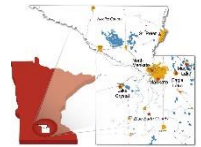


Belgrade Avenue Corridor Study MAPO and City of North Mankato, MN



MEMORANDUM

Date: October 21, 2016
To: Paul Vogel
From: Angie Bersaw, Senior Transportation Planner
Matt Lassonde, Transportation Planner
Subject: Existing Conditions
Belgrade Avenue Corridor Study, North Mankato, MN

INTRODUCTION

The Mankato/North Mankato Area Planning Organization (MAPO) and the City of North Mankato, in partnership with the Minnesota Department of Transportation (MnDOT), are working together to identify multimodal transportation improvements on Belgrade Avenue between Lee Boulevard and the Veterans' Memorial Bridge (see study area map in Appendix A). Belgrade Avenue serves as the central corridor for the downtown business district and provides a gateway to North Mankato from Highway 169 and the City of Mankato to the east. Belgrade Avenue serves multiple transportation users including automobiles, freight, transit, pedestrians and bicyclists.

The City of North Mankato has demonstrated a commitment to improving the central business district (CBD) through the Belgrade Master Plan planning process and several other previous planning efforts. The Belgrade Avenue Corridor Study will include:

- Understand the needs and opportunities in the corridor
- Develop and evaluate potential transportation improvement alternatives
- Gather public and business input on corridor needs and improvement alternatives
- Reach consensus on a recommended corridor plan
- Develop an implementation plan that prioritizes projects for completion over time

The purpose of this memorandum is to document existing conditions on Belgrade Avenue as it relates to land use and previous studies, traffic operations, safety, access, pedestrian/bicycle accommodations and environmental resources. This information will serve as the framework to develop improvement goals for Belgrade Avenue into the future.

PREVIOUS STUDIES OVERVIEW

Several short and long-range documents have been completed which provide planning direction for future transportation system needs within and near the Belgrade Avenue corridor. The key points in each study relevant to Belgrade Avenue are summarized below by plan title.

Mankato/North Mankato Area Planning Organization (MAPO) 2045 Long-Range Transportation Plan (LRTP) (2015)

- Belgrade Avenue is a minor arterial roadway under the MAPO's existing functional classification system.
- Forecasted 2045 Congested Roadway Segments:
 - Lee Boulevard - Lor Ray Drive to Belgrade Avenue; LOS F; 1.27 V/C ratio.
 - Belgrade Avenue - Lee Boulevard to Range Street; LOS E; .96 V/C ratio.
- Future projects:

Belgrade Avenue Corridor Study

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- Restripe Belgrade Avenue from Center Street to Range Street as a 3-lane facility (2021-2025 timeframe)
 - Reconstruct Lee Boulevard from Lookout Drive to Belgrade Avenue as a 3-lane (2021-2025 timeframe)
 - Reconstruct Belgrade as 2-lane from Lee Boulevard to Range Street (2031-2045 timeframe)
 - Reconstruct Belgrade as 4-lane from Range Street to Highway 169 (2031-2045 timeframe)
 - Expand Lee Boulevard to a 4-lane roadway from Lor Ray Drive to Belgrade Avenue (illustrative project)
- Need for an Intersection Control Evaluation (ICE) Study on Lee Boulevard at Belgrade Avenue (2021-2025 timeframe)

DRAFT City of North Mankato Complete Streets Plan & Policy (2016)

- Proposed On-Street Bicycle Accommodations Chart which includes Lee Boulevard from Lookout Drive to Hoover Drive and Range Street from Nicollet Street to McKinley Street.

North Mankato Comprehensive Plan (2015)

- Highlights the CBD as a development style common among other older downtowns with features such as being pedestrian oriented, on-street parking, and the preferred location for prominent community events.
- CBD is the community focal point and plans for its continued momentum by:
 - Creating an attractive gateway to downtown off Highway 169 through streetscape improvements and design standards.
 - Implement land use standards that emphasize walkability (i.e., rear parking at businesses, wider sidewalks with no obstructions, unique streetscape methods)
 - References the Downtown Planning Study (2011) which found a “perceived shortage of parking” yet the supply is generally sufficient for the existing uses during the day.
- Roadway design should consider the user friendliness of alternative modes of transportation while preserving on-street parking where feasible.

The City of North Mankato Parks Master Plan (2015)

- Identifies Centennial Park, a 1 Acre Commemorative Park located at 840 Belgrade Avenue with a decorative water fountain and benches.

City of North Mankato Downtown Planning Study (2012)

- Rates vehicular circulation as “generally good” but during peak traffic hours (7:45 – 8:15 AM and 4:45 – 5:15 PM), negotiating a turn at mid-block is difficult and parallel parking on Belgrade is problematic.
- Recommends additional pedestrian access and circulation to promote pedestrian traffic to businesses across the street from each other in the 200 block
- Identified the following parking/traffic/pedestrian concerns from a July 26, 2011 public meeting
 - More parking near businesses.
 - Wheel stops to keep parked cars off of sidewalks.
 - Manage traffic coming over the bridge and vehicles leaving businesses.
 - Better public transportation service.
 - Parking is a priority for future development efforts in the downtown.

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- Implies that the parking issue is a perceived inconvenience due to a lack of visibility of existing parking stalls on the 200 block of Belgrade Avenue and on Nicollet Street.
- Recommends providing signage for patron and public parking and possibly asking the city to provide a single page flyer for businesses to distribute to show downtown parking options.
- Recommends creating gathering spaces/opens spaces/green spaces/pathways that include amenities such as bike racks outdoor seating/benches and routes that tie into nearby parks and trails.
- Recommends improving connectivity to Belgrade Avenue over Veterans' Memorial Bridge and beyond to Wheeler Park, City Hall, Taylor Library and Centennial Park.

Downtown Focus Group (2010)

- Recommends a more attractive entrance to the downtown off Veterans' Memorial Bridge.
- Recommends pedestrian, bicycle, family friendly and handicap accessible pathways.
- Recommends lighting improvements on Belgrade Avenue.
- Recommends slowing vehicular traffic coming over the bridge onto Belgrade Avenue.
- Recommends reconfiguring the four-lane stretch of Belgrade to help increase pedestrian traffic.
- Recommends adding signage indicating the location of parking.

Belgrade Master Plan (2016)

- Identifies future redevelopment efforts at key intersections in the Central Business District (CBD) along Belgrade Avenue to include two to three story multi-use buildings.
- A steering committee of 27 members was assembled in early 2016 to assist with guiding planning efforts. As of July 2016, City Staff are working to develop a draft plan based on public input. Plan adoption is anticipated in December 2016.

DEMOGRAPHICS AND TRENDS

Located in south central Minnesota, the Mankato/North Mankato metropolitan planning area is 75 miles south of Minneapolis-St. Paul at the junction of US Trunk Highway (TH) 14 and TH 169. The area has experienced widespread growth across the metropolitan area and serves southern Minnesota as a hub for health care, education, retail, agriculture, and industry. The area is comprised of Mankato, North Mankato, Eagle Lake and Skyline; Blue Earth and Nicollet counties; and Belgrade, Lime, South Bend, LeRay and Mankato townships.

Population

The Mankato/North Mankato area has seen rapid growth. In 2010, the metropolitan statistical area (MSA) population was 96,740 with an urbanized population of 58,265. The 2010 population estimate represents a 12.9% change from the year 2000 for the MSA. Table 1 illustrates historic population figures referenced from the Mankato/North Mankato Metropolitan Planning Organization's (MAPO) 2040 Long Range Transportation Plan.

	1980 CENSUS	1990 CENSUS	2000 CENSUS	% CHANGE 1990-2000	2010 CENSUS	% CHANGE 2000-2010	2015 ESTIMATE
North Mankato	9,145	10,164	11,798	16.1%	13,394	13.5%	13,529
MSA	79,243	82,120	85,712	4.4%	96,740	12.9%	99,134

Table 1. 1980 – 2010 Historic Population (*Source: US Census Bureau; Minnesota State Demographer (Mankato Area Housing Study Update, 2013; MAPO 2040 Long Range Transportation Plan.)*)

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Age

The population's age distribution is important as it effects transportation usage. Within the period from 2000 to 2010, 18-34 year olds as well as those of retirement age saw the highest increases in populations indicating increased commuters and dial-a-ride transit users. Retirees exhibited the greatest increase in population while 18-20 year olds represented the largest demographic group. With a large 18-20 year old group, the area may see a higher demand for pedestrian and bicycle amenities.

Employment

Most household trips include travel to and from places of employment. Mankato and North Mankato are the major employment centers for the region with a labor shed spanning 16 counties. There is a net inflow of primary jobs in the MAPO market area meaning there are more jobs in the market than people living in the market area. Almost 72 percent of labor force living in the market area also work there.

AGE	MSA		
	2000	2010	CHANGE
0-9	9,869	11,466	1,597
10-17	9,447	8,298	(1,149)
18-20	17,249	19,606	2,357
25-34	10,460	13,342	2,882
35-44	11,879	10,009	(1,870)
45-54	10,640	12,129	1,489
55-64	6,161	10,411	4,250
65-74	4,785	5,627	842
75-84	3,649	3,867	218
85+	1,573	1,985	412
Total	85,712	96,740	11,028

Table 2. Population by Age (Source: US Census Bureau; MAPO 2040 Long Range Transportation Plan).

TRANSPORTATION SYSTEM CHARACTERISTICS

Functional Classification

The functional classification system is used to create a roadway network that efficiently collects and distributes traffic from neighborhoods to the state highway system. A successful system coordinates and manages mobility, roadway design, and route alignment as well as seeks to match current and future access and land use with the adjacent roadway's purpose, speeds, and spacing. Functional classifications are comprised of principal arterials, minor arterials, major and minor collectors, and local roadways.

Belgrade Avenue serves is a minor arterial roadway spanning from Veterans' Memorial Bridge and the TH 169 Interchange to Lee Boulevard. It serves a diverse mix of personal vehicle, freight, transit, bicycle, and pedestrian traffic. It also bisects North Mankato's downtown Central Business District (CBD). From a regional perspective, mobility on Belgrade Avenue is important, as it provides connections to other minor arterial roadways such as Lee Blvd, Range Street and the Veterans Memorial Bridge which provide access to other portions of North Mankato and across the river into Mankato.

Existing Number of Lanes

Belgrade Avenue is a two lane undivided roadway from Lee Boulevard to Range Street with westbound right turn lanes at Lee Blvd and Center Street; four lane undivided roadway from Range Street to Nicollet Avenue; and a four lane divided roadway from Nicollet Avenue to the TH 169 interchange ramps. The intersections of Belgrade Avenue at the TH 169 interchange ramps are signalized. The intersections of Belgrade at Range Street and Center Street are all way stop controlled. Belgrade Avenue at Sherman Street and Belgrade Avenue at Lake Street are side street stop controlled with Belgrade Avenue having the right of way. The intersection of Belgrade Ave at Lee Boulevard is side street stop controlled with Lee Boulevard having the right of way.

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Parking Accommodations

Belgrade Avenue permits on-street parking within the CBD and westward towards Lee Boulevard. In addition, on-street parking is permitted on adjacent streets and off-street public, private, and private-shared parking is permitted at select businesses along Belgrade Avenue. A parking assessment reveals a total of 273 public parking spaces, 286 private parking spaces, and 211 private-shared parking spaces in the central business district of the study area (200 – 500 Block of Belgrade). The parking assessment took into account on-street parking resources along side streets intersecting Belgrade Avenue extending north and south to the next street. On Belgrade Avenue in the CBD, 34 public parking spaces are on the north side of the roadway and 58 spaces are on the south side. More information can be seen in the Parking Assessment map in the appendix.

