DRAFT

MANKATO/ NORTH MANKATO

MAPO 2045 Transportation Plan

October 1, 2015

SRF Consulting Group, Inc.

Bolton & Menk Engineers & Surveyors

MAPO 2045 TRANSPORTATION PLAN

Table of Contents

Acknowledgements

Mankato/North Mankato Area Planning Organization Staff

Paul Vogel	Executive Director
Jake Huebsch	Transportation Planner

Technical Advisory Team

Sheri Allen	Mankato Public Schools (District #77)
Mark Anderson	City of Mankato
Lisa Bigham	MnDOT (District 7)
Scott Fichtner	Blue Earth County
Ronald Fields	Minnesota State University, Mankato
Michael Fisher	City of North Mankato
Al Forsberg	Blue Earth County
Karl Friedrichs	Lime Township
Seth Greenwood	Nicollet County
Travis Javens	City of Skyline
Jeff Johnson	City of Mankato
Curt Kloss	Leray Township
Mandy Landkamer	Nicollet County
Loren Lindsay	Belgrade Township
Dave Wentzel	Region 9 Development Commission
Brad Potter	City of Eagle Lake
Ed Pankratz	Mankato Township
Dan Sarff	City of North Mankato
Open	South Bend Township

Project Consultant Team

Brian Shorten	SRF Consulting Group, Inc.
Craig Vaughn	SRF Consulting Group, Inc.
BrieAnna Simon	SRF Consulting Group, Inc.
Angie Bersaw	Bolton & Menk, Inc.

The preparation of this document was funded in part by the United States Department of Transportation with funding administered through the Minnesota Department of Transportation, the Federal Highway Administration, and the Federal Transit Administration. Additional funding was provided through local contributions from Mankato/North Mankato Area Planning Organization (MAPO). The United States Government and the State of Minnesota assume no liability for the contents or use thereof.

The document does not constitute a standard specification, or regulation. The United States Government, the State of Minnesota, and MAPO do not endorse products or manufactures. Trade or manufacturers' names appear herein only because they are considered essential to the objective of the document.

The contents of the document reflect the authors, who are responsible for facts and accuracy of data presented herein. Contents do not necessarily reflect policies of the State and Federal Department of Transportation.

Introduction

The Mankato/North Mankato Area Planning Organization's (MAPO) Long Range Transportation Plan (LRTP) translates identified multimodal needs into specific actionable projects. The Plan prioritizes improvements to coordinate preservation needs (so as to maintain the future metropolitan transportation system in a state of good repair) with mobility, safety, freight, and congestion needs to accommodate planned growth in the area. The Plan has been financially constrained and also presents new transportation initiatives and strategies that can be mandated over the next few years to address key issues. This federally compliant plan outlines how the MAPO and its member jurisdictions will grow and manage the transportation system over the next 30 years (year 2045 horizon).

The MAPO is a new Metropolitan Planning Organization (MPO) designated because the Mankato/North Mankato urbanized area is now larger than 50,000 population. It is charged with carrying out the 3-C metropolitan transportation planning process (continuing, cooperative, and comprehensive). MAPO is comprised of 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 Plan elements were coordinated with the MAPO member jurisdictions, in particular the Minnesota Department of Transportation (MnDOT), Blue Earth County, Nicollet County, City of Mankato, City of North Mankato, and City of Eagle Lake.

Further, the Plan's development was guided by two key MAPO standing committees:

Technical Advisory Committee (TAC) – the TAC is comprised of 20 individuals representing engineering, planning, transit, public institutions, township, city, county, and state interests. The TAC reviews and formulates recommendations to the Policy Board regarding technical aspects of transportation planning prepared by the MAPO.

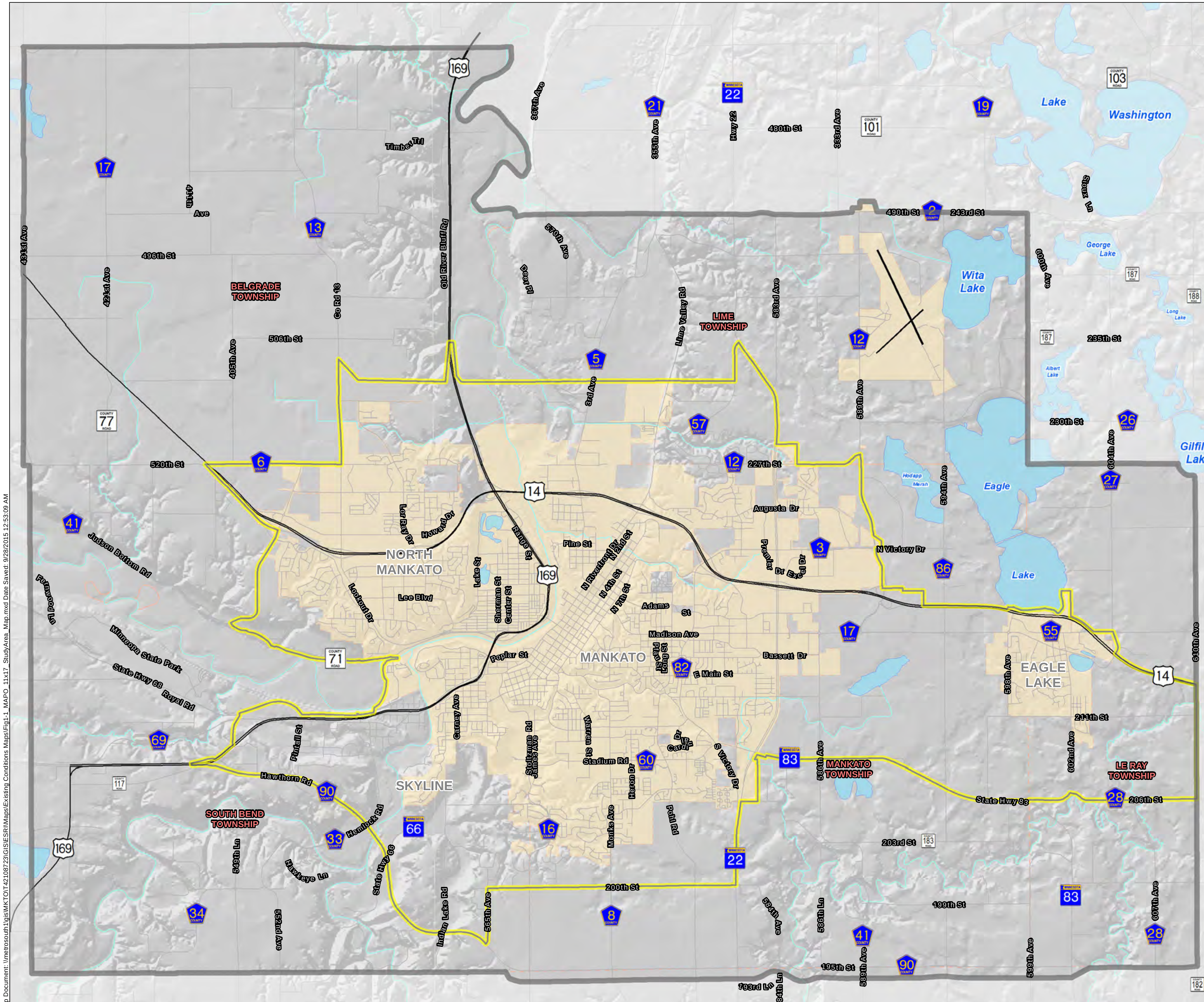
Policy Board – the Policy Board is comprised of elected leaders from Blue Earth County, City of Mankato, City of North Mankato, Nicollet County, Mankato Township, and City of Eagle Lake. The MAPO Policy Board reviews, evaluates, comments upon, makes recommendations, and ultimately endorses the required plans and programs such that federal and state funding eligibility is maintained for the metropolitan area.

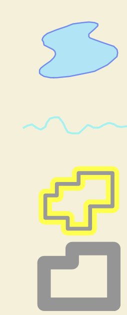
The full MAPO study area is shown in Figure 1-1.

MAPO 2045
TRANSPORTATION PLAN

Study Area

Figure 1-1





PWI (Basin)

PWI (Watercourse)

Adjusted Urbanized Boundary

MAPO Planning Area

Source: Blue Earth County, Nicollet County, MnDOT, North Mankato, Mankato, MnDNR, Esri Imagery

N

0 1 2 Miles

SRF

Bolton & Menk

Plan Framework

The Plan serves as a blueprint for making transportation decisions moving forward. It offers guidance and direction for elected leaders, citizens, economic interests, and stakeholders to achieve a shared vision for system preservation and mobility. In order to provide this guidance, the plan focused on 10 key planning elements, which include the following:

Public Engagement Process

Public participation and agency coordination was an important element in identifying issues and needs and in building support for the overall Transportation Plan. In order to build consensus and garner support for the Plan, a series of stakeholder meetings and open houses were conducted. In addition, other social media channels were used to reach the public including a Facebook page and Twitter account. MySidewalk/MindMixer were also incorporated to expand public engagement and reach community members who frequently use these outlets.

Existing System Conditions

The Existing System Conditions chapter provides a baseline to understand the current transportation system. This chapter presents information on demographics, land use, roadway jurisdiction, system classification, functional classification, system continuity and connectivity, crash history, and existing traffic volumes, along with multimodal elements including freight, rail, public transit, aviation, bicycle, and pedestrian. This data aided in the development of the Plan's goals and objectives while providing insights on future roadway system operations and needs.

Safety and Crash Assessment

This chapter provides an overview of existing safety concerns along both corridors and intersections throughout the MAPO. Conducting this safety assessment helps set the foundation for identifying goals and objectives and future operation and project needs.

Goals, Objectives, and Performance Measures

In order to be effective, the Plan must address MAPO's stated transportation goals, objectives, and performance measures. The goals reflect MAPO's transportation vision, while the objectives provide direction and guidance in achieving these goals. The goals, objectives, and performance measures were developed early in the planning process based on a wide range of stakeholder input and were refined as the technical analysis progressed. In essence, the goals and objectives provided the foundation for the Plan's development. Performance measures were developed for five of MAPO's key performance focus areas. These were developed to function as a benchmark to assess and measure progress over time.

Future System Forecasts and Operations

Over the next 30 years, the MAPO planning area will experience change in land use patterns and traffic growth. It is important to recognize these changes and determine their impacts on the transportation system. This section documents the MAPO area's future traffic forecasts and resultant future system operations. It also evaluates opportunities for low-cost/high-benefit system improvements and assesses future multimodal issues given the information available at this time. Performance of the system under the 2040 future horizon was compared to the existing system conditions, from which the range of needed improvement of alternatives were developed.

Range of Alternatives Analysis

This section defines the scope and cost of needed roadway improvement projects, identifies potential environmental constraints, and analyzes anticipated future operation and maintenance activities and schedules. Previously identified projects, along with new multimodal projects, were compiled to encompass a full range of multimodal alternatives. The range of alternatives were developed recognizing that federal legislation – Moving Ahead for Progress in the 21st Century Act (MAP-21) – dictates system operation, and maintenance activities must be addressed first, before future new construction or system expansion needs are undertaken.

Financial/Revenue Forecasts

As required by MAP-21, the Plan must be fiscally constrained by providing an outlook of anticipated revenue streams. This section provides an overview of the reasonably expected future transportation funds available for jurisdictions within the (MAPO) planning area. The financial/revenue forecasts provide an understanding of what partnering agencies can accomplish over the life of the plan for preservation and maintenance projects, major reconstruction/rehabilitation, corridor/intersection expansion, trails, transit, and safety projects.

Implementation Plan

This section presents the project prioritization methodology and schedule and also presents the fiscally constrained program of projects. Project fiscal constraint recommendations were developed to maintain consistency with stakeholder input and technical analysis while satisfying the identified goals. Projects were programmed into four time frames: short-(2016-2020), mid 1-(2021-2025), mid 2-(2026-2030) and long-term (2031-2045). Projects falling outside of the fiscally constrained program of projects are identified as illustrative and can be programmed when additional resources are identified.

Recommended Future Network

The future roadway system plan considered all previous analyses, public input, and the updated goals and objectives and synthesized these into a coordinated set of system recommendations regarding future functional classification and jurisdiction. These recommendations were identified to enhance mobility over the next 30 years.

System Management

The system management section provides policies and tools that can enhance and extend the utility of the current multimodal transportation facilities. These tools include access management, traffic control, right-of-way (ROW), and preservation policies. The policy recommendations and tools identified in this section should be used in coordination with the project recommendations identified in the implementation plan.

MAP-21 Compliance

This Plan addresses all planning requirements associated with MAP-21. Key features of MAP-21 are:

- MAP-21 consolidated some programs and eliminated others to make more financial resources available and provides greater flexibility to states and metropolitan areas to invest in their prioritized transportation needs.
- MAP-21 maintained previously established planning factors, which served as guides when developing MAPO goals and objectives and reviewing projects for implementation.
- MAP-21 included a focus on streamlining project delivery, measuring system performance, and prioritizing improvements.

The Federal Highway Administration (FHWA) states that "MAP-21 creates a streamlined and performance-based surface transportation program and builds on many of the highway, transit, bike, and pedestrian programs and policies established in 1991."

The MAPO LRTP applied performance-based planning in selecting fiscally constrained projects to implement over at least the next 30 years. Additional discussion of MAP-21 components is included in Chapter 5 with respect to performance goals and planning factors.

Public Engagement Process

Public participation and agency coordination were important elements in identifying issues and needs, developing alternatives, and building support for the Plan recommendations. Transportation projects are major public investments that impact and serve residents of the greater MAPO planning area and those traveling through the region. In order to build consensus, a number of public engagement tools were used to engage the community during the planning process. These included a series of public open houses and online media outlets to engage stakeholders and citizens in the Plan development process. This chapter describes the key stakeholders, public involvement process, specific engagement activities, and feedback received.

MAPO Public Participation Plan

Adopted in June 2014, the *Public Participation Plan and Staff Guide for the MAPO's Transportation Plans and Programs* serves to guide all of the MAPO's public involvement processes.

Adherence to the MAPO Public Participation Plan, as part of the Long Range Transportation Plan development process, ensured compliance with the federal 3-C (continuous, cooperative and coordinated) transportation planning procedures and satisfied federal regulations as outlined in 23 USC 134 and 23 CFR 450.

Stakeholder Guidance

Technical Advisory Committee

The MAPO Technical Advisory Committee (TAC) was used to provide technical direction for the Plan. The TAC is comprised of all MAPO member agencies. Meetings with this group are held the third Thursday of every month or on an as-needed basis; seven meetings were held to coordinate the Plan's development. These meetings were used to solicit feedback and guidance on preliminary findings, proposed priorities, and draft recommendations, as identified during the planning process. In-depth contributions by TAC members aided in the decision-making process for the MAPO planning area.

Policy Board

The MAPO Policy Board was used to review, evaluate, comment upon, make recommendations, and ultimately endorse the required plans and programs such that federal and state funding eligibility is maintained for the metropolitan area. Meetings with the Policy Board were used to gain feedback and guidance on policies and draft recommendations specific to the Long Range Transportation Plan, as identified during the planning process. Meetings were held on an as-needed basis, which resulted in four meetings being held.

MnDOT and FHWA Coordination Meetings

Meetings with the Minnesota Department of Transportation (MnDOT) and Federal Highway Administration (FHWA) staff were convened to ensure compliance with policies and standards. These meetings were also used to gain input from management staff on the preliminary findings, proposed priorities, and draft recommendations, as identified during the planning process. Agreement on financial forecasting assumptions was achieved during these meetings so that all assumptions had early buy-in and direction from those that review the Plan for approval. Two meetings were held at key milestones.

One-on-One Local Agency Meetings

Throughout the planning process, one-on-one local agency meetings were held with stakeholders and partnering agencies. The purpose of the one-on-one meetings was to establish a clear understanding of community issues and opportunities related to the transportation system and to discuss key elements of the Plan as they related to each respective agency. This input was supplemented with comments received from the general public and ongoing TAC meetings.

Regional Public Agency Meeting

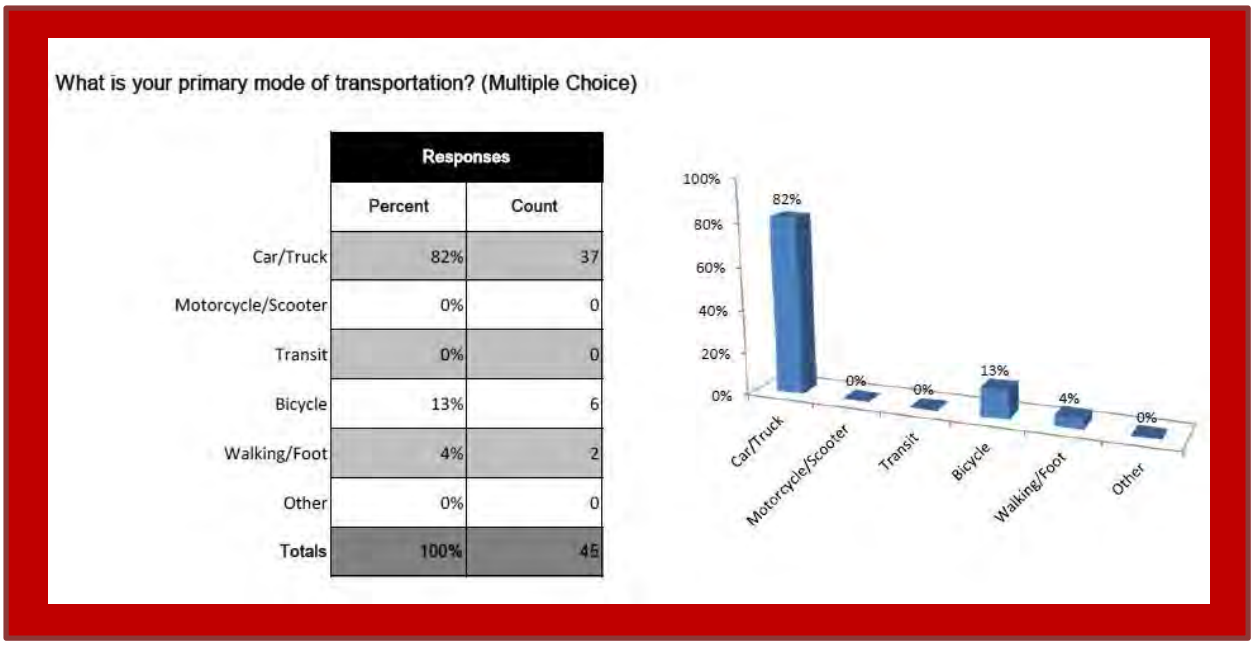
In order to gain the support of regional public agencies throughout the MAPO planning area, numerous agencies were invited to attend an open forum information and feedback meeting on the Plan's recommendations and the range of alternatives. The intent was to provide an opportunity for these regional resource agencies to provide feedback and answer any questions. No major questions arose during this open forum. The agencies contacted and letters sent are provided in Appendix 2-A.

Public Engagement Activities

Public Open Houses

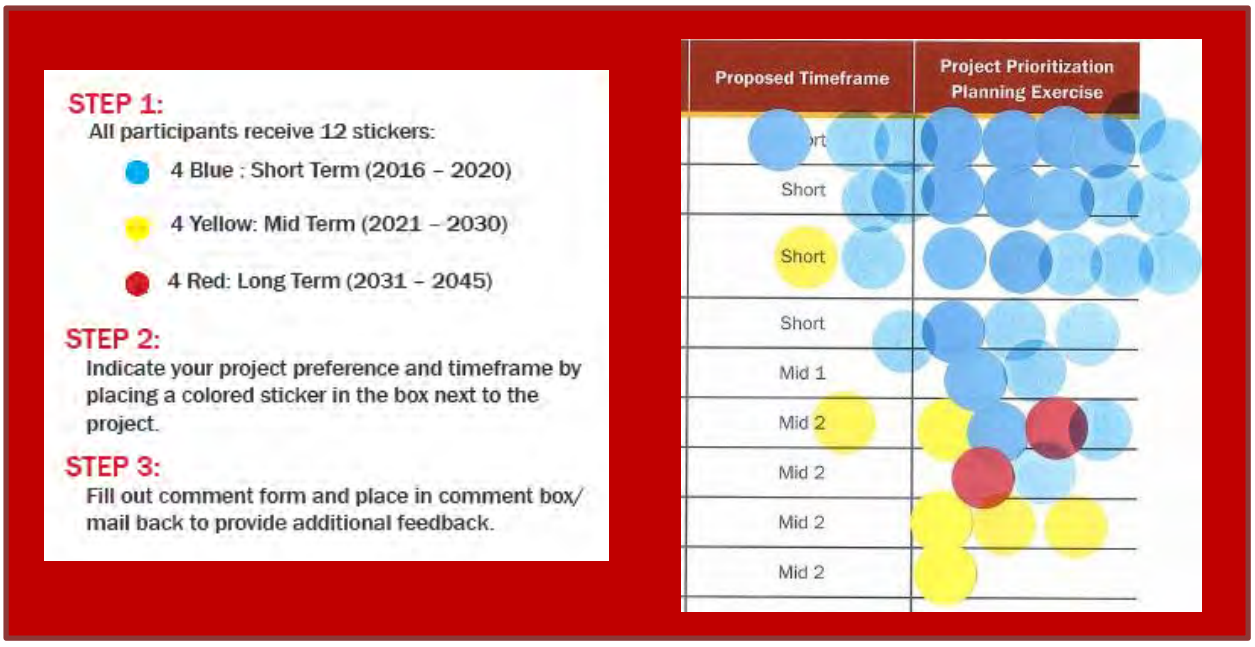
Three public open house meetings were held during the planning process. These meetings were conducted to provide the public and key stakeholders information on the Transportation Plan and to seek input regarding issues and needs, goals/objectives/performance measures, range of project alternatives, and Plan outcomes. Display boards, presentations, surveys, comment forms, and engagement activities were used to actively involve the public at these meetings. Importantly, the open house format offered an informal venue for citizens, agency staff, and community leaders to ask questions and share their thoughts on the Plan findings and recommendations.

The first public open house meeting was held early in the planning process. The purpose of the meeting was to introduce the MAPO's Long Range Transportation Plan process and provide an early input opportunity for the public to identify transportation issues. A variety of display boards and maps were presented to help facilitate discussions. Initial data collection activities and analysis results were presented to provide context regarding current condition understanding. Input was solicited from attendees in the form of an electronic facilitation survey. Questions on the survey were pertinent to issues surrounding the MAPO area. The survey was administered interactively with a graphic presentation, and participants responded anonymously using an electronic device. Following completing of each question, responses were automatically tallied and shared with the group in real time.



Results of the interactive survey are provided in Appendix 2-B.

The second public open house was conducted at about the halfway point of the study process to share proposed goals and objectives and a preliminary listing of the potential range of alternatives, based on future system assessment and public input received during the first open house and online comments. An interactive ranking exercise was conducted to gauge the community's response to the range of alternatives and their preference for improvement projects. This was accomplished with a "dot exercise" whereby participants placed color-coded dots on the range of alternatives matrices to indicate their preference for time horizon investment.



Results of the interactive dot exercise are provided in Appendix 2-C.

The third and final public open house was held near the end of the planning process to present the Draft Plan to the community and seek feedback. Comments received were incorporated where appropriate and are provided in Appendix 2-E. All public meeting notifications were coordinated by the MAPO and conformed to the documented Public Participation Plan.

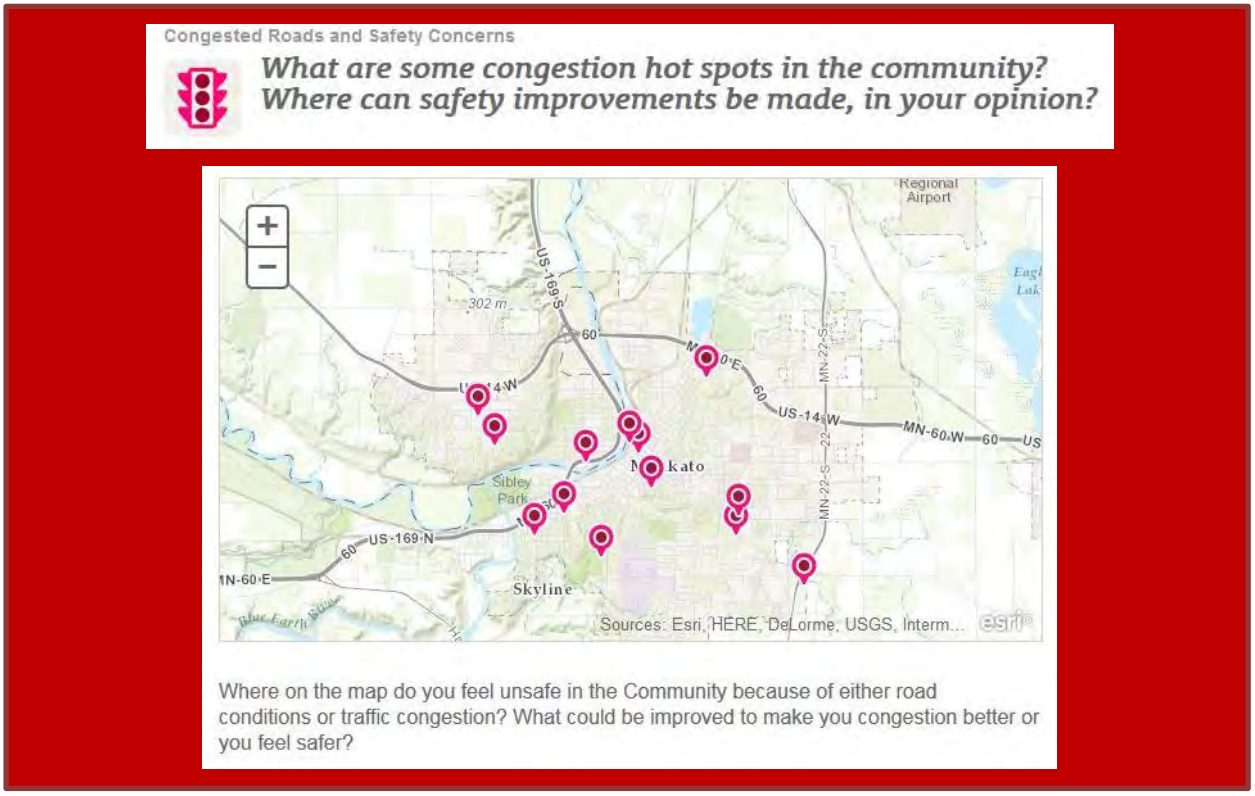
Project Website

A project website was established to communicate the project schedule, opportunities for public involvement, provide meeting materials, highlight project milestones, and present study products. The website also provided an additional resource for citizens, agency staff, and community leaders so they could monitor ongoing progress throughout the planning process.

MindMixer/MySidewalk

A targeted, enhanced, and interactive citizen engagement website (MindMixer/MySidewalk) was established to provide even greater opportunities to encourage public involvement, seek feedback/share ideas, discuss project activity, and supply additional survey of community interests.

Various discussion topics were offered through this site, especially during interim times between public open house meetings. This offered the public another chance to engage MAPO staff and the Plan development team by offering additional input. Engagement topics and their responses are provided in Appendix 2-F.



Social Media

Social media outlets, such as Facebook and Twitter, were also used to reach the public. These resources provided opportunities for stakeholders and citizens to stay more engaged with the project and provide additional input throughout the planning process. The social media outlets were meant to share information and direct participants to the project website and public open house meetings.

Existing System Conditions

A critical element in developing the overall Long Range Transportation Plan was to define the transportation needs of the MAPO planning area. In order to do so, one must have the background information necessary to proceed in identifying issues, constraints, and opportunities. This section documents the MAPO area demographics and trends, existing land use patterns, environmental resource features, the current roadway system, and multimodal elements. This base data was also important in helping to identify goals and objectives for the transportation system. It provided a basis on which to forecast future traffic volumes and evaluate the future performance of the transportation system.

