



MAPO

MANKATO/NORTH MANKATO
AREA PLANNING ORGANIZATION

Highway 169 Corridor Study

Final Existing Conditions & No-Build Conditions Report

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Subject: Existing and No-Build Conditions

Highway 169 Corridor Study

Mankato/North Mankato Area Planning Organization (MAPO)

Project No.: T61120619

Table of Contents

Table of Contents	1
Appendices.....	1
I. Introduction.....	1
A. Previous Studies	2
B. Planned Projects.....	9
C. Demographics and Trends	9
II. Transportation System Characteristics	15
A. Functional Classification and Jurisdiction.....	16
B. Study Area Overview	16
C. Land Use and Major Traffic Generators	16
III. Environmental Screening.....	18
D. Cover Types.....	18
E. Geology, Soils and Topography/Land Forms	19
F. Water Resources	19
G. Contaminated/Hazardous Materials/Wastes	20
H. Fish, Wildlife, Plant Communities, and Sensitive Ecological Resources	20
I. Visual	21
J. Air, Noise, and Cumulative Potential Effects	21
IV. Existing Traffic Conditions.....	21
VI. Summary of Issues.....	34

Appendices

Appendix A – Figures, Maps and City Resolutions

Appendix B – Environmental Justice Analysis

Appendix C – Environmental Screening

Appendix D – Existing Conditions Safety Memo

Appendix E – Issues Identification Infographic

I. Introduction

The Highway 169 Corridor Study was initiated by the Mankato/North Mankato Area Planning Organization (MAPO) and the Minnesota Department of Transportation (MnDOT) District 7 to develop a comprehensive plan for future corridor investments. Portions of the Highway 169 Corridor in the Mankato/North Mankato/Sound Bend Township area have been studied numerous times over the past two decades. The study area is depicted in **Figure 1** (Appendix A). Improvements such as turn lanes, acceleration lanes, pedestrian crossing enhancements, trail connections, and frontage road improvements have resulted, yet a few key concerns remain:

1. Operational and safety concerns from County Road 120 to the Blue Earth River Crossing
2. Pedestrian and bicycle connectivity across Highway 169 throughout the corridor
3. Maintaining access to area businesses
4. Maintaining emergency access
5. Operational and safety concerns between Veterans Memorial Bridge and Lake Street, including the Highway 169/14 interchange
6. Maintaining economically viable access to business and property owners near Lind Street (per City of Mankato Resolution No. R-19-0708-119)
7. Maintaining full access at Webster Avenue; if Webster Avenue is proposed to be relocated, it must:
 - a. Provide economically viable and safe access for all existing businesses in the corridor
 - b. Remain within the boundaries (present or expanded) of the City of North Mankato
 - c. Include an area that is economically viable and feasible for redevelopment and reinvestment
 - d. Provide a safe outlet for residents in Lower North Mankato, and that access point must be within the municipal boundaries (present or expanded) of North Mankato (per City of North Mankato Resolution No. 53-19).

Both the City of Mankato and City of North Mankato resolutions noted above, are included in Appendix A and the previous studies section of this report, and as an attachment to the study's Project Management Plan. These resolutions state each city's conditions of consent to participating in the Corridor Study.

The study will seek to understand the needs and opportunities in the corridor; establish purpose and need, and goals and objectives; develop and evaluate alternatives; reach consensus on a vision; and develop an implementation plan that defines improvement triggers and allows the vision to be achieved in increments. Consultant staff will utilize the history of the corridor to bring fresh ideas and innovative approaches to the proposed vision. This process will allow an aligned vision that blends and balances competing interests like mobility, access, and economic needs. The Highway 169 implementation plan will guide future planning and programming of land use/economic development opportunities, bridge improvements, and operational and safety enhancements for all modes of travel.

The purpose of the Highway 169 Corridor Study is to:

- Define an ultimate vision for Highway 169 that is innovative, realistic, and ensures economic vitality and safety, mobility, and access for all modes of travel,
- Secure public and agency support for the ultimate vision, and
- Develop a detailed implementation plan outlining future improvements, sequencing/triggers, timing, cost, and agency responsibility.

The purpose of this report is to document existing and no-build conditions and to identify and confirm issues along and near Highway 169 within the Cities of North Mankato and Mankato and the South Bend

Township area. This information will guide the development of plan goals and objectives and ultimately the identification of improvement alternatives for Highway 169.

This memo is organized by the following sections:

- Previous studies overview
- Planned projects
- Demographics and trends
- Functional classification and jurisdiction
- Study area characteristics
- Land use and major traffic generators
- Existing and no-build traffic conditions
- Crash history
- Access
- Pedestrian and bicycle
- Transit
- Social, environmental, and economic (SEE) resources
- Summary of issues

Appendix A of this memo contains figures of each of the study area characteristics listed above and SEE resources.

A. Previous Studies

Several studies have been completed which provide direction for future transportation needs within and around Highway 169. The key points in each study relevant to the Highway 169 area are summarized below by plan title.

MAPO 2045 LRTP (November 2015)

The Mankato/North Mankato Area Planning Organization's (MAPO) Long Range Transportation Plan (LRTP), guided by MAPO's Technical Advisory Committee (TAC) and Policy Board was published in 2015 to share long-range and short-range transportation planning strategies and actions that contribute to the development of and integrated multimodal transportation system with the capacity to facilitate the safe and efficient movement of people and goods. The geographic extent of the plan included Blue Earth and Nicollet counties; the cities of Mankato, North Mankato, Eagle Lake, and Skyline; and the townships of Belgrade, Lime, South Bend, LeRay and Mankato. All member jurisdictions were included in the development of the plan. The following provides a summary of findings from this study:

- A system management and preservation approach should be applied to preserve the principal arterial system, extend the capacity of current transportation facilities, and maximize highway efficiency.
- Identified Downtown (Civic Center) Mankato, Mankato West High School, Mankato City Hall/Government Center, Minnesota State University as high-risk emergency and disaster response areas adjacent the Highway 169 corridor
- The Highway 169 and Highway 14 Interchange is an issue area with crash rates exceeding critical thresholds, intersection and corridor deficiency, and access spacing less than minimum requirements.
 - An intersection operations analysis found that high mainline speeds, in combination with significant southbound traffic volumes, limit the availability of acceptable gaps for

- eastbound left-turning motorists, causing significant side-street delays (LOS F) and queues at the Highway 169/Highway 14 South Ramp intersection
 - Identified crash types at the south ramp intersection were rear-end crashes at side-street stop control intersection
 - Potential improvements include installation of a warning sign, traffic control improvement, interchange reconfiguration and access modifications
- The Highway 169 and Lind Street intersection exceeds typical crash rates but does not exceed calculated critical rates
 - Identified crash types were rear-end crashes at a signalized intersection
 - Potential casual crash factors included large turning movement volumes and inadequate signal timing
 - Potential improvements including a traffic control improvement, re-timing of the signal, interchange reconfiguration and access modification
- The Highway 169 from Highway 14 South Ramp to Webster Avenue exceeds the typical crash rate but does not exceed the calculated critical rate
 - Identified crash types include rear-end crashes
 - Potential casual factors include excessive speeds, significant queues large turning movement volumes, and inadequate signal timing
 - Potential improvements including reduced speed limit with enforcement, re-time signals, interchange reconfiguration and access modifications
- Includes five design concepts reviewed by MnDOT and previous MATAPS efforts at the Highway 169 and Highway 14 interchange
- Includes several other low-cost/high-benefit solutions along the Highway 169 corridor for access control and traffic signal management

City of Mankato Riverfront Drive Corridor Study (June 2017)

In June 2017, the Mankato/North Mankato Area Planning Organization (MAPO) published the Riverfront Drive Corridor Study which identified a long-term vision for multimodal improvements on Riverfront Drive to help address pedestrian safety, speed issues, and freight and local access for businesses along the corridor. The study was led by MAPO and the City of Mankato. The study extent included Riverfront Drive from Woodland Avenue on the south to Highway 14 on the north.

The study partners desired to define a comprehensive vision for Riverfront Drive to continue their momentum in City Center reinvestment while also serving continued growth and local/regional mobility needs over the next 25 years. The study included defining the issues and potential opportunities along the corridor, establishing the corridor vision and goals, developing and evaluating potential multimodal infrastructure improvement alternatives, and developing a short- and long-term implementation plan that identifies potential projects and cost estimates.

The study included the following findings and recommendations relevant to the Highway 169 corridor.

- Peak hour queuing at the Riverfront Drive/Highway 169 interchange from both northbound and southbound directions.
- Improvements at the southbound Riverfront Drive/Highway 169 interchange ramp and additional turn lanes and access configurations between the interchange and Stoltzman Road.

Belgrade Avenue Corridor Study (July 2017)

In July 2017, the Mankato/North Mankato Area Planning Organization (MAPO) and the City of North Mankato completed the Belgrade Avenue Corridor Study to identify a long-term vision for multimodal

improvements on Belgrade Avenue in North Mankato. The study extent included Belgrade Avenue from Lee Boulevard on the west to the Veteran's Memorial Bridge on the east. The study defines a comprehensive vision for Belgrade Avenue to understand the needs and opportunities in the corridor, develop and evaluate potential transportation improvement alternatives, and develop an implementation plan that prioritizes projects for completion over time. The study included the following findings and recommendations ranging from short- to long-term for five focus areas along the corridor relevant to the Highway 169 corridor:

- Highway 169 Southbound Ramp Intersection: construct a roundabout for traffic calming

MAPO ADA Transition Plan (May 2019)

The Mankato/North Mankato Area Planning Organization (MAPO) ADA – Transition Plan & Inventory for Public Right-of-Way was published in May 2019 as part of requirements laid out in the Americans with Disabilities Act (ADA). The ADA requires MAPO and partner agencies to conduct self-evaluations of facilities within public rights-of-way and develop a transition plan detailing how the agency will ensure all facilities are accessible to all individuals. The study includes evaluations of MAPO member jurisdictions including Blue Earth and Nicollet counties and the cities of Mankato, North Mankato, Eagle Lake, and Skyline.

Implementation of the plan was separated into priority levels ranging from high priority to low priority. MAPO partner agencies used the priority ranking outlined above to create the plan and schedule for integrating ADA compliance projects in future streets projects. Each agency utilized two methods for upgrading pedestrian facilities to the current ADA standards. The first is the scheduled street and utility improvement projects. All pedestrian facilities impacted by these projects were recommended to be upgraded to current ADA accessibility standards. The second method is the stand-alone sidewalk and ADA accessibility improvement project. These projects were recommended to be incorporated into the Capital Improvement Program (CIP) on a case by case basis as determined by agency staff. The study found that the following sidewalks, pedestrian ramps, bus stops, and traffic signals along the Highway 169 corridor were not compliant with ADA accessibility standards:

- Priority area at Highway 169 and Kiwanis Recreation Area
- Eight not compliant pedestrian ramps at W Lind Street & Highway 169
- Priority area at CSAH 33 and Highway 169
- Two sidewalk barriers at S Riverfront Drive & Highway 169
- Six not compliant pedestrian ramps at S Riverfront Drive & Highway 169
- Three sidewalk barriers at Highway 169 and the Blue Earth River Crossing
- Four traffic signals at the Highway 169 & Lookout Drive ramps are not compliant
- Two not compliant pedestrian ramps at Sherman Street & Highway 169
- One sidewalk barrier at Sherman Street & Highway 169
- Three not compliant pedestrian ramps at Center Street & Highway 169
- One not compliant pedestrian ramp at Belgrade Avenue & Highway 169

City of Mankato Transit Development Plan (June 2018)

In June 2018, the City of Mankato published the Mankato Transit Development Plan. This plan explores the community's vision for a future transit system that increases access and reliability, encourages ridership

growth, and identifies additional opportunities for improvement in service and operations. The Greater Mankato Transit System (GMTS) serves 24 square miles in Mankato and North Mankato. In May 2018, GMTS operated 19 fixed route bus line and paratransit service.

The planning process identified three service recommendation scenarios. The scenarios give GMTS flexibility to begin addressing deficiencies in the existing system as funding becomes available.

- Cost neutral scenarios that maintain 2017 funding levels: removing deviations to increase travel time and reliability, transferring segments of routes to create more efficient connections, and realigning routes to adjust low performing routes
- New service expansion scenarios that add service funded by MnDOT grants: level of service improvements, route extensions to provide better connections to new and existing activity centers, and creating new routes to connect to new areas throughout the region
- Illustrative scenarios that include recommendations that address community feedback but are not yet funded: increased peak and all-day frequencies on existing routes, enhanced weekend service, extended weekday hours of service and new routes

City of Mankato Riverside North Redevelopment (Ongoing 2020)

The City of Mankato is in the process updating the plan for the Riverside North Redevelopment, adopted by the Council in the 1980's. The Riverside North Project area consists of approximately 24 acres located in the northwest section of the city. The area lies between Highway 169 and the Minnesota River, immediately south of Highway 14. The entire western side of the project area fronts on Highway 169. Plan updates are anticipated to include an area investigation/market analysis, land use/redevelopment scenarios, and a small area plan. Public engagement is also anticipated with the Mankato property owners/residents. The scope of the plan is only for areas along the corridor within the City of Mankato.

City of North Mankato Webster Avenue Land Use Study (Ongoing 2020)

This study covers the primarily industrial and commercial area along and around Webster Avenue in North Mankato between Highway 169 and Lake Street. Webster Avenue serves as a gateway to the City of North Mankato, providing access to a thriving commercial/industrial zone, area recreation, and residential neighborhoods in the area known collectively as Lower North Mankato. Businesses surrounding Webster Avenue rely on connections to US Highway 169 as many are oriented around the sale or maintenance of trucks and deliveries. Webster Avenue connects to US Highway 169 with an at-grade, full movement intersection today and is also near US Highway 14, providing vital regional connectivity.

As changes continue to develop across the North Mankato and Mankato region, the City of North Mankato is working to develop a vision for Webster Avenue to guide redevelopment and revitalization of the area. This study is intended to inform the MnDOT Highway 169 study by defining a vision of the Webster Avenue area that has the combined support of the City and area citizens, businesses, and property owners.

Webster Avenue handles a mix of vehicular traffic from tractor-trailer and large freight trucks down to passenger cars. Between 2011 and 2015, eight crashes occurred at the intersection of Webster and Range Street. The intersection receives traffic from Highway 169 and descends in elevation to the lower Webster Avenue below. With Spring Lake Park on the western terminus, Webster must also accommodate pedestrian and bicycle traffic coming primarily from the residential area south of the roadway. Access to the Webster Area is largely provided by the Webster Avenue and Highway 169 intersection. Each roadway within the industrial district feeds to Webster Avenue, with Cross Street and Range Street providing

north/south through access along the area's eastern edge. Each north/south roadway also provides access to residential areas south of Webster Avenue.

Goals and objectives of the ongoing study include:

- Direct Highway 169 access. Businesses expressed heavy reliance on Webster Avenue access to Highway 169 for the servicing of trucks, sales of trailers and parts to trucking customers, and shipments and deliveries by truck as the basis for their businesses. As such, most respondents agree that sustained direct access is vital to the continuation of their businesses and that loss of access would result in detrimental effects, including possible business closure.
- Continue to work with the Highway 169 Study Team and area stakeholders to outline a future for the Webster/Highway 169 intersection, while ensuring continued regional access to Webster Avenue from the highway.
- Coordinated wayfinding signage on Highway 169 and Webster Avenue to remove confusion for truck drivers finding their business.

City of North Mankato Comprehensive Plan (2015)

The Comprehensive Plan is a vision and roadmap for where the City of North Mankato is headed. The ideas and goals expressed in this plan are intended to reflect the community's values and the desire for what North Mankato is to become. The planning process identified the following as it pertains to Highway 169:

- The Land Use chapter gave recognition that Webster Avenue and Highway 169 is an area that people first see as they come into North Mankato and provide visitors with their first impression of the community. Webster Avenue has an opportunity to create a gateway into the community and let visitors know they are in North Mankato and will contribute to the creation of a "sense of place".
- The Transportation Plan provides information about previous planning efforts through the 2011 Mankato/North Mankato Area Transportation Planning Study (MATAPS) in which it identified; existing and potential deficiencies of the arterial-collector street system, the functional hierarchy of streets and roads related to access and capacity requirements, access management policies and intersection controls, and future planning through the Mankato/North Mankato Area Planning Organization's (MAPO) 2045 Long Range Transportation Plan.

The Mankato Area Transportation and Planning Study (MATAPS), completed in 2011, included a comprehensive technical analysis and public outreach effort to identify transportation issues for the MATAPS area. The following major issues were identified specific to North Mankato and Highway 169:

- Highway 14/Highway 169 interchange – safety and connectivity concern (eastbound on Highway 14 to northbound Highway 169); high-crash location
 - Highway 169 at Lind Street and Webster Avenue – local access and safety concerns
 - Trail expansion – potential trail expansion through the MATAPS study area and MAPO's Long Range
- The large vacant parcel at the northwest quadrant of the Highway 169/West Lind Street intersection lies within the City of Mankato and is designated for heavy industrial development on their land use map. The City of Mankato has also received inquiries from potential developers regarding the possibility of a large retail development being located on this site. Either an industrial or commercial/retail development could result in traffic impacts on the North Mankato local street

system, namely West Lind Street and North Lake Street. Lake Street north of Webster Avenue is designated as a local street in the proposed functional classification. It is the intent of the City of North Mankato that this segment of Lake Street remains a low-volume local street to preserve the unique character of the street corridor and the adjacent residential properties.

- Several scenarios for modification to the Highway 169 and Highway 14 interchange and for access modification to the segment of Highway 169 from Highway 14 interchange to Webster Avenue have been developed in the past. The primary objectives of the proposed improvements for the interchange are to eliminate the need to cross lanes of traffic when making the following turning movements; eastbound Highway 14 to northbound Highway 169, northbound Highway 169 to westbound Highway 14. Most of the improvement scenarios also included modification to the existing access conditions at the Lind Street and/or Webster Avenue intersections. Options considered included the removal of signals, closing access completely, or modifying access to right in/right out at one or both locations. During the last MATAPS updates in 2003 and 2011, the City of North Mankato staff and Council voiced opposition to any option that eliminated or reduced the level of access at Webster Avenue. Based on discussions with City staff and City Council, the position of the City of North Mankato has not changed on this issue. The City will not support options for improvements within this corridor that restrict access at the Highway 169/Webster Avenue intersection from today's full access condition. See the City of North Mankato Resolution No. 53-19 below for conditions regarding any option that includes relocating the Webster Avenue intersection.
- A policy relating to Highway 169 was listed in the Transportation System Goals, Objectives, and Policies, states that full access conditions be maintained at the Webster Avenue/Highway 14 intersection.

City of North Mankato Resolution No. 53-19 (adopted July 2019)

The City of North Mankato resolution No. 53-19 stated the following:

- In 1996, area government decided that an area transportation plan was needed. This resulted in a coordinated effort to produce the Mankato Area Transportation & Planning Study (MATAPS); and
- An update of MATAPS was completed in 2003 and 2012; and
- A reoccurring component of MATAPS was Highway 169 corridor improvements; and
- The Mankato/North Mankato Area Planning Organization Policy Board (MAPO) budgeted funds for the Highway 169 Corridor Study from Lake Street Northwest to State Highway 60 to be completed in 2019; and
- The proceeding with corridor studies requires a resolution of consent from local governments included in the study; and
- A critical intersection along the Highway 169 Corridor is at Webster Avenue where many North Mankato businesses rely on unrestricted access and turning movements on and off Highway 169; and
- In 2017, the City of North Mankato held business engagement meetings with area businesses to discuss the importance of the Highway 169 and Webster Avenue intersection; and
- It was evident that all participating area businesses believe that both north and southbound access from Webster Avenue to Highway 169 is critical; and
- The official position of the City of North Mankato is Webster Avenue shall remain open as a full access intersection with no restriction on turning movements and this has been North Mankato's position for over twenty years; and

- Webster Avenue is a critical full access intersection for both transportation and emergency response in Lower North Mankato; and
- The North Mankato City Council supports the inclusion of a Highway 169 Corridor Study in the 2019 MAPO work plan subject to the following condition:
 - The study will include maintain a full access intersection at Webster Avenue that is supported by the City of North Mankato
- If the study includes an option for relocating the Webster Avenue intersection, North Mankato's support for the recommendations is conditioned on the following:
 - All existing businesses in the corridor are provided with an economically viable and safe access.
 - Any new proposed location of the Webster Avenue intersection must remain within the boundaries (present or expanded) of the City of North Mankato.
 - Any new proposed location for the Webster Avenue intersection must include an area that is economically viable and feasible for redevelopment and reinvestment.
 - Any new proposed location of the Webster Avenue intersection must include a safe outlet for residents in Lower North Mankato, and that access point must be within the municipal boundaries (present or expanded) of North Mankato.

City of Mankato Strategic Plan (through 2023)

The City of Mankato Strategic Plan through 2023 acts as a guiding document for the City as it updates its services and initiatives. The plan outlines challenges and strategies intended to improve affordability, stewardship, and community building in Mankato. To increase transportation options and access for residents, the City plans to provide and promote affordable multi-modal transportation involving public and private partnerships and examine non-traditional modes and land use decisions that positively impact availability and feasibility. The following initiatives will be used to achieve these goals:

- Create opportunities for affordable transportation choices by developing and actionable multimodal plan and expanding the complete streets plan for bike/pedestrian connections.
- Establish innovative partnerships for expanded transit services by developing public/private partnerships to improve fixed route transit services in the City.
- Develop a transportation hub for local and regional connections and neighborhood transit stop locations that have passenger support elements.
- Apply transit supportive design by developing land use standards that encourage and support transit routes, such as high-density residential centers throughout the community.

City of Mankato Resolution No. R-19-0708-119 (adopted July 2019)

The City of Mankato resolution No. R-19-0708-119 stated the following:

- In 1996, a Highway 169 Corridor Plan was developed under the Mankato Area Transportation & Planning Study (MATPS) process; and
- The City of Mankato facilitated certain local road improvements, connections, and aspects of the MATAPS plan; and
- Subsequent updates to the MATAPS plan were made in 2003, and again in 2010; and
- The public engagement process identified concerns on the part of Mankato property owners along the corridor that any closure and subsequent relocation of the Lind Street access to be done in a

manner that assures long-term economic vitality of the businesses and properties serviced by the Lined Street access; and

- The Highway 14/Highway 169 interchange is inadequate, and in particular, the turning movements from North Mankato Highway 14 to the Highway 169 ramp are in need of critical safety and operational improvements; and
- It is imperative that the corridor plan be prepared and included in the revised 10-year Long Range Transportation Plan for MnDOT District 7, so as to assure effective reinvestment of future state transportation funding and securing federal funding opportunities.
- The City Council for the City of Mankato that participation is authorized in the Highway 169 Joint Corridor Study provided that any alternatives which include the closure and relocation of Lind Street remain economically viable to the affected businesses and property owners within the City of Mankato
- The City of Mankato retains its rights of municipal consent over local street closures and access relocations identified through the Highway 169 Corridor Study process.

B. Planned Projects

A few projects are planned or programmed within and around the study area.

The following lists potential **MnDOT** bridge and pavement projects within the next 10 years:

- 2018 Highway 169 Levee Project including 0.8 miles just north of the Highway 14 junction raised to meet the 100-year base flood elevation
 - The issue of flooding and the Highway 169 elevation from Lake Street to Highway 14 remains an important issue for both communities and businesses in the area. The levee project raised Highway 169 to meet flood insurance requirements but not to an elevation the communities desire. Interchange improvements may require re-visiting this issue with the U.S. Army Corps of Engineers.
- The current draft Capital Highway Investment Plan (2020-2029) for District 7 includes a potential project on Highway 169 (from approximately Riverfront Drive to Lake Street) in 2027 that will include major bridge work on three primary bridges (including the Northstar Bridge), as well as pavement needs, potential bicycle and pedestrian infrastructure, freight needs, etc. It is estimated that this project may exceed \$37,000,000, or almost one-third of the District budget for that year. Within the next 10-15 years it is anticipated that Bridge 07023 (Highway 14 over Highway 169) and Bridge 07011 (Highway 14 over Minnesota River and UP Railroad) will need to be addressed, which combined could exceed \$100,000,000. MnDOT intends to use the vision established in this study and the needs of the region to inform these future investments.

City of Mankato planned projects:

- 2020 rehabilitation of pavement on Riverfront Drive from Woodland Avenue to Sibley Parkway

C. Demographics and Trends

This section provides an overview of past and projected demographics in the study area, to demonstrate how growth has and will impact demand for facilities.

Population and Households

The Mankato/North Mankato area has experienced steady growth since 2000. The MAPO area had an estimated population of 62,578 in 2012 and 65,175 in 2020, increasing 4%. Based on forecasts by MAPO the 2045 population is projected to be approximately 73,200, increasing an additional 12% from the 2020 estimation. **Tables 2** details population, households and employment trends for the MAPO area.

Rapid growth, such as that seen in the MAPO area has implications on transportation systems. Fast growth may increase demand for roadway capacity and lead to greater density to support increased transit or bicycle/pedestrian facilities. In addition, the study area corridors are also influenced by their travel sheds which go beyond the immediate study area. Further detail on this is provided in section II.C Land Use and Major Traffic Generators. Travel sheds will be identified early in the study by analyzing traffic pattern data.

Table 2: Populations, Households, and Employment within the MAPO area

Table 2: MAPO – Population and Households				
Category	2012	2020	2030	2045
Population ¹	62,578	65,175	68,400	73,200
Households ¹	24,235	26,800	30,300	34,300
Employment ²	34,257	37,200	40,800	46,300

1 Extrapolated using year 2020 projections developed in the Mankato Area Housing Study Update

2 Extrapolated to correspond with MATAPS 2010 year 2035 employment projections

Source: MAPO 2045 Long Range Transportation Plan (LRTP) Update

Employment

The Minnesota Department of Employment and Economic Development (DEED) estimates approximately 59,399 jobs exist in the Cities of North Mankato and Mankato as of 2017. The average hourly earnings is \$26.44/hour. The largest industries are manufacturing, health care and social assistance, and retail trade. 20.4% of workers are employed in the manufacturing industry which could mean an increased demand for highway efficiency.

Of these employees, the majority either drove alone or carpoolled to work in 2017 (**Table 3**). This high reliance on driving single-occupancy vehicles could mean greater numbers of auto trips as population in the MAPO area increases, placing greater demand on the existing transportation infrastructure. Currently the average travel time for each jurisdiction is lower than the average travel time to work for Minnesota. The City of Mankato has the highest percentage of residents who use public transit to get to work, likely due to the level of availability of transit within Mankato serving more routes and destinations. This emphasizes the importance of multimodal transportation facilities.

Table 3 – Means of Transportation to Work, 2017					
Age	North Mankato	Nicollet County	Mankato	Blue Earth County	South Bend Township
Drove Alone	84.8%	76.7%	79.5%	80.9%	85.1%
Carpooled	6.4%	7.8%	7.3%	7.6%	4.5%
Walked	3.7%	3.9%	5.3%	4.0%	2.2%
Transit	0.7%	0.5%	2.2%	1.5%	0.4%

Other Means	1.2%	1.1%	1.4%	1.0%	0.7%
Mean Travel Time to Work (minutes)	16.4	17.9	15.5	17.3	16.4

Source: US Census Bureau

Minority, Low-Income, and other Vulnerable Populations

The following section is a summary of findings from the Environmental Justice Analysis in Appendix B. The Highway 169 corridor is located in Blue Earth and Nicollet Counties in Minnesota. The two counties combine for a population of 99,244. The corridor study area consists of census block groups that either fall significantly within 0.5 miles of the Highway 169 project corridor or is a key location just outside the 0.5-mile radius. There are 21 block groups in the Highway 169 analysis area which have a population of 30,797 people according to the 2017 American Community Survey 5-year Estimates (**Table 4**).

Table 4: Environmental Justice Populations in the Highway 169 Project Area

		Hwy 169 Project Area		Nicollet and Blue Earth Counties, MN	
		Count	Percent	Count	Percent
Race and ethnicity	Population	30,797	—	99,244	—
	White	27,691	90%	88,457	89%
	Minority population	3,548	12%	12,729	13%
	Hispanic or Latino	822	3%	3,562	4%
	African American	1,149	4%	3,141	3%
	Asian or Pacific Islander	442	1%	1,954	2%
	Two or more races	555	2%	1,806	2%
	Native American	66	0.2%	245	0.2%
	Some other race	72	0.2%	79	0.1%
Income	Population for whom poverty status is determined	30,420	—	93,466	—
	Income below 200% of the poverty level	8,510	28%	14,835	16%
Education	25 years and older	20,386	—	59,878	—
	Less than high school education	941	5%	3,525	6%
Language	5 years and older	28,781	—	93,641	—
	Speak English less than "very well"	387	1.3%	1,719	2%
	Speak Spanish	31	0.1%	705	0.8%
	Speak and other language	282	1%	466	0.5%
	Speak an Asian language	73	0.3%	457	0.5%
	Speak an Indo European language	1	0%	91	0.1%
Age	Population	30,797	—	99,244	—
	Under 5 years	2,016	7%	5,603	6%
	65 years and older	4,205	14%	13,384	13%
Housing	Households	12,729	—	38,220	—
	Owner occupied households	8,472	67%	25,066	66%
	Renter occupied households	4,257	33%	13,154	34%
Disability	Population for whom disability status is determined	35,555	—	98,443	—
	Population with a disability	3,792	11%	10,240	10%
Vehicles	Households	5,042	—	38,220	—
	No vehicle households	539	11%	2,654	7%

*Data from census tracts. All other data is from the block group level.

Rental and Low-Income Housing

About 33% of the housing in the study area is renter occupied compared to 34% of the occupied housing in Nicollet and Blue Earth Counties.

The neighborhood north of where the Blue Earth River meets the Minnesota River has a high concentration of minority and low-income individuals and contains a number of large multi-unit housing including the Villa Terrace Apartments (1560 Tower Blvd), Hoover Estates Apartments (1866 Lee Blvd), Lee Estates Apartments (1740 Lee Blvd), Roe Crest Estate Apartments (1604 Roe Crest Drive), Colony Apartments (1621 Colony Ct), Allen Avenue Apartments (301 Allan Ave), and Village Court Apartments (1620 Village Ct), as

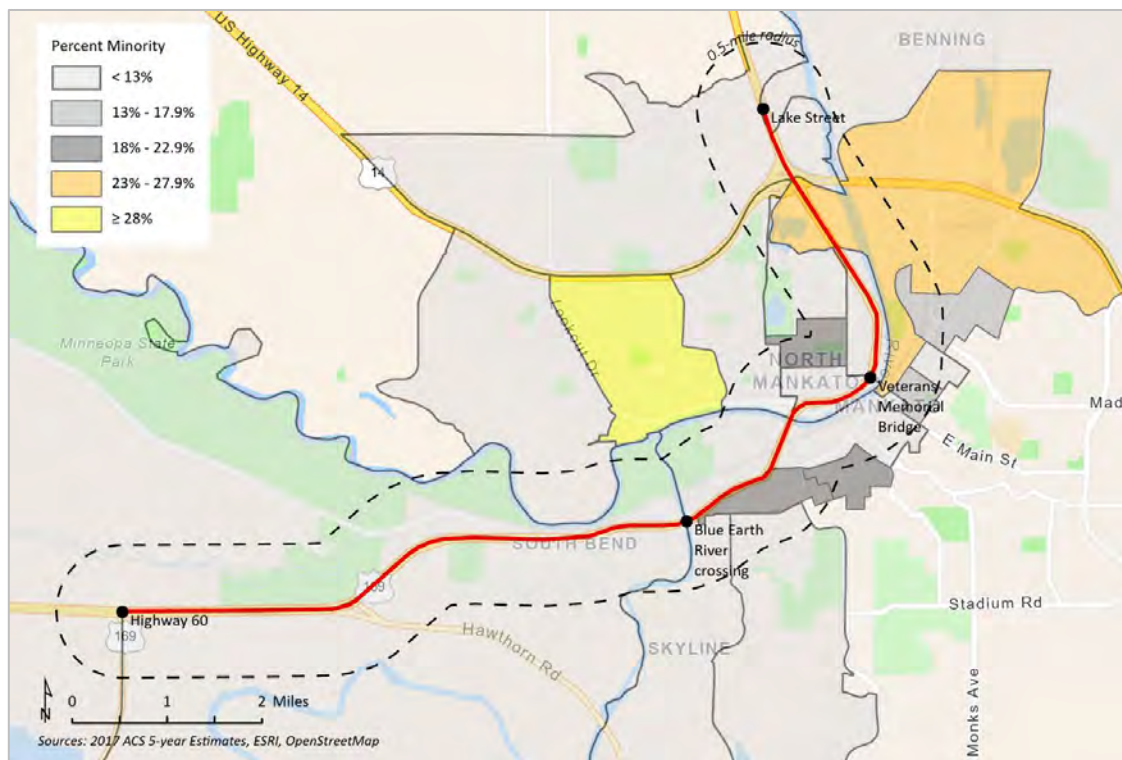
well as several other smaller multi-unit buildings and single family units. The area directly surrounding the Highway 14 intersection contains mostly businesses and the Kiwanis Recreation Area, with the notable exception of the Park Place Townhomes just south of Hiniker Pond (281 Butterworth Street).

Minority Populations

Minority populations includes individuals who identify as Hispanic or Latino, Black or African American, Asian American or Pacific Islander, Native American, some other race, or two or more races, as defined by the U.S. Census Bureau. There are two block groups above 23 percent minority populations that fall within the project area (**Figure 2**) and can be considered environmental justice populations.

The yellow block group north of the Minnesota River has the highest concentration of minority individuals in project area with 34 percent (Figure 2). The block group contains a number of large multi-unit dwellings as well as several other smaller multi-unit dwellings and single-family homes. The orange block group that crosses the segment between Lake Street and Veterans Memorial bridge south of Highway 14 has mostly businesses west of the Minnesota River, with the notable exception of the townhomes south of Hiniker Pond.

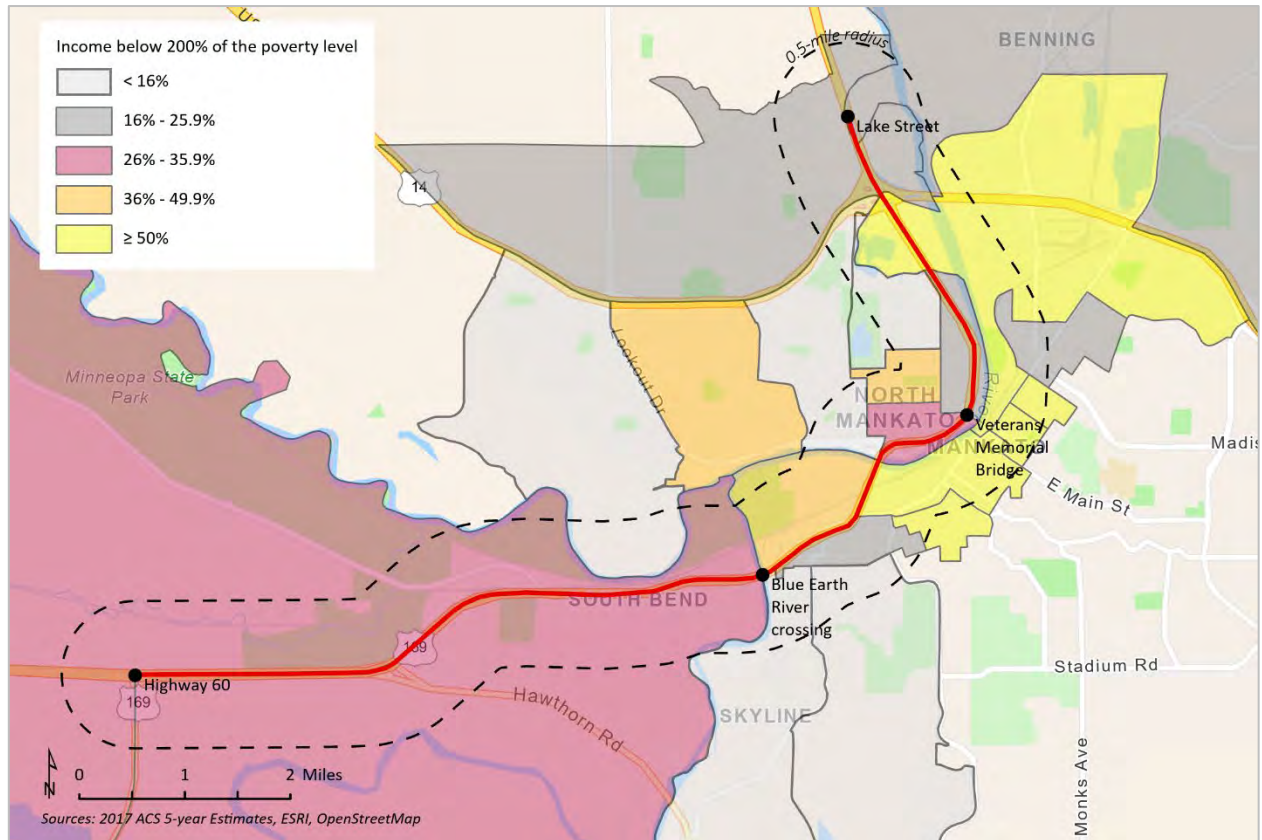
Figure 2: Percent of Minority Individuals by Block Group in the Highway 169 Project Area



Low-Income Populations

A low-income population is defined as one where the block group contains a 10 percent higher concentration of low-income individuals than the county average. There are 11 block groups above 26 percent low-income populations that fall within the project area (**Figure 3**). The block groups range between 26 percent and 70 percent of populations that have low incomes. Due to the significantly greater low-income concentrations compared to the general population than the counties, all 11 block groups can be considered environmental justice populations.

Figure 3: Percent of Low-Income Individuals by Block Group in the Highway 169 Project Area



Education

About 5% of the population aged 25 years or older living in the study area has less than a high school education compared to 6% for the overall populations of Nicollet and Blue Earth Counties.

Language

About 1% of the population living in the study area speaks a language other than English and speaks English less than “very well” compared to 2% for the overall populations of Nicollet and Blue Earth Counties. Of those people who speak English less than very well in the study area, most speak a language not identified in the ACS 5-year estimates (an “Other” language).

Age

The age distribution of a jurisdiction (**Table 5**) is important because it affects transportation usage. In 2017, the largest population group in the MAPO area was residents between 20-34 years old. A large portion of this age group lives in Mankato, partially due to the Minnesota State University, Mankato campus.

About 7% of the population living in the study area is under 5 years old compared to 6% for the overall populations of Nicollet and Blue Earth Counties. South Bend Township and North Mankato have greater percentages of residents under 18 years old than the state of Minnesota or the rest of the MAPO area. This may mean greater demand for transportation alternatives or safe routes to school programs. About 14% of the population living in the study area is 65 years and over compared to 13% for the overall populations of Nicollet and Blue Earth Counties. In South Bend Township, the percentage of residents over 65 years old is

much higher than the rest of the MSA and State of Minnesota at 20.2%. This percentage indicates the importance of dial-a-ride transit services.

Table 5 – Age Distribution, 2017			
Age	North Mankato	Mankato	South Bend Township
Under 5	903	2,263	124
5-9	969	1,912	139
10-14	868	1,967	175
15-19	835	4,350	48
20-24	611	9,798	67
25-34	2,090	5,842	254
35-44	1,716	3,843	203
45-54	1,611	3,212	215
55-59	1,030	1,681	129
60-64	973	1,844	98
65-74	1,038	2,228	114
75-84	609	1,546	125
85 and Over	330	755	129
Median Age	38.0	25.5	40.6
% Under 18	24.4%	17.1%	26.2%
% Over 65	14.6%	11.0%	20.2%

Source: US Census Bureau

Disability

Although not an EJ population, it is important to be aware of the people with disabilities in the project area. About 11% of the population for whom disability status is determined has a disability in the project area compared to 10% for the overall populations of Nicollet and Blue Earth Counties.

Household Without a Vehicle

Although not an EJ population, it is also important to be aware of the number of households in the project area without a vehicle. About 11% of households in the project area do not have a vehicle compared to 7% for the overall households in Nicollet and Blue Earth Counties. Staff will need to work with locals to identify how to best reach these households that live near the project area.

II. Transportation System Characteristics

This section describes elements of the existing transportation network, information related to land use, traffic operations, safety, access, and non-motorized connections. This section concludes with a review of known social, economic, and environmental (SEE) resources considerations within the study area.

A. Functional Classification and Jurisdiction

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. The functional classification system is comprised of principal arterials, minor arterials, major and minor collectors, and local roadways.

Highway 169 serves as a north-south principal arterial and National Highway System (NHS) route. It provides direct and relatively high-speed connections to southern Minnesota and beyond and to the north to the Twin Cities Metropolitan Area and northern Minnesota. The existing ADT (vehicles per day) ranges from 16,600 at the north end to 32,500 in the middle and 23,600 at the southern end of the study area.

Figure 4 (Appendix A) shows the existing functional classification network in the study area.

Highway 169 functions as a hybrid freeway-expressway in the MAPO planning area, with access restricted to grade-separated interchanges through the urban core of Mankato and North Mankato and at-grade (signalized and unsignalized) access points as the corridor extends radially from the urban core. The middle subarea (Blue Earth River crossing to Veterans' Memorial Bridge) is the only full freeway segment in the study area with a four-lane corridor. The northern subarea (Veterans Memorial Bridge to Lake Street) and southern subarea (Highway 60 to the Blue Earth River crossing) are both a four-lane divided expressway corridor.

One other principal arterial, US Highway 14/Trunk Highway 60, and six minor arterials connect to Highway 169 in the study area. Minor arterials include Belgrade Avenue/Mulberry Street, Lookout Drive, Riverfront Drive, Trunk Highway 68, Gadwall Road/County State Aid Highway (CSAH) 69), CSAH 33, CSAH 69/Hawley Street, and Hawthorn Road/CSAH 90).

Figure 5 (Appendix A) shows the roadway jurisdiction in the study area.

B. Study Area Overview

For ease in describing key corridor characteristics in more depth, the corridor is split into three subareas based on the unique context within each.

Northern Subarea - The northern subarea runs from the Veterans Memorial Bridge to Lake Street. This segment is a four-lane divided expressway with a speed limit of 50 mph.

Middle Subarea – The middle subarea runs from the Blue Earth River crossing to Veterans Memorial Bridge. This is a four-lane divided freeway corridor with a speed limit of 50 mph.

Southern Subarea – The southern subarea runs from Highway 60 to the Blue Earth River crossing. This is a four-lane divided expressway corridor with a speed limit ranging from 50 to 65 mph.

The sections below provide additional detail on these three subareas.

C. Land Use and Major Traffic Generators

Existing and future land uses in the study area are shown on **Figures 6 and 7** (Appendix A) and described below. At the time of creating this existing conditions report, the Cities of Mankato and North Mankato

were in the process of updating their future land use plans. **Figure 7** includes a map from the Cities of North Mankato and Mankato's latest Comprehensive Plan update. When each process is complete, the updated future land use plan will be reflected here and in other relevant Highway 169 Study documentation. There is currently no future land use plan for South Bend Township and the southern subarea of this study.

Northern Subarea

The northern subarea is within the Cities of Mankato and North Mankato. North of the Highway 169 and Highway 14 interchange is primarily park and open space with some commercial land use. The Kiwanis Recreation Area is a 100-acre, regional destination, many-featured, park including 5-miles of mountain bike trails, cross country ski trails, other trails, dog park, archery range, water access, camping, and a large picnic shelter. South of the Highway 169 and Highway 14 interchange is a large concentration of commercial, heavy industrial, light industrial, residential, and public/institutional land uses served by Lind Street and Webster Avenue connections to Highway 169. This concentration of commercial and industrial land use is a major local and regional traffic generator served by its direct access to Highway 169 and proximity and ease of access to the Highway 169 and Highway 14 interchange. This area also includes high-density residential near Hiniker Pond with access off Lind Street and access to residential neighborhoods, parks and schools in Lower North Mankato via Webster Avenue.

As Highway 169 moves towards the Veterans Memorial Bridge, direct access spacing becomes more distant, with the surrounding land use being dominated by low density residential. Both the North Mankato and Mankato central business districts can be accessed by the Highway 169/Veterans Memorial Bridge interchange.

Middle Subarea

The middle subarea also includes the Cities of Mankato and North Mankato, with the land uses directly adjacent Highway 169 dominated by low and medium density residential and heavy industrial along the eastern edge of the Minnesota River. Other adjacent land uses include high density residential, mixed use, commercial, and public/institutional. North Mankato Fire Station #1 has access to Highway 169 via Lookout Drive.

As the only full freeway segment there is no direct access, traffic movements rely heavily on the Veterans Memorial Bridge, Lookout Drive, and South Riverfront Drive interchanges. These interchanges also provide critical connections to Downtown Mankato for northbound Highway 169 travelers, in addition to the local roadway network in this area for access to West Mankato, southern Mankato and the Minnesota State University, Mankato campus, lower and upper North Mankato, and across the Minnesota and Blue Earth Rivers. This subarea also provides the only two connections across the Minnesota River; at the Veterans Memorial Bridge and the Northstar Bridge, for access between communities.

Southern Subarea

The southern subarea is located in South Bend Township and includes primarily agriculture, low density residential and park and open space land uses directly adjacent Highway 169, with sparse areas of commercial and light industrial.

Connectivity of the local roadway network is inhibited in many areas by topography, including steep slopes and natural areas, the Union Pacific Railroad, the Minnesota and Blue Earth Rivers and adjacent land uses. Limited local network connectivity put pressure on Highway 169 and conversely, any change in access will put pressure on the local system.

Regional Multimodal Corridor

Located in south central Minnesota, the Mankato/North Mankato metropolitan planning area is 75 miles south of Minneapolis-St. Paul at the junction of Highway 14 and Highway 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.

Highway 169 is the primary transportation corridor for funneling freight into the Twin Cities from the Mankato/North Mankato region and southern Minnesota. This area produces almost half of Minnesota's corn, soybeans and ethanol, making Minnesota third in the nation for production among all states. Other major commodities moving along this corridor include aggregates, clay and sand, hogs, manufactured goods and food products. Other key freight attributes of the Highway 169 corridor between Mankato and the Twin Cities include:

- Moves the equivalent of 30,000 tons of freight by truck per day with an average daily vehicle count of 1,200 – 3,700 heavy commercial vehicles.
- Carries the fifth heaviest freight volume of any highway in Minnesota – the top four are I-94, I-90, I-35 and MN 52.
- Connects major producers of ethanol, biodiesel, and other byproducts to markets and refiners along MN 60 and the adjacent Union Pacific Railroad.
- Provides one of two major conduits to the Ports of Savage for grain exports via the Minnesota and Mississippi River systems.

III. Environmental Screening

This section documents findings related to potential environmental impacts within the footprint of the Highway 169 corridor project. The complete Environmental Screening Summary with more detail and mapping can be found in Appendix C. This includes identification of potentially sensitive areas by considering all National Environmental Policy Act (NEPA) protected social, economic, and environmental categories and will be used as a primer for required NEPA and state environmental reviews later in the project, and will be used to inform and evaluate corridor alternatives.

D. Cover Types

The corridor zone for the Hwy 169 area, as defined as the 0.5-mile radius around the corridor, includes about 6,000 acres of land in Blue Earth and Nicollet Counties. Land cover data for the area was obtained from the National Land Cover Database. Cover types are listed by acreage in the corridor zone in Table 6. About half of the land overall is developed land in the corridor zone. A majority of the cover in the Northern subarea and nearly all of the cover in the middle subarea consists of developed land. A little more than one-fourth of the land in the Southern subarea is developed while other large portions of land consist of cropland and wooded area.

Table 6: Existing cover types in the project subareas

Cover Type	Northern Subarea (Acres)	Middle Subarea (Acres)	Southern Subarea (Acres)	TOTAL
Open Water	162	70	132	364
Developed	1,067	1,109	861	3,037
Barren Land (Rock/Sand/Clay)	30	5	207	242
Wooded/forest	102	4	523	629

Cover Type	Northern Subarea (Acres)	Middle Subarea (Acres)	Southern Subarea (Acres)	TOTAL
Grassland	111	8	340	460
Cropland	109	0	673	782
Wetland	117	7	365	489
TOTAL	1,698	1,203	3,101	6,003

E. Geology, Soils and Topography/Land Forms

Elevations range from 774 feet at the Highway 169 intersection at TH 60 to 994 feet at the Highway 169 and Lake Street intersection, an elevation change of 200 feet.

Soil data were obtained from the NRCS Web Soil Survey for Blue Earth and Nicollet Counties. Table 2 lists the 60 different soils present by acreages in the corridor zone, organized by the overall acres for the entire corridor zone. This information will be used to assess various soil limitations such as hydric characteristics and the limitations for local roads and streets.