STUDY AREA CHARACTERISTICS

This section contains existing conditions of Belgrade Avenue related to land use, traffic operations, crash history, roadway access, transit, and pedestrian and bicycle connections.

Several Figures are appended to this document relating to the existing characteristics described within the study area in the text below. Refer to the appendix for the following graphics:

- A. Land Use
- B. Traffic Operations
- C. Crash History
- D. Access Inventory
- E. Existing Pedestrian and Bicycle Accommodations
- F. Transit
- G. Parking Assessment

Land Use

Land uses along the study corridor consist of general commercial, high density residential, and low density residential within the central business district. Beyond the central business district, uses consist of predominately low density residential and institutional centers. Open spaces/parks are located north of the study corridor west of Lake Street. The eastern terminus of the study corridor is the TH 169 interchange and the western terminus is Lee Blvd. Intersections where potential redevelopment may occur according to the Belgrade Master Plan are indicated. Major traffic generators along Belgrade Avenue include Cenex gas station, Frandsen, US Postal Office, multiple dining establishments, Belgrade Avenue United Methodist Church, Taylor Library and the City of North Mankato City Hall and Police Annex. For more information on land use in this segment, please refer to the Land Use map in the appendix.

Traffic Operations

Approximately 21,500 vehicles per day currently use the Veterans Memorial Bridge. Approximately 9,800 vehicles per day continue onto Belgrade Avenue between the TH 169 west off ramp intersection and Range St. There are 7,200 vehicles per day from Center St to Sherman St, and 6,700 vehicles from Cornelia St to Lee Blvd.

The average intersection control delay is a volume weighted average of delay experienced by all motorists entering the intersection on all intersection approaches. Intersections and each intersection approach are given a ranking from LOS A through LOS F. LOS A indicates the best traffic operation, with vehicles experiencing minimal delays. LOS A through D is generally perceived to be acceptable to drivers. LOS E indicates that an intersection is operating at, or very near, its capacity and that drivers experience

Belgrade Avenue Corridor Study

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considerable delays. LOS F indicates an intersection where demand exceeds capacity and drivers experience substantial delays.

All of the intersections along the study corridor are operating at generally acceptable levels of service. Traffic delays for westbound to southbound movements at the Lee Blvd intersection were identified for both AM and PM peak hour periods. Problematic back-ups were also identified for the westbound Belgrade movements at the Range Street intersection during the AM and PM peak hour periods. Further information regarding traffic operations can be seen in the Traffic Operation map in the appendix.

Crash History 2010 to 2014

A crash review was completed using the Minnesota Crash Mapping Analysis Tool (MnCMAT) which identified 42 crashes on Belgrade Avenue between Lee Blvd and the west TH 169 interchange ramp within a five-year period from 2010 to 2014. MnDOT uses a comparison of the crash rate and the critical rate when determining whether or not safety issues exist at an intersection. The crash rate is the number of crashes per million entering vehicles (MEV). The critical rate is a statistical comparison based on similar intersections statewide. An observed crash rate greater than the critical rate indicates that the intersection operates outside of the expected, normal range. The critical index reports the magnitude of this difference and a critical index of less than one shows that the intersection is operating within the normal range. Most intersections in this segment exhibit crash counts within a normal range during the five-year period. The Sherman Street intersection exhibited serious injury crashes outside of the normal range for this intersection type. Six crashes occurred in this location within the 5-year period, two of these involved a pedestrian. More information on crash history in this segment can be seen in the Crash History 2010 to 2014 map in the appendix.

Access Inventory

There are 55 access points in this segment including six primary accesses (6 per mile), seven secondary accesses (7 per mile), and 42 private accesses (40 per mile). Both primary and secondary access counts fall below MAPO's recommendations for 9 to 19 accesses per mile along minor arterial roadways. More information can be seen in the Access Inventory map in the appendix.

Pedestrian and Bicycle Accommodations

Sidewalks are present along both sides of the study corridor from Lee Blvd to the TH 169 interchange. There are no bicycle facilities along Belgrade Avenue, however, two on-road bike routes intersect Belgrade Ave at Sherman St. and Center St. An on-road bike route exists on Lake St. from its intersection with Belgrade Ave. north to the recent trail addition on TH 14. In addition, an on-road bike route extends along Nicollet Ave from its western intersection with Belgrade Ave to its eastern intersection with Belgrade Ave. and continues east to join the Rex Macbeth River Trail. More information can be seen in the Pedestrian & Bicycle Connections map in the appendix.

There are a few high demand pedestrian crossing locations along Belgrade Avenue. The Wall Street intersection allows pedestrians' access from public parking lots access to Circle Inn, Dino's Pizzeria, and Like-Nu Cleaners. The Range Street intersection accommodates a high volume of pedestrians accessing the American Legion, Frandsen Bank, NaKato Bar & Grill, and Spinners Bar. The Center Street intersection provides an on-street bike path encouraging bicycle access across Belgrade Avenue to BellTower Apartments, Wheels Unlimited, and Benderz Bar and Grill. The Sherman Street intersection provides an on-street bike path encouraging bicycle access across Belgrade Avenue to Belgrade Avenue United Methodists Church. Pedestrian crossings exist at both intersections as well.

Belgrade Avenue Corridor Study

MAPO and City of North Mankato, MN

Transit Routes

Two routes of the Mankato Area Transit System pass through the study corridor. Bus stops are located at Belgrade and Nicollet, Belgrade and Sherman, Belgrade and Center, and Belgrade and Range. More information can be seen in the Transit Routes map in the appendix.

All Segments - Social, Economic, and Environmental (SEE) Concerns

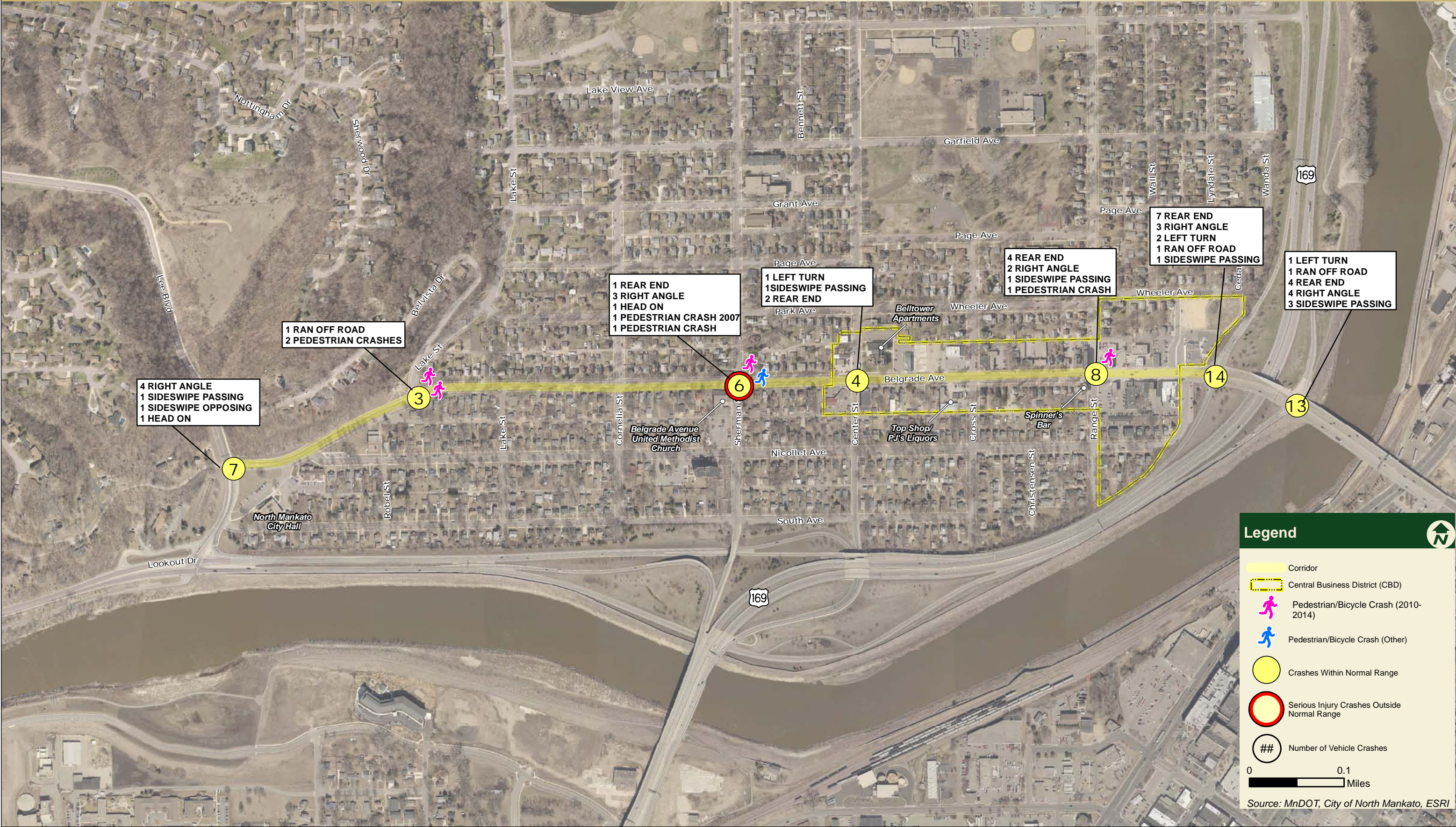
An environmental screening was completed for the entire study area. This screening included a high-level review of previously identified social, economic and environmental (SEE) resources. The following key findings are summarized from the environmental screening attached in Appendix D:

1. The study area is protected from the 100 year flood by a levee along the Minnesota River.
2. Minnesota Department of Natural Resources Natural Heritage Information Systems data suggests threatened, endangered, and rare species do not exist within the study area.
3. The study area is dominated by developed residential and commercial uses with altered vegetation.
4. Several areas were identified along the corridor that have a known history of contamination based on the Minnesota Pollution Control Agency's "What's in My Neighborhood?" data. More detailed investigations may need to take place as roadway alternatives are implemented along the corridor.
5. There is one park and one trail that are adjacent to the corridor that represent Section 4f and Section 6f properties. Impacts to these properties will need to be taken into consideration in a future environmental review.
6. There is one historic property located in the study area along the study corridor. The BellTower Apartments at 442 Belgrade Avenue is listed on the National Register of Historic Places.