Demographics and Trends

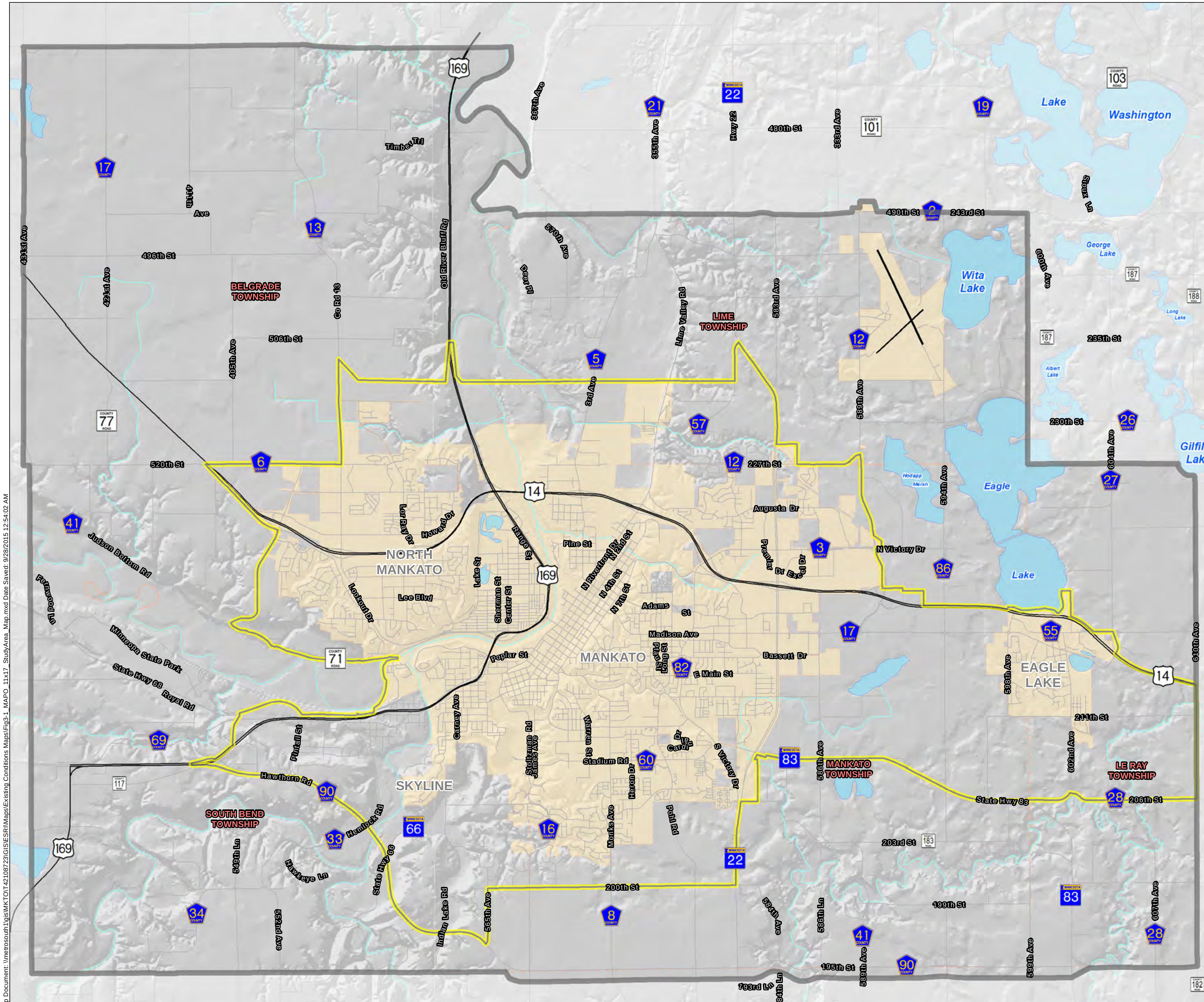
Regional Perspective

The Mankato/North Mankato metropolitan planning area is located in south central Minnesota, nestled in the scenic beauty of the Minnesota River Valley, with convenient access to Minneapolis-St. Paul just 75 miles away. The Mankato/North Mankato urban area is located at the crossroads of US 14 and US 169. In 2013, the US Department of Commerce reported that Mankato's economic growth leads Minnesota and is among the top in the nation. The region serves as a regional hub for health care, education, retail, agriculture, and industry across southern Minnesota.

Over the past decades, the Mankato/North Mankato metropolitan area has continued its growth and after the last census, its population allowed it to meet the metropolitan planning organization (MPO) demographic threshold. MAPO is responsible for the coordination, development, and implementation of the metropolitan transportation planning program for an area that includes the cities of Mankato, North Mankato, Eagle Lake and Skyline; Blue Earth and Nicollet counties; and Belgrade, Lime, South Bend, LeRay and Mankato townships. Figure 3-1 illustrates the Mankato/North Mankato Area Planning Organization (MAPO) and its urbanized area and planning boundary.

Population

The Mankato/North Mankato area has been a rapidly growing area. Table 3-1 shows the historic population trends in the cities and counties within the MAPO planning area since 1960. Historic population data for the townships within the MAPO is also shown for the 2000, 2010 and 2013 Minnesota State Demographer's Estimate. This table reflects the entire population within each MAPO planning area, which covers a slightly larger area than the MAPO urbanized area, as illustrated in Figure 3-1. The 2010 metropolitan statistical area (MSA) population of the Mankato/North Mankato region was 96,740 and the urbanized population was 58,265. Table 3-2 shows the MSA's change in population between 2000 and 2010.



MAPO 2045
TRANSPORTATION PLAN

Study Area

Figure 3-1

- PWI (Basin)
- PWI (Watercourse)
- Adjusted Urbanized Boundary
- MAPO Planning Area

Source: Blue Earth County, Nicollet County, MnDOT, North Mankato, Mankato, MnDNR, Esri Imagery

0 1 2 Miles

SRF

Table 3-1: 1960 – 2013 Historic Population (MAPO Jurisdictions)

	1960	1970	1980	1990	2000	2010	2013 Estimate	Change 2000-2013	% Change 2000-2013
Mankato	23,797	30,895	28,651	31,477	32,427	39,309	40,743	8,316	26%
North Mankato	5,927	7,347	9,145	10,164	11,798	13,394	13,520	1,722	15%
Eagle Lake	506	839	1,470	1,703	1,787	2,422	2,609	822	46%
Skyline	354	400	399	272	330	289	285	-45	-14%
Belgrade Township	-	-	-	-	1,023	1,052	1,035	12	1%
Lime Township	-	-	-	-	1,314	1,395	1,031	-283	-22%
South Bend Township	-	-	-	-	1,491	1,682	1,666	175	12%
LeRay Township	-	-	-	-	846	800	737	-109	-13%
Mankato Township	-	-	-	-	1,833	1,969	1,968	135	7%
Blue Earth County	44,385	52,322	52,314	54,044	55,941	64,013	65,218	9,277	17%
Nicollet County	23,196	24,518	26,929	28,076	29,771	32,727	33,002	3,231	11%
Total	**67,935**	**77,240**	**79,642**	**82,392**	**92,549**	**103,927**	**161,814**	**69,265**	**75%**

Source: US Census, 2013 Minnesota Demographer Estimates

Table 3-2: 2000 – 2010 Historic Population

	2000	2010	Change 2000-2010	% Change 2000-2010
Mankato-North Mankato MSA	85,712	96,740	11,028	12.9%

Source: 2010 US Census Bureau

A 2013 Mankato Area Housing Study Update documented population, housing, and employment trends in Mankato and the jurisdictions that are immediately contiguous to the City, including the cities of North Mankato, Eagle Lake and Skyline, along with the townships of Belgrade, Lime, Mankato and South Bend. Le Ray Township was the only MAPO jurisdiction not included as part of this study. This Housing Study referred to this aggregation as "Greater Mankato." A larger, secondary market area was also reviewed and included all of Blue Earth and Nicollet counties. The two-county aggregation is consistent with the boundaries of the MSA, as delineated by the Federal Office of Management and Budget. The Housing Study referred to this area as the MSA. The following information on population, housing, and employment was reported in the Mankato Area Housing Study Update (2013). Table 3-3 illustrates the population trend analysis conducted as part of this study.

Table 3-3: 2000 – 2010 Historic Population

	1980 Census	1990 Census	2000 Census	% Change 1990-2000	2010 Census	% Change 2000-2010	2012 Estimate
Mankato	28,651	31,477	32,427	3.0%	39,309	21.2%	40,183
Greater Mankato	46,150	49,878	52,013	4.3%	61,512	18.3%	62,578
MSA	79,243	82,120	85,712	4.4%	96,740	12.9%	98,107

Source: US Census Bureau; Minnesota State Demographer (Mankato Area Housing Study Update, 2013)

The decade between 2000 and 2010 was a period of rapid growth in the Mankato area. Over the course of that decade, Mankato had an average annual population growth of nearly 690 people. Although Mankato accounted for most of the growth within the MAPO area, the other jurisdictions also added population. Between 2000 and 2010, the entire area, including Mankato, added 950 people a year. When viewed over an entire decade, this average annual growth was very impressive. However, much of it probably occurred in the first half of the decade. After 2007, the best indicators of growth, such as housing unit construction starts, dropped significantly. The official estimates released after 2010 now point to a more moderate pace of growth. The MAPO area has added between 450 and 535 people annually since the year 2010.

Age Cohorts

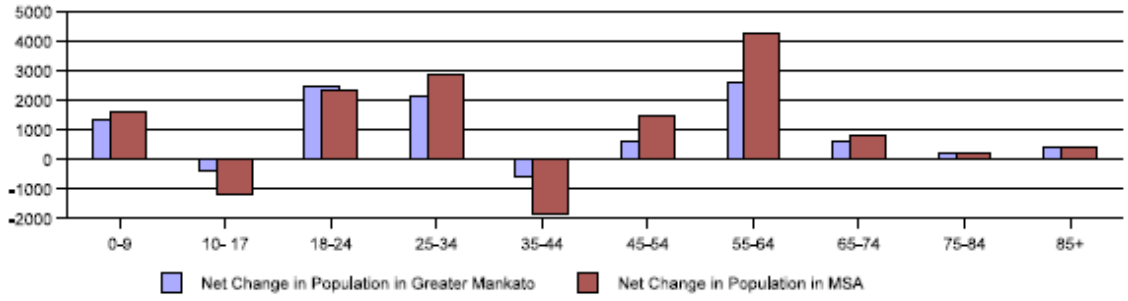
The age of area population also plays a role in transportation, as different age groups use the transportation network in different ways. Younger populations tend to frequently use the bicycle and pedestrian amenities that are provided. Working-aged populations use the transportation system to commute to employment centers or conduct various daily needs (shopping, recreation, etc.) The elderly and disabled populations tend to make up a larger percentage of those that need paratransit or dial-a-ride public transit services. Low-income populations, as defined as the percentage of population below the poverty line, may lack independent transportation options, and therefore also rely on public transit. Further, the location of these age cohort populations can play an important role in the framework of a transportation network.

The 2010 Census allows for some analysis of the area's changing age patterns. The following table and figure compare population by age in 2000 and 2010, along with numeric changes. Since some of the growth in Mankato may have been due to annexation, the comparison examines the changes for the Greater Mankato area and two-county MSA as well.

Table 3-4: Population by Age – 2000 to 2010

Age	Greater Mankato Area			MSA		
	2000	2010	Change	2000	2010	Change
0-9	5,661	7,022	+1,361	9,869	11,466	+1,597
10-17	5,069	4,677	-392	9,447	8,298	-1,149
18-24	12,481	14,958	+2,477	17,249	19,606	+2,357
25-34	6,898	9,069	+2,171	10,460	13,342	+2,882
35-44	6,717	6,125	-592	11,879	10,009	-1,870
45-54	6,149	6,759	+610	10,640	12,129	+1,489
55-64	3,445	6,023	+2,578	6,161	10,411	+4,250
65-74	2,646	3,254	+608	4,785	5,627	+842
75-84	2,085	2,329	+244	3,649	3,867	+218
85+	862	1,296	+434	1,573	1,985	+412
Total	52,013	61,512	+9,499	85,712	96,740	+11,028

Figure 3-2: – Population Change by Age Between 2000 and 2010



Source: US Census Bureau (Mankato Area Housing Study Update, 2013)

For many years, demographic analysts have been talking about the impact as the large "baby boom" generation moves through the aging cycle. This trend has been very evident in the Mankato area. Between 2000 and 2010, Greater Mankato had a net gain of nearly 3,200 people in the age ranges between 45 and 64 years old. In 2010, nearly all of the baby boomers were within these age ranges. The numeric net gain in the 55 to 64 year-old age group was the largest of any defined adult age cohort above the age of 25.

The area also witnessed significant growth in the number of young adults ages 18 to 24 years old. This age range increased in size by nearly 2,500 people and would generally include any traditional student growth at area colleges and universities. The young adult group between 25 and 34 years old also increased substantially over the decade and may reflect some older students, including people in graduate degree programs, as well as younger workers moving into the area for job opportunities.

There was an increase in senior citizens age 65 and older, but this was primarily due to strong growth in the youngest senior age range, between 65 and 74 years old. Outside of the Greater Mankato aggregation, there was actually a minor reduction in the number of older seniors age 75 and above.

Households

A strong pattern of household growth has occurred in the Greater Mankato area over the past decade. Between 2000 and 2010, the aggregated Greater Mankato area added 3,845 total households, for an increase of more than 19 percent. Between 2010 and 2012, the Greater Mankato area added 382 households. The entire MSA, encompassing all of Blue Earth and Nicollet counties, added more than 4,900 households between 2000 and 2010, and 642 households between 2010 and 2012.

The following table provides decennial Census information on household size. Estimates from the State Demographer for 2012 are also included.

Table 3-5: Average Household Size

	1980 Census	1990 Census	2000 Census	2010 Census	2012 Estimate
Mankato	2.48	2.46	2.31	2.35	2.35
Greater Mankato	2.65	2.57	2.41	2.40	2.39
MSA	2.72	2.62	2.49	2.44	2.44

Source: US Census Bureau; MN State Demographer (Mankato Area Housing Study Update, 2013)

Counter to national and regional trends, the average household size in the Mankato area remained relatively stable over the last decade, while the average for the MSA has continued to decrease. Mankato's average household size actually increased slightly between 2000 and 2010, and has then remained stable. The average household size for the Greater Mankato area has remained relatively stable, decreasing from 2.41 persons per household in 2000 to 2.39 persons per household in 2012.

It is possible that students may have had some impact on the stabilization of household size. A number of larger apartments, sometimes with four or more bedrooms, have been constructed in Mankato, which are then shared by students, negating a trend for smaller households within the general population.

The 2010 Census also provides some information on household composition by ownership and rental occupancy. This information has been compared to 2000 Census data to determine trends that are emerging in the housing market.

Table 3-6: Greater Mankato Owner Household Composition: 2000 to 2010

	2000 Census	2010 Census	Change
Family Households			
Married Couple Family Households (with or without children)	7,993	8,950	957 / 12.0%
Male or Female Headed Family (no spouse present)	1,265	1,616	351 / 27.7%
Total Families	9,258	10,566	1,308 / 14.1%
Non-Family Households			
Single Person Living Alone	2,584	3,196	612 / 23.7%
Two or More Persons	629	902	273 / 43.4%
Total Non-Families	3,213	4,098	885 / 27.5%

Source: US Census Bureau (Mankato Area Housing Study Update, 2013)

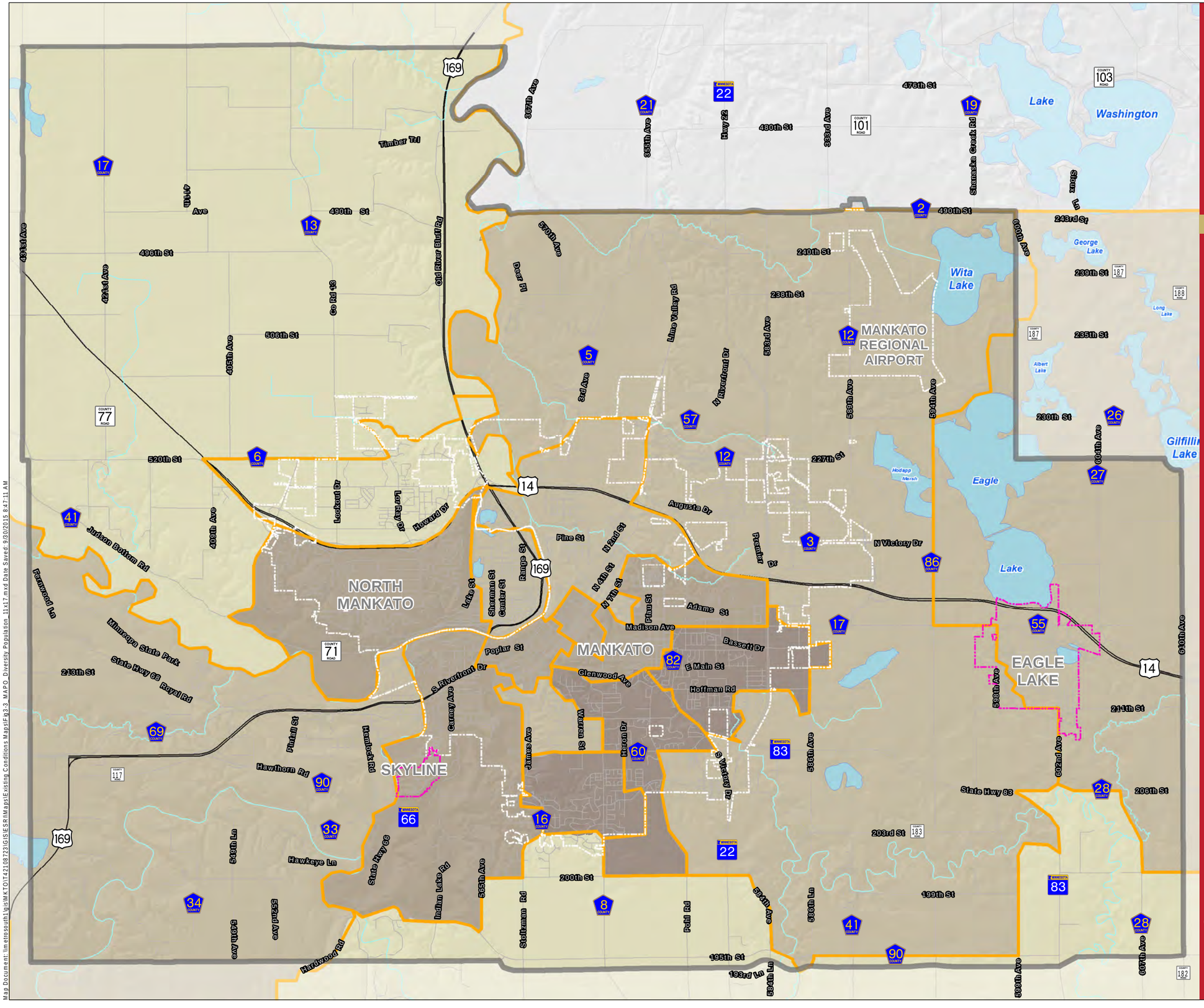
Home ownership rates for family households tend to be very high, and most of the net growth that was achieved between 2000 and 2010 in the Mankato area was due to families that owned their unit. Overall, there was a net increase of more than 1,300 families that owned their housing. Most of the family growth was among married couple families, both with and without children.

There was also fairly strong net growth among non-family households, primarily due to an increase of one-person households that owned their housing unit.

Environmental Justice

In 1994, President Clinton issued Executive Order 12898, which states that each federal agency "shall make environmental justice part of its mission by identifying and addressing disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low income populations."

In an effort to comply with Executive Order 12898, 2010 US Census data was used to identify the concentrations of low-income and minority populations within the MAPO planning area, respectively, in an effort to limit disproportionate impacts to these communities. Figure 3-3, Figure **3-4** and Figure **3-5** illustrate minority populations, low-income population, and populations of 60 years and older.



MAPO 2045 TRANSPORTATION PLAN

Diversity Population

Figure 3-3

Source: Blue Earth County, Nicollet County, MnDOT, North Mankato, Mankato, MnDNR, Esri Imagery

Map Document: \\mtetosouth1\gis\MKTO\T4210872\3\GIS\ESRI\Maps\Existing Conditions Maps\Fig3-3_MAPO_Diversity Population_11x17.mxd Date Saved: 9/30/2015 8:47:11 AM

MAPO 2045 TRANSPORTATION PLAN

Low Income Population

Figure 3-4

Percent Below Poverty Line

- < 5%
- 5.1% - 9%
- 9.1 - 14%
- 14.1% - 25%
- 25.1% - 40%
- 40.1% - 50%
- >50%
- State Aid City
- Non State Aid City
- Census Tract
- MAPO Planning Area

Source: Blue Earth County, Nicollet County, MnDOT, North Mankato, Mankato, MnDNR, Esri Imagery

0 1 2 Miles

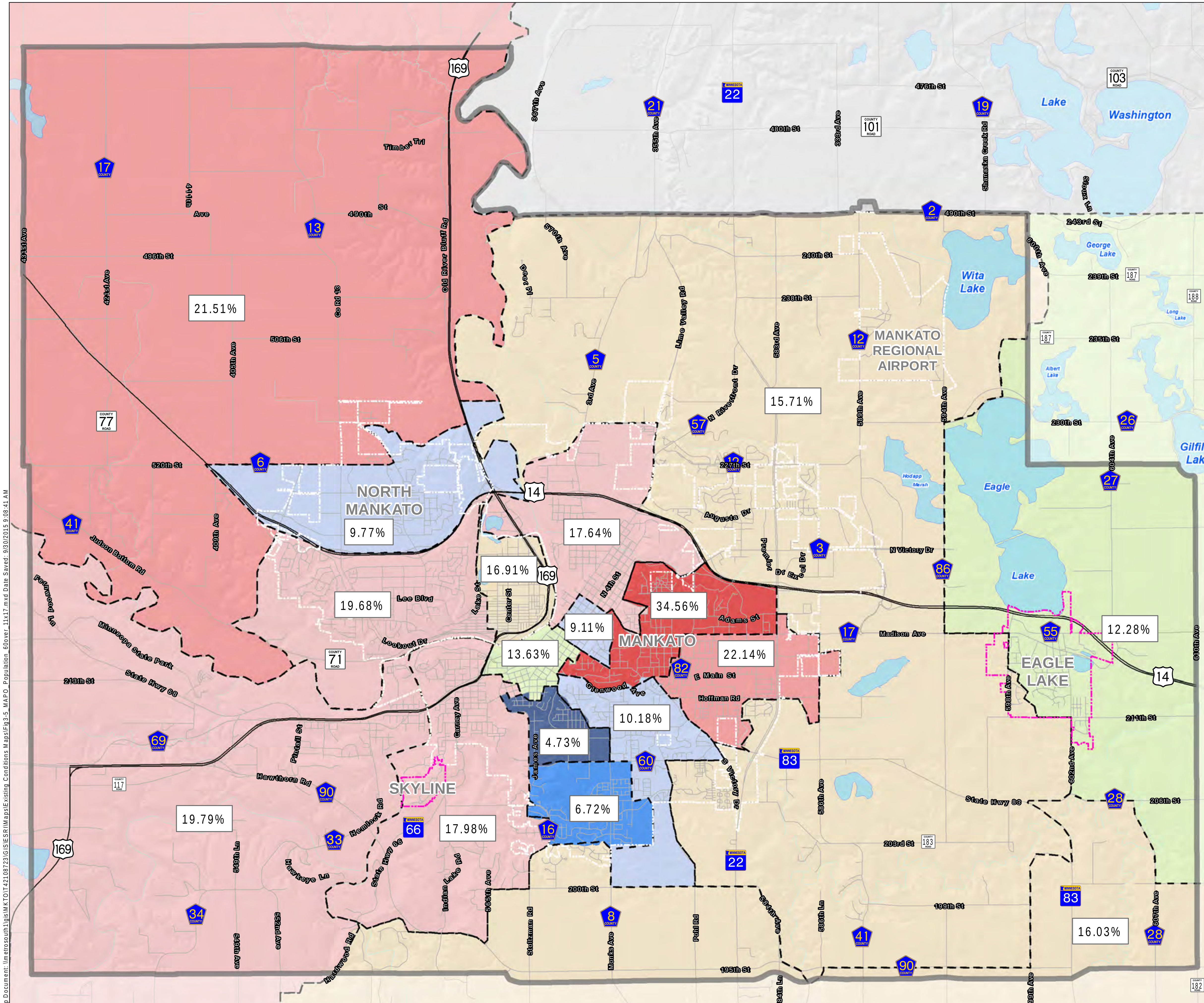
SRF

BOLTON & MENK

MAPO 2045
TRANSPORTATION PLAN

Population of 60 Years and Older

Figure 3-5



Percent Over 60

- 5%
- 5.1% - 8%
- 8.1% - 11%
- 11.1% - 15%
- 15.1% - 17%
- 17.1% - 20%
- 20.1% - 25%
- 25.1% - 35%
- State Aid City
- Non State Aid City
- Census Tract
- MAPO Planning Area

Source: Blue Earth County, Nicollet County, MnDOT, North Mankato, Mankato, MnDNR, Esri Imagery

0 1 2 Miles

SRF

BOLTON & MENK

Minority populations illustrated in Figure 3-3 are primarily located within the urbanized areas of Mankato and North Mankato, with higher concentrations (12-18 percent) located in the central, south and east portions of Mankato. Low-income populations, as measured by the percentage of population below the poverty line, are shown in Figure 3-4. Census tracks with higher concentrations (40-50 percent) of low-income populations exist in the City of Mankato in the areas between Stoltzman Road (CSAH 16) and Victory Drive (CSAH 82) and south of Main Street to the Riverfront Drive area. The location of Minnesota State University (MSU), Mankato within both of these areas of low-income and minority populations likely contributes to these concentrations. Figure 3-5 illustrates the areas with populations over 60 years old. The census tract with the highest concentration of these populations is located in central and northern Mankato (34 percent).

Employment

Most household trips are those going to and from places of employment, which is substantiated by the hours during which the highest traffic counts have been recorded (typically 7-9 a.m. and 4-6 p.m.). Understanding where major employers are located throughout the MAPO area provides a good understanding of travel behavior, especially during morning and evening peak hours of travel.

Major Employers

Mankato and North Mankato are the major employment centers for the immediate region. Jobs are available in manufacturing, commercial services, agriculture, and other industries. Major employers (see Table 3-7) in Mankato and North Mankato include Taylor Companies, Mayo Clinic Health System, MSU, Mankato, and Mankato Area Public Schools. In addition to the large employers listed, the Mankato area has some pending projects that will add to the employment options as follows:

- Imperial Plastics recently completed a new facility with approximately 80 employees. It is expected that the facility will have more than 100 employees after the first two years. The new facility is located in Mankato's Eastwood Energy Industrial Park on N. Victory Drive (CSAH 3), east of MN 22.
- Wal-Mart began construction on a 400,000 square-foot distribution facility in early 2014. Initial employment projections are for 300 employees, which will likely grow over time. The distribution center is being constructed in the northwest quadrant of the US 14/CSAH 12 interchange.
- FedEx Ground division began construction in 2014 on a 91,000 square-foot distribution center in Mankato. The distribution center will replace a smaller facility FedEx already operates in Mankato and will initially employ about 50 package handlers, drivers, and managers. Employment projections indicate this could increase to 120 employees. The new FedEx distribution center is located on Energy Drive, north of N. Victory Drive (CSAH 3) in Mankato's Eastwood Energy Industrial Park.
- The City Center projects in downtown Mankato include the development of a seven-story office complex at the corner of Riverfront Drive and Warren Avenue, and a four-story multi-use development with restaurants and residential rental units along South Front Street, just east of the office complex. Several existing Mankato businesses intend to lease space in the new office complex, providing the retention of approximately 100 jobs. Profinium Financial

also intends to lease space in the office complex and expand by adding 41 to 46 new jobs to the City Center.

