAFETY:

REDUCTION IN ANGLE CRASHES AT SB
INTERSECTION

ESTIMATED COST:

\$3.0-\$3.5 MILLION

CITY COST: APPROX. \$600,000

ALTERNATIVE IMPACTS:

- SPIRAL GEOMETRY TO ACCOMMODATE
CONSECUTIVE DUAL LEFT TURNS

- ROW IMPACTS AT SB EXIT RTL

- ROUNDABOUT INFIELD AREA MAY OFFER
OPPORTUNITY FOR CITY-FUNDED AESTHIC
TREATMENTS/GATEWAY FEATURES

- SB RAMP INFIELDS ARE VERY FLAT,
MINIMAL GRADING IMPACTS

11/19/2021

ICE REPORT PHASE

BELGRADE AVE

NEW SIGNAL
SYSTEM

TH 169

LEGEND

- CURB AND GUTTER,
RAISED MEDIAN & BARRIER
- ROADWAYS
(INCLUDING TURN LANES)
- SHOULDERS (PAVED)
- TRUCK APRON
- WALK
- LANDSCAPING



100
SCALE IN FEET

TH 169/ BELGRADE AVE
ROUNDAABOUT - ROUNDAABOUT

ALTERNATIVE 5B

SUMMARY

OPERATIONS:

SB INTERSECTION LOS D/E
NB INTERSECTION LOS A/B
LONGEST DELAYS FOR SB-EB
LEFT TURN (77 SEC),
SB THRU (111 SEC) AND EB THRU (190 SEC)
WB APPROACH AT NB INTERSECTION
BACKS UP ACROSS THE VET'S BRIDGE

SAFETY:

REDUCTION IN ANGLE CRASHES AT
BOTH INTERSECTION

ESTIMATED COST:

\$3.2-\$3.7 MILLION
CITY COST: APPROX. \$600,000

ALTERNATIVE IMPACTS:

- SPIRAL GEOMETRY TO ACCOMMODATE
CONSECUTIVE DUAL LEFT TURNS
- ROW IMPACTS AT SB EXIT RTL
- ROUNDAABOUT INFIELD AREA MAY OFFER
OPPORTUNITY FOR CITY-FUNDED AESTHIC
TREATMENTS/GATEWAY FEATURES
- SB RAMP INFIELDS ARE VERY FLAT, MINIMAL
GRADING IMPACTS
- GEOMETRY FOR NB ROUNDAABOUT IS A TIGHT
FIT ON THE BRIDGE

11/19/2021

ICE REPORT PHASE

BELGRADE AVE

TH 169

LEGEND

- CURB AND GUTTER,
RAISED MEDIAN & BARRIER
- ROADWAYS
(INCLUDING TURN LANES)
- SHOULDERS (PAVED)
- TRUCK APRON
- WALK
- LANDSCAPING



100

SCALE IN FEET

TH 169/ BELGRADE AVE
DIVERGING DIAMOND INTERCHANGE

ALTERNATIVE 6B

SUMMARY

OPERATIONS:
SB INTERSECTION LOS B/B
NB INTERSECTION LOS B/C
LONGEST DELAYS FOR NB-WB
LEFT TURN (78 SEC)
AND EB/WB THRU (33 SEC)

SAFETY:
HIGHEST REDUCTION IN OVERALL CRASHES
REDUCTION IN LEFT ANGLE CRASHES

ESTIMATED COST:
\$3.7-\$4.2 MILLION
CITY COST: APPROX. \$700,000

ALTERNATIVE IMPACTS:
- GREATER ABILITY TO SUPPORT LONG-TERM
ECONOMIC GROWTH OR REDEVELOPMENT

- CHANGE IN PEDESTRIAN ROUTE, PROTECTED
CENTER MEDIAN AND ADDED CROSSING

- LARGE MEDIAN AREA OFFERS OPPORTUNITY
FOR CITY-FUNDED TREATMENT

- SIGNAL TIMING OPTIMIZATION FOR SIGNAL
SYSTEM AFTER CONSTRUCTION

11/19/2021

ICE REPORT PHASE

BELGRADE AVE

TH 169

LEGEND

-  PEDESTAL
-  MAST ARM
-  CURB AND GUTTER,
RAISED MEDIAN & BARRIER
-  ROADWAYS
(INCLUDING TURN LANES)
-  SHOULDERS (PAVED)
-  TRUCK APRON
-  WALK
-  LANDSCAPING