APPENDIX A

Figures







Access	
Length of Corridor (ft)	5,596
# of Primary Access	6
Primary Access Per Mile	6
# of Secondary Access	7
Secondary Access Per Mile	7
# of Private Access	42
# of Private Access Per Mile	40

Legend

Study Corridor

Parcels with Side Street Access

Parcels

Access Type

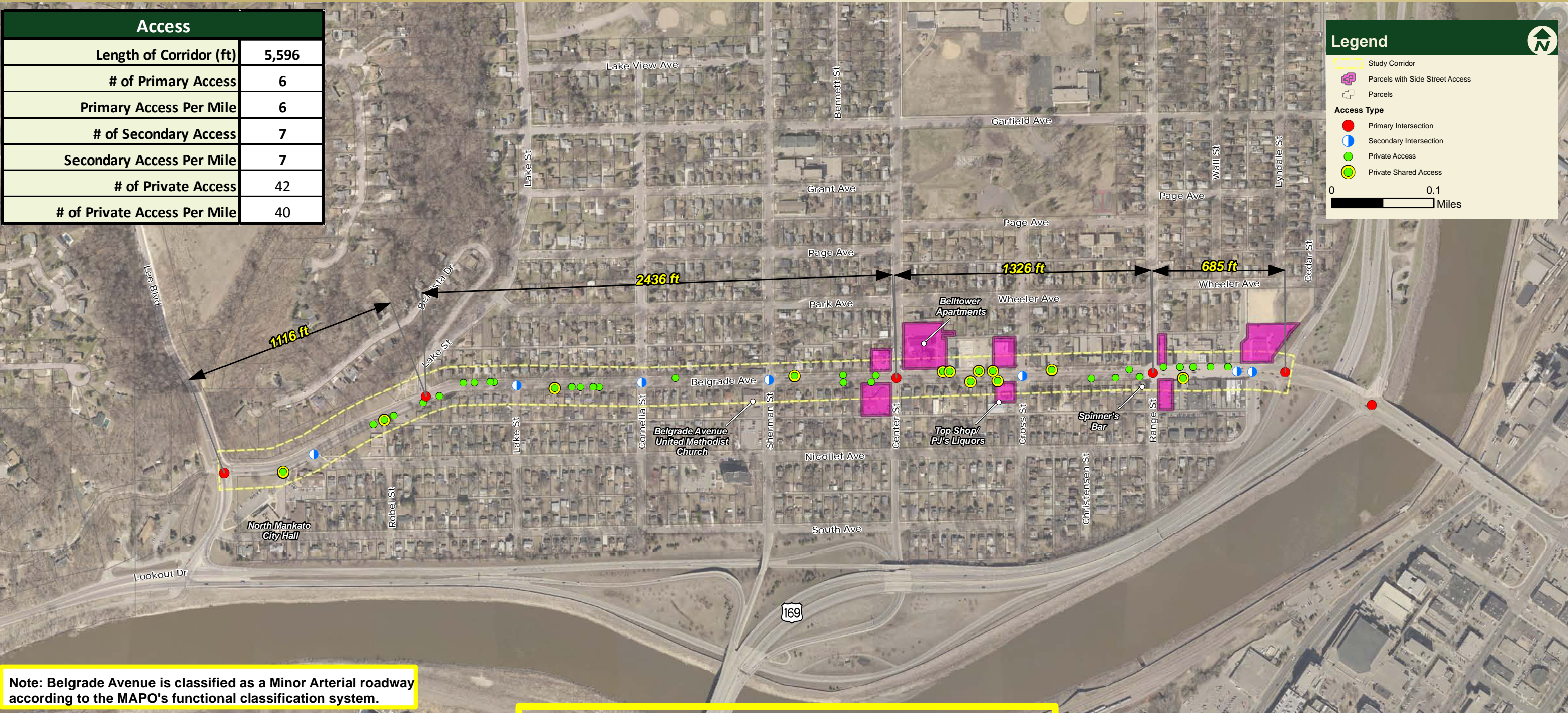
Primary Intersection

Secondary Intersection

Private Access

Private Shared Access

00.1 Miles



Note: Belgrade Avenue is classified as a Minor Arterial roadway according to the MAPO's functional classification system.

PRINCIPAL ARTERIALS	Primary (Full - Movement) Intersection Spacing		
	Rural	1 mile	2 access / mile
	Urban/Urbanizing	1/2 mile	3 access / mile
	Urban Core	300-660 feet	9-19 access / mile
	Secondary Intersection Spacing		
	Rural	1/2 mile	3 access / mile
	Urban/Urbanizing	1/4 mile	5 access / mile
	Urban Core	300-660 feet	9-19 access / mile

MINOR ARTERIAL	Primary (Full - Movement) Intersection Spacing Guidelines		
	Rural	1/2 mile	3 access / mile
	Urban/Urbanizing	1/4 mile	5 access / mile
	Urban Core	300-660 feet	9-19 access / mile
	Secondary Intersection Spacing		
	Rural	1/4 mile	5 access / mile
	Urban/Urbanizing	1/8 mile	9 access / mile
	Urban Core	300-660 feet	9-19 access / mile

COLLECTORS	Primary (Full - Movement) Intersection Spacing Guidelines		
	Rural	1/2 mile	3 access / mile
	Urban/Urbanizing	1/8 mile	9 access / mile
	Urban Core	300-660 feet	9-19 access / mile
	Secondary Intersection Spacing		
	Rural	1/4 mile	5 access / mile
	Urban/Urbanizing	N/A	N/A
	Urban Core	300-660 feet	9-19 access / mile

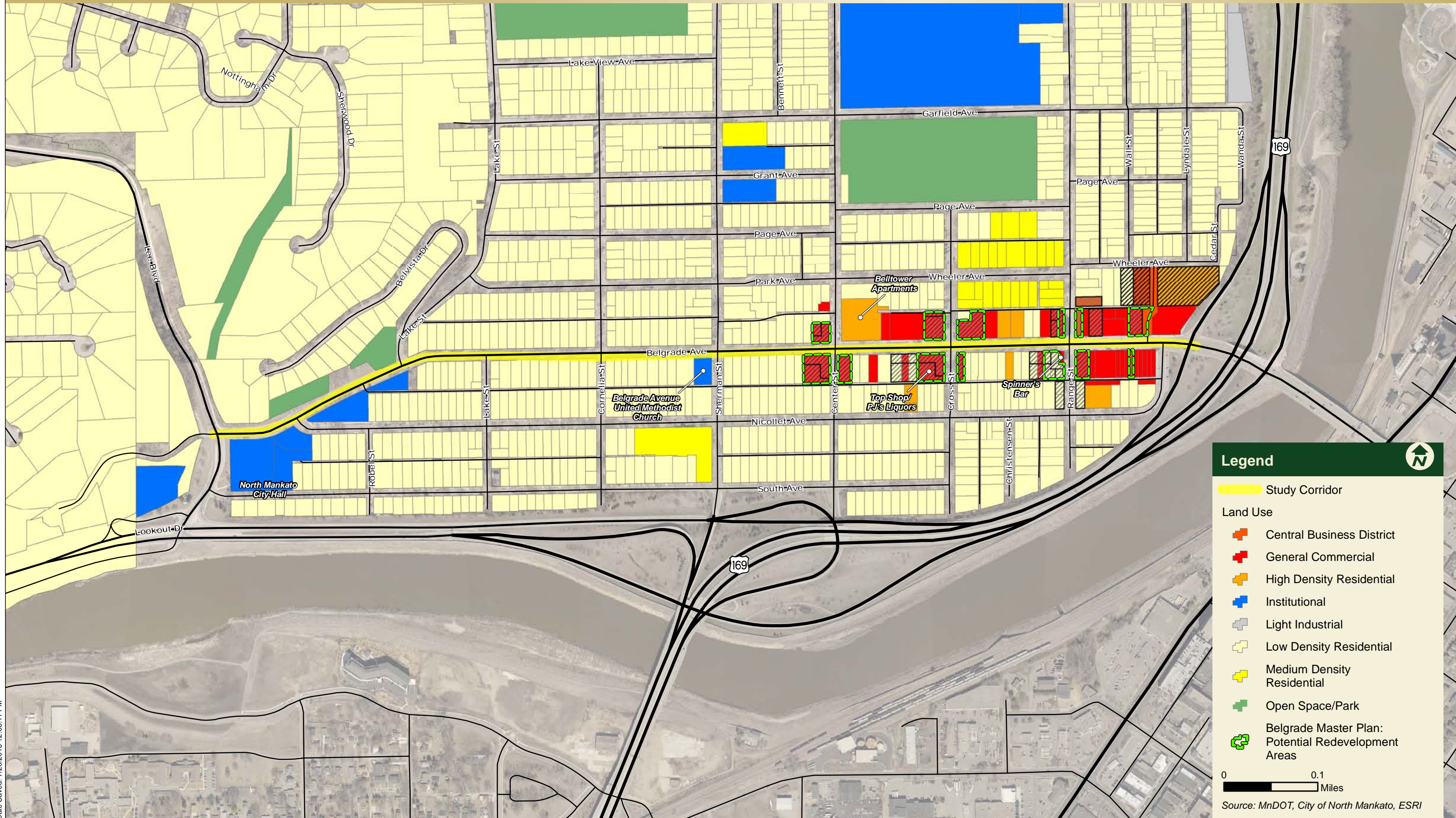


Belgrade Avenue Corridor Study

Mankato/North Mankato Area Planning Organization

Existing & Future Land Use

July, 2016



Legend

Study Corridor

Land Use

Central Business District

General Commercial

High Density Residential

Institutional

Light Industrial

Low Density Residential

Medium Density Residential

Open Space/Park

Belgrade Master Plan: Potential Redevelopment Areas

0 0.1 Miles

Source: MnDOT, City of North Mankato, ESRI

Map Document: \\Arcserver1\gis\MAPO_MUIT42111862\ESRI\Belgrade_Dillon\Belgrade - Land Use.mxd
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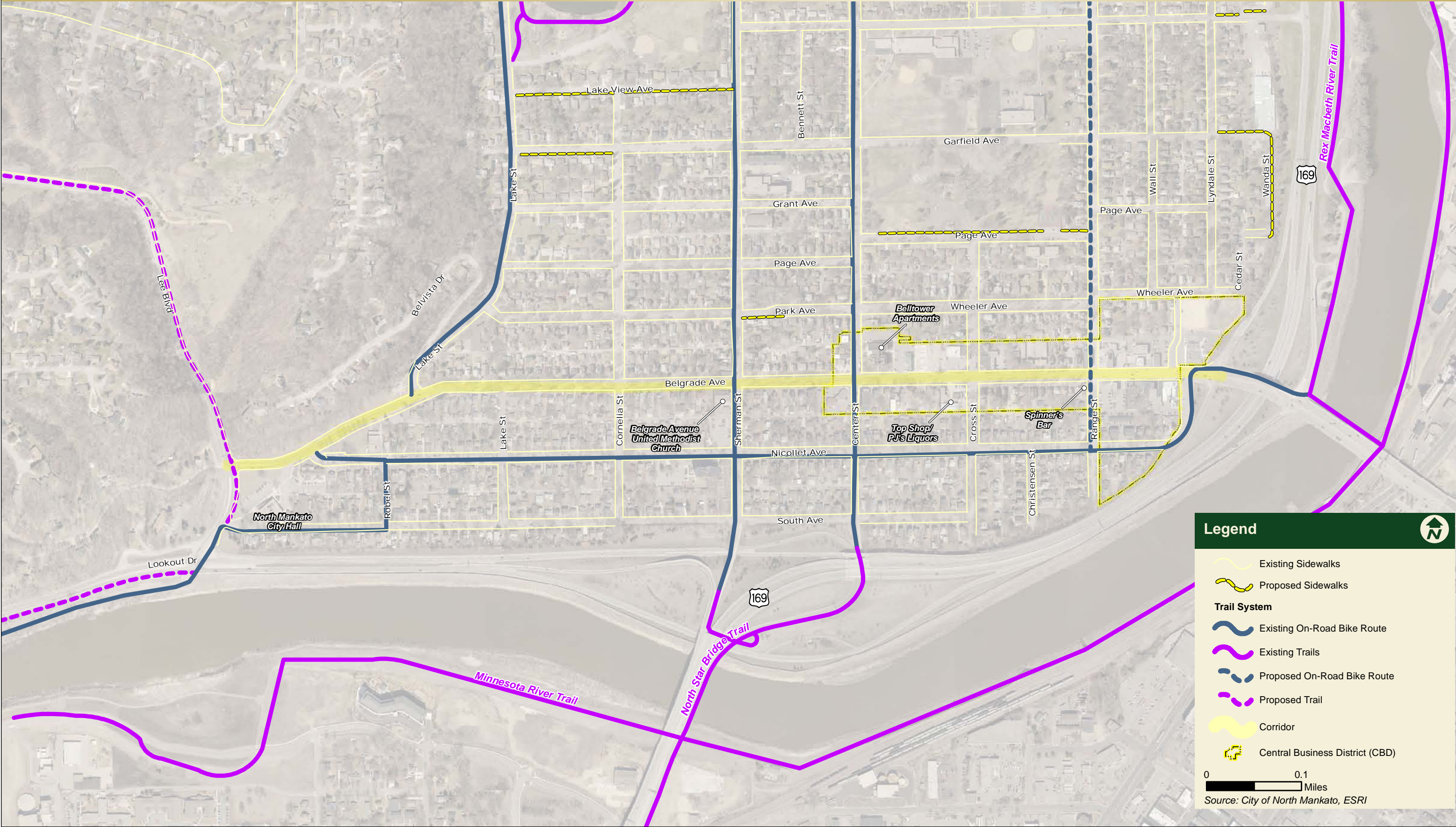