- Mankato has recently seen a significant amount of growth in retail establishments, which was anticipated to continue in 2014.

Table 3-7: Major Employers – Greater Mankato

Employer	Products/Services	Employees	City
Taylor Companies	Other Commercial Printing	3,100	N. Mankato
Mayo Clinic Health System	General Medical & Surgical Hospitals	2,200	Mankato
Minnesota State University, Mankato	Colleges, Universities & Professional Schools	1,700	Mankato
Mankato Area Public Schools	Elementary and Secondary Schools	1,400	Mankato
Mankato Rehabilitation Center	Vocational Rehabilitation Services	1,240	Mankato
Mankato Clinic	Offices of Physicians	682	Mankato
The Thro Company	Nursing Care Facilities	656	Mankato
Verizon Wireless	Wireless Telecommunications Carriers	540	Mankato
Kato Engineering/Reliance Electric	Turbine & Turbine Generator Set Units Mfg.	476	Mankato
Blue Earth County	Executive, Legislative & Other Gen. Govt Support	415	Mankato
MTU Onsite Energy	Turbine & Turbine Generator Set Units Mfg.	342	Mankato
City of Mankato	Executive, Legislative & Other Gen. Govt Support	322	Mankato
MICO Inc.	Motor Vehicle Brake System Mfg	310	N. Mankato
Hickory Tech	Wired Telecommunications Carriers	293	Mankato
Bolton & Menk Inc.	Engineering Svcs	250	Mankato
Southern Minn Construction Co	Nonresidential Building Construction	250	Mankato
EI Microcircuits	Semiconductor & Other Electronic Components	225	Mankato
Schwickert Company	Foundation, Structure & Bldg	225	Mankato
Coughlan Companies	Newspaper, Periodical, Book & Directory Publishers	217	Mankato
South Central College	Other Technical & Trade Schools	212	N. Mankato
Johnson Outdoors- MinnKota	Sporting & Recreational Goods & Supplies	210	Mankato
CHS, Inc.	Grain & Oilseed Milling	202	Mankato
Xcel Energy	Electric Power Generation, Trans & Dist	194	Mankato

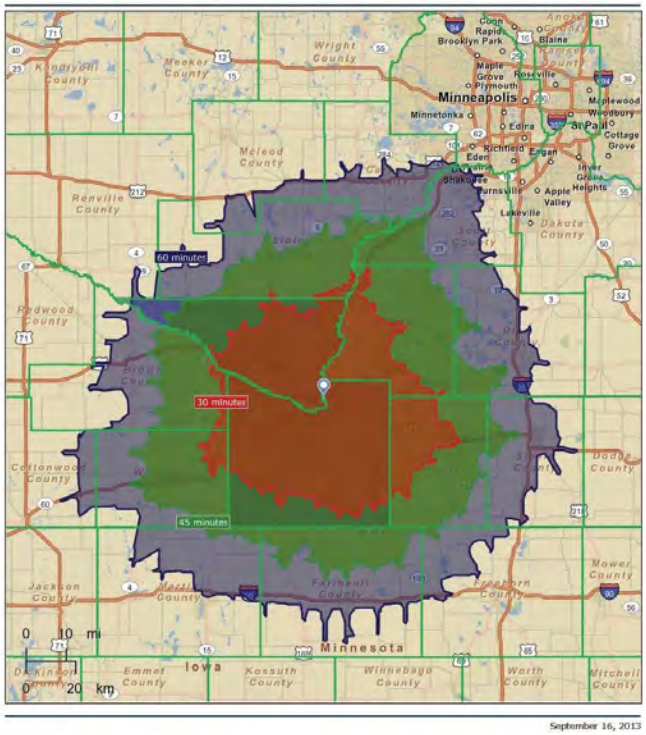
Source: Minnesota DEED Community Profiles Compiled by Greater Mankato Growth

Each of these employment sectors has varying demands and impacts on the transportation network. The traffic forecasting methodology developed as part of this transportation plan will consider these employers, as well as employment centers, when forecasting future travel needs for the MAPO area.

Labor Shed

The labor shed for the Greater Mankato marketplace spans 16 counties. Figure 3-6 illustrates the roadway infrastructure within the region provides far reaching 30, 45, and 60-minute commutes that have a population of more than 381,000 and a labor force of more than 250,000 (ages 15-64).

Figure 3-6: Labor Shed Drive Times



Source: 2010 US Census, Greater Mankato Growth

Commuter Data

Greater Mankato Growth, the MAPO area's Chamber of Commerce and Economic Development Agency, has assembled commuter data based on 2010 US Census information for a selection area defined as the Mankato-North Mankato Metropolitan Statistical Area (Blue Earth and Nicollet Counties). The following summarizes the trends displayed in Table 3-8 to Table 3-10 and Figure 3-7 and Figure 3-8:

- There is a net inflow of jobs to the MAPO market area, meaning there are more jobs in this market than people living within the market area.
- Almost 72 percent of the labor force living in the market area also works here.
- 28 percent of the labor force lives in the market area but commutes to work outside the area.
- The majority (57 percent) of the labor force that lives in the market area commutes less than 10 miles to work.
- 60 percent of those employed in the market area also live in the market area; 40 percent are employed here but live outside the market area.

- Almost 50 percent of those employed in the market area travel less than 10 miles to work; approximately 22 percent travel greater than 50 miles.

Table 3-8: Selection Area Labor Market Size (Primary Jobs)

	Count	Share
Employed in Selection Area	46,441	100.0%
Living in the Selection Area	39,190	84.4%
Net Job Inflow (+) or Outflow (-)	7,251	-

Source: 2010 US Census; Greater Mankato Growth

Table 3-9: In-Area Labor Force Efficiency (Primary Jobs)

	Count	Share
Living in Selection Area	39,190	100.0%
Living and Employed in the Selection Area	28,059	71.6%
Living in the Selection Area but Employed Outside	11,131	28.4%

Source: 2010 US Census; Greater Mankato Growth

Figure 3-7: Commuting Residents: How far do they go?

	Count	Share
Total Primary Jobs	39,190	100.0%
Less than 10 miles	22,498	57.4%
10 to 24 miles	8,080	20.6%
25 to 50 miles	2,553	6.5%
Greater than 50 miles	6,059	15.5%

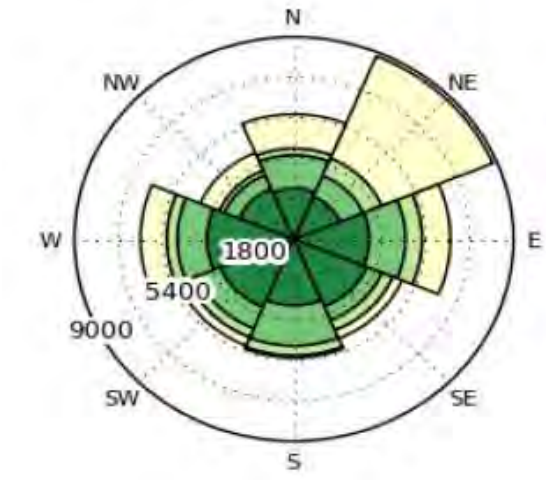
Source: 2010 US Census; Greater Mankato Growth

Table 3-10: In-Area Employment Efficiency (Primary Jobs)

	Count	Share
Employed in the Selection Area	46,441	100.0%
Employed and Living in the Selection Area	28,059	60.4%
Employed in the Selection Area but Living Outside	18,382	39.6%

Source: 2010 US Census; Greater Mankato Growth

Figure 3-8: Workforce: Where are they coming from?



	Count	Share
Total Primary Jobs	46,441	100.0%
Less than 10 miles	22,909	49.3%
10 to 24 miles	9,337	20.1%
25 to 50 miles	3,812	8.2%
Greater than 50 miles	10,383	22.4%

Source: 2010 US Census; Greater Mankato Growth

The transportation network in the MAPO area is a critical link to continued economic success by supporting the major employers located here as well as the labor shed of workers coming into and out of the area each day.

LAND USE

Land use and transportation are directly linked, such that travel behavior is determined by the location of where people live in relation to where they work and consume goods and services. In order to evaluate the transportation system, a key component is an understanding of land uses within the MAPO area. Table 3-9 illustrates the existing land use and zoning for the MAPO urbanized areas.

Agriculture

Agriculture land uses make up the majority of land use within the MAPO planning area as a whole. The majority of available agricultural land within this area is under cultivation, with high-quality soil producing high-yield crops. The counties have placed high values on these agricultural areas by enacting and enforcing strong zoning policies, maintaining agricultural preservation policies, and encouraging growth within existing communities.

Residential

Residential land uses comprise the majority of the MAPO urbanized area land use. Mankato, North Mankato, and Eagle Lake all have a residential land use supply that contains a mixture of low-, medium- and high-density residential uses. Skyline's land use is comprised entirely of low-density residential land uses.

MAPO 2045 TRANSPORTATION PLAN

Zoning

Figure 3-9

MAPO Planning Area
Zone A
Zone B
Zone C

ZONING

- One Family Dwelling
- One and Two Family Dwelling
- Limited Multiple Dwelling
- Multiple Dwelling
- Residential Transitional District
- Office Residential
- Community Business District
- General Business District
- Highway Commercial
- Central Business District - Fringe
- Central Business District
- Institutional Overlay District
- Light Industrial
- Industrial
- Office District
- Planned Industrial
- Public Park
- Residential Agricultural
- Agricultural District
- Transition District

Source: Blue Earth County, Nicollet County, MnDOT, North Mankato, Mankato, MnDNR, Esri Imagery

0 1 2 Miles

SRF

BOLTON & MENK

Map Document: \\metrosouth1\gis\MKTO\T4210872\3\GIS\ESRI\Maps\Existing Conditions Maps\Fig3-9_MAPO_11x17_Zoning.mxd Date Saved: 9/30/2015 11:10:54 AM

Commercial

Commercial land uses rely heavily on the transportation network and are therefore mostly located along roadways that carry high volumes of traffic. The MAPO area includes a variety of existing commercial land uses including highway commercial, central business districts, and office districts. The majority of commercial land uses in the MAPO area are located along existing high volume transportation corridors such as US 14 and 169, MN 22, and other county and city roads such as Commerce Drive and Lor Ray Drive in North Mankato; Stadium Road (CSAH 60), Victory Drive (CSAH 82), and Madison Avenue/CSAH 17 in Mankato; and CSAH 17 and CSAH 55 in Eagle Lake. The central business districts of Mankato and North Mankato are served by city routes including Riverfront Drive and Belgrade Avenue respectively.

The City of Mankato has two large projects under construction in the City Center on the block encased by Riverfront Drive and South Front Street between Warren Avenue and Cherry Street. The projects include a four-story mixed-use building along South Front Street and a seven-story office complex at the corner of Riverfront Drive and Warren Avenue. The mixed-use building will include a restaurant on the first and fourth floors and residential rental units on the second and third floors. The office complex will include 60,000 square feet of leasable office space. A 200-stall parking ramp is also being constructed behind the mixed-use building and adjacent office tower. These developments are consistent with the City of Mankato's City Center Renaissance Plan to bring a rebirth of the City Center by strengthening the interdependence of residential, industrial, service, and commercial sectors through revitalization, reconnection, and reinvestment.

In recent years, Mankato's commercial growth has focused on the hilltop area surrounding and to the east of MN 22 between MN 83 and 227th Street. Mankato's commercial uses include all of the various types of commercial listed above. North Mankato's commercial uses are generally characterized as neighborhood commercial uses that serve the surrounding area. North Mankato is lacking in community commercial type uses, and residents typically travel to the City of Mankato for these types of goods and services. Eagle Lake's commercial areas have remained largely in their downtown district along CSAH 17 and along US 14. Similar to North Mankato, Eagle Lake's commercial land uses are limited to convenience and neighborhood uses. Residents of Eagle Lake also typically travel to Mankato for the majority of their goods and services. There are no commercial land uses within Skyline.

Industrial

Industrial uses are highly dependent on the transportation network, but in different ways than commercial uses. Where commercial uses seek high-traffic locations, industrial uses seek locations with easy access to interregional transportation facilities. Industrial land development within the MAPO area is strong. Both Mankato and North Mankato have made recent expansions to their industrial parks. The majority of industrial land uses in the MAPO area are located along US 169, US 14, and MN 22 and adjacent to the rail corridors. The City of North Mankato has a strong industrial base with large employers such as Taylor Corporation and Pepsi Company. In addition, within the past few years the City has also expanded their Northport Industrial Park located on the north side of

US 14 adjacent to a new interchange with CSAH 41/US 14. The City has been successful in attracting additional light industrial development to this new industrial park.

The City of Mankato has also experienced continued success in their heavy industrial areas such as the Sakatah Industrial Park located on the northern edge of the community surrounding 3rd Avenue (CSAH 5) and the railroad corridors. In addition, the City has been expanding light industrial development in its Eastwood Industrial Center, Industrial Park, and Energy Center, all located north of US 14 and east of MN 22. The 2012 extension of CSAH 12 to a new interchange with US 14 and connection to CSAH 17 has been an important transportation connection that has facilitated this development.

The City of North Mankato has a portion designated as industrial land use on the northwest side of the city served by US 14. This area is expected to expand north to CSAH 6 and east to CSAH 41 in future.

The City of Eagle Lake has a small area designated as industrial land use on the east side of the community, north of CSAH 17 adjacent to US 14. Skyline does not have any industrial land uses.

Public

Public uses include schools, public golf courses, parks, cemeteries, and other publicly owned places. Public areas are often destination points with high travel and tend to be areas where pedestrians frequent. Public uses such as schools and parks often have special speed designations, pedestrian crossing points, and public parking (either on- or off-street) near them. Each community within the MAPO area has signature parks serving a larger community function as well as neighborhood parks serving the immediate residential areas surrounding it. The MAPO region is well served with existing park facilities and public land uses.

Environmental Features

The MAPO planning area is comprised of a wide variety of topographic conditions. The Minnesota, Blue Earth, and Le Sueur rivers are the major features that transect Mankato, North Mankato, and surrounding areas. The rivers are generally located in the low-lying areas of each community and in heavy rain events contribute to adjacent flooding. Flood walls and dikes were constructed the late 1960s to protect the downtown areas of Mankato and North Mankato from flooding. There are three existing bridges to cross the Minnesota River between Mankato and North Mankato. These include US 14, US 169, and Veterans Memorial Bridge.

MnDOT is currently working on two flood mitigation projects between Mankato/North Mankato and Saint Peter. The first involves raising US 169 one foot above the 100-year flood elevation to maintain traffic during high water events. The other is MN 22 and includes raising the road elevation and extending Bridge 40002. Several 100-year flood events have occurred in this area within the past 10 years and have caused complete closures of these highways. The flood mitigation projects would eliminate the need to completely close the roadway during flood conditions.

Moving away from low-lying areas near the rivers, the Mankato and North Mankato topography changes dramatically. Steep slopes, ravines, and wooded areas separate both communities into lower and hilltop areas. Because of this drastic change in elevation, there are few transportation routes in each community that connect both the lower and hilltop areas. The following lists the primary transportation corridors providing access between lower and hilltop areas in both Mankato and North Mankato.

- North Mankato:
  - Lookout Drive (CSAH 13)
  - Lee Blvd/Lor Ray Drive
- Mankato:
  - US 14
  - Stoltzman Road (CSAH 16)
  - Warren Street
  - Monks Avenue/Glenwood Avenue/Cherry Street
  - Main Street
  - Madison Avenue
  - Adams Street
  - Thompson Ravine Road

Several of these routes are very steep (many greater than 5 percent grade) and are sometimes closed for safety during winter weather events. Table **3-10** depicts the existing water resources, floodplains, NWI wetlands, and topography within the MAPO area, providing insight on the limiting factors for transportation options through steep areas.

The entire MAPO area is also comprised of many wetland complexes, ponds, and lakes. When planning for and designing new roadways, efforts to avoid, minimize, and mitigate impacts to these resources must be taken into consideration.

MAPO 2045 TRANSPORTATION PLAN

Environmental

Figure 3-10

Flood Zone

- PROTECTED BY LEVEE
- 100 Year - Zone A
- 100 Year - Zone AE
- 500 Year
- NWI
- MAPO Planning Area

Source: Blue Earth County, Nicollet County, MnDOT, North Mankato, Mankato, MnDNR, Esri Imagery

0 1 2 Miles

SRF

BOLTON & MENK

Roadway System

Jurisdiction

The management of roadways should be closely aligned with its function and the jurisdiction best suited to maintain it. The jurisdiction of roadways is an important component of the Plan because it defines the regulatory, maintenance, construction, and financial obligations of each governmental unit.

Jurisdictional classification documents these responsibilities among state, county, municipal, and township agencies. The hierarchy of jurisdictional classification is typically established so that higher-volume regional corridors carrying inter-county traffic are maintained by MnDOT (e.g., state highways), while intermediate volume corridors that primarily carry more intra-county traffic are maintained by Blue Earth and Nicollet counties, and roadways serving local traffic are maintained by Mankato, North Mankato, Eagle Lake, Skyline, and the surrounding townships.

Table 3-11 below provides a mileage summary of current roadway jurisdiction within the MAPO planning area. Figure 3-11 illustrates, by map, the roadway jurisdiction in the MAPO area.

Table 3-11: MAPO Jurisdictional Roadway Summary

Jurisdictional Classification System	Miles	System %
State	101	15%
County	118	18%
Township	158	24%
City	291	43%
Total	668	100%

On October 7, 2014, the Blue Earth County Board of Commissioners accepted the jurisdictional transfer of MN 66, which connects Mankato and Good Thunder. It should be noted Table 3-11 and Figure 3-11 do not reflect this recent transfer. MnDOT will turn back this route and designate the portion between CSAH 90 and Mankato as a natural preservation route. The turn back agreement includes the upgrade of this portion of the route with wider shoulders, gentler slopes, and new drainage facilities. Blue Earth County will take possession of the roadway in the fall of 2014, but will not have maintenance responsibilities until June 30, 2016, roughly when the road improvements are expected to begin.

MAPO 2045 TRANSPORTATION PLAN

Roadway Jurisdiction

Figure 3-11

Jurisdiction

- US Highway
- State Highway
- County
- Township
- City
- Private or Other
- PWI (Basin)
- PWI (Watercourse)
- MAPO Planning Area

Source: Blue Earth County, Nicollet County, MnDOT, North Mankato, Mankato, MnDNR, Esri Imagery

0 1 2 Miles

SRF

BOLTON & MENK

MnDOT completed a Minnesota Jurisdictional Realignment Study in 2014. This study analyzed and recommended one jurisdictional transfer in the MAPO area as detailed in Table 3-12.

Table 3-12: Minnesota Jurisdictional Realignment Study Recommendations

Route #	Route System	Owner	Functional Class	County	City/Closest Terminus	Miles	Proposed Jurisdiction	Reason
860 (Veterans Memorial Bridge)	Minnesota State Highway	State	Principal Arterial-Other	Nicollet	Mankato/North Mankato	0.046	City	Road system continuity preferences

System Classification

The roadway system within the MAPO has certain designations that define key routes at the national, state, county, and city levels. These designations are important because, by their nature, they identify many roadways that should be considered elements of the MPO's primary roadway system. This primary system, in accordance with MAP-21 and MnDOT policies, must be the focus of MPO planning and programming activities. Further, future MPO investments must ensure that this primary system is maintained in a "state of good repair" before expansion or capacity needs are addressed. Provided below is a summary of the system designations.

Federal Designations-National Highway System (NHS)

The National Highway System (NHS) was developed by the United States Department of Transportation in cooperation with states, local governments, and metropolitan planning organizations. The NHS includes the interstate highway system and the strategic highway network (STRAHNET), which is a system of public highways that provides access, continuity and emergency capabilities for military personnel and equipment. Other principal arterials and connector routes are also part of the NHS. Within the MAPO study area US 169 and 14, as well as MN 22, MN 60, MN 860 (Veterans Memorial Bridge), Madison Avenue (west of MN 22), and Riverfront Drive are all NHS routes, primarily due to their status as principal arterials. There are no Interstate or STRAHNET routes within the MPO. Preserving the NHS system is a key policy of MAP- 21.

State Designations-Interregional Corridor System (IRC)

A statewide, 2,996-mile interregional corridor system was designated by MnDOT in 1999 (and later updated with supplemental freight routes) to enhance the economic vitality of the state by providing safe, timely, and efficient movement of goods and people. The IRC system consists of Minnesota trunk highways. High-priority IRCs connect the Twin Cities metropolitan area with primary regional trade centers throughout the state, such as Mankato. IRC-designated routes include US 169, 14, and MN 60. There are no supplemental freight route designations within the MPO study area, although there are the National Truck Network and Minnesota Twin Trailer Network designations in the study area (see later freight section).

County Designations- County State Aid Highway (CSAH) and County Road (CR)

In Minnesota, each county must designate a county state-aid (CSAH) and a county road system. Chapter 8820.07 of the state aid rules explains the designation criteria for CSAH routes. Generally, these are higher-volume, higher-functionally classified county highways that make key intercounty connections, or are principal mail or school bus routes.

City Designations-Municipal State Aid Street (MSAS)

Similar to counties, by state law, cities over 5,000 population are eligible for state aid and must define a municipal state-aid system (MSAS) that is eligible for the state funds. Again, MSAS routes typically are the most significant streets within the city.

While not all of these designated roadways will be included on the primary roadway system, the various designations provide an initial starting point in the preparation of the MPO's primary system, while the remainder of these roadways play important roles in the MPO's overall multijurisdictional transportation network.

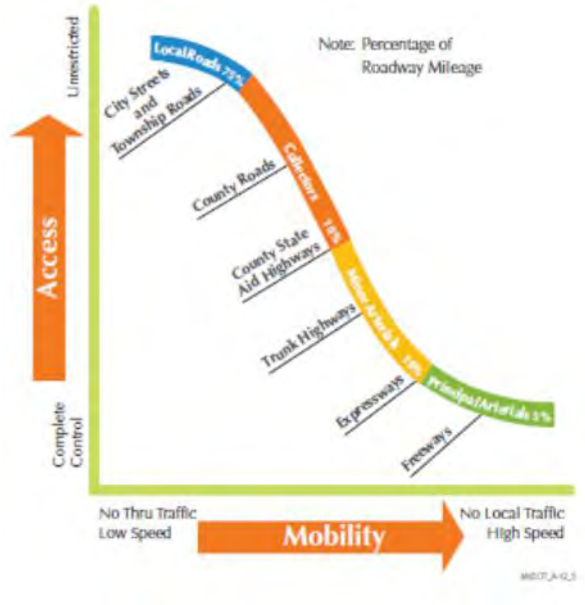
The next section, roadway functional classification, builds on the designation data to establish the primary roadway system.

Functional Classification

The functional classification system defines both the function and role of a roadway system within the hierarchy of an overall roadway system. This classification system is used to create a roadway network that collects and distributes traffic from neighborhoods and ultimately to the state highway system. A good functional classification system coordinates and manages mobility, roadway design, and alignment of routes.

Functional classifications are comprised of principal arterials, minor arterials, major and minor collectors, and local roadways. The main focus of the MPO planning and programming will be on the arterial system, since most federal funding (NHPP and STP) will be needed for preservation and possible expansion of the principal and minor arterials system. Nonetheless, all collectors within the cities and major collectors in the counties are eligible for federal funding and play a role in the metropolitan transportation system, as well as other modal elements such as trails, bikeways, transit, rail, aviation, etc. Functional classification also seeks to match current and future access and land use with the adjacent roadway's purpose, speeds, and spacing. Figure 3-12 illustrates the relationship between functional classification, access, and mobility.

Figure 3-12: Access/Mobility Relationship



Source: MnDOT

By maintaining and periodically updating the City's functional classification system, local agencies and planning officials are able to manage access, promote mobility, and design roadways appropriately for their current and intended future function. The formal process of determining functional classification is outlined by FHWA's Manual, *Highway Functional Classification – Concepts, Criteria and Practices, 2013*.

An important element of this Plan is a review of the current functional classification system. The objective of this analysis is to achieve better performing and better alignment of routes, where functional classification designations match current and future land use and roadway purpose.

A roadway's functional classification is based on several factors including:

- Trip characteristics: length of route, type and size of activity centers, and route continuity
- Access to regional population centers, activity centers, and major traffic generators
- Proportional balance of access, ease of approaching or entering a location
- Proportional balance of mobility, ability to move without restrictions
- Continuity between travel destinations
- Relationship with neighboring land uses

The MAPO's functional classification system is divided into five major categories – principal arterials, minor arterials, major collectors, minor collectors, and local roadways. Figure 3-13 displays the current functional classification system for MAPO area roadways.

Federal Functional Classification Guidance

The U.S. Census Bureau considers municipalities with populations over 5,000 as "urban areas." While established urban limits may not directly influence a route's function, they may trigger a change in the functional classification terminology. The Federal Highway Administration (FHWA) new guidance now only allows an upgrade by one classification when a roadway enters an urban area, if the function of the road changes at the boundary. (For example, collectors from the rural areas entering into an urban area may be upgraded to minor arterials only if the function actually changes. In previous guidance (1989), this step up was an automatic practice.)

FHWA has established functional classification guidelines that are commonly used by MnDOT and counties and cities as a comparison tool. Table 3-13 provides the FHWA guidelines for the ideal ranges of system mileage for urban functional classification systems. Figure 3-13 presents the current functionally classed system.

Table 3-13: FHWA Guidelines Urban Area Functional Classification System

FUNCTIONAL CLASSIFICATION SYSTEM		FHWA GUIDELINES URBAN	
Principal Arterials	Interstate	1-3%	5-14%
	Other Freeways & Expressways	0-2%	
	Other Principal Arterials	4-9%	
Minor Arterial		7-14%	
Major Collector		3-16%	6-32%
Minor Collector		3-16%	
Local		62-74%	

Source: FHWA Functional Classification Guidelines – Concepts, Criteria and System Characteristics, 2013.

MnDOT works in partnership with the State's metropolitan planning organizations to periodically review and revise the statewide Functional Classification System. At the writing of this document, MAPO is working with MnDOT to update the functional classification system in this area. MAPO has been working closely with the local jurisdictions to identify proposed changes to the system. Figure 3-14 displays the MAPO proposed changes to the existing functional classification system. These changes have been submitted to MnDOT for review and comment but, at this time, are not yet finalized.

Table 3-14 andTable **3-15** summarize the urban and rural MAPO functional classification system by mileage and the deviation from FHWA standards. The MAPO functional classification system as proposed is generally consistent with FHWA guidance.