F. Water Resources

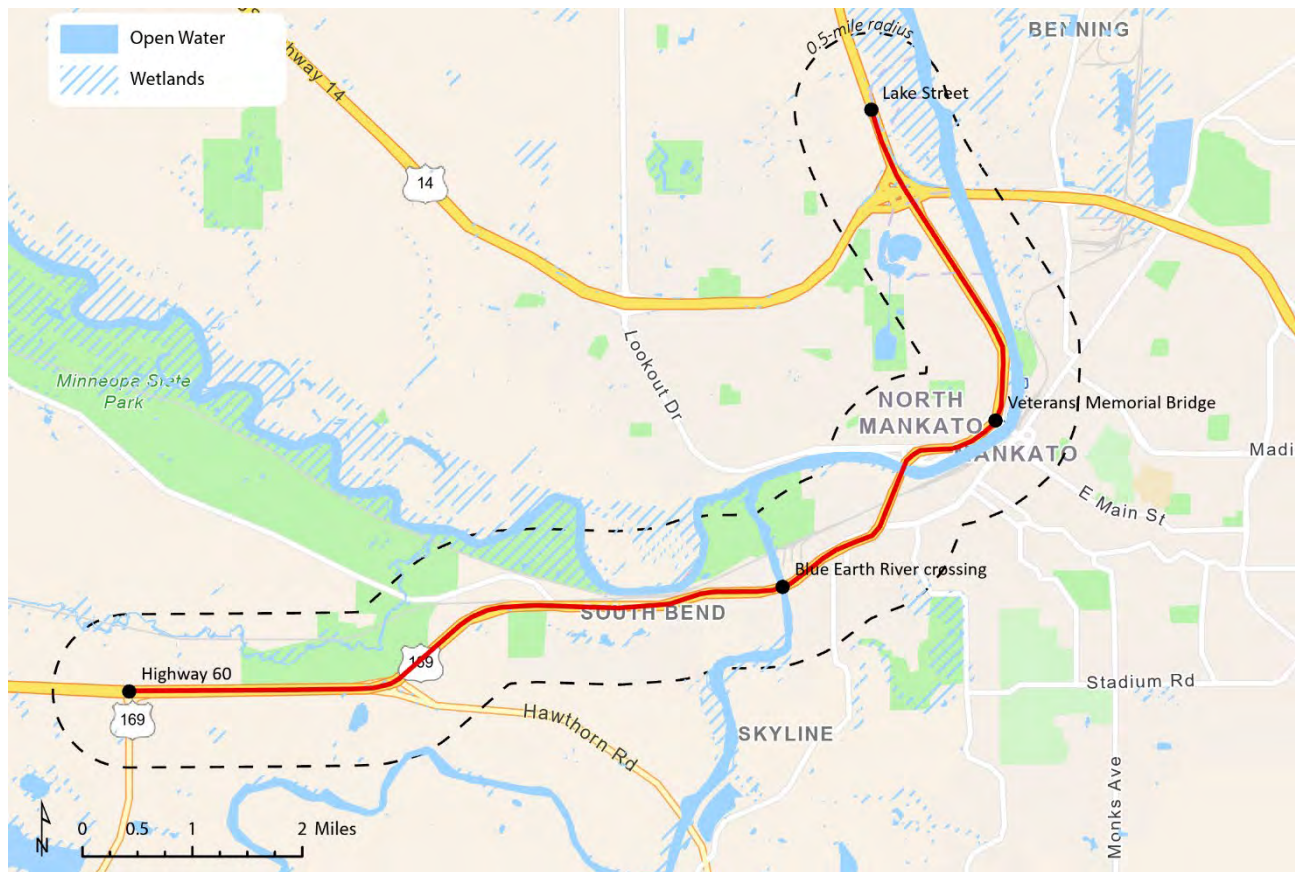
Water resources data from the National Wetlands Inventory shows approximately 935 acres of water resources exist within the 0.5 miles of the corridor zone and include rivers, ponds and wetlands (Figure 3). Hwy 169 runs to the west of the Minnesota River in the northern subarea and then crosses the River in the middle subarea. The Minnesota River bends outside of the 0.5-mile corridor zone in the middle subarea but then bends back to run adjacent to the north of Highway 169 for approximately 0.75 miles in the southern subarea. The Blue Earth River bisects the middle and southern subareas. There are many small unnamed ponds in the areas surrounding the two rivers.

Other major water features include Hiniker Pond which lies to the west of Highway 169 in the northern subarea to the southwest of the Highway 169/Highway 14 interchange. There are also two unnamed ponds in the Kiwanis Recreation Area, to the northeast of the Highway 169/Highway 14 interchange.

In addition to the open water features, many of the areas around the rivers and ponds are designated as wetlands, either freshwater emergent or freshwater forested. Table 3 lists the types of water features present within the corridor by acreage.

A locally controlled levee exists within the corridor on the river side of Highway 169 to minimize flooding associated with high water levels in the Minnesota River. The levee is a combination of earthen berm and concrete floodwall that provides flood protection for North Mankato, Mankato, and LeHillier when the River is at flood stage. Until recently, the levee had a gap in protection that existed north of the Highway 169/Highway 14 interchange. A project in 2018 closed this gap in the levee by raising the elevation of Highway 169 just north of the Highway 14 interchange. At this location, Highway 169 and Highway 14 are considered a part of the levee.

Figure 8: Water Resources



G. Contaminated/Hazardous Materials/Wastes

Potentially contaminated site data was obtained from the MPCA's What's in My Neighborhood dataset. There are 479 potentially contaminated sites in the corridor zone. Potentially contaminated sites include sites with any activity that may lead to toxic or hazardous contamination. There are 156 potentially contaminated sites in the northern subarea, 262 in the middle subarea, and 61 in the southern subarea. The highest type of activity for potentially contaminated sites in the corridor zone include hazardous waste sites. Hazardous waste is hazardous waste is dangerous or potentially harmful effect on human health or the environment. There are 161 total hazardous waste sites throughout the entire corridor zone with 55 hazardous waste sites in the Northern subarea, 87 in the middle subarea, and 19 in the southern subarea.

H. Fish, Wildlife, Plant Communities, and Sensitive Ecological Resources

Native plant communities in the corridor zone were identified using the MnDNR's Native Plant Communities dataset for sites surveyed by MnDNR ecologists. Most of the native plant communities exist in the southern subarea, a majority of which are Pin Oak – Bur Oak Woodlands. There is a Red Oak - Sugar Maple - Basswood - Forest directly adjacent to the corridor in Minneapolis State Park, north of the intersection at Highway 169 and Hawthorn Road.

Only 12 acres of surveyed sites native plant communities exist in the Northern subarea—on the east side of the Minnesota River across from the Kiwanis Recreation Area—and no native plant species exist in the developed middle subarea. The low numbers in may be due to a lack of surveyed sites in those two subareas. One area to keep in mind for the project is the Kiwanis Recreation Area in the Northern subarea.

Most of the corridor has been previously disturbed for development or is used for agriculture. As such, habitat present in the corridor zone and vicinity has been fragmented or degraded. In general, the corridor zone consists of the MnDOT right of way of Highway 169. Natural resources in the corridor zone consist of scattered stands of trees, landscape plantings that line the Highway 169 right of way, grassy areas, lakes, streams, minor rock outcroppings, and wetlands. Grassed areas are primarily in the right of way of Highway 169.

Any wildlife displaced by any projects or construction resulting from the completion of this study will likely relocate to suitable nearby areas, including lands immediately adjacent to the corridor zone. There will be vegetation impacts because of the project, including the removal of trees and shrubs primarily located within the right of way of Highway 169. Landscaping or reseeding with native plants will be used to mitigate impacts as a result of the project.

I. Visual

The corridor zone views consist of a mixture of open space, commercial and residential. The northern subarea includes some views of strip mall commercial developments, low to medium density residential, and open space that include trees, grass and shrubs along Highway 169. The middle subarea view includes downtown commercial and medium density residential. Views of the rivers in the middle subarea are mostly obstructed by development or freeway barriers except on the Minnesota River bridge and Blue Earth River bridge crossings. The southern subarea consists of open space, low-density residential, and commercial views.

J. Air, Noise, and Cumulative Potential Effects

Air, noise and cumulative potential effects will be considered in a future NEPA analysis once a project is funded.

Recreational Land Effects

Since recreational land is adjacent to the highway right-of-way there may be a need to obtain land from these properties. This means right-of-way processes and construction plans will need to be coordinated with the Federal Highway Administration, Mn Department of Natural Resources, the local owners of jurisdiction, and potentially the National Park Service.

Cultural and Historic Properties

Cultural and Historic properties will need to be reviewed when specific projects are identified for this corridor. Even though there are no designated tribal lands in this area, the confluence of the Blue Earth and Minnesota Rivers has cultural significance for the Dakota people.

IV. Existing Traffic Conditions

Existing Traffic Operations

Due to irregular traffic patterns because of the COVID-19 pandemic, existing traffic counts could not be obtained using traditional collection methods. The project management team agreed upon an alternative approach to establish existing traffic counts. This alternative approach consists of the following:

Step 1. Identify all available data within the last 10 years

- Automatic traffic recorder (ATR) data – Blue Earth River Crossing
- Traffic counts from previous studies
- Previously completed plans and studies

Step 2. Apply additional information

- Obtain turning movement patterns/breakdowns by approach using StreetLight Insight. Compare to previous counts if applicable
- Obtain latest annual average daily traffic (AADT) from MnDOT Traffic Mapping Application. In locations where 2019 draft AADT is lower than previously published count use the older count volume
- Determine peak hour percentages from automatic traffic recorder (ATR) data and previous counts
- Apply peak hour percentages to latest AADT data to determine peak hour entering/exiting traffic volumes
- Enter the peak hour entering/exiting volumes and percentage breakdowns of each turning movement from StreetLight Insight into the TurnsW32 program to calculate counts
- For locations without any previous count data use the ITE Trip Generation Manual to calculate peak entering/exiting traffic volumes
- Confirm that turning volumes are higher than or equal to the latest turning movement count where previous counts were completed
- Balance turning movement counts between intersections

Figure 9A in Appendix A shows the existing turning movement counts that were derived based on steps 1 and 2. **Figure 9B** in Appendix A shows the previous turning movement count data provided by the local agencies.

The existing peak hours were analyzed in Synchro/SimTraffic to understand delay and queuing issues throughout the project area. Signal timing was provided by MnDOT. Heavy vehicle percentages were obtained from previous counts available.

The following intersections are signalized throughout the project area:

- Lind St at TH 169
- Webster Ave at TH 169
- Belgrade Ave at SB TH 169 Ramps
- Belgrade Ave at NB TH 169 Ramps
- Riverfront Dr at SB TH 169 Ramps

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 Level of Service (LOS) A through LOS F. LOS A indicates the best traffic operation, with vehicles experiencing minimal delays. LOS A through D are 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** shows the intersection delay as well as the maximum delay of all movements at each intersection.

Table 7 – Existing Traffic Operations Analysis Results

Intersection	A.M. Peak Hour						P.M. Peak Hour					
	Intersection		Maximum Movement				Intersection		Maximum Movement			
	Delay*	LOS	Mvmt	Delay*	LOS	Queue (ft)	Delay*	LOS	Mvmt	Delay*	LOS	Queue (ft)
Lake St NW (North Access) at TH 169	1	A	WBL	27	D	25	2	A	WBL	41	E	50
Lake St NW (Southern Access) at TH 169	1	A	NBL	6	A	75	1	A	NBL	9	A	100
WB TH 14 Entrance Ramp at TH 169	1	A	NBL	8	A	75	2	A	NBL	12	B	100
EB TH 14 Exit Ramp at TH 169	5	A	EBL	31	D	175	7	A	EBL	81	F	275
Lind St at TH 169	16	B	NBL	49	D	75	18	B	SBL	48	D	225
River Ln at TH 169	4	A	NBR	8	B	-	5	A	NBR	9	A	-
Webster Ave at TH 169	16	B	SBL	69	E	50	19	B	SBL	64	E	75
Monroe Ave at TH 169	5	A	EBR	13	B	125	4	A	EBR	10	B	100
Belgrade Ave at SB TH 169 Ramps	15	B	SBL	30	C	200	14	B	SBL	35	D	175
Belgrade Ave at NB TH 169 Ramps	3	A	NBL	18	B	50	7	A	NBL	21	B	75
Owatonna St at SB TH 169 Ramps	3	A	NBT	29	D	50	3	A	SBT	3	A	25
Riverfront Dr at SB TH 169 Ramps	23	C	SBL	33	C	375	21	C	SBL	34	C	300
Riverfront Dr at NB TH 169 Ramps	6	A	NBL	33	D	25	5	A	NBL	22	C	50
CSAH 69 (Hawley St) at TH 169	5	A	WBL	32	D	300	2	A	WBL	12	C	50
CSAH 33 at TH 169	3	A	NBL	50	F	75	21	C	NBL	423	F	850
TH 68 at TH 169	3	A	SBL	18	C	175	5	A	SBL	34	D	225
CSAH 69 (Gadwall Rd) at TH 169	2	A	SBL	16	C	50	3	A	SBL	26	D	75
CSAH 90 at TH 169	1	A	WBL	3	A	50	1	A	WBL	8	A	50
TH 60 at TH 169	6	A	NBL	28	D	75	7	A	NBL	145	F	75

*Delay in seconds per vehicle.

The existing operational analysis indicates that all intersections overall operate with acceptable delay of LOS C or better. The following intersection have a movement that operates with LOS E or F during the peak hours:

- Lake St NW (North Access) at TH 169: EBL and WBL operate with LOS E (PM Peak)
- EB TH 14 Exit Ramp at TH 169: EBL operates with LOS F (PM Peak)
- Webster Ave at TH 169: SBL operates with LOS E (both peaks)
- CSAH 33 at TH 169: NBL operates with LOS F (both peaks), NBR operates with LOS F (PM Peak), and WBL operates with LOS E (PM Peak)
- TH 60 at TH 169: NBL operates with LOS F (PM Peak)

Traffic queuing issues were also identified in the existing operational analysis. The following queues were found to be problematic:

- Lind St:
 - Maximum NBT queue blocks turn lanes during both peak hours
 - Maximum WB queues extend beyond Lind Ct during both peak hours

- Webster Ave:
 - Average EBL/T queues extend to Range St (located approximately 175 ft from TH 169) during the AM peak hour and beyond Range St during the PM peak hour
 - Maximum EBL/T queues extend 325 ft during the AM peak hour and 425 ft during the PM peak hour blocking business driveways.
 - Maximum EBR queue extends to Range St during both peak hours
 - Maximum WBL/T queues extend to River Dr (located approximately 70 ft from TH 169) during the AM peak hour
 - Maximum WBL/T/R queues extend onto River Dr during the PM peak hour
- Belgrade Ave at SB TH 169 Ramps:
 - Maximum EBT queue extends past Nicollet Ave (located approximately 125 ft from the intersection) during both peak hours
 - Maximum WBL queue extends beyond the turn lane during the PM peak hour
- Riverfront Dr at SB TH 169 Ramps:
 - Maximum SB queues extend past Owatonna St (located approximately 200 ft from Riverfront Dr) during both peak hours, however the queues do not extend onto TH 169.
- Riverfront Dr at NB TH 169 Ramps:
 - Maximum WB queues extend 375 ft during the AM peak hour. The intersection of Poplar St and Riverfront Dr is located approximately 200 ft away.
- CSAH 33 at TH 169:
 - Maximum NB queues extend 850 ft during the PM peak hour. Southbend Ave is located approximately 200 ft away.

The existing traffic operations are summarized in **Figure 10** (Appendix A).

2040 No-Build Traffic Conditions

Future traffic volumes for 2040 were developed using a combination of the Mankato/North Mankato Area Planning Organization (MAPO) 2045 Long Range Transportation Plan (LRTP) and historical data from the MnDOT Traffic Mapping Application. See the Traffic Operational Evaluation Memorandum for more information on the forecasting process. **Figure 11** (Appendix A) shows the 2040 peak hour turning movement counts. A level of service (LOS) analysis of the 2040 no build peak hours was completed using the forecasted turning movement counts in Synchro/SimTraffic. The no build operational analysis demonstrates deficiencies that will need to be addressed through system improvements. **Table 8** shows the anticipated 2040 operations with the existing geometry.

Table 8 – 2040 No Build Traffic Operations Analysis Results

Intersection	A.M. Peak Hour						P.M. Peak Hour					
	Intersection		Maximum Movement				Intersection		Maximum Movement			
	Delay*	LOS	Mvmt	Delay*	LOS	Queue (ft)	Delay*	LOS	Mvmt	Delay*	LOS	Queue (ft)
Lake St NW (North Access) at TH 169	2	A	EBL	37	E	125	4	A	EBL	81	F	175
Lake St NW (Southern Access) at TH 169	1	A	NBL	10	A	75	1	A	NBL	13	B	75
WB TH 14 Entrance Ramp at TH 169	2	A	NBL	15	B	100	2	A	NBL	18	C	100
EB TH 14 Exit Ramp at TH 169	25	D	EBL	204	F	800	87	F	EBL	926	F	800
EB TH 14 Exit Ramp at TH 14	1	A	NBR	2	C	-	43	E	NBR	297	F	2750
Lind St at TH 169	20	C	NBL	52	D	50	24	C	NBL	51	D	175
River Ln at TH 169	6	A	NBR	10	B	-	7	A	WBR	12	B	275
Webster Ave at TH 169	19	B	SBL	62	E	75	21	C	SBL	61	E	100
Monroe Ave at TH 169	6	A	EBR	18	C	175	5	A	EBR	15	C	125
Belgrade Ave at SB TH 169 Ramps	17	B	SBL	29	C	225	16	B	SBL	39	D	200
Belgrade Ave at NB TH 169 Ramps	4	A	NBL	23	C	75	9	A	NBL	28	C	75
Owatonna St at SB TH 169 Ramps	4	A	NBT	23	C	50	3	A	SBT	3	A	-
Riverfront Dr at SB TH 169 Ramps	26	C	EBT	32	C	450	22	C	EBT	31	C	225
Riverfront Dr at NB TH 169 Ramps	9	A	NBL	46	E	50	8	A	NBL	33	D	50
CSAH 69 (Hawley St) at TH 169	16	C	WBL	129	F	475	2	A	WBL	18	C	75
CSAH 33 at TH 169	5	A	NBL	148	F	100	130	F	NBL	1385	F	4750
TH 68 at TH 169	6	A	SBL	46	E	300	8	A	SBL	70	F	350
CSAH 69 (Gadwall Rd) at TH 169	3	A	SBL	23	C	50	3	A	SBL	36	E	125
CSAH 90 at TH 169	1	A	WBL	6	A	25	1	A	WBL	12	B	75
TH 60 at TH 169	7	A	NBL	57	F	75	25	D	NBL	1200	F	450

*Delay in seconds per vehicle.

The 2040 no build operational analysis indicates that most intersections are anticipated to continue to operate acceptably with delay of LOS C or better except the following intersections which operate with LOS E or F:

- EB TH 14 Exit Ramp at TH 169: Intersection operates with LOS F (PM Peak)
- EB TH 14 Exit Ramp at TH 14: Queues from the EB TH 14 Exit Ramp/TH 169 intersection back up onto TH 14 causing the exit ramp (which should be free flowing) to operate with LOS E (PM Peak)
- CSAH 33 at TH 169: Intersection operates with LOS F (PM Peak)

Additionally, there are several intersections with movements anticipated to operate with LOS E or F during the 2040 peak hours. These include:

- Lake St NW (North Access) at TH 169: EBL operates with LOS E (AM peak); EBL, EBR and WBL operate with LOS F (PM Peak)
- EB TH 14 Exit Ramp at TH 169: EBL operate with LOS F (both peaks); EBR operate with LOS E (AM peak) and LOS F (PM Peak)
- EB TH 14 Exit Ramp at TH 14: NBR operates with LOS F (PM Peak)

- Webster Ave at TH 169: SBL operates with LOS E (both peaks); NBL, EBL and EBT operates with LOS E (PM Peak),
- Riverfront Dr at the NB TH 169 ramps: NBL operate with LOS E (AM Peak)
- CSAH 69 (Hawley St) at TH 169: WBL operates with LOS F (AM Peak)
- CSAH 33 at TH 169: NBL operates with LOS F (both peaks), NBR and WBL operate with LOS F (PM Peak)
- TH 68 at TH 169: SBL operates with LOS E (AM Peak) and LOS F (PM Peak); SBR operates with LOS F (PM Peak)
- CSAH 69 (Gadwall Rd) at TH 169: SBL operates with LOS E (PM Peak)
- TH 60 at TH 169: NBL operates with LOS F (both peaks) and WBL operates with LOS F (PM Peak)

Traffic queuing issues were also identified in the 2040 no build operational analysis. The following queues were found to be problematic:

- EB TH 14 Exit Ramp:
 - Average EB queue extends beyond the left turn lane during both peak hours
 - Maximum EB queue extends onto TH 14 during both the PM peak hours During the PM peak the queue extends 2750 ft beyond the diverge point.
- Lind St:
 - Maximum NBT queue blocks turn lanes during both peak hours
 - Maximum WB queues extend beyond Lind Ct during both peak hours
 - Maximum SBT queue blocks turn lanes the PM peak hour
- Webster Ave:
 - Average EBL/T queues extend beyond Range St (located approximately 175 ft from TH 169) during both peak hours
 - Maximum EBL/T queues extend 350 ft during the AM peak hour and 525 ft during the PM peak hour blocking business driveways.
 - Maximum EBR queue extends to Range St during both peak hours
 - Maximum WBL/T/R queues extend onto River Dr (located approximately 70 ft from TH 169) during both peak hours
- Belgrade Ave at SB TH 169 Ramps:
 - Maximum EBT queue extends past Nicollet Ave (located approximately 125 ft from the intersection) during both peak hours
 - Maximum WBL queue extends beyond the left turn lane during both peak hours
- Riverfront Dr at SB TH 169 Ramps:
 - Maximum EB queue extends beyond the left turn lane during both peak hours

- Maximum WBL queue extends to the Riverfront Dr/NB TH 169 ramp intersection during the PM peak hour
- Maximum SB queues extend past Owatonna St (located approximately 200 ft from Riverfront Dr) during both peak hours, however the queues do not extend onto TH 169.
- Riverfront Dr at NB TH 169 Ramps:
 - Maximum WB queues extend 550 ft during the AM peak hour and 250 ft during the PM peak hour. The intersection of Poplar St and Riverfront Dr is located approximately 200 ft away.
- CSAH 69 (Hawley St):
 - Maximum WBL queue extends beyond the turn lane during the AM peak hour
- CSAH 33:
 - Average NB queue extend over 2000 ft and maximum queues extends nearly one mile during the PM peak hour. This is because only 31% of the traffic can make it through the intersection as there are not adequate gaps in traffic for the northbound left turners to go even with an acceleration lane along WB TH 169.

The 2040 no build traffic operations are summarized in **Figure 12** (Appendix A).

Corridor O/D Assessment

StreetLight Insight was used to analyze origin-destination information for each of the subareas. This information was used to see the main travel patterns and understand what percent of the traffic along Highway 169 is local verses regional.

Each of the subareas were analyzed comparing all vehicle traffic and heavy commercial traffic. A pass-through zone was drawn along each of the TH 169 subareas. Traffic passing through each zone was analyzed for a full 24 hour period. The destinations of all traffic passing through each subarea was analyzed by city and the destinations of heavy commercial traffic passing through each subarea was analyzed by county. The heavy commercial traffic was analyzed by county rather than by city because an initial check of the data indicated that truck traffic was traveling to destinations further away from the project area, where most of the all vehicle trips were local. All of the analysis assumed the zone along TH 169 was the “origin” and the county or city that traffic ended their trip in was considered the “destination”. However, by analyzing a full day of trips, the destinations are almost equally the trip origins as a trip leaving home and passing through TH 169 would likely pass through TH 169 on their way home as well. Analyzing the cities and counties as origins was checked in StreetLight. It was found that the percentages were very similar to when they were analyzed as destinations so only the destinations were illustrated.

Figures 13 and 14 (Appendix A) show the results of this analysis. Also, please note that only cities and counties within the state of Minnesota were analyzed as the StreetLight license is limited to Minnesota. An origin-destination analysis completed using zip codes (a preset geometry in StreetLight which analyzes all traffic in state and out of state) indicated that 11-16% of the heavy commercial trips and 2-5% of all vehicle trips were destined for outstate. The analysis discussed below and shown in the figures represents totals for the trips destined for cities and counties in Minnesota (84-89% of heavy commercial trips, 95-98% of all vehicle trips). The southern subarea, which showed the greatest amount of heavy commercial traffic passing through destined for other states, was further analyzed to see which states the 16% of outstate

traffic was destined for. This analysis showed that 8% was destined for Iowa, 6% for South Dakota, 1% for Wisconsin and 1% for other states.

The main trends of the trips destined for Minnesota are summarized below:

- **Northern Subarea:**
 - All Vehicle Traffic – 62% of all traffic passing through are destined for North Mankato and Mankato
 - Heavy Commercial Traffic – 39% of the heavy commercial traffic passing through are destined for Blue Earth County and Nicollet County. Other popular destinations include Nobles County (7%) and Watonwan County (8%)
- **Middle Subarea:**
 - All Vehicle Traffic – 69% of all traffic passing through are destined for North Mankato and Mankato
 - Heavy Commercial Traffic – 37% of the heavy commercial traffic passing through are destined for Blue Earth County and Nicollet County. Other popular destinations include Nobles County (8%) and Watonwan County (10%)
- **Southern Subarea:**
 - All Vehicle Traffic – 43% of all traffic passing through are destined for North Mankato and Mankato
 - Heavy Commercial Traffic – 30% of the heavy commercial traffic passing through are destined for Blue Earth County and Nicollet County. Other popular destinations include Nobles County (9%) and Watonwan County (12%)

This shows that overall traffic patterns are similar throughout the northern and middle subareas, however traffic in the southern subarea shows differing patterns. Far less traffic passing through the southern subarea is destined for North Mankato or Mankato. The heavy commercial data shows similar patterns for all three subareas with 30-39% of traffic destined for Blue Earth County and Nicollet County. Nobles County and Watonwan County were also major destinations for the heavy commercial traffic passing through all three subareas.

A more detailed origin-destination analysis was completed for both all vehicle and heavy commercial traffic throughout the northern and southern subareas. **Figures 15 through 18** (Appendix A) show the results of this analysis. Data was analyzed for the overall day (24 hr total) in addition to the AM and PM peak travel times. Similar results were seen regardless of the time of day analyzed. The main trends of the daily traffic patterns throughout the northern subarea are summarized below.

- **Northern Subarea:**
 - All Vehicle Traffic
 - NB Highway 169 Traffic: Main destinations include Belgrade Ave east of TH 169 (29%), TH 14 east of TH 169 (21%) and TH 169 north of Lake St (22%).
 - SB Highway 169 Traffic: Main destinations include TH 14 east of TH 169 (14%), TH 14 west of TH 169 (14%), Belgrade Ave east of TH 169 (16%), and TH 169 south of Belgrade Ave (35%)
 - Heavy Commercial Traffic
 - NB Highway 169 Traffic: Main destinations include TH 14 east of TH 169 (27%) and TH 169 north of Lake St (45%).

- SB Highway 169 Traffic: Main destinations include TH 14 east of TH 169 (13%) and TH 169 south of Belgrade Ave (57%)

This analysis indicates that most of the heavy commercial vehicle traffic in the northern subarea remains on the highways. The all vehicle analysis indicates that in addition to TH 169 and TH 14, East Mulberry is a major destination for both northbound and southbound Highway 169 traffic.

The main trends of the daily traffic patterns throughout the southern subarea are summarized below.

- **Southern Subarea:**

- All Vehicle Traffic
 - NB Highway 169 Traffic: Most traffic remains on Highway 169 throughout the entire subarea (74%). The only other roadways with more than 2% of the traffic include TH 60 west of TH 169 (5%), CSAH 90 (5%), and CSAH 33 (6%).
 - SB Highway 169 Traffic: Main destinations include CSAH 69/Hawley St (19%), CSAH 33 (10%), TH 68 (10%), TH 169 south of TH 60 (9%), and TH 60 west of TH 169 (41%)
- Heavy Commercial Traffic
 - NB Highway 169 Traffic: Most traffic remains on Highway 169 throughout the entire subarea (76%). The only other roadways with more than 2% of the traffic include TH 60 west of TH 169 (11%), CSAH 90 (3%), and TH 68 (5%).
 - SB Highway 169 Traffic: Most of the traffic ends up along TH 60 west of TH 169 (83%). The only other roadways with more than 2% of the traffic include TH 169 south of TH 60 (6%), TH 68 (3%), and CSAH 69/Hawley St (4%).

This analysis indicates that most of the traffic remains on TH 169 or TH 60 throughout the southern subarea, but the all vehicle analysis showed that CSAH 69/Hawley St and CSAH 33 are also popular destinations for southbound TH 169 traffic in addition to TH 60 and TH 169.

Crash History (2015-2019)

Historic crash data in the study area was analyzed in the Existing Conditions Safety Memorandum (Appendix D) and are summarized on **Figure 19** (Appendix A). This analysis used data obtained from MnDOT for the last five years (2015-2019).

The key results of the crash analysis for the given timeframe include:

- 232 intersection related crashes
- 44 interchange ramp related crashes
- 187 segment crashes
- 4 fatal crashes
 - CSAH 90
 - CSAH 69 (Gadwall Road)
 - Highway 68
 - CSAH 69 (Hawley Street)
- 6 serious injury crashes
- 4 pedestrian and/or bicycle crashes (2010-2019)
- Reviewing the total critical crash rate the following intersections are operating outside the normal range compared to similar intersections statewide:
 - Lind Street at Highway 169
 - Riverfront Drive at NB Highway 169 Ramps
 - Highway 68 at Highway 169

Table 9 provides a crash summary for each intersection. This table details the total crash rate data, not the fatal & serious injury crash rate data. The latest available crash rates are from 2015 and were used for comparison purposes as current statewide average data is unavailable.

Table 9 – Intersection Crash Summary (2015-2019)						
Intersection	Total Crashes	Severe Crashes (K + A)	Actual Crash Rate	Statewide Average	Critical Rate	Critical Index
Lake St NW (North Access) at TH 169	5	0	0.18	0.18	0.41	0.44
Lake St NW (Southern Access) at TH 169	6	0	0.20	0.18	0.40	0.50
Lind St at TH 169	70	1*	1.45	0.45	0.71	2.04
Webster Ave at TH 169	29	0	0.61	0.45	0.71	0.86
Belgrade Ave at NB TH 169 Ramps	21	0	0.50	0.70	1.04	0.48
Belgrade Ave at SB TH 169 Ramps	27	1	0.83	0.70	1.09	0.76
Riverfront Dr at NB TH 169 Ramps	19	0	0.49	0.18	0.37	1.32
Riverfront Dr at SB TH 169 Ramps	11	0	0.35	0.52	0.86	0.41
CSAH 69 (Hawley St) at TH 169	12	1	0.26	0.18	0.36	0.72
CSAH 33 at TH 169	8	1	0.17	0.18	0.36	0.47
TH 68 at TH 169	17	2	0.38	0.18	0.36	1.06
CSAH 69 (Gadwall Rd) at TH 169	2	1	0.06	0.18	0.38	0.16
Loren Dr at TH 169	1	0	0.04	0.18	0.42	0.10
CSAH 69 (Gadwall Rd) West at TH 169	1	0	0.04	0.18	0.41	0.10
TH 60 at TH 169	13	0	0.47	0.25	0.52	0.90

*The serious injury crash at Lind Street was the result of a motorist under the influence and no relation to existing geometry or infrastructure issues.

Table 10 shows the Highway 169 segment crash summary without intersection crashes included. This table details the total crash rate data, not the fatal & serious injury crash rate data.

Table 10 – Segment Crash Summary (2015-2019)*						
Segment	Total Crashes	Severe Crashes (K + A)	Actual Crash Rate	Statewide Average	Critical Rate	Critical Index
Lake St NW to Belgrade Ave	28	1	0.29	0.50	0.69	0.42
Belgrade Ave to the Blue Earth River Crossing	105	0	0.77	0.82	1.02	0.75
Blue Earth River Crossing to Highway 60	58	1	0.31	0.50	0.64	0.48

*Does not include intersection related crashes within each segment

Table 11 shows the segment crash summary with intersection and ramp crashes included. This table also details the total crash rate data, not the fatal & serious injury crash rate data. This shows a crash issue along the middle subarea of the study from Belgrade Avenue to the Blue Earth River Crossing.

Table 11 – Segment Crash Summary (2015-2019)						
Segment	Total Crashes	Severe Crashes (K + A)	Actual Crash Rate	Statewide Average	Critical Rate	Critical Index
Lake St NW to Belgrade Ave	160	2	1.65	1.64	1.98	0.83
Belgrade Ave to the Blue Earth River Crossing	203	1	1.49	1.13	1.37	1.09
Blue Earth River Crossing to Highway 60	116	7	0.61	1.64	1.88	0.32

Table 11 shows that the middle subarea operates with a critical index of 1.09 which indicates that the segment operates outside the normal range. Although the total crash critical index is less than one along the southern subarea from the Blue Earth River Crossing to Highway 60, with seven severe crashes in the last 5 years, this segment has a fatal & serious injury critical index of 1.03. This indicates that the segment is operating above the normal range for fatal and serious injury crashes compared to similar roadway segments statewide.

Interchange Crash Summary

Crashes at the Highway 14, Lookout Drive and CSAH 90 interchanges were also analyzed. Since crashes at the ramps and merge areas are not considered intersection or segment crashes, these crashes were analyzed separately and are summarized below.

Highway 14 at Highway 169

- 21 crashes
- No severe crashes

Belgrade Ave at Highway 169

- 3 crashes
- No severe crashes

Lookout Drive at Highway 169

- 19 crashes
- No severe crashes

Riverfront Drive at Highway 169

- 11 crashes
- No severe crashes

CSAH 90 at Highway 169

- 4 crashes
- 1 fatal crash involving a motorcycle merging onto NB Highway 169 from WB CSAH 90 that hit a semi-truck

For details on the crash analysis including crash trends and predominate crash types please see Appendix D.

Access

Highway 169 is defined as a Category 2 – Medium Priority Interregional Corridor throughout the study area according to the Minnesota Department of Transportation (MnDOT) Access Management Manual. Category 2 corridors connect secondary regional trade centers to primary regional trade centers and provide both interstate and intrastate travel. Access management emphasizes mobility on Category 2 highways.

The subcategory however changes throughout the project area. **Table 12** below shows the subcategory limits along Highway 169.

Table 12. Access Management Subcategory Limits

Limits	Subcategory
Lake St (north) to Lind St	A - Rural
Lind St to Belgrade Ave	B - Urban/Urbanizing
Belgrade Ave to CSAH 69 (Hawley St)	AF - Non-Interstate Freeway
CSAH 69 (Hawley St) to Highway 60	A - Rural

The recommended spacing for primary and secondary intersections varies based on the subcategory. A primary intersection refers to a junction between two major roads and a secondary access refers to a junction between a major road and a minor road or local street. **Tables 13 and 14** below show the spacing between primary and secondary intersections along Highway 169 throughout the project limits. Interim spacing requirements for a Category AF roadway in transition does not specifically recommend secondary intersection spacing so these intersections were evaluated using a spacing of ½ mile. When measuring between interchanges, the spacing was measured from the ramp gore.

Table 13. Spacing Between Primary Intersections

Subcategory	Primary Intersections	Miles	Spacing Recommendation (Miles)	Meets Spacing Recommendation
A/B Mix	Highway 14 to Webster Ave	0.64	0.5	Yes
B	Webster Ave to Belgrade Ave	0.60	0.5	Yes
AF	Belgrade Ave to Lookout Dr	0.09	1	No
	Lookout Dr to Riverfront Dr	0.13	1	No
	Riverfront Dr to CSAH 69 (Hawley St)	0.74	1	No
A	CSAH 69 (Hawley St) to CSAH 33	0.57	1	No
	CSAH 33 to Highway 68	0.68	1	No
	Highway 68 to CSAH 90	1.2	1	Yes
	CSAH 90 to Highway 60	1.4	1	Yes

Table 14. Spacing Between Secondary Intersections

Subcategory	Secondary Intersection	Miles	Spacing Recommendation (Miles)	Meets Spacing Recommendation
A	Lake St (North) to Lake St (South)	0.02	0.5	No
	Lake St (South) to Highway 14	0.16	0.5	No
	Highway 14 to Lind St	0.08	0.5	No
B	Lind St to River Ln	0.14	0.25	No
	River Ln to Webster Ave	0.44	0.25	Yes
	Webster Ave to Monroe Ave	0.45	0.25	Yes
	Monroe Ave to Belgrade Ave	0.15	0.25	No
AF	Riverfront Dr to Woodland Ave	0.42	0.5	No
	Woodland Ave to CSAH 69 (Hawley St)	0.32	0.5	No
A	CSAH 69 (Hawley St) to Amos Owen Ln	0.19	0.5	No
	Amos Owen Ln to CSAH 33	0.38	0.5	No
	CSAH 33 to Bison St	0.50	0.5	Yes
	Bison St to Highway 68	0.18	0.5	No
	Highway 68 to 211th Ln	0.32	0.5	No
	211th Ln to CSAH 69 (Gadwall Rd)	0.14	0.5	No
	CSAH 69 (Gadwall Rd) to CSAH 120	0.47	0.5	No
	CSAH 120 to CSAH 90	0.26	0.5	No
	CSAH 90 to CSAH 117	0.10	0.5	No
	CSAH 117 to Loren Dr	1.02	0.5	Yes
	Loren Dr to CSAH 69 (Gadwall Rd)	0.14	0.5	No
	CSAH 69 (Gadwall Rd) to Highway 60	0.14	0.5	No

Table 14 shows that only 4 of the 9 distances between primary intersections along Highway 169 meet the recommended spacing and only 4 of the 21 distances between secondary intersections meet the recommended spacing. 211th Lane and Loren Drive are technically local roadways which only serve a few businesses and therefore could be classified as driveways; however, they were analyzed as a secondary access as they both provide full access to Highway 169. All field entrances are served by the adjacent roadway network. None have direct access onto Highway 169. The primary and secondary intersection are shown in **Figure 20** (Appendix A).

Pedestrian and Bicycle Connections

The Highway 169 study area includes existing regional and local trail connections throughout. The primary continuous north-south trail connections align both sides of the Minnesota River. Existing and planned pedestrian and bicycle connection in the study area are shown in **Figure 12**. The following summarizes bicycle and pedestrian facilities and needs within the study area.

On the east side of the river, the Rex Macbeth River Trail follows Highway 169 from the Kiwanis Recreation Area north of the Highway 169/14 interchange to the Veterans Memorial Bridge. On the west side of the river, the Minnesota River Trail follows Highway 169 from the Highway 14 trail and the Highway 169/14 interchange to the Northstar Bridge. The Northstar Bridge Trail runs adjacent to Highway 169 from Lookout Drive to S Riverfront Drive. The West Mankato Trail connects to the Minnesota River Trail and runs south through West Mankato. Farther south along the study area, the Minneopa Trail runs adjacent to the west side of Highway 169 from Woodland Avenue, across the Blue Earth River, and to Highway 68 for connection to and within the Minneopa State Park.

Several of the trails along Highway 169 demand safe crossings across the Highway and currently not all crossings are ADA compliant. This is the case at Lind Street, Webster Avenue, Riverfront Drive, CSAH 69, and Highway 14. Below summarizes existing gaps and safety concerns in the pedestrian and bicycle network along Highway 169:

- Connection from the Highway 14 trail on the west side of Highway 169 to the east near Lind Street for access to the Minnesota River Trail.
- Pedestrian crossing demand exists at the CSAH 69/Hawley Street intersection due to the need to connect the residential areas both north and south of the highway to the Quick Mart and to the Minneopa Trail for access across the Blue Earth River bridge. The trail on this bridge is the only access point by bike or foot into West Mankato destinations such as Roosevelt Elementary School, West High School, Cub Foods, and other commercial businesses and employment in downtown Mankato. A striped crosswalk was removed from this location due to safety concerns; a legal crossing with ramps is still present, however pedestrians are required to yield to traffic on Highway 169. Demand still exists for this crossing and often includes children and young adults.

Figure 21 (Appendix A) also includes planned bike and pedestrian trails. The planned trail along Poplar Street will connect the West Mankato Trail to important destinations such as downtown Mankato.

Transit

City of Mankato Transit serves the cities of Mankato, North Mankato, Eagle Lake, and parts of South Bend Township. **Figure 22** (Appendix A) depicts transit routes that intersect the Highway 169 corridor. These routes run every 30-60 minutes depending on route every Monday through Friday from 6:30 AM to 5:30 PM or 10:00 AM to 10 PM (Route 7 only). Youth, age zero through high school student, may ride all City of Mankato buses at no cost. For those living outside fixed-route bus lines, Mankato bus service offers the Kato Flex, a free, curb-to-curb service for residents living in Sibley, Germania, Tourtellotte, Skyline, Eagle Lake, West Mankato, and LeHillier in South Bend. This service provides residents with transportation

anywhere Mankato bus service is provided at no cost for others living in the areas listed above. Kato Flex runs from 6 AM to 6 PM, Monday through Friday. All buses are ADA accessible and equipped with bike racks.

Route 5, primarily serving North Mankato intersects with Highway 169 and crosses the Minnesota River at the Belgrade Avenue and Lookout Drive interchanges to connect Downtown North Mankato through its residential areas and into to downtown Mankato. From there, routes 2, 3, 7, 10, 11, 12, and 13 connect to destinations around the MAPO area such as Minnesota State University, Mankato, Mankato Public Schools, Blue Earth County Library, and many commercial destinations offering daily service needs.

Summary of Issues

Appendix E contains an Issues Identification infographic highlighting the summary of issues below.

- *Existing Capacity Needs:* All intersections overall operate acceptably with LOS C or better. There are several intersections however with movement or two that operate with LOS E or F during the peak hours. These include: Lake St NW (North Access) at TH 169, EB TH 14 Exit Ramp at TH 169, Webster Ave at TH 169, CSAH 33 at TH 169, and TH 60 at TH 169. Additionally, the following intersections along Highway 169 have problematic queuing issues during the peak hours: Lind St, Webster Ave, Belgrade Ave at the SB TH 169 ramps, Riverfront Dr at the SB TH 169 ramps, Riverfront Dr at the NB TH 169 ramps, and CSAH 33 at TH 169.
- *Future Capacity Needs:* The 2040 no build analysis showed that two intersections are anticipated to operate with excessive delay during the peak hours if improvements are not made. These intersections include: EB TH 14 Exit Ramp at TH 169 and CSAH 33 at TH 169. Additionally, problematic queuing is anticipated at the following intersections during the 2040 peak hours: EB TH 14 Exit Ramp, Lind St, Webster Ave, Belgrade Ave at the SB TH 169 ramps, Riverfront Dr at the SB TH 169 ramps, Riverfront Dr at the NB TH 169 ramps, CSAH 69 (Hawley St), and CSAH 33.
- *Access Spacing.* Several primary and secondary intersections along Highway 169 do not meet recommended spacing.
- *Safety:* The intersections of Lind Street, Belgrade Avenue at SB Highway 169 Ramps, Riverfront Drive at NB Ramps, Highway 68, CSAH 69 (Hawley St) are operating outside the normal range compared to similar intersections. Highway 169 from Belgrade Avenue to Highway 60 has a segment crash rate outside the statewide average for similar corridors.
- *System Linkages:* Highway 169 is a principal arterial, NHS route, and major freight corridor providing a north-south connection between Minneapolis-St. Paul, Mankato/North Mankato, and into southern Minnesota. Highway 169 also provides an important regional connection to US Highway 14. The Mankato/North Mankato area has experienced widespread growth across the metropolitan area and serves southern Minnesota as a hub for health care, education, retail, agriculture, and industry.
- *Local Connectivity & Accessibility:* Highway 169 provides important local connections passing through the Cities of Mankato and North Mankato. The corridor serves as the point of entry to both Downtowns in Mankato and North Mankato as well as to Minnesota State University Mankato. Highway 169 also provides important local connections to major industrial areas and highway commercial in Mankato, North Mankato, and South Bend Township. Overall, local residential, commercial, industrial, institutional, and recreational uses depend on local connectivity and accessibility to the highway.

- *Consistency with State and Local Plans:* Many previous plans and studies have been completed for the study's system corridors, in which many areas of concern were identified along Highway 169 with crash issues including; at the Highway 14 interchange, Lind Street intersection, and the corridor segment from the Highway 14 south ramp to Webster Street. Previous efforts include five design concepts for the Highway 169 and Highway 14 interchange. Planned projects by MnDOT and the City of Mankato have also resulted. Proposed improvements include roadway expansion, ramp intersection reconfiguration, pavement preservation, pedestrian oriented safety improvements, trail extensions, and transit travel time and reliability solutions. Some of these projects have been programmed for implementation or are soon starting design. All planned and programmed projects will need to be considered in the development of concept alternatives through this effort.

Previous planning efforts have identified major population growth and some development/redevelopment along the Highway 169 corridor (i.e. Riverside North Redevelopment in Mankato and Webster Avenue in North Mankato). Population growth coupled with additional commercial, industrial, and residential uses may increase traffic volumes and safety concerns.

Both the City of Mankato and City of North Mankato passed resolutions stipulating their consent to the Corridor Study in July 2019. Both resolutions are included in the previous studies section of this report, Appendix A, and as an attachment to the Project Management Plan.

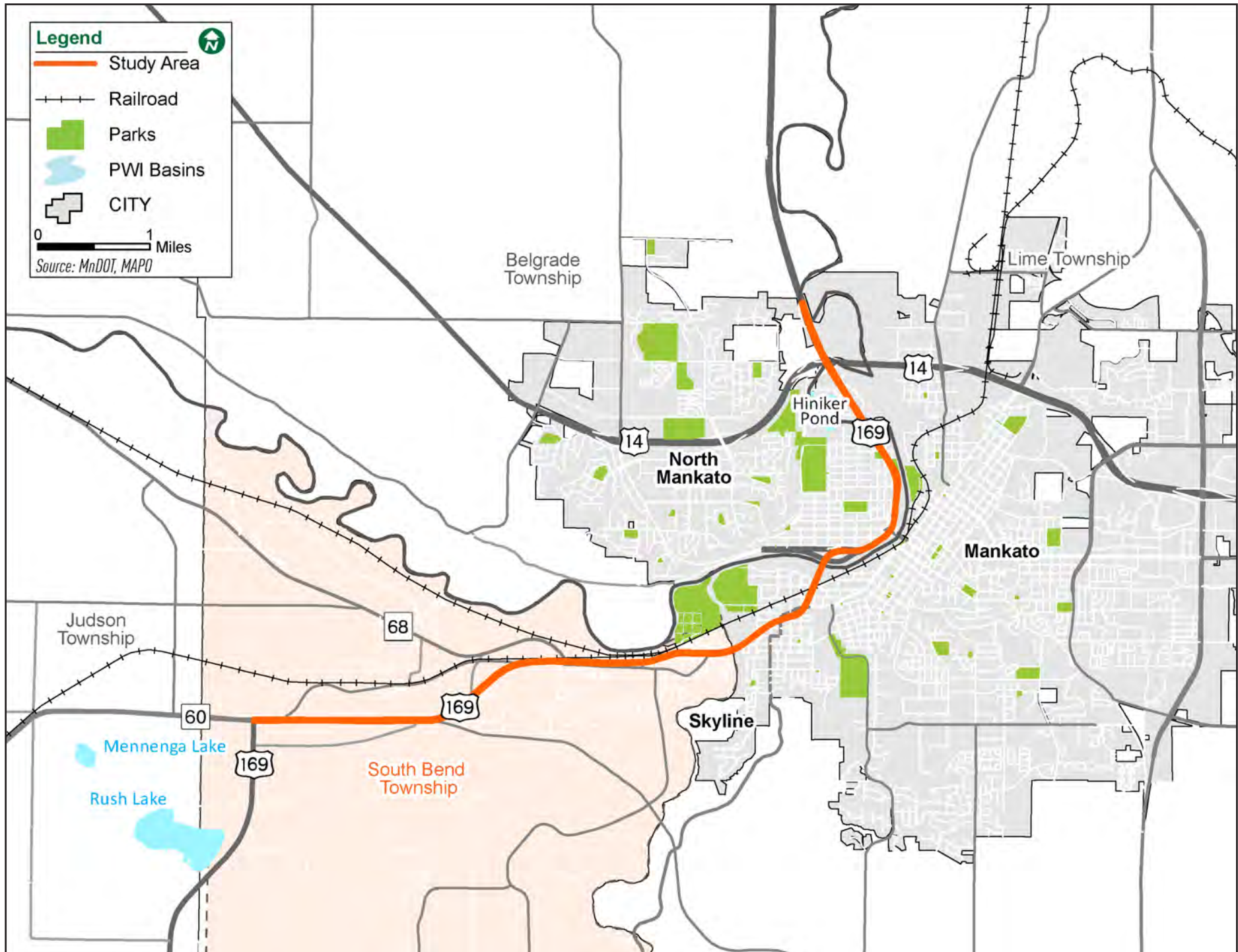
The City of North Mankato's Comprehensive Plan includes a policy related to Highway 169 listed in the Transportation System Goals, Objectives, and Policies, that states that full access conditions must be maintained at the Webster Avenue/Highway 14 intersection

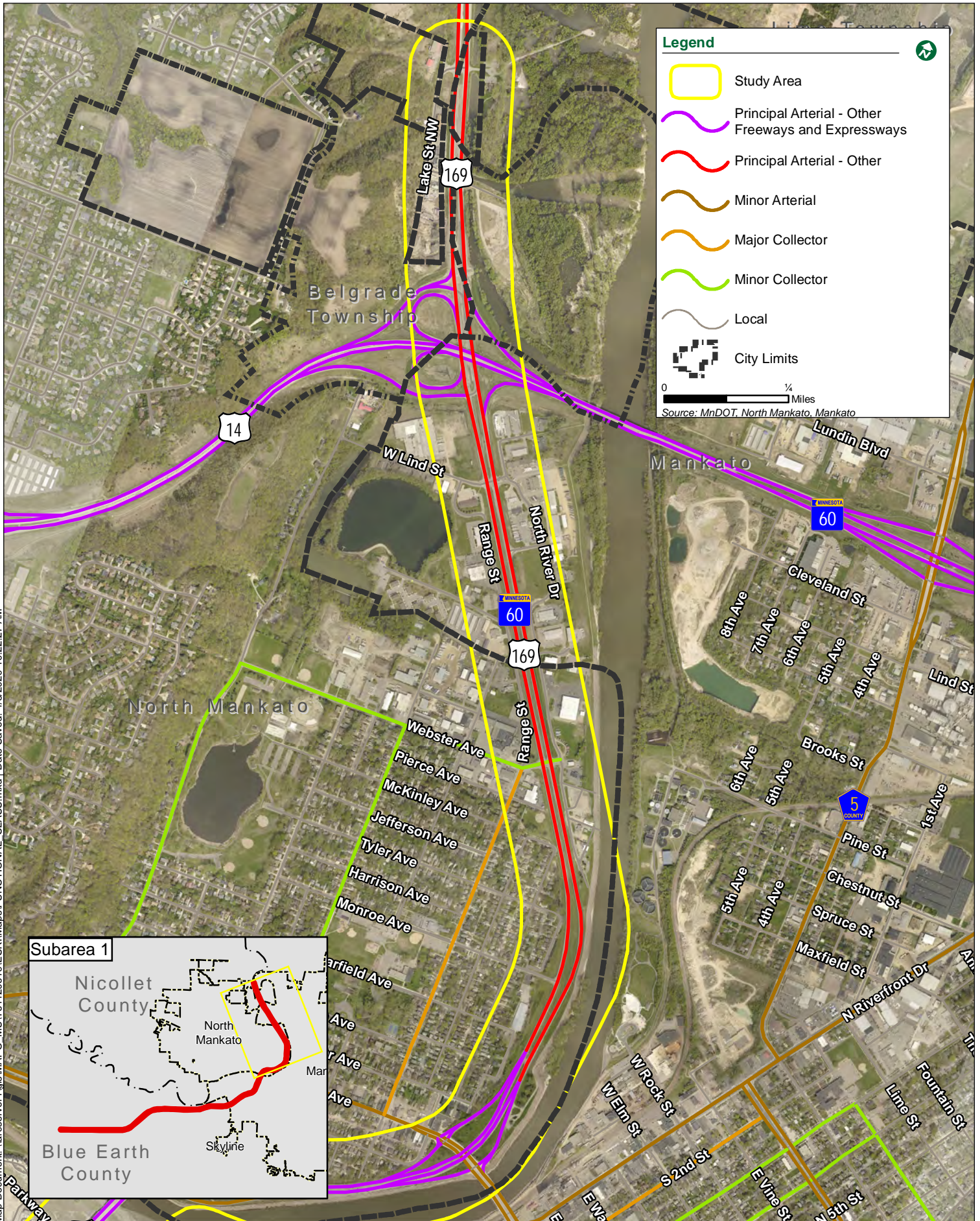
- *Modal Interrelationships:* The planning area is served by several regional trail connections including the Rex Macbeth River Trail, Minnesota River Trail, West Mankato Trail, Northstar Bridge Trail, and the Minneopa Trail. These trails provide pedestrian and bicycle connections along Highway 169. There are a few gaps that remain including crossing accommodations for pedestrians and bicyclists at Lind Street.