Belgrade Avenue Corridor Study

Mankato/North Mankato Area Planning Organization

Pedestrian & Bicycle Connections

August, 2016



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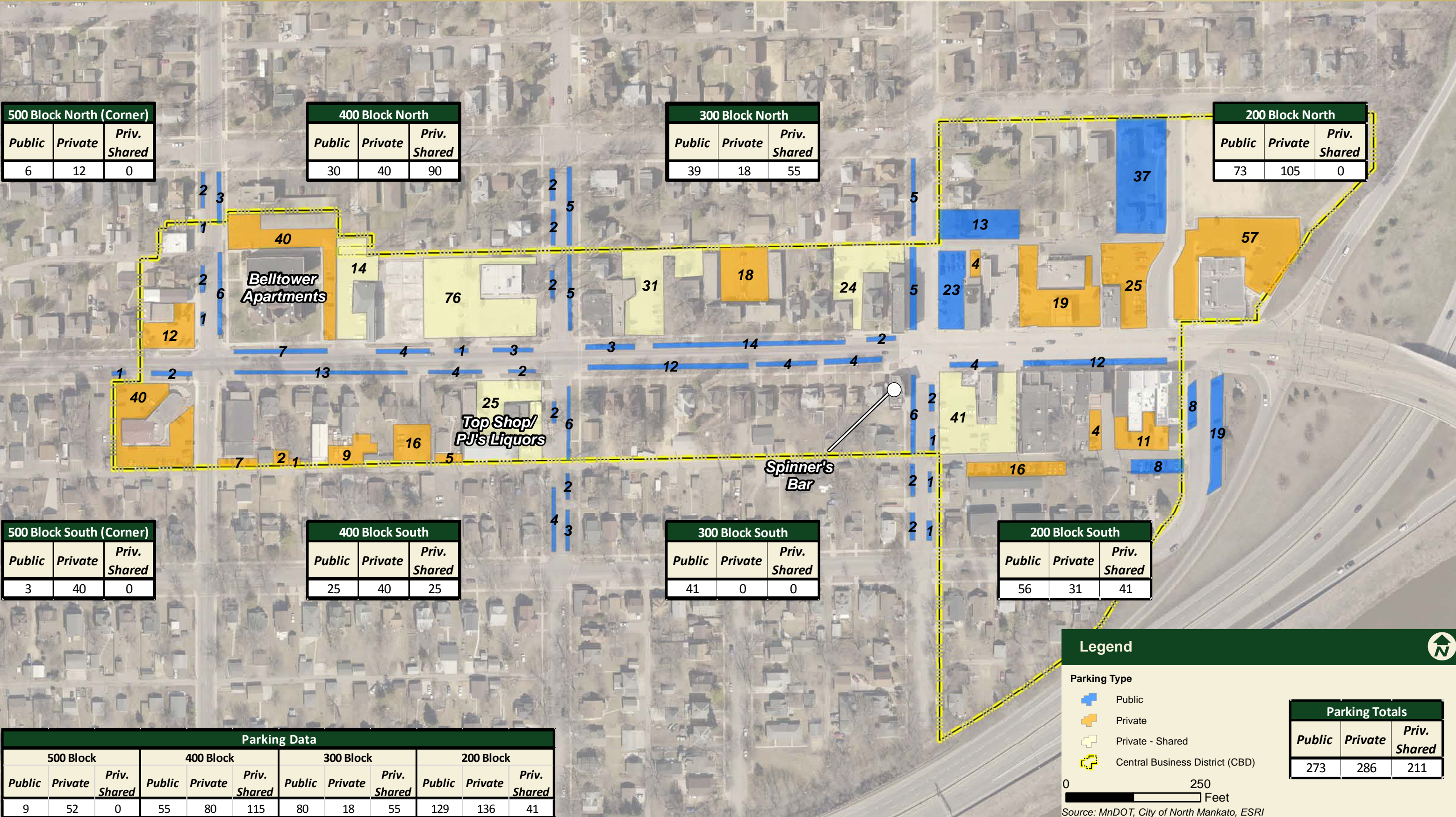


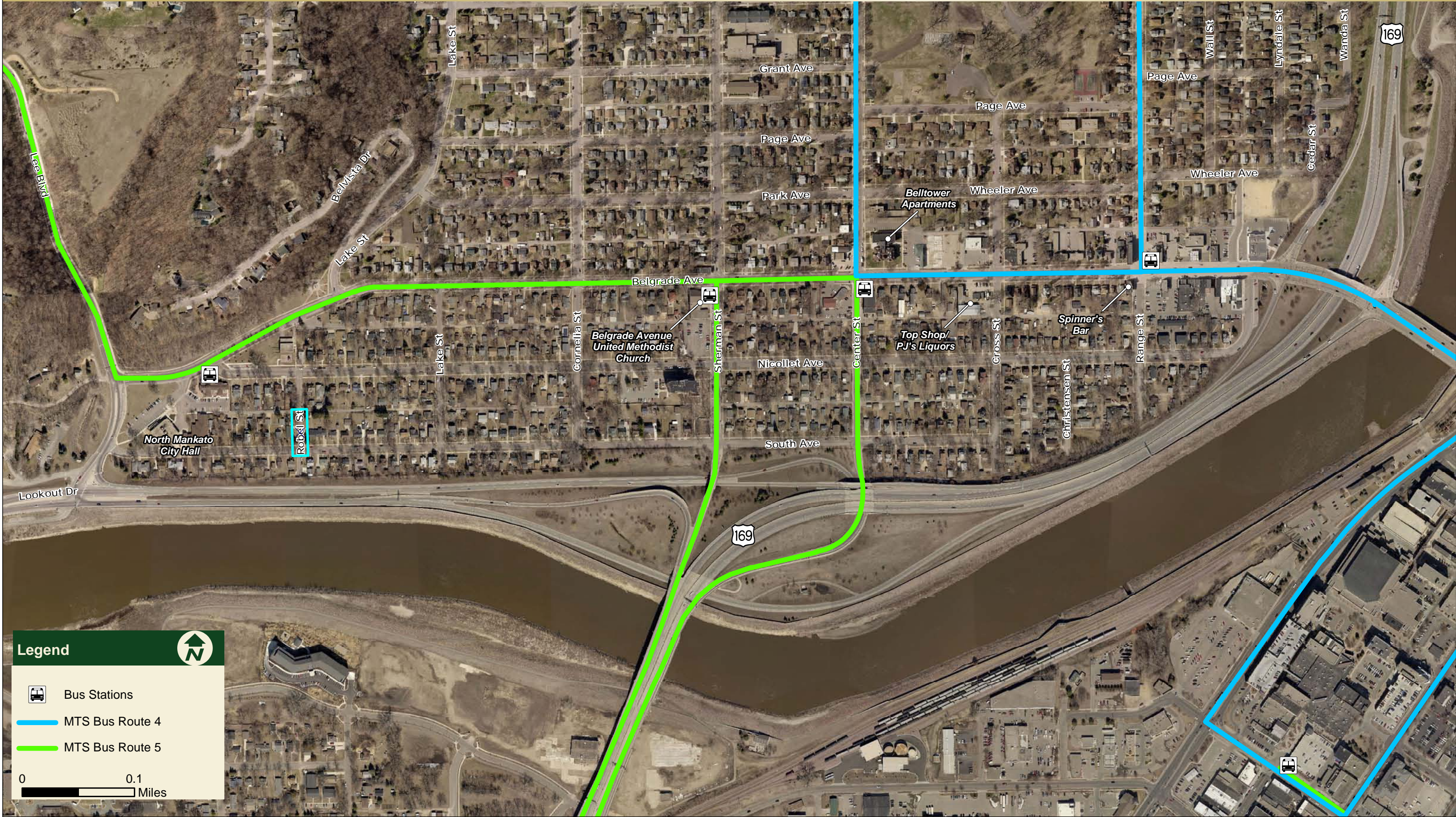
Belgrade Avenue Corridor Study

Mankato/North Mankato Area Planning Organization

Parking Assessment

August, 2016

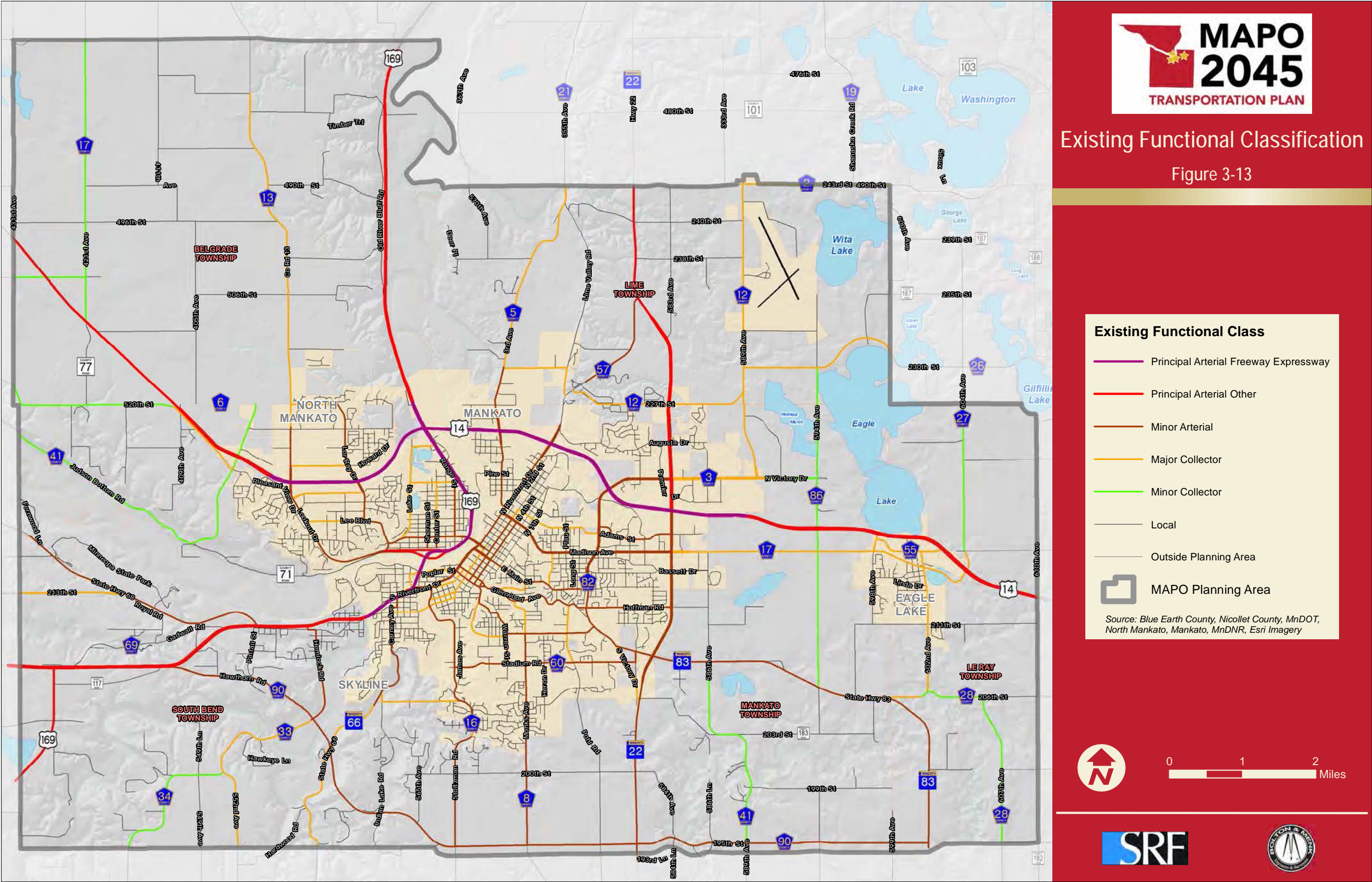




APPENDIX B

MAPO Functional Classification

Figure 3-13: Existing Functional Classification



APPENDIX C

Existing Traffic Conditions Analysis Memo



Real People. Real Solutions.