MAPO 2045 TRANSPORTATION PLAN

Existing Functional Classification

Figure 3-13

Existing Functional Class

- Principal Arterial Freeway Expressway
- Principal Arterial Other
- Minor Arterial
- Major Collector
- Minor Collector
- Local
- Outside Planning Area
- MAPO Planning Area

Source: Blue Earth County, Nicollet County, MnDOT, North Mankato, Mankato, MnDNR, Esri Imagery

0 1 2 Miles

SRF

BOLTON & MENK

MAPO 2045 TRANSPORTATION PLAN

MAPO Proposed Functional Classification

Figure 3-14

Existing Functional Class

- Principal Arterial Freeway Expressway
- Principal Arterial Other
- Minor Arterial
- Major Collector
- Minor Collector
- Local
- Outside Planning Area
- MAPO Planning Area

Source: Blue Earth County, Nicollet County, MnDOT, North Mankato, Mankato, MnDNR, Esri Imagery

0 1 2 Miles

SRF

BOLTON & MENK

Map Document: \\metrosouth1\gis\MKTOT\42108723\GIS\ESRI\Maps\Existing Conditions Maps\Fig3-14_MAPO_11x17_Proposed_Functional_Class.mxd Date Saved: 9/28/2015 11:44:36 AM

Table 3-14: MAPO Urban Functional Classification Mileage

FUNCTIONAL CLASSIFICATION SYSTEM	URBAN MILES	SYSTEM %	FHWA GUIDELINE		RANGE
Principal Arterials	78	16	5-14%		Higher
Minor Arterial	33	7	7-14%		Within
Major Collector	34	7	3-16%	6-32%	Within
Minor Collector	52	11	3-16%		
Local	280	59	62-74%		Lower
Total per Category	477	100%			

Source: MAPO Functional Classification Data, 2014

Table 3-15: MAPO Rural Functional Classification Mileage

FUNCTIONAL CLASSIFICATION SYSTEM	RURAL MILES	SYSTEM %	FHWA GUIDELINE		RANGE
Principal Arterials	15	8%	3-11%		Within
Minor Arterial	23	12%	2-6%		Higher
Major Collector	12	6%	8-19%	11-34%	Within
Minor Collector	25	13%	3-15%		
Local	115	60%	62-74%		Lower
Total per Category	191	100%			

Source: MAPO Functional Classification Data, 2014

The MAPO area should attempt to be consistent with FHWA guidelines, but since this area is a growing urban area, it can expect some deviation from the provided guidance. Based on the analysis shown in Table 14, it appears the MAPO's Principal Arterial system percentage (16 percent) is slightly above FHWA's guideline (5-14 percent), and the local system percentage (59 percent) is slightly below FHWA's guidelines (62-74 percent).

As previously mentioned, MnDOT and MAPO are currently in the process of reviewing changes to the existing functional classification system, which may result in some additional adjustments to the overall system. For example, the classification of Madison Avenue and Riverfront Drive as principal arterials under local jurisdiction is still under review. At the writing of this document, the MAPO Policy Board supports maintaining both Riverfront Drive and Madison Avenue as principal arterials. MnDOT has recommended these roadways be classified as Minor Arterials. The MAPO urban

functional classification mileage will be updated depending on the outcomes of discussions such as this example.

Roadway Operations

Roadway Geometrics and Intersection Signalization

Travel throughout a region can be influenced by available roadway capacity (lanes and intersection configurations) that provide the basis for mobility on the local transportation system. A summary of the MAPO area's current roadway geometry is provided in Figure 3-15. Existing signalized intersections are also represented on the figure.

Traffic Volumes

The study area's current traffic volumes are key datasets used in evaluating the MAPO area's existing transportation system conditions. The MAPO area includes two US highways, 169 and 14, which traverse the region from north to south, and east to west respectively. US 169 and US 14 carry the highest volume on the regional roadway network with Average Daily Traffic (ADT) counts reaching 26,000 vehicles per day (vpd) on US 169 and 35,500 vpd on US 14.

Figure 3-16 illustrates the most recent average daily traffic (ADT) volumes provided by MnDOT. Roadways closer to the urbanized area tend to have higher traffic volumes. Additionally, volumes on the major routes extending north and east (toward the Twin Cities and Rochester, respectively) have higher volumes than routes extending south and west.

Traffic Congestion

Corridor Congestion

Planning-level capacity thresholds were used to evaluate current roadway congestion for all facility types within the study area. Table 3-16 lists the typical planning-level traffic volume ranges used in determining congestion levels for specific facility types. The capacity thresholds are based on guidance from the Highway Capacity Manual, professional engineering judgment, and input from the MAPO TAC. A capacity threshold is a theoretical measure that can be affected by functional classification, peak traffic flows, access spacing, speed, and other roadway characteristics.

MAPO 2045 TRANSPORTATION PLAN

Roadway Geometry and Intersection Signalization

Figure 3-15

- Signalized Intersections
- 6 or more lanes
- 5 Lane Divided
- 5 Lane
- 4 Lane Divided
- 4 Lane
- 3 Lane
- 2 Lane
- PWI (Basin)
- PWI (Watercourse)
- MAPO Planning Area

Source: Blue Earth County, Nicollet County, MnDOT, North Mankato, Mankato, MnDNR, Esri Imagery

0 1 2 Miles

SRF

BOLTON & MENK

MAPO 2045 TRANSPORTATION PLAN

Existing Traffic Volumes

Figure 3-16

AADT (Current Year)

- 1,000
- 5,000
- 10,000
- 30,000
- PWI (Basin)
- PWI (Watercourse)
- MAPO Planning Area

Source: Blue Earth County, Nicollet County, MnDOT, North Mankato, Mankato, MnDNR, Esri Imagery

0 1 2 Miles

SRF

BOLTON & MENK

Map Document: \\metrosouth1\gis\MKTO\T421087231GIS\ESRI\Maps\Existing Conditions Maps\Fig3-16_MAPO_11x17_Existing_Traffic_Volumes.mxd Date Saved: 9/28/2015 8:54:27 AM

Table 3-16: Planning-Level Capacity Thresholds

Facility Type (Design Code)	Roadway Capacity [1]
Two-Lane at-grade local urban street (U-1)	8,000
Two-Lane one-way local urban street (U-2)	14,000
Two-Lane at-grade urban arterial street (U-3)	10,000
Three-Lane at-grade urban street[2] (U-4)	16,000
Four-Lane at-grade urban street (U-5)	24,000
Urban expressway (U-6)	35,000
Four-Lane urban grade-separated freeway (U-7)	60,000
Two-Lane rural trunk highway (R-1A)	14,000
Two-Lane rural at-grade highway (R-1)	14,000
Two-Lane rural reduced capacity[3] (R-2)	8,000
Rural expressway (R-3)	45,000
Four-Lane rural grade-separated freeway (R-4)	60,000

1 - Represents the daily planning-level capacity
2 - Also represents two-lane with turn lanes
3 - Two-lane rural highways with limited visibility and poor geometrics

An analysis of roadway segments with congestion or operational problems is critical to the identification of system needs and/or future roadway improvements. Measuring congestion can aid the process of determining implementation strategies for roadway improvements, access management, transit services, or demand management strategies. However, it should be noted that the planning-level capacity thresholds do not provide a basis for design decisions for specific intersection improvements. For instance, traffic conditions that do not fit the average daily traffic criteria (e.g., weekend thru traffic, holiday travel periods, fall agricultural volumes, or special events) are likely to produce different levels of congestion. Additionally, factors such as access and roadway geometrics may influence the capacity of a roadway.

Congestion and operational problems were first evaluated by determining the ratio of current traffic volume to roadway capacity (v/c ratio). The v/c ratio analysis provided a measure of congestion along roadways, flagging existing or future operational problems. A level of service (LOS) threshold was developed for each range of v/c ratios to provide a qualitative summary for each roadway segment. It should be noted that roadway segments with volumes that fall within the LOS D (approaching congestion) range may not currently exceed the roadway's capacity, but users may still perceive the roadway as congested. Table 3-17 summarizes the capacity and level of service thresholds established for the MAPO planning area.

Table 3-17: Level of Service Thresholds

Congestion Level	General Description	V/C Ratio	LOS
Approaching	Uncongested, generally operating at an acceptable level of service	< 0.85	D
Light to Moderate	Near-congested, generally operating at an acceptable level of service, may experience peak hour traffic congestion	0.85 - 1.05	E
Moderate to Severe	Congested, generally operating with periods of congestion; improvements, including additional capacity, may be needed	> 1.05	F

All of the roadways currently exhibiting congestion (LOS E or worse) were identified by calculating the volume to capacity ratios, which incorporated the most recently published AADT data. A majority of these capacity issues were located on two-lane urban streets providing connections to/from downtown Mankato. These congested roadway segments are summarized in Table 3-18 and displayed in Figure 3-17.

Table 3-18: Congested Roadway Segments (Existing)

Roadway	Location	Capacity	ADT	V/C	LOS
Monks Ave	Glenwood Ave - Balcerzak Dr	8,000	11,100	1.39	F
Stoltzman Rd	W Pleasant St - Stadium Rd	10,000	11,700	1.17	F
Glenwood Ave	Highland Ave - Monks Ave	10,000	9,800	0.98	E
E Main St	Agency Rd - S Victory Dr	10,000	9,700	0.97	E
N 2nd St	Madison Ave - E Plum St	8,000	6,900	0.86	E

MAPO 2045 TRANSPORTATION PLAN

Roadway Capacity Deficiencies (Existing)

Figure 3-17

Corridor Capacity Analysis

- LOS E
- LOS F
- PWI (Basin)
- PWI (Watercourse)
- MAPO Planning Area

Source: Blue Earth County, Nicollet County, MnDOT, North Mankato, Mankato, MnDNR, Esri Imagery

0 1 2 Miles

SRF

BOLTON & MENK

Intersection Congestion

Beyond the planning-level v/c ratio analysis, the TAC requested a detailed intersection operations analysis be conducted for 12 key intersections throughout the MAPO area. The key intersections were chosen based on local knowledge of areas with perceived recurring peak-period congestion. Peak-period turning movement counts were collected at each of the key intersections in the fall of 2014. An operations analysis was conducted for the a.m. and p.m. peak hours at the key intersections to understand current and future traffic operations. Signalized intersections were analyzed using the Synchro/SimTraffic software, while unsignalized intersections were analyzed using a combination of Synchro/SimTraffic software and the Highway Capacity Manual. It should be noted that where unsignalized intersections are in close proximity to signalized intersections, the signalized intersections have a significant impact on the overall operations of the unsignalized intersections. To account for this situation, Synchro/SimTraffic results are reported for the unsignalized intersections as well as the signalized intersections.

Operating Level of Service (LOS) was again assessed for each location. The LOS results are based on average delay per vehicle, which correspond to the delay threshold values shown in Table 3-19. LOS A indicates the best traffic operation, while LOS F indicates an intersection where demand exceeds capacity. Overall, intersection LOS A though LOS C is generally considered acceptable in the Mankato/North Mankato area.

Table 3-19: Level of Service Criteria for Signalized and Unsignalized Intersections *

LOS Designation	Signalized Intersection Average Delay/Vehicle (Seconds)	Unsignalized Intersection Average Delay/Vehicle (Seconds)
LOS A	< 10	< 10
LOS B	10-20	10-15
LOS C	20-35	15-25
LOS D	35-55	25-35
LOS E	55-80	35-50
LOS F	80 <	50 <

*HCM 2010 – Interrupted Flow Chapters

For side-street stop-controlled intersections, special emphasis is given to providing an estimate for the LOS of the minor approach. The traffic operations at an unsignalized intersection with side-street stop control can be described in two ways. First, consideration is given to the overall intersection LOS. This takes into account the total number of vehicles entering the intersection and the capability of the intersection to support those volumes. Second, it is important to consider the delay on the minor approach. Since the mainline does not have to stop, the majority of delay is attributed to the side-street approaches.

Results of the existing intersection operations analysis shown in Table 3-20 indicate that all key intersections currently operate at an acceptable overall LOS C or better during the a.m. and p.m. peak

hours. In addition, no significant side-street delays or queuing issues were observed in the traffic simulation at the key intersections, except at the US 169/US 14 South Ramp side-street stop intersection. 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 US 169/US 14 South Ramp intersection.

Table 3-20: Existing Intersection Operations Analysis

Intersection (Existing Traffic Control)	A.M. LOS(1)	P.M. LOS(1)
US 169 and US 14 South Ramp (Side-Street Stop)	A/C	C/F
US 169 and Lind Street (Traffic Signal)	B	B
US 169 and Webster Avenue (Traffic Signal)	B	B
Stadium Road and Stoltzman Road (Side-Street Stop)	A/B	A/A
Stadium Road and Pohl Road (All-Way Stop)	B	C
Stoltzman Road and Pleasant Street (All-Way Stop)	A	A
TH 22 and Augusta Drive (Side-Street Stop)	A/C	A/D
TH 22 and Hoffman Road (Traffic Signal)	B	B
TH 22 and CSAH 90 (Side-Street Stop)	A/A	A/B
Lor Ray Drive and Carlson Drive (Side-Street Stop)	A/A	A/A
Lor Ray Drive and Howard Drive (All-Way Stop)	A	A
Lookout Drive and Lee Boulevard (Traffic Signal)	B	B

(1) For signalized and all-way stop controlled intersections, the overall LOS is shown and the corresponding delay represents the overall intersection delay. For side-street stop controlled intersections, the overall LOS is shown followed by the worst approach LOS and the corresponding delay represents the worst side-street approach delay.
Overall LOS D or approach LOS E-F (approaching capacity)
Overall LOS E-F (over capacity)

Roadway Condition and Connectivity

Pavement Condition

With new federal and state policies, MPO plans are required to give greater emphasis to preserving and maintaining the existing transportation infrastructure. The Plan's pavement analysis used data from pavement management systems maintained by MnDOT and the cities of Mankato and North Mankato. Each jurisdiction maintained a slightly different pavement rating system that was merged into one for purposes of comparison in this plan. The City of Mankato utilizes a pavement condition index (PCI) rating between 1 and 100. The City of North Mankato also uses a PCI, but their scale is 1 to 10. MnDOT provided a Ride Quality Index (RQI) rating for their pavements with a scale from 1 to 5. Blue Earth County and Nicollet County pavement data was provided by MnDOT and the county engineer's qualitative assessments of pavement condition.

Although each jurisdiction's pavement rating system was slightly different, they all included a qualitative assignment with their scales rating pavements from "Excellent" to "Poor," "Good" to "Serious," or something similar. For purposes of creating a pavement condition snapshot of the entire MAPO area, each of the individual jurisdiction's pavement rating systems were merged into the five category system shown in Table 3-21.

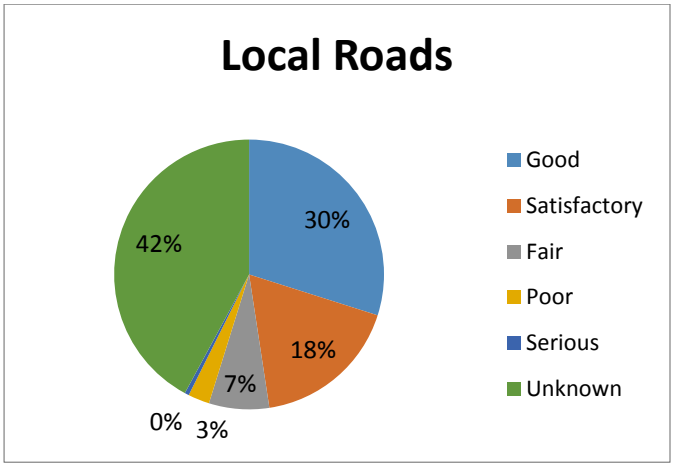
Table 3-21: Pavement Condition Categories

MAPO LRTP Rating	City of Mankato (PCI)	City of North Mankato (PCI)	MnDOT (RQI)
Good	100-81	9-10	5.0-3.8
Satisfactory	80-61	7-8	3.7-3.3
Fair	60-41	5-6	3.2-2.7
Poor	40-21	3-4	2.6-1.1
Serious	20-1	1-2	1.0-0.00

Source: City of Mankato PCI (2012-2014), City of North Mankato PCI (2013-2014), Eagle Lake (2014), MnDOT RQI (2014)

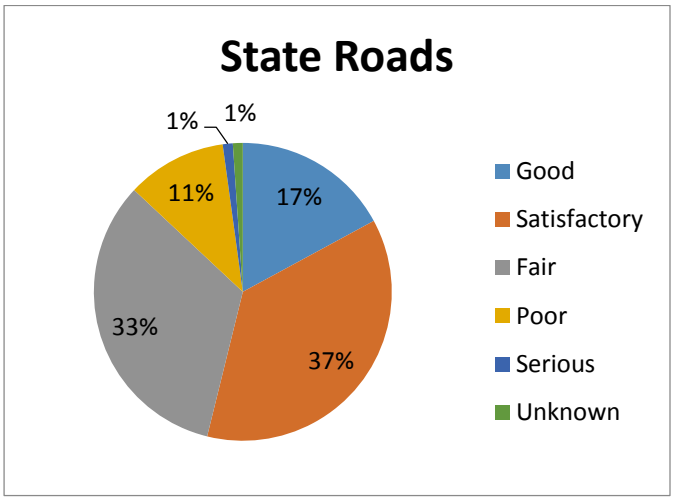
Figure 3-18 and **Figure 3-19** summarize the current pavement conditions for both local (city, township, and county roads) and state roads within the MAPO area. These pavement conditions are also depicted in Figure 3-20.

Figure 3-18: Local Road Pavement Conditions



Source: City of Mankato PCI (2012-2014), City of North Mankato PCI (2013-2014), Eagle Lake (2014), MnDOT RQI (2014)

Figure 3-19: State Road Pavement Conditions



Source: City of Mankato PCI (2012-2014), City of North Mankato PCI (2013-2014), Eagle Lake (2014), MnDOT RQI (2014)

MAP-21 requires special consideration for the preservation of the National Highway System. Based on the data presented in Table 3-21, it should be noted that 54 percent of the total state system is considered to be in "Good" or "Satisfactory" pavement conditions. It is also important to note that 12 percent of the State DOT's pavement is considered to be in "Poor" or "Serious" condition, and when a roadway system falls into these categories, it is often too deteriorated for rehabilitation and requires a costly total reconstruction, while segments within the "Fair" category can be rehabilitated at a lower cost. Therefore, it is important to maintain the number of miles in the "Good" condition and to ensure mileage in the "Fair" condition category do not drop into poor condition, which will necessitate greater taxpayer expenditures.

MAPO 2045 TRANSPORTATION PLAN

Pavement Conditions

Figure 3-20

Pavement Condition

- Good
- Satisfactory
- Fair
- Poor
- Serious
- Unknown
- PWI (Basin)
- PWI (Watercourse)
- MAPO Planning Area

Source: Blue Earth County, Nicollet County, MnDOT, North Mankato, Mankato, MnDNR, Esri Imagery

NOTE: US & STATE HIGHWAYS REPRESENT RIDE QUALITY INDEX

0 1 2 Miles

SRF

BOLTON & MENK

Emergency and Disaster Response

Emergency Evacuation Routes

Several of the MAPO jurisdictions were involved in an emergency evacuation route planning effort in 2008. The following agencies were key stakeholders in the development of the Mankato Area Evacuation Traffic Management Plan: MnDOT, Blue Earth County (Sheriff, Emergency Management), Nicollet County (Sheriff, Emergency Management), City of Mankato (Public Safety, Fire, Public Works, Engineering, Transit, and Community Development), City of North Mankato (Police, Emergency Management), MSU, Mankato, Department of Public Safety, and State Patrol.

The purpose of the Plan was to increase knowledge of each agency's role in order to make effective decisions during an evacuation and identify ideas for increasing capacity on the current transportation infrastructure. The study area for the development of the plan includes an approximate one-mile radius from the City of Mankato's downtown core section. Figure 3-21 illustrates this area, which encapsulates the higher daytime populations of workforce at the time, including city and county government centers.

Key transportation infrastructure within the evacuation footprint included two parallel north-south roadways along the Minnesota River, US 169 on the west side and Riverfront Drive on the east side. The plan process included the identification of priority high-risk areas and development of an evacuation and traffic management plan that can be used as template for incident commanders, emergency managers, and first responders to identify resources necessary to activate the evacuation process no matter where an incident occurs. The following high-risk areas were identified by key stakeholders:

- Downtown – Civic Center (Mankato)
- Water treatment plant near Mound Avenue and nearby nursing home –chlorine/chemical storage (Mankato)
- Vicinity of St. Joseph's and Bethany College (Mankato)
- Mankato East and West High Schools (Mankato)
- River Hills Mall (Mankato)
- City Hall/Government Center (Mankato)
- Minnesota State University (Mankato)
- South Central College (North Mankato)

High Risk Locations	
1	Downtown Mankato - Verizon Wireless Civic Center
2	Mankato Water Treatment Facility
3	Chemical Storage Facilities
4	Immanuel St. Joseph's Hospital
5	Bethany College
6	Mankato East HS (EHS)
7	Mankato West HS (WHS)
8	Mankato & Blue Earth County Government Center
9	Minnesota State University - Mankato
10	South Central College
11	River Hills Mall

MAPO 2045 TRANSPORTATION PLAN

Emergency Evacuation Routes

Figure 3-21

- Motorist Evacuation Route
- High Risk Area
- Pedestrian Pick-up Location
- School Property
- Colleges
- PWI (Basin)
- PWI (Watercourse)
- MAPO Planning Area

Source: Blue Earth County, Nicollet County, MnDOT, North Mankato, Mankato, MnDNR, 2008 Mankato Evacuation Traffic Management Plan

0 1 2 Miles

The high-risk areas identified for the Mankato region were based on a number of factors including high daytime populations, government office(s), regional hospital facility, academic institutions location, and roadway infrastructure concerns.

Figure 3-22 identifies the high-risk area evacuation footprint, evacuation routes, and transit pickup zones. Based on the downtown core study area, the following primary motorist evacuation routes were identified:

- North: 1) US 169 and 2) N. Riverfront Drive
- East: 1) Madison Avenue and 2) Main Street
- South: 1) Val Imm Drive/Cedar Street/Warren Street and 2) Stoltzman Road (CSAH 16)
- West: 1) S. Riverfront Drive to US 169 and 2) Sherman Street to US 169

The Plan did not identify specific walking routes but did identify strategic transit pickup locations in relation to the evacuation footprint. Transit pickup locations included Tourtellotte Park, Spring Lake Park, Mankato West High School, and Washington Elementary School/Emerson Park.

County Hazard Mitigation Plans

Both Nicollet and Blue Earth counties have developed Hazard Mitigation Plans with the purpose of reducing or eliminating risk to people and property resulting from natural disasters or manmade hazards. Each of these plans describes a large variety of risk types and mitigation strategies. The risk areas in each plan that are most likely to affect the transportation network are summarized below.

Nicollet County

Three areas of note in the *Nicollet County All Hazard Mitigation Plan* are flooding, hazardous materials transportation, and transportation and infrastructure failure. Severe flooding in Nicollet County and the surrounding area is primarily caused by the overflowing of the Minnesota River in the spring season due to heavy rains and snowmelt. Levees on the east bank of the river near Saint Peter also restrict water flow and can cause backwater issues at upstream locations. Three major flooding events (requiring Presidential Disaster Declarations) have occurred in Nicollet County in 1993, 1997, and 2001.

High Risk Locations	
1	Downtown Mankato - Verizon Wireless Civic Center
2	Mankato Water Treatment Facility
3	Chemical Storage Facilities
4	Immanuel St. Joseph's Hospital
5	Bethany College
6	Mankato East HS (EHS)
7	Mankato West HS (WHS)
8	Mankato & Blue Earth County Government Center
9	Minnesota State University - Mankato
10	South Central College
11	River Hills Mall

MAPO 2045 TRANSPORTATION PLAN

Potential Emergency Evacuation Routes for Future Study

Figure 3-22

- Motorist Evacuation Route
- High Risk Area
- Additional Evacuation Areas for Study
- Pedestrian Pick-up Location
- School Property
- Colleges
- Additional High Risk Locations
- PWI (Basin)
- PWI (Watercourse)
- MAPO Planning Area

Source: Blue Earth County, Nicollet County, MnDOT, North Mankato, Mankato, MnDNR, 2008 Mankato Evacuation Traffic Management Plan

0 1 2 Miles

Map Document: \\metrosouth\gis\MKTOT\42108723\GIS\ESRI\Maps\Existing Conditions Maps\Fig3-22_MAPO_11x17_PotentialEvacuation_Routes_Future.mxd Date Saved: 9/28/2015 12:31:28 AM

The potential aggregate loss impacts of severe floods (i.e., 100-year flood events) were evaluated using the Hazus software program. Hazus is a risk assessment tool provided by FEMA and is defined as a "nationally applicable standardized methodology that contains models for estimating potential losses from earthquakes, floods, and hurricanes. Hazus used Geographic Information Systems (GIS) technology to estimate physical, economic, and social impacts of disasters." The Hazus analysis resulted in the following findings for Nicollet County:

- The areas with the most potential for loss are located around the cities of Kasota and Saint Peter. Most of the areas around Mankato and North Mankato are estimated to remain undamaged during a 100-year flood event.
- No essential facilities – defined as care facilities, fire stations, police stations, and schools – are anticipated to be affected during a 100-year flood event.
- An estimated 639 households would be displaced as the result of a 100-year flood event. An estimated population of 1,000 persons would require temporary shelter in public locations.

Hazardous materials are defined as materials that are flammable, combustible, explosive, toxic, noxious, corrosive, oxidizers, irritants, or radioactive. Past events in Nicollet County involving hazardous materials have involved diesel, manure, hydraulic oil, sewage, and anhydrous ammonia. Nicollet County does not have a dedicated hazardous materials response team and contracts these services to private companies. The review of the potential for disasters involving hazardous materials are separated into two categories: fixed facilities and transportation related. Nicollet County currently has approximately 600 facilities that store or use hazardous materials onsite.

Transportation of hazardous materials through Nicollet County can be by road, rail, water, air, and pipeline. The Plan notes that the estimated risk of a hazardous material event in Nicollet County is rated as "low to elevated." The elevated ranking is due to the transportation of materials on heavily traveled roads through dense populations.

The Plan notes that there have been no documented large transportation or infrastructure-related failures within the Nicollet County. The estimated risk of transportation infrastructure failure in the County is ranks as "low to elevated." The Highway 22 bridge entering Saint Peter is a key piece of infrastructure that has documented structural integrity issues. The bridge is slated to be replaced by MnDOT.

Blue Earth County

The Blue Earth County All Hazard Mitigation Plan includes a vulnerability analysis for four categories: Critical Facilities, Vulnerability Assessment by Jurisdiction, Future Assets & Infrastructure, and Land Uses & Development Trends.

The review of essential facilities in Blue Earth County identified 63 locations, including 8 police stations, 14 fire stations, 14 medical facilities, and 27 schools. Additional facilities identified include those related to lifeline utility systems, high potential loss facilities (e.g., dams), hazardous materials facilities, key economic elements (e.g., banks, credit unions), historic and cultural resources, and

facilities catering to vulnerable populations such as children or the elderly. The greatest risk to these facilities is related to heavy winter storms with the potential to delay emergency response times.

The review of essential transportation infrastructure identified highway, rail, air, and water as critical systems used in the County. It also identified 189 highway bridges in the County, 10 of which are identified as structurally deficient by MnDOT. These bridges are posted as restricted to vehicles exceeding a specific weight in order to remain open, but will be closed in the event that unsafe conditions are identified during a physical inspection.

The review of vulnerability by district included an assessment of the probability and potential impact of specific hazards for each community within the County. The City of Mankato was identified as having a high probability of hazards, but a relatively lower potential impact. The City of Good Thunder was identified as having both a high probability and high potential impact for multiple hazard types. Examples of these hazards include drought, flood, and erosion/landslides.

For each potential hazard, the Blue Earth Plan also identifies the potential impacts to existing and future land uses, development trends, infrastructure conditions and potential future assets.

Existing Multimodal System

Freight

Figure 3-23 illustrates the most recent heavy vehicle AADT for the MAPO area. The following roadways are significant freight corridors within the MAPO area due to their importance to the region's and State's economy:

- US 169 from Mankato to the Twin Cities
- US 14 from South Dakota to I-35 and Rochester
- MN 60 from Iowa to Mankato (for ethanol plants and shuttle elevators);

Specifically, US 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 US 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.