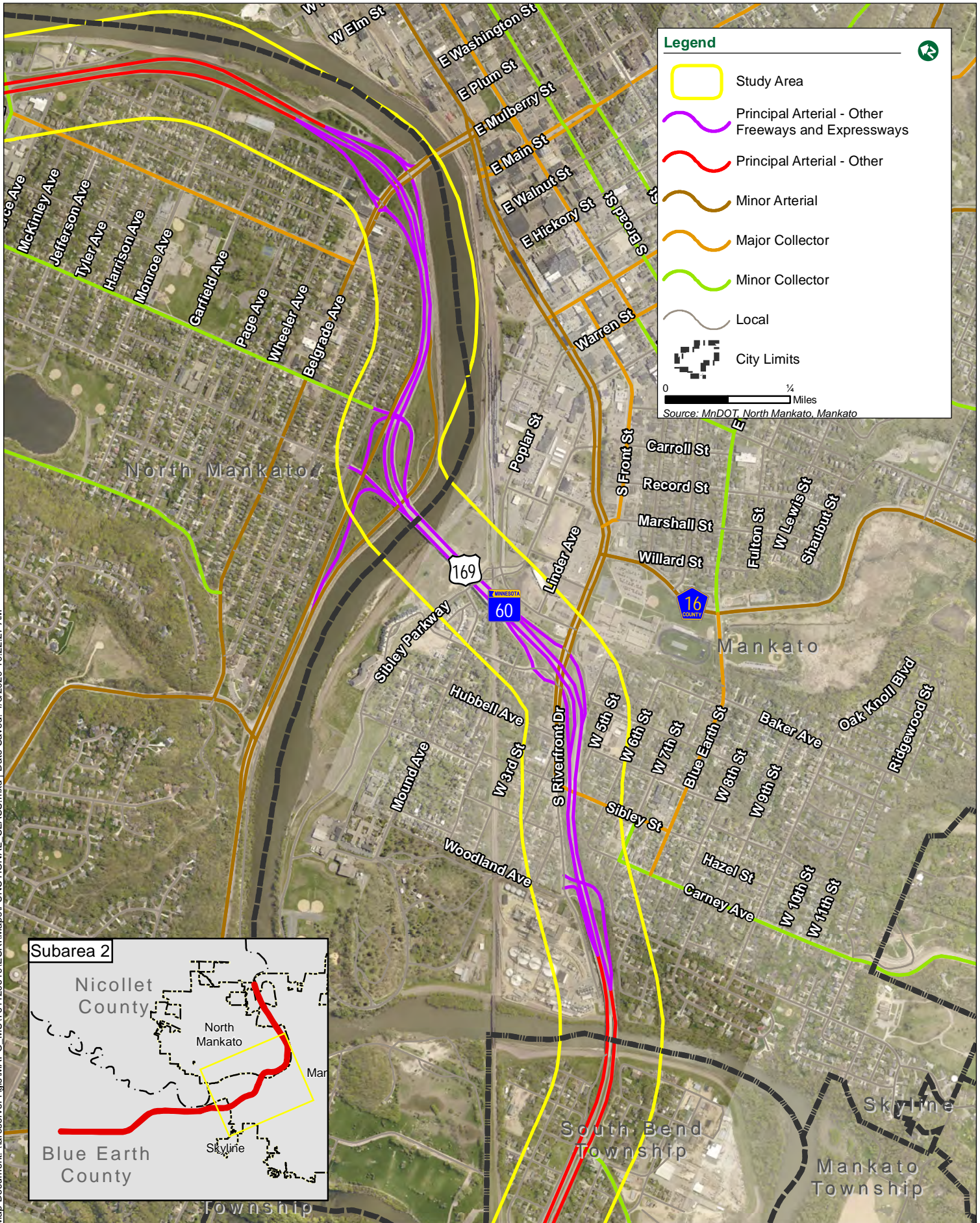
The area is serviced by the City of Mankato Transit with a few routes intersecting Highway 169 but none currently using the highway corridor.

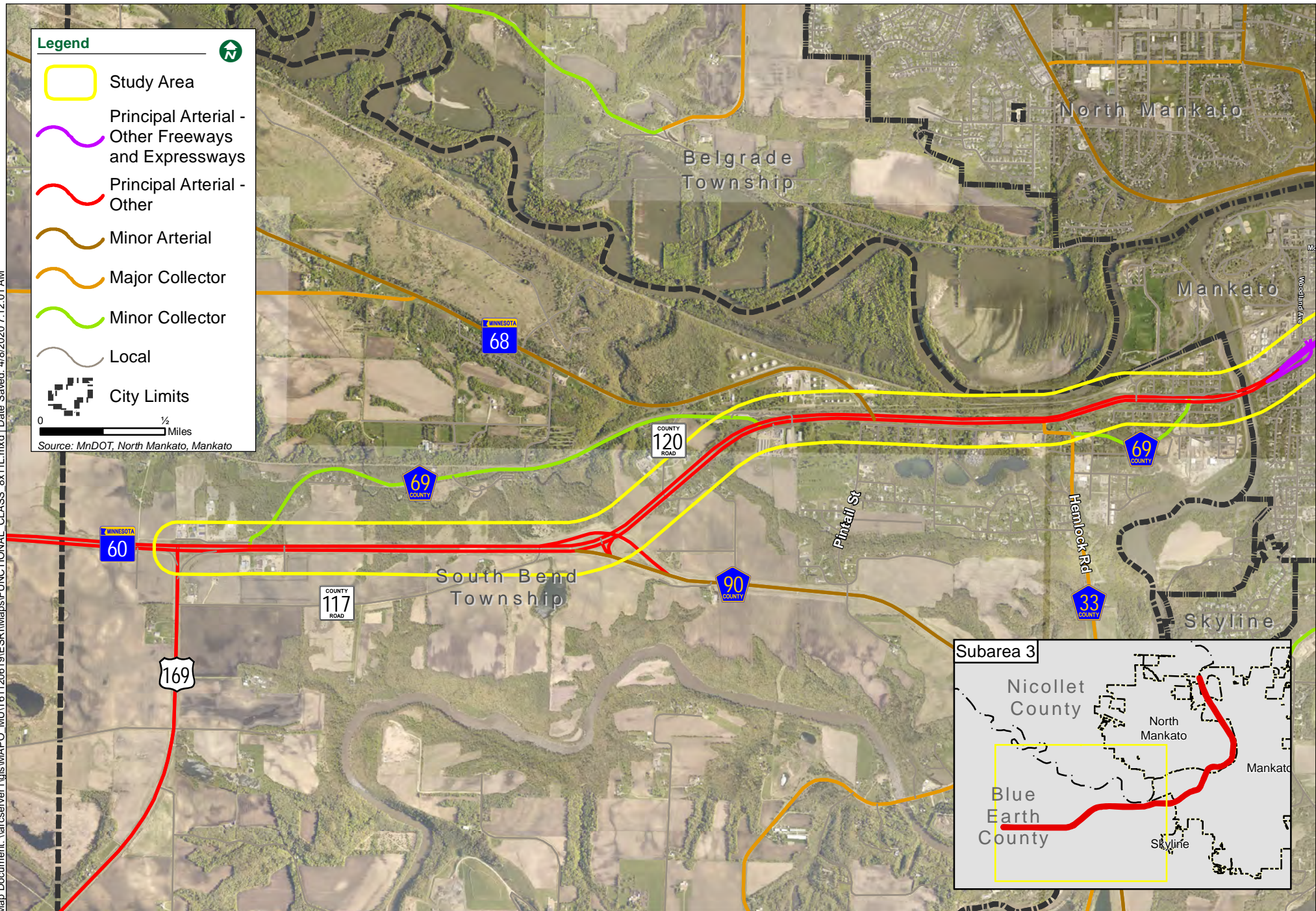
- *Environmental Considerations:* There are some social, economic, and environmental (SEE) resources in proximity to the planning area that need to be considered that include environmental justice populations, several potentially contaminated sites, scattered stands of trees, grassy areas, lakes, streams, rivers, ponds, and wetlands. Any wildlife displaced by any projects or construction resulting from the completion of this study will likely relocate to suitable nearby areas, including lands immediately adjacent to the project area. A FEMA controlled levee exists along the corridor on the river side of Highway 169 to minimize flooding associated with high water levels in the Minnesota River. The levee is a combination of earthen berm and concrete floodwall that provides flood protection for North Mankato, Mankato, and LeHillier when the River is at flood stage.

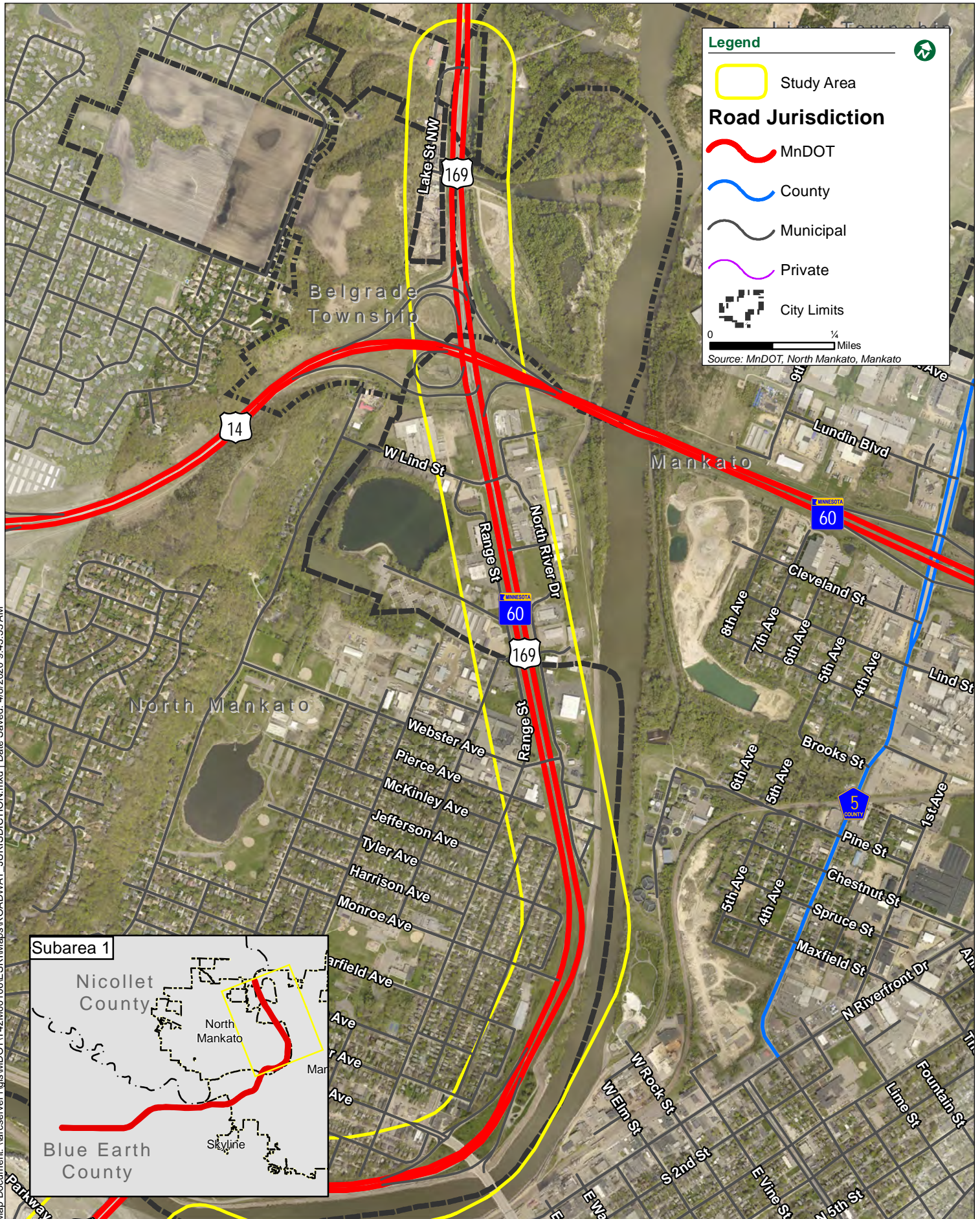
Existing & No-Build Conditions Appendix A: Study Area Figures and City Resolutions

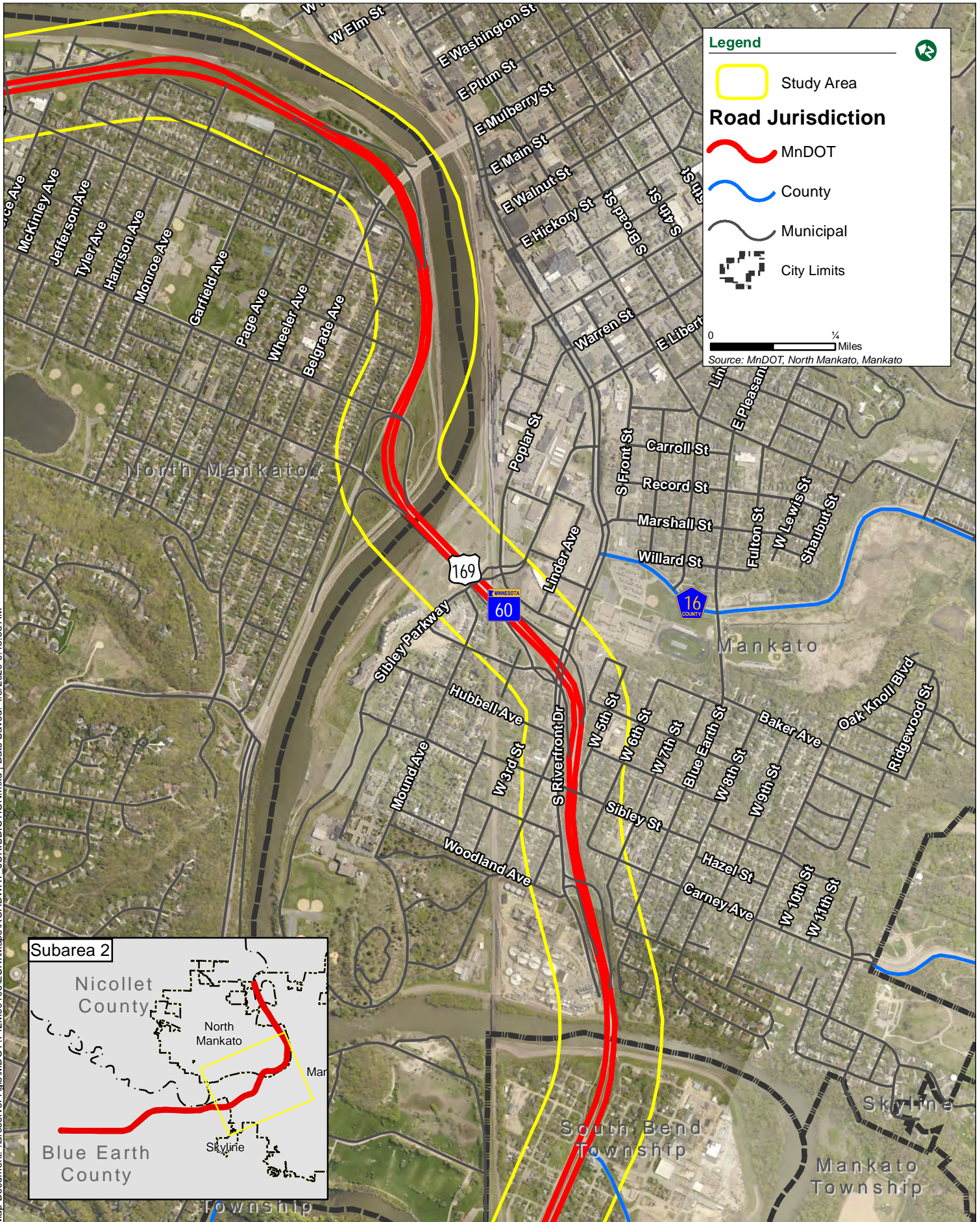


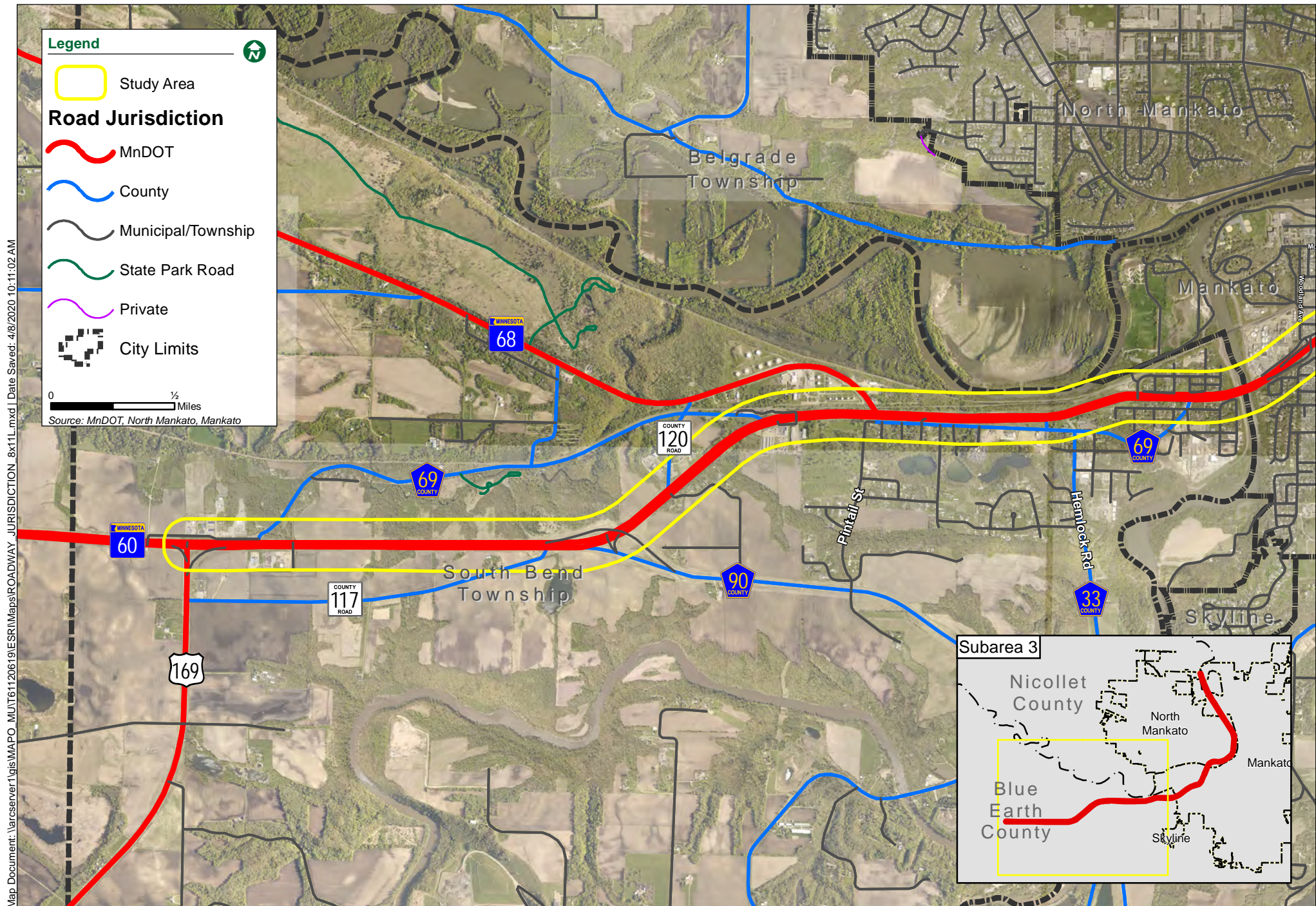


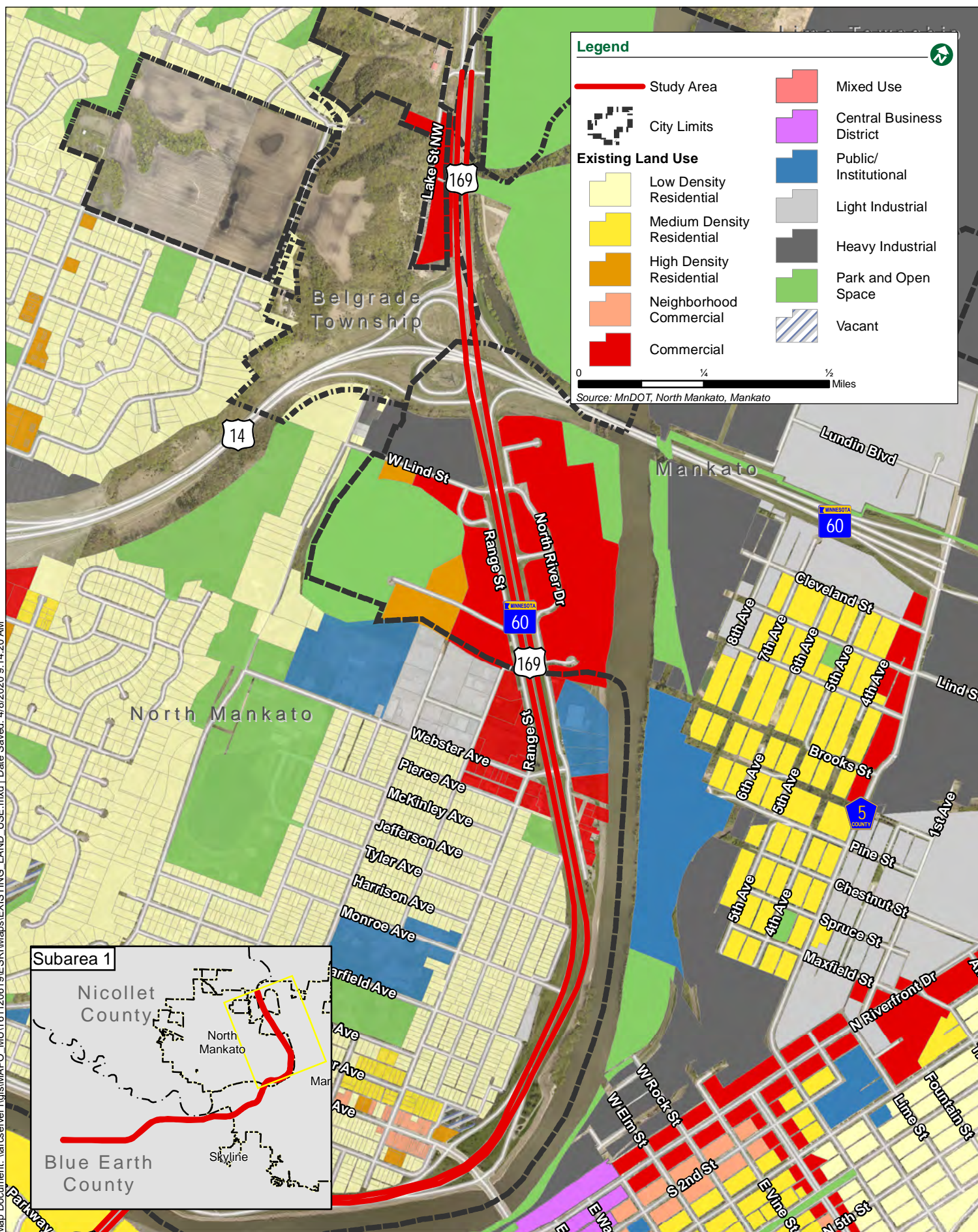


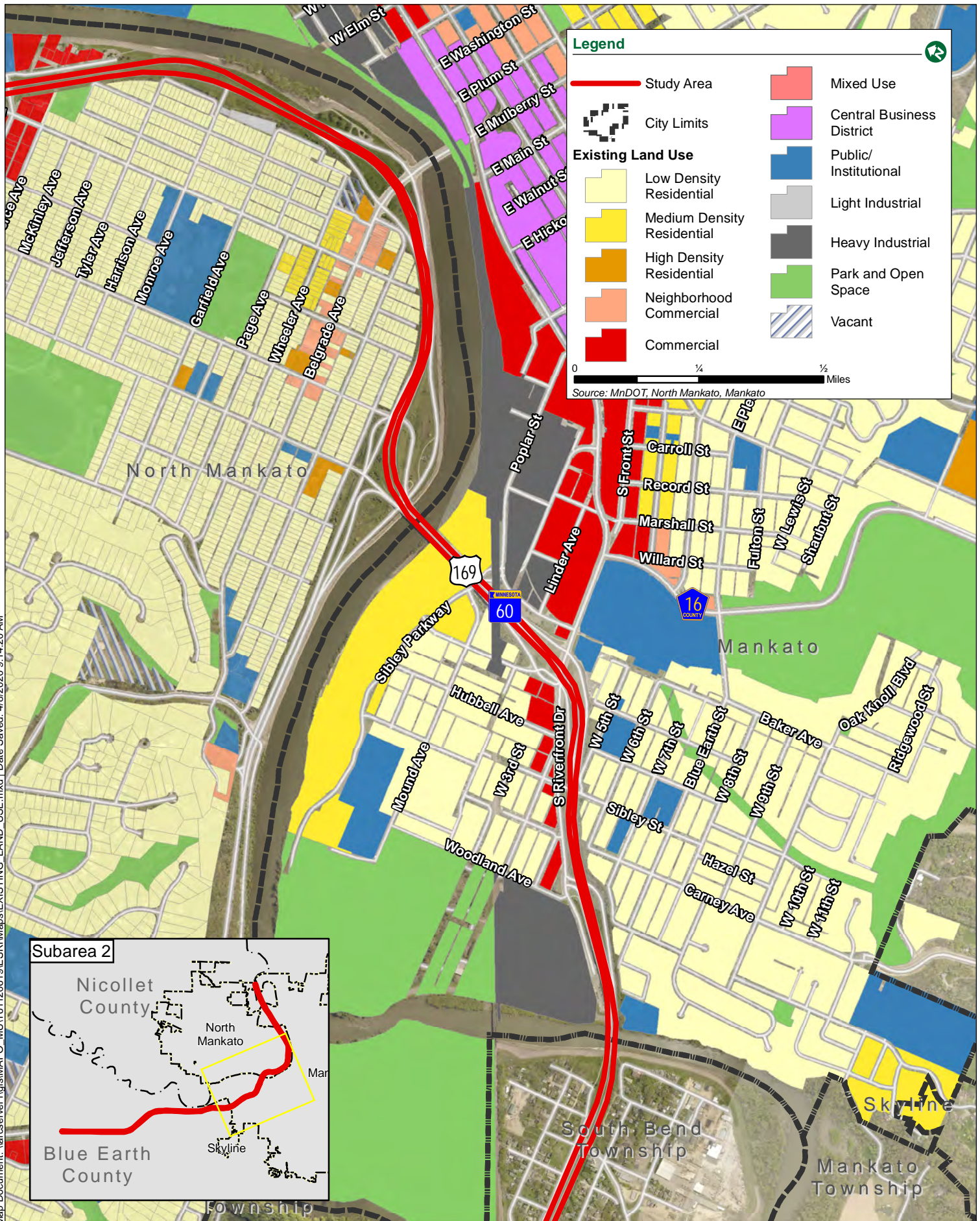


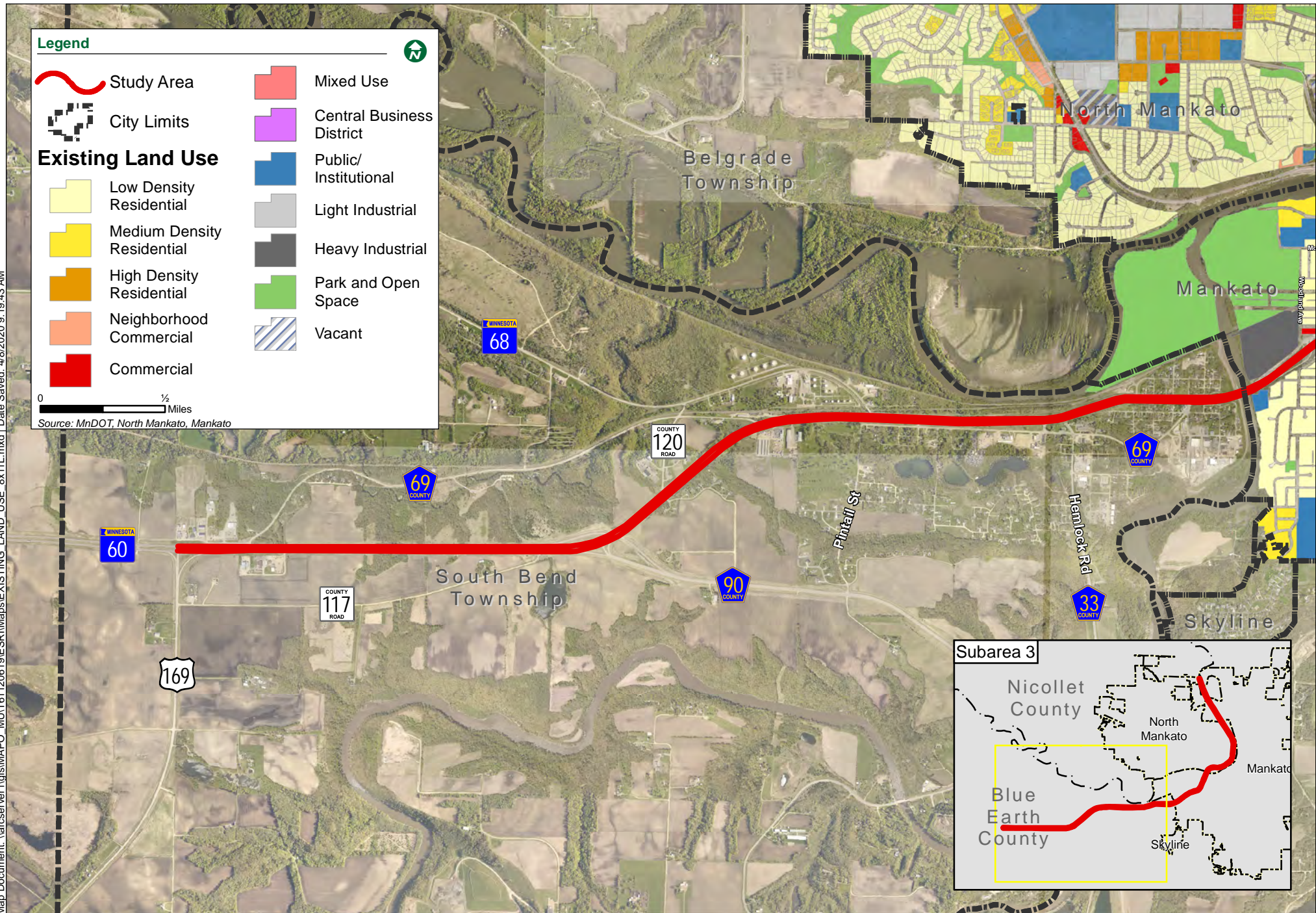












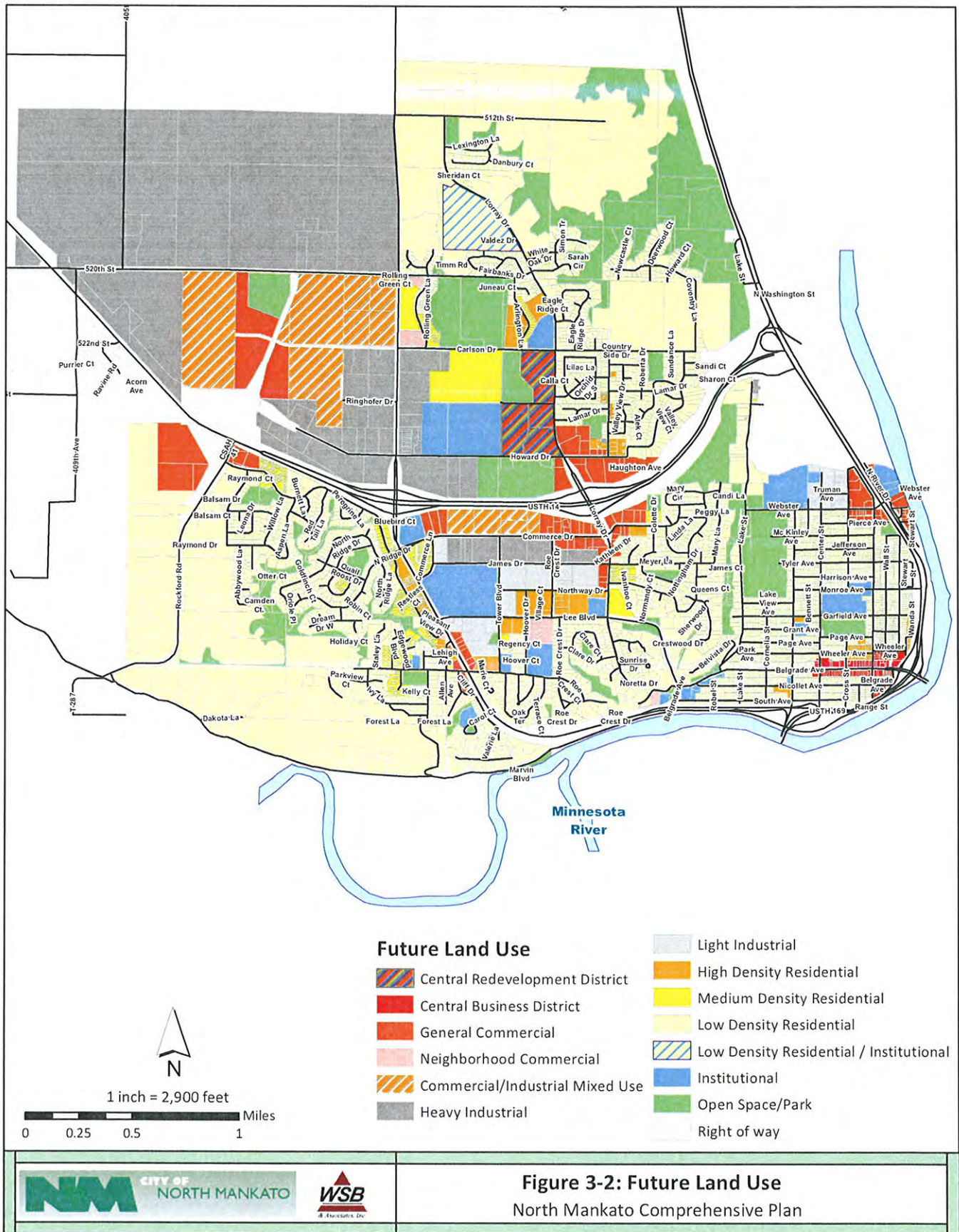
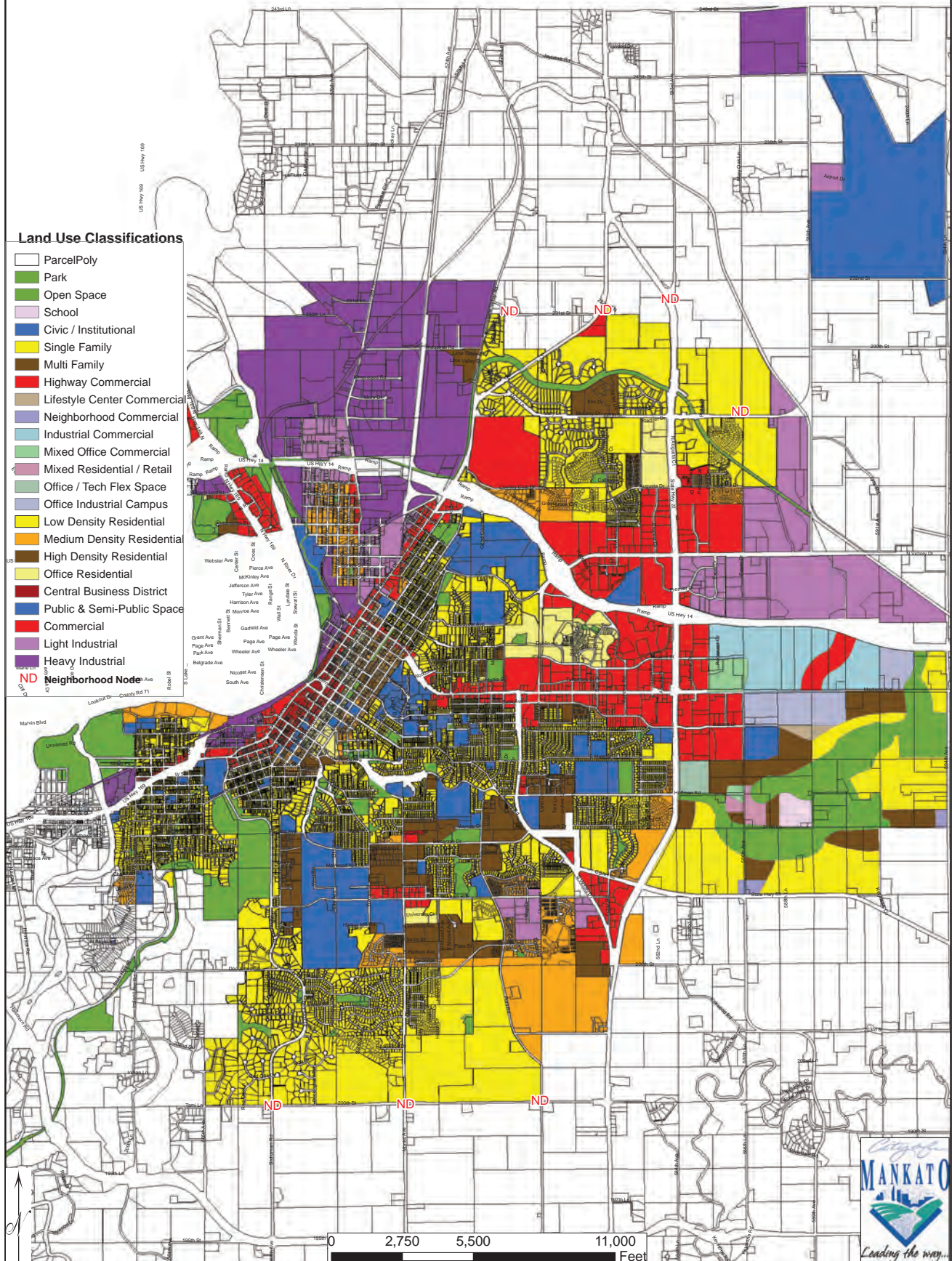
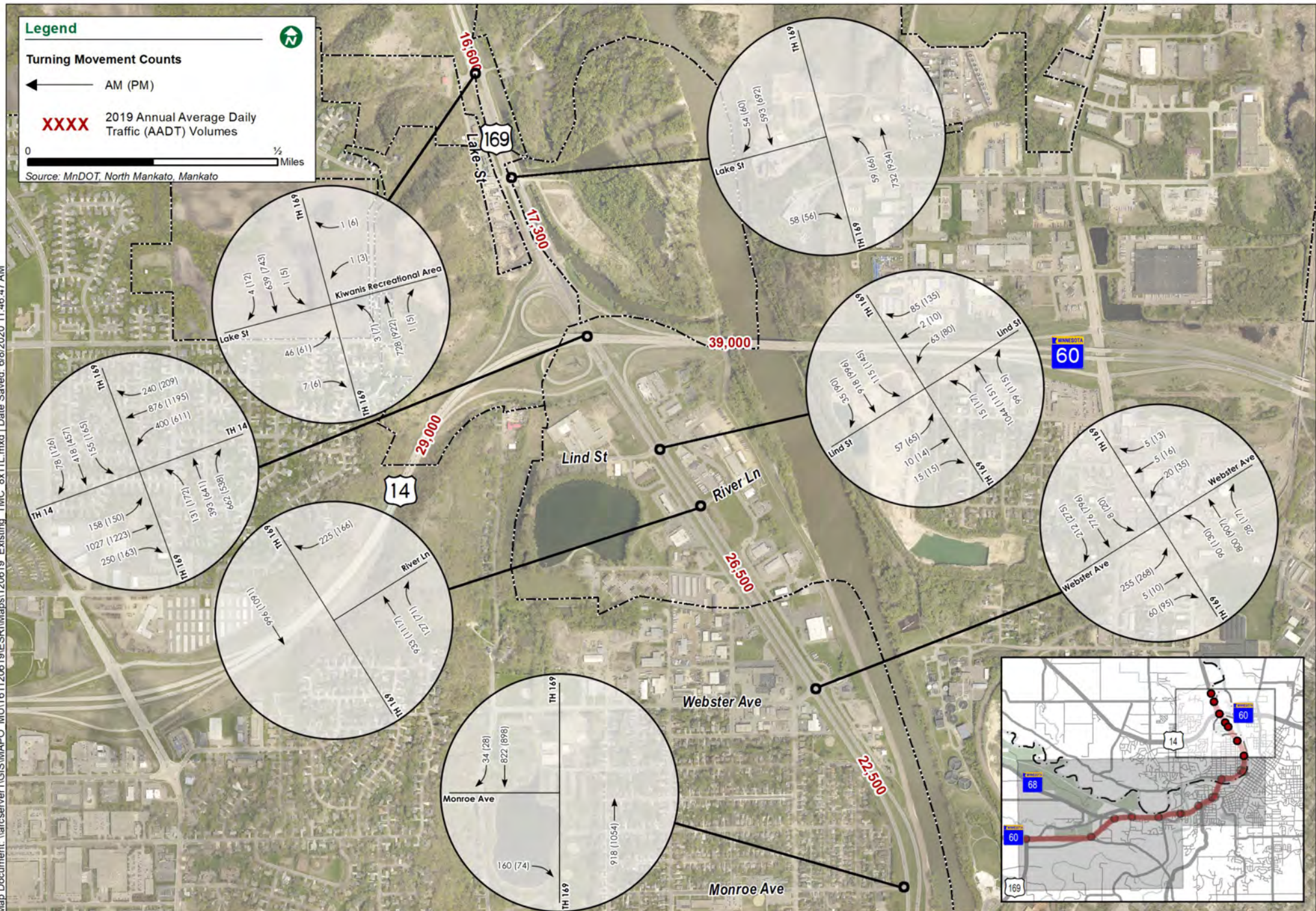
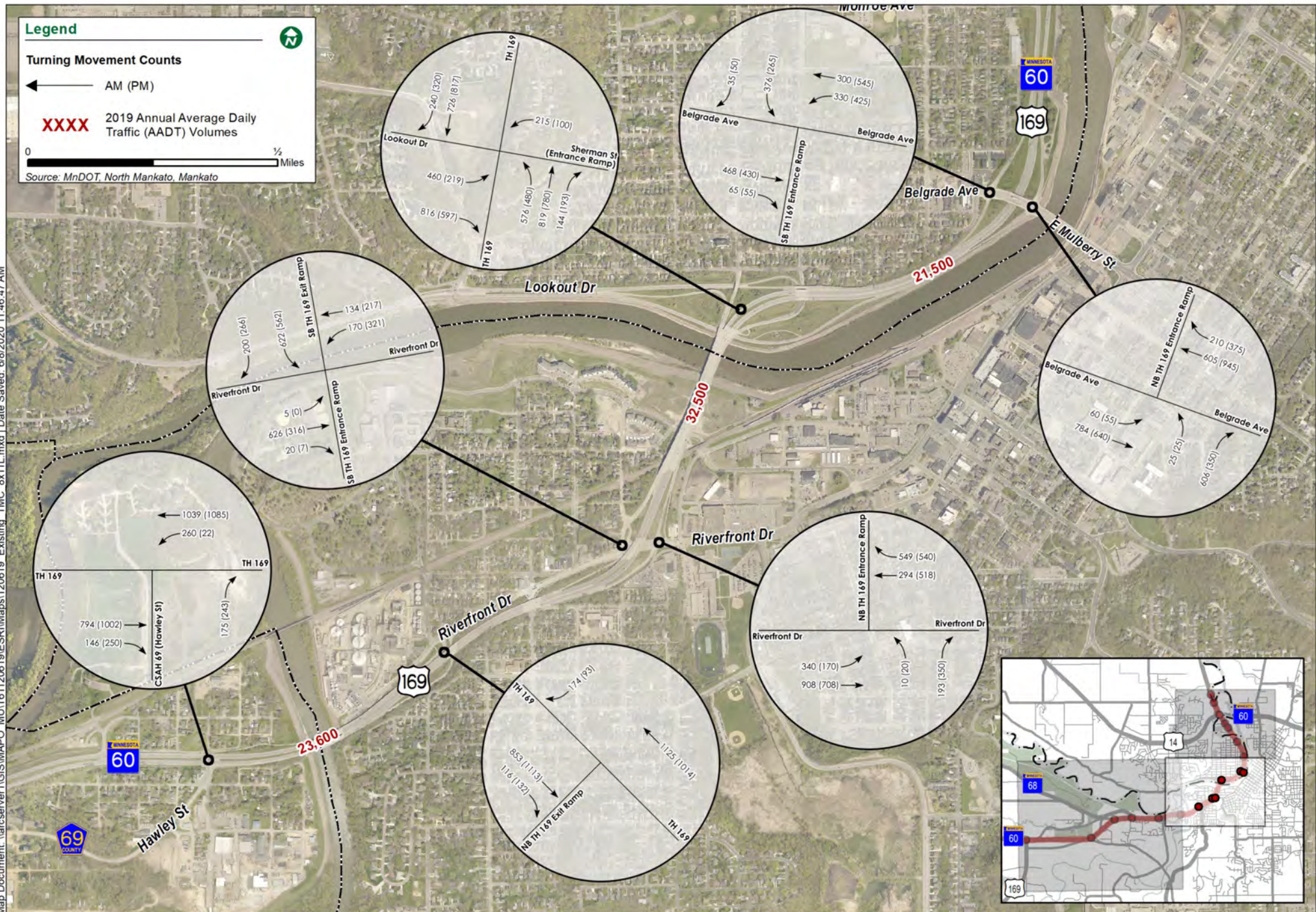