12224 Nicollet Avenue
Burnsville, MN 55337-1649

Ph: (952) 890-0509
Fax: (952) 890-8065
Bolton-Menk.com

MEMORANDUM

Date: September 19, 2016
To: Paul Vogel
From: Ross B. Tillman, P.E.
Kelsey E. Retherford, E.I.T.
Subject: Existing Traffic Conditions
Belgrade Avenue Corridor Study
City of Northern Mankato, MN
Project No.: T42.111862

Introduction

The Mankato/North Mankato Area Planning Organization in cooperation with the City of North Mankato have requested a corridor study along Belgrade Avenue from Lee Boulevard to TH 169 North Ramp. Belgrade Avenue is located along the southern edge of the City of Northern Mankato. This memorandum provides a summary of the existing conditions as a baseline to understand the needs and potential solutions.

Data Collection

13-hour turning movement counts were completed at the intersections analyzed in May of 2016. The AM peak hour was found to be from 7:15-8:15am and the PM peak hour was found to be from 5:00-6:00pm. The existing traffic volumes are shown in **Figure 1** of **Appendix A**.

Existing Conditions

Belgrade Avenue is a two lane undivided roadway from Lee Boulevard to Range Street, four lane undivided roadway from Range Street to Nicollet Avenue and a four lane divided roadway from Nicollet Avenue to east of the TH 169 North Ramps. The intersections of Belgrade Avenue at the TH 169 North and South Ramps are signalized. The intersections of Belgrade at Range Street and Center Street are all way stop controlled. Belgrade Avenue at Sherman Street and Belgrade Avenue at Lake Street are side street stop controlled with Belgrade Avenue having the right of way. The intersection of Belgrade Ave at Lee Boulevard is side street stop controlled with Lee Boulevard having the right of way.

The speed limit on roadways throughout the project area is 30 MPH. TH 169 is classified as a Principal Arterial. Belgrade Avenue and Lee Boulevard are classified as Minor Arterials. North of Belgrade Avenue Range Street is classified as a Major Collector. Center Street and Lake Street north of Belgrade Avenue are classified as a Minor Collector. All other roadways are classified as Local roadways.

Safety Analysis

A crash review was completed using the Minnesota Crash Mapping Analysis Tool (MnCMAT) for the previous five years (2010-2014). MnDOT uses a comparison of the crash rate and the critical rate when

determining whether or not there is a safety issue at an intersection. The crash rate is the number of crashes per million entering vehicles (MEV). The critical rate is a statistical comparison based on similar intersections statewide. An observed crash rate greater than the critical rate indicates that the intersection operates outside of the expected, normal range. The critical index reports the magnitude of this difference and a critical index of less than one shows that the intersection is operating within the normal range.

Table 1 shows the critical index comparing the total number of crashes and the critical index for the amount of fatal and serious injury crashes at each intersection analyzed.

Table 1. Intersection Crash Indices

Intersection	Total Crash Critical Index	Fatal & Serious Injury Crash Critical Index
Belgrade Avenue at TH 169 North Ramp	0.32	-
Belgrade Avenue at TH 169 South Ramp	0.53	0.86
Belgrade Avenue at Range Street	0.6	-
Belgrade Avenue at Center Street	0.35	-
Belgrade Avenue at Sherman Street	0.88	1.26
Belgrade Avenue at Lake Street	0.47	-
Belgrade Avenue at Lee Boulevard	0.68	-

All intersections have a total crash critical index less than one showing that the number of crashes reported at each of the intersections between 2010 and 2014 is within the normal range. However when analyzing the number of fatal and serious injury crashes reported at each intersection it was found the intersection of Belgrade Avenue at Sherman Street is experiencing a higher than usual number compared to similar intersections statewide.

Table 2 below summarizes the crashes reported at the intersection of Belgrade Avenue at Sherman Street from 2010 to 2014. There were a total of 6 reported crashes.

Table 2. Crash Type and Severity at Belgrade Avenue at Sherman Street

Crash Type	Incapacitating Injury	Possible Injury	Property Damage
Right Angle	-	1	2
Rear End	-	-	1
Pedestrian	1	-	-
Head On	-	-	1

Due to the low volume at this intersection having an incapacitating injury crash is what caused this intersection to operate outside the normal range compared to similar intersection for fatal and serious injury crashes. Additionally with a total crash critical index of 0.88, if there had been one more crash reported over the five year period analyzed this intersection would also be operating outside the normal range for total crashes.

At the intersection of Belgrade Avenue at TH 169 North Ramps there were 13 crashes reported. **Table 3** below summarizes the crashes.

Table 3. Crash Type and Severity at Belgrade Avenue at TH 169 North Ramps

Crash Type	Possible Injury	Property Damage
Rear End	1	3
Right Angle	3	1
Sideswipe Passing	-	3
Left Turn	-	1
Ran off Road	-	1

At the intersection of Belgrade Avenue at TH 169 North Ramps rear end and right angle crashes were the most common types of crashes. One of the rear end crashes and three of the right angle crashes resulted in possible injury crashes. All other crashes at the intersection were property damage only crashes.

At the intersection of Belgrade Avenue at TH 169 South Ramps there were 14 crashes reported. **Table 4** below summarizes the crashes.

Table 4. Crash Type and Severity at Belgrade Avenue at TH 169 South Ramps

Crash Type	Incapacitating Injury	Possible Injury	Property Damage
Rear End	1	1	5
Right Angle	-	-	3
Sideswipe Passing	-	-	1
Left Turn	-	-	2
Ran off Road	-	-	1

At the intersection of Belgrade Avenue at TH 169 South Ramps rear end crashes were the most common types of crash. One of the rear end crashes resulted in an incapacitating injury, one was a possible injury crash and the other five were property damage only crashes. All other crashes at the intersection were property damage only crashes.

At the intersection of Belgrade Avenue at Range Street there were 8 crashes reported. **Table 5** below summarizes the crashes.

Table 5. Crash Type and Severity at Belgrade Avenue at Range Street

Crash Type	Non-Incapacitating Injury	Possible Injury	Property Damage
Rear End	-	1	3
Right Angle	-	1	1
Sideswipe Passing	-	-	1
Pedestrian	1	-	-

Rear end crashes were the most common at the intersection of Belgrade Avenue at Range Street. Three of the rear end crashes were property damage only crashes and one was a possible injury crash. There were two right angle crashes, one sideswipe crash and a pedestrian crash that resulted in a non-incapacitating injury.

At the intersections of Belgrade Avenue with Center Street, Lake Street, and Lee Boulevard there were seven or less reported crashes between 2010 and 2014. At Center Street there were two rear end crashes, one sideswipe passing, and one left turn crash. One of the rear end crashes was a possible injury crash. The other three crashes reported at Center Street were property damage only crashes. At Lake Street there were two pedestrian crashes with one resulting in a non-incapacitating injury and the other was a possible injury crash. There was a property damage only crash from a vehicle who ran off the road at Lake Street. At the intersection of Belgrade Avenue at Lee Boulevard there were four right angle crashes with two resulting in possible injury crashes and two were property damage only crashes. There was also a head on, sideswipe opposing, and a sideswipe passing crash that were all property damage only crashes. The intersection crash rate worksheets are included in **Appendix B**.

Segment Crashes

A crash analysis was also completed along Belgrade Avenue to analyze non-intersection related crashes along the corridor from 2010 to 2014. All of the segment crashes were property damage only crashes.

Table 6 below shows the types of crashes reported along Belgrade Avenue.

Table 6. Belgrade Avenue Segment Crashes

Location	Crash Type
Lee Blvd to S Lake St	2-Sideswipe Passing, 3-Ran Off Road
S Lake St to Center St	1-Rear End
Center St to Nicollet Ave	1-Parking Related Crash
Nicollet Ave to TH 14	No Reported Crashes

There were two sideswipe passing crashes and three crashes from vehicles driving off the roadway between Lee Boulevard and South Lake Street. There was one rear end crash reported between South Lake Street and Center Street and one crash between Center Street and Nicollet Avenue from a car backing up into a parked car.

Existing Operational Analysis

A level of service (LOS) analysis of the peak hours was completed using the existing turning movement counts in SimTraffic. The LOS results are based on average delay per vehicle as calculated by the 2010 Highway Capacity Manual (HCM), which defines the level of service, based on control delay. Control delay is the delay experienced by vehicles slowing down as they are approaching the intersection, the wait time at the intersection, and the time for the vehicle to speed up through the intersection and enter into the traffic stream. The average intersection control delay is a volume weighted average of delay experienced by all motorists entering the intersection on all intersection approaches. Intersections and each intersection approach are given a ranking from LOS A through LOS F. LOS A indicates the best traffic operation, with vehicles experiencing minimal delays. LOS A through D is generally perceived to be acceptable to drivers. LOS E indicates that an intersection is operating at, or very near, its capacity and that drivers experience considerable delays. LOS F indicates an intersection where demand exceeds capacity and drivers experience substantial delays. **Table 7** includes the results of the existing traffic analysis.

Table 7 - Existing (2016) Traffic Operations Analysis

Traffic Control Scenario	Peak Hour	Intersection Delay*- LOS		Maximum Delay- LOS**		Limiting Movement ***	Max Approach Queue		
							Direction	Average Queue (ft)	Max Queue (ft) ****
NB TH 169 Ramp at Belgrade Ave <i>Signalized Intersection</i>	AM	4	A	14	B	NBL	WBT	44	109
	PM	5	A	16	B	NBL	WBT	99	190
SB TH 169 Ramp at Belgrade Ave <i>Signalized Intersection</i>	AM	11	B	21	C	SBL	WBL	72	129
	PM	11	B	25	C	SBL	WBL	123	225
Range St at Belgrade Ave <i>All-Way Stop Controlled</i>	AM	7	A	9	A	EBT	EBL/T	45	71
	PM	8	A	10	B	WBL/EBT	WBL	83	145
Center St at Belgrade Ave <i>All-Way Stop Controlled</i>	AM	7	A	9	A	WBT	EBL/T	41	74
	PM	8	A	10	A	WBT	WBT	54	86
Sherman St at Belgrade Ave <i>Side-Street Stop Controlled</i>	AM	3	A	8	A	SBT	SBL/T/R	38	62
	PM	3	A	9	A	SBL	SBL/T/R	35	60
Lake St at Belgrade Ave <i>Side-Street Stop Controlled</i>	AM	2	A	6	A	SBL	SBL/R	23	43
	PM	2	A	8	A	SBL	EBL/T	17	50
Lee Blvd at Belgrade Ave <i>Side-Street Stop Controlled</i>	AM	4	A	40	E	WBL	SBL	38	93
	PM	4	A	25	D	WBL	SBL	45	97