100

SCALE IN FEET



Water, Sanitary and Storm Sewer Update

4.25.22



North Mankato Public Works Dept. Objectives

- Safety
- Quality
- Productivity



WATER

Goal 1: Provide clean drinking water to homes and businesses in North Mankato

- *Objective 1: Deploy best practices to produce and distribute water to meet the demand of residents and businesses in the community.*
 - Tactic 1.1.1: Maintain city wells to produce demand to meet the needs of North Mankato residents and businesses (approximately 450-490 million gallons per year)
 - Tactic 1.1.2: Treat, distribute, and sample drinking water per state of Minnesota guidelines in the most efficient manner possible (approximately 450-475 million gallons per year)
 - Tactic 1.1.2: Minimize water loss through leak detection program and other means to below 10% per year
 - Tactic 1.1.4: Perform daily rounds to ensure equipment is functioning properly and conduct locates for water lines in response to utility locate requests. Resolve and upgrade equipment as necessary and respond to emergencies in the water system (approximately 3,000 hours per year, 1,450 hydrants, 2,500 locates per year, 170 valves per year).
 - Tactic 1.1.5: Flush all hydrants once per year and conduct regular valve exercises for emergency response. (approximately 600 hours per year).
 - Tactic 1.1.6: Perform utility shutoffs upon request from the finance department. (115-300 hours per year or 270 shutoffs)
 - Tactic 1.1.7: Convert 50% of water meters in the city to auto water meters by 2025.
 - Tactic 1.1.8: Complete filter rehab project on filter #1 and #2 at plant 2 by end of 2023. Complete generator transfer switch to water plant 1 by 2023.
 - Tactic 1.1.9: Complete risk and resilience plan and emergency response plan by end of 2021.
 - Tactic 1.1.10: Develop lead service line inventory by end of 2024.



North Mankato Water System

- 4.5 Full Time Employees
- 2 Water Plants
- 2 Water Towers
- 1 Reservoir
- 2 Redundant Connections with Mankato
- 5 Active wells
- 76 Miles of watermain
- Average 450 million gallon pumped from 5 wells
- Average 425 Million gallons distributed
- 7475 Water Meters in System, 849 are Auto Read. 11%



North Mankato Water System

- Opportunities

- New Technology
- Effective CIP
- Leak Detection
- Valve Exercising

- Challenges

- Aging Infrastructure
- Locates

- 55% of Water Dept hours

- Maintenance
- Locates
- Shut-offs
- Training/Continuing Ed.
- Call Outs



WASTEWATER

Goal 1: Install and maintain appropriate infrastructure to collect and convey waste to the Mankato Wastewater and Water Recovery Treatment plant (approximately 525 million gallons per year).

- *Objective 1.1: Deploy best practices in the installation and maintenance of the North Mankato wastewater collection system.*
 - Tactic 1.1.1: Ensure lift stations are function properly and respond to notifications of malfunction
 - Tactic 1.1.2: Perform 50,000 linear feet of jetting each year for the sewer system
 - Tactic 1.1.3: Perform inspection of 500 wastewater manholes each year.
 - Tactic 1.1.4: Respond to 8 main breaks per year and resolve.
 - Tactic 1.1.5: Televisе all city sewer lines and have uploaded to GIS by 2022.