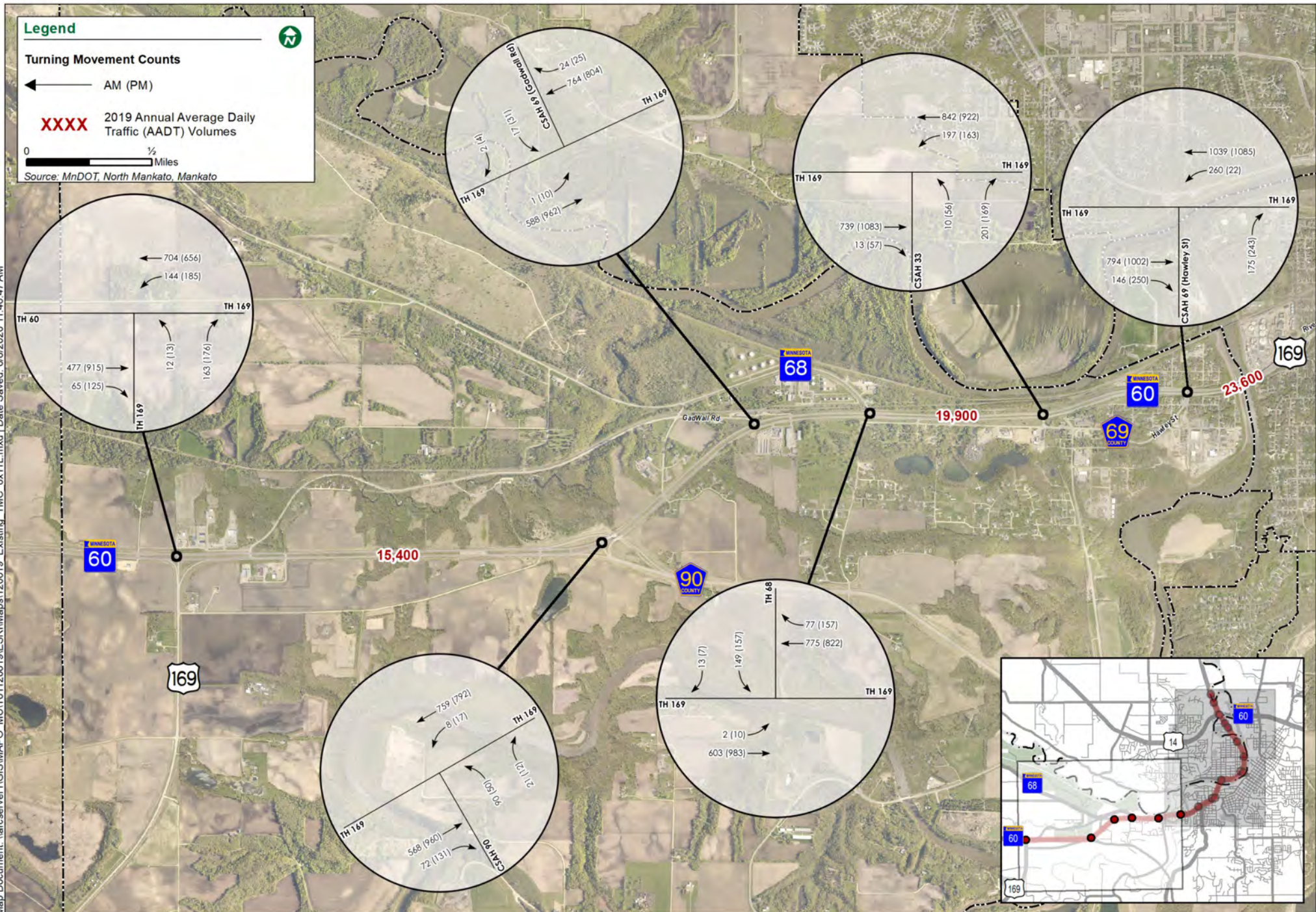
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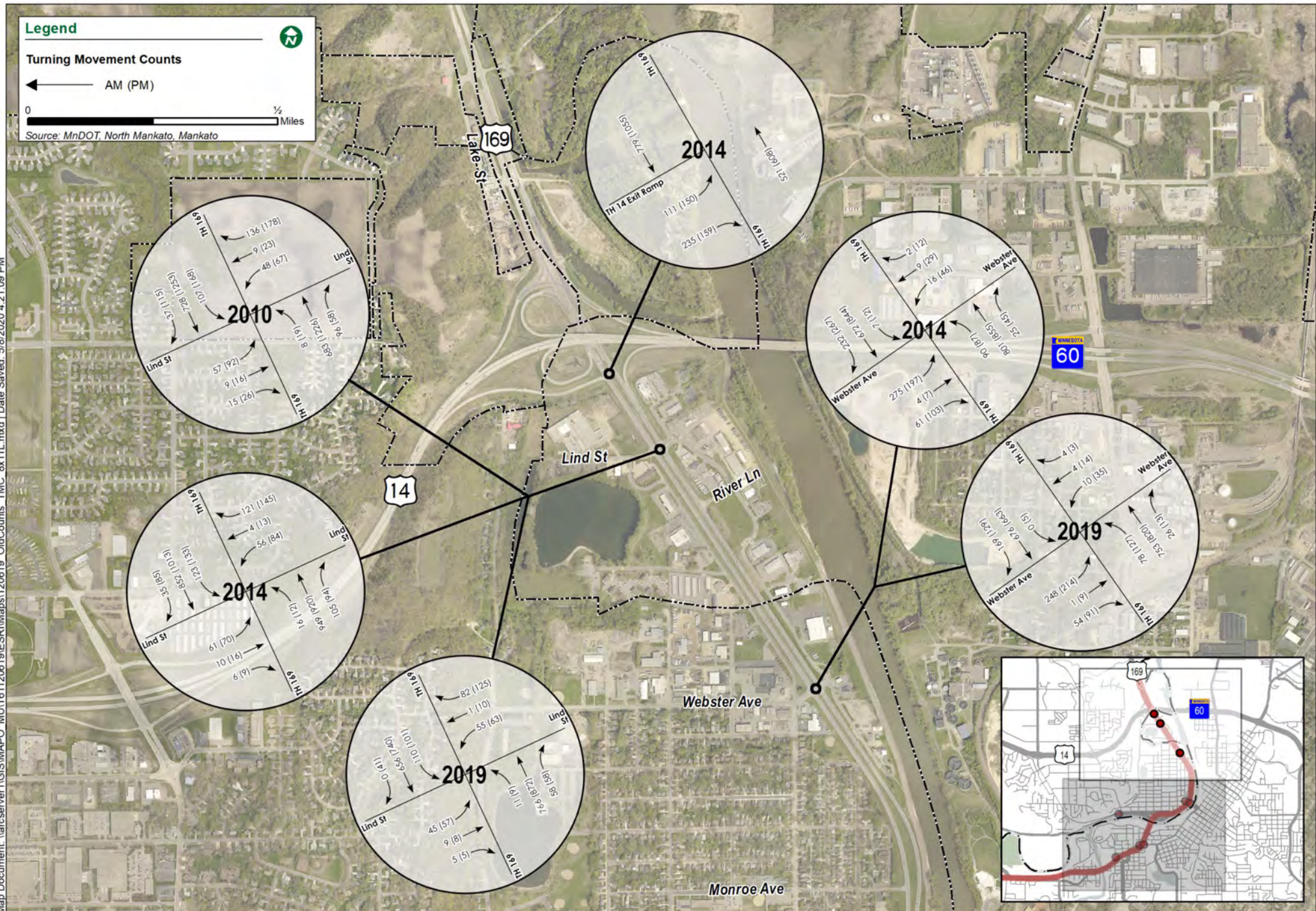
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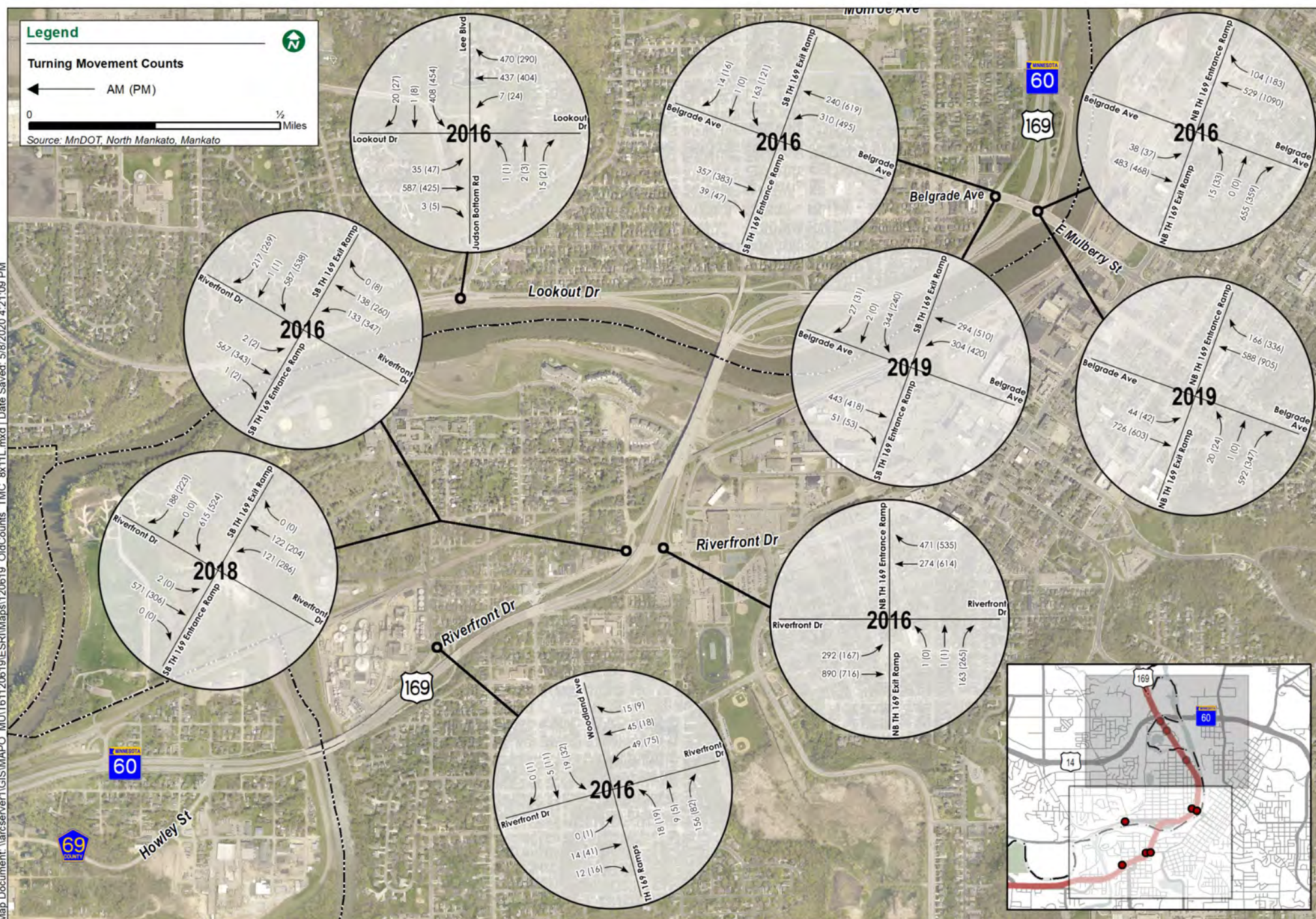