*Delay in seconds per vehicle

**Maximum delay and LOS on any approach and/or movement

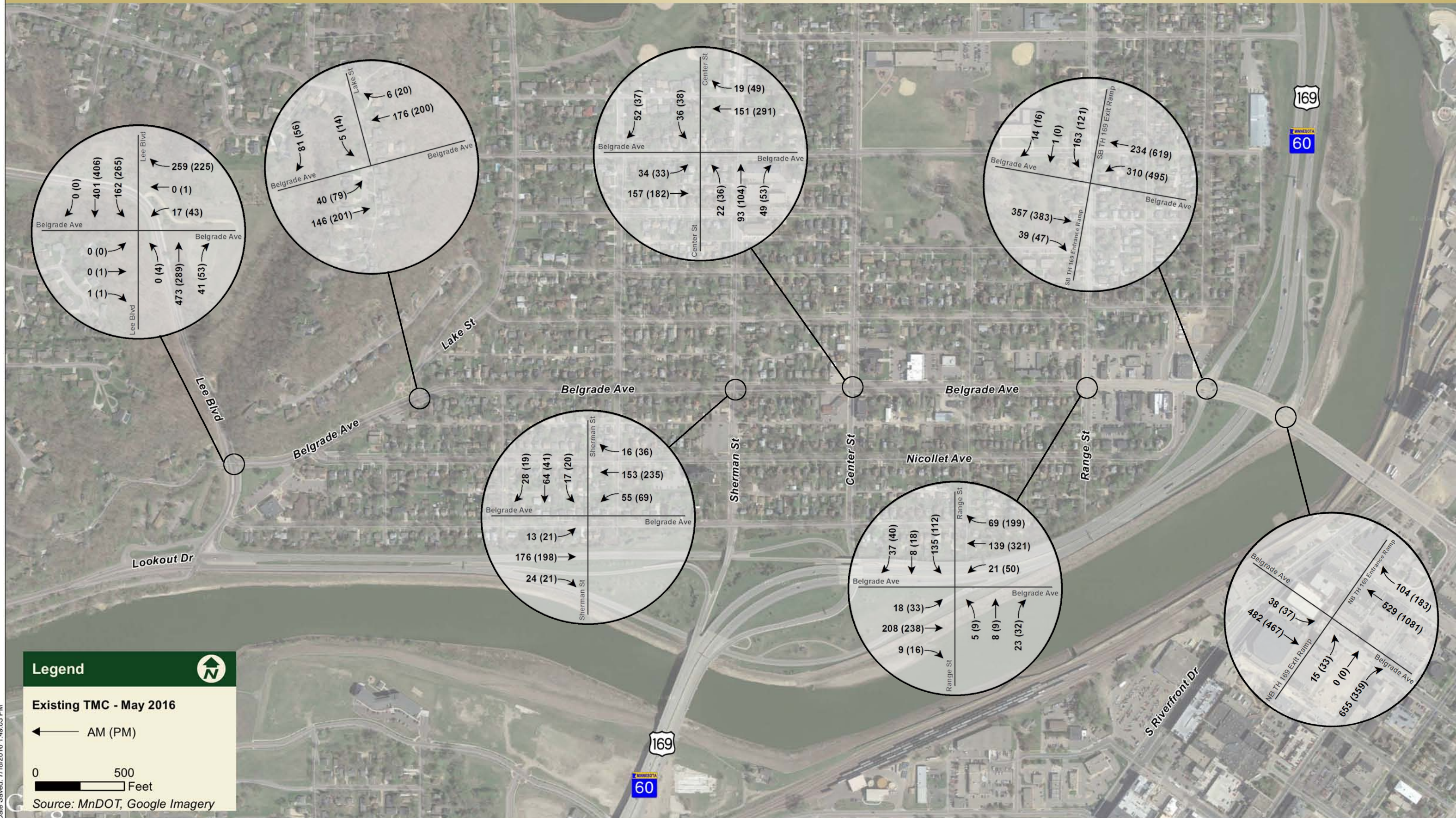
***Limiting Movement is the highest delay approach.

****Max Queue refers to the 95% Queue (Passenger car stored length = 25 ft, Heavy vehicle stored length = 45 ft)

- Intersection delay is acceptable with LOS B or better at all of the intersections during both peak hours.
- The limiting movement operates with LOS E during the AM peak hour at the intersections of Lee Boulevard at Belgrade Avenue and LOS D during the PM peak hour.
- Queue Lengths
 - Belgrade Avenue at Range Street
 - The westbound left average queue extends beyond the American Legion and Frandsen Bank driveway

Tables C1 and C2 in Appendix C show the existing delay and queue lengths for each movement at all of the intersections analyzed.

Appendix A: Turning Movement Counts



Appendix B: Intersection Crash Rates

Intersection Safety Screening

Intersection: Belgrade Avenue at NB TH 169 Ramps



Crash Data, 2010-2014

Crashes by Crash Severity	
Fatal	0
Incapacitating Injury	0
Non-incapacitating Injury	0
Possible Injury	4
Property Damage	9
Total Crashes	13

Intersection Characteristics	
Entering Volume	21,400
Traffic Control	Signals
Environment	Suburban
Speed Limit	30 mph

Annual crash cost = \$78,120

Statewide Comparison

Signals: high volume, low speed

Total Crash Rate	
Observed	0.33
Critical Rate	1.04
Critical Index	0.32

Fatal & Serious Injury Crash Rate	
Observed	0.00
Critical Rate	3.72
Critical Index	0.00

The observed crash rate is the number of crashes per million entering vehicles (MEV). The critical rate is a statistical comparison based on similar intersections statewide. An observed crash rate greater than the critical rate indicates that the intersection operates outside the expected, normal range. The critical index reports the magnitude of this difference.

The observed total crash rate for this period is 0.33 per MEV; this is 68% below the critical rate. Based on similar statewide intersections, an additional 28 crashes over the five years would indicate this intersection operates outside the normal range.

The observed fatal and serious injury crash rate for this period is 0.00 per 100 MEV; this is 100% below the critical rate. The intersection operates within the normal range.

Intersection Safety Screening

Intersection: Belgrade Avenue at SB TH 169 Ramps



Crash Data, 2010-2014

Crashes by Crash Severity	
Fatal	0
Incapacitating Injury	1
Non-incapacitating Injury	0
Possible Injury	1
Property Damage	12
Total Crashes	14

Intersection Characteristics	
Entering Volume	15,600
Traffic Control	Signals
Environment	Suburban
Speed Limit	30 mph

Annual crash cost = \$143,960

Statewide Comparison

Signals: low volume, low speed

Total Crash Rate	
Observed	0.49
Critical Rate	0.92
Critical Index	0.53

Fatal & Serious Injury Crash Rate	
Observed	3.51
Critical Rate	4.06
Critical Index	0.86

The observed crash rate is the number of crashes per million entering vehicles (MEV). The critical rate is a statistical comparison based on similar intersections statewide. An observed crash rate greater than the critical rate indicates that the intersection operates outside the expected, normal range. The critical index reports the magnitude of this difference.

The observed total crash rate for this period is 0.49 per MEV; this is 47% below the critical rate. Based on similar statewide intersections, an additional 13 crashes over the five years would indicate this intersection operates outside the normal range.

The observed fatal and serious injury crash rate for this period is 3.51 per 100 MEV; this is 14% below the critical rate. The intersection operates within the normal range.

Intersection Safety Screening

Intersection: Belgrade Avenue at Range Street



Crash Data, 2010-2014

Crashes by Crash Severity	
Fatal	0
Incapacitating Injury	0
Non-incapacitating Injury	1
Possible Injury	2
Property Damage	5
Total Crashes	8

Intersection Characteristics	
Entering Volume	10,300
Traffic Control	All stop
Environment	Suburban
Speed Limit	30 mph

Annual crash cost = \$71,800

Statewide Comparison

All Way Stop

Total Crash Rate	
Observed	0.43
Critical Rate	0.71
Critical Index	0.60

Fatal & Serious Injury Crash Rate	
Observed	0.00
Critical Rate	5.02
Critical Index	0.00

The observed crash rate is the number of crashes per million entering vehicles (MEV). The critical rate is a statistical comparison based on similar intersections statewide. An observed crash rate greater than the critical rate indicates that the intersection operates outside the expected, normal range. The critical index reports the magnitude of this difference.

The observed total crash rate for this period is 0.43 per MEV; this is 40% below the critical rate. Based on similar statewide intersections, an additional 6 crashes over the five years would indicate this intersection operates outside the normal range.

The observed fatal and serious injury crash rate for this period is 0.00 per 100 MEV; this is 100% below the critical rate. The intersection operates within the normal range.

Intersection Safety Screening

Intersection: Belgrade Avenue at Center Street



Crash Data, 2010-2014

Crashes by Crash Severity	
Fatal	0
Incapacitating Injury	0
Non-incapacitating Injury	0
Possible Injury	1
Property Damage	3
Total Crashes	4

Intersection Characteristics	
Entering Volume	8,200
Traffic Control	All stop
Environment	Suburban
Speed Limit	30 mph

Annual crash cost = \$20,640

Statewide Comparison

All Way Stop

Total Crash Rate	
Observed	0.27
Critical Rate	0.76
Critical Index	0.35

Fatal & Serious Injury Crash Rate	
Observed	0.00
Critical Rate	5.93
Critical Index	0.00

The observed crash rate is the number of crashes per million entering vehicles (MEV). The critical rate is a statistical comparison based on similar intersections statewide. An observed crash rate greater than the critical rate indicates that the intersection operates outside the expected, normal range. The critical index reports the magnitude of this difference.

The observed total crash rate for this period is 0.27 per MEV; this is 65% below the critical rate. Based on similar statewide intersections, an additional 8 crashes over the five years would indicate this intersection operates outside the normal range.

The observed fatal and serious injury crash rate for this period is 0.00 per 100 MEV; this is 100% below the critical rate. The intersection operates within the normal range.

Intersection Safety Screening

Intersection: Belgrade Avenue at Sherman Street



Crash Data, 2010-2014

Crashes by Crash Severity	
Fatal	0
Incapacitating Injury	1
Non-incapacitating Injury	0
Possible Injury	1
Property Damage	4
Total Crashes	6

Intersection Characteristics	
Entering Volume	7,000
Traffic Control	Thru / stop
Environment	Suburban
Speed Limit	30 mph

Annual crash cost = \$132,120

Statewide Comparison

Urban Thru / Stop

Total Crash Rate	
Observed	0.47
Critical Rate	0.53
Critical Index	0.88

Fatal & Serious Injury Crash Rate	
Observed	7.82
Critical Rate	6.21
Critical Index	1.26

The observed crash rate is the number of crashes per million entering vehicles (MEV). The critical rate is a statistical comparison based on similar intersections statewide. An observed crash rate greater than the critical rate indicates that the intersection operates outside the expected, normal range. The critical index reports the magnitude of this difference.

The observed total crash rate for this period is 0.47 per MEV; this is 12% below the critical rate. Based on similar statewide intersections, an additional 1 crashes over the five years would indicate this intersection operates outside the normal range.

The observed fatal and serious injury crash rate for this period is 7.82 per 100 MEV; this is 1.3 times the critical rate.

Intersection Safety Screening

Intersection: Belgrade Avenue at Lake Street



Crash Data, 2010-2014

Crashes by Crash Severity	
Fatal	0
Incapacitating Injury	0
Non-incapacitating Injury	1
Possible Injury	1
Property Damage	1
Total Crashes	3

Intersection Characteristics	
Entering Volume	6,250
Traffic Control	Thru / stop
Environment	Suburban
Speed Limit	30 mph

Annual crash cost = \$49,680

Statewide Comparison

Urban Thru / Stop

Total Crash Rate	
Observed	0.26
Critical Rate	0.56
Critical Index	0.47

Fatal & Serious Injury Crash Rate	
Observed	0.00
Critical Rate	6.80
Critical Index	0.00

The observed crash rate is the number of crashes per million entering vehicles (MEV). The critical rate is a statistical comparison based on similar intersections statewide. An observed crash rate greater than the critical rate indicates that the intersection operates outside the expected, normal range. The critical index reports the magnitude of this difference.