North Mankato Sewer System

- 64 Miles of Sewer Main
- 10 Sanitary Sewer Lift Stations
- 4.5 Miles of Sewer Forcemain
- Average 522 Million Gallons sent to Mankato Treatment Plant
- Average 50,000 feet of Jetting
- Average 75,000 feet of televising



North Mankato Sewer System

- Opportunities

- New Technology
- Effective CIP

- Challenges

- Aging Infrastructure
- Treatment Cost



STORM WATER / FLOOD CONTROL

Goal 1: Provide for the protection of life and property through oversight of North Mankato's storm water utility and flood control system.

- *Objective 1: Maintain the system of storm water mains, ravines, holding ponds, manholes, and pumping stations necessary protect life and property.*
 - Tactic 1.1.1: Conduct regular maintenance of catch basins, inlets, and ponds.
 - Tactic 1.1.2: Ensure compliance with new MS4 permit by end of 2022.
 - Tactic 1.1.3: Ensure storm water stations #1 and #2 are functioning properly. Remove debris from wet wells twice a year.
 - Tactic 1.1.4: Monitor Minnesota River Level daily and implement levy patrols when necessary.
 - Tactic 1.1.5: Maintain levy system in accordance with Army Corp of Engineers.
 - Tactic 1.1.6: In accordance with the Ravine maintenance plan conduct 25 inspections per year and recommend ravine improvement projects in response to erosion as necessary.



North Mankato Storm Sewer System

- 4 Storm Sewer Pumping Stations
 - 90 Miles of Storm Sewer Main
-
- | | |
|---|--|
| <ul style="list-style-type: none">■ Opportunities<ul style="list-style-type: none">■ Establishment of CIP■ Addition of Underdrain in Mill and Overlay Projects | <ul style="list-style-type: none">■ Challenges<ul style="list-style-type: none">■ Ravine Maintenance■ Aging Infrastructure■ Implementation of new MS4 Permit |
|---|--|



Questions?

MEMORANDUM

TO: Mike Fischer, Community Development Director/ Interim City Administrator
FROM: Matt Lassonde, City Planner
DATE: April 14, 2022
SUBJECT: Outdoor Patio Seating Evaluation

Introduction

City staff was asked to review existing permanent and seasonal (temporary) outdoor patio seating among restaurants and drinking establishments throughout the City. The City of North Mankato Code does not currently contain ordinances regulating the size of permanent or seasonal outdoor patio seating.

This memo provides a review of those restaurants/drinking establishments in the City to assess the proportion of total lot area existing permanent and seasonal (temporary) patios have used in the past. This information could prove useful in aiding the City Council in a decision to consider developing an ordinance regulating the size of future outdoor patio seating arrangements.

Properties Providing Permanent and Seasonal (temporary) Outdoor Patio Seating

Table 1 identifies establishments in the City providing permanent and seasonal (temporary) outdoor patio seating along with the proportion of the total lot area occupied, minus the primary structure footprint. Establishments are depicted in **Attachment 1** which also includes more detailed information on patio extent and placement.

Properties with Existing Permanent Outdoor Patio Seating

The following restaurants/drinking establishments in North Mankato utilize permanent outdoor patio seating:

1. American Legion
2. Caribou Coffee
3. Circle Inn
4. Culver's
5. Curiousi-Tea
6. J's Sambusa
7. Mankato Brewery
8. Nakato
9. Spinner's Bar

Table 1. Current North Mankato Outdoor Patio Seating (% of lot occupied minus primary structure)			
Business	Permanent Patio	Seasonal (Temporary) Patio	Cumulative Patio
Circle Inn	7.0%	23.1% (proposed)	30.1%
Nakato	11.9%	N/A	11.9%
Big Dog	N/A	3.3%	3.3%
Curiousi-Tea	2.6%	N/A	2.6%
Caribou Coffee	1.0%	N/A	1.0%
American Legion	10.1%	N/A	10.1%
J's Sambusa	3.1%	N/A	3.1%
Culver's	1.6%	N/A	1.6%
Spinner's Bar*	29.7%	N/A	29.7%
Mankato Brewery	3.1%	N/A	3.1%
Average	7.8%	13.2%	9.6%
Range	1.0%-29.7%	3.3%-23.1%	1.0%-30.1%