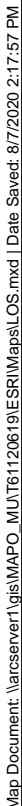


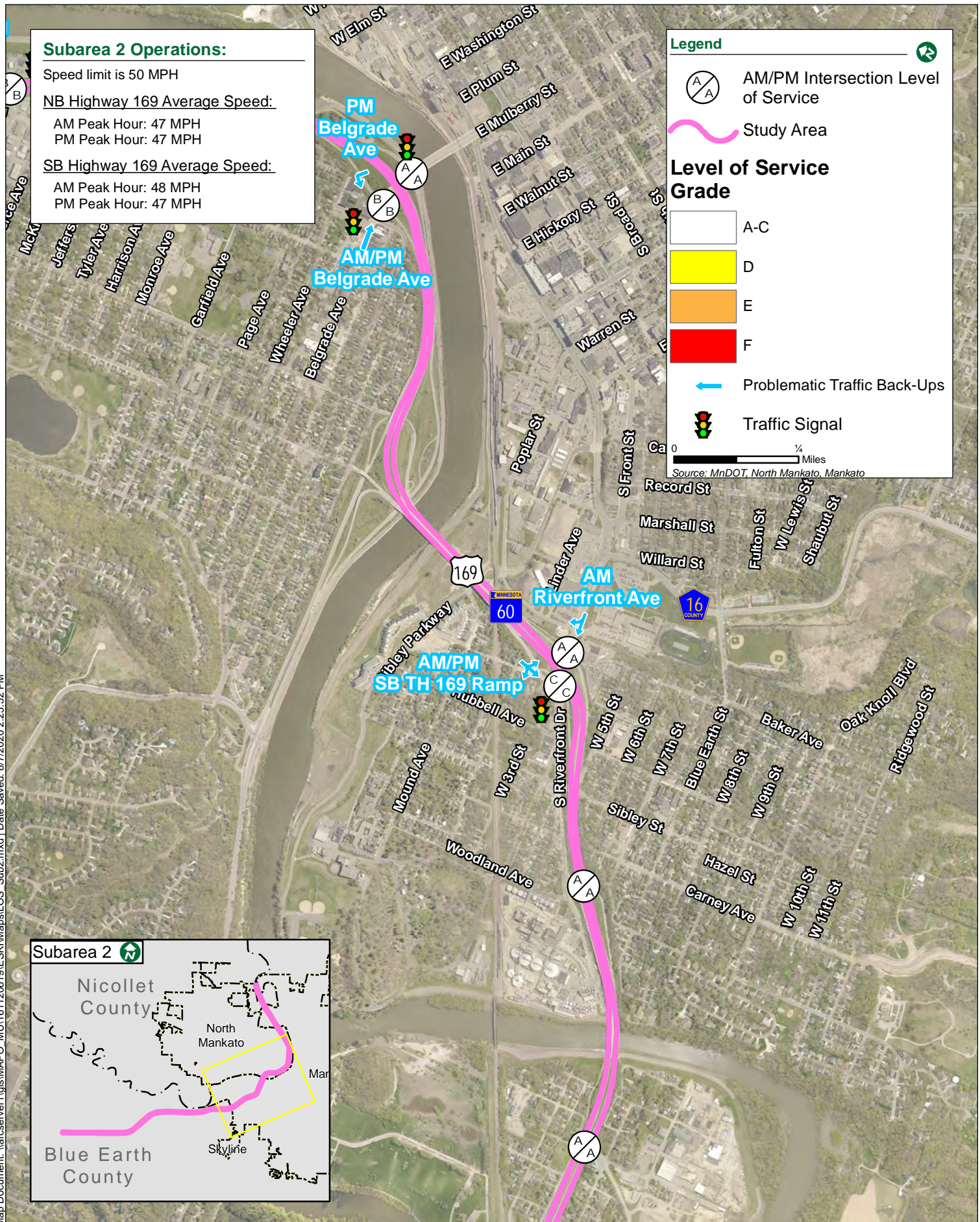


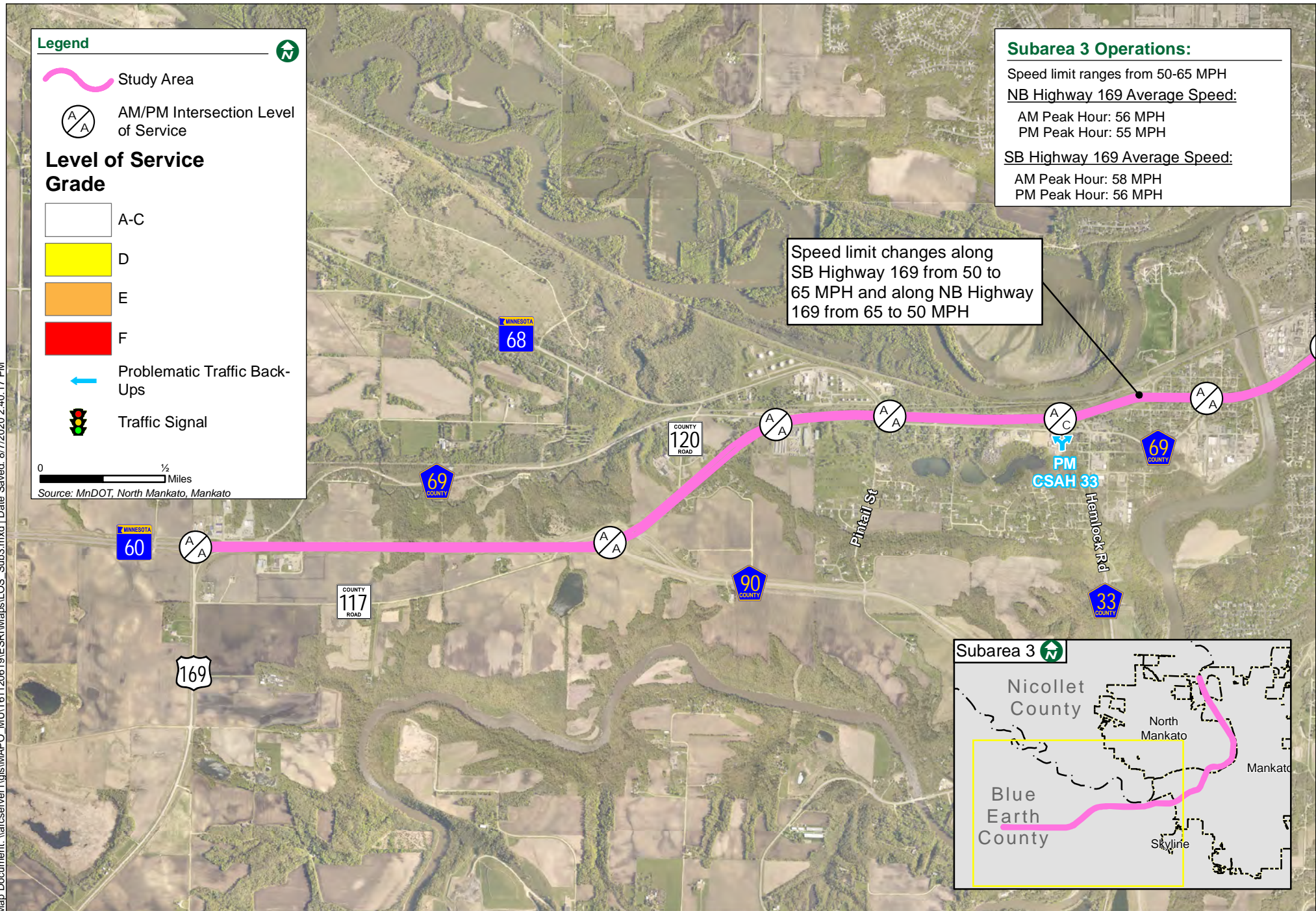


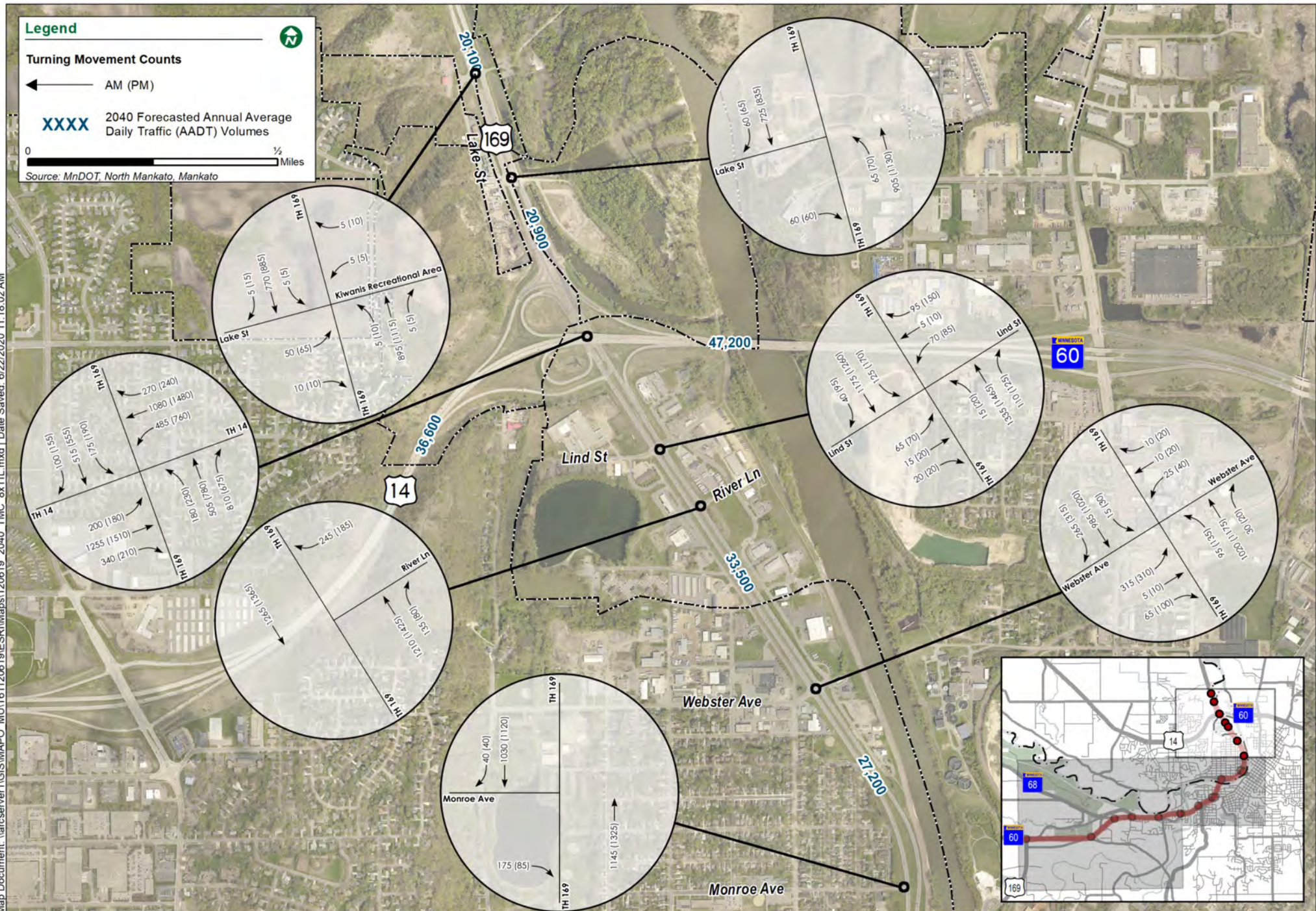


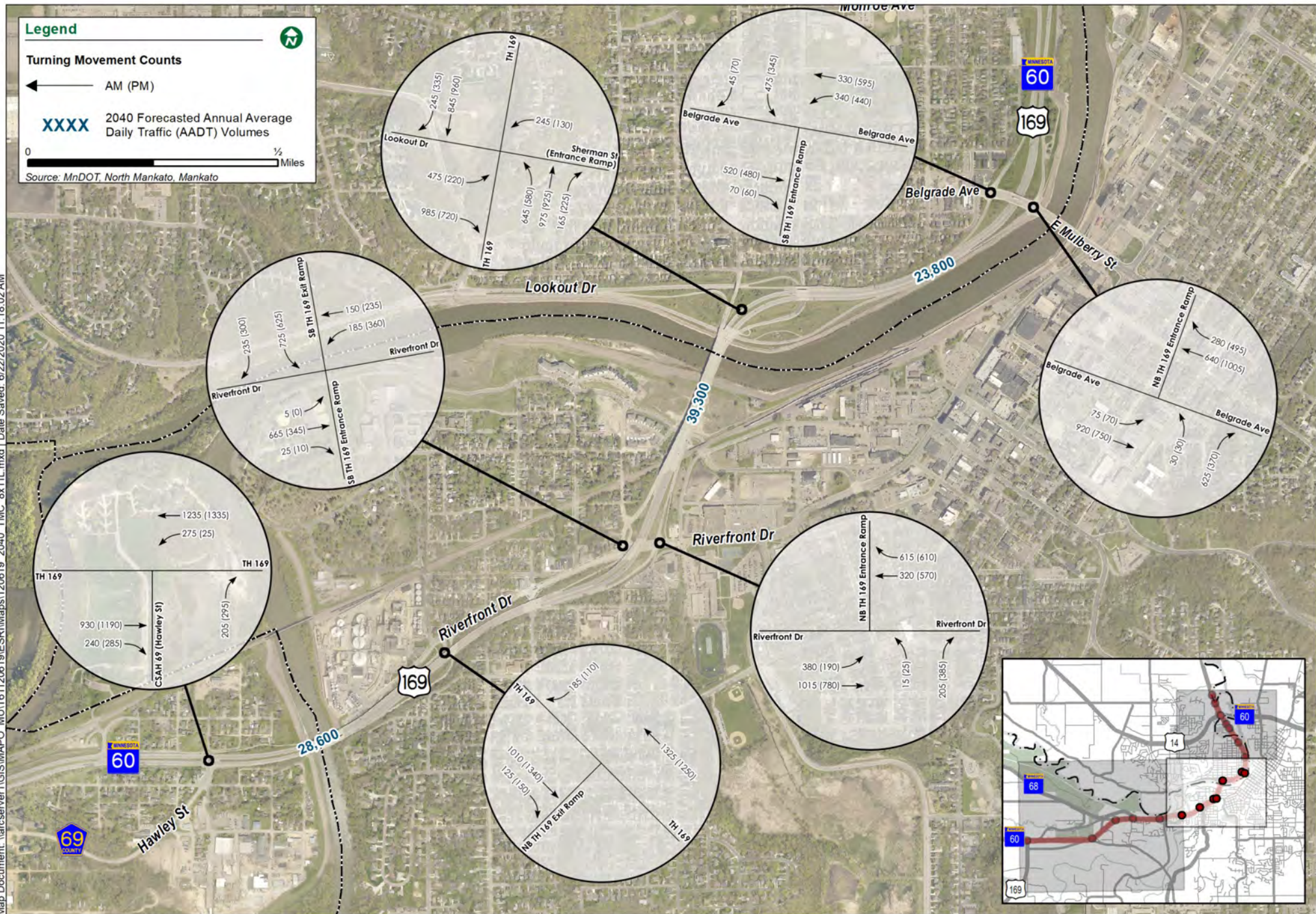


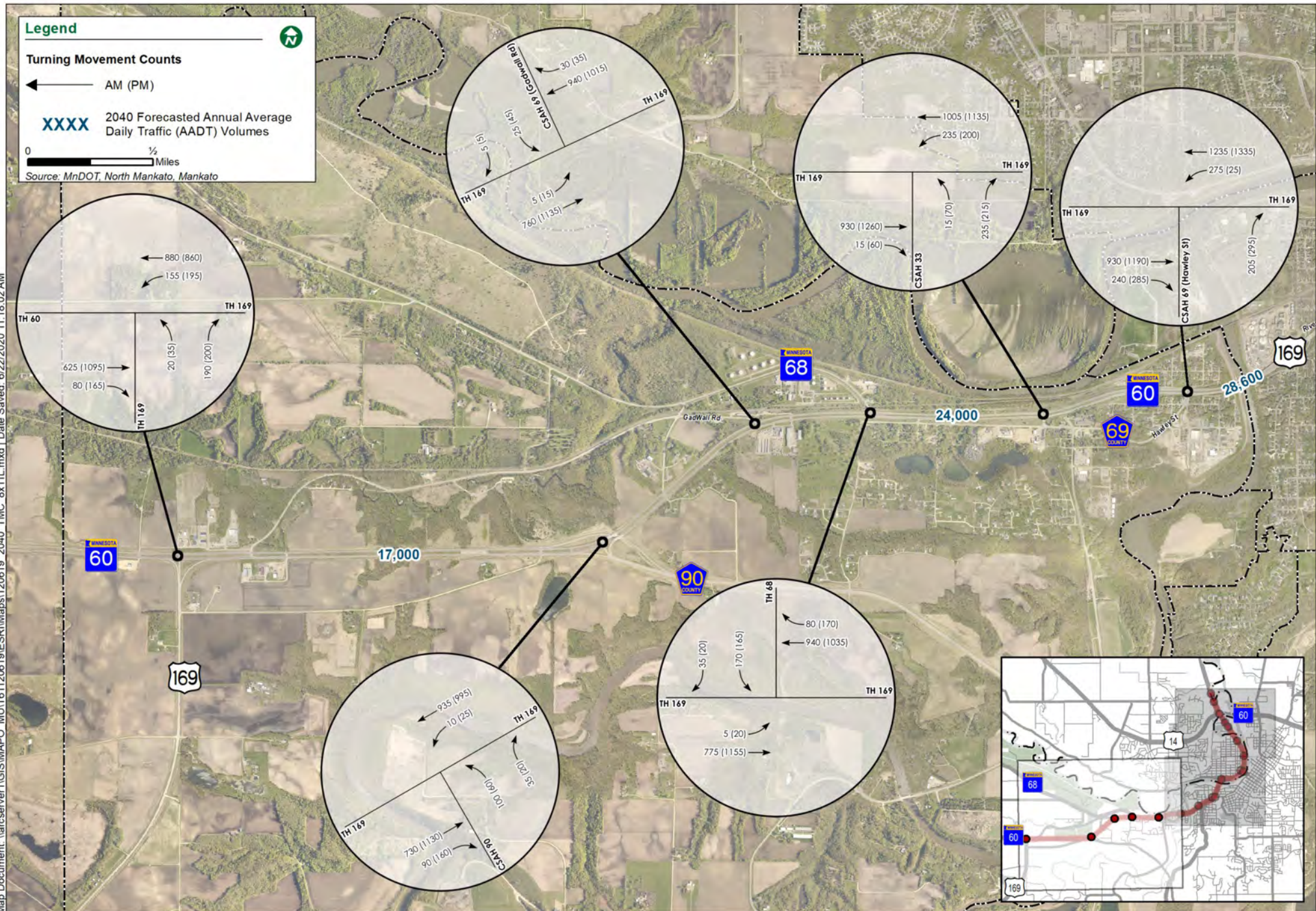


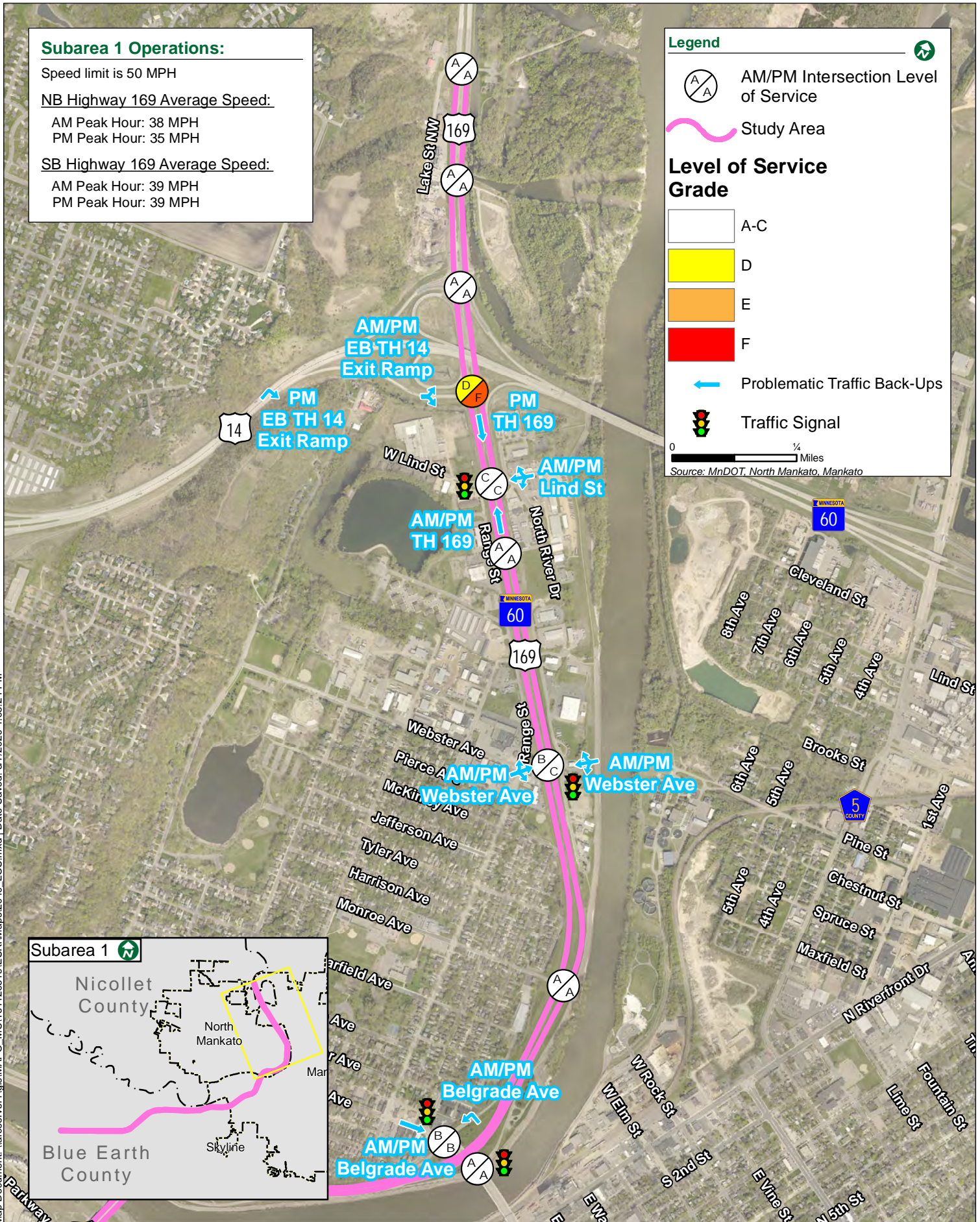


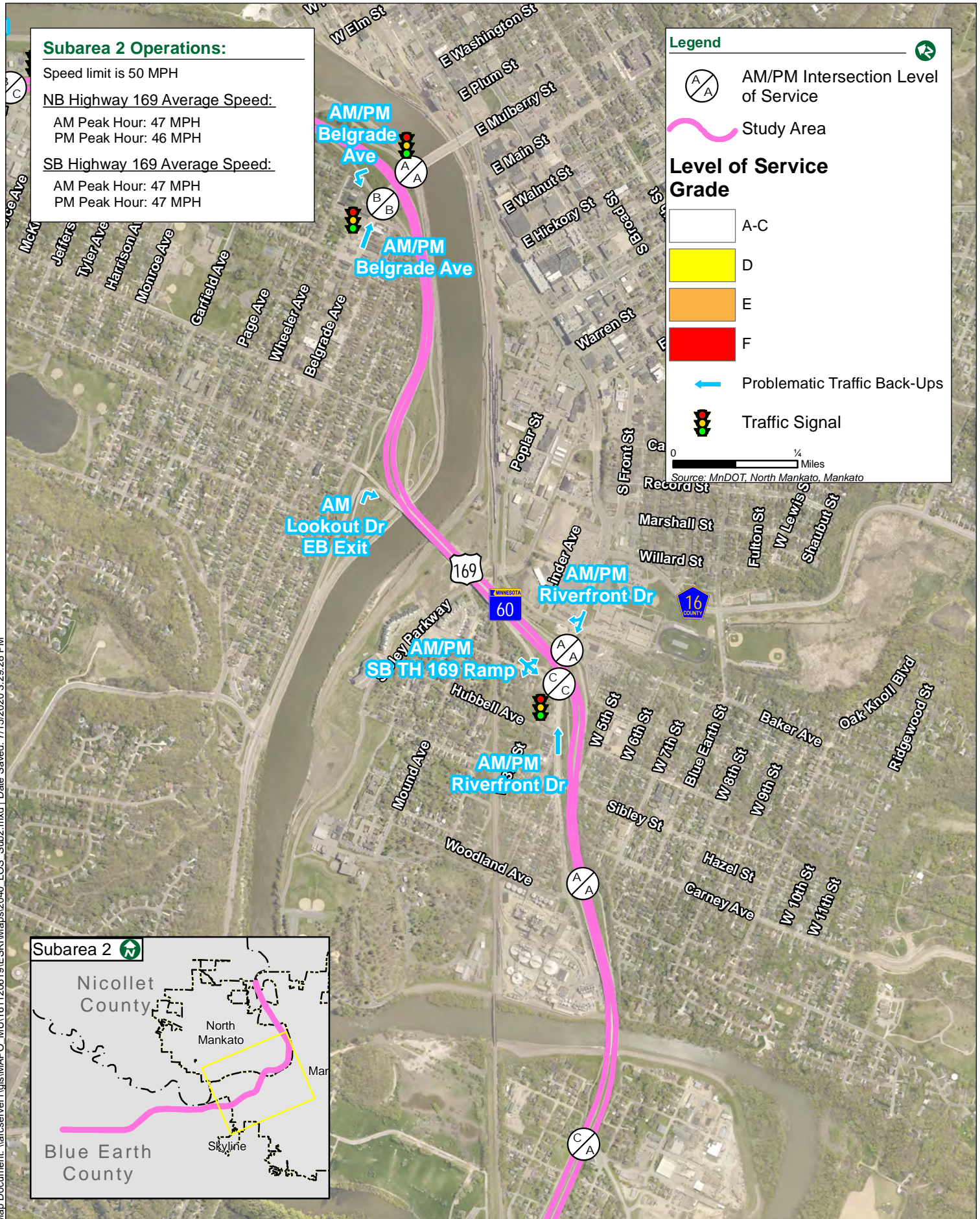


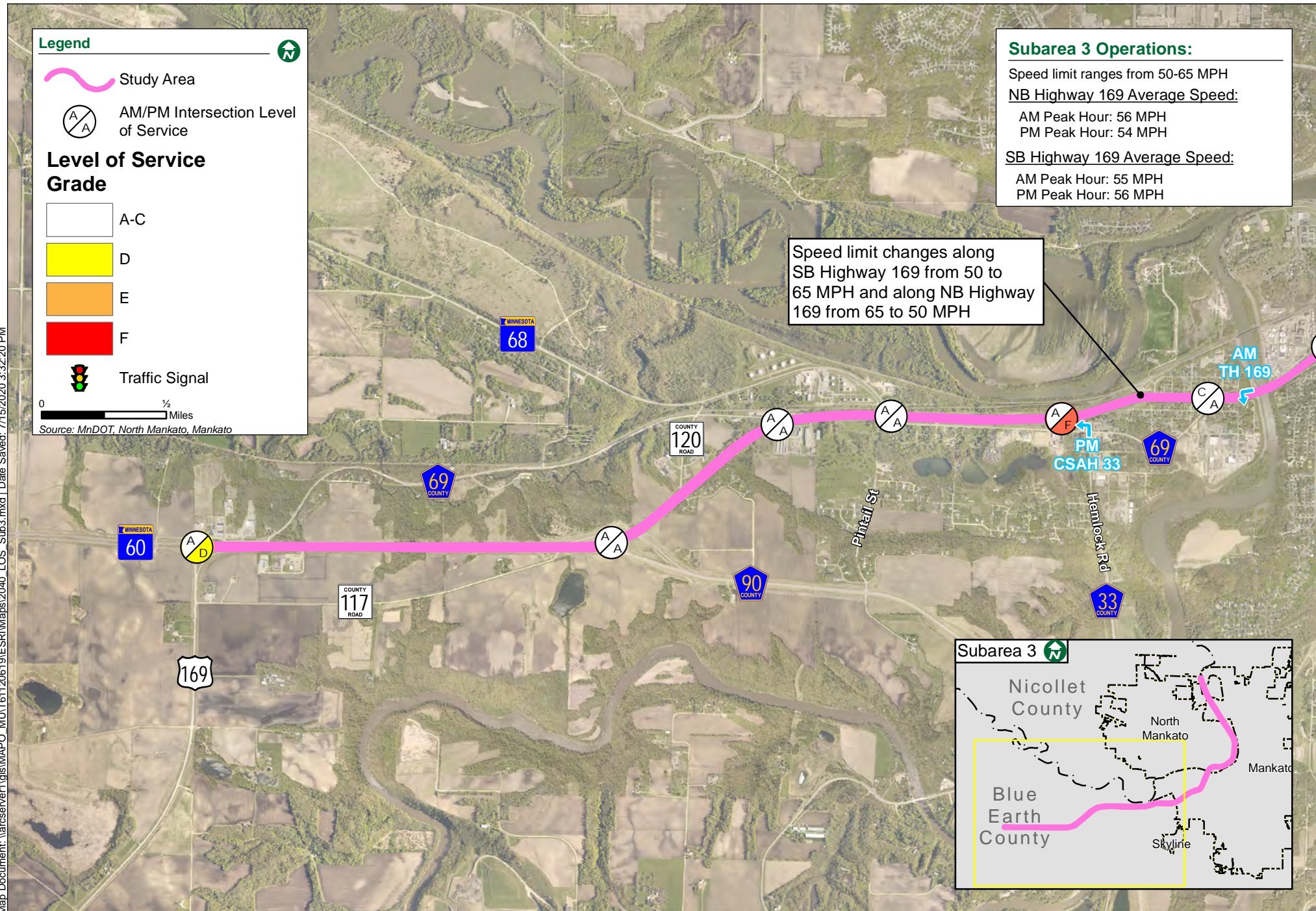


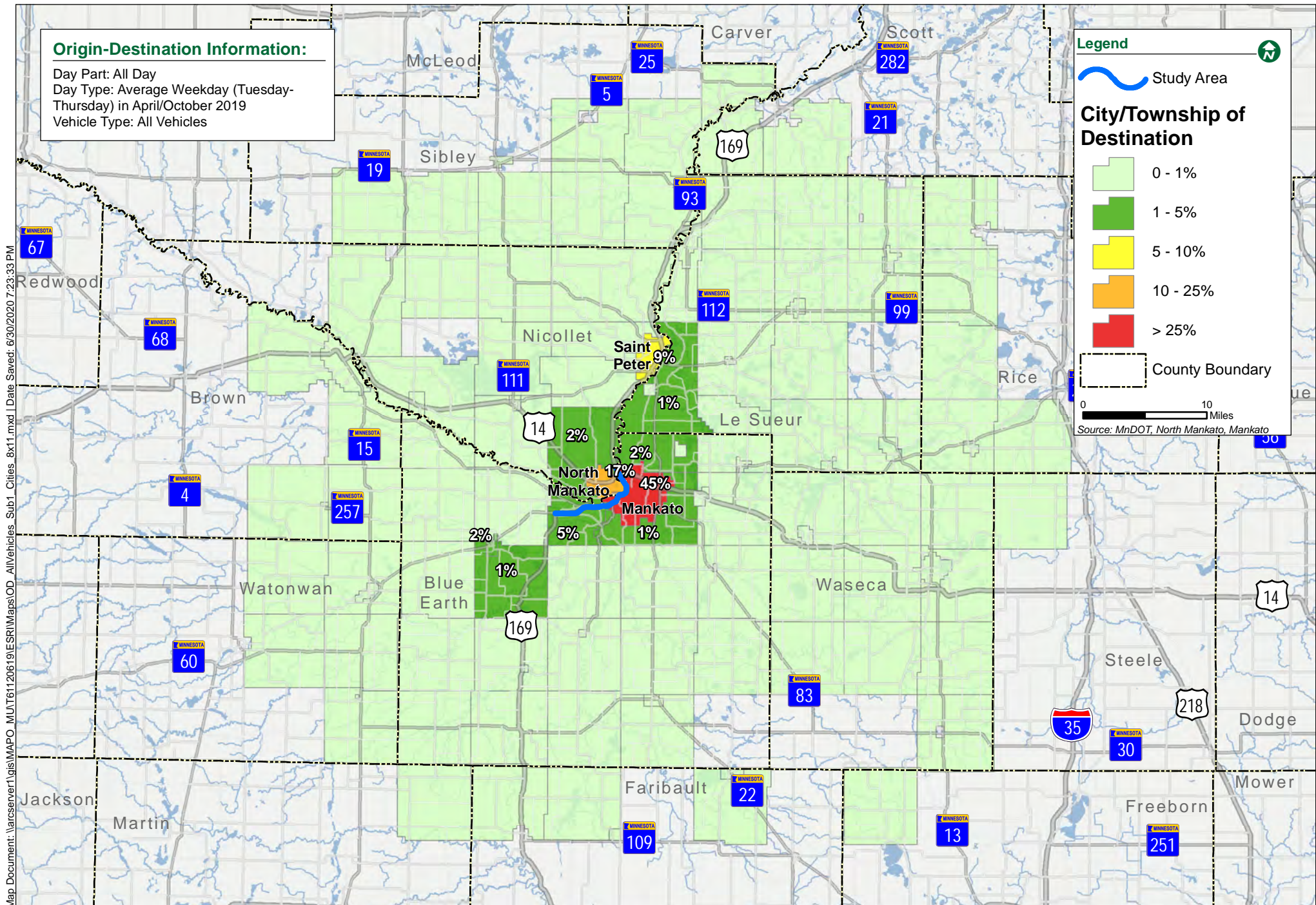


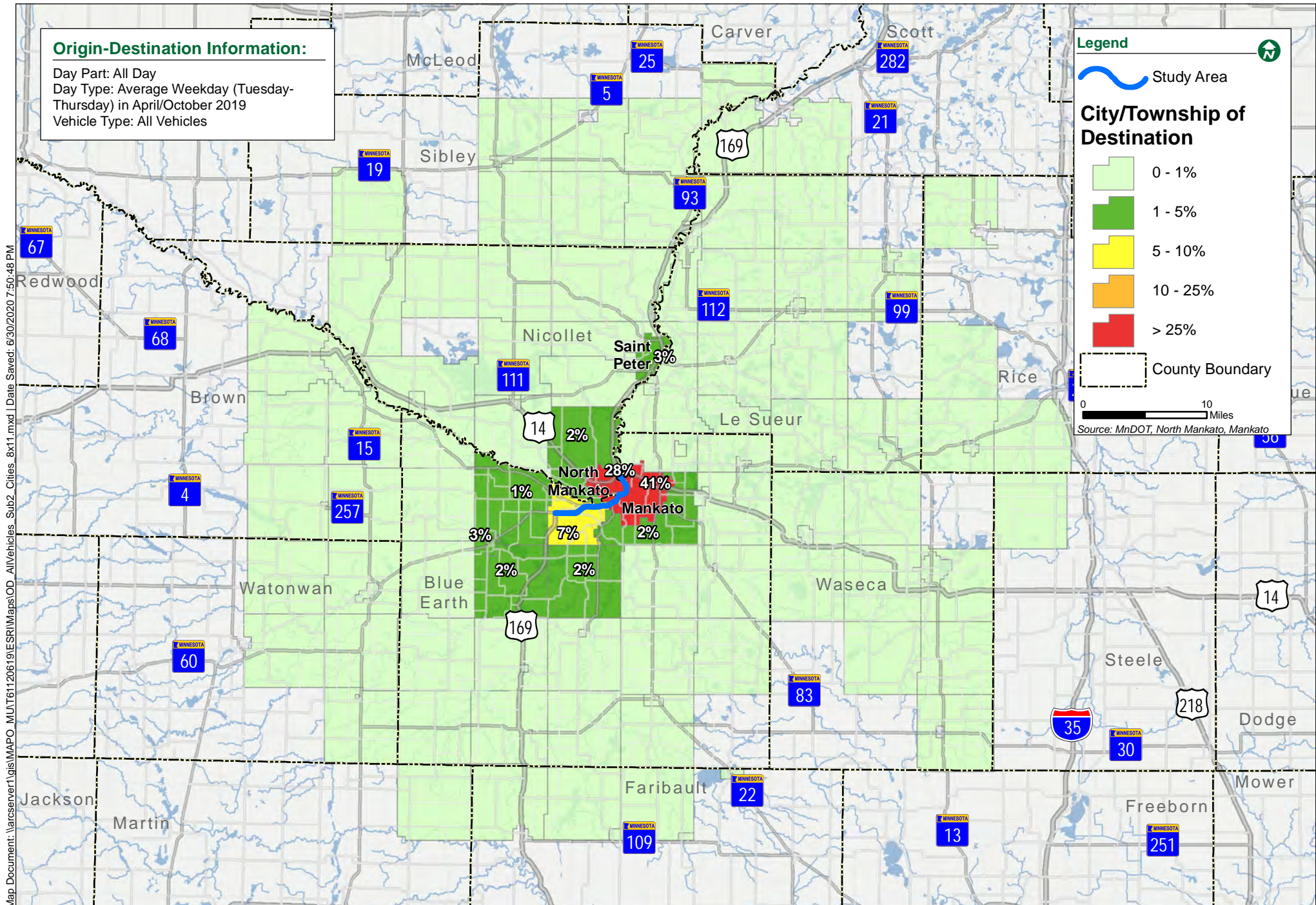


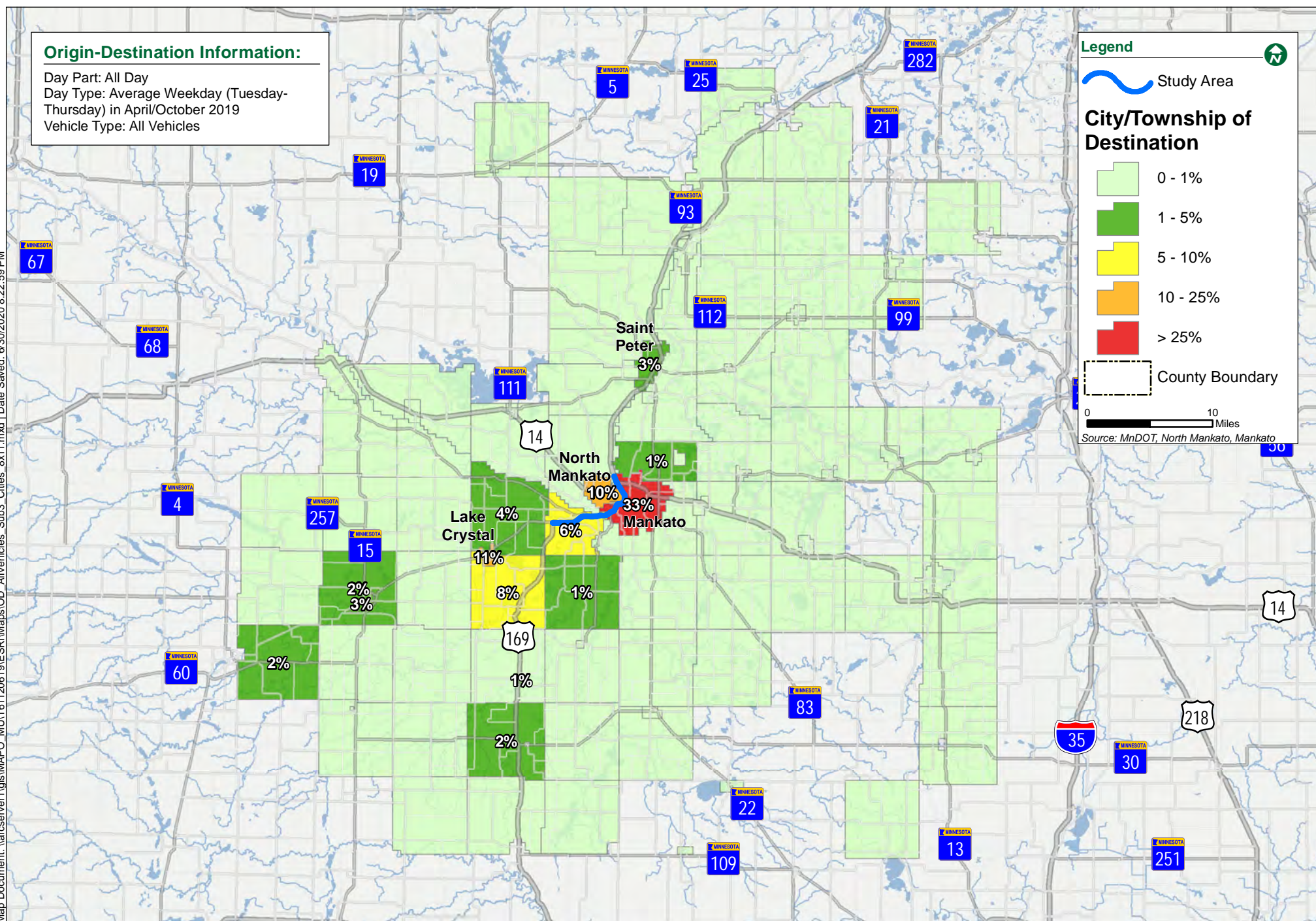


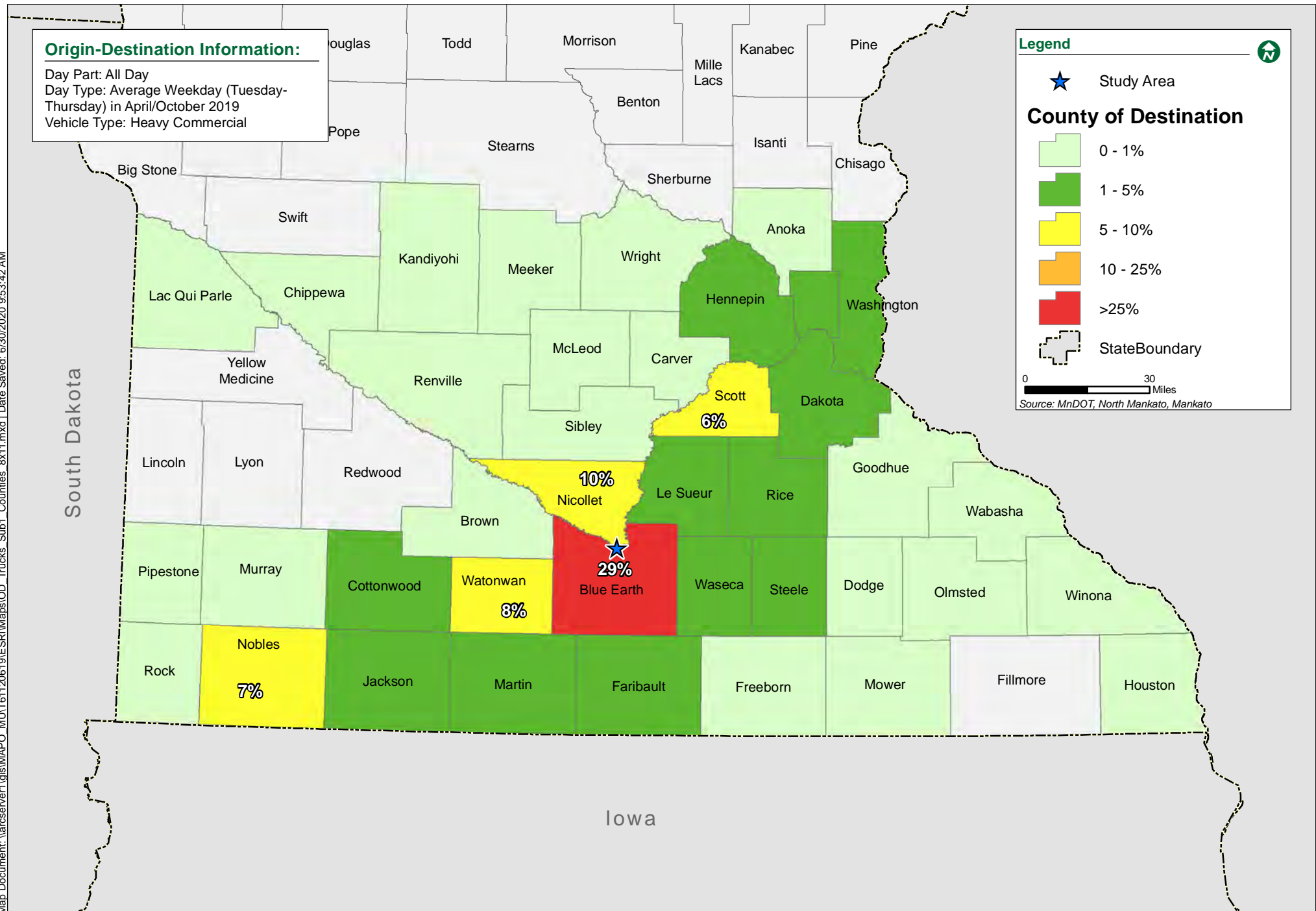


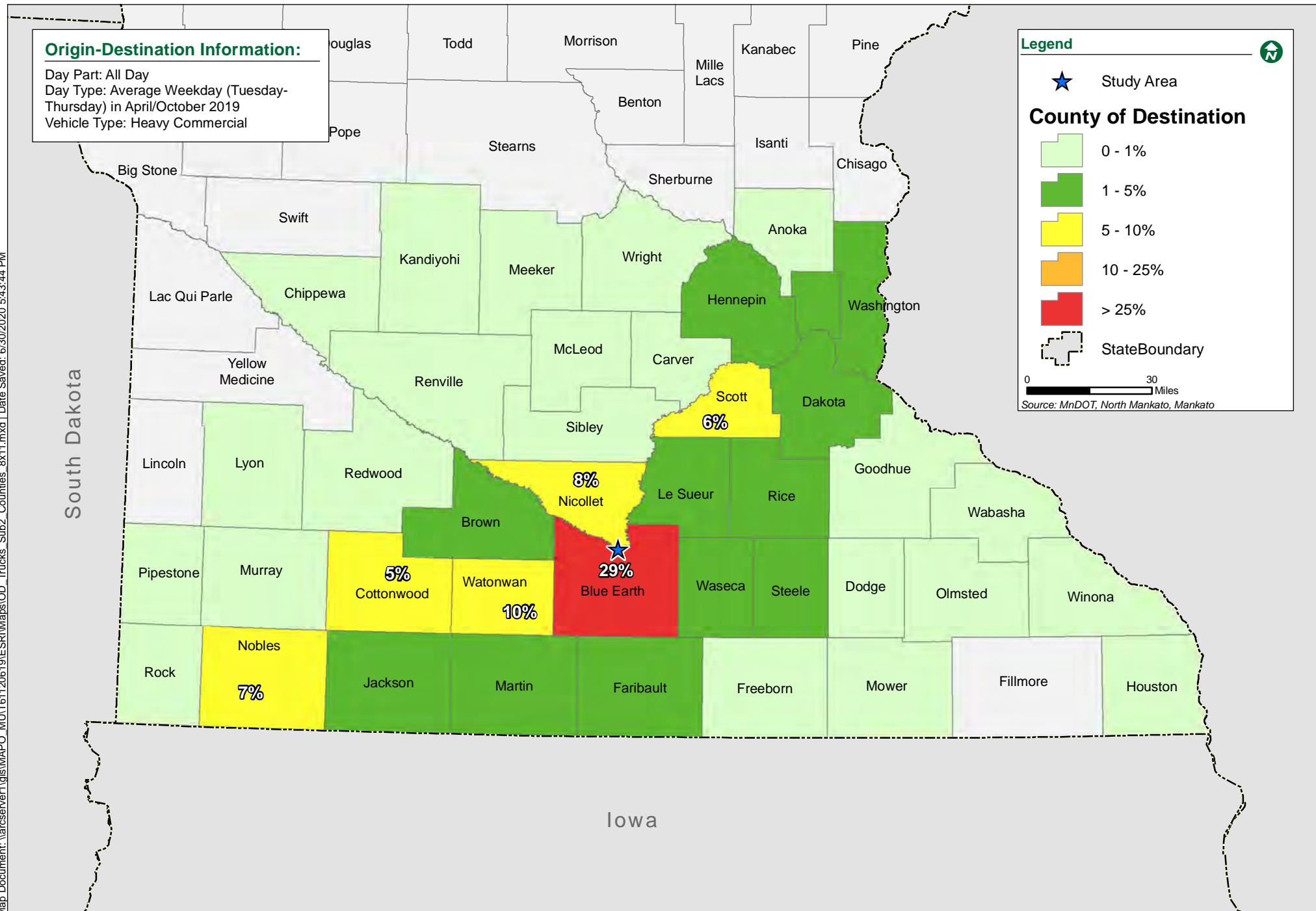












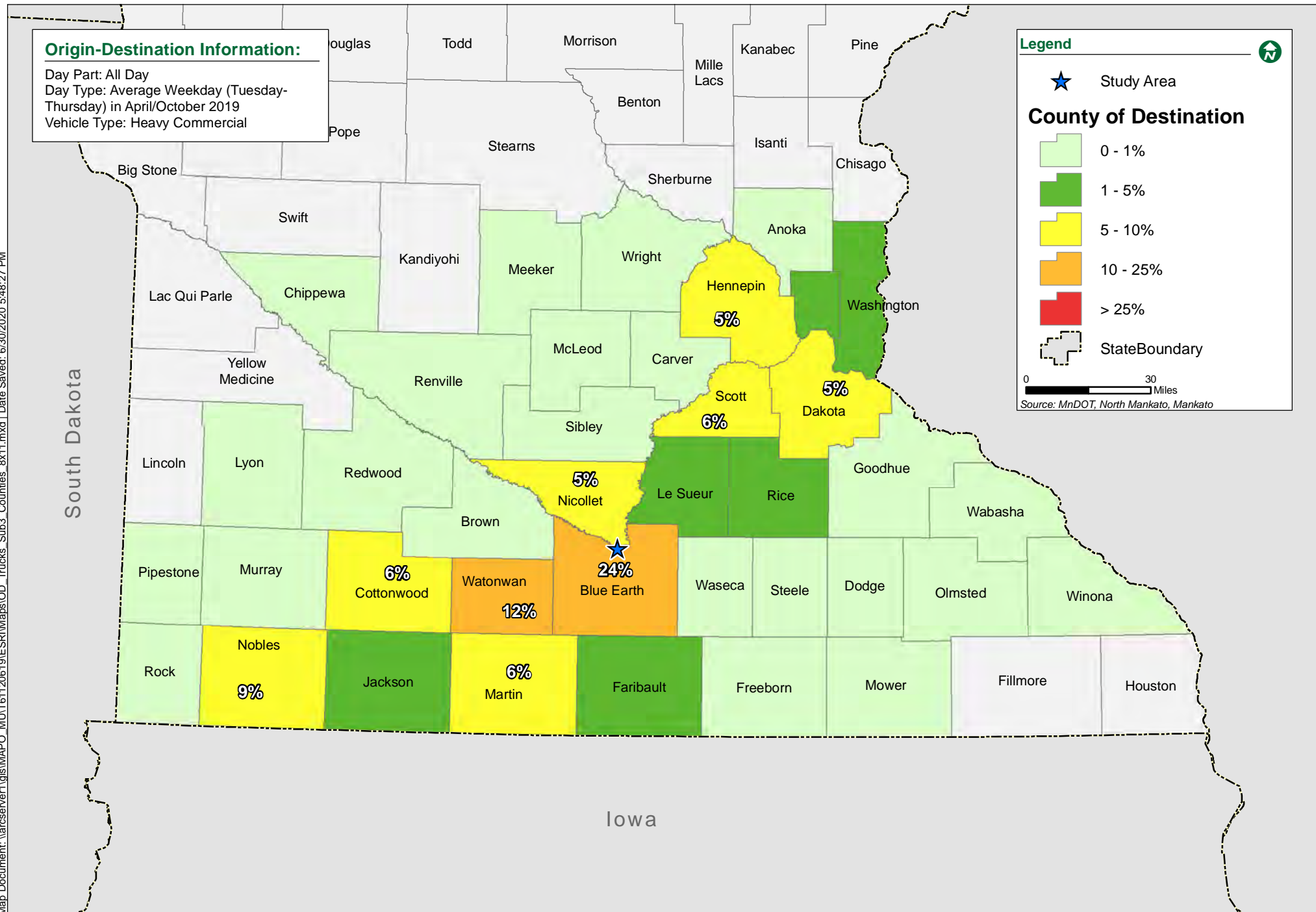


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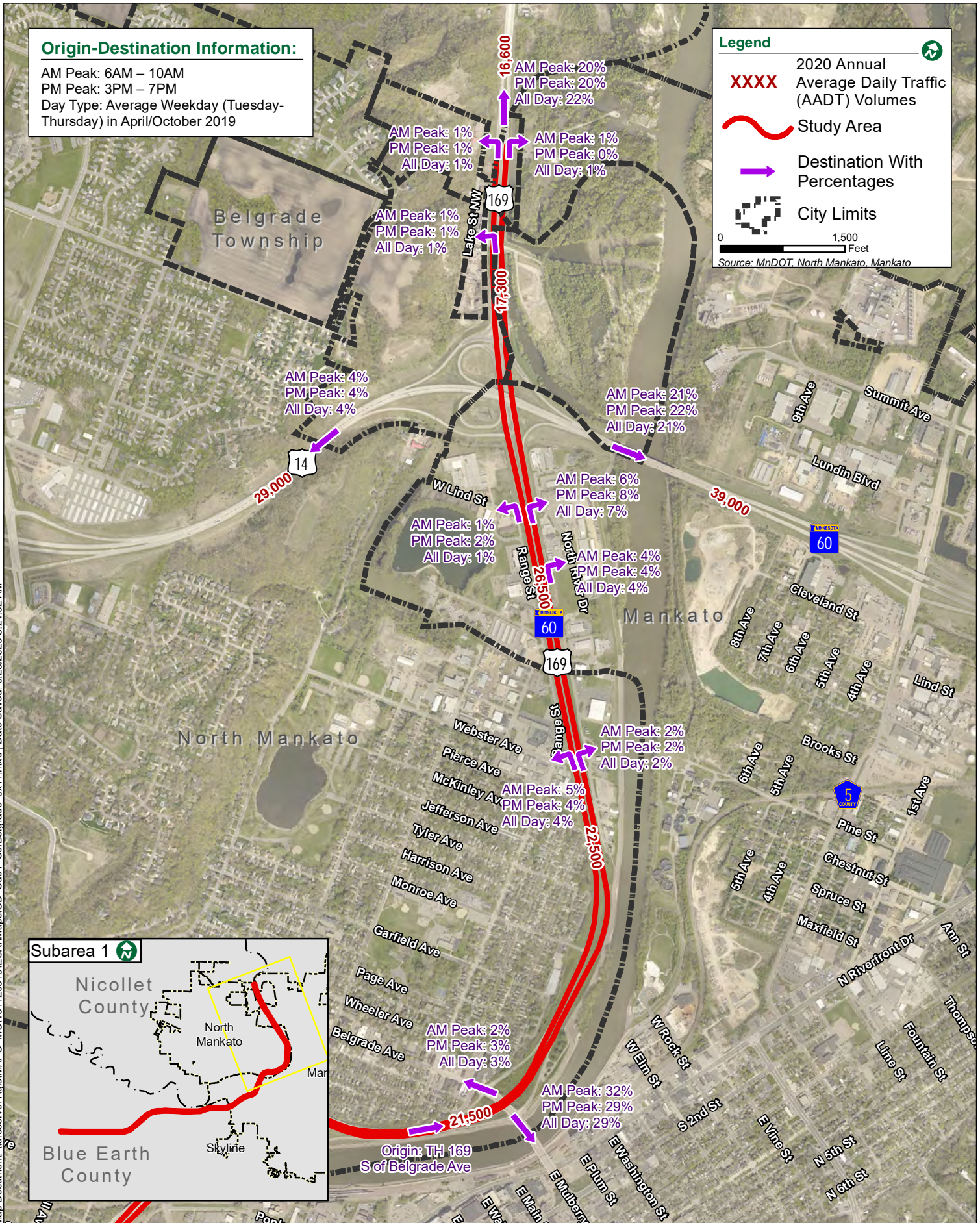
Highway 169 Corridor Study Subarea 1 - Origin: TH 169 S of Belgrade Ave (All Vehicles)

Mankato/North Mankato Area Planning Organization (MAPO)

August 2020



Real People. Real Solutions.



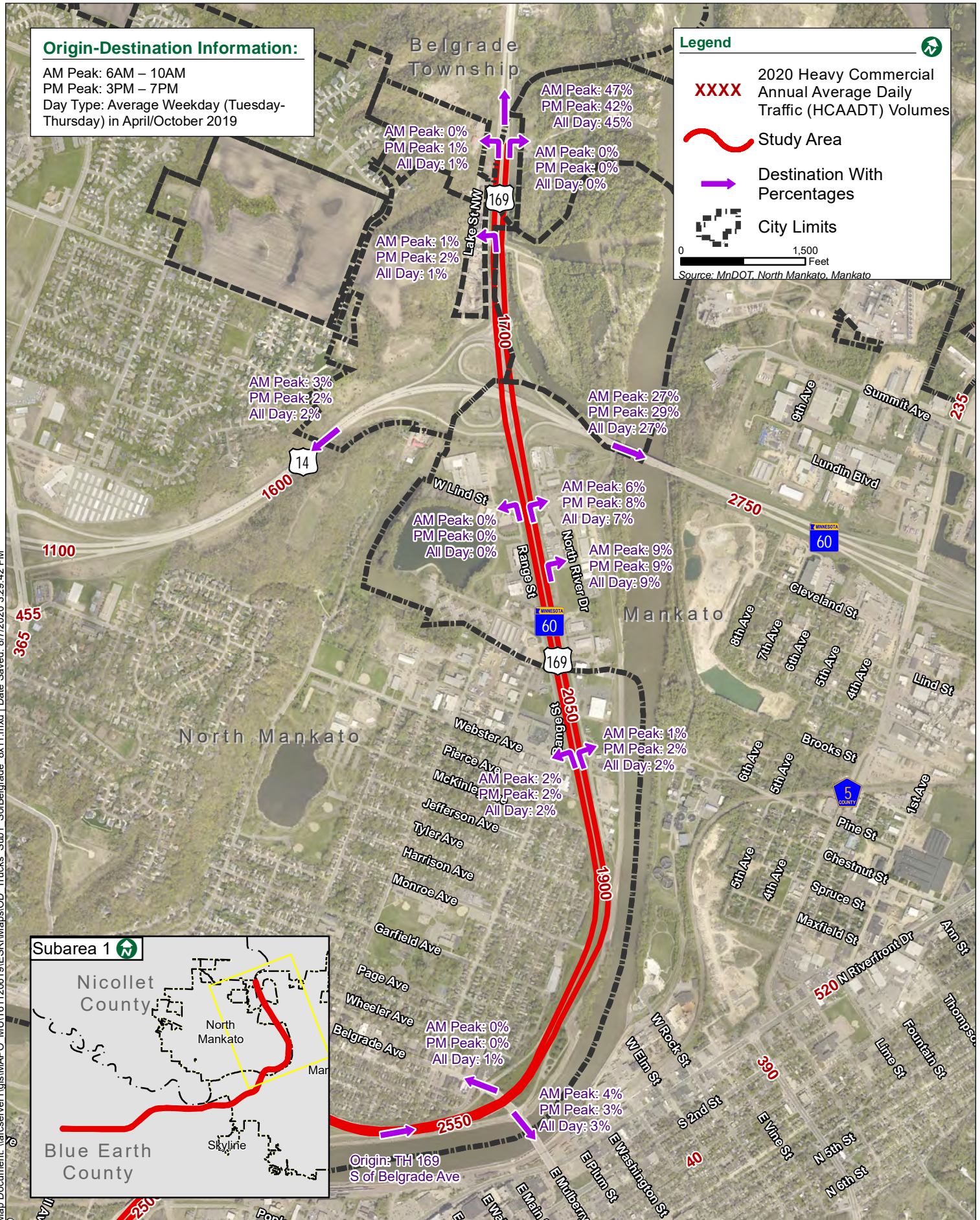
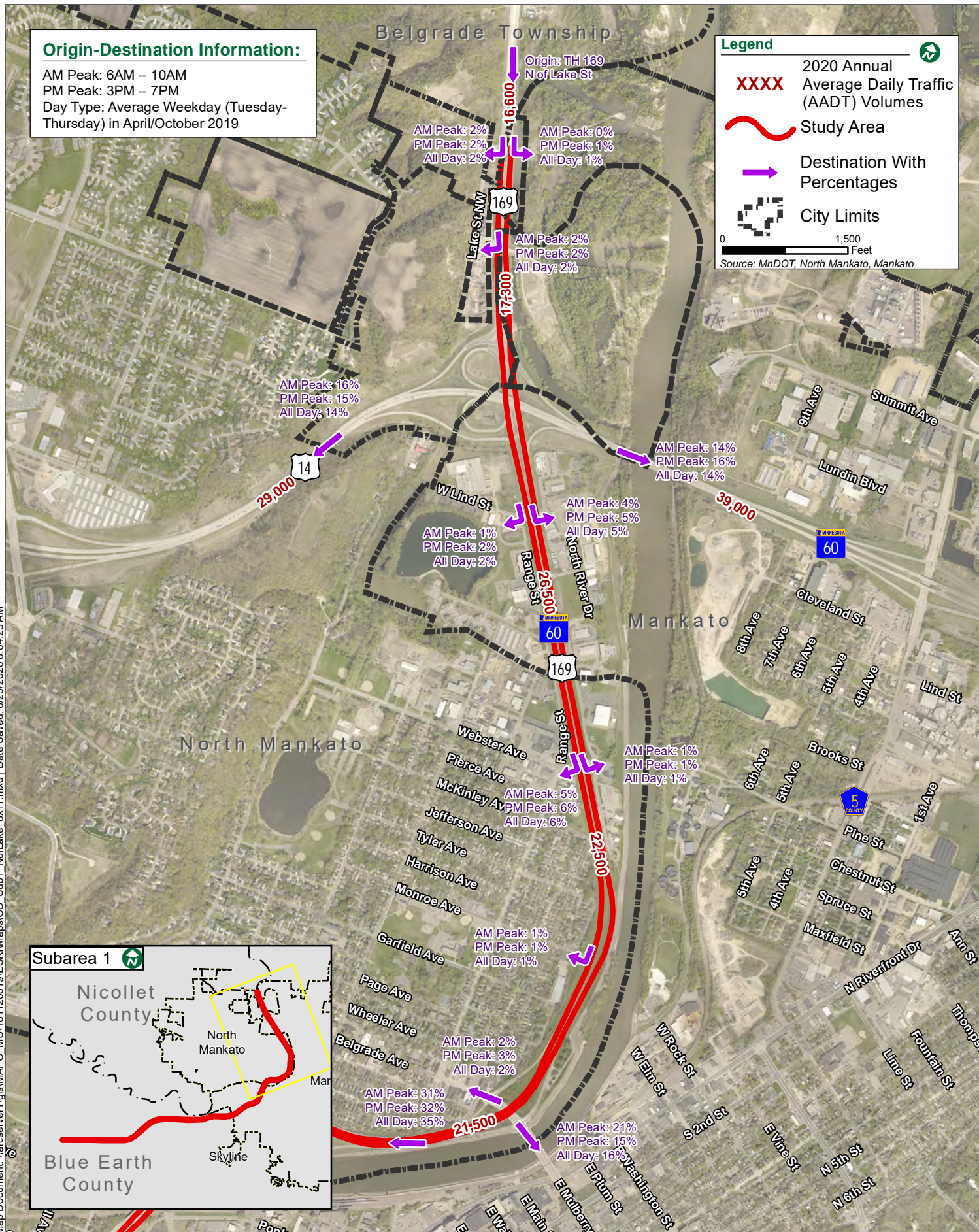
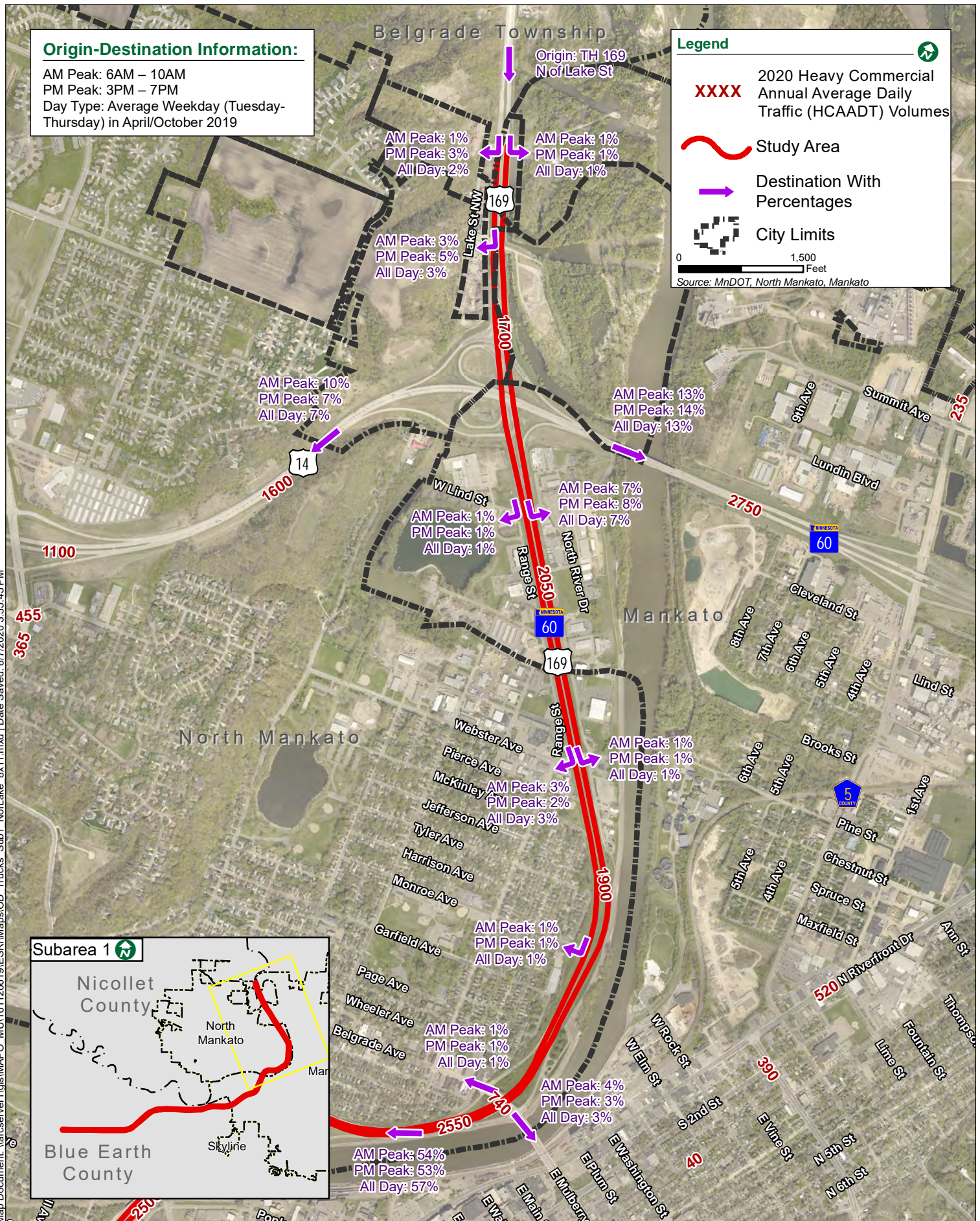
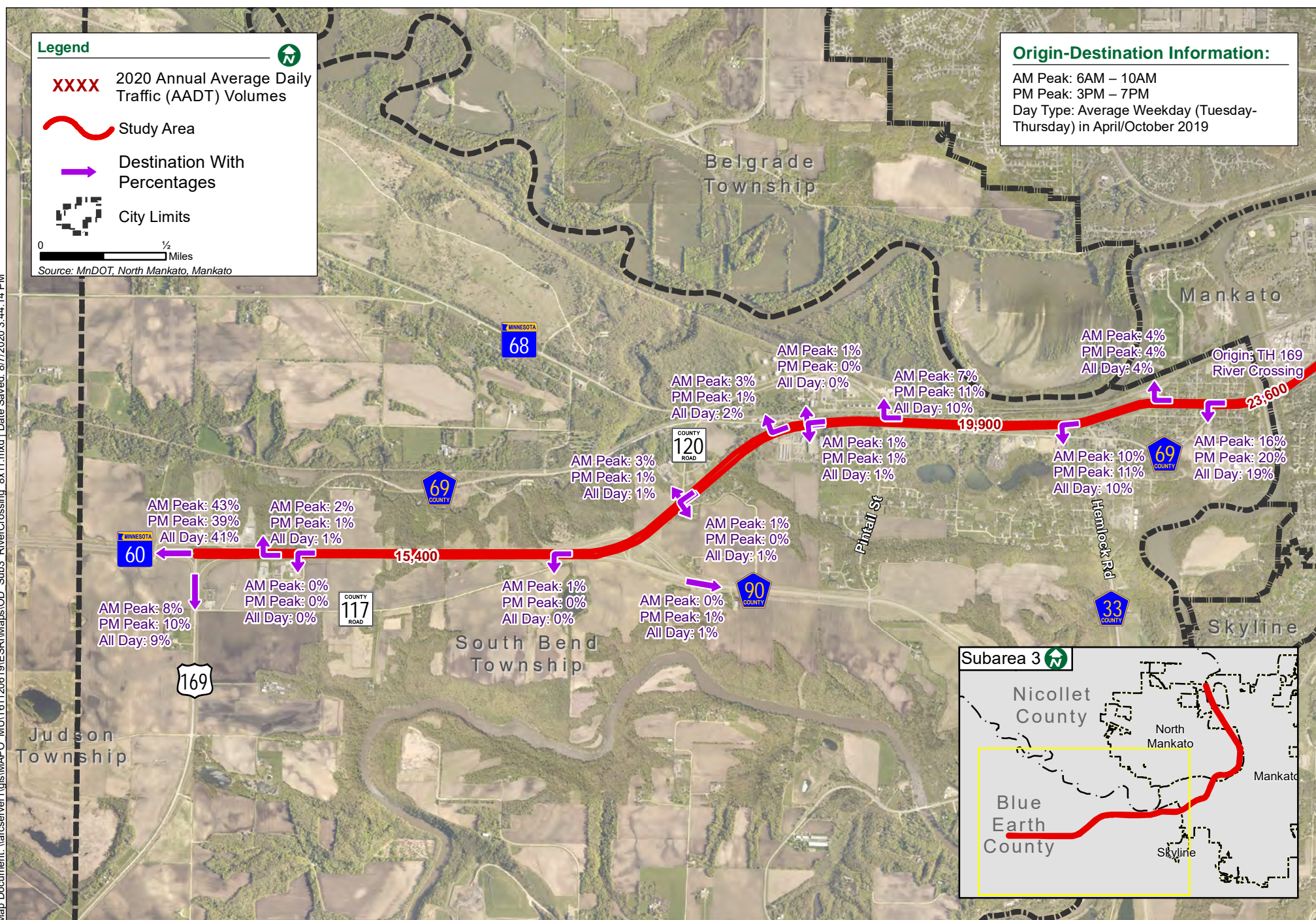
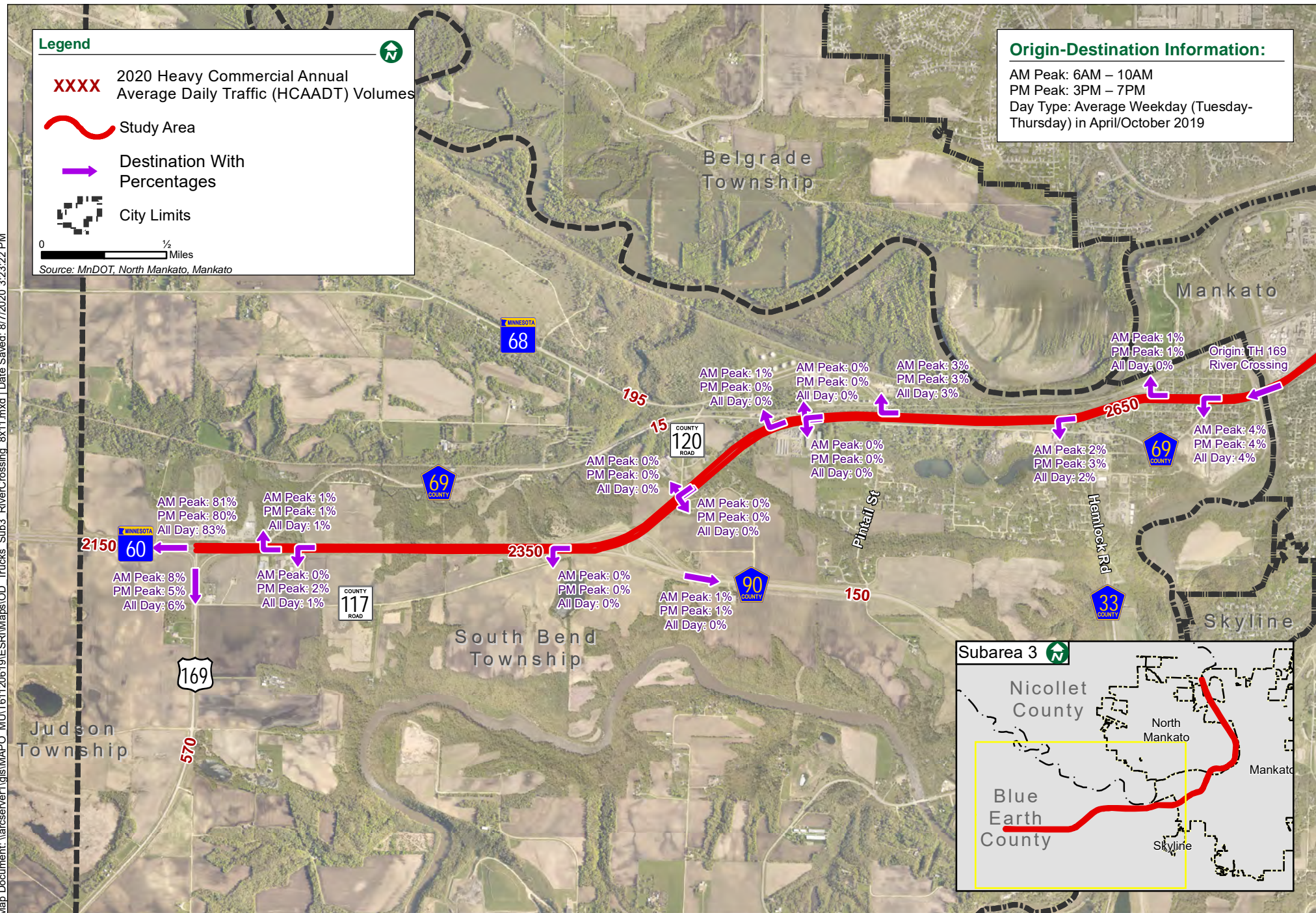


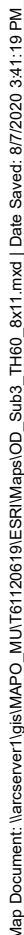
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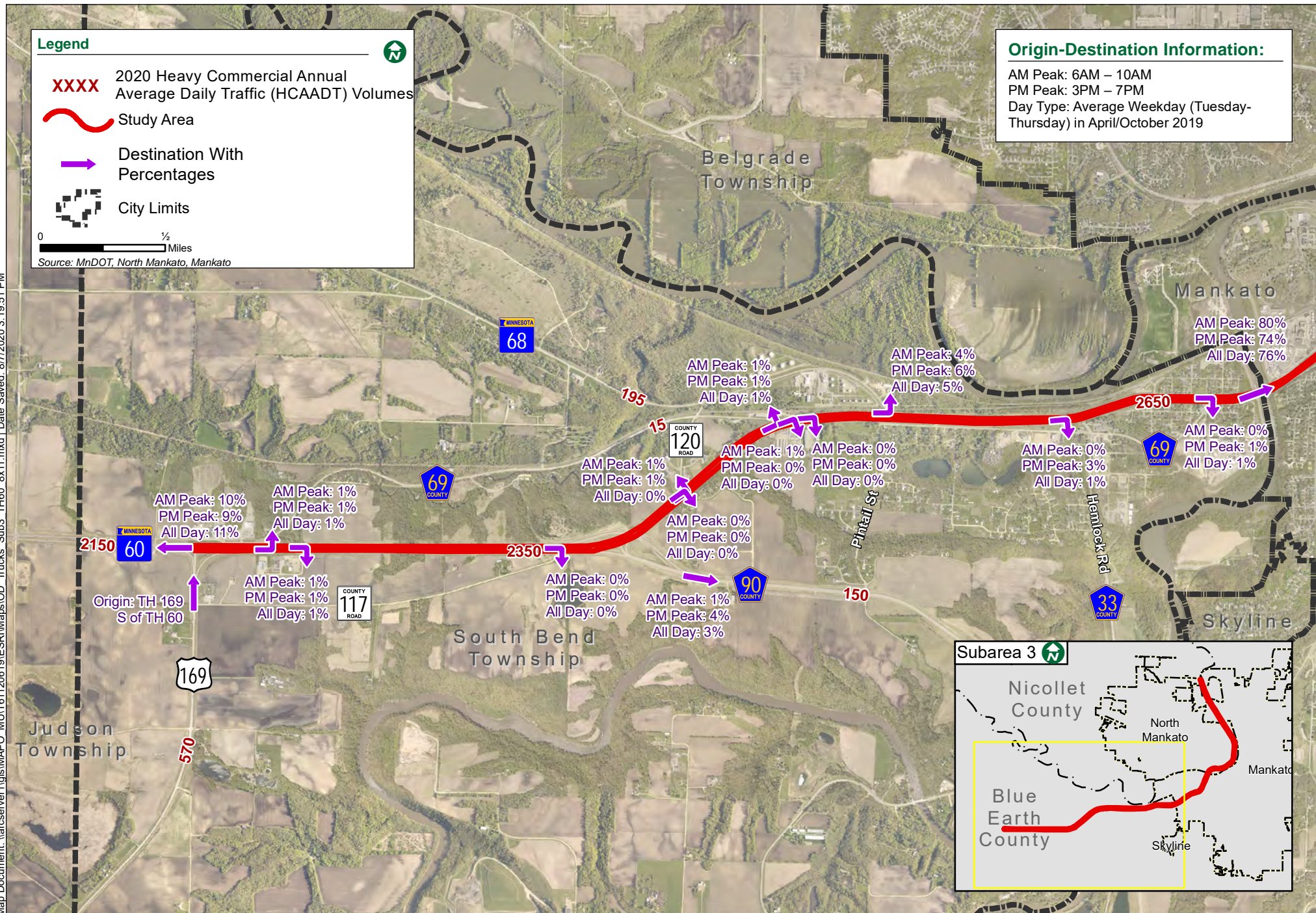