The observed total crash rate for this period is 0.26 per MEV; this is 53% below the critical rate. Based on similar statewide intersections, an additional 4 crashes over the five years would indicate this intersection operates outside the normal range.

The observed fatal and serious injury crash rate for this period is 0.00 per 100 MEV; this is 100% below the critical rate. The intersection operates within the normal range.

Intersection Safety Screening

Intersection: Belgrade Avenue at Lee Street



Crash Data, 2010-2014

Crashes by Crash Severity	
Fatal	0
Incapacitating Injury	0
Non-incapacitating Injury	0
Possible Injury	2
Property Damage	5
Total Crashes	7

Intersection Characteristics	
Entering Volume	13,450
Traffic Control	Thru / stop
Environment	Suburban
Speed Limit	30 mph

Annual crash cost = \$39,800

Statewide Comparison

Urban Thru / Stop

Total Crash Rate	
Observed	0.29
Critical Rate	0.43
Critical Index	0.68

Fatal & Serious Injury Crash Rate	
Observed	0.00
Critical Rate	3.78
Critical Index	0.00

The observed crash rate is the number of crashes per million entering vehicles (MEV). The critical rate is a statistical comparison based on similar intersections statewide. An observed crash rate greater than the critical rate indicates that the intersection operates outside the expected, normal range. The critical index reports the magnitude of this difference.

The observed total crash rate for this period is 0.29 per MEV; this is 32% below the critical rate. Based on similar statewide intersections, an additional 4 crashes over the five years would indicate this intersection operates outside the normal range.

The observed fatal and serious injury crash rate for this period is 0.00 per 100 MEV; this is 100% below the critical rate. The intersection operates within the normal range.

Appendix C: Existing Traffic Operations

Table C1. 2016 Traffic Operational Analysis - Existing Geometry

Traffic Control Scenario	Peak Hour	Intersection Delay*- LOS		Movement Delay (sec/veh)																							
				EBL		EBT		EBR		WBL		WBT		WBR		NBL		NBT		NBR		SBL		SBT		SBR	
NB TH 169 Ramp at Belgrade Ave Signalized Intersection	AM	4	A	5	A	2	A	-		-		3	A	3	A	14	B	0	A	5	A	-		-		-	
	PM	5	A	7	A	3	A	-		-		6	A	4	A	16	B	3	A	5	A	-		-		-	
SB TH 169 Ramp at Belgrade Ave Signalized Intersection	AM	11	B	-		14	B	3	A	9	A	4	A	-		-		-		-		21	C	16	B	2	A
	PM	11	B	-		17	B	4	A	12	B	4	A	-		-		-		-		25	C	0	A	2	A
Range St at Belgrade Ave All-Way Stop Controlled	AM	7	A	7	A	9	A	5	A	6	A	7	A	4	A	5	A	7	A	3	A	6	A	9	A	4	A
	PM	8	A	9	A	10	A	7	A	10	B	10	A	6	A	5	A	7	A	4	A	7	A	9	A	5	A
Center St at Belgrade Ave All-Way Stop Controlled	AM	7	A	7	A	7	A	-		-		9	A	6	A	5	A	8	A	5	A	6	A	-		4	A
	PM	8	A	6	A	8	A	-		-		10	A	6	A	5	A	9	A	5	A	6	A	-		4	A
Sherman St at Belgrade Ave Side-Street Stop Controlled	AM	3	A	3	A	1	A	1	A	4	A	2	A	2	A	-		-		-		7	A	8	A	4	A
	PM	3	A	4	A	2	A	1	A	5	A	3	A	3	A	-		-		-		8	A	9	A	4	A
Lake St at Belgrade Ave Side-Street Stop Controlled	AM	2	A	3	A	1	A	-		-		1	A	1	A	-		-		-		6	A	-		3	A
	PM	2	A	4	A	1	A	-		-		1	A	1	A	-		-		-		8	A	-		3	A
Lee Blvd at Belgrade Ave Side-Street Stop Controlled	AM	4	A	0	A	0	A	18	C	40	E	0	A	2	A	0	A	6	A	7	A	9	A	1	A	0	A
	PM	4	A	0	A	13	B	4	A	25	D	2	A	2	A	7	A	6	A	6	A	6	A	1	A	0	A

*Delay in seconds per vehicle

Table C2. 2016 Peak Hour Queues by Movement - Existing Geometry

Traffic Control Scenario	Peak Hour	Queue Lengths																								
		EBL		EBT		EBR		WBL		WBT		WBR		NBL		NBT		NBR		SBL		SBT		SBR		
		Avg	Max*	Avg	Max*	Avg	Max*	Avg	Max*	Avg	Max*	Avg	Max*	Avg	Max*	Avg	Max*	Avg	Max*	Avg	Max*	Avg	Max*	Avg	Max*	
NB TH 169 Ramp at Belgrade Ave <i>Signalized Intersection</i>	AM	9	32	11	52	-		-		44	109	0	0	9	32	9	32	0	0	-		-		-		
	PM	12	42	20	72	-		-		99	190	0	0	21	48	21	48	0	0	-		-		-		
SB TH 169 Ramp at Belgrade Ave <i>Signalized Intersection</i>	AM	-		56		98	0	0	72	129	26	64	-		-		-		-		59	113	59	113	0	0
	PM	-		67		111	1	13	123	225	53	108	-		-		-		-		45	85	45	85	0	0
Range St at Belgrade Ave <i>All-Way Stop Controlled</i>	AM	45	71	45	71	8	30	45	68	45	68	30	57	-		18	46	-		-		36	66	-		
	PM	55	87	55	87	14	41	83	145	83	145	49	83	-		28	51	-		-		35	63	-		
Center St at Belgrade Ave <i>All-Way Stop Controlled</i>	AM	41	74	41	74	-		-		42	67	14	41	17	43	40	67	40	67	23	45	-		23	45	
	PM	47	77	47	77	-		-		54	86	26	51	21	45	43	70	43	70	23	44	-		23	44	
Sherman St at Belgrade Ave <i>Side-Street Stop Controlled</i>	AM	-		4	25	-		-		9	32	-		-		-		-		-		38	62	-		
	PM	-		8	43	-		-		13	43	-		-		-		-		-		35	60	-		
Lake St at Belgrade Ave <i>Side-Street Stop Controlled</i>	AM	7	33	7	33	-		-		0	0	0	0	-		-		-		23	43	-		23	43	
	PM	17	50	17	50	-		-		0	0	0	0	-		-		-		25	46	-		25	46	
Lee Blvd at Belgrade Ave <i>Side-Street Stop Controlled</i>	AM	-		0	5	-		10	32	10	32	14	38	0	0	0	4	1	10	38	93	4	50	4	50	
	PM	-		2	10	-		19	47	19	47	12	34	2	16	2	16	2	13	45	97	2	26	2	26	

*Max Queue refers to the 95% Queue (Passenger car stored length = 25 ft, Heavy vehicle stored length = 45 ft)

APPENDIX D

Environmental Screening

Environmental Screening Belgrade Ave Corridor Study

SEE Topics	Considerations	Existing Conditions
Water Resources	Effects to water resources. Wetlands that may be impacted by partial or complete filling, excavation or drainage, or severance of water supply	Known Water Resources Locations (Figure 1) <ul style="list-style-type: none"> • The Minnesota River traverses to the east and south of the study area. • The Minnesota River is listed as an Impaired Stream. • No wetlands were located near the study area.
Floodplains	Development encroachments on the 100-year floodplain	Known Floodplains Locations (Figure 1) <ul style="list-style-type: none"> • Flood Hazard Areas are associated with the Minnesota River to the east and south of TH 169. • Study area protected from the 100-year flood by levee or other structure which may be subject to possible failure or overtopping during prolonged floods or high riverstages.
Surface Water Drainage/Water Quality	Effects of drainage modifications. Run-off effects to protected lakes and watercourses	Drainage infrastructure alterations and impervious surface additions may affect the bodies of water.
Wildlife, Threatened and Endangered Species	<ul style="list-style-type: none"> • Unique habitats • Widened section • Federal and state listed threatened and endangered species 	There are no known wildlife, threatened and endangered species in the study area.
Fisheries	<ul style="list-style-type: none"> • Trout streams • Fish migrations • Spawning runs • Unique habitats 	There are no designated trout streams within the study area.
Vegetation	<ul style="list-style-type: none"> • Native plant communities • Landscape vegetation • Functional vegetation • High value vegetation • Hazard trees 	The study area is dominated by developed residential and commercial uses with altered vegetation.

Environmental Screening Belgrade Ave Corridor Study

SEE Topics	Considerations	Existing Conditions
Contaminated Properties	Disturbance of contaminated properties may increase project cost	<p>Known history of contamination in the study area (Figure 2).</p> <ul style="list-style-type: none"> • 1 activity in southwest quadrant of Belgrade Ave. and Nicollet Ave. • 1 activity on north side of Belgrade Ave. at Nicollet Ave. intersection • 1 activity on the north side of Belgrade Ave. between Range St. and Nicollet Ave. mid-block • 2 activities in northeast quadrant of Belgrade Ave. and Range St. intersection • 1 activity in southwest quadrant of Belgrade Ave. and Cross St. intersection • 1 activity in northwest quadrant of Belgrade Ave. and Cross St. intersection • 1 activity on north side of Belgrade Ave. between Center St. and Cross St. mid-block • 1 activity in southeast quadrant of Belgrade Ave. and Center St. intersection • 2 activities in northwest quadrant of Belgrade Ave. and Center St. intersection • 1 activity on west side of Center St. between Belgrade Ave. and Wheeler Ave. mid-block • 1 activity on south side of Belgrade Ave. between Lake St. and South Lake St. mid-block • 1 activity at Belgrade Ave. and Lake St. intersection south side • 1 activity on south side of Belgrade Ave. and Nicollet Ave. intersection <p>More detailed investigations may be recommended for properties with existing/past land uses that may have used hazardous/chemical waste.</p>
Parks and Recreation Areas (Section 4f/6f Resources)	<ul style="list-style-type: none"> • Parks and recreation areas • Land and Water Conservation (LAWCON) funds • Wildlife & waterfowl refuges • Historic sites • Landscapes • Highways • Bridges • Buildings & districts • Wildlife management areas • School playgrounds • Fairgrounds • Public multiple-use land holdings • Public golf courses • Archaeological sites • Wild & scenic rivers 	<p>Known Parks and Recreational Areas (Figure 3)</p> <ul style="list-style-type: none"> • Centennial Park at the northwest corner of Belgrade Ave. and Lake St. and meets the Section 4(f) criteria. • BellTower Apartments at 442 Belgrade Avenue is listed on the National Register of Historic Places and meets the Section 4(f) criteria. • No LAWCON parks identified in the study area. • No Schools identified in the study area.