Figure 3-23 also illustrates both the National Truck Network and the Minnesota Twin Trailer Network. The National Truck Network is a network of approved state highways and interstates designated for use by large commercial trucks. The Minnesota Twin Trailer Network is a system of state highways and interstates designated by the Minnesota Commissioner of Transportation for long combination heavy commercial vehicles. MN 22 from the northern MAPO planning boundary to US 14 is on the Minnesota Twin Trailer Network. Recently, CSAH 12 from CSAH 3 to US 14, CSAH 3 from CSAH 12 to MN 22 and Energy Drive were added to the Minnesota Twin Trailer Network to support the new FedEx Ground Distribution Center in Mankato's Eastwood Industrial Park. National Truck Network routes in the MAPO area include US 169, US 14, MN 60 and MN 22 (from US 14 to the southern MAPO planning limits).

Figure 3-23 also illustrates the existing freight generators within the MAPO area. These include industrial type land uses that attract and generate heavy commercial vehicle traffic. Concentrations of freight generators in the MAPO area are located along primary transportation corridors including US 169, US 14, and MN 22.

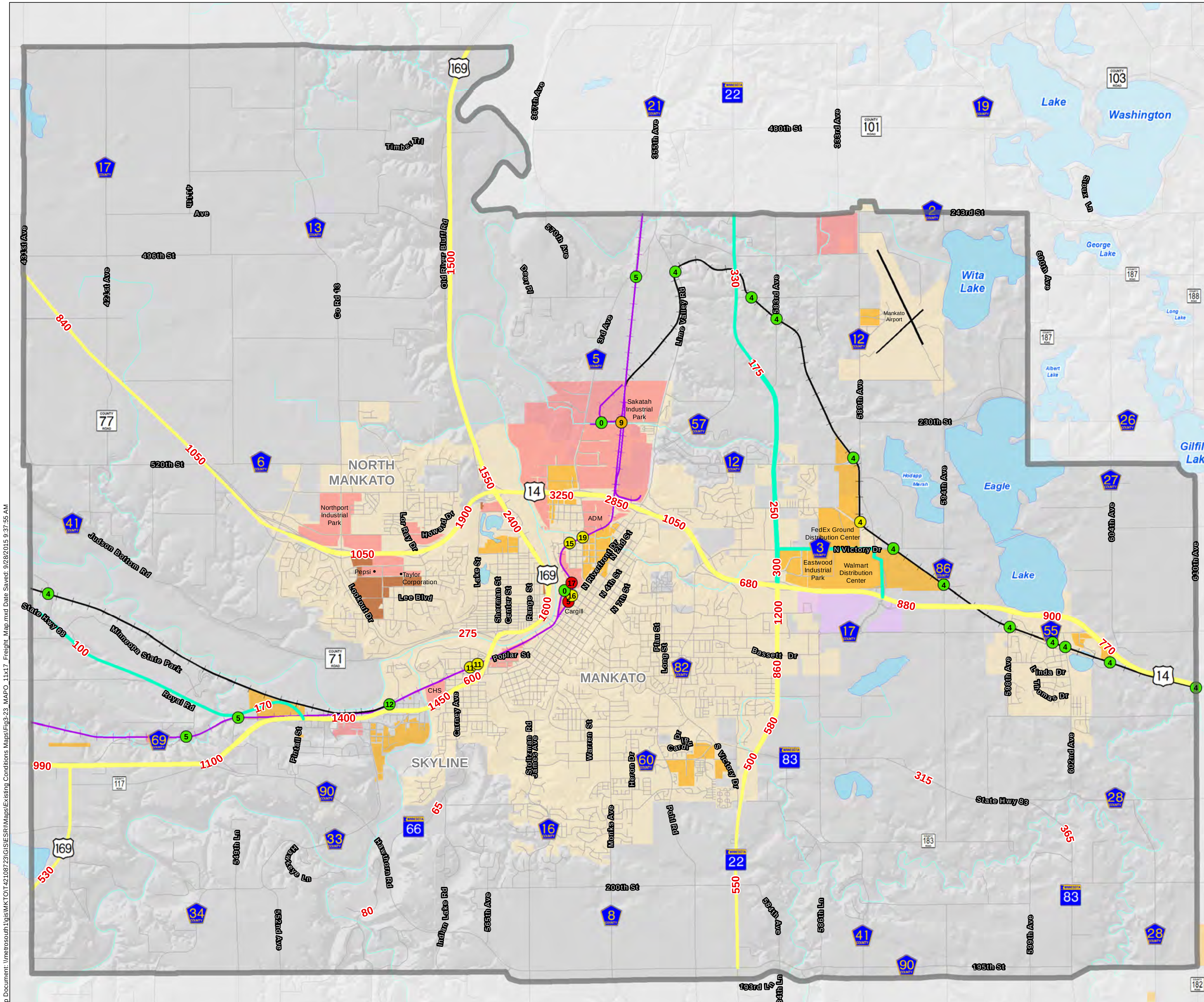
Mankato has recently begun construction on the third regional distribution center within the City by a national company. The True Value Hardware distribution center is an existing business located in Mankato along CSAH 5 just north of US 14. Two other distribution centers began construction in 2014. The Wal-Mart Distribution Center is currently under construction in Mankato's Eastwood Industrial Park off of CSAH 3 in the northwest quadrant of the US 14/CSAH 12 interchange. FedEx Ground also began construction of a distribution center in Mankato's Eastwood Industrial Park in late 2014. This facility is located north of CSAH 3 along Energy Drive.

The system of high load-bearing roadways in the MAPO area is composed primarily of US and trunk highways and major roadways on the County State-Aid system. Current roadways with 10-ton limits are noted in Table 3-22. All other roadways are subject to axle load limitations, including seasonal load restrictions. Seasonal or other load limits have a notable impact on farm and commercial access in the MAPO area and Southwest Minnesota. The low-weight capacity of these roadways limits the ability to efficiently move freight from a regional perspective. Expansion of the year-round 10-ton roadway network, as identified on the conceptual 10-ton system by MnDOT's Southwest Minnesota Freight Study (2007) and the MnDOT State Aid office, is widely recognized as a need for the area to better serve freight movement.

MAPO 2045 TRANSPORTATION PLAN

Freight

Figure 3-23



4 Trains Per Day

Number of Tracks

- 1
- 2
- 3
- 4

Industrial Land Use

- Industrial Commercial
- Light Industrial
- Heavy Industrial
- Planned Industrial

500 Heavy Commercial ADT

MN Twin Trailer Network

National Truck Network

Canadian Pacific

Union Pacific

MAPO Planning Area

Source: Blue Earth County, Nicollet County, MnDOT, North Mankato, Mankato, MnDNR, Esri Imagery

0 1 2 Miles

SRF

BOLTON & MENK

Table 3-22: MAPO Area 10-Ton Roadway Network

Roadway	Location	Roadway	Location
US 14	Blue Earth County, Nicollet County	CSAH 12	Blue Earth County
US 169	Blue Earth County, Nicollet County	CSAH 17	Blue Earth County
MN 22	Blue Earth County	CSAH 33	Blue Earth County
MN 60	Blue Earth County	CSAH 57	Blue Earth County
MN 66	Blue Earth County	CSAH 82	Blue Earth County
MN 68	Blue Earth County	CSAH 90	Blue Earth County
MN 83	Blue Earth County	CSAH 6	Nicollet County
CSAH 2	Blue Earth County	CSAH 13	Nicollet County
CSAH 3	Blue Earth County	CSAH 17	Nicollet County
CSAH 5	Blue Earth County	CSAH 41	Nicollet County
CSAH 8	Blue Earth County		

Source: MnDOT CVO, Blue Earth County (MATAPS 2035)

Rail

Minnesota is served by four Class I railroads and 17 active shortlines and switching railroads. Two of the four Class I railroads, the Union Pacific (UP) railway, and the Canadian Pacific (CP) railway, directly serve the MAPO area. The region does not currently have passenger rail service; however, MnDOT has prepared a plan that envisions statewide passenger rail service, including a route from Mankato to Minneapolis.

The UP railway owns tracks that run north-south through the MAPO area. UP also has switching yard just north of Mankato. UP switching also occurs within the City of Mankato at freight generators such as ADM, CHS, Cargill, and metal scrap businesses. Over the entire length of Federal Railroad Administration (FRA) Class 3-rated track to the Twin Cities, the average freight speed is 49 miles per hour with between six and 12 trains per day on average (there are some segments of track north of Mankato where freight speeds are limited to 10 miles per hour). South of Mankato the UP track has grade crossings that average over one per mile (134 crossings over the 104-mile corridor). This track is FRA Class 4-rated track with train control by TWC[1]. The five trains per day have an average speed of almost 45 miles per hour. The UP tracks through Mankato are referred to as the Mankato subdivision, which stretches from Minneapolis to St. James.

The CP railway runs on east-west tracks through the MAPO area. Within Mankato it runs on UP tracks and averages around four trains per day. The main commodities are agricultural products and

[1] Track Warrant Control (TWC) is a train control system where the train conductor has to obtain permission or warrants to enter a section of track.

construction materials. The track segment, known as the Tracy Subdivision, runs from Waseca to Tracy and has 181 grade crossings on the FRA Class 3 rated track. Table 3-23 displays the current at-grade crossings, by warning device, within the MAPO area.

Table 3-23: At-Grade Rail Crossings

Warning Device	Number of Crossings	Average AADT	Average Daily Trains	Average Tracks	Average Train Speed (MPH)	Average Vehicle Speed (MPH)
Crossbuck	6	700	4	1	25-30	45
Flashing Lights	4	3,000	4	1	20-25	35
Gates	11	1,800	10	2	20-25	35
Stop Sign & Crossbuck	5	500	8	1	30-35	40
Total for Study Area	**26**	**1,500**	**7**	**1**	**20-30**	**40**

Source: MnDOT (MATAPS 2035)

Figure 3-23 illustrates the rail network within the MAPO study area and also shows the number of trains per day and the number of tracks that exist at each at-grade rail crossing location. Figure 3-24 displays rail ownership, the location of existing at-grade rail crossings, and the current warning device at each crossing. Table 3-24 summarizes the highest AADT crossings within the MAPO area.

Table 3-24: Highest AADT Crossing (by Warning Device)

Owner	Location	Warning Device	AADT	Daily Trains	Tracks	Train MPH	Vehicle MPH
UP	3rd Ave	Cants & Gates	8,500	19	2	20	30
DM&E	589th Ave	Crossbuck	2,700	4	2	30	55
UP	CSAH 5	Flashing Lights	5,700	5	1	20	55

MAPO 2045 TRANSPORTATION PLAN

At grade Rail Crossing Warning Device

Figure 3-24

Warning Device

- Crossbuck Only
- Flashing Lights
- Gates
- Stop Sign & Crossbuck

- Canadian Pacific
- Union Pacific
- PWI (Basin)
- PWI (Watercourse)
- MAPO Planning Area

Source: Blue Earth County, Nicollet County, MnDOT, North Mankato, Mankato, MnDNR, Esri Imagery

0 1 2 Miles

Public Transit

Mankato's Transit System (MTS) is the Greater Mankato area's transit operator serving neighborhoods and commercial corridors within the cities of Mankato and North Mankato as well as the MSU, Mankato's campus area.

In 2011, a Greater Mankato Transit Redesign Study was completed, resulting in changes to the overall transit system. Recommendations from this study were implemented in August 2012. Since implementation, ridership has increased from:

- 2011: 375,776
- 2012: 472,767
- 2013: 672,573

Additionally, the first four months of 2014 vs. 2013 showed continued strength in the service area, with ridership up 13 percent. As a result of these significant gains in productivity, MnDOT awarded the City of Mankato funding to procure additional vehicles to sustain operations. This funding was targeted at two enhanced service improvements identified in the transit study. The two improvements included the realignment of the Campus Express (Route 1) into a north and south route during peak service hours; and a fixed route bus service from Cherry Street to the Wickersham Health Campus (Route 13).

Figure 3-25 illustrates the study's implemented recommendations showing how transit routes are currently operating in this region, including the recent changes outlined above which came online in July-August 2014. Table 3-25 displays the characteristics of each route.

As shown in Table 21, there are 11 weekday fixed routes that serve the City of Mankato and two weekday fixed routes serving North Mankato. There are two fixed routes serving the region on Saturdays. There is no Sunday service, except for the MSU Red Eye Shuttle. MSU also operates the Maverick Shuttle for on-campus transportation. Complementary paratransit is offered in the Mankato/North Mankato service area in conjunction with the fixed route hours of operation. The destinations, service days and frequencies are listed in Table 3-25.

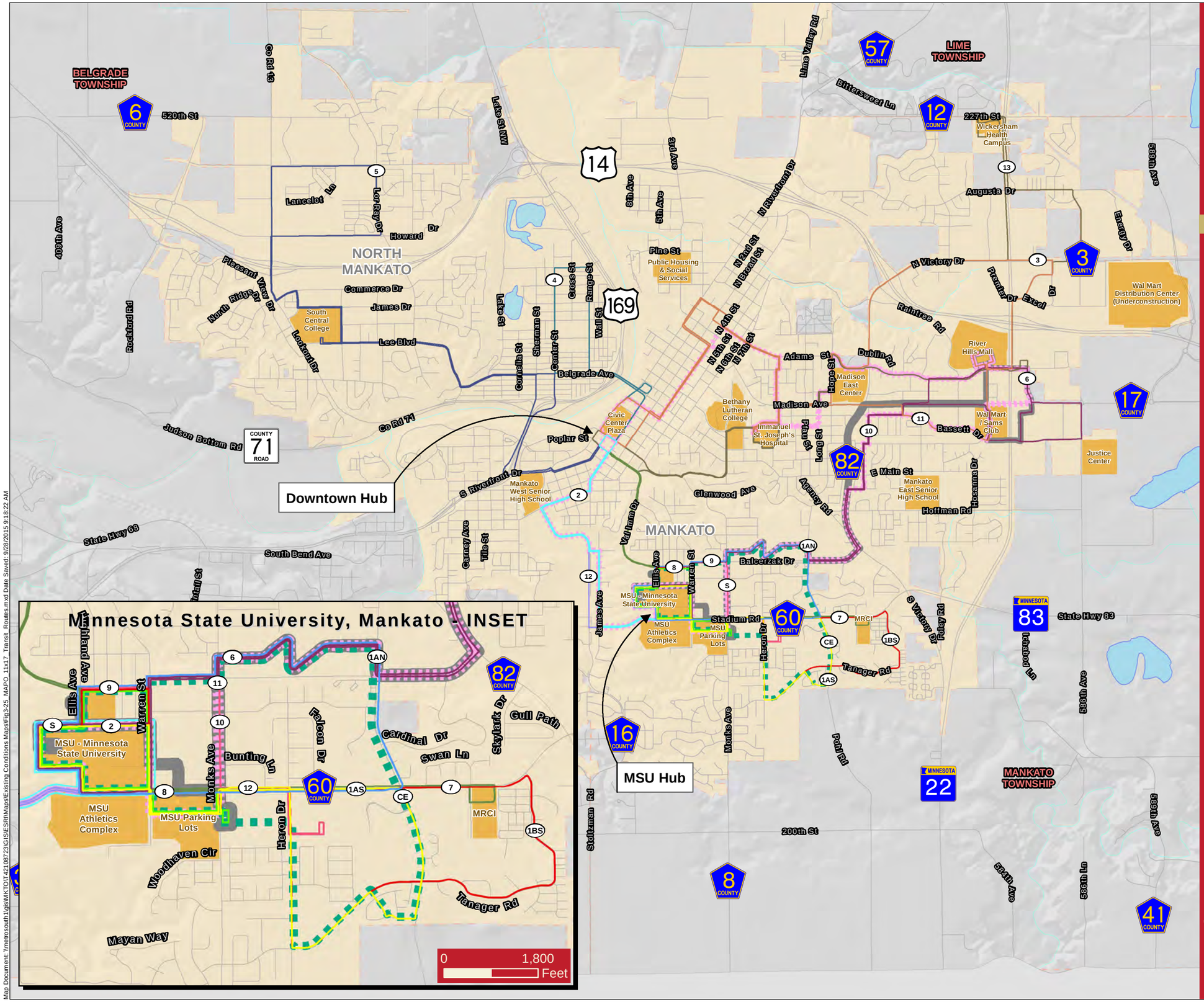
There are two primary transfer hubs in the MTS system:

- Downtown Hub (S. Front Street and Cherry Street). This is the primary stop for Monday – Friday Routes 2, 3, 4, 5, 7 and 13; Saturday Routes 10 and 11
- MSU Hub (Wigley Administration Building at MSU). This is the primary stop for Routes 1 North, 1 South, Campus Express, 6, 8, 9, 12 and Stomper Express. Additionally, this hub also serves as a secondary hub for Route 2.

MAPO 2045 TRANSPORTATION PLAN

Transit Routes

Figure 3-25



Trip Generators
PWI (Basin)
PWI (Watercourse)

Mankato Bus Route

- Route 1A North
- Route 1A South
- Route 1B South
- Route 2
- Route 3
- Route 4
- Route 5
- Route 6
- Route 7
- Route 8
- Route 9
- Route 12
- Route 13
- Saturday Service
- Campus Express
- Stomper Express

Source: Blue Earth County, Nicollet County, MnDOT, North Mankato, Mankato, MnDNR, Esri Imagery

SRF

BOLTON & MENK Engineers & Surveyors

Map Document: \\metrosouth1\gis\MKTOT\4210872\GIS\ESRI\Maps\Existing Conditions Maps\Fig3-25_MAPO_11x17_Transit_Routes.mxd Date Saved: 9/28/2015 9:18:22 AM

Table 3-25: Mankato Transit Service Characteristics

Route Number	Route Description/Name	Destinations	Service Days	Service Span	Service Frequency
Weekday Service					
2	MSU - Downtown Mankato	Cherry St, Lincoln Community Center, Stadium/James, Student Union, Nelson Hall	M-F	6:35 am - 5:35 pm	60 minutes
3	East End - North End	Cherry St, Gus Johnson, Holiday, Hospital Door 2 Clinic, Wal-Mart, River Hills Mall, VA Clinic, Orness Plaza	Monday - Friday	6:35 am - 5:35 pm	60 minutes
4	Lower North Mankato - Downtown	Cherry St, Center/Belgrade, Best Western, Range/Belgrade	Monday - Friday	7:20 am - 5:35 pm	6 round trips
5	North Mankato - Downtown	Cherry St, YMCA, Belgrade/Center, Colony Ct Apts, South Central College, Precision Press, Benson Park, Dakota Meadows	Monday - Friday	6:35 am - 5:20 pm	6 round trips
6	East End - MSU Route	Student Union, Briargate Apts, Fire Station, Public Works, Open Door Health Clinic, Wal-Mart, Justice Center, McDonalds/Hy-Vee	Monday - Friday Summer	6:55 am - 5:55 pm 7:30 am - 5:30 pm	60 minutes
7	MRCI - Downtown Mankato	Cherry St, Durham, 300 Ramsey, Nelson Hall, MRCI	Monday - Friday	6:55 am - 4:25 pm	3 round trips
13	Downtown - Wickersham	Cherry St, Cherry Ridge, Bethany, Hospital/Mankato Clinic, Madison/Long, Orness Plaza, VA Clinic, Wickersham, Menards	Monday - Wednesday	6:35 am - 5:35 pm	60 minutes
Paratransit	Mankato/North Mankato	City Wide	Monday – Saturday	Aligned with fixed routes	As needed

Route Number	Route Description/Name	Destinations	Service Days	Service Span	Service Frequency
Saturday Service					
10	Mankato Clockwise Loop	Cherry St, Pleasant/Marshall, Stadium/James, Student Union, MSU Library, Briargate Apts, Marwood/Blackeagle, Wal-Mart, River Hills Mall, Orness Plaza, Hospital Door 2, Adams/5th St	Saturday	10:00 am - 5:00 pm	60 minutes
11	Mankato Counterclockwise Loop	Cherry St, Adams/4th St, Hospital Door 2, Orness Plaza, Urgent Care, River Hills Mall, Wal-Mart, Marwood/Blackeagle, Southridge Terrace, MSU Library, Student Union, Pleasant/Record	Saturday	10:30 am - 5:30 pm	60 minutes
MSU Bus Routes (School Year Only)					
Campus Express	U-Zone	McElroy Shelter, Briargate/Southridge Apts, Meadow View, College Town, Heron Dr, Lots 20-23, MSU	Monday - Thursday Fridays	6:00 pm - 10:00 pm 7:00 am - 4:30 pm	30 minutes
1 North	U-Zone	College Station, Southridge Apts, Briargate Apts, Ellis/Val Imm, MSU	Monday - Thursday	7:00 am -6:00 pm	20 minutes
1 South	U-Zone	McElroy Shelter, Maywood/Warren, College Town, Heron Dr, Lots 20-23, MSU	Monday - Thursday	7:00 am -6:00 pm	30 minutes
8	U-Zone MSU Parking Lot Shuttle	MSU Parking Lot Shuttle	Monday - Thursday Friday	7:00 am - 6:00 pm 7:00 am - 4:30 pm	15 minutes
9	U-Zone Morning Express	Nelson Shelter, Stadium Heights, Monks Ave	Monday - Friday	7:00 am - 10:00 am	20 minutes
12	U-Zone Nightime	MSU, Southwood Terrace, James Ave/Fairfield, James Ave/Stadium Rd, Stadium Heights, Monks Ave	Monday - Thursday	6:00 pm - 9:30 pm	30 minutes
MSU Red Eye Shuttle	On Campus	MSU Residence Halls, CSU, Parking Lots	Monday - Thursday Sundays	3:30 pm - Midnight 5:00 pm - 11:00 pm	30 minutes
Stomper Express	MSU - River Hills Mall Area	MSU, McElroy Complex, University Square, Summit Apts, Briargate/Southridge, Wal-Mart, Old Navy, River Hills Mal	Monday - Saturday	6:00 pm - 11:00 pm	60 minutes
Maverick Shuttle	On Campus	Wigly Administration, Parking lots 20-23	Monday-Friday	7:30 am – 4:30 pm	15 minutes

Additional Transit/Public Transportation Services

The Volunteer Interfaith Network Effort (VINE): Is a volunteer-based initiative serving Blue Earth and Nicollet counties providing transportation for individuals age 60 and older and on a limited basis for individuals with disabilities (under the age of 60). Transportation services can be arranged for doctor appointments, the grocery store, or other various needs; however, the program is not intended to be a person's only source of transportation. VINE's senior transportation service is supported through donations and funding through Blue Earth Human Services. VINE runs 24 hours a day, seven days a week; however, weekend service is more limited. VINE is currently providing approximately 125 rides per week.

VINE also provides transportation for single parents, immigrants, and other low-income workers. Transporting their children to daycare or school while parents work is also an important part of the service provided. VINE Faith in Action, Greater Mankato Area United Way, and Blue Earth County Employment Services jointly sponsor the program.

Jefferson Lines: Offers a College Connection, which provides regional service to the Twin Cities and other destinations including North Dakota, Iowa, Wisconsin, and Oklahoma. Jefferson Lines picks up at the Taylor Corporation in North Mankato and the Mankato Depot and MSU, Mankato.

Land to Air Express: Intercity bus service in Mankato is provided by Land-to-Air Express. A total of three round trips are provided daily between Mankato and Rochester; two round trips follow US 14 stopping in Waseca, Owatonna, and Dodge Center, and one round trip follows I-90 stopping on Austin and Albert Lea. These services are supported by FTA Section 5311 (f) intercity bus program funding managed by MnDOT. In Rochester, timed transfers can be made to the national intercity bus network via Jefferson Lines.

Service from Mankato to the Minneapolis – St. Paul International Airport is provided on a wholly private basis by Land-to-Air Express. Land-to-Air Express makes six weekday round trips and three weekend round trips between Mankato and Minneapolis – St. Paul International Airport.

Aviation

The Mankato Regional Airport is a regional aviation transportation asset located approximately five miles north of the City of Mankato. The airport consists of runways, taxiways, parking aprons, navigational aids, an airport terminal, and facility areas for general aviation, corporate, air cargo (future), and flight training.

The airport has supported up to 180,000 operations (takeoffs and landings) at their peak and annually averages between 70,000 and 102,000 operations. Flights annually serve general aviation, charter flights, military and government flights, and corporate/business aviation. According to MnDOT's State Airport System Plan, the Mankato Airport is one of the busier airports in Minnesota outside of the Twin Cities metro area.

The airport is owned and operated by the City of Mankato. Customer service operations are provided by a private contractor, North Star Aviation, operating as the airport's Fixed Base Operator (FBO). North Star Aviation provides ground handling, fuel sales, aircraft maintenance, aircraft rental, charter and flight training services to the public.

Facilities

The current airport was built in 1970 after relocating from its original location on the south side of Mankato, near the current MSU campus. The current size is approximately 1,000 acres. The airport consist of two runways:

- Runway 15 / 33 – 6,600ft x 100ft – Suitable for small/medium/large aircraft up to 150,000 pounds (Boeing 737/Airbus A320 sized aircraft). This is the primary instrument runway with Instrument Landing System (ILS), GPS and Radio Navigation Aid (VOR) approaches for landing in poor weather (instrument) conditions.
- Runway 04 / 22 – 4,000ft x 75ft – Suitable for small medium aircraft up to 40,000 pounds (small and medium turboprop and multi-engine jets). This is the secondary instrument and crosswind runway with GPS approaches for landing in instrument conditions

The airport has full paved parallel taxiway access to all runways and more than 143,000 square feet of paved aircraft parking and tie-down space (apron areas). The Terminal Building was completed in 1997 and consists of 15,500 square feet of space leased to North Star Aviation and Minnesota State University and open to the public. Numerous upgrades and improvements have been funded over the past 44 years including runway and taxiway expansion, hangar development, storm and wastewater improvements, and a new terminal building.

The airport has more than 175,000 square feet of storage space across 15 large hangars that accommodate aircraft ranging from small single engine recreational aircraft to medical helicopters to corporate jet aircraft.

Operations and Users

The Mankato Regional Airport is primarily used for flight training, charter flights, business travelers, and recreational flight. There is currently no scheduled airline service in Mankato. The airport is used extensively by the Federal and State Government, including all branches of military, the Minnesota National Guard, and the Civil Air Patrol.

The Mankato Airport does not currently have any cargo operations. In July 2009, Mead & Hunt completed a Cargo Study, which concluded that the Mankato Airport has adequate accommodations for air cargo activity, but the recent expansions at the Rochester International Airport will most likely deter expanding cargo operations westerly into the Mankato market. This could change in the future, particularly if Wal-Mart's new distribution facility would create a need for these types of services.

Approximately 70 aircraft (small single-engine and multi-engine aircraft) are based at the airport and lease hangar space from the City. Another six jet and turboprop aircraft flown by local businesses are based in large conventional hangars. Each year, hundreds of local and international businesses fly into Mankato transporting employees, visiting manufacturing facilities and looking for development opportunities. Recent businesses landing at Mankato include Wal-Mart, Verizon, Cargill, Target, Menards, and dozens more.

The airport is primarily funded through the FAA's National Aviation Trust Fund (revenue from fuel sales, ticket/user fees), along with MnDOT Aeronautics revenue and local City sales tax revenue.

- Annually, the airport hosts fly-ins, special events, and a large air show every three years, which draws approximately 50,000 spectators. The airport is home to six aviation-related businesses/organizations: North Star Aviation, MSU Aviation Department, Mayo One Aviation, TAC Aero, TACNAM aircraft, and PRO TRAIN Aviation
- Directly, these organizations employ more than 40 full-time equivalent employees.
- Mayo One provides 24-hour-a-day medical evacuation flights to their trauma centers using a dedicated helicopter and on-site pilots, paramedics, and flight nurses.