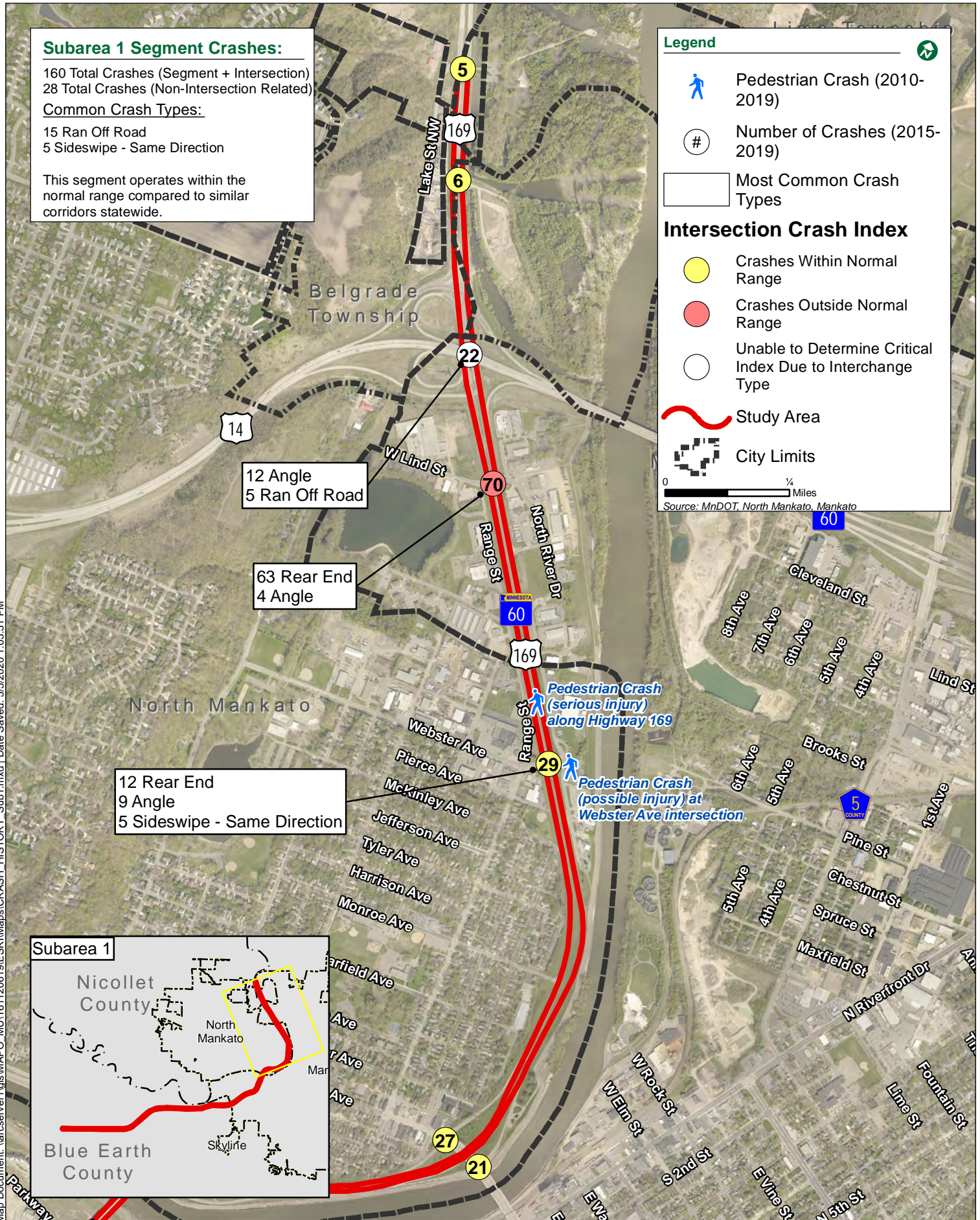


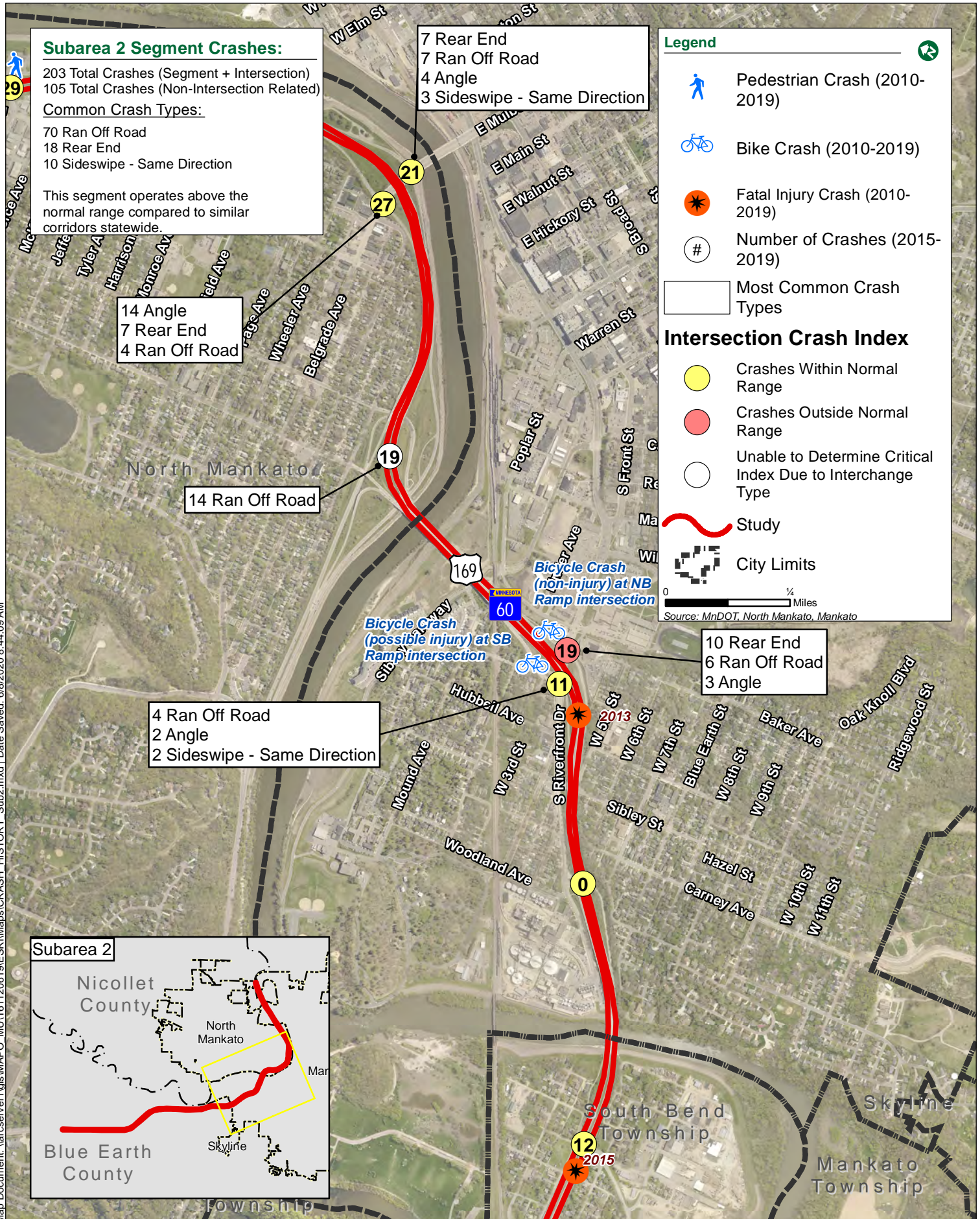


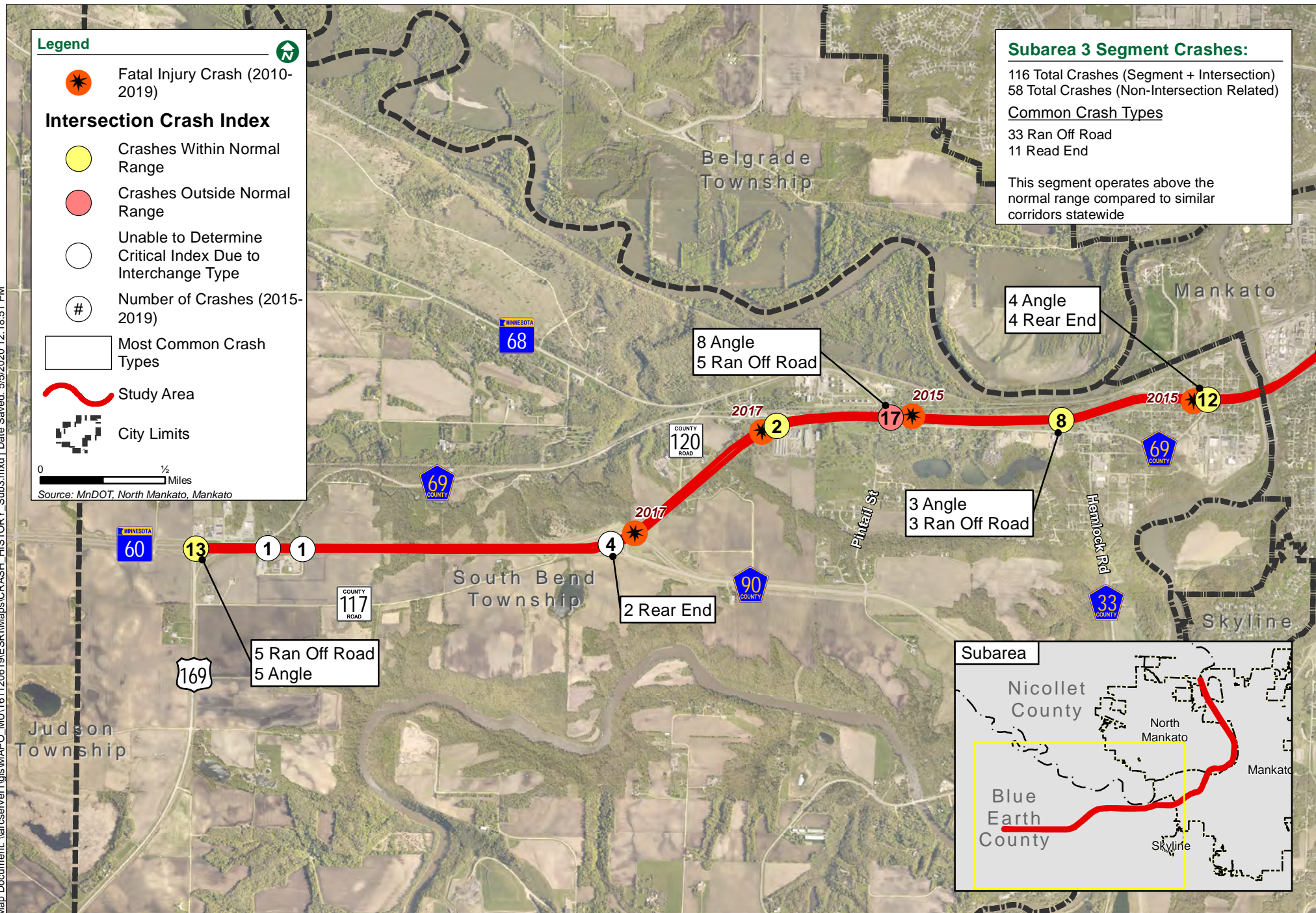


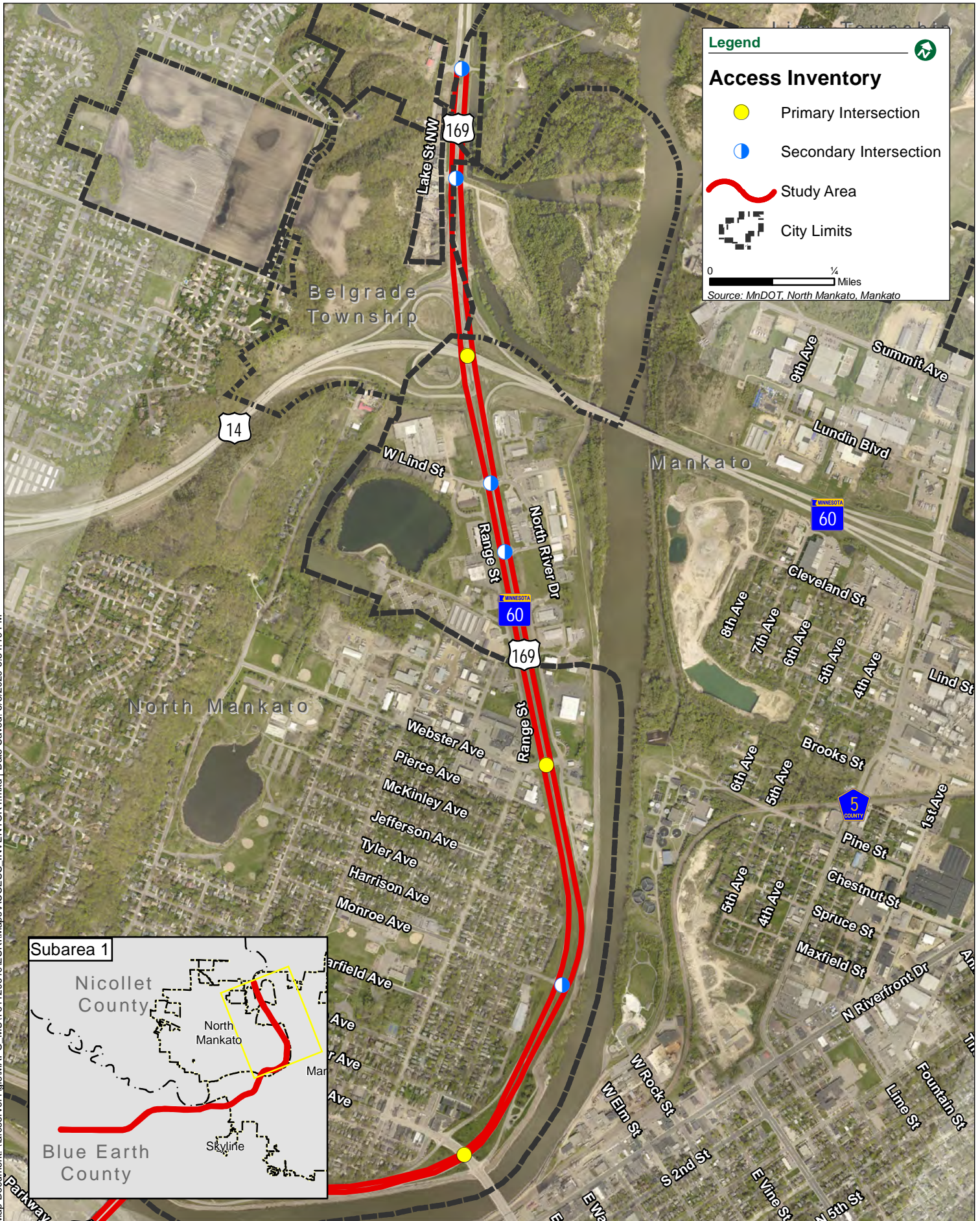


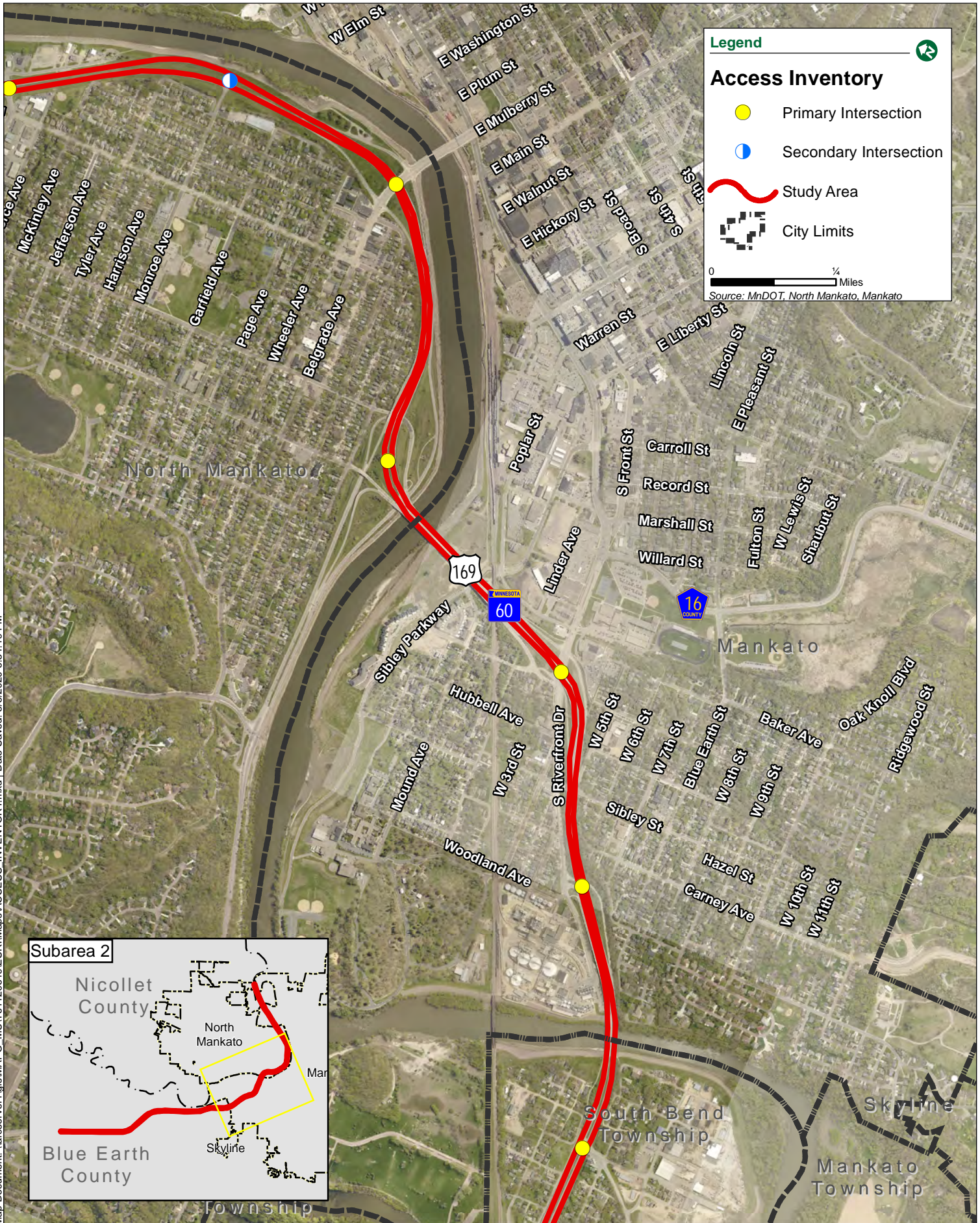


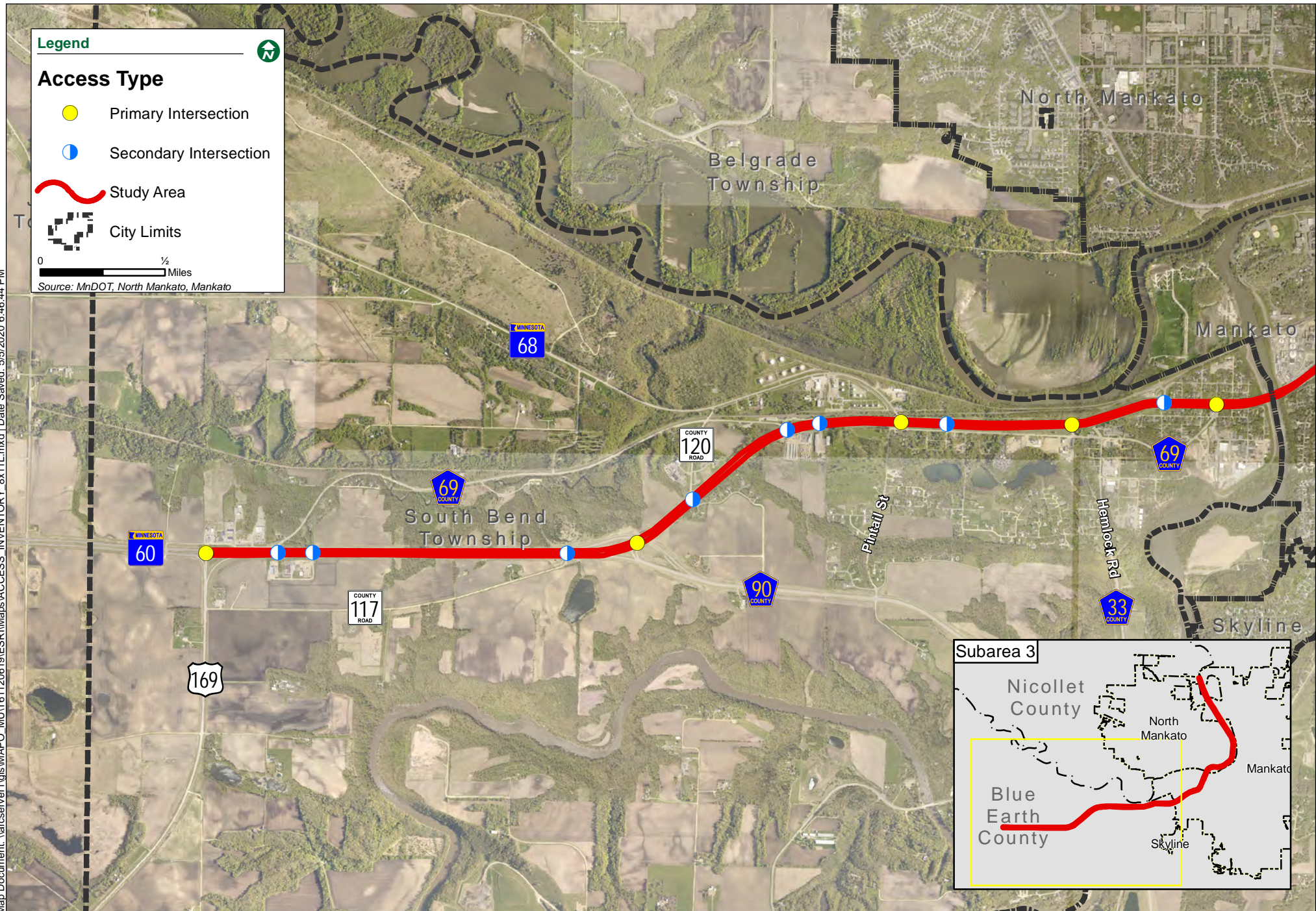


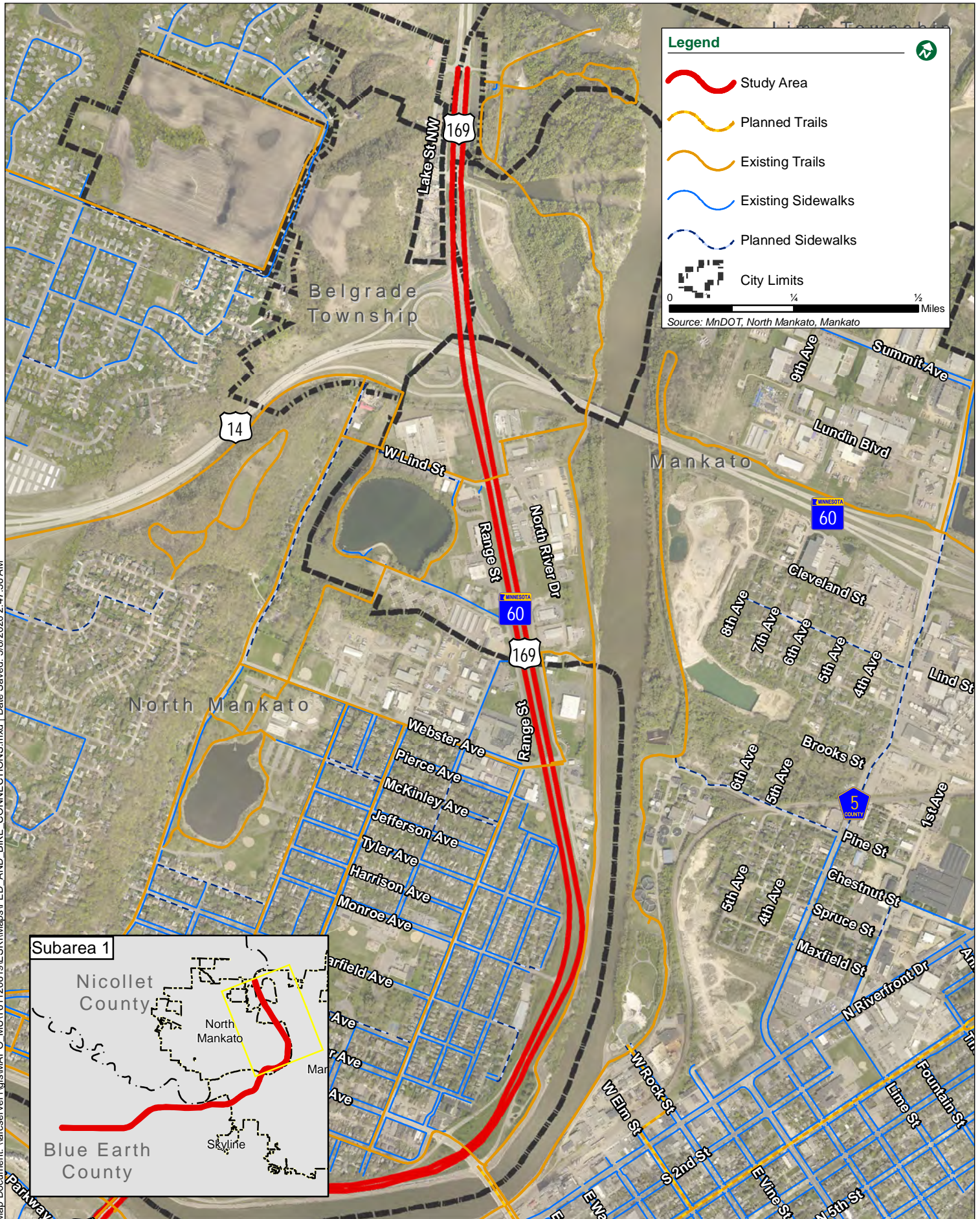


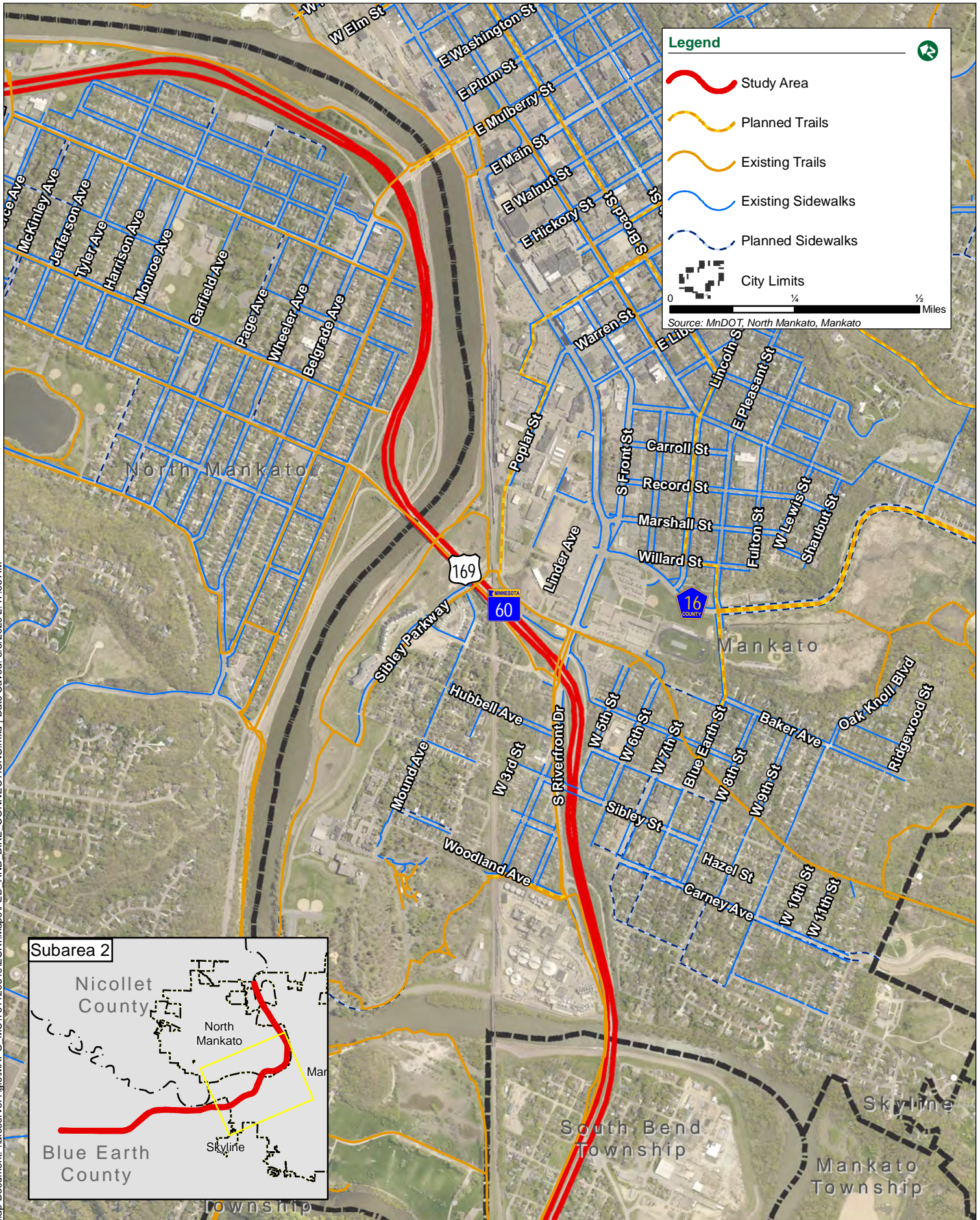


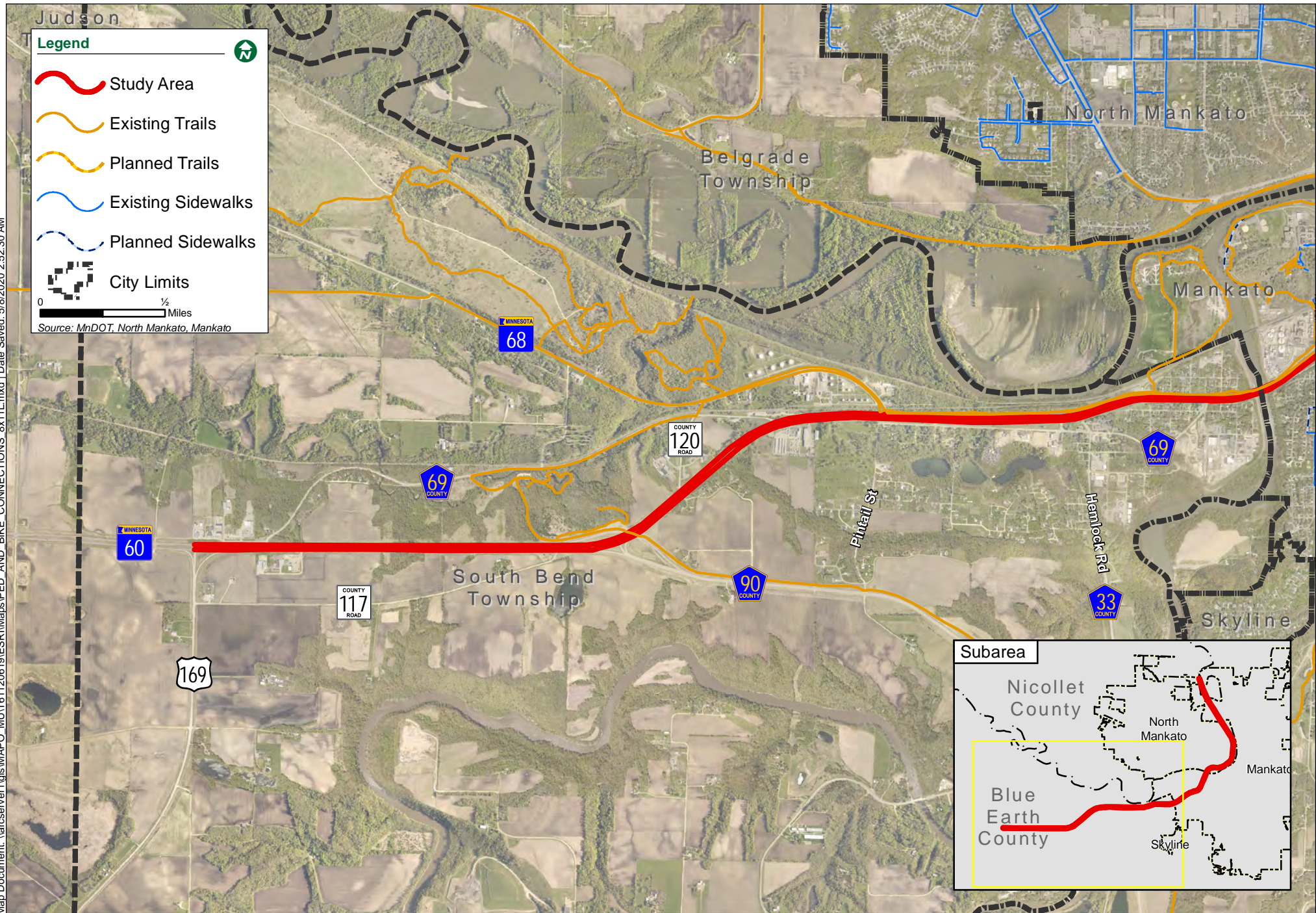




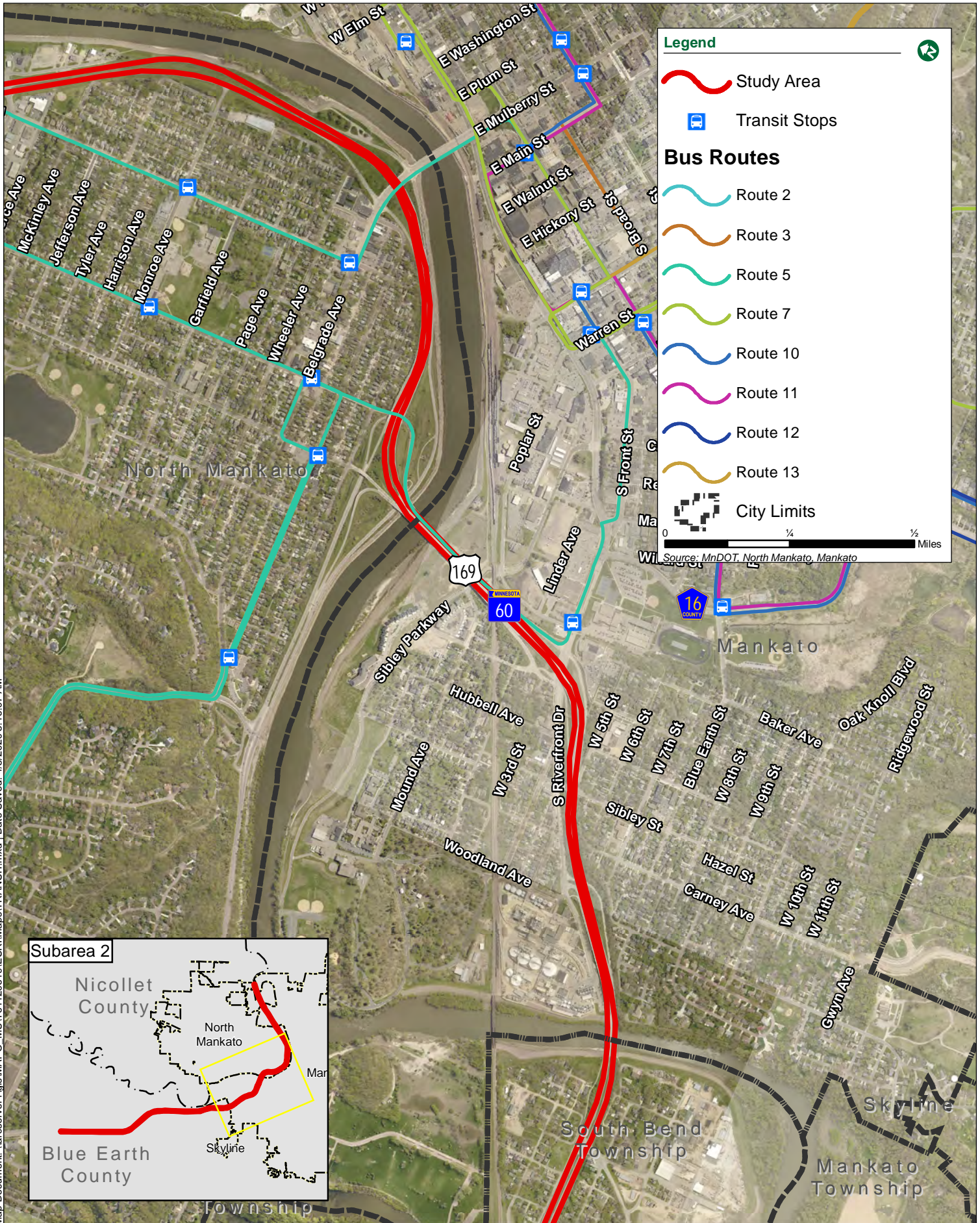


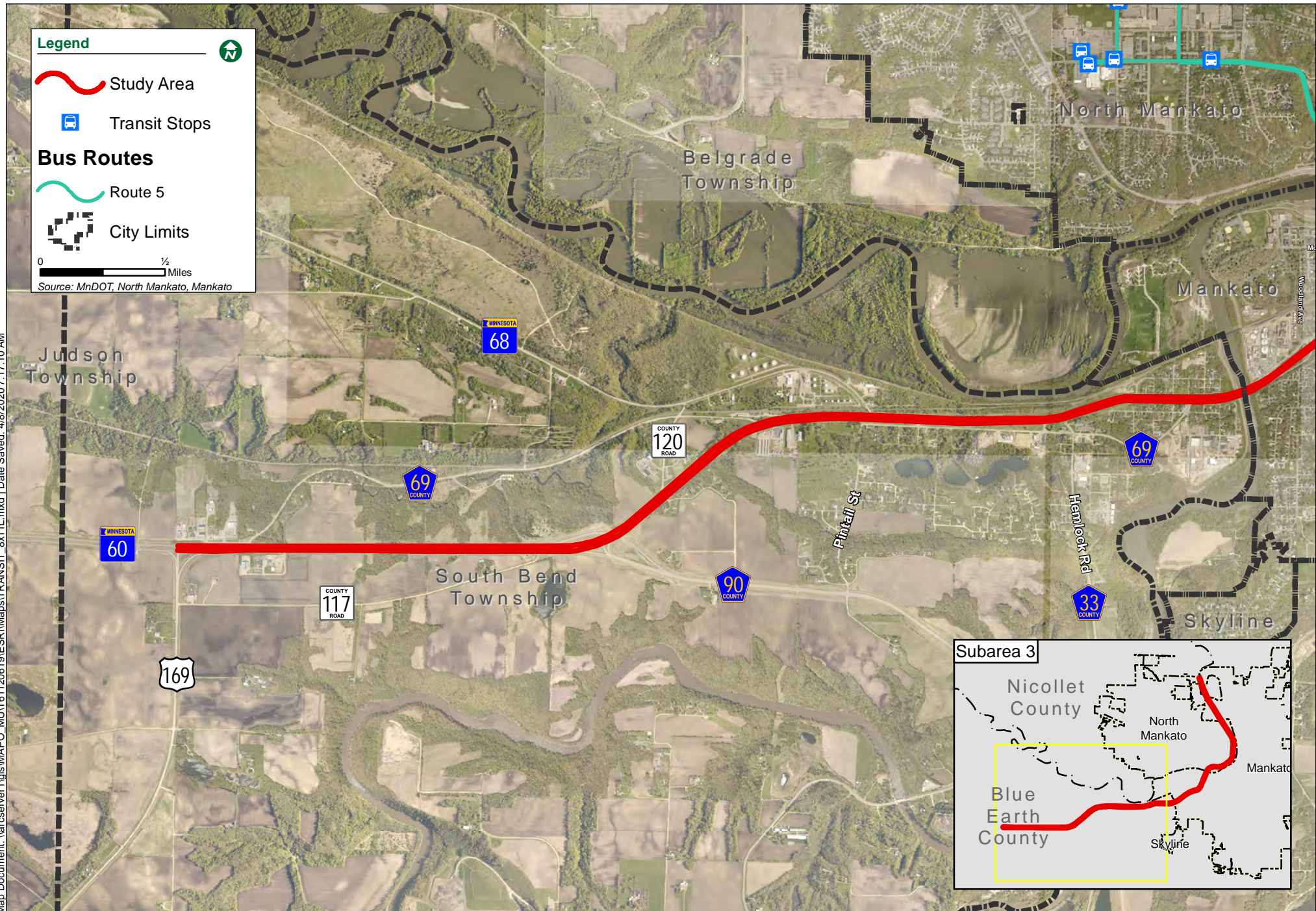












Existing & No-Build Conditions Appendix B: Environmental Justice Analysis



MAPO

MANKATO/NORTH MANKATO
AREA PLANNING ORGANIZATION

Highway 169 Corridor Study

Final Environmental Justice Analysis

Date: June 8, 2020

To: Charles Androsky, Transportation Planner, MAPO

From: Dan Edgerton, Principal, Zan Associates

Subject: *Environmental Justice Analysis*

Highway 169 Corridor Study

Mankato/North Mankato Area Planning Organization (MAPO)

Table of Contents

I. Background.....	2
II. Demographics.....	2
A. Overview.....	2
B. Minority Populations.....	3
C. Low-Income Populations	4
D. Education	5
E. Language.....	6
F. Age.....	6
G. Housing	6
H. Disability	6
I. Households Without a Vehicle.....	7
III. Findings.....	7
References	7

Tables

Table 1: Environmental justice populations in Hwy 169 project area

Figures

Figure 1: Percent of minority individuals by block group in the Hwy 169 project area

Figure 2: Percent of low-income individuals by block group in the Hwy 169 project area

I. Background

Executive Order 12898 (1994), *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, must be addressed if impacts result in an adverse and disproportionately high impact on minority or low-income communities. Minority and low-income populations are “readily identifiable groups...who live in geographic proximity, and if circumstances warrant, geographically dispersed/transient persons...who will be similarly affected by a proposed DOT program, policy or activity” (U.S. DOT, 2012).

Environmental justice populations are minority and/or low-income populations that are meaningfully greater than those of the general population. “Meaningfully greater” for environmental justice populations is generally defined as one where the minority or low-income population is either 10 percent higher than the county average, or greater than 50 percent of the total geographic unit, or determined based on input from local officials or stakeholders (FHWA Office of Human Environment, 2012).

In addition to minority and low-income populations, the EPA also uses education, language, and age demographic indicators to determine a community’s potential susceptibility to environmental impacts associated with construction activities. In addition to these indicators, this analysis also looks at housing indicators to determine susceptibility to environmental impacts.

II. Demographics

A. Overview

The Hwy 169 corridor is located in Blue Earth and Nicollet Counties in Minnesota. The two counties combine for a population of 99,244 (Table 1). The corridor study area consists of census block groups that either fall significantly within 0.5 miles of the Hwy 169 project corridor or is a key location just outside the 0.5-mile radius. There are 21 block groups in the Hwy 169 analysis area which have a population of 30,797 people according to the 2017 American Community Survey 5-year Estimates (2017) (Table 1).

Table 1: Environmental justice populations in Hwy 169 project area

		Hwy 169 Project Area		Nicollet and Blue Earth Counties, MN	
		Count	Percent	Count	Percent
Race and ethnicity	Population	30,797	—	99,244	—
	White	27,691	90%	88,457	89%
	Minority population	3,548	12%	12,729	13%
	Hispanic or Latino	822	3%	3,562	4%
	African American	1,149	4%	3,141	3%
	Asian or Pacific Islander	442	1%	1,954	2%
	Two or more races	555	2%	1,806	2%
	Native American	66	0.2%	245	0.2%
	Some other race	72	0.2%	79	0.1%
Income	Population for whom poverty status is determined	30,420	—	93,466	—
	Income below 200% of the poverty level	8,510	28%	14,835	16%
Education	25 years and older	20,386	—	59,878	—
	Less than high school education	941	5%	3,525	6%
Language	5 years and older	28,781	—	93,641	—
	Speak English less than "very well"	387	1.3%	1,719	2%
	Speak Spanish	31	0.1%	705	0.8%
	Speak and other language	282	1%	466	0.5%
	Speak an Asian language	73	0.3%	457	0.5%
	Speak an Indo European language	1	0%	91	0.1%
Age	Population	30,797	—	99,244	—
	Under 5 years	2,016	7%	5,603	6%
	65 years and older	4,205	14%	13,384	13%
Housing	Households	12,729	—	38,220	—
	Owner occupied households	8,472	67%	25,066	66%
	Renter occupied households	4,257	33%	13,154	34%
Disability	Population for whom disability status is determined	35,555*	—	98,443	—
	Population with a disability	3,792*	11%	10,240	10%
Vehicles	Households	5,042*	—	38,220	—
	No vehicle households	539*	11%	2,654	7%

*Data from census tracts. All other data is from the block group level.

B. Minority Populations

Minority populations includes individuals who identify as Hispanic or Latino, Black or African American, Asian American or Pacific Islander, Native American, some other race, or two or more races, as defined by the U.S. Census Bureau. A minority population is considered an environmental justice population for this analysis if a block group in the study area contains a minority population that is 10 percent higher than the Blue Earth and Nicollet County's overall minority population. Since 13 percent of Blue Earth's and Nicollet's

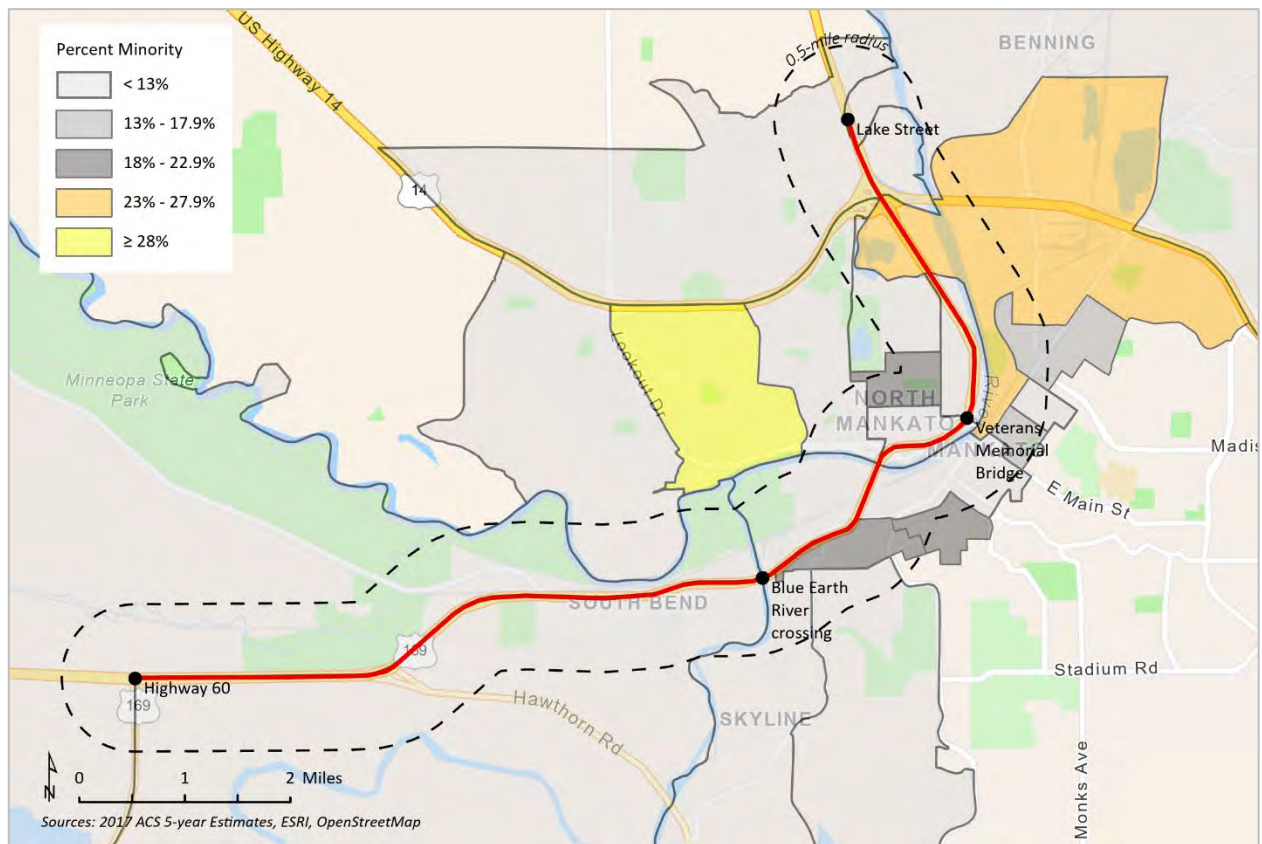
populations are considered minorities, we are interested in block groups in the Hwy 169 study area that have 23 percent or greater minority populations.

There are two block groups above 23 percent minority populations that fall within the project area (Figure 1). Due to the significantly greater minority population compared to the general population than the counties, both of these block groups can be considered environmental justice populations.

The yellow block group north of the Minnesota River has the highest concentration of minority individuals in project area with 34 percent (Figure 1). The block group contains a number of large multi-unit dwellings as well as several other smaller multi-unit dwellings and single-family homes. The orange block group that crosses the segment between Lake Street and Veterans Memorial bridge south of Hwy 14 has mostly businesses west of the Minnesota River, with the notable exception of the townhomes south of Hiniker Pond.

To reach minority populations, staff could contact the Mankato Islamic Center (329 N Broad St) or Dar Abi Bakr Islamic Center (329 E Plum St) to conduct a listening session with the community leaders.

Figure 1: Percent of minority individuals by block group in the Hwy 169 project area



C. Low-Income Populations

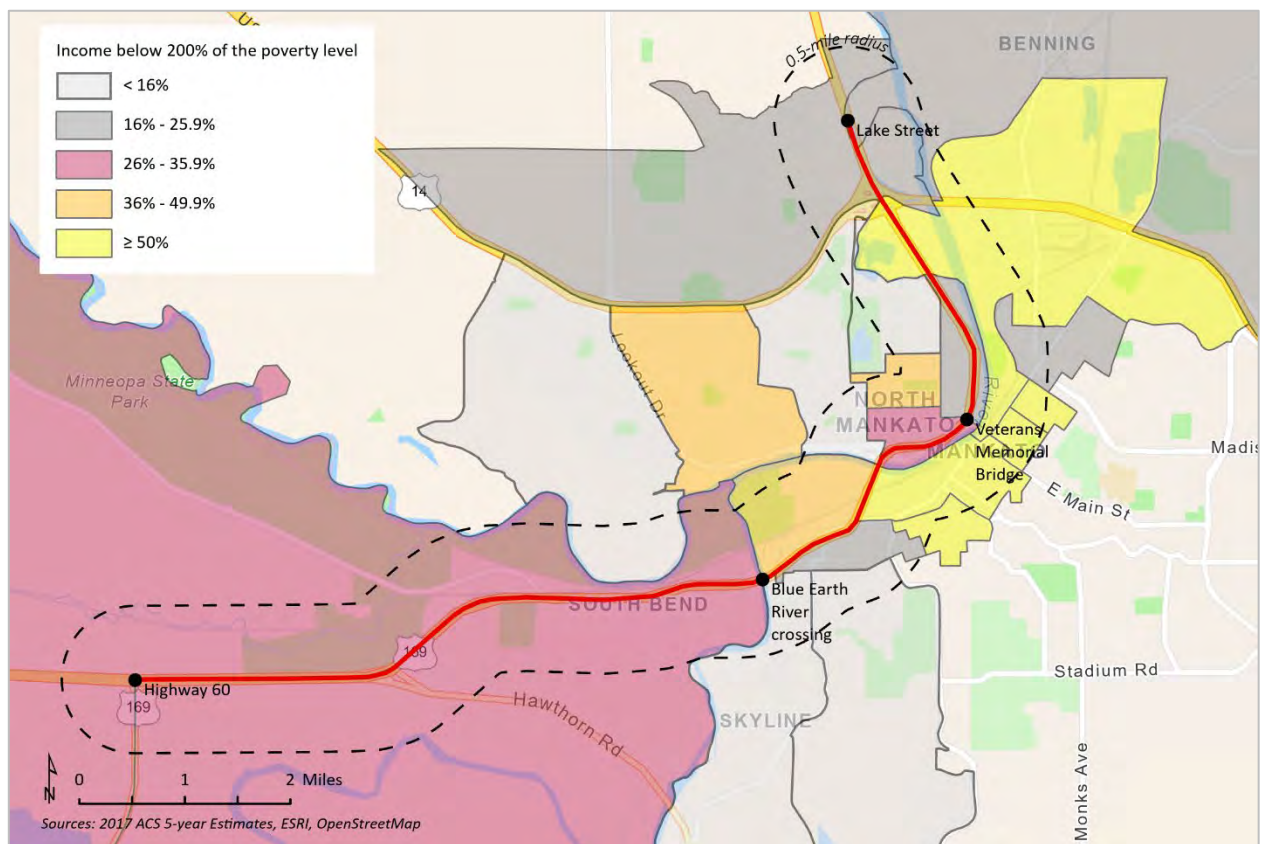
Low income is approximated by census reporting of individuals with income below 200 percent of the poverty level. A low-income population is defined as one where the block group contains a 10 percent

higher concentration of low-income individuals than the county average. Since 16 percent of Blue Earth's and Nicollet's overall populations are considered low income, we are interested in block groups in the Hwy 169 study area that have 26 percent or greater low-income populations.

There are 11 block groups above 26 percent low-income populations that fall within the project area (Figure 2). The block groups range between 26 percent and 70 percent of populations that have low incomes. Due to the significantly greater low-income concentrations compared to the general population than the counties, all 11 block groups can be considered environmental justice populations.

To reach low-income populations in the study area, staff could set-up a table at a food shelf like the Echo Food Shelf (1014 S Front St) or attend a community dinner at one of the many churches near Hwy 169.

Figure 2: Percent of low-income individuals by block group in the Hwy 169 project area



D. Education

About 5% of the population aged 25 years or older living in the study area has less than a high school education compared to 6% for the overall populations of Nicollet and Blue Earth Counties (Table 1). Staff will need to work with locals to identify how to best reach these populations that live near the project area.

E. Language

About 1% of the population living in the study area speaks a language other than English and speaks English less than “very well” compared to 2% for the overall populations of Nicollet and Blue Earth Counties (Table 1). Of those who speak English less than very well, most speak a language not identified in the ACS 5-year estimates (an “Other” language). Staff will need to work with locals to identify which languages are spoken in the area and may be able to engage with people through English as a Second Language programs through Mankato’s Adult Basic Education or through Minnesota State University’s Center for English Language Programs.

F. Age

About 7% of the population living in the study area is under 5 years old compared to 6% for the overall populations of Nicollet and Blue Earth Counties (Table 1). In addition to working with locals to identify how to best reach families with young children that live near the project area, staff could work with nearby daycares to like the Tip Top Tots Daycare or early childhood education centers like the Mankato Early Learning Center.

About 14% of the population living in the study area is 65 years and over compared to 13% for the overall populations of Nicollet and Blue Earth Counties (Table 1). Staff could work with assisted living homes like Oak Terrace Assisted Living (1575 Hoover Dr) to reach older adults.

G. Housing

In addition to the demographic indicators used by the EPA, project staff are interested in understanding where renters in the area live. About 33% of the housing in the study area is renter occupied compared to 34% of the occupied housing in Nicollet and Blue Earth Counties (Table 1). Staff should focus on engaging with people in multi-unit rental housing to reach renters for the project.

The neighborhood north of where the Blue Earth River meets the Minnesota River has a high concentration of minority and low-income individuals and contains a number of large multi-unit housing including the Villa Terrace Apartments (1560 Tower Blvd), Hoover Estates Apartments (1866 Lee Blvd), Lee Estates Apartments (1740 Lee Blvd), Roe Crest Estate Apartments (1604 Roe Crest Dr), Colony Apartments (1621 Colony Ct), Allen Avenue Apartments (301 Allan Ave), and Village Court Apartments (1620 Village Ct), as well as several other smaller multi-unit buildings and single family units.

The area directly surrounding the Hwy 14 intersection contains mostly businesses and the Kiwanis Recreation Area, with the notable exception of the Park Place Townhomes just south of Hiniker Pond (281 Butterworth St).

H. Disability

Although not an EJ population, it is important to be aware of the people with disabilities in the project area. About 11% of the population for whom disability status is determined has a disability in the project area

compared to 10% for the overall populations of Nicollet and Blue Earth Counties (Table 1). Staff will need to work with locals to identify how to best reach these populations that live near the project area.

I. Households Without a Vehicle

Although not an EJ population, it is also important to be aware of the number of households in the project area without a vehicle. About 11% of households in the project area do not have a vehicle compared to 7% for the overall households in Nicollet and Blue Earth Counties (Table 1). Staff will need to work with locals to identify how to best reach these households that live near the project area.

III. Findings

Since there are environmental justice populations located in the Hwy 169 corridor, these populations have the potential to experience disproportional impacts should impacts during construction activities along the corridor happen to be limited to the area where the environmental justice populations are located. However, permanent impacts of projects along the corridor are intended to improve the transportation corridor for all users. Although the anticipated improvements to the Hwy 169 corridor would unlikely disproportionately impact the identified environmental justice populations, a robust public engagement effort is strongly recommended.

References

Executive Order 12898. (1994).

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Existing & No-Build Conditions Appendix C: Environmental Screening



MAPO

MANKATO/NORTH MANKATO
AREA PLANNING ORGANIZATION

Highway 169 Corridor Study

Final Environmental Screening

Date: June 8, 2020

To: Charles Androsky, Transportation Planner, MAPO

From: Dan Edgerton, Principal, Zan Associates

Subject: *Environmental Screening Summary*

Highway 169 Corridor Study

Mankato/North Mankato Area Planning Organization (MAPO)

Table of Contents

I. Introduction	2
II. Project Area	2
III. Social, Economic and Environmental Impacts (SEE)	3
A. Cover Types	3
B. Land Use	3
C. Geology, Soils and Topography/Land Forms	5
D. Water Resources	7
E. Contamination/Hazardous Materials/Wastes	9
F. Fish, Wildlife, Plant Communities, and Sensitive Ecological Resources	11
G. Transportation	12
H. Visual	14
I. Other Potential Effects	14

Tables

Table 1: Existing cover types in the project subareas

Table 2: Soil survey for Blue Earth and Nicollet Counties

Table 3: Water resource types in the project area

Table 4: Potentially contaminated sites in the project area

Table 5: Native plant communities in the project area

Figures

Figure 1: Project area

Figure 2: Existing land use

Figure 3: Water resources

Figure 4: Potentially contaminated sites

Figure 5: Native plant communities

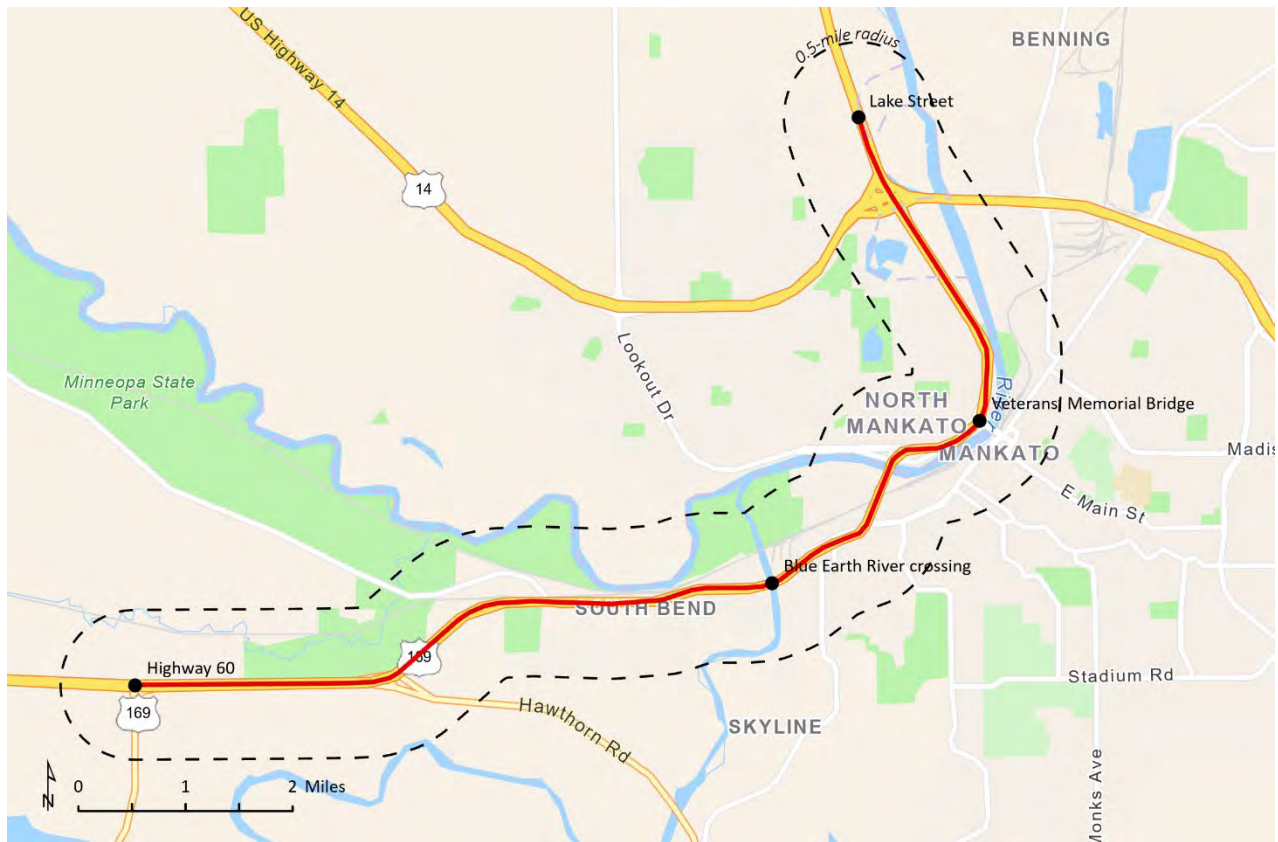
I. Introduction

This is a preliminary screening of the potential environmental impacts within the footprint of the Highway 169 corridor project. The purpose of this document is to identify potentially sensitive areas by considering all National Environmental Policy Act (NEPA) protected social, economic, and environmental categories. This screening will be used as a primer for required NEPA and state environmental reviews later in the project, and will be used to inform and evaluate corridor alternatives. This document does not accommodate the necessary NEPA process or state environmental review process, which would occur once a project becomes funded.