*Spinner's Bar has no on-site, off-street parking

Current permanent outdoor patio seating areas exhibit most or all of the following characteristics among the nine establishments:

- Most have poured/separate concrete pads that delineate the patio space from the parking lot
- All are immediately adjacent to the primary structure
- Existing permanent patios occupy 29.7% or less of total lot area minus the primary structure footprint (*average of 7.8%; range of 1.0%-29.7%*). Six of the nine establishments have permanent patios occupying 7.0% or less and three occupy 10.1% or more (see **Table 1** and **Attachment 1**).
- Establishments that serve alcohol have a permanent barrier in place surrounding the space (i.e. fencing, landscape block wall, etc).
- All businesses containing permanent outdoor patio seating have obtained a permit from the City to construct and utilize.
- Most establishments have off-street parking on-site.

Most permanent outdoor patio seating generally occupies a small percentage of the lot and does not conflict with vehicle parking areas.

Properties Requesting Additional Permanent Outdoor Patio Seating

At the time of this memo, the Circle Inn was requesting additional outdoor patio seating adjacent to their building. The proposed additional space is 2,100 square feet making up 23% of the lot, minus the footprint of the primary structure. The initial request was for seasonal patio seating, but the property owner has inquired about the possibility of this becoming a permanent patio in the future. The requested patio area is depicted in **Attachment 1**.

Properties Utilizing Seasonal (temporary) Outdoor Patio Seating

With the advent of COVID-19, the City worked with establishments to explore options for outdoor seating to offset lost business due to restrictions on indoor seating. During this time, seasonal (temporary) patios were utilized by businesses by way of erecting a tent over and/or placing temporary

fencing around a designated portion of the parking lot. Even though restrictions have been lifted on indoor seating and establishments are now functioning normally, seasonal (temporary) patios are still desirable among some establishments and have become an annual opportunity with a seasonal patio permit obtained through the City.

The following three establishments have utilized seasonal (temporary) outdoor patio seating in this manner:

1. American Legion
2. Big Dog Sports Café
3. Circle inn

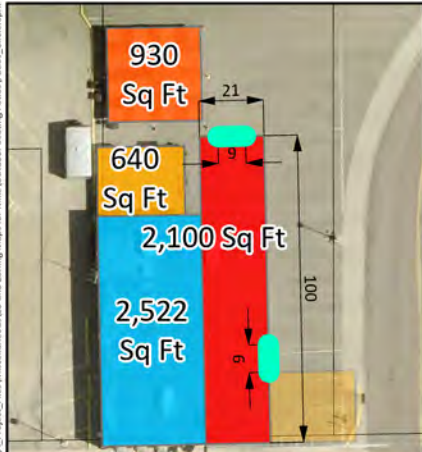
All seasonal outdoor patio seating requires a permit from the City and the term is May 1st through October 31st in any given calendar year. Seasonal (temporary) outdoor patio seating proportions are detailed in **Table 1** and **Attachment 1**.

Conclusion

Many establishments utilize outdoor patio seating in North Mankato, most using permanent arrangements and some using seasonal (temporary). Existing permanent patios range from 1.0% to 29.7% of the total lot (minus the primary structure footprint). One business is requesting an additional 23% of their property be converted to permanent outdoor patio seating. Several businesses (American Legion, Big Dog Sports Café, and Circle Inn) have utilized seasonal (temporary) outdoor patio seating in recent years spurred by COVID-19. City Council should use the information provided here to assist with determining if it is desirable to limit the size of outdoor patio seating arrangements.