The MSU Aviation Department offers the only four-year aviation bachelor's degree program in the State of Minnesota (Professional Flight and Aviation Management Degrees). The MSU flight training program consists of 10 dedicated training aircraft and three simulators with approximately 150 students flying 7,000 hours per year.

Bicycle and Pedestrian

Most residential subdivisions within the MAPO area have sidewalk facilities integrated into their design. The sidewalk systems in Mankato, North Mankato, and Eagle Lake are generally well established in a traditional grid pattern within the core areas of these communities. However, the sidewalk system is not as dense in the neighborhoods outside of the downtown areas. Outside the core areas, sidewalks are generally located along the major thoroughfares and along connections between neighborhoods. The sidewalk systems generally lead to the local and regional trail networks which consist mainly of off-street, shared-use paths.

The MAPO area is served by the following multi-purpose regional trail systems:

- Minnesota River Trail
- Red Jacket Trail
- Sakatah Singing Hills State Trail
- South Route Trail
- Minneopa Trail

The Minnesota River Trail meanders from the north side of Mankato in the vicinity of Lime Valley Road and Sakatah State Trail west and south along the Minnesota River to just south of Sibley and Land of Memories Park. Amenities along this route include natural river scenery, access to downtown Mankato, access to North Mankato, and access to local parks. The Minnesota DNR is in the process

of completing a Master Plan for a Minnesota River Trail extension from Mankato to Saint Peter. Potential trail alignments have been identified, and the DNR, along with trail supporters, are working on potential right-of-way for this future trail.

The Red Jacket Trail runs from the Minnesota River at Mankato south approximately 5.5 miles to the South Route Trail. The Red Jacket Trail follows a former railroad grade, runs near the Blue Earth River, crosses the Le Sueur River over a trestle bridge, and for much of its length, follows a deeply incised natural ravine. Other amenities along the trail include Mount Kato Ski and Bike Area and the Red Jacket Park. The park includes a picnic shelter, drinking water, parking lot, viewing area, and a canoe launch at the Le Sueur River.

The South Route Trail runs for approximately 8 miles from Minneopa State Park adjacent to CSAH 90 to MN 22. The South Route Trail intersects the Red Jacket Trail one mile north of the Red Jacket Park.

The Sakatah Singing Hills State Trail was developed for bicycling, hiking, in-line skating, horseback riding, skiing, and snowmobiling. The Sakatah Trail provides a paved treadway for bicyclists and second trail for horseback riding from Lime Valley Road near US 14 to Eagle Lake and continues east out of the MAPO area to Faribault.

The Minneopa Trail is a biking and hiking trail linking Sibley and Minneopa parks. The trail features two bridges and a tunnel and connects the Red Jacket and Minnesota River trails.

The well-established regional trail system provides connectivity to local trails, recreation areas, and communities within the MAPO area. These regional trail systems can be used for biking; however, there are limited dedicated on-street bicycle facilities in the MAPO area at this time. Figure 3-26 illustrates existing sidewalks and trail facilities and on-street bicycle routes in the MAPO area.

MAPO 2045 TRANSPORTATION PLAN

Existing Pedestrian and Bicycle Facilities

Figure 3-26

SCHOOL	
1	Lincoln Community Center
2	Dakota Meadows
3	Eagle Lake
4	East High School
5	Franklin
6	Hoover
7	Jefferson
8	Kennedy
9	Monroe, Garfield
10	Roosevelt
11	Rosa Parks
12	Washington
13	West High School

- Sakatah Singing Hills State Trail
- On-Street Bike Route
- Paved Trail
- Natural
- Sidewalks
- Park / Open Space
- School Property
- Colleges
- Railroad
- MAPO Planning Area

Source: Blue Earth County, Nicollet County, MnDOT, North Mankato, Mankato, MnDNR, Esri Imagery

0 1 2 Miles

Safety and Crash Assessment

Safety is a key component in the development and implementation of the Long Range Transportation Plan. This section provides an overview of existing safety concerns along both corridors and intersections throughout the Mankato/North Mankato Area Planning Organization (MAPO). Conducting this safety assessment helped set the foundation for identifying goals and objectives and future operation and project needs.

The safety strategies and countermeasures outlined in this chapter are consistent with the Minnesota Strategic Highway Safety Plan and the Blue Earth and Nicollet County Road Safety Plans.

Crash History

Crash data was obtained from MnDOT for the five-year period from 2009-2013. There were a total of 5,225 crashes that occurred within the MAPO planning area during this five-year period. Figure 4-1 displays all crashes within this period and also indicates the severity of crashes that occurred.

Table 4-1 documents total crashes by years as well as the relative change in crashes. As shown in the table, the total annual number of crashes has remained relatively stable over the past five years.

Table 4-1: MAPO Area Crash Summary

Year	Number of Crashes	Percent Change From Previous Year (Crashes)
2009	1,031	--
2010	1,108	7%
2011	1,073	-3%
2012	973	-9%
2013	1,040	7%
TOTAL	5,225	
Average Growth (2009-2013)		~ 0%

Source: MnDOT Crash Mapping Analysis Tool, 2009-2013

Figure 4-2 provides an overview of the fatal crashes reported during the five-year period under review. Twenty-eight fatal crashes were reported, resulting in 32 fatalities between 2009 and 2013. The majority (22 percent) of fatal crashes reported "distracted driving" as the primary cause for the crash. Failure to yield and alcohol were also listed as reasons for some of the fatal crashes. Four of the fatal crashes involved a pedestrian and/or bicyclist. There were no fatal crashes involving a railroad crossing.

MAPO 2045 TRANSPORTATION PLAN

Crashes (2009-2013)

Figure 4-1

Crash Severity

- Fatal (28)
- Incapacitating Injury (38)
- Non-incapacitating Injury (417)
- Possible Injury (967)
- Property Damage (3,753)
- Unknown (22)
- PWI (Basin)
- PWI (Watercourse)
- MAPO Planning Area

Source: Blue Earth County, Nicollet County, MnDOT, North Mankato, MnDNR, Esri Imagery

0 1 2 Miles

SRF

BOLTON & MENK

MAPO 2045 TRANSPORTATION PLAN

Fatal Crashes (2009-2013)

Figure 4-2

Non-Intersection, Right-angle crash. 4:00 PM. December. One Fatality. Slushy road conditions with clear weather.Driver 1 (traveling south) skidded into improper lane and collided with driver 2 (traveling north).

Non-intersection. Head on crash. 10:41 AM. July. Two Fatalities. Dry road with clear weather conditions.Driver 1 (traveling east) crossed centerline colliding with Drivers 2, 3 and 4 (traveling west).

Non-intersection. Head on crash. 6:51 AM. September. One Fatality. Dry road with fog/ smoke weather conditions.Driver 1 (traveling east) was distracted and crossed centerline colliding with Driver 2 (traveling west).

4-legged intersection, 2-way stop. Sideswipe crash. 6:54 PM. July. One Fatality.Dry road with clear weather conditions.Driver 2 (traveling west) sideswiped Driver 1 (traveling west) in attempt to avoid pedestrian who failed to yeild to traffic.

4-legged intersection, 2-way stop. Sideswipe crash.9:25 AM. November. One Fatality. Dry road with clear weather conditions. Driver 1 (traveling west) was distracted and failed to yield colliding with Driver 2 (traveling north) at a right angle.

4-legged intersection. 1:20 PM. June. One Fatality. Right angle crash.Dry road with clear weather conditions. Driver 1 (traveling east) was over centerline and failed to yield while turning left colliding with Driver 2 (traveling north) traveling straight through intersection.

Non-intersection. 11:43 PM. August. One Fatality. Dry road with clear weather conditions. Driver 1 (traveling west) was traveling at illegal/unsafe speed and collided with embankment/ditch/curb.

Non-intersection. 1:23 PM. May. One Fatality. Dry road with clear weather conditions. Driver 1 (traveling south) collided with Bicyclist (traveling west) who failed to yield to traffic and was crossing road.

4-legged intersection. 2-way stop. Right-angle crash, Over Turn/Rollover. 3:46 PM. September. One Fatality. Dry road with clear weather conditions. Driver 1 (traveling east) was distracted and failed to yield colliding with Driver 2 (traveling south) traveling straight through intersection.

Non-intersection. Head on crash.6:30 AM. November. Two Fatalities. Dry road with cloudy weather conditions.Driver 1 (traveling west) collided with Pedestrian who was walking/running in road against traffic.

Non-intersection. Rear end crash. 7:43 PM. September. Two Fatalities. Dry road with clear weather conditions.Driver 1 (traveling east) had been drinking and was distracted and collided with Driver 2 (traveling east) who was using improper lane.

Non-intersection.10:19 PM. January. One Fatality.Dry road with cloudy weather conditions.Driver 1 (traveling north) was improperly using lane and collided with tree or shrub.

Interchange On Ramp. Right-angle crash. 1:04 PM. September. One Fatality. Dry road with clear weather conditions. Driver 1 (traveling west) failed to yield to Driver 2 (traveling north).

Non-intersection.Head on crash.6:53 PM. April.One Fatality.Dry road with clear weather conditions. Driver 1 (traveling west) over corrected and skidded into guardrail.

Intersection.12:25 PM. July. One Fatality.Dry road with cloudy weather conditions.Driver 1 (traveling north) had been drinking, was distracted and collided with embankment/ditch/curb.

Non-intersection.Pedestrian crash. 8:09 PM. March.One Fatality.Wet road with cloudy and rainy weather conditions. Pedestrian failed to yield to traffic and was struck by Driver 1 (traveling northeast) along the roadside.

T-intersection. Right-angle crash. 1:10 PM. April. One Fatality. Dry road with clear weather conditions.Driver 2 (traveling north) making an improper U-turn and failed to yield and collided with Driver 1 (traveling east) straight ahead.

Intersection. Bicycle crash.Right-angle crash. 10:43 PM. June. One Fatality.Dry road with clear weather conditions. Bicyclist (traveling north) failed to yield to traffic while crossing the road and was struck by Driver 1 (traveling west).

Non-intersection.7:00 AM. December. One Fatality.Icy/packed snow road with clear weather conditions. Driver 1 (traveling north) was distracted while traveling at an illegal/unsafe speed and ran off road (left side) and collided with median barrier.

Non-intersection. 2:13 AM. January. One Fatality. Icy/packed snow road with blowing snow and cloudy weather conditions.Driver 1 (traveling east) had been drinking and collided with median and had overturn/rollover crash.

Non-Intersection. Head on crash.12:30 PM. August. One Fatality.Dry road with clear weather conditions. Driver 1 (traveling east) had been drinking and was distracted and crossed centerline and collided with Driver 2 (traveling west).

4-legged intersection. No passing zone. Right-angle crash. 2:33 PM. June. One Fatality.Dry road with clear weather conditions.Driver 1 (traveling north) was distracted and failed to yield while making right turn colliding with Driver 2 (traveling south) traveling through intersection.

4-legged intersection. Yield sign.Right-angle crash 5:06 PM. May. One Fatality.Dry road with cloudy weather conditions. Driver 1 (traveling north) failed to yield and collided with Driver 2 (traveling west) traveling through intersection.

Non-intersection. Right angle crash. 11:41 PM. December. Two Fatalities. Ice packed road with cloudy and snowing weather conditions. Driver 1 (traveling north) had been drinking traveling at unsafe speed the wrong way into traffic collided with Driver 2 (traveling south).

Non-intersection. Head on crash. 7:50 AM. July. One Fatality.Dry road with clear weather conditions. Driver 1 (traveling south) crossed the centerline (not passing) into oncoming traffic colliding with Driver 2 (traveling north).

Non-intersection. Overturn/rollover. 10:00 AM. January. One Fatality. Icy/packed snow road with clear weather conditions.Driver 1 (traveling east) was an inexperienced driver traveling at illegal/unsafe speed and ran off road (right-side) and had overturn/rollover crash.

Intersection. 7:20 AM. March. One Fatality. Dry road with clear weather conditions. Driver 1 (traveling east) had been drinking and ran off road (right side). Additional events are unknown.

Non-Intersection. Head on crash.6:44 PM. February. One Fatality.Dry road with foggy weather conditions. Driver 1 (traveling west) was improperly using lane and veered into oncoming traffic and collided with Driver 2 (traveling east) and Driver 3 (traveling east).

- Fatal Crash (28)
- PWI (Basin)
- PWI (Watercourse)
- MAPO Planning Area

Source: Blue Earth County, Nicollet County, MnDOT, North Mankato, Mankato, MnDNR, Esri Imagery

Summary:
32 Total Fatalities
5 crashes involved alcohol
6 crashes list failure to yield as a factor
4 crashes list speed as a factor
4 crashes involved pedestrians/bicyclist
7 crashes involved distracted driving
3 crashes list improper maneuvers as a factor

0 1 2 Miles

SRF

BOLTON & MENK

Crash Density

An overall crash density analysis was performed to identify crash hotspot locations using a point density and GIS spatial analysis tools. The crash density (crashes per square mile) was calculated using a 500-foot inference area.

Segment Crash Density

While the overall crash density can be useful for identifying locations of high-crash activity, these locations may be the result of higher traffic volumes rather than a higher than normal crash rate. Therefore, a second analysis was completed that evaluated the crash rate on individual roadway segments based on their length and AADT volumes.

Each crash location was attributed to the roadway segment closest to it, such that all crashes within 100 feet of a roadway segment were considered to have occurred on that roadway. This step resulted in a total number of crashes for each roadway segment. Each roadway segment had information for the total number of crashes, the segment length, and the most recent AADT volumes. Using this information, a crash rate per million vehicle-miles (MVM) was calculated for each roadway segment using the following formula

$$Crash\ Rate = \frac{Segment\ Crashes}{Segment\ Length\ \times\ ADT\ \times Years\ of\ Data\ \times 365} \times 1{,}000{,}000$$

Some analytical judgment was used when interpreting the results of this crash rate calculation, as the length of each roadway segment impacted the resulting crash rate calculation (see above equation). In some cases, short roadway segments resulted in very high crash rates, despite having only a small number of crashes. Likewise, a long roadway segment resulted in a very low crash rate despite having a concentration of crashes at one location that may warrant further study. A comparison of the roadway segment crash rate data to the point crash density data was made to help identify areas where anomalies may be occurring.

The results of the analysis are shown in Figure 4-3. The dark red and light red locations on the map indicate areas of high crash density for both the overall density and the segment density. A review of this graphic identified a number of locations that should be further evaluated using a more detailed crash analysis later in the planning process. These areas are summarized briefly below:

- **4th Street S between Warren Street and Main Street:** This segment is approximately 0.4 miles long with an AADT of 1,650 on the majority of the segment. The northernmost block of the segment has an AADT of 3,400. A total of 91 crashes were recorded on this segment. The majority of these crashes appear to be occurring at intersections rather than mid-segment. This count is similar to the number of crashes occurring on Broad Street S and 2nd Street S immediately to the northwest of the 4th Street S segment. However, these other two segments have AADTs of 6,500 and 6,600 respectively. The much lower AADT value for 4th Street S results in a very high crash rate. If the recorded AADT value is indeed correct, this segment is an ideal candidate for additional safety analysis.

- **Sioux Road between Madison Avenue and River Hills Mall:** This segment is approximately 0.25 miles long with an AADT of 8,800. A total of 113 crashes were recorded on this segment. While many of these appear to be concentrated at the intersection with Madison Avenue, many crashes were also recorded mid-segment. This segment of Sioux Road is a four-lane undivided facility with many closely spaced access points, some of which are offset.
- **Raintree Road between Madison Avenue and River Hills Mall:** This segment is approximately 0.17 miles long with an AADT of 8,200. A total of 87 crashes were recorded on this segment. There appears to be a larger than normal concentration of mid-segment crashes between the intersections of Madison Avenue to the south and Adams Street to the north. This segment of Raintree Road is a four-lane undivided facility with many closely spaced access points, some of which are offset.
- **May Street between Riverfront Drive N and 5th Street N:** This segment is approximately 0.3 miles long with an AADT of 1,050. A total of 17 crashes were recorded on this segment. The majority of these crashes occurred at the intersections with Broad Street N and Riverfront Drive N.

In some instances, roadway segments scored high for segment crash density, but upon further review were not determined to warrant further analysis. An example of one of these areas is summarized below.

- **Owatonna Street between Riverfront Drive and Mound Avenue:** This roadway segment is approximately 0.2 miles long with an AADT of 1,100. A total of 28 crashes were recorded on this segment. However, upon further review, nearly half of these crashes were found to be located on Riverfront Drive, but were included in the Owatonna crash tally. Given this, the segment did not warrant further review.

Overall, roadway safety is an important issue and a high priority for the MAPO, partnering agencies and the public. This Plan sought to reduce severe crashes by documenting at-risk locations and identifying cost-effective safety improvement strategies. Improvement projects included in the Plan may be eligible to compete for available state and federal funding.

MAPO 2045 TRANSPORTATION PLAN

Crash Density Map (2009-2013)
Figure 4-3

Crashes/MVM

- 0 - 5
- 6 - 13
- 14 - 26
- 27 - 44
- 45 - 76

Crashes / Sq Mi (500' Inf. Area)

- 0 - 100
- 101 - 500
- 501 - 1,000
- 1,001 - 1,500
- 1,501+
- PWI (Watercourse)
- MAPO Planning Area

Source: Blue Earth County, Nicollet County, MnDOT, North Mankato, Mankato, MnDNR, Esri Imagery

0 2,600 Feet

SRF

BOLTON & MENK Engineers & Surveyors

Crash Rates

A detailed crash rate analysis was conducted for the 12 key intersections and three key corridors to identify safety issues. Overall crash rates were calculated to determine the statistical significance of the number of crashes at the key intersections. The overall crash rates were then compared to published typical crash rates for intersections with similar characteristics. Results of the crash analysis presented in Table 4-2 indicate that eight key intersections have crash rates above the comparison typical crash rates. It should be noted that a higher than typical crash rate does not necessarily indicate a significant crash problem. Therefore, critical crash rates were calculated to determine the statistical significance of the above average crash rates. If the crash rate is below the critical crash rate, crashes that occurred are typically due to the random nature of crashes and are not necessarily a geometric design or traffic control issue. However, if the crash rate is above the critical crash rate, there is generally a significant amount of crashes above normal to warrant further review or mitigation.

Table 4-2: Intersection Crash Analysis

Intersection	Intersection Type	Total Crashes	Crash Rate (1)	Typical Crash Rate (2)	Critical Crash Rate
US 169 and US 14 South Ramp	Unsignalized; Urban, Through-Stop	34	0.56	0.19	0.32
US 169 and Lind Street	Signalized; High Volume, High Speed	29	0.55	0.43	0.59
US 169 and Webster Avenue	Signalized; High Volume, High Speed	18	0.39	0.43	0.60
Stadium Road and Stoltzman Road	Unsignalized; Urban, Through-Stop	9	0.42	0.19	0.37
Stadium Road and Pohl Road	All-Way Stop	13	0.51	0.42	0.65
Stoltzman Road and Pleasant Street	All-Way Stop	9	0.30	0.42	0.63
TH 22 and Augusta Drive	Unsignalized; Urban, Through-Stop	6	0.23	0.19	0.35
TH 22 and Hoffman Drive	Signalized; High Volume, High Speed	25	0.77	0.43	0.64
TH 22 and CSAH 90	Unsignalized; Rural, Through-Stop	10	0.63	0.26	0.51
Lor Ray Dr and Carlson Drive	Unsignalized; Urban, Through-Stop	8	1.03	0.19	0.67
Lor Ray Dr and Howard Drive	All-Way Stop	8	0.39	0.42	0.97
Lookout Drive and Lee Boulevard	Signalized; Low Volume, High Speed	8	0.32	0.64	0.93

(1) Crashes per million entering vehicles. Crash rate above typical, but below critical. Crash rate above critical.
(2) Typical crash rates published by MnDOT.

Results of the critical crash rate comparison indicate that the crash rates of five key intersections exceed calculated critical rates:

- US 169 and US 14 South Ramp
- Stadium Road and Stoltzman Road
- TH 22 and Hoffman Drive
- TH 22 and CSAH 90
- Lor Ray Drive and Carlson Drive

Results of the critical crash rate comparison also indicate that the crash rates of three key intersections exceed typical crash rates but do not exceed calculated critical rates:

- US 169 and Lind Street
- Stadium Road and Pohl Road
- TH 22 and Augusta Drive

Intersection Crash Countermeasures

Not all crashes can be mitigated in every circumstance. Often times there are other contributing factors that cannot be overcome (i.e. inattentive driving, driving under the influence, poor decision making, etc.). However, potential countermeasures can be considered to mitigate probable causes when patterns are identified. Table 4-3 identifies potential causes and possible countermeasures by crash type for each of the key intersections with an above average crash rate.

Table 4-3: Intersection Crash Countermeasures

Intersection Above Critical Rate	Identified Crash Types	Potential Causal Factor	Possible Countermeasures
US 169 and US 14 South Ramp	Rear-end crashes at side-street stop control intersection	Excessive speed, Restricted sight distance, Significant queues, Limited mainline gaps in traffic	Install warning sign, Traffic control improvement, Interchange reconfiguration and access modifications
Stadium Road and Stoltzman Road	Right-angle and Left-turn crashes at side-street stop control intersection	Excessive speed, Restricted sight distance	Install signage and/or reduce speed limit with enforcement, Traffic control improvement
TH 22 and Hoffman Drive	Rear-end crashes at signalized intersection	Large turning movement volumes, Inadequate signal timing	Traffic control improvement, Re-time signal
TH 22 and CSAH 90	Right-angle crashes at side-street stop control intersection	Excessive speed, Limited mainline gaps during peak periods	Install warning sign and/or collision warning system, Completed ICE Report recommends a roundabout
Lor Ray Dr and Carlson Drive	Right-angle crashes at side-street stop control intersection	Excessive speed, Restricted sight distance	Install warning sign and/or collision warning system, Traffic control improvement, Remove sight obstruction
Intersection Above Typical Rate	**Identified Crash Types**	**Potential Causal Factor**	**Possible Countermeasures**
US 169 and Lind Street	Rear-end crashes at signalized intersection	Large turning movement volumes, Inadequate signal timing	Traffic control improvement, Re-time signal, Interchange reconfiguration and access modifications
Stadium Road and Pohl Road	Rear-end crashes at all-way stop control intersection	Excessive speed, Significant queues	Install warning sign, Traffic control improvement
TH 22 and Augusta Drive	Right-angle crashes at side-street stop control intersection	Excessive speed, Limited mainline gaps in traffic	Install signage and/or reduce speed limit with enforcement, Restrict access to mainline

Reference: US Department of Transportation Federal Highway Administration, Report No. FHWA-SA-07-015 "Desktop Reference for Crash Reduction Factors"

Corridor Crash Analysis

Overall crash rates were also calculated for the key corridor segments to assess crash issues. The overall crash rates were then compared to published typical crash rates for segments with similar characteristics. Results of the crash analysis presented in Table 4-4 indicate that eight segments of the key corridors have crash rates above the comparable typical crash rates. Therefore, critical crash rates were once again calculated to determine the statistical significance of the above average crash rates.

Table 4-4: Corridor Crash Analysis

Roadway	Segment	Roadway Type	Length (miles)	Total Crashes	Crash Rate (1)	Typical Crash Rate (2)	Critical Crash Rate
US 169	US 14 South Ramp to Webster Avenue	Urban Expressway	0.76	61	1.75	1.63	1.96
	Webster Avenue to Garfield Avenue	Urban Expressway	0.58	18	0.85	1.63	2.00
	Garfield Avenue to Veterans Bridge	Urban Expressway	0.27	5	0.49	1.63	1.99
Stadium Road	Stoltzman Road to Ellis Avenue	Urban 4-Lane Undivided	0.49	26	3.78	3.86	4.76
	Ellis Avenue to Warren Street	3-Lane Undivided	0.25	34	6.74	2.10	2.66
	Warren Street to Monks Avenue	3-Lane Undivided	0.25	30	4.84	2.10	2.60
	Monks Avenue to Pohl Road	3-Lane Undivided	0.65	50	3.57	2.10	2.95
	Pohl Road to S Victory Drive	3-Lane Undivided	0.68	18	1.56	2.10	2.71

Roadway	Segment	Roadway Type	Length (miles)	Total Crashes	Crash Rate (1)	Typical Crash Rate (2)	Critical Crash Rate
TH 22	227th Street to N Victory Drive	Urban Expressway	1.02	14	0.61	1.63	2.10
	N Victory Drive to US 14	Urban 4-Lane Divided	0.44	57	4.72	2.81	3.36
	US 14 to Madison Avenue	Urban 4-Lane Divided	0.57	141	7.12	2.81	3.30
	Madison Avenue to Hoffman Road	Urban 4-Lane Divided	0.75	99	4.50	2.81	3.34
	Hoffman Road to TH 83	Urban Expressway	0.73	24	1.43	1.63	2.09
	TH 83 to S Victory Drive	Urban Expressway	0.61	36	4.51	1.63	2.25

(1) Crashes per million vehicle miles.
(2) Typical crash rates published by MnDOT.
Crash rate above typical, but below critical
Crash rate above critical

Results of the critical crash rate comparison indicate that the crash rates of seven key corridor segments exceed calculated critical rates:

- Stadium Road from Ellis Avenue to Warren Street
- Stadium Road from Warren Street to Monks Avenue
- Stadium Road from Monks Avenue to Pohl Road

- TH 22 from N Victory Drive (CSAH 3) to US 14
- TH 22 from US 14 to Madison Avenue *
- TH 22 from Madison Avenue to Hoffman Road *
- TH 22 from TH 83 to S Victory Drive (CSAH 82)

*The corridor critical crash rate calculations and crashes that are taken into account predate the intersection improvements at TH 22/Adams Street and TH 22/Madison Avenue intersections. Although intersection crashes were excluded from the corridor crash rate calculations there may be residual crash issues not attributed to the intersections that entered into the corridor calculations.

Results of the critical crash rate comparison also indicate that the crash rate of one key corridor segment exceeds the typical crash rate but does not exceed the calculated critical rate:

- US 169 from US 14 South Ramp to Webster Avenue

Corridor Crash Countermeasures

It should be noted that the majority of the reported crashes analyzed occurred at intersections along the key corridors. Thus, mitigation strategies focused on improving safety at key corridor intersections would be expected to significantly improve crash rates. Table 4-5 identifies potential causes and possible countermeasures by crash type for each of the key corridors with an above average crash rate.

Table 4-5: Corridor Crash Countermeasures

Corridor Above Critical Rate	Identified Crash Types	Potential Causal Factor	Possible Countermeasures
Stadium Road Ellis Avenue to Pohl Road	Rear-end crashes, Right-angle and Left-turn crashes	Excessive speed, Large turning movement volumes, Significant queues, Inadequate signal timing	Traffic control improvements, Re-time signals, Access modifications
TH 22 N Victory Drive to Hoffman Road & TH 83 to S Victory Drive	Rear-end crashes, Right-angle crashes	Excessive speed, Large turning movement volumes, Significant queues, Restricted sight distance, Inadequate signal timing	Traffic control improvements, Re-time signals (where appropriate), Access modifications
Corridor Above Typical Rate	**Identified Crash Types**	**Potential Causal Factor**	**Possible Countermeasures**
US 169 US 14 South Ramp to Webster Ave	Rear-end crashes	Excessive speed, Significant queues, Large turning movement volumes, Inadequate signal timing	Reduce speed limit with enforcement, Re-time signals, Interchange reconfiguration and access modifications

Goals, Objectives, and Performance Measures

A key element of the Plan's development was establishing goals, objectives, and performance measures. In essence, these elements set the framework for a safe, efficient, and accessible transportation system that meets the system preservation and mobility needs of the MAPO planning area. The Plan's goals, objectives, and performance measures were coordinated with federal and state polices and were evaluated and revised during the study process based on technical analysis and input from the public, partnering agencies, and the Technical Advisory Committee (TAC).