II. Project Area

Figure 1 shows the study area which includes Highway 169 from the northern Mankato city limits (Lake Street NW) to its intersection with Trunk Highway 60 and Highway 169 turning south at the western extents of South Bend township. Landscaping features along the highway are sparse and limited with grass medians and roadside features typically being grass with a few sporadic trees.

Figure 1: Project area



For ease in describing key corridor characteristics in more depth, the corridor is split into three subareas based on the unique context within each.

Northern Subarea - The northern subarea runs from the Veterans Memorial Bridge to Lake Street. This segment is a four-lane divided expressway with a speed limit of 50 mph.

Middle Subarea – The middle subarea runs from the Blue Earth River crossing to Veterans Memorial Bridge. This is a four-lane divided freeway corridor with a speed limit of 50 mph.

Southern Subarea – The southern subarea runs from Highway 60 to the Blue Earth River crossing. This is a four-lane divided expressway corridor with a speed limit ranging from 50 to 65 mph.

III. Social, Economic and Environmental Impacts (SEE)

This section describes existing conditions and potential environmental impacts of the Highway 169 project for further investigation as alternatives are developed. The sections are arranged in a format similar to the one used in Minnesota for environmental review of projects in the Environmental Assessment Worksheet (EAW) for incorporation into a future NEPA document, as needed.

A. Cover Types

The project area for the Hwy 169 area, as defined as the 0.5-mile radius around the corridor, includes about 6,000 acres of land in Blue Earth and Nicollet Counties. Land cover data for the area was obtained from the National Land Cover Database. Cover types are listed by acreage in the project area in Table 1.

About half of the land overall is developed land in the project area. A majority of the cover in the Northern subarea and nearly all of the cover in the middle subarea consists of developed land. A little more than one-fourth of the land in the Southern subarea is developed while other large portions of land consist of cropland and wooded area.

Table 1: Existing cover types in the project subareas

Cover Type	Northern Subarea (Acres)	Middle Subarea (Acres)	Southern Subarea (Acres)	TOTAL
Open Water	162	70	132	364
Developed	1,067	1,109	861	3,037
Barren Land (Rock/Sand/Clay)	30	5	207	242
Wooded/forest	102	4	523	629
Grassland	111	8	340	460
Cropland	109	0	673	782
Wetland	117	7	365	489
TOTAL	1,698	1,203	3,101	6,003

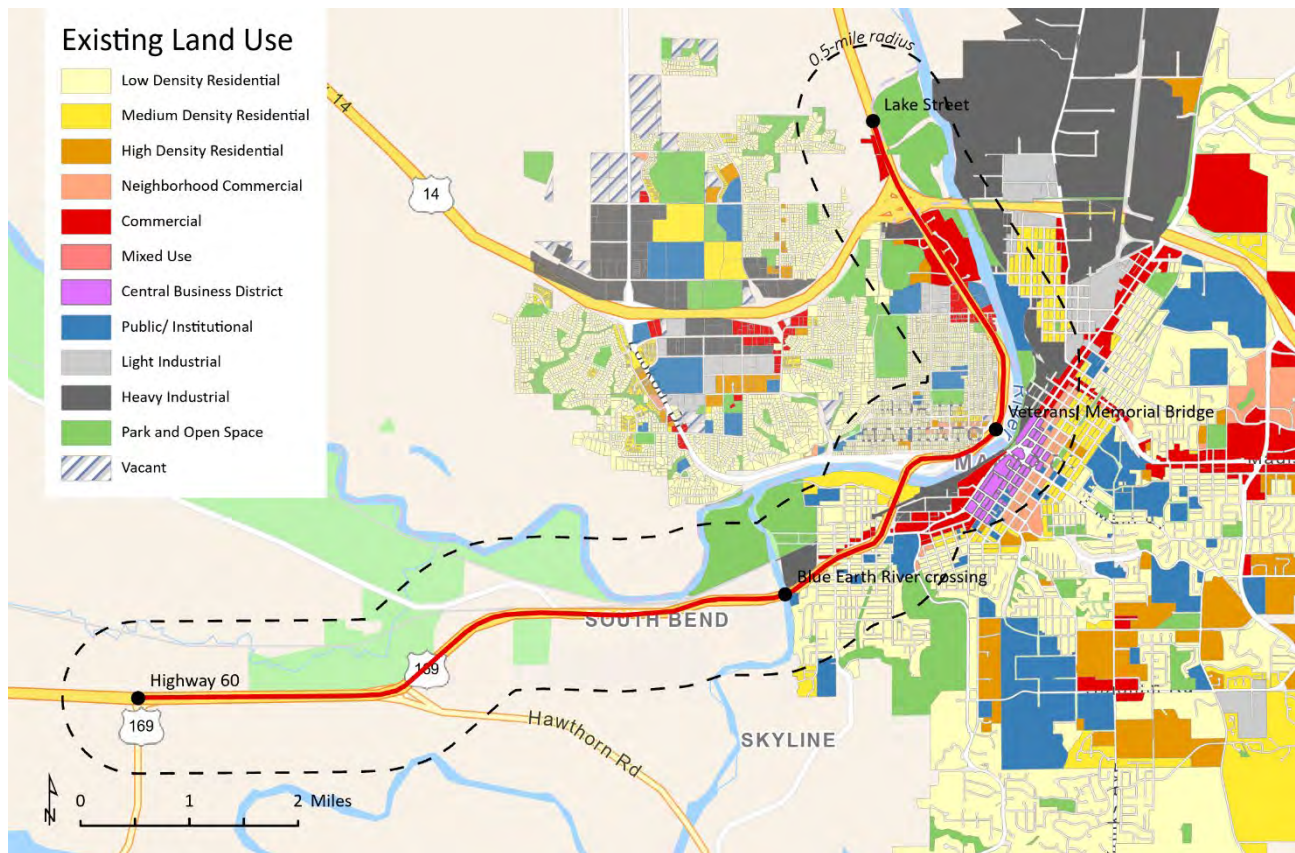
B. Land Use

Existing land uses in the study area are shown in Figures 2 and described below. At the time of this report, the Cities of Mankato and North Mankato were in the process of updating their future land

use plans. The existing conditions report includes a map from the Cities of North Mankato and Mankato's latest Comprehensive Plan update. When each process is complete, the updated future land use plan will be reflected here and in other relevant Highway 169 Study documentation.

There are currently no changes to the land use planned for the South Bend Township and the southern subarea of this study, much of which consists of agriculture and low density development.

Figure 2: Existing land use



Northern Subarea

The northern subarea is within the Cities of Mankato and North Mankato. North of the Highway 169 and Highway 14 is primarily park and open space with some commercial land use. The Kiwanis Recreation Area is a 100-acre regional destination many-featured park including 5-miles of mountain bike trails, cross country ski trails, other trails, dog park, archery range, water access, camping, and a large picnic shelter. South of the Highway 169 and Highway 14 is a large concentration of commercial, heavy industrial, light industrial, residential, and public/institutional land uses served by Lind Street and Webster Avenue connections to Highway 169. This concentration of commercial and industrial land use is a major local and regional traffic generator served by its direct access to Highway 169 and proximity and ease of access to the Highway 169 and Highway 14 interchange. This area also includes high-density residential near Hiniker Pond

with access off Lind Street and access to residential neighborhoods, parks and schools in Lower North Mankato via Webster Avenue.

As Highway 169 moves towards Veterans Memorial Bridge direct access spacing becomes more distant, with the surrounding land use being dominated by low density residential. Both the North Mankato and Mankato central business districts can be accessed by the Highway 169/Veterans Memorial Bridge.

Middle Subarea

The middle subarea also includes the Cities of Mankato and North Mankato, with the land uses directly adjacent Highway 169 dominated by low and medium density residential and heavy industrial along the eastern edge of the Minnesota River. Other adjacent land uses include high density residential, mixed use, commercial, and public/institutional and North Mankato Fire Station #1 has access to Highway 169 via Lookout Drive.

As the only full freeway segment there is no direct access, traffic movements rely heavily on the Veterans Memorial Bridge, Lookout Drive, and South Riverfront Drive interchanges. These interchanges also provide critical connections to Downtown Mankato for northbound Highway 169 travelers, in addition to the local roadway network in this area for access to West Mankato, southern Mankato and Minnesota State University, Mankato campus, lower and upper North Mankato, and across the Minnesota and Blue Earth Rivers. This subarea also provides the only two connections across the Minnesota River at the Veterans Memorial Bridge and the Northstar Bridge for access between communities.

Southern Subarea

The southern subarea is located in South Bend Township and includes primarily agriculture, low density residential and park and open space land uses directly adjacent Highway 169, with sparse areas of commercial and light industrial.

Connectivity of the local roadway network is inhibited in many areas by topography, including steep slopes and natural areas, the Union Pacific Railroad, the Minnesota and Blue Earth Rivers and adjacent land uses. Limited local network connectivity put pressure on Highway 169 and conversely, any change in access will put pressure on the local system.

C. Geology, Soils and Topography/Land Forms

Elevations range from 774 feet at the Highway 169 intersection at TH 60 to 994 feet at the Highway 169 and Lake Street intersection, an elevation change of 200 feet.

Soil data were obtained from the NRCS Web Soil Survey for Blue Earth and Nicollet Counties. Table 2 lists the 60 different soils present by acreages in the project area, organized by the overall acres for the entire project area. This information will be used to assess various soil limitations such as hydric characteristics and the limitations for local roads and streets.

Table 2: Soil survey for Blue Earth and Nicollet Counties

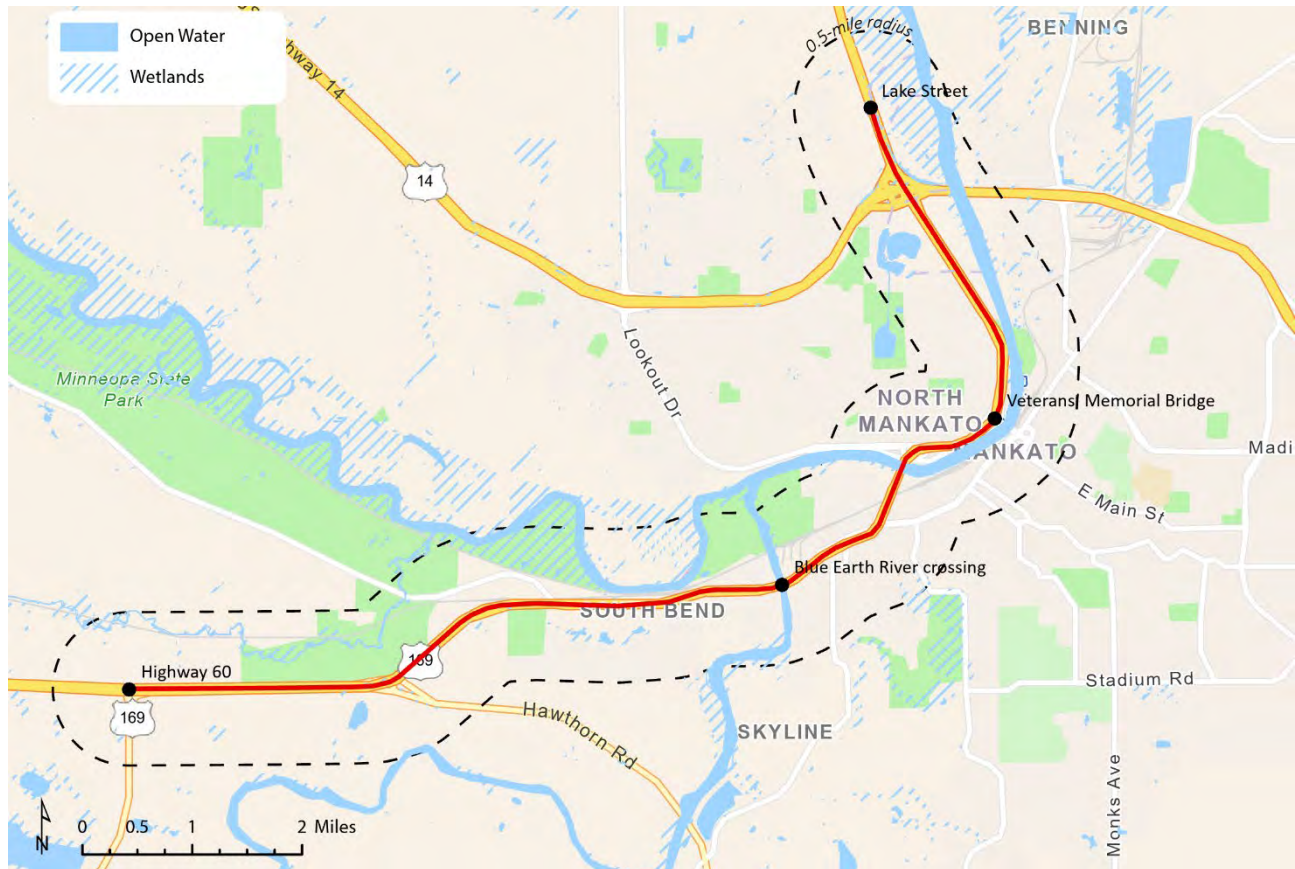
Name	Northern Subarea (Acres)	Middle Subarea (Acres)	Southern Subarea (Acres)	TOTAL
Chaska-Urban land complex	537	291	0	829
Alluvial land	179	56	291	527
Alluvial-Urban land complex	104	233	97	434
Storden complex	0	11	250	261
Urban land	19	121	109	249
Rock outcrop-Copaston complex	55	26	162	243
Copaston-Rock outcrop complex	75	8	158	241
Water	105	51	68	224
Copaston-Urban land bouldery complex	0	210	0	210
Lasa loamy fine sand	0	0	202	202
Lester-Belview complex	185	6	0	192
Reedslake-Le Sueur complex	24	1	150	176
Copaston loam	8	0	167	175
Marna silty clay loam	0	0	154	154
Le Sueur loam	23	0	127	150
Terril loam	40	1	106	147
Copaston-Urban land complex	112	33	1	146
Chaska loam	26	0	107	133
Kilkenny clay loam	0	0	125	125
Clarion loam	0	0	124	124
Dorchester-Urban land complex	4	95	0	99
Webster clay loam	0	0	78	78
Lester loam	0	0	75	75
Minneiska-Kalmarville complex	26	0	44	70
Minneiska sandy loam	11	0	47	58
Grogan silt loam	0	0	54	54
Cordova clay loam	38	0	11	49
Millington clay loam	0	0	43	43
Dorchester loam	42	0	0	42
Oshawa silt loam	39	0	0	39
Hamel loam	0	0	39	39
Wadena loam	0	12	26	38
Calco silty clay loam	16	21	0	37
Estherville sandy loam	0	0	36	36
Shorewood silty clay loam	0	0	35	35
Marsh	0	0	31	31
Terril-Urban land complex	3	25	0	28

Name	Northern Subarea (Acres)	Middle Subarea (Acres)	Southern Subarea (Acres)	TOTAL
Muskego soils	0	0	28	28
Nicollet clay loam	0	0	27	27
Comfrey clay loam	0	0	21	21
Tilfer silty clay loam	0	0	20	20
Omsrud-Storden complex	0	0	18	18
Le Sueur-Reedslake-Cordova complex	8	0	8	16
Fedji loamy fine sand	0	0	11	11
Barrington silt loam	0	0	8	8
Reedslake-Swanlake complex	0	0	7	7
Cordova-Urban land complex	6	0	0	6
Minneopa loamy fine sand	0	0	6	6
Le Sueur-Urban land complex	6	0	0	6
Grogan loamy fine sand	0	0	5	5
Glencoe silty clay loam	0	0	5	5
Darfur loam	0	0	4	4
Dickinson loam	4	0	0	4
Litchfield loamy fine sand	0	0	4	4
Clarion-Estherville complex	0	0	3	3
Guckeen silty clay loam	0	0	3	3
Klossner muck	0	0	3	3
Glencoe clay loam	0	0	2	2
Canisteo clay loam	0	0	1	1
Minneopa sandy loam	0	0	1	1
TOTAL	1698	1203	3101	6003

D. Water Resources

Water resources data from the National Wetlands Inventory shows approximately 935 acres of water resources exist within the 0.5 miles of the project limits and include rivers, ponds and wetlands (Figure 3). Hwy 169 runs to the west of the Minnesota River in the northern subarea and then crosses the River in the middle subarea. The Minnesota River bends outside of the 0.5-mile project area limits in the middle subarea but then bends back to run adjacent to the north of Highway 169 for approximately 0.75 miles in the southern subarea. The Blue Earth River bisects the middle and southern subareas. There are many small unnamed ponds in the areas surrounding the two rivers.

Figure 3: Water resources



Other major water features include Hiniker Pond which lies to the west of Highway 169 in the northern subarea to the southwest of the Highway 169/Highway 14 interchange. There are also two unnamed ponds in the Kiwanis Recreation Area, to the northeast of the Highway 169/Highway 14 interchange.

In addition to the open water features, many of the areas around the rivers and ponds are designated as wetlands, either freshwater emergent or freshwater forested. Table 3 lists the types of water features present within the corridor by acreage.

A locally controlled levee exists within the corridor on the river side of Highway 169 to minimize flooding associated with high water levels in the Minnesota River. The levee is a combination of earthen berm and concrete floodwall that provides flood protection for North Mankato, Mankato, and LeHillier when the River is at flood stage. Until recently, the levee had a gap in protection that existed north of the Highway 169/Highway 14 interchange. A project in 2018 closed this gap in the levee by raising the elevation of Highway 169 just north of the Highway 14 interchange. At this location, Highway 169 and Highway 14 are considered a part of the levee.

Table 3: Water resource types in the project area

Name	Northern Subarea (Acres)	Middle Subarea (Acres)	Southern Subarea (Acres)	TOTAL
River (Minnesota River, Blue Earth River, Minneopa Creek & all associated backwaters)	135	75	125	335
Freshwater Pond	42	0	17	59
Freshwater Emergent Wetland	65	11	104	180
Freshwater Forested/Shrub Wetland	161	11	190	362
TOTAL	403	98	435	935

**Wetland and Water permits will be coordinated with the US Army Corps of Engineers, Minnesota's Wetland Conservation Act representatives, and the Minnesota Department of Transportation.*

E. Contamination/Hazardous Materials/Wastes

Potentially contaminated site data was obtained from the MPCA's What's in My Neighborhood dataset. There are 479 potentially contaminated sites in the project area (Figure 4).

Figure 4: Potentially contaminated sites

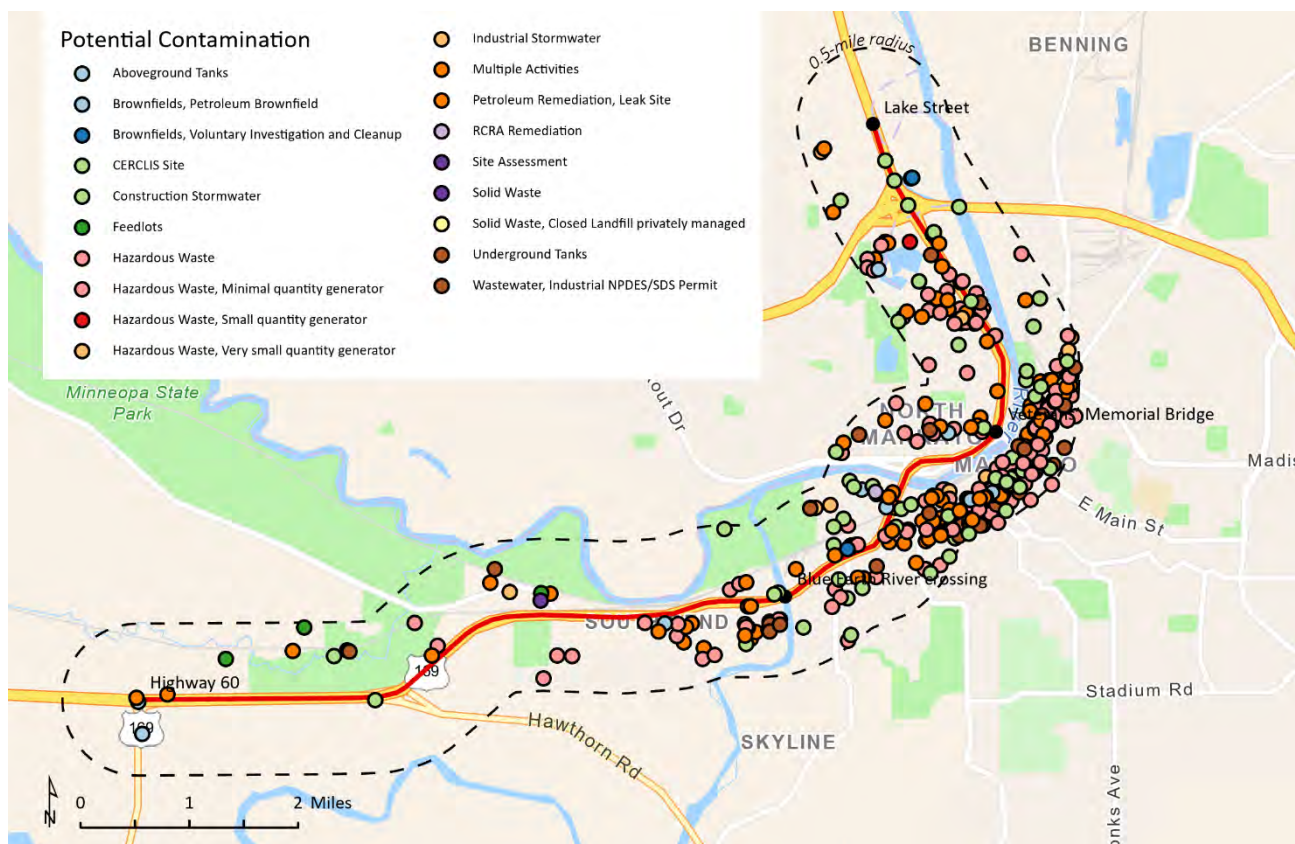


Table 4 lists potentially contaminated sites by activity and subarea, including sites with multiple activities. Potentially contaminated sites include sites with any activity that may lead to toxic or hazardous contamination. There are 156 potentially contaminated sites in the northern subarea, 262 in the middle subarea, and 61 in the southern subarea.

The highest type of activity for potentially contaminated sites in the project area include hazardous waste sites. Hazardous waste is hazardous waste is dangerous or potentially harmful effect on human health or the environment. There are 161 total hazardous waste site throughout the entire project area with 55 hazardous waste sites in the Northern subarea, 87 in the middle subarea, and 19 in the southern subarea.

Table 4: Potentially contaminated sites in the project area

Activity	Northern Subarea	Middle Subarea	Southern Subarea	TOTAL
Aboveground Tanks	2	4	3	9
Brownfields, Voluntary Investigation and Cleanup	1	6	0	7
Brownfields, Voluntary Investigation and Cleanup	0	1	0	1
CERCLIS Site	1	0	0	1
Construction Stormwater	20	71	6	97
Feedlots	0	0	3	3
Hazardous Waste	55	87	19	161
Hazardous Waste, Minimal quantity generator	14	11	0	25
Hazardous Waste, Small quantity generator	1	0	0	1
Hazardous Waste, Very small quantity generator	6	7	1	14
Industrial Stormwater	2	1	2	5
Multiple Activities	37	43	15	95
Petroleum Remediation, Leak Site	7	9	5	21
RCRA Remediation	0	1	0	1
Site Assessment	0	0	1	1
Solid Waste	0	1	1	2
Solid Waste, Closed Landfill privately managed	1	0	0	1
Underground Tanks	8	19	5	32
Wastewater, Industrial NPDES/SDS Permit	1	1	0	2
TOTAL	156	262	61	479

F. Fish, Wildlife, Plant Communities, and Sensitive Ecological Resources

Native plant communities in the project area were identified using the MnDNR's Native Plant Communities dataset for sites surveyed by MnDNR ecologists (Figure 5). Table 5 shows the native plant communities by subarea, organized by total acreage for the entire study area.

Figure 5: Native plant communities



Most of the native plant communities exist in the southern subarea, a majority of which are Pin Oak – Bur Oak Woodlands. There is a Red Oak - Sugar Maple - Basswood - Forest directly adjacent to the corridor in Minneopa State Park, north of the intersection at Highway 169 and Hawthorn Road.

Only 12 acres of surveyed sites native plant communities exist in the Northern subarea—on the east side of the Minnesota River across from the Kiwanis Recreation Area—and no native plant species exist in the developed middle subarea. The low numbers in may be due to a lack of surveyed sites in those two subareas. One area to keep in mind for the project is the Kiwanis Recreation Area in the Northern subarea.

Table 5: Native plant communities in the project area

Name	Northern Subarea (Acres)	Middle Subarea (Acres)	Southern Subarea (Acres)	TOTAL
Pin Oak - Bur Oak Woodland	11	0	156	168
Red Oak - Sugar Maple - Basswood - (Bitternut Hickory) Forest	0	0	65	65
Silver Maple - (Virginia Creeper) Floodplain Forest	0	0	6	6
Dry Sand - Gravel Prairie (Southern)	0	0	1	1
Mesic Prairie (Southern)	0	0	0	0
Seepage Meadow/Carr	0	0	0	0
TOTAL	12	0	228	240

Most of the project area has been previously disturbed for development or is used for agriculture. As such, habitat present in the project area and vicinity has been fragmented or degraded. In general, the project area consists of the MnDOT right of way of Highway 169. Natural resources in the project area consist of scattered stands of trees, landscape plantings that line the Highway 169 right of way, grassy areas, lakes, streams, minor rock outcroppings, and wetlands. Grassed areas are primarily in the right of way of Highway 169.

Any wildlife displaced by any projects or construction resulting from the completion of this study will likely relocate to suitable nearby areas, including lands immediately adjacent to the corridor zone. There will be vegetation impacts because of the project, including the removal of trees and shrubs primarily located within the right of way of Highway 169. Landscaping or reseeding with native plants will be used to mitigate impacts as a result of the project.

G. Transportation

This section describes elements of the existing transportation network, information related to land use, traffic operations, safety, access, and non-motorized connections. This section concludes with a review of known social, economic, and environmental (SEE) resources considerations within the study area.

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. The functional classification system is comprised of principal arterials, minor arterials, major and minor collectors, and local roadways.

Highway 169 serves as a north-south principal arterial and National Highway System (NHS) route. It provides direct and relatively high-speed connections to southern Minnesota and beyond and to the north to the Twin Cities Metropolitan Area and northern Minnesota. The existing ADT (vehicles per day) ranges from 16,600 at the north end to 32,500 in the middle and 23,600 at the southern

end of the study area. Figure 4 in the existing conditions report shows the existing functional classification network in the study area.

Highway 169 functions as a hybrid freeway-expressway in the MAPO planning area, with access restricted to grade-separated interchanges through the urban core of Mankato and North Mankato and at-grade (signalized and unsignalized) access points as the corridor extends radially from the urban core. The middle subarea (Blue Earth River crossing to Veterans' Memorial Bridge) is the only full freeway segment in the study area with a four-lane corridor. The northern subarea (Veterans Memorial Bridge to Lake Street) and southern subarea (Highway 60 to the Blue Earth River crossing) are both a four-lane divided expressway corridor.

One other principal arterial, US Highway 14/Trunk Highway 60, and six minor arterials connect to Highway 169 in the study area. Minor arterials include Belgrade Avenue/Mulberry Street, Lookout Drive, Riverfront Drive, Trunk Highway 68, Gadwall Road/County State Aid Highway (CSAH) 69), CSAH 33, CSAH 69/Hawley Street, and Hawthorn Road/CSAH 90).

Figure 5 in the existing conditions report shows the roadway jurisdiction in the study area.

Regional Multimodal Corridor

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 Highway 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.

Highway 169 is the primary transportation corridor for funneling freight into the Twin Cities from the Mankato/North Mankato region and southern Minnesota. This area produces almost half of Minnesota's corn, soybeans and ethanol, making Minnesota third in the nation for production among all states. Other major commodities moving along this corridor include aggregates, clay and sand, hogs, manufactured goods and food products. Other key freight attributes of the Highway 169 corridor between Mankato and the Twin Cities include:

- Moves the equivalent of 30,000 tons of freight by truck per day with an average daily vehicle count of 1,200 – 3,700 heavy commercial vehicles.
- Carries the fifth heaviest freight volume of any highway in Minnesota – the top four are I-94, I-90, I-35 and MN 52.
- Connects major producers of ethanol, biodiesel, and other byproducts to markets and refiners along MN 60 and the adjacent Union Pacific Railroad.
- Provides one of two major conduits to the Ports of Savage for grain exports via the Minnesota and Mississippi River systems.

Recreational travel along the corridor includes at least two bicycle/pedestrian trails. One is located along the north side of Highway 169 and runs between the from urban core to Minneopa State Park and the city of Lake Crystal. The other is runs between the urban core to Kiwanis Recreational

Area along the top of the levee/floodwall. Both trails connect to a larger county-wide recreational trail and state trail system.

H. Visual

The project area views consist of a mixture of open space, commercial and residential. The northern subarea includes some views of strip mall commercial developments, low to medium density residential, and open space that include trees, grass and shrubs along Highway 169. The middle subarea view includes downtown commercial and medium density residential. Views of the rivers in the middle subarea are mostly obstructed by development or freeway barriers except on the Minnesota River bridge and Blue Earth River bridge crossings. The southern subarea consists of open space, low-density residential, and commercial views.

I. Other Potential Effects

Environmental Justice

Environmental justice populations are minority and/or low-income populations that are meaningfully greater than those of the general population. “Meaningfully greater” for environmental justice populations is generally defined as one where the minority or low-income population is either 10 percent higher than the county average, or greater than 50 percent of the total geographic unit, or determined based on input from local officials or stakeholders (FHWA Office of Human Environment, 2012).

Since there are environmental justice populations located in the Hwy 169 corridor, these populations have the potential to experience disproportional impacts should impacts during construction activities along the corridor happen to be limited to the area where the environmental justice populations are located. However, permanent impacts of projects along the corridor are intended to improve the transportation corridor for all users.

For more information on the regulatory context, see the Environmental Justice (EJ) Technical Memo.

Air, Noise, and Cumulative Potential Effects

Air, noise and cumulative potential effects will be considered in a future NEPA analysis once a project is funded.

Recreational Land Effects

Since recreational land is adjacent to the highway right-of-way there may be a need to obtain land from these properties. This means right-of-way processes and construction plans will need to be coordinated with the Federal Highway Administration, Mn Department of Natural Resources, the local owners of jurisdiction, and potentially the National Park Service.

Cultural and Historic Properties

Cultural and Historic properties will need to be reviewed when specific projects are identified for this corridor. Even though there are no designated tribal lands in this area, the confluence of the Blue Earth and Minnesota Rivers has cultural significance for the Dakota people.

Existing & No-Build Conditions Appendix D: Existing Conditions Safety Memo



MAPO

MANKATO/NORTH MANKATO
AREA PLANNING ORGANIZATION

Highway 169 Corridor Study

Existing and Future Safety Evaluation

Date: October 6, 2021

To: Charles Androsky, Transportation Planner, MAPO

From: Scott McBride, PE, Project Manager, Bolton & Menk, Inc.

Kelsey Retherford, PE, Traffic Engineer, Bolton & Menk, Inc.

Subject: Existing and Future Safety Evaluation

Highway 169 Corridor Study

Mankato/North Mankato Area Planning Organization (MAPO)

Introduction

The Mankato/North Mankato Area Planning Organization (MAPO) in collaboration with the Cities of North Mankato, Mankato, Blue Earth County, Nicollet County, and the Minnesota Department of Transportation (MnDOT) are working to identify transportation improvements on Highway 169. This report summarizes the existing and future safety conditions of Highway 169 from Lake St to Highway 60. The existing safety analysis includes an overview of the current crash issues at intersections, interchanges, and along the highway segment. The future safety analysis summarizes the anticipated crash frequency and severity with alternative designs.

Existing Safety Analysis

The existing safety along the Highway 169 was analyzed by reviewing the crash history along the corridor. **Figure 1** in the **Appendix** summarizes the crash trends and key findings of the analysis. This figure shows which intersections have a crash issue, what the most common crash types were at intersections, and the location of the fatal, pedestrian, and bicycle crashes.

Intersection Crash Analysis

A crash review was completed for the intersections and segments throughout the project area for the previous five years (2015-2019). **Table 1** provides a crash summary for each intersection. This table details the total crash rate data, not the fatal & serious injury crash rate data. The latest available crash rates are from 2015 and were used for comparison purposes as current statewide average data is unavailable.

Table 1 – Intersection Crash Summary (2015-2019)						
Intersection	Total Crashes	Severe Crashes (K + A)	Actual Crash Rate	Statewide Average	Critical Rate	Critical Index
Lake St NW (North Access) at TH 169	5	0	0.18	0.18	0.41	0.44
Lake St NW (Southern Access) at TH	6	0	0.20	0.18	0.40	0.50
Lind St at TH 169	70	1	1.45	0.45	0.71	2.04
Webster Ave at TH 169	29	0	0.61	0.45	0.71	0.86
Belgrade Ave at NB TH 169 Ramps	21	0	0.50	0.70	1.04	0.48
Belgrade Ave at SB TH 169 Ramps	27	1	0.83	0.70	1.09	0.76
Riverfront Dr at NB TH 169 Ramps	19	0	0.49	0.18	0.37	1.32
Riverfront Dr at SB TH 169 Ramps	11	0	0.35	0.52	0.86	0.41
CSAH 69 (Hawley St) at TH 169	12	1	0.26	0.18	0.36	0.72
CSAH 33 at TH 169	8	1	0.17	0.18	0.36	0.47
TH 68 at TH 169	17	2	0.38	0.18	0.36	1.06
CSAH 69 (Gadwall Rd) at TH 169	2	1	0.06	0.18	0.38	0.16
Loren Dr at TH 169	1	0	0.04	0.18	0.42	0.10
CSAH 69 (Gadwall Rd) West at TH 169	1	0	0.04	0.18	0.41	0.10
TH 60 at TH 169	13	0	0.47	0.25	0.52	0.90

Table 1 shows that three intersections have a critical index greater than one. A critical index greater than one indicates that the intersection is operating outside the normal range when compared to similar intersections statewide.

The crash worksheets for each intersection can be found in the **Appendix**. The intersections operating outside the normal range were further analyzed to understand the crash trends.

Lind St at TH 169

Over the past five years there have been 70 crashes that have occurred at the intersection of Lind St at TH 169. **Table 2** summarizes the crash types and **Table 3** summarizes the crash severity that occurred at the intersection.

Table 2 – Lind St at TH 169 Crash Type	
Crash Type	Frequency
Rear End	63
Right Angle	3
Sideswipe - Same Direction	2
Left Turn	1
Ran off Road	1

Table 3 – Lind St at TH 169 Crash Severity	
Crash Severity	Frequency
Fatal	0
Serious Injury	1
Minor Injury	4
Possible Injury	12
Property Damage Only	53

Table 2 shows that rear end crashes were the most common at the intersection, accounting for 63 (90%) of the crashes. Of the 63 rear end crashes, 42 occurred along the northbound TH 169 intersection approach. **Table 3** shows that most crashes resulted in property damage, however there was one serious injury and four minor injury crashes at the intersection in the last five years. The serious injury crash involved one vehicle that ran off the roadway. The crash report listed that the driver was not in a proper state to be driving so the intersection geometry and traffic control device did not have an impact on the crash.

The observed crash rate at Lind St and TH 169 was found to be 1.45. This is over three times higher than the statewide average crash rate for similar intersections which is 0.45. The critical index was found to be 2.04 which shows that the intersection is operating outside the normal range. The number of crashes at this intersection would need to be reduced by 35 over a five-year timeframe to fall within the normal range. The fatal and serious injury crash critical index was found to be 0.74 which shows that the intersection is operating within the normal range for fatal and serious injury crashes.

Riverfront Dr at NB TH 169

Over the past five years there have been 19 crashes that have occurred at the intersection of Riverfront Dr at NB TH 169. **Table 4** summarizes the crash types and **Table 5** summarizes the crash severity that occurred at the intersection.

Table 4 – Riverfront Dr at NB TH 169 Crash Type	
Crash Type	Frequency
Rear End	8
Ran off Road	7
Right Angle	2
Pedestrian	1
Left Turn	1

Table 5 – Riverfront Dr at NB TH 169 Crash Severity	
Crash Severity	Frequency
Fatal	0
Serious Injury	0
Minor Injury	1
Possible Injury	2
Property Damage Only	17

Table 4 shows that rear end crashes were the most common at the intersection accounting nearly half of the crashes. Five of the rear end crashes occurred along westbound Riverfront Dr as they were turning right onto the TH 169 entrance ramp. Westbound right vehicles must yield to eastbound left vehicles at the ramp. Crashes along westbound Riverfront Dr indicates that vehicles are not always anticipating the need to stop and yield to other traffic. Three of the rear end crashes occurred along the northbound TH 169 exit ramp and one crash occurred along eastbound Riverfront Dr. **Table 5** shows that most crashes resulted in property damage, however there was one minor injury crashes at the intersection in the last five years.

The observed crash rate at Riverfront Dr and SB TH 169 was found to be 0.49. This is nearly three times higher than the statewide average crash rate for similar intersections which is 0.18. The critical index was found to be 1.32 which shows that the intersection is operating outside the normal range. The number of crashes at this intersection would need to be reduced by four over a five-year timeframe to perform within the normal range.

TH 68 at TH 169

Over the past five years there have been 17 crashes that have occurred at the intersection of TH 68 at TH 169. **Table 6** summarizes the crash types and **Table 7** summarizes the crash severity that occurred at the intersection.

Table 6 – TH 68 at TH 169 Crash Type	
Crash Type	Frequency
Right Angle	6
Ran off Road	5
Rear End	3
Left Turn	2
Sideswipe - Same Direction	1

Table 7 – TH 68 at TH 169 Crash Severity	
Crash Severity	Frequency
Fatal	1
Serious Injury	1
Minor Injury	4
Possible Injury	3
Property Damage Only	8

Table 6 shows that right angle crashes were the most common at the intersection. All of the right angle crashes involved a vehicle attempting to turn left from TH 68 onto northbound TH 169, but were struck by a vehicle going southbound along TH 169. The fatal, serious injury and two of the minor injury crashes at the intersection were from right angle. **Table 7** shows that most crashes resulted in injury over the last five years.

The observed crash rate at TH 68 at TH 169 was found to be 0.38. This is over two times higher than the statewide average crash rate for similar intersections which is 0.18. The critical index was found to be 1.06 which shows that the intersection is operating outside the normal range. The number of crashes at this intersection would need to be reduced by one over a five-year timeframe to perform within the normal range.

With one fatal crash and one serious injury crash the fatal and serious injury observed crash rate was found to be 4.43. This is over 13 times higher than statewide average crash rate for similar intersections which is only 0.33. The critical index for fatal and serious injury crashes was found to be 1.76 which shows that the intersection is operating outside the normal range for fatal and serious injury crashes.

Interchange Crash Analysis

Crashes at the TH 14, Belgrade Ave, Lookout Dr, Riverfront Dr, and CSAH 90 interchange ramps were also analyzed. Since the ramp merge areas are not considered a typical intersection type by the crash worksheets, these crashes were reviewed to for crash trends, but could not be compared to other interchanges statewide to determine if the number of crashes is statistically significant.

TH 14 at TH 169

Over the past five years there have been 22 crashes that have occurred at the TH 14 and TH 169 interchange. There were three minor injury crashes, five possible injury crashes, and thirteen property damage crashes. The location of the crashes and major trends in crash types are summarized below.

- 11 crashes at the EB TH 14 Exit Ramp
 - 6 of the crashes were right angle crashes involving a vehicle attempting to turn left onto NB TH 169 from the exit ramp and a vehicle along SB TH 169. One resulted in minor injury, three in possible injury, and two were property damage only crashes.
 - The other five crashes consisted of three rear ends, one ran off the road and one a right turn into traffic. All four crashes resulted in property damage only.
- 5 crashes at the WB TH 14 Exit Ramp
 - 3 crashes were along the exit ramp to SB TH 169. 2 of those crashes occurred in the merge area along SB TH 169 and the other crash was a vehicle that ran off the road along the loop exit ramp. All three crashes resulted in property damage only.
 - 2 crashes were along the exit ramp to NB TH 169. Both crashes involved a vehicle who crossed over the solid white lines along the ramp and NB TH 169 traffic while attempting to get back onto WB TH 14 via the left turn from NB TH 169 to the WB TH 14 entrance ramp. There is a sign along the exit ramp that shows this left turn movement is not allowed. These crashes were listed as right angle crashes. One of the crashes resulted in possible injury and one in property damage.

- 4 crashes at the WB TH 14 Entrance Ramp
 - 3 of the crashes were left turn crashes involving a vehicle attempting to turn left onto the WB TH 14 entrance ramp and a vehicle along SB TH 169. Two of the crashes resulted in minor injury and third resulted in possible injury.
 - The fourth crash was a ran off road crash that resulted in property damage involving a vehicle attempting to drive along the ramp at too high of a speed.
- 2 crashes at the EB TH 14 Entrance Ramp
 - Both crashes involved a vehicle running off the road along the loop ramp from SB TH 169 to EB TH 14. Both crashes resulted in property damage only.

Table 8 shows the crash severity breakdown at the TH 14 and TH 169 interchange. This shows that most crashes resulted in property damage, however there were three minor injury crashes and five possible injury crashes at the interchange in the last five years.

Table 8 – TH 14 at TH 169 Crash Severity	
Crash Severity	Frequency
Fatal	0
Serious Injury	0
Minor Injury	3
Possible Injury	5
Property Damage Only	13

Belgrade Ave at TH 169

No crashes were found associated with the merge areas along TH 169 and the Belgrade entrance ramps. There were three ran off the road crashes reported along the exit ramps. One of the crashes occurred along the NB TH 169 exit ramp and resulted in property damage only. The report indicates that the driver lost control due to icy roadway conditions and ran into the cement wall to the right of the ramp. The other two were along the SB TH 169 exit ramp. One of the crashes indicated that the driver failed to follow the curve of the ramp running off the road and into several trees. This crash resulted in possible injury. The other crash occurred at the very start of the ramp diverge. The driver was noted to have been drinking and exited the roadway hitting the guardrail. This crash resulted in property damage only.

Lookout Drive at TH 169

Over the past five years there have been 19 crashes that have occurred at the Lookout Dr and TH 169 interchange. The location of the crashes and major trends in crash types are summarized below.

- 11 crashes along the NB TH 169 Exit Ramp
- 4 crashes along the SB TH 169 Exit Ramp
- 2 crashes along the NB TH 169 Entrance Ramp
- 2 crashes long the SB TH 169 Entrance Ramp

15 of the 19 crashes were vehicles that ran off the road while traversing the ramps at this interchange. **Table 9** shows the crash severity breakdown at the Lookout Dr and TH 169 interchange. This shows that most crashes resulted in property damage, however there were four minor injury crashes and two possible injury crashes at the interchange in the last five years. The two possible injury crashes and one of the minor injury crashes occurred along the southbound TH 169 exit ramp. One of the crashes was a rear end, one was a ran off the road, and one was a sideswipe same direction crash. There were two minor injury ran off the road crashes along the southbound TH 169 entrance ramp and the other minor injury crash was also a ran off road crash along the northbound TH 169 exit ramp.

Table 9 – Lookout Dr at TH 169 Crash Severity	
Crash Severity	Frequency
Fatal	0
Serious Injury	0
Minor Injury	4
Possible Injury	2
Property Damage Only	13

Riverfront Dr at TH 169

There were 11 crashes reported at the TH 169 and Riverfront Dr merge/diverge areas over the past five years. The location of the crashes and major trends in crash types are summarized below.

- 4 crashes along the NB TH 169 Entrance Ramp/TH 169 merge area
 - One of the crashes was a sideswipe passing crash that involved two vehicles attempting to merge onto NO TH 169. This crash resulted in property damage only.
 - Two of the crashes were rear end crashes along the entrance ramp. One of the crashes resulted in property damage only and the other in a possible injury.
 - The fourth crash was a vehicle who lost control and ran off road into the bridge barrier. This crash resulted in property damage only.

- 4 crashes along the SB TH 169 Exit Ramp/TH 169 diverge area
 - Three of the crashes were rear ends that occurred when traffic along the exit ramp was backed up to the highway. The vehicles were not anticipating the back up and rear ended the vehicle in front of them when attempting to stop. These crashes resulted in property damage only.
 - The other crash was a sideswipe crash involving a vehicle that had merged onto SB TH 169 from Lookout Dr and was attempting to exit onto Riverfront Dr. A semi-truck attempting to exit onto Riverfront Dr did not see the other vehicle. This crash resulted in property damage only.
- 2 crashes along the NB TH 169 Exit Ramp/TH 169 diverge area
 - Both of the crashes were ran off road crashes caused by current weather conditions that resulted in property damage only.
- 1 crash along the SB TH 169 Entrance Ramp/TH 169 merge area
 - This crash occurred at the entrance ramp from the Riverfront Dr/Woodland Ave entrance ramp. The vehicle merging sideswiped a vehicle along the mainline causing the merging vehicle to spin out and roll several times. This crash resulted in property damage only.

CSAH 90 at TH 169

Over the past five years there have been four crashes that have occurred at the CSAH 90 and TH 169 interchange. One of the crashes resulted in a fatality. The fatal crash involved a motorcycle merging onto northbound TH 169 from westbound CSAH 90 that hit a semi-truck. This crash is discussed in more detail in the fatal crashes section of the report. The other three crashes resulted in property damage only. One of the property damage crashes involved a vehicle merging onto southbound TH 169. The crash involved a vehicle along SB TH 169 and a vehicle merging from WB CSAH 90. The crash report states that the vehicle merging from WB CSAH 90 failed to yield to the mainline vehicle.

SB TH 169 to EB CSAH 90 is the only movement that does not have a typical ramp at this interchange. There is a left turn lane along SB TH 169 where vehicles must wait for a gap in NB TH 169 traffic before turning onto CSAH 90.

The other two crashes involved vehicles attempting to turn left onto CSAH 90 from southbound TH 169. One of the crashes involved a vehicle along SB TH 169 that caused a crash while attempting to get into the left turn lane. The vehicle was noted to be in the right most lane and abruptly slowed down trying to change lanes causing a rear end crash. The other crash of a vehicle attempting to turn left onto CSAH 90 was a ran off the road crash. While making the turn the vehicle left the roadway and struck a sign. Both of these crashes appear to be caused by driver error, not the unique design of the interchange.

Segment Crash Analysis

A crash review was completed for TH 169 as a segment as well with each of the three subareas analyzed separately. The descriptions below depict these three subareas.

Northern Subarea - The northern subarea runs from Lake Street to the Veterans' Memorial Bridge/Belgrade Ave. This segment is a four-lane divided expressway with a speed limit of 50 mph.

Middle Subarea – The middle subarea runs from the Veterans' Memorial Bridge/Belgrade Ave to the Blue Earth River crossing. This is a four-lane freeway corridor with a speed limit of 50 mph.

Southern Subarea – The southern subarea runs from the Blue Earth River crossing to Highway 60. This is a four-lane expressway corridor with a speed limit ranging from 50 to 65 mph.

All three subareas were analyzed with and without intersection related crashes. **Table 10** summarizes the key crash findings along each segment without including the intersection related crashes. This table details the total crash rate data, not the fatal & serious injury crash data.

Table 10 – Segment Crash Summary (2015-2019)*

Segment	Total Crashes	Severe Crashes (K + A)	Actual Crash Rate	Statewide Average	Critical Rate	Critical Index
Lake St NW to Belgrade Ave	28	1	0.29	0.05	0.69	0.42
Belgrade Ave to the Blue Earth River Crossing	105	0	0.77	0.82	1.02	0.75
Blue Earth River Crossing to TH 60	58	1	0.31	0.50	0.64	0.48

*Does not include intersection related crashes within each segment

Table 10 shows that without the intersection related crashes included, none of the segments show a crash issue, but there are a significant amount of crashes along each subarea of TH 169. The most common crash type in all three subareas is ran off the road crashes. This accounts for 15 (54%) of the 28 crashes in the northern subarea, 70 (67%) of the 105 crashes in the middle subarea and 33 (57%) of the 58 crashes in the southern subarea.

Table 11 summarizes the key crash findings along each segment with the intersection and ramp related crashes included. This table details the total crash rate data, not the fatal & serious injury crash data.