Attachment 1 – Outdoor Patio Area Calculations

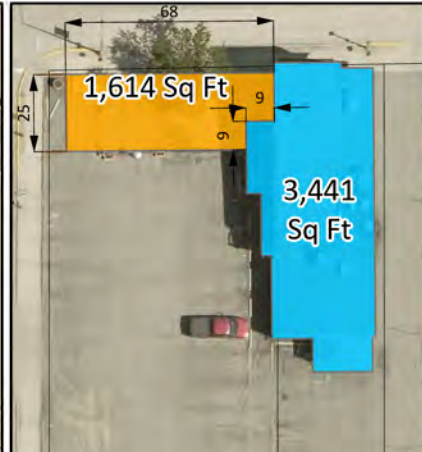
Location: Z:\Planning\A. Project - Files\Miscellaneous\LU and Zoning Maps for Mike\Outdoor Seating\Patios\Patios, Circle.aex



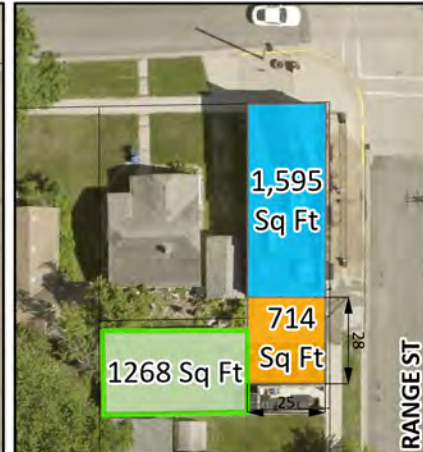
Circle Inn	
1 - Lot Sq Ft	11,625
2 - Building Sq Ft	2,522
3 - Remaining Sq Ft (Lot minus Bldg)	9,103
4 - Patio Sq Ft (Permanent)	640
5 - Patio % of Lot minus Bldg (% of Line 3)	7.0%
6 - Proposed Patio Sq Ft (Permanent)	2,100
7 - Proposed Patio (Permanent) % of Lot minus Bldg (% of Line 3)	23.1%
8 - Cumulative Patio Space (Existing/Proposed; Seasonal/Perm.)	2,740
9 - Cumulative Patio Space % of Lot minus Bldg (% of Line 3)	30.1%



American Legion	
1 - Lot Sq Ft	5,813
2 - Building Sq Ft	2,492
3 - Remaining Sq Ft (Lot minus Bldg)	3,321
4 - Patio Sq Ft (Permanent)	336
5 - Patio % of Lot minus Bldg (% of Line 3)	10.1%



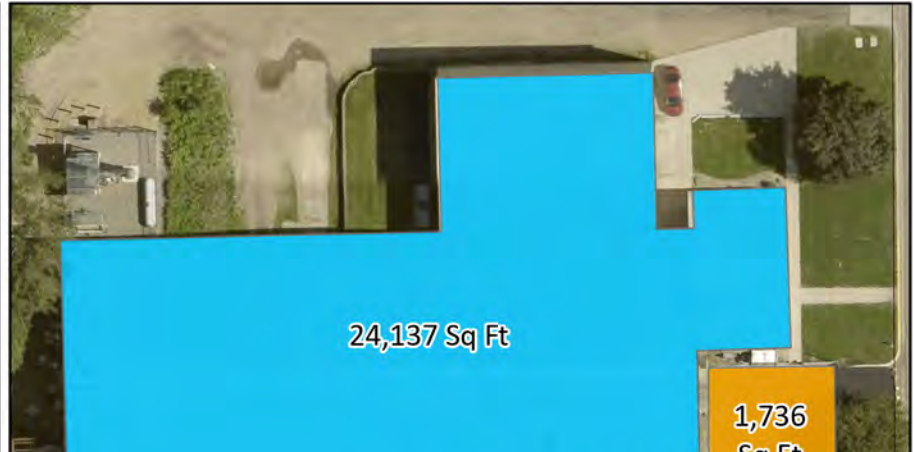
Nakato	
1 - Lot Sq Ft	16,949
2 - Building Sq Ft	3,441
3 - Remaining Sq Ft (Lot minus Bldg)	13,508
4 - Patio Sq Ft (Permanent)	1,614
5 - Patio % of Lot minus Bldg (% of Line 3)	11.9%