The goals, objectives, and performance measures provided guidance that aided in achieving a shared transportation vision among elected officials, county staff, local communities, and citizens. These elements set the foundation for the long range transportation plan by providing direction for key assessments, basic evaluations, and project prioritization. MAPO staff and planning partners used these elements through each step of the planning process.

Moving Ahead for Progress in the 21st Century (MAP-21)

National Performance Goals

Passed in July of 2012, the national performance goals for the Federal-Aid Highway program under the Moving Ahead for Progress in the 21st Century (MAP-21) are identified below:

Safety: To achieve a significant reduction in traffic fatalities and serious injuries on all public roads.

Infrastructure Condition: To maintain the highway infrastructure assets in a state of good repair.

Congestion Reduction: To achieve a significant reduction in congestion on the National Highway System.

System Reliability: To improve the efficiency of the surface transportation system

Freight Movement and Economic Vitality: To improve the national freight network, straighten the ability of rural communities to access national and international trade markets, and support regional economic development.

Environmental Sustainability: To enhance the performance of the transportation system while protecting and enhancing the natural environment.

Reduced Project Delivery Delays: To reduce project costs, promote jobs and the economy, and expedite the movement of people and goods by accelerating project completion through eliminating delays in the project development and delivery process, including reducing regular burdens and improving agencies' work practices.

These national goals were used as a guide for development of the MAPO Long Range Transportation Plan goals.

National Planning Factors

In addition to these goals, MAP-21 provided eight national planning factors that MPOs must demonstrate compliance with when preparing their LRTP's. Conformity with these planning factors ensures the metropolitan transportation planning process such that it is "continuous, cooperative, and comprehensive, and provides for consideration and implementation of projects, strategies, and services that will address the following factors:

Economic Vitality: Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency.

Safety: Increase the safety of the transportation system for motorized and non-motorized users.

Security: Increase the security of the transportation system for motorized and non-motorized user.

Accessibility: Increase the accessibility and mobility of people and for freight.

Environment: Protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and State and local planned growth and economic development patterns.

Connectivity across Modes: Enhance the integration and connectivity of the transportation system, across and between modes, people and freight.

System Management and Operation: Promote efficient system management and operation.

System Preservation: Emphasize the preservation of the existing transportation system."

MAPO considered these planning factors and addressed each during the preparation of the LRTP.

Goals

Goals are defined as broad statements of desired accomplishment or direction, representing ideas and visions for the MAPO planning area. The MAPO transportation system consists of multiple modes of transportation (e.g., roads, rail, trails, freight and transit routes, and air services) and facility types. An outreach engagement process took place during the first open house to determine how the public perceived transportation goals and objectives within the community. This information helped shape the emphasis areas as the goals were developed.

Along with the public outreach process, the national performance goals, planning factors, and MnDOT policies were considered. In order to cover the scope of the metropolitan transportation system and public input received, while setting realistic and achievable goals, five MAPO key performance focus goal areas and statements were developed regarding accessibility and reliability,

economic vitality, safety, preservation, and multimodal transportation to achieve the MAPO's long-term vision. An additional seven transportation goal areas and statements were identified including coordination and collaboration, education, environmental conservation and sustainability, funding and implementation, land use, security, and system management to demonstrate consideration of these elements to MAPO stakeholders. However, in order to focus the MAPO performance monitoring efforts, these seven elements were not moved forward for performance measure consideration.

The MAPO key performance focus goals and the additional MAPO transportation goals align well with the MAP-21 Planning Factors as demonstrated in Table 5-1. Importantly, as a result of aligning with the FHWA planning goal areas and factors, the MAPO goals are in alignment with the *Minnesota 20-Year Statewide Highway Investment Plan (MnSHIP)* due to its linkage to the same goal areas. Similar linkages can be found in other plans within the MnDOT family of plans.

Objectives

Objectives are specific statements of action that help accomplish the goals and can often be measured (quantitatively and/or qualitatively) over time. The TAC, partnering agencies, and MAPO staff worked together to identify objectives to guide policies, investments, and decisions related to fulfilling the MAPO's goals.

Performance Measures

The purpose of creating and implementing performance measures is to improve the transportation system. By establishing performance standards, then monitoring and assessing the effectiveness of various transportation investments, progress toward the Plan's goals can be measured. Performance measures are designed to serve as a benchmark to evaluate and quantify progress over time. A performance-based approach is valuable in evaluating asset management risks and can be very useful in increasing decision-making transparency to the public.

MAPO chose to initiate a performance-based approach for the five MAPO key performance focus goal areas. Over time, other performance measures may be added from the additional goal areas as staff become comfortable with data collection methods, the setting of measures, and the reporting process. Figure 5-1 presents the Goals, Objectives, and Performance Measures for the five key performance focus areas. Figure 5-2 presents the Goals and Objectives developed for the remaining MAPO area goals, without identification of Performance Measures at this time.

MAPO staff will work with partnering agencies to establish an appropriate monitoring and reporting schedule.

Table 5-1 MAPO Goal Alignment with MAP-21 Planning Factors

	MAPO Goal Areas	Accessibility	Economic Vitality	Safety	Security	Environment	Connectivity Across Modes	System Management and Operation	System Preservation
MAPO Key Performance Focus Areas	Access and Reliability	√	√				√		
	Economic Vitality		√				√		
	Safety			√					
	Preservation							√	√
	Multi-Modal Transportation	√		√	√		√		
Additional MAPO Goal and Objective Areas	Coordination and Collaboration							√	
	Education								
	Environmental Conservation and Sustainability					√			
	Funding and Implementation		√					√	√
	Land Use	√	√			√	√	√	
	Security				√				
	System Management		√					√	√

MAP-21 Planning Factor Definitions (1)

1 Economic Vitality: Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency.

2 Safety: Increase the safety of the transportation system for motorized and non-motorized users.

3 Security: Increase the security of the transportation system for motorized and non-motorized users.

4 Accessibility: Increase the accessibility and mobility of people for freight.

5 Enivronment: Protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and State and local planned growth and economic development patterns.

6 Connectivity Across Modes: Enhance the integration and connectivity of the transportation system, across and between modes, people and freight.

7 System Management and Operation: Promote efficient system management and operation.

8 System Preservation: Emphasize the preservation of the existing transportation system.

[1] http://www.fhwa.dot.gov/map21/summaryinfo.cfm

Figure 5-1: FHWA Performance Focus Areas

Goals, Objectives & Performance Measures

Goal Area	Goal Statement	Objectives	Performance Measure
MAPO Key Performance Focus Areas			
Access and Reliability	Develop a transportation system that increases access and reliability options for all users.	Provide sufficient connectivity and capacity in the transportation system to accommodate existing and future travel demand, while reducing excessive travel delays. Adhere to access management guidelines, while providing regional connections to major job centers, educational institutions and services.	Miles of roadway (existing and year 2045) exceeding a volume to capacity (v/c) ratio over 1.05 (LOS F).
Economic Vitality	Maintain a transportation system that promotes economic growth throughout the planning area.	Enhance the movement of goods and services, including intermodal linkages, by improving connections to the local and regional freight and rail routes. Promote consistency between transportation improvements and locally planned growth areas that support jobs and regional commerce, while capitalizing on the regions assets (i.e., trails, agricultural, tourism, etc.).	Improvement of communication and coordination between freight operators and transportation officials.
Safety	Develop and maintain a transportation system that promotes the safety of all users.	Reduce the number of fatalities and the severity of crashes throughout the planning area for all modes. Prioritize transportation improvements that address safety and operational needs, while meeting engineering design standards for all users.	Number of fatal and severe vehicle injuries systemwide.
Preservation	Develop a regional system that promotes the preservation of the existing and future transportation system.	Implement preservation strategies such as new pavement management techniques, right-of-way preservation, and land use considerations to maintain the functionality of the transportation system for all modes. Apply innovative preservation and maintenance strategies that increases the useful life of roads, bridges and other transportation assets.	Limit bridge and pavement in poor condition and maintain a percentage of the pavement mileage in good and very good condition.
Multi-Modal Transportation	Develop and maintain a transportation system that integrates multi-modal options for all users, while taking into account active living and public health initiatives.	Promote and invest in multi-modal solutions that reduce vehicle trips and foster positive public health outcomes. Increase the availability and attractiveness of the County-wide transit system in Blue Earth and Nicollet County. Expand transit programs and partnerships to provide services that meet the needs for the entire planning area, including populations with limited transportation options. Apply complete street solutions to roadway improvements, when appropriate, to ensure pedestrian, bicycle, and transit elements are integrated seamlessly into the built environment. Continue to explore the feasibility and vitality of regional passenger rail by promoting an incremental approach which includes enhancing bus transit and participating in the organization of county/municipal rail authorities or alliances that would promote the construction and operation of passenger rail service between Mankato and the Twin Cities.	Percent of investments spent on transit, bike, and pedestrian projects.

Figure 5-2: Additional MAPO Goal Areas

Goals & Objectives

Goal Area	Goal Statement	Objectives
Additional MAPO Goal Areas		
Coordination and Collaboration	Maintain intergovernmental cooperation and coordination, along with community participation and input in all stages of the transportation planning process.	Collaborate with MnDOT, county staff and various local governmental agencies, including but not limited to city and township staff, to achieve balance among the Transportation Plan and other approved transportation plans or policies. Develop a clearinghouse for regional data sets, such as pavement management systems and geographic information systems to help inform sound planning decisions. Develop a meaningful public participation plan that involves all members of the community during the planning process.
Education	Establish the building blocks of a new MPO.	Educate key stakeholders, businesses, local leaders and the public on the purpose and function of an MAPO. Develop best practices to increase and maintain continued education and communication with stakeholders and the community on the MAPO's activities and progress.
Environmental Conservation and Sustainability	Support transportation improvements that promote energy conservation to improve the community quality of life, health, and character.	Coordinate land use and transportation planning decisions to support contiguous development, preserve and emphasize community/natural resources, and incorporate context sensitive solutions. Avoid, minimize, and/or mitigate adverse social, environmental, and economic impacts resulting from existing or new transportation facilities; particularly scenic, historic and cultural assets.
Funding and Implementation	Develop a balanced transportation system that effectively and efficiently uses available transportation funds.	Optimize and prioritize investments that adhere to a fiscally constrained environment, while maintaining and preserving the existing infrastructure. Invest public funds sustainably and efficiently for all jurisdictions. Identify innovative funding sources (e.g., local, state, and federal), while exploring low-cost/high-benefit transportation solutions that maximize funding resources.
Land Use	Establish a strong connection between transportation modes and the land uses that they serve.	Facilitate and promote moderate to higher density and mixed-use development in areas near or along planned/existing transit routes. Encourage the concentration of employment and services, such as mixed-use developments, at transfer hubs and along primary transportation corridors. Promote pedestrian and transit oriented growth and developments into small area plans, master-planned developments, and site plans along primary transportation corridors and non-motorized facilities. Encourage the concentration of industrial and primary sector developments along the arterial transportation system.
Security	Increase the security of the transportation system for motorized and non-motorized users in preparedness for emergency events and natural disasters.	Identify and proactively protect critical street and highway system assets that are essential for emergency response routes and those that are vulnerable to natural disasters (i.e., flood proof larger culverts, slope protection, etc.). Identify and incorporate state and regional emergency, evacuation, and security plans into transportation plans and Transportation Improvement Plan (TIP) project selection. Improve incident management response times within the MAPO area.
System Management	Promote efficient system management and operations while increasing collaboration among businesses, community and industry groups, and federal, state, and local governments to better target investments and improve accountability.	Encourage the application of Intelligent Transportation System (ITS) technologies in the MAPO area by promoting the application of new ITS technologies. Encourage public-private partnerships and other applicable innovative financing alternatives. Consider all local partners in the transportation planning process to create a seamless transportation network.

Future System Forecasts, Operational Needs, and Modal Opportunities

The MAPO 2045 Long Range Transportation Plan is a 30-year vision that seeks to identify and document transportation system needs and improvements that can be implemented within fiscal constraints to best serve the metro area. This section documents the MAPO area future traffic forecasts, resultant future system operational needs, opportunities for low-cost/high-benefit system improvements, and future emergency response and multimodal opportunities. Performance of the system under this future horizon can be compared to the existing system conditions, from which the universe of alternatives are developed.

Traffic Forecasts

Traffic forecasts were prepared using a methodology called "historic growth analysis" for the MAPO since it did not wish to develop a travel demand forecast model. These growth factors utilized demographic data and current trends (land use growth, employment, etc.), as well as data from previously completed studies, information from anticipated developments and economic development plans to gain a greater understanding of local traffic trends. Using this methodology, Annual Average Daily Traffic (AADT) projections were developed and posted for three target periods (years 2020, 2030, and 2045) in an effort to identify future capacity or system deficiencies within the MAPO planning area.

Traffic Forecasts Methodology

Demographic Data

Demographic information was gathered and evaluated to gain a greater understanding of the traffic growth trends within the MAPO planning area. This process included reviewing the demographic projections developed as part of the 2010 Mankato Area Transportation and Planning Study (MATAPS 2010) (Table 6-1), which projected population and employment to year 2035. Updated projections for year 2045 were developed using year 2012 demographic data and extrapolating year 2020 demographic projections published in the Mankato Area Housing Study Update (December 2013). The results of this process are displayed in Table 6-2.

Table 6-1: MAPO Planning Area Demographics (MATAPS 2010)

Growth Scenario	Population			
	2000	2020	2035	AGR*
Low	53,170	58,456	61,146	0.4%
Mid	53,170	62,026	66,218	0.7%
High	53,170	63,268	70,769	0.9%

Growth Scenario	Employment			
	2000	2020	2035	AGR*
Low	36,725	39,507	40,544	0.3%
Mid	36,725	41,068	43,666	0.5%
High	36,725	42,683	46,898	0.8%

*Average growth rate

Table 6-2: MAPO Planning Area Demographics (MAPO 2045)

	2012	2020	2030	2045	AGR
Population[1]	62,578	65,165	68,400	73,200	0.5%
Households[1]	24,235	26,800	30,300	34,300	1.2%
Employment[2]	34,257[3]	37,200	40,800	46,300	1.0%

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
3 – MAPO planning area year 2012 employment (QCEW, 2012)

A review of the year 2045 demographic forecasts indicates that the updated projections are consistent with the year 2035 population and employment projections developed as part of MATAPS 2010. The year 2045 population projection aligns with the year 2035 "high growth" scenario, but the growth rate is consistent with the "low growth" and "mid growth" scenarios. It should be noted that MATAPS 2010 did not produce household projections, but household projections were developed based on the data published in the Mankato Area Housing Study Update.

Employment projections were not readily available at the municipal level to match up with the MAPO planning area, thus the updated employment projections relied on the projections developed by MATAPS 2010. This process consisted of developing a year 2012 employment estimate using Quarterly Census of Employment and Wages (QCEW) data for the planning area municipalities and matching in with the year 2035 "high growth" employment scenario identified in MATAPS 2010. It should be noted that the growth rate for year 2045 is slightly higher than the growth rate published in MATAPS 2010, but that is reflective of the year 2012 employment being slightly lower than what was reported in the year 2000.

This review indicates that the traffic forecasts should remain fairly consistent with volumes published in MATAPS 2010. However, growth rates will be lowered and flattened now that the forecast horizon year has been extended an additional 10 years to year 2045.

Historical Traffic Data

Historical AADT volumes for the years 1992 through 2013 were gathered for all MnDOT count locations within the planning area. Growth rates were calculated and analyzed to identify short-term and long-term trends. In an effort to eliminate irregular growth trends, outliers and anomalies were identified and removed to produce a more representative historical growth rate. It was during this phase of the analysis that volumes, which may have been impacted by construction or recent developments, were flagged to indicate changes in historical growth patterns.

MnDOT AADT counts were available for every four-year period since 1992; the published volumes reviewed were from the following cycles:

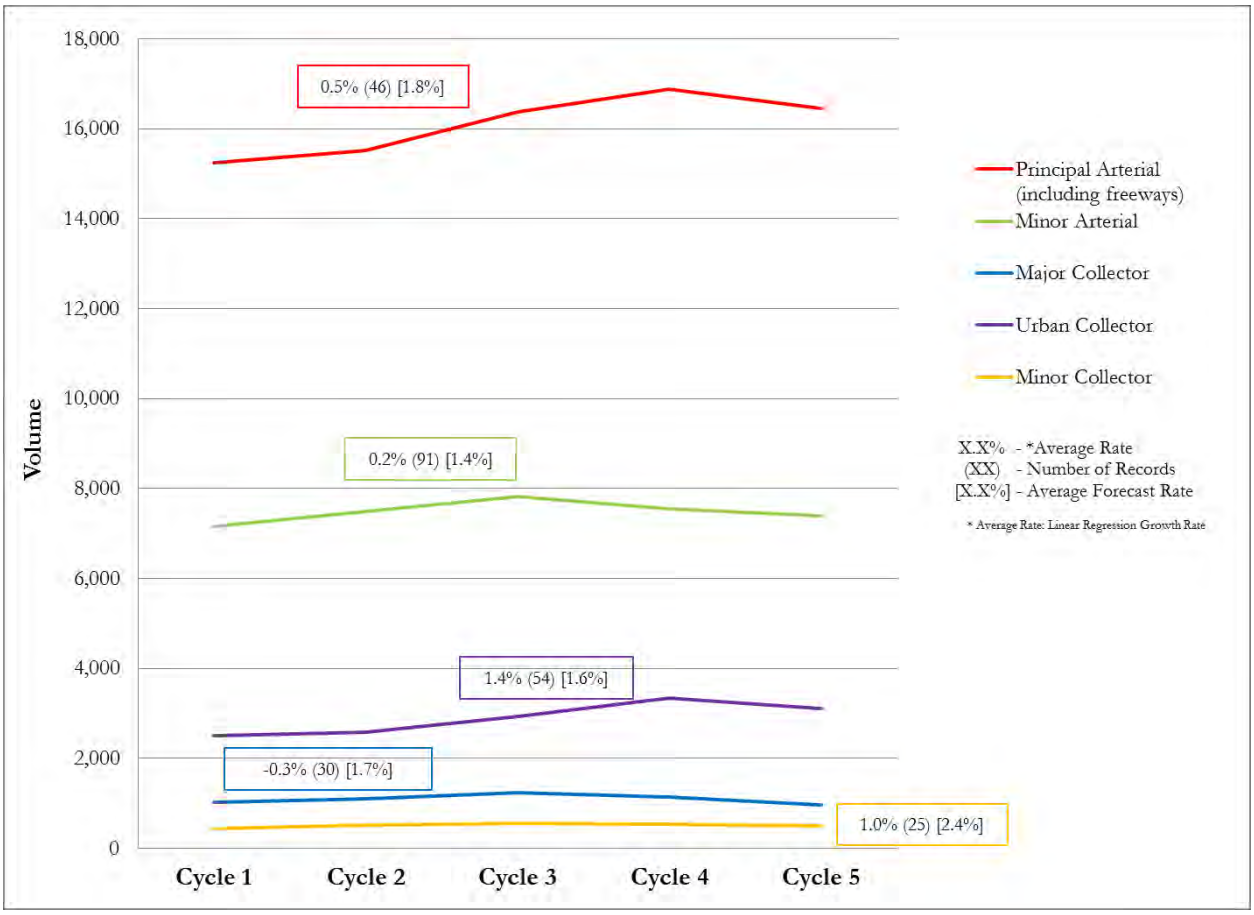
- Cycle 1: 1992-1995
- Cycle 2: 1996-1999
- Cycle 3: 2000-2003
- Cycle 4: 2004-2007
- Cycle 5: 2008-2013

Historical Growth Trends and Development Assumptions

Land use changes were identified through a review of the MATAPS 2010, the Greater East Mankato Alternative Urban Area Review (AUAR), and other relevant studies (e.g., Intersection Control Evaluation, or ICE, reports). All land use impacts were classified by intensity to characterize the potential influence on future traffic volumes.

With the land use component considered as part of the historical volume dataset review, count locations were stratified into five groups based on functional classification to summarize historical growth rates by classification and to determine "best fit" projections. The classifications included: urban collector (both minor and major), rural minor and rural major collectors, minor arterial, and principal arterial (including freeways). The functional class grouping provided a method to evaluate historic growth rates by averaging the historical volumes for all sites within each group and plotting them over time to determine average growth rates. Figure 6-1 graphically depicts the growth trends by functional classification for each of the five identified count cycles.

Figure 6-1: Historical Growth Rates by Functional Class



Another method applied to evaluate historical traffic growth was the summarization of traffic volumes, broken into seven distinct groups (e.g., <1,000, 1,000-2,499, 2,500-4,999, 5,000-7,499, 7,500-9,999, 10,000-15,000, and >15,000). This approach provided allowable growth rates for each volume group. This approach prevents a low-volume roadway with a higher projected growth rate to be treated the same as a higher-volume roadway with the same rate (see examples below). While the relative growth is similar on an annual basis, the total magnitude of growth over the target periods differs dramatically.

Example 1

A roadway with 500 AADT at 3 percent annual growth for 30 years results in a projected volume of ~ 1,215 AADT.

Example 2

A roadway with 10,000 AADT at 3 percent annual growth for 30 years results in a projected volume of ~ 24,275 AADT.

Four Forecast Methods

Four forecasting methods were utilized during the development of the traffic projections, including: linear regression, compound growth rate, 1 percent growth and 2.5 percent annual growth. Each method was developed to provide a range of projected volumes to address the MAPO area's unique development patterns. The linear regression and compound growth rate method relied on historical growth rates, whereas the 1 percent and 2.5 percent growth methods represent static growth rates. In instances where development patterns indicate a higher or lower growth rate, manual adjustments were necessary (resulting in alternative growth rates – i.e., 1.25 percent, 1.5 percent or an alternative rate influenced by stagnant or aggressive growth).

Forecasted Volumes for Consistency between Segments

Newly forecasted volumes that were produced as a result of this process were compared to forecast volumes published in the MATAPS 2010, Greater East Mankato AUAR, and several other studies including several ICE reports and the CSAH 12 Extension Planning Review Study. It was understood these other efforts had a different horizon year, but order of magnitude was still applicable.

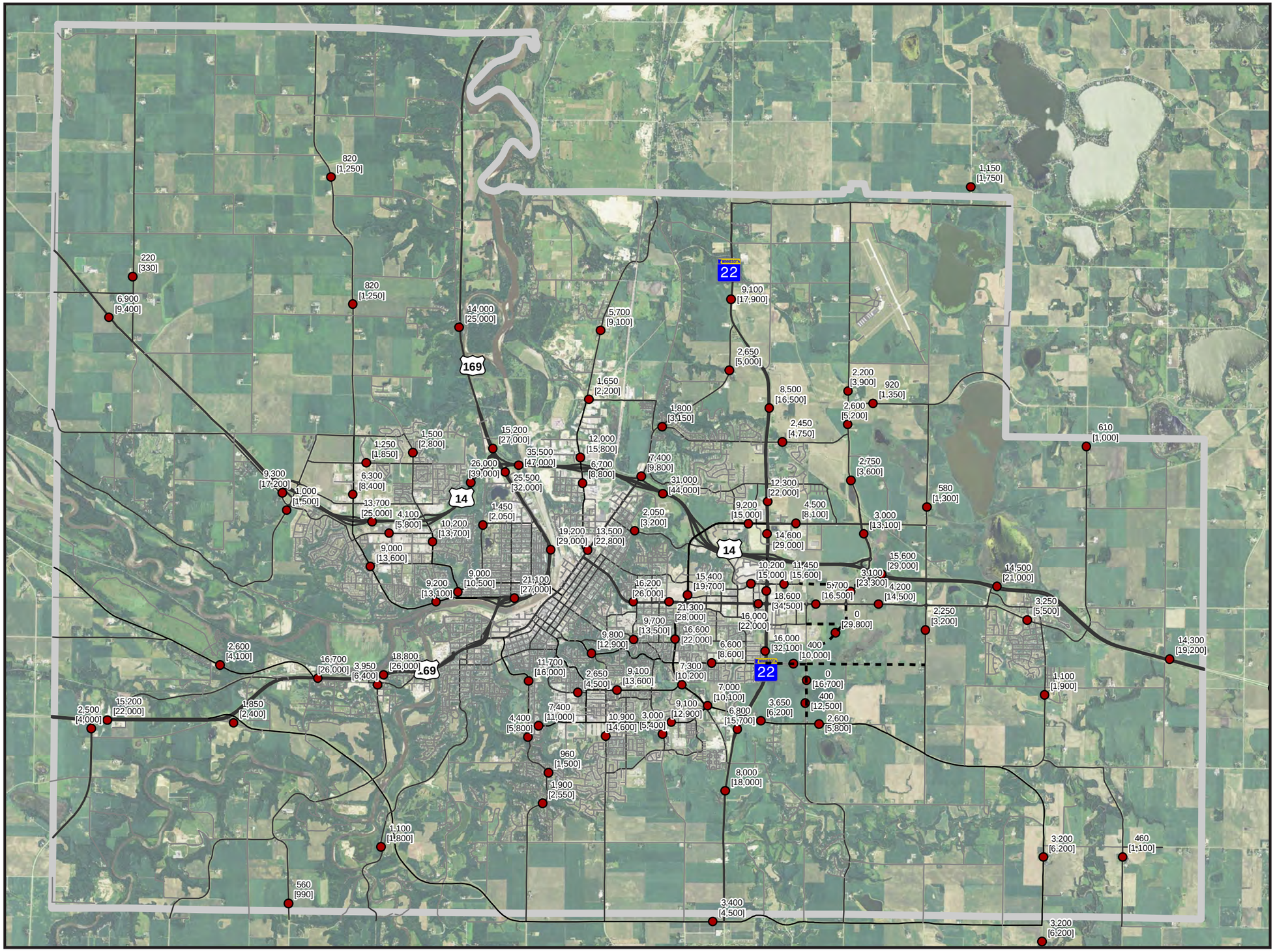
Each projection method was concurrently reviewed on a site-by-site basis with the previous studies, development potential, recent construction activity, future land uses, growth tiers, and volume grouping information. It was understood that in some locations, there had been significant development (i.e. CSAH 12 and CSAH 41), so in these situations recent studies were relied on to prepare forecasts. Wherever possible, projections between adjacent or nearby count locations, with similar characteristics, were coordinated for consistency.

Traffic Forecasts Results

Following the completion of this analysis, year 2045 traffic forecasts were established for all roadway segments within the MAPO planning area. A summary of the historical volumes, forecast growth methods and selected method for each roadway segment is attached in Appendix B. Forecasts for interim years 2020 and 2030 were developed using a linear interpolation between the existing volume and the selected year 2045 volume. The year 2045 forecast traffic volumes are shown in Figure 6-2 and Figure 6-3 for the entire MAPO planning area and the urban core. Similarly, the interim year 2020 and 2030 forecast traffic volumes are shown in Figure 6-4 to Figure 6-7.