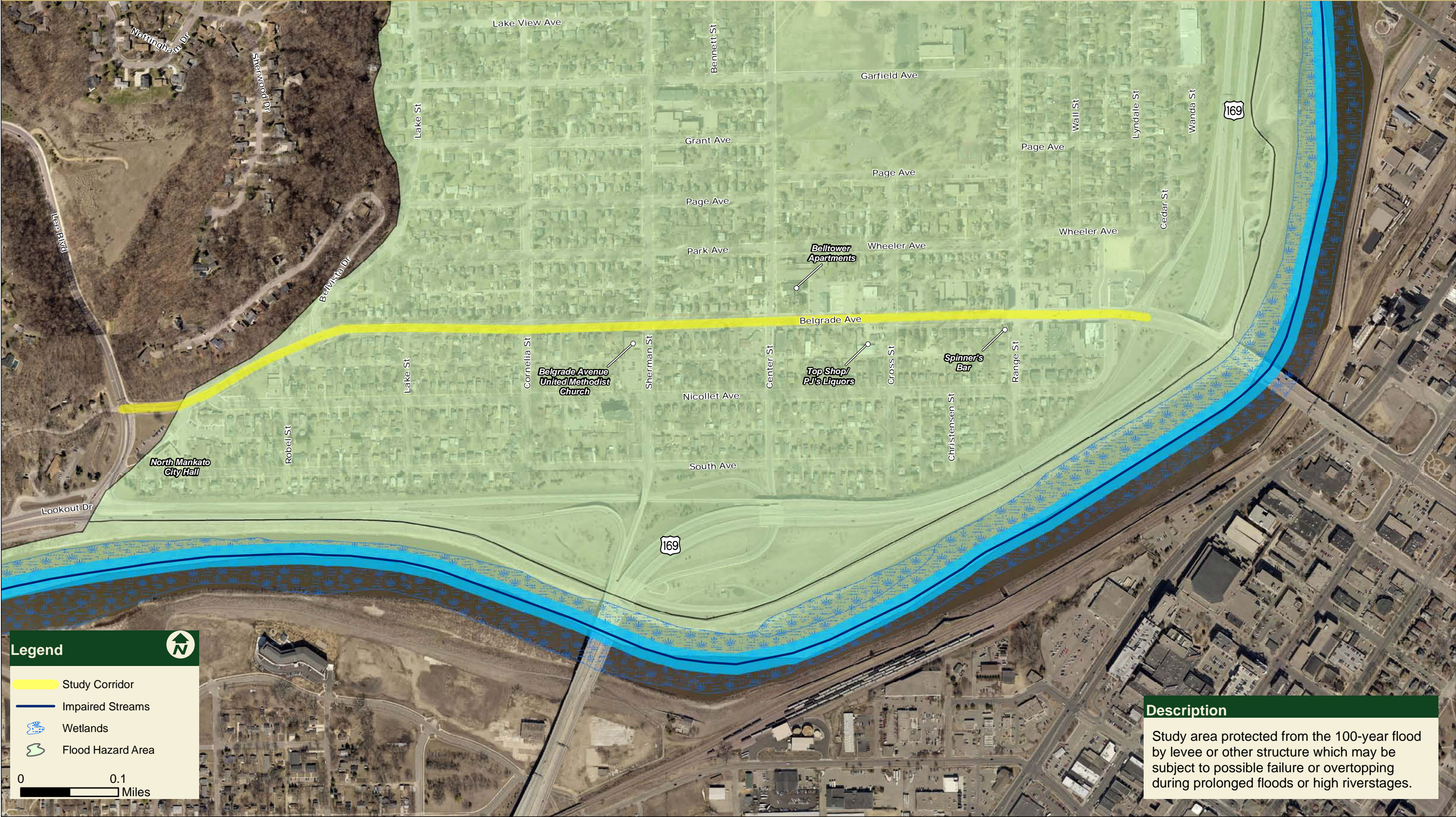
Environmental Screening Belgrade Ave Corridor Study

SEE Topics	Considerations	Existing Conditions
Environmental Justice	Disproportionate effects to low-income or minority populations	<p>Known current Zoning (Figure 4)</p> <ul style="list-style-type: none"> The study area predominately includes the CBD and R-1 (One Family Dwelling) housing. Smaller concentrations of R-3 (Limited Multiple Dwelling) and R-4 (Multiple Dwelling) housing are in the vicinity of the study area. Improvements to the study area are not expected to cause disproportionately high or adverse effects.
Social and Community	<ul style="list-style-type: none"> Hospitals Schools Libraries Churches Government buildings Post offices 	<p>Known Social and Community Locations (Figure 3)</p> <ul style="list-style-type: none"> U.S. Post Office located between Nicollet Ave. and Range St. on the south side mid-block Belgrade Avenue United Methodist Church located in the southwest quadrant of the intersection of Belgrade Ave. and Sherman St. City of North Mankato Water Plant No. 1 located between Lake St. and Nicollet Ave. on the south side mid-block North Mankato Taylor Library located on the south corner of Belgrade Ave. and Nicollet St. North Mankato Police Annex located in the southeast quadrant of Belgrade Ave. and Lee Blvd. North Mankato Municipal Building located in the southeast quadrant of Belgrade Ave. and Lee Blvd.
Cultural Resources	Buildings that exceed 50 years in age, archaeological sites, and Traditional Cultural Properties.	<p>Known Cultural Resources Locations (Figure 3)</p> <ul style="list-style-type: none"> BellTower Apartments; the former North Mankato Public School at 442 Belgrade Ave. Additional buildings along Belgrade Ave. exceed 50 years of age and may be eligible for designation
Pedestrian & Bicycle Facilities	Bicycle and pedestrian safety	<p>Known Pedestrian and Bicycle Facilities (Figure 3)</p> <ul style="list-style-type: none"> A Regional Trail exists along east side of TH 169 and crosses the Minnesota River on Veterans' Memorial Bridge into the City of Mankato. On-Road Bicycle Routes exist on Nicollet Ave, Center St, Sherman St, Lake St & Robel St. to South Ave.
Transit & Intermodal Issues	All modes of transportation and existing facilities for alternatives.	<p>Known Transit & Intermodal Issues</p> <ul style="list-style-type: none"> The eastern terminus of Belgrade Avenue is serviced by TH 169. Greater Mankato Transit System Bus Routes 4 and 5 traverse through the study area.
Air Quality	<ul style="list-style-type: none"> Impacts to air quality Mobile source air toxins 	The need for an air quality analysis, conformity determination, or Mobile Source Air Toxics analysis will be determined once individual improvement projects are identified.*
Traffic Noise	<ul style="list-style-type: none"> Comply with federal noise criteria and Minnesota Noise Standards Identify of sensitive noise receptors 	The need for a noise analysis will be determined once individual improvement projects are identified.*

Environmental Screening Belgrade Ave Corridor Study

SEE Topics	Considerations	Existing Conditions
Costruction Noise	<ul style="list-style-type: none"> • Comply with federal noise criteria and Minnesota Noise Standards • Identify of sensitive noise receptors 	Construction noise will be further considered in a future environmental review.* City ordinances can regulate the daytime hours of construction activities in order to minimize potential impacts to adjacent areas.
Utilities	Impacts to utilities may incur additional project costs.	To be considered in future environmental review.*
Farmland and Soils	<ul style="list-style-type: none"> • Minimization of effects to agricultural land • Properties of soils • Suitability for roadway construction 	There are no designated farmland and soils in the project area.
Erosion	<ul style="list-style-type: none"> • Erosional effects • Water pollution 	To be considered in a future environmental review.*
Right of Way and Relocation	Effects of right of way acquisition	Additional right-of-way may need to be acquired for future improvement projects. Temporary easements and changes to local roadway and property access points are also likely. Any impacts resulting from right-of-way acquisition, relocation or access changes will be identified in a future environmental review.
Visual Quality	<ul style="list-style-type: none"> • Scenic intrusion • Grading, Trails • Vegetation modifications • Bridges • Walls • Lighting • Fencing • Railings 	The proposed project is not anticipated to result in adverse visual impacts.

*Additional study considerations will be pursued when improvements are identified.



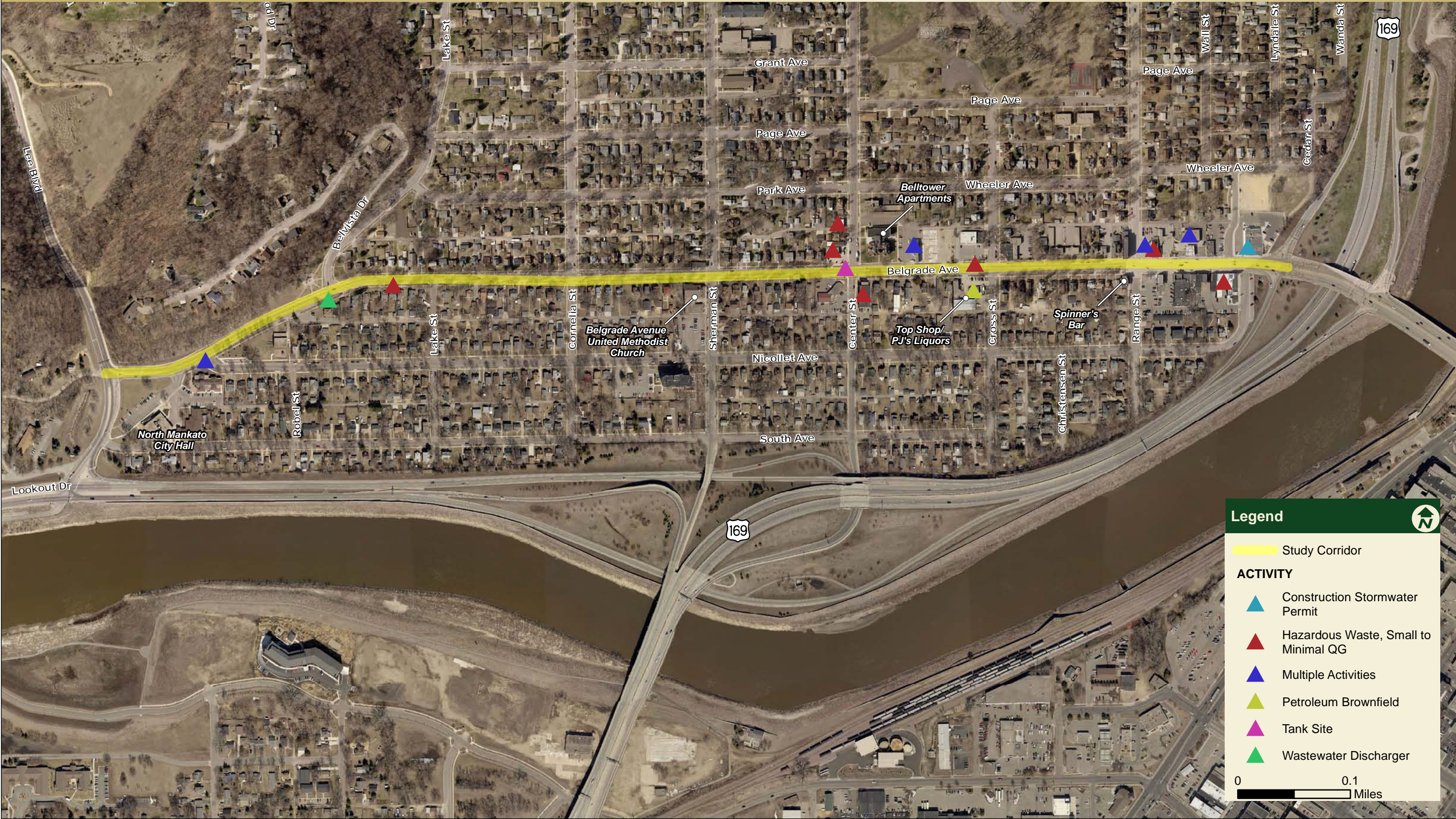


Belgrade Avenue Corridor Study

Mankato/North Mankato Area Planning Organization

Figure 2: Contaminated Properties

July, 2016



Legend

Study Corridor

ACTIVITY

Construction Stormwater Permit

Hazardous Waste, Small to Minimal QG

Multiple Activities

Petroleum Brownfield

Tank Site

Wastewater Discharger

00.1

Miles