Table 11 – Segment Crash Summary (2015-2019)

Segment	Total Crashes	Severe Crashes (K + A)	Actual Crash Rate	Statewide Average	Critical Rate	Critical Index
Lake St NW to Belgrade Ave	160	2	1.65	1.64	1.98	0.83
Belgrade Ave to the Blue Earth River Crossing	203	1	1.49	1.13	1.37	1.09
Blue Earth River Crossing to TH 60	116	7	0.61	1.64	1.88	0.32

Table 11 shows that the middle subarea operates with a critical index of 1.09 which indicates that the segment operates outside the normal range. Although the total crash critical index is less than one along the southern subarea from the Blue Earth River Crossing to TH 60, with seven severe crashes in the last 5 years, this segment has a fatal & serious injury critical index of 1.03. This indicates that the segment is operating above the normal range for fatal and serious injury crashes compared to similar roadway segments statewide.

Fatal Crashes

A ten-year crash analysis (2010-2019) was completed for fatal crashes throughout the project area. Five fatal crashes occurred along TH 169 within the project limits in the last ten years.

- TH 169 near Riverfront Dr (2013) – Vehicle was driving along northbound TH 169 near Riverfront Dr when they lost control and collided with the concrete median barrier.
- CSAH 69 (Hawley St) at TH 169 (2015) – Left turn crash at the intersection involving a vehicle along northbound TH 169 and a vehicle making a southbound left turn from TH 169 onto CSAH 69 (Hawley St).
- TH 68 at TH 169 (2015) – Right angle crash at the intersection involving a vehicle along southbound TH 169 and a vehicle making an eastbound left turn from TH 68 onto northbound TH 169.
- CSAH 69 (Gadwall Rd) at TH 169 (2017) – Right angle crash at the intersection involving a vehicle along southbound TH 169 and a vehicle making an eastbound left turn from CSAH 69 (Gadwall Rd) onto northbound TH 169.
- CSAH 90 at TH 169 (2017) – Motorcycle was attempting to merge onto northbound TH 169 from westbound CSAH 90 and hit a semi-truck. This crash was caused by driver error by the motorcycle. The crash report indicates that he failed to stay in his lane, cutting over into traffic too soon and striking the back end of the semi-truck.

Pedestrian and Bicycle Crashes

A ten-year crash analysis (2010-2019) was also completed for pedestrian and bicycle crashes throughout the project area. There were four crashes involving a pedestrian or a bicycle in the last ten years.

- Pedestrian Crashes
 - Serious injury crash along TH 169 between River Ln and Webster Ave. Pedestrian was on the shoulder of TH 169 when hit by vehicle. (2019)
 - Possible injury crash at TH 169 and Webster Ave intersection. A pedestrian was crossing the south side of the intersection from east to west when hit by a semi-truck along northbound TH 169 making a right turn on red. (2017)
- Bicycle Crashes
 - Non-injury crash at the intersection of Riverfront Dr and the NB TH 169 Ramps. Vehicle was making a northbound right turn onto Riverfront Dr from the NB TH 169 exit ramp and hit a bicyclist crossing the exit ramp. (2018)

- Possible injury crash at the intersection of Riverfront Dr and the SB TH 169 Ramps. Vehicle was making a southbound right turn onto Riverfront Dr from the SB TH 169 exit ramp and hit a bicyclist crossing Riverfront Dr. (2015)

Geometric Concerns

While analyzing the crash data there were a few locations that were found to have geometric concerns. These are described below:

WB TH 14 to NB TH 169 Exit Ramp

There were two crashes along the WB TH 14 exit ramp to NB TH 169. Both crashes involved a vehicle who crossed over the solid white lines along the ramp and NB TH 169 traffic while attempting to get back onto WB TH 14 via the left turn from NB TH 169 to the WB TH 14 entrance ramp. One of the crashes resulted in possible injury and one in property damage. There is a sign along the exit ramp that shows this left turn movement prohibited and the gore is painted approximately 100 ft past the location of the turn lane. These crashes indicate that the sign and paint prohibiting this movement might not be enough. Delineators or other items to create a physical gore should be considered.

Riverfront Dr at NB TH 169 Entrance Ramp

There were five rear end crashes that occurred along westbound Riverfront Dr as vehicles were turning right onto the NB TH 169 entrance ramp. Westbound right vehicles must yield to eastbound left vehicles at the ramp. These crashes indicate that vehicles are not always anticipating the need to stop and yield to other traffic. With the right turn channelized and the intersection unsignalized vehicles may be incorrectly assuming they have the right of way and therefore are not expecting the vehicle in front of them to stop for oncoming traffic.

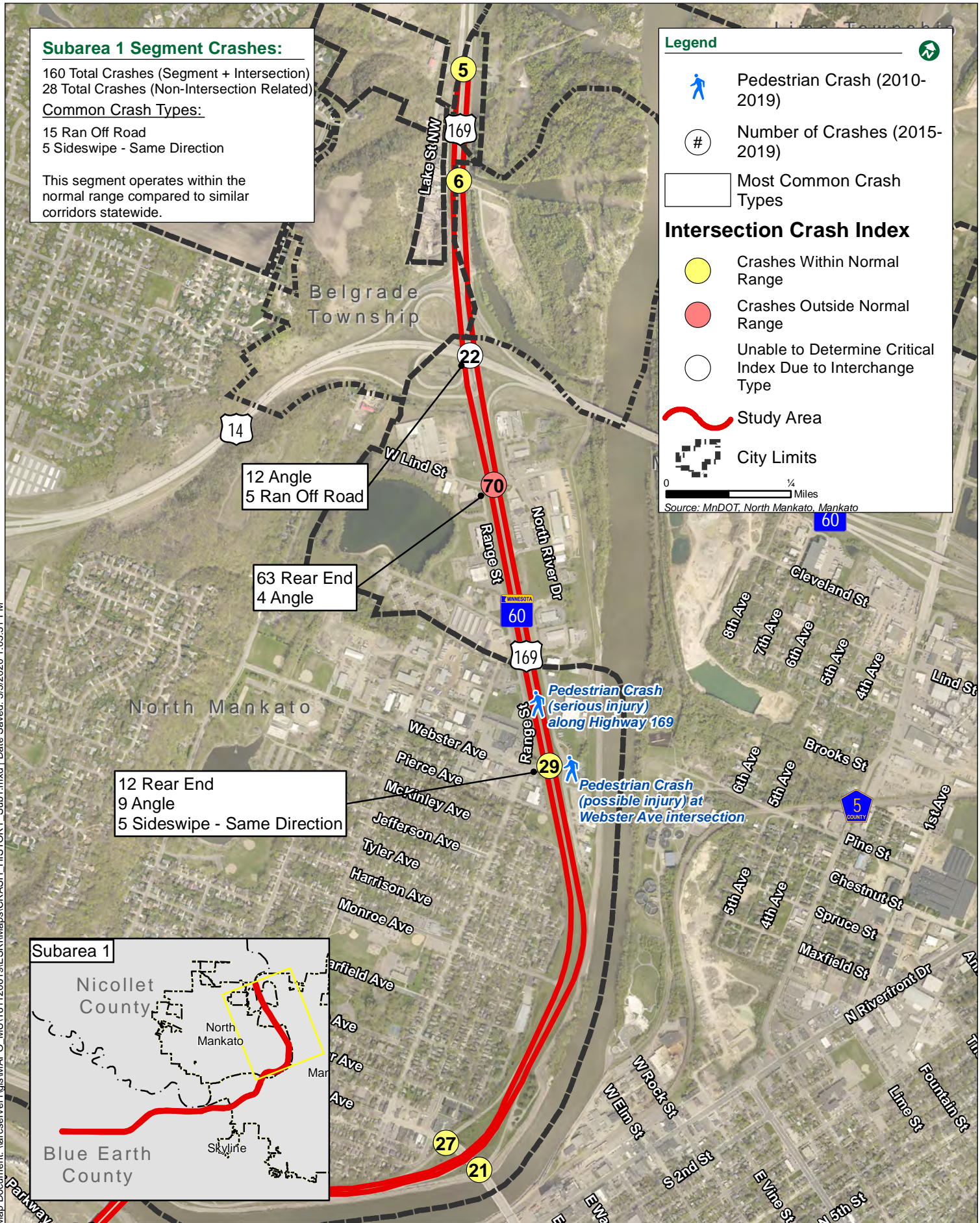
TH 68 at TH 169

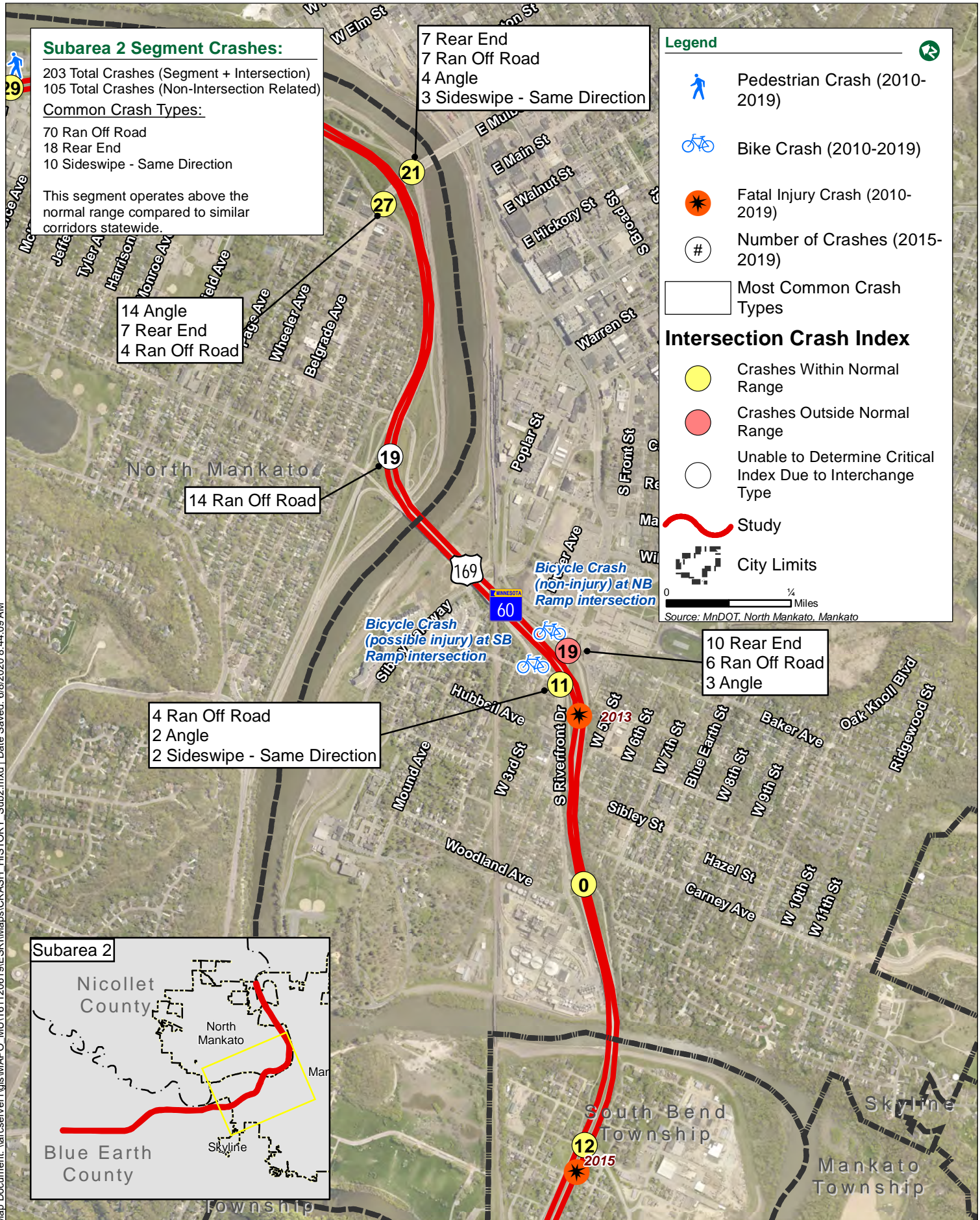
There were six right angle crashes over the last five years involving a vehicle attempting to turn left from TH 68 onto northbound TH 169 that were struck by a vehicle going southbound along TH 169. These right angle crashes resulted in a fatal, serious injury, two of the minor injury, and a possible injury crash. With speeds along TH 169 at 65 mph, the intersection sight distance for the left turn movement from TH 68 onto TH 169 is 720 ft according to the AASTHO Green Book. This distance does not appear to be met for southbound TH 169 traffic due to the vertical curvature of the roadway.

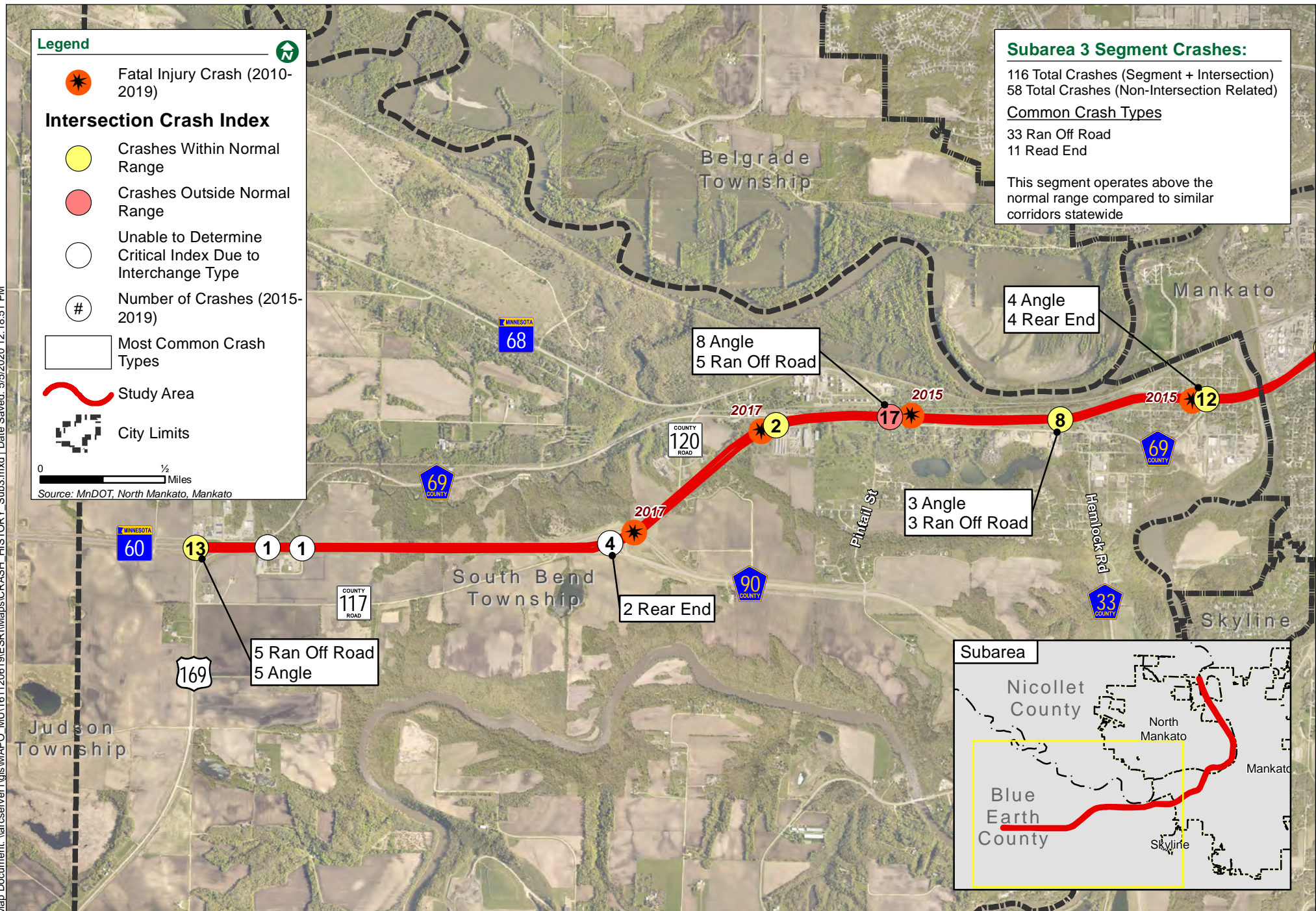
Future Safety Analysis

As a part of the alternative evaluation the ability of each option to safety accommodate all system users was analyzed (Goal C). Specifically, each concept was evaluated for how it reduces crash rates and provides safe pedestrian and bicycle facilities. Please see the “Identification and Evaluation of Corridor Concepts” report for a summary of the safety analysis evaluation for each concept analyzed. Additionally, a more detailed safety benefit was calculated for each of the northern subarea concepts. Please see the “Benefit Cost Analysis” report for the more detailed analysis.

Safety Memo Appendix







Intersection Safety Screening

Intersection: TH 169 and Lake St NW (northern access)



Crash Data, 2015-2019.

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

Intersection Characteristics	
Entering Volume	15,500
Traffic Control	Thru / stop
Environment	Suburban
Speed Limit	50 mph

Annual crash cost = \$7,600

Statewide Comparison

Urban Thru / Stop

Total Crash Rate	
Observed	0.18
Statewide Average	0.18
Critical Rate	0.41
Critical Index	0.44

Fatal & Serious Injury Crash Rate	
Observed	0.00
Statewide Average	0.33
Critical Rate	3.47
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 0.18 per MEV; this is 56% below the critical rate. Based on similar statewide intersections, an additional 7 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: TH 169 and Lake St NW (southern access)



Crash Data, 2015-2019.

Crashes by Crash Severity	
Fatal	0
Incapacitating Injury	0
Non-incapacitating Injury	0
Possible Injury	1
Property Damage	5
Total Crashes	6

Intersection Characteristics	
Entering Volume	16,500
Traffic Control	Thru / stop
Environment	Suburban
Speed Limit	50 mph

Annual crash cost = \$24,200

Statewide Comparison

Urban Thru / Stop

Total Crash Rate	
Observed	0.20
Statewide Average	0.18
Critical Rate	0.40
Critical Index	0.50

Fatal & Serious Injury Crash Rate	
Observed	0.00
Statewide Average	0.33
Critical Rate	3.32
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 0.20 per MEV; this is 50% below the critical rate. Based on similar statewide intersections, an additional 7 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: TH 169 and Lind St



Crash Data, 2015-2019.

Crashes by Crash Severity	
Fatal	0
Incapacitating Injury	1
Non-incapacitating Injury	4
Possible Injury	12
Property Damage	53
Total Crashes	70

Intersection Characteristics	
Entering Volume	26,500
Traffic Control	Signals
Environment	Suburban
Speed Limit	50 mph

Annual crash cost = \$529,760

Statewide Comparison

Signals: high volume, high speed

Total Crash Rate	
Observed	1.45
Statewide Average	0.45
Critical Rate	0.71
Critical Index	2.04

Fatal & Serious Injury Crash Rate	
Observed	2.07
Statewide Average	0.48
Critical Rate	2.78
Critical Index	0.74

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 1.45 per MEV; this is 2.0 times the critical rate. If crashes were reduced by 35 over five years, this intersection would perform within normal range.

The observed fatal and serious injury crash rate for this period is 2.07 per 100 MEV; this is 26% below the critical rate. The intersection operates within the normal range.

Intersection Safety Screening

Intersection: TH 169 and Webster Ave



Crash Data, 2015-2019.

Crashes by Crash Severity	
Fatal	0
Incapacitating Injury	0
Non-incapacitating Injury	4
Possible Injury	3
Property Damage	22
Total Crashes	29

Intersection Characteristics	
Entering Volume	26,125
Traffic Control	Signals
Environment	Suburban
Speed Limit	50 mph

Annual crash cost = \$219,240

Statewide Comparison

Signals: high volume, high speed

Total Crash Rate	
Observed	0.61
Statewide Average	0.45
Critical Rate	0.71
Critical Index	0.86

Fatal & Serious Injury Crash Rate	
Observed	0.00
Statewide Average	0.48
Critical Rate	2.81
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 0.61 per MEV; this is 14% below the critical rate. Based on similar statewide intersections, an additional 5 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: NB TH 169 at Belgrade Ave



Crash Data, 2015-2019.

Crashes by Crash Severity	
Fatal	0
Incapacitating Injury	0
Non-incapacitating Injury	1
Possible Injury	1
Property Damage	19
Total Crashes	21

Intersection Characteristics	
Entering Volume	22,800
Traffic Control	Signals
Environment	Suburban
Speed Limit	45 mph

Annual crash cost = \$79,480

Statewide Comparison

Signals: high volume, low speed

Total Crash Rate	
Observed	0.50
Statewide Average	0.70
Critical Rate	1.04
Critical Index	0.48

Fatal & Serious Injury Crash Rate	
Observed	0.00
Statewide Average	0.76
Critical Rate	3.70
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 0.50 per MEV; this is 52% below the critical rate. Based on similar statewide intersections, an additional 23 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: SB TH 169 at Belgrade Ave



Crash Data, 2015-2019.

Crashes by Crash Severity	
Fatal	0
Incapacitating Injury	1
Non-incapacitating Injury	2
Possible Injury	7
Property Damage	17
Total Crashes	27

Intersection Characteristics	
Entering Volume	17,850
Traffic Control	Signals
Environment	Suburban
Speed Limit	45 mph

Annual crash cost = \$324,040

Statewide Comparison

Signals: high volume, low speed

Total Crash Rate	
Observed	0.83
Statewide Average	0.70
Critical Rate	1.09
Critical Index	0.76

Fatal & Serious Injury Crash Rate	
Observed	3.07
Statewide Average	0.76
Critical Rate	4.26
Critical Index	0.72

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 0.83 per MEV; this is 24% below the critical rate. Based on similar statewide intersections, an additional 9 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 3.07 per 100 MEV; this is 28% below the critical rate. The intersection operates within the normal range.

Intersection Safety Screening

Intersection: NB TH 169 and Riverfront Dr



Crash Data, 2015-2019.

Crashes by Crash Severity	
Fatal	0
Incapacitating Injury	0
Non-incapacitating Injury	1
Possible Injury	2
Property Damage	16
Total Crashes	19

Intersection Characteristics	
Entering Volume	21,300
Traffic Control	Thru / stop
Environment	Suburban
Speed Limit	45 mph

Annual crash cost = \$91,520

Statewide Comparison

Urban Thru / Stop

Total Crash Rate	
Observed	0.49
Statewide Average	0.18
Critical Rate	0.37
Critical Index	1.32

Fatal & Serious Injury Crash Rate	
Observed	0.00
Statewide Average	0.33
Critical Rate	2.78
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 0.49 per MEV; this is 1.3 times the critical rate. If crashes were reduced by 4 over five years, this intersection would perform within 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: SB TH 169 and Riverfront Dr



Crash Data, 2015-2019.

Crashes by Crash Severity	
Fatal	0
Incapacitating Injury	0
Non-incapacitating Injury	1
Possible Injury	3
Property Damage	7
Total Crashes	11

Intersection Characteristics	
Entering Volume	17,100
Traffic Control	Signals
Environment	Suburban
Speed Limit	45 mph

Annual crash cost = \$94,440

Statewide Comparison

Signals: low volume, low speed

Total Crash Rate	
Observed	0.35
Statewide Average	0.52
Critical Rate	0.86
Critical Index	0.41

Fatal & Serious Injury Crash Rate	
Observed	0.00
Statewide Average	0.42
Critical Rate	3.52
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 0.35 per MEV; this is 59% below the critical rate. Based on similar statewide intersections, an additional 16 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: TH 169 and CSAH 69 (Hawley St)



Crash Data, 2015-2019.

Crashes by Crash Severity	
Fatal	1
Incapacitating Injury	0
Non-incapacitating Injury	1
Possible Injury	4
Property Damage	6
Total Crashes	12

Intersection Characteristics	
Entering Volume	25,150
Traffic Control	Thru / stop
Environment	Suburban
Speed Limit	50 mph

Annual crash cost = \$337,520

Statewide Comparison

Urban Thru / Stop

Total Crash Rate	
Observed	0.26
Statewide Average	0.18
Critical Rate	0.36
Critical Index	0.72

Fatal & Serious Injury Crash Rate	
Observed	2.18
Statewide Average	0.33
Critical Rate	2.49
Critical Index	0.88

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 28% below the critical rate. Based on similar statewide intersections, an additional 5 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 2.18 per 100 MEV; this is 12% below the critical rate. The intersection operates within the normal range.

Intersection Safety Screening

Intersection: TH 169 and CSAH 33



Crash Data, 2015-2019.

Crashes by Crash Severity	
Fatal	0
Incapacitating Injury	1
Non-incapacitating Injury	1
Possible Injury	0
Property Damage	6
Total Crashes	8

Intersection Characteristics	
Entering Volume	25,325
Traffic Control	Thru / stop
Environment	Suburban
Speed Limit	65 mph

Annual crash cost = \$157,120

Statewide Comparison

Urban Thru / Stop

Total Crash Rate	
Observed	0.17
Statewide Average	0.18
Critical Rate	0.36
Critical Index	0.47

Fatal & Serious Injury Crash Rate	
Observed	2.16
Statewide Average	0.33
Critical Rate	2.48
Critical Index	0.87

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 0.17 per MEV; this is 53% below the critical rate. Based on similar statewide intersections, an additional 9 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 2.16 per 100 MEV; this is 13% below the critical rate. The intersection operates within the normal range.

Intersection Safety Screening

Intersection: TH 169 and TH 68



Crash Data, 2015-2019.

Crashes by Crash Severity	
Fatal	1
Incapacitating Injury	1
Non-incapacitating Injury	4
Possible Injury	3
Property Damage	8
Total Crashes	17

Intersection Characteristics	
Entering Volume	24,725
Traffic Control	Thru / stop
Environment	Suburban
Speed Limit	65 mph

Annual crash cost = \$539,960

Statewide Comparison

Urban Thru / Stop

Total Crash Rate	
Observed	0.38
Statewide Average	0.18
Critical Rate	0.36
Critical Index	1.06

Fatal & Serious Injury Crash Rate	
Observed	4.43
Statewide Average	0.33
Critical Rate	2.52
Critical Index	1.76

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 0.38 per MEV; this is 1.1 times the critical rate. If crashes were reduced by 0 over five years, this intersection would perform within normal range.

The observed fatal and serious injury crash rate for this period is 4.43 per 100 MEV; this is 1.8 times the critical rate.

Intersection Safety Screening

Intersection: TH 169 and CSAH 69 (Gadwall Rd)



Crash Data, 2015-2019.

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

Intersection Characteristics	
Entering Volume	19,195
Traffic Control	Thru / stop
Environment	Suburban
Speed Limit	65 mph

Annual crash cost = \$229,520

Statewide Comparison

Urban Thru / Stop

Total Crash Rate	
Observed	0.06
Statewide Average	0.18
Critical Rate	0.38
Critical Index	0.16

Fatal & Serious Injury Crash Rate	
Observed	2.85
Statewide Average	0.33
Critical Rate	2.99
Critical Index	0.95

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 0.06 per MEV; this is 84% below the critical rate. Based on similar statewide intersections, an additional 12 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 2.85 per 100 MEV; this is 5% below the critical rate. The intersection operates within the normal range.

Intersection Safety Screening

Intersection: TH 169 and Loren Dr



Crash Data, 2015-2019.

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

Intersection Characteristics	
Entering Volume	14,700
Traffic Control	Thru / stop
Environment	Suburban
Speed Limit	65 mph

Annual crash cost = \$1,520

Statewide Comparison

Urban Thru / Stop

Total Crash Rate	
Observed	0.04
Statewide Average	0.18
Critical Rate	0.42
Critical Index	0.10

Fatal & Serious Injury Crash Rate	
Observed	0.00
Statewide Average	0.33
Critical Rate	3.60
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 0.04 per MEV; this is 90% below the critical rate. Based on similar statewide intersections, an additional 11 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: TH 169 and CSAH 69 (Gadwall Rd) (west end)



Crash Data, 2015-2019.

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

Intersection Characteristics	
Entering Volume	14,795
Traffic Control	Thru / stop
Environment	Suburban
Speed Limit	65 mph

Annual crash cost = \$16,600

Statewide Comparison

Urban Thru / Stop

Total Crash Rate	
Observed	0.04
Statewide Average	0.18
Critical Rate	0.41
Critical Index	0.10

Fatal & Serious Injury Crash Rate	
Observed	0.00
Statewide Average	0.33
Critical Rate	3.58
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 0.04 per MEV; this is 90% below the critical rate. Based on similar statewide intersections, an additional 11 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: TH 169 and TH 60



Crash Data, 2015-2019.

Crashes by Crash Severity	
Fatal	0
Incapacitating Injury	0
Non-incapacitating Injury	2
Possible Injury	2
Property Damage	9
Total Crashes	13

Intersection Characteristics	
Entering Volume	15,200
Traffic Control	Thru / stop
Environment	Rural
Speed Limit	65 mph

Annual crash cost = \$114,880

Statewide Comparison

Rural Thru / Stop

Total Crash Rate	
Observed	0.47
Statewide Average	0.25
Critical Rate	0.52
Critical Index	0.90

Fatal & Serious Injury Crash Rate	
Observed	0.00
Statewide Average	1.05
Critical Rate	5.34
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 0.47 per MEV; this is 10% below the critical rate. Based on similar statewide intersections, an additional 2 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.

Trunk Highway Section Summary

Section: Northern Subarea - TH 169 from Lake St NW to Belgrade Ave

Crash Data, 2015-2019. Excludes crashes at junctions.

Crashes by Crash Severity	
Fatal	0
Incapacitating Injury	1
Non-incapacitating Injury	1
Possible Injury	3
Property Damage	23
Total Crashes	28

Section Characteristics	
Length	2.000 miles
Volume (ADT)	26,500
Environment	Suburban
Median Type	Divided / depressed
Number of Lanes	4
Roadway Design	Expressway

Annual crash cost per mile = \$116,380

Statewide Comparison

Urban Expressway

Total Crash Rate	
Observed	0.29
Statewide Average	0.50
Critical Rate	0.69
Critical Index	0.42

Fatal & Serious Injury Crash Rate	
Observed	1.03
Statewide Average	0.61
Critical Rate	2.14
Critical Index	0.48

Trunk Highway Section Summary

Section: Middle Subarea - TH 169 from Belgrade Ave to the Blue Earth River Crossing

Crash Data, 2015-2019. Excludes crashes at junctions.

Crashes by Crash Severity	
Fatal	0
Incapacitating Injury	0
Non-incapacitating Injury	7
Possible Injury	12
Property Damage	86
Total Crashes	105

Section Characteristics	
Length	2.300 miles
Volume (ADT)	32,500
Environment	Suburban
Median Type	Divided / depressed
Number of Lanes	4
Roadway Design	Freeway

Annual crash cost per mile = \$246,922

Statewide Comparison

Urban Freeway

Total Crash Rate	
Observed	0.77
Statewide Average	0.82
Critical Rate	1.02
Critical Index	0.75

Fatal & Serious Injury Crash Rate	
Observed	0.00
Statewide Average	0.49
Critical Rate	1.62
Critical Index	0.00

Trunk Highway Section Summary

Section: Southern Subarea - TH 169 from the Blue Earth River Crossing to TH 60

Crash Data, 2015-2019. Excludes crashes at junctions.

Crashes by Crash Severity	
Fatal	0
Incapacitating Injury	1
Non-incapacitating Injury	5
Possible Injury	7
Property Damage	45
Total Crashes	58

Section Characteristics	
Length	4.400 miles
Volume (ADT)	23,500
Environment	Suburban
Median Type	Divided / depressed
Number of Lanes	4
Roadway Design	Expressway

Annual crash cost per mile = \$106,500

Statewide Comparison

Urban Expressway

Total Crash Rate	
Observed	0.31
Statewide Average	0.50
Critical Rate	0.64
Critical Index	0.48

Fatal & Serious Injury Crash Rate	
Observed	0.53
Statewide Average	0.61
Critical Rate	1.60
Critical Index	0.33

Trunk Highway Section Summary

Section: Northern Subarea - TH 169 from Lake St NW to Belgrade Ave

Crash Data, 2015-2019. Includes crashes at junctions.

Crashes by Crash Severity	
Fatal	0
Incapacitating Injury	2
Non-incapacitating Injury	12
Possible Injury	24
Property Damage	122
Total Crashes	160

Section Characteristics	
Length	2.000 miles
Volume (ADT)	26,500
Environment	Suburban
Median Type	Divided / depressed
Number of Lanes	4
Roadway Design	Expressway

Annual crash cost per mile = \$609,920

Statewide Comparison

Urban Expressway

Total Crash Rate	
Observed	1.65
Statewide Average	1.64
Critical Rate	1.98
Critical Index	0.83

Fatal & Serious Injury Crash Rate	
Observed	2.07
Statewide Average	2.02
Critical Rate	4.39
Critical Index	0.47

Trunk Highway Section Summary

Section: Middle Subarea - TH 169 from Belgrade Ave to the Blue Earth River Crossing

Crash Data, 2015-2019. Includes crashes at junctions.

Crashes by Crash Severity	
Fatal	0
Incapacitating Injury	1
Non-incapacitating Injury	16
Possible Injury	27
Property Damage	159
Total Crashes	203

Section Characteristics	
Length	2.300 miles
Volume (ADT)	32,500
Environment	Suburban
Median Type	Divided / depressed
Number of Lanes	4
Roadway Design	Freeway

Annual crash cost per mile = \$586,035

Statewide Comparison

Urban Freeway

Total Crash Rate	
Observed	1.49
Statewide Average	1.13
Critical Rate	1.37
Critical Index	1.09

Fatal & Serious Injury Crash Rate	
Observed	0.73
Statewide Average	0.67
Critical Rate	1.93
Critical Index	0.38

Trunk Highway Section Summary

Section: Southern Subarea - TH 169 from the Blue Earth River Crossing to TH 60

Crash Data, 2015-2019. Includes crashes at junctions.

Crashes by Crash Severity	
Fatal	4
Incapacitating Injury	3
Non-incapacitating Injury	13
Possible Injury	18
Property Damage	79
Total Crashes	117

Section Characteristics	
Length	4.400 miles
Volume (ADT)	23,500
Environment	Suburban
Median Type	Divided / depressed
Number of Lanes	4
Roadway Design	Expressway

Annual crash cost per mile = \$480,655

Statewide Comparison

Urban Expressway

Total Crash Rate	
Observed	0.62
Statewide Average	1.64
Critical Rate	1.88
Critical Index	0.33

Fatal & Serious Injury Crash Rate	
Observed	3.71
Statewide Average	2.02
Critical Rate	3.61
Critical Index	1.03

Existing & No-Build Conditions Appendix E: Issues Identification Infographic

Highway 169 Corridor Issues Identification



Principal Arterial and National Highway System (NHS) route

Provides direct and relatively high-speed connections to southern Minnesota and to the Twin Cities Metropolitan Area

Vehicles per day on Highway 169



16,600

Northern Subarea

32,500

Middle Subarea

23,600

Southern Subarea



AM PEAK HOUR

Today there are no excessive intersection delays
2040: No intersections operate with excessive delay



PM PEAK HOUR

Today there are no excessive intersection delays
2040: 3 intersections operate with excessive delay



Middle and southern subareas **exceed the typical crash rate** for compatible corridors.

3 major intersections have high crash rates

2015-2019

4 fatal crashes
4 pedestrian crashes
6 serious injury crashes



8 Bus Routes serve the project area



The MAPO area had an estimated population of 62,578 in 2012 and 65,175 in 2020, increasing 4%. MAPO projects a **2045 population of 73,200, increasing an additional 12%** from the 2020 estimation.



33% renter occupied housing (34% in Nicollet and Blue Earth Counties)



Areas of high concentration of **minority or low income populations**



37,200 jobs in the MAPO area (2017), of which most drove or carpoled to work.



20% age 65+ in South Bend Township (13% in Nicollet and Blue Earth Counties)



There are social, economic, and environmental resources within the study area including environmental justice populations, potentially contaminated sites, scattered stands of trees, grassy areas, lakes, streams, rivers, ponds, and wetlands. No adverse effects to wildlife is anticipated with construction.



A FEMA controlled levee exists on the river side of Highway 169. The levee is a combination of earthen berm and concrete floodwall providing flood protection for North Mankato, Mankato, and LeHillier when the Minnesota River is at flood stage.

Northern Subarea Findings

The northern subarea runs from Veterans' Memorial Bridge to Lake Street. This segment is a four-lane divided expressway within the Cities of Mankato and North Mankato.

This subarea provides access to the 100 acre Kiwanis Recreation Area and has a large concentration of commercial, heavy industrial, light industrial, residential, and public/institutional land uses served by Lind Street and Webster Avenue connections to Highway 169.



2040 projections show excessive delays at the eastbound Highway 14 exit ramp during AM & PM peak hours.



159 crashes (2015-2019)

2 severe crashes

This segment operates within the normal range compared to similar corridors statewide.



Access Management

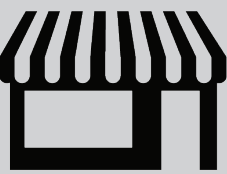
5 of 7 existing minor road intersections **do not meet recommended spacing**. Future access plans must give consideration to the North Mankato resolution No. 53-19 stating full access must be maintained at Webster Avenue and the Mankato resolution R-19-0708-119 stating that businesses currently served by the Lind Street access must be assured long-term economic vitality.



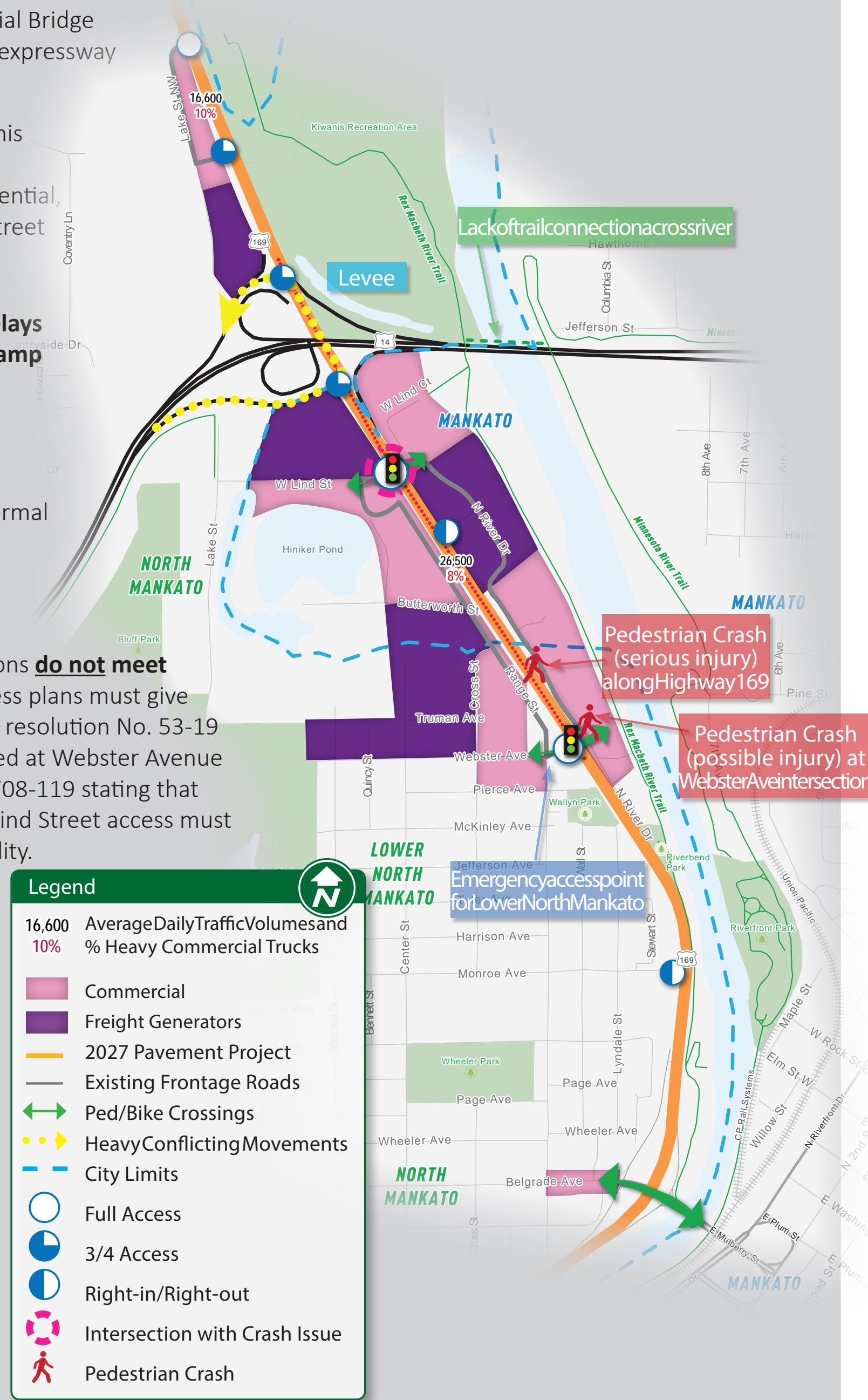
The Minnesota River Trail runs along Highway 169. This trail provides access within North Mankato and Mankato. There is demand for safe highway crossings to access the trail from Lind Street and Webster Avenue.



Ongoing Land Use Studies for the Riverside North Redevelopment in Mankato and Webster Avenue in North Mankato.



Primary Highway Business District requiring local access for economic vitality of existing and future commercial and industrial businesses.



Middle Subarea Findings

The middle subarea runs from the Blue Earth River crossing to Veterans Memorial Bridge within the Cities of Mankato and North Mankato. This is a four-lane divided freeway corridor. This area includes primarily low and medium density residential and heavy industrial land uses along the eastern edge of the Minnesota River. North Mankato Fire Station #1 has access to Highway 169 via Lookout Drive.

As the only freeway segment in the study area, traffic movements rely heavily on the Veterans Memorial Bridge, Lookout Drive, and South Riverfront Drive interchanges. These interchanges provide critical connections to Downtown Mankato, West Mankato, southern Mankato and Minnesota State University, Mankato campus, lower and upper North Mankato, and across the Minnesota and Blue Earth Rivers.



204 crashes (2015-2019) **1 severe crash**

This segment operates **above** the normal range compared to similar corridors statewide.



Access Management

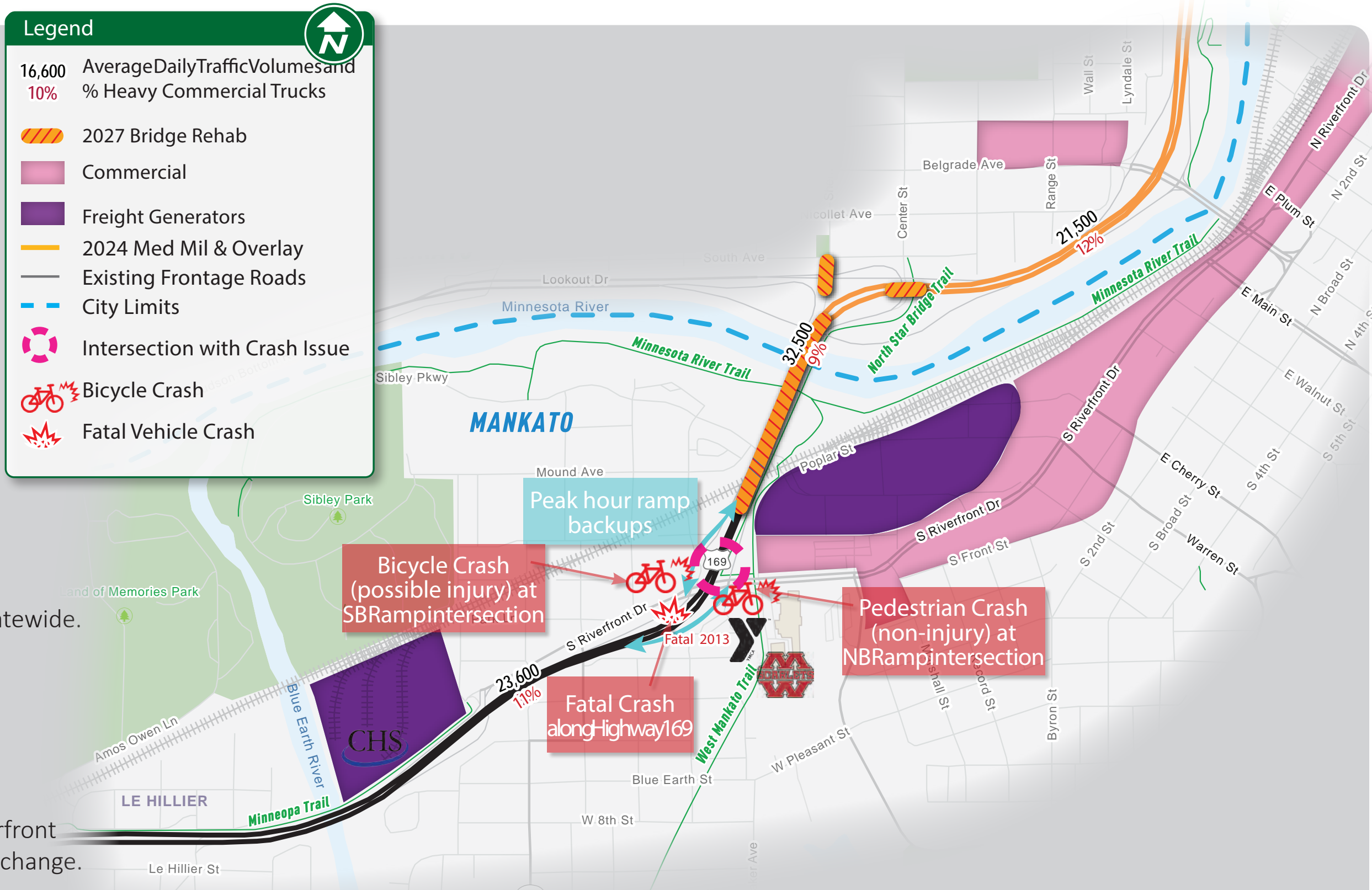
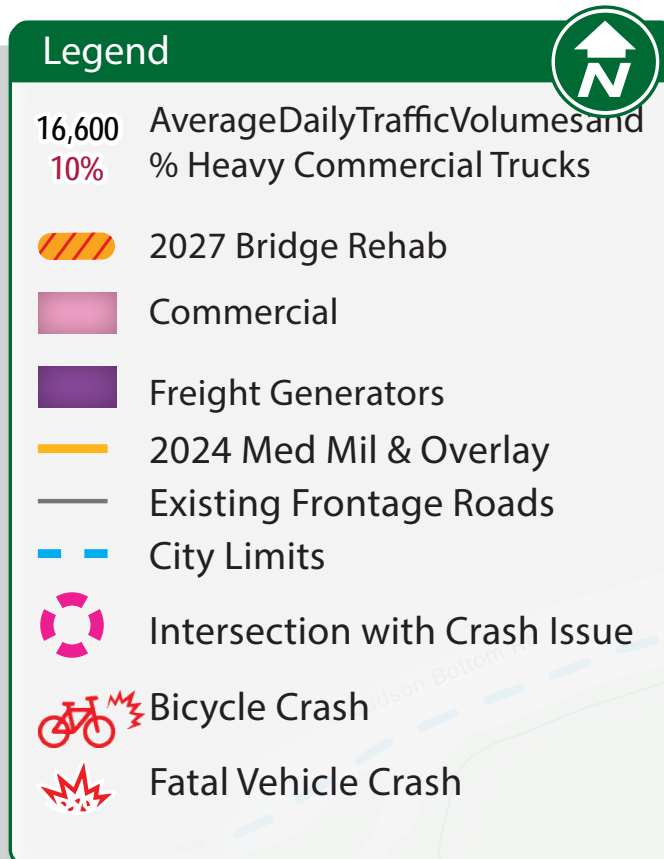
3 of 3 Primary Intersections **do not meet recommended spacing**. 2 of 2 minor road intersections **do not meet recommended spacing**. *



Freight access to industrial areas along the railroad in Mankato occurs at the Riverfront Drive ramp, Riverfront Drive interchange, and the Veteran's Memorial Bridge interchange.



The area is well connected with **existing trails** across the North Star Bridge and along both sides of the Minnesota River.



* Access spacing applies to the spacing between at grade or grade separated access points. In the middle subarea there are no at grade intersections so spacing between the grade separated accesses were measured. Recommended spacing from the Minnesota Department of Transportation (MnDOT) Access Management Manual was compared to the actual spacing. This analysis indicated that none of the accesses in the Middle Subarea meet the spacing recommended in the MnDOT Access Management Manual.

Southern Subarea Findings

The southern subarea runs from Highway 60 to the Blue Earth River crossing within South Bend Township. This is a four-lane divided expressway corridor. This area includes primarily low density residential and park and open space land uses directly adjacent Highway 169, with some areas of commercial and light industrial.

Connectivity of the local roadway network is inhibited in many areas by topography, including steep slopes and natural areas, the Union Pacific Railroad, the Minnesota and Blue Earth Rivers and adjacent land uses. Limited local network connectivity puts pressure on Highway 169 and conversely, any change in access will put pressure on the local system.



2040 projections show back-ups extending beyond the westbound left turn lane at Highway 60 and CSAH 69 (Hawley Street) and excessive delay at the intersection of Highway 60 and 33 during the PM peak hour.



171 crashes (2015-2019) **7 severe crashes**

This segment operates **above** the normal range for **fatal and serious injury** crash critical index compared to compatible corridors statewide.



Access Management

2 of 4 Primary Intersections **do not meet recommended spacing**. 10 of 12 minor road intersections **do not meet recommended spacing**.



Freight access is important for the industrial land uses and connections to the county road network.



Trails in this area include the **South Route Trail** and the **Minneopa Trail**. Pedestrian demand is high to connect the residential areas across Highway 169 to the Blue Earth River bridge, one of two access points by bike or foot to West Mankato destinations such as Roosevelt Elementary School, West High School, and Downtown Mankato. There is also an existing at-grade pedestrian crossing at Hawley Street.