Spinner's	
1 - Lot Sq Ft	4,000
2 - Building Sq Ft	1,595
3 - Remaining Sq Ft (Lot minus Bldg)	2,405
4 - Patio Sq Ft (Permanent)	714
5 - Patio % of Lot minus Bldg (% of Line 3)	29.7%
6 - Grass Area Sq Ft (Seasonal Seating)	1,268
7 - Grass Area % of Lot minus Bldg (% of Line 3)	52.7%



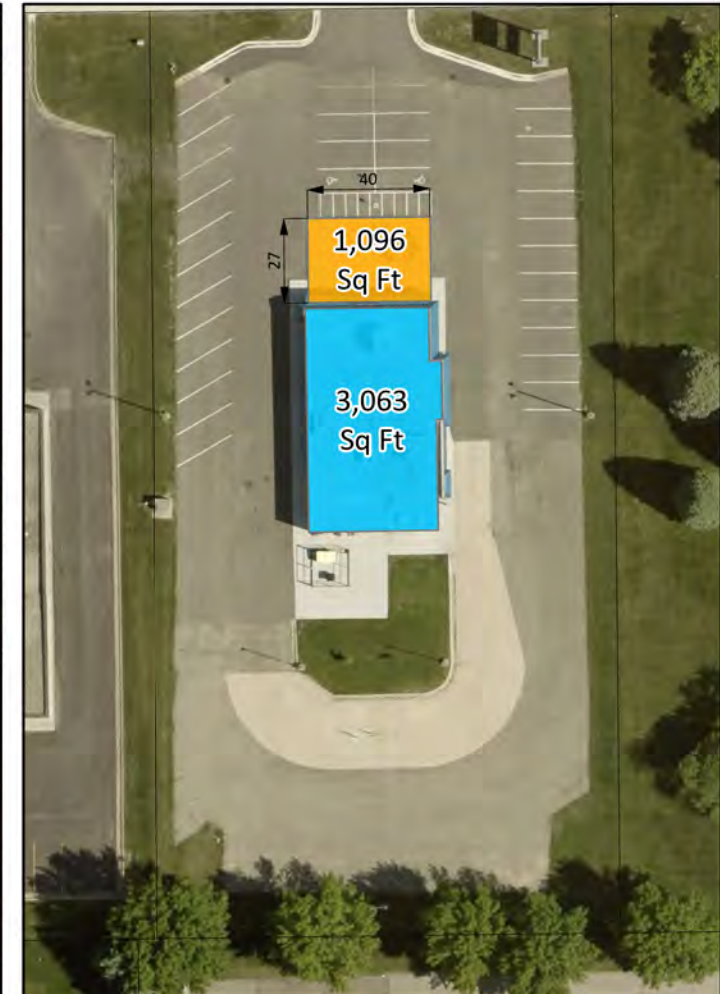
J's Sambusa	
1 - Lot Sq Ft	24,375
2 - Building Sq Ft	5,430
3 - Remaining Sq Ft (Lot minus Bldg)	18,945
4 - Patio Sq Ft (Permanent)	579
5 - Patio % of Lot minus Bldg (% of Line 3)	3.1%



Mankato Brewery	
1 - Lot Sq Ft	80,891
2 - Building Sq Ft	24,137
3 - Remaining Sq Ft (Lot minus Bldg)	56,754
4 - Patio Sq Ft (Permanent)	1,736
5 - Patio % of Lot minus Bldg (% of Line 3)	3.1%



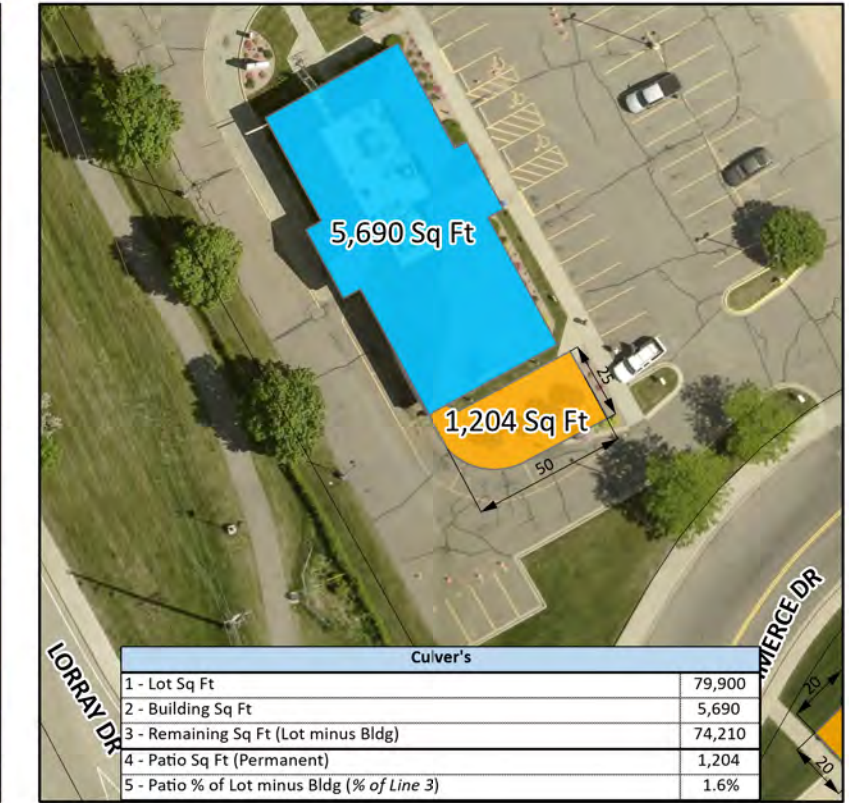
Big Dog	
1 - Lot Sq Ft	56,192
2 - Building Sq Ft	7,672
3 - Remaining Sq Ft (Lot minus Bldg)	48,520
4 - Patio Sq Ft (Seasonal)	1,585
5 - Patio % of Lot minus Bldg (% of Line 3)	3.3%



Curiousi-Tea	
1 - Lot Sq Ft	45,449
2 - Building Sq Ft	3,063
3 - Remaining Sq Ft (Lot minus Bldg)	42,386
4 - Patio Sq Ft (Permanent)	1,096
5 - Patio % of Lot minus Bldg (% of Line 3)	2.6%



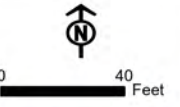
Caribou Coffee	
1 - Lot Sq Ft	39,885
2 - Building Sq Ft	3,305
3 - Remaining Sq Ft (Lot minus Bldg)	36,580
4 - Patio Sq Ft (Permanent)	353
5 - Patio % of Lot minus Bldg (% of Line 3)	1.0%



Culver's	
1 - Lot Sq Ft	79,900
2 - Building Sq Ft	5,690
3 - Remaining Sq Ft (Lot minus Bldg)	74,210
4 - Patio Sq Ft (Permanent)	1,204
5 - Patio % of Lot minus Bldg (% of Line 3)	1.6%

Legend

- Building
- Existing - Permanent Patio
- Existing - Seasonal Patio
- Proposed - Seasonal Patio
- Existing - Grass Area (Intermittent Seating)
- No Parking
- Entrance
- Parcel



Patio Square
Foot Calculations

April 2022