MAPO 2045 TRANSPORTATION PLAN

Figure 6-2
Year 2045 Travel Demand Forecasts



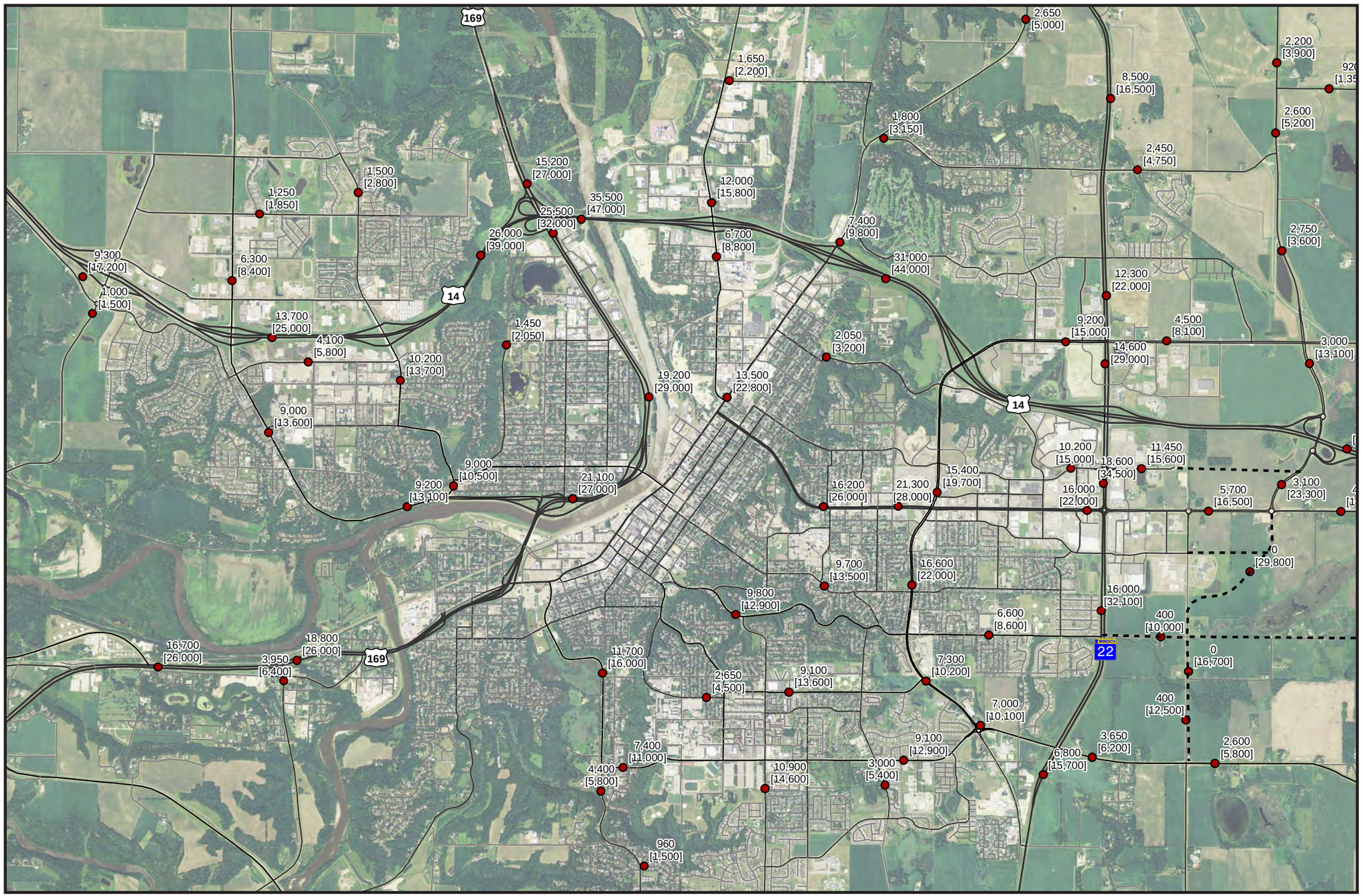
X,XXX Existing ADT
[X,XXX] Year 2045 ADT

Source: Blue Earth County, Nicollet County, MnDOT, North Mankato, Mankato, MnDNR, Esri Imagery

0 1 2 Miles

SRF

COLTON & MATH



MAPO 2045 TRANSPORTATION PLAN

Figure 6-3
Year 2045 Travel Demand Forecasts

X,XXX Existing ADT
[X,XXX] Year 2045 ADT

Source: Blue Earth County, Nicollet County, MnDOT, North Mankato, Mankato, MnDNR, Esri Imagery

0 1 2 Miles

SRF

Bolton & Menk

MAPO 2045 TRANSPORTATION PLAN

Figure 6-4
Year 2030 Travel Demand Forecasts

X,XXX Existing ADT
[X,XXX] Year 2030 ADT

Source: Blue Earth County, Nicollet County, MnDOT, North Mankato, Mankato, MnDNR, Esri Imagery

0 1 2 Miles

SRF

BOLTON & MENK

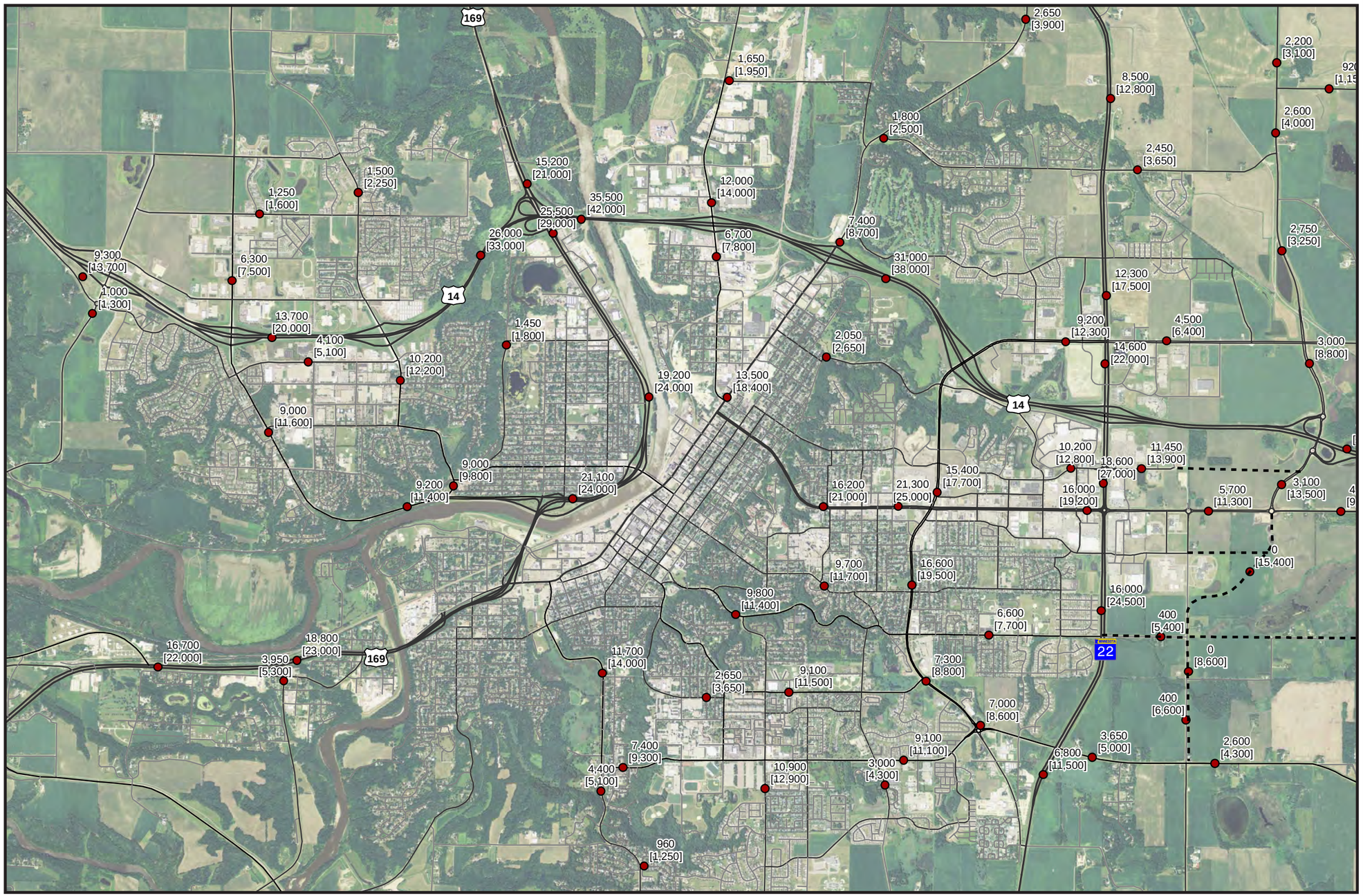


Figure 6-5
Year 2030 Travel Demand Forecasts

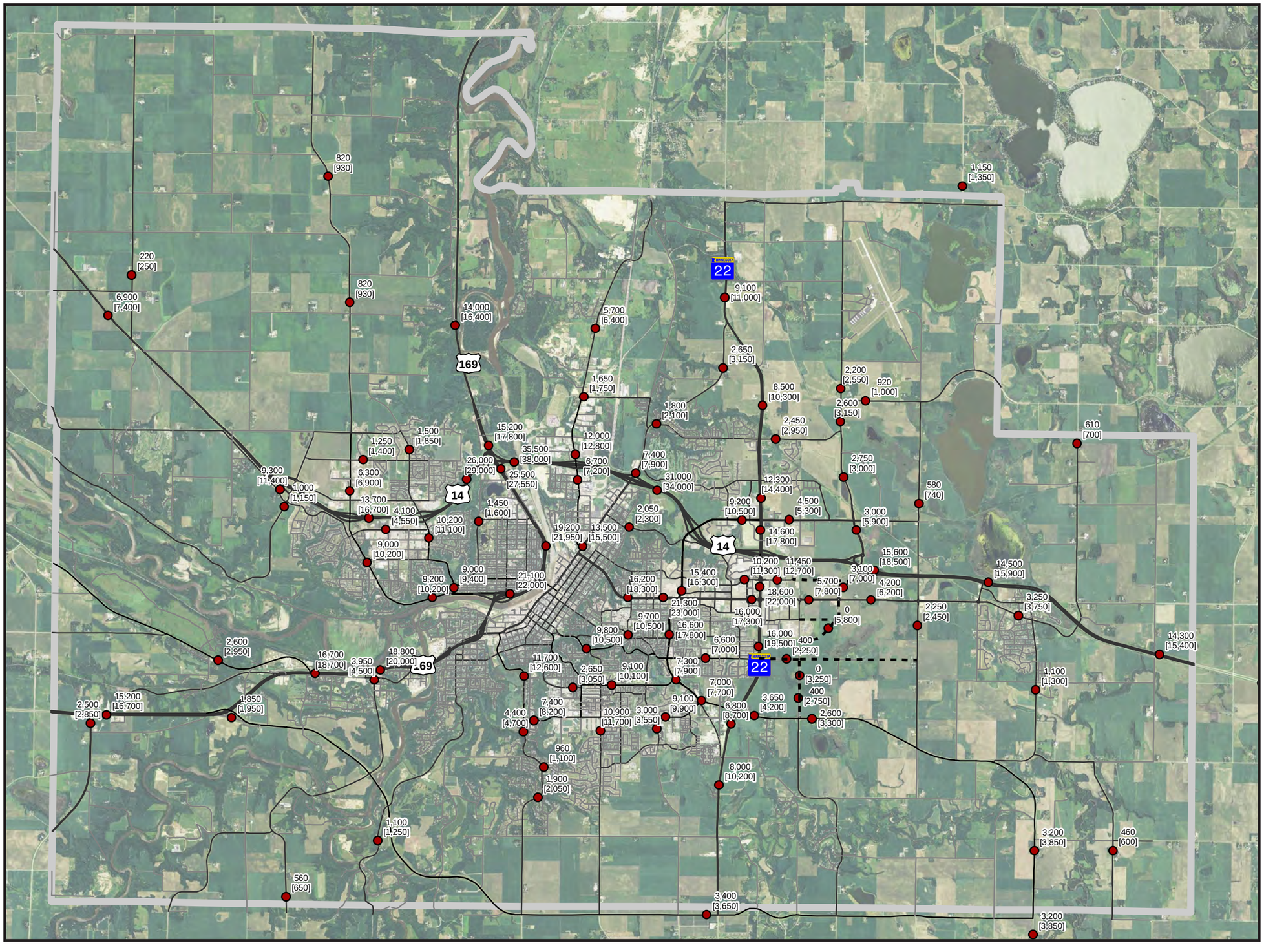
X,XXX Existing ADT
[X,XXX] Year 2030 ADT

Source: Blue Earth County, Nicollet County, MnDOT, North Mankato, Mankato, MnDNR, Esri Imagery

0 1 2 Miles

MAPO 2045 TRANSPORTATION PLAN

Figure 6-6
Year 2020 Travel Demand Forecasts



X,XXX Existing ADT
[X,XXX] Year 2020 ADT

Source: Blue Earth County, Nicollet County, MnDOT, North Mankato, Mankato, MnDNR, Esri Imagery

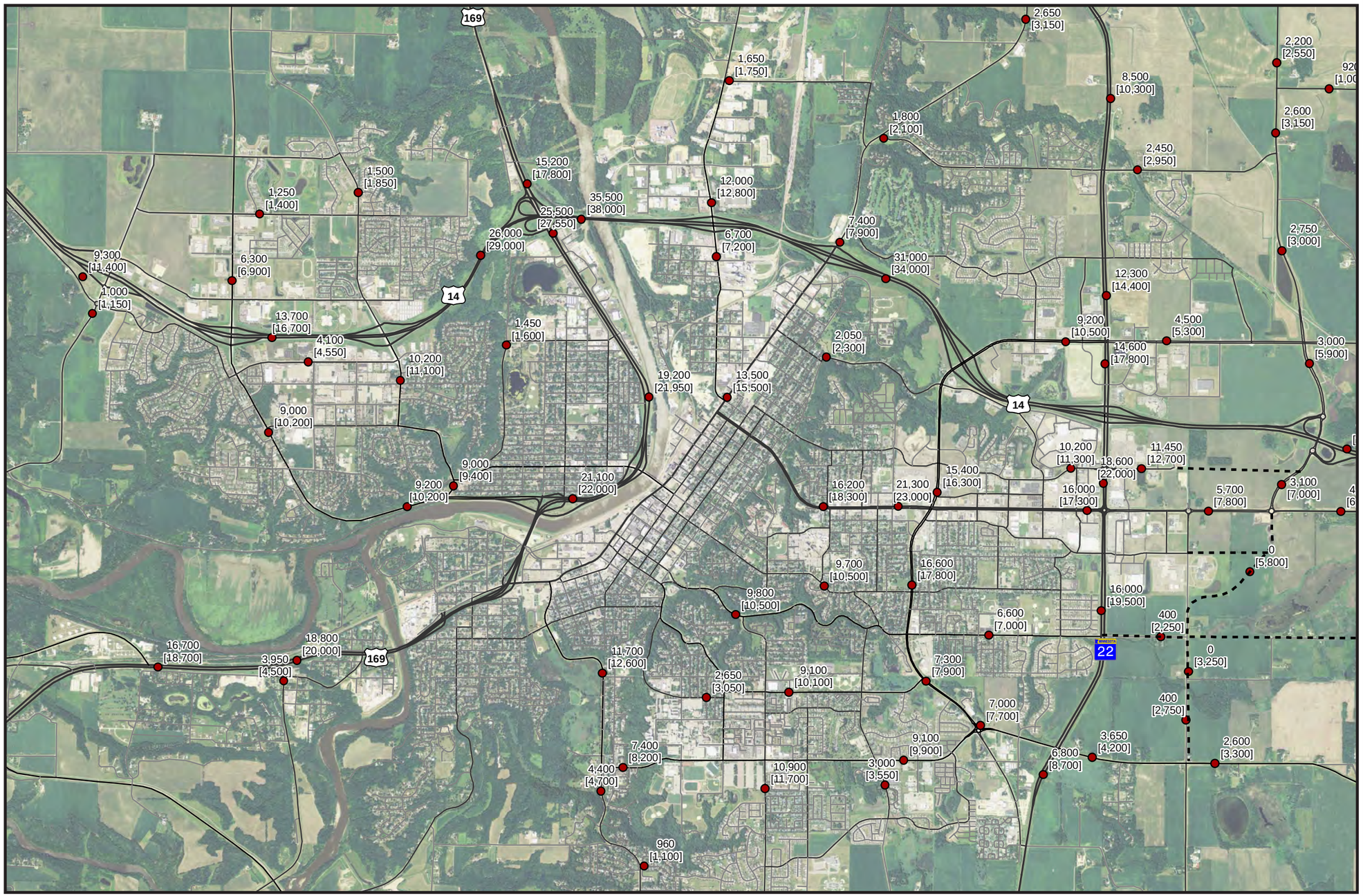
0 1 2 Miles

SRF

HOUSTON ENGINEERING

MAPO 2045 TRANSPORTATION PLAN

Figure 6-7
Year 2020 Travel Demand Forecasts



X,XXX Existing ADT
[X,XXX] Year 2020 ADT

Source: Blue Earth County, Nicollet County, MnDOT, North Mankato, Mankato, MnDNR, Esri Imagery

0 1 2 Miles

SRF

Bolton & Menk

Future Roadway Operations

While three target time periods were developed, only the year 2045 capacity issues were reviewed for corridor congestion to depict the state of the transportation system over the life of the Plan. The key intersections identified under existing conditions were again reviewed under future conditions; this analysis did review all three target time periods in order to determine if phased mitigation may be necessary for these key locations.

Future Corridor Congestion

Future corridor capacity issues (e.g., LOS E or worse) were identified by calculating the volume-to-capacity ratios, which incorporated year 2045 AADT forecasts and all known programmed roadway capacity expansion projects. Congested roadway segments are summarized in Table 6-3 and displayed in Figure 6-8 for year 2045 conditions.

Table 6-3: Congested Roadway Segments (Year 2045)

Roadway	Location	Capacity	ADT	V/C	LOS
Stoltzman Rd	W Pleasant St - Stadium Rd	10,000	17,700	1.77	F
E Main St	Agency Rd - S Victory Dr	10,000	13,500	1.35	F
Glenwood Ave	Highland Ave - Monks Ave	10,000	12,900	1.29	F
Highland Ave	Val Imm Dr - Cedar St	10,000	12,900	1.29	F
Cedar St	Highland Ave - Warren St	10,000	12,900	1.29	F
Warren St	Cedar St - Malin St	10,000	12,900	1.29	F
TH 22	CSAH 90 - 206th St	14,000	18,000	1.29	F
TH 22	CSAH 2 - CSAH 57	14,000	17,900	1.28	F
Lee Blvd	Lor Ray Dr - Belgrade Ave	16,000	20,300	1.27	F
Stadium Rd	Warren St - Monks Ave	16,000	18,900	1.18	F
N 2nd St	Madison Ave - E Plum St	8,000	9,100	1.14	F
Dickinson St	Main St - Anderson Dr	8,000	8,800	1.10	F
Dane St	Anderson Dr - Madison	8,000	8,800	1.10	F
Monks Ave	Glenwood Ave - Balcerzak Dr	8,000	16,500	2.06	F
Stadium Rd	Monks Ave - Pohl Rd	16,000	16,500	1.03	E
Glenwood Ave	Bruels St - Victory Dr	10,000	10,100	1.01	E
E Main St	S Victory Dr - Hosanna Dr	8,000	7,800	0.98	E
Cherry St	Riverfront Dr - 5th St	8,000	7,800	0.98	E
Stadium Rd	Ellis Ave - Warren St	16,000	15,400	0.96	E
Belgrade Ave	Lee Blvd - Range St	10,000	9,600	0.96	E
Adams St	Raintree Rd - TH 22	16,000	15,000	0.94	E
Pleasant St	Stoltzman Rd - Baker Ave	8,000	7,500	0.94	E
TH 22	Hoffman Rd - TH 14	35,000	32,100	0.92	E
Monks Ave	Stadium Rd - Woodhaven Cir	16,000	14,600	0.91	E
Lee Blvd	Roe Crest Dr - Lor Ray Dr	8,000	7,100	0.89	E
S Riverfront Dr	TH 169 - Lamm St	35,000	31,000	0.89	E
TH 169	TH 14 - Webster Ave	35,000	30,000	0.86	E
Lor Ray Dr	Commerce Dr - James Dr	16,000	13,700	0.86	E
Marsh St	Dane St - Oak Lawn Ave	8,000	6,800	0.85	E

MAPO 2045 TRANSPORTATION PLAN

Forecast 2045 Roadway Capacity Deficiencies

Figure 6-8

Roadway Capacity Deficiencies (2045)

- LOS D
- LOS E
- LOS F
- PWI (Basin)
- PWI (Watercourse)
- MAPO Planning Area

Source: Blue Earth County, Nicollet County, MnDOT, North Mankato, Mankato, MnDNR, Esri Imagery

0 1 2 Miles

SRF

BOLTON & MENK

Future Intersection Congestion

The three target time-period (years 2020, 2030, and 2045) AADT projections were further distilled into detailed turning movements for analysis at the 12 key intersections. The three target time periods were evaluated at the intersection level to provide the level of detail necessary to inform the MAPO stakeholders regarding potential issues.

Year 2020

Results of the year 2020 intersection operations analysis shown in Table 6-4 indicate that all but two key intersections are expected to operate at an acceptable overall LOS C or better during the a.m. and p.m. peak hours under the existing geometric layout and traffic control. The US 169/US 14 South Ramp intersection is expected to operate at an overall LOS F during the p.m. peak hour due to increased traffic volumes. Similarly, increased traffic volumes at the Stadium Road/Pohl Road all-way stop intersection are expected to result in an overall LOS D during the p.m. peak hour. Moderate side-street delays (LOS E) are expected at the TH 22/Augusta Drive side-street stop intersection during the p.m. peak hour. Higher mainline speeds and traffic volumes result in a limited availability of acceptable gaps for side-street through and left-turning motorists. No other significant side-street delays or queuing issues were observed in the traffic simulation at the key intersections.

Table 6-4: Year 2020 Intersection Operations Analysis

Intersection (Existing Traffic Control)	A.M. LOS(1)	P.M. LOS(1)
US 169 and US 14 South Ramp (Side-Street Stop)	A/D	F/F
US 169 and Lind Street (Traffic Signal)	B	B
US 169 and Webster Avenue (Traffic Signal)	B	B
Stadium Road and Stoltzman Road (Side-Street Stop)	A/B	A/A
Stadium Road and Pohl Road (All-Way Stop)	B	D
Stoltzman Road and Pleasant Street (All-Way Stop)	B	B
TH 22 and Augusta Drive (Side-Street Stop)	A/C	A/E
TH 22 and Hoffman Road (Traffic Signal)	B	B
TH 22 and CSAH 90 (Side-Street Stop)	A/A	A/B
Lor Ray Drive and Carlson Drive (Side-Street Stop)	A/A	A/A
Lor Ray Drive and Howard Drive (All-Way Stop)	A	A
Lookout Drive and Lee Boulevard (Traffic Signal)	B	B

(1) For signalized and all-way stop controlled intersections, the overall LOS is shown and the corresponding delay represents the overall intersection delay. For side-street stop controlled intersections, the overall LOS is shown followed by the worst approach LOS and the corresponding delay represents the worst side-street approach delay.
Overall LOS D or approach LOS E-F (approaching capacity)
Overall LOS E-F (over capacity)

Year 2030

Results of the year 2030 intersection operations analysis shown in Table 6-5 indicate that all but the US 169/US 14 South Ramp and Stadium Road/Pohl Road intersections are expected to continue operating at an acceptable overall LOS C or better during the a.m. and p.m. peak hours under the existing geometric layout and traffic control. The US 169/US 14 South Ramp intersection is expected to continue operating at an overall LOS F during the p.m. peak hour, while the Stadium Road/Pohl Road intersection is also expected to operate at an overall LOS F during the p.m. peak hour. Significant side-street delays (LOS F) are expected at the TH 22/Augusta Drive side-street stop intersection during the p.m. peak hour. No other significant side-street delays or queuing issues were observed in the traffic simulation at the key intersections.

Table 6-5: Year 2030 Intersection Operations Analysis

Intersection (Existing Traffic Control)	A.M. LOS(1)	P.M. LOS(1)
US 169 and US 14 South Ramp (Side-Street Stop)	C/**F**	**F/F**
US 169 and Lind Street (Traffic Signal)	B	B
US 169 and Webster Avenue (Traffic Signal)	C	B
Stadium Road and Stoltzman Road (Side-Street Stop)	A/C	A/B
Stadium Road and Pohl Road (All-Way Stop)	C	**F**
Stoltzman Road and Pleasant Street (All-Way Stop)	B	B
TH 22 and Augusta Drive (Side-Street Stop)	A/D	B/**F**
TH 22 and Hoffman Road (Traffic Signal)	C	C
TH 22 and CSAH 90 (Side-Street Stop)	A/A	A/B
Lor Ray Drive and Carlson Drive (Side-Street Stop)	A/A	A/A
Lor Ray Drive and Howard Drive (All-Way Stop)	A	A
Lookout Drive and Lee Boulevard (Traffic Signal)	B	B

(1) For signalized and all-way stop controlled intersections, the overall LOS is shown and the corresponding delay represents the overall intersection delay. For side-street stop controlled intersections, the overall LOS is shown followed by the worst approach LOS and the corresponding delay represents the worst side-street approach delay.
Overall LOS D or approach LOS E-F (approaching capacity)
Overall LOS E-F (over capacity)

Year 2045

Results of the year 2045 intersection operations analysis shown in Table 6-6 indicate that all but the US 169/US 14 South Ramp, Stadium Road/Pohl Road, and TH 22/Augusta Drive intersections are expected to continue operating at an acceptable overall LOS C or better during the a.m. and p.m. peak hours under the existing geometric layout and traffic control. The US 169/US 14 South Ramp intersection is expected to operate at an overall LOS F during both the a.m. and p.m. peak hours, while the Stadium Road/Pohl Road and TH 22/Augusta Drive intersections are expected to operate at an overall LOS F during the p.m. peak hour. No other significant delays or queuing issues were observed in the traffic simulation at the key intersections. However, it should be noted that the TAC made note of operational issues observed at both the Stadium Road/Stoltzman Road and Stoltzman

Road/Pleasant Street intersections. Although the intersection operations analysis did not indicate an issue at either of these locations, TAC observations merit future monitoring at these intersections.

Table 6-6: Year 2045 Intersection Operations Analysis

Intersection (Existing Traffic Control)	A.M. LOS(1)	P.M. LOS(1)
US 169 and US 14 South Ramp (Side-Street Stop)	**F/F**	**F/F**
US 169 and Lind Street (Traffic Signal)	B	B
US 169 and Webster Avenue (Traffic Signal)	C	C
Stadium Road and Stoltzman Road (Side-Street Stop)	A/D	A/B
Stadium Road and Pohl Road (All-Way Stop)	**E**	**F**
Stoltzman Road and Pleasant Street (All-Way Stop)	B	C
TH 22 and Augusta Drive (Side-Street Stop)	A/**F**	**F/F**
TH 22 and Hoffman Road (Traffic Signal)	**F**	**F**
TH 22 and CSAH 90 (Side-Street Stop)	A/A	A/C
Lor Ray Drive and Carlson Drive (Side-Street Stop)	A/A	A/A
Lor Ray Drive and Howard Drive (All-Way Stop)	A	A
Lookout Drive and Lee Boulevard (Traffic Signal)	B	B

(1) For signalized and all-way stop controlled intersections, the overall LOS is shown and the corresponding delay represents the overall intersection delay. For side-street stop controlled intersections, the overall LOS is shown followed by the worst approach LOS and the corresponding delay represents the worst side-street approach delay.
Overall LOS D or approach LOS E-F (approaching capacity)
Overall LOS E-F (over capacity)

Intersection Operations Countermeasures

Table 6-7 identifies potential causes and possible countermeasures for the 2045 operational issues.

Table 6-7: Operational Countermeasures

Intersection	Identified Operational Issue	Potential Causal Factor	Possible Countermeasures
US 169 and US 14 South Ramp	Significant eastbound queues	Excessive speed, Limited mainline gaps in traffic	Traffic control improvement, Interchange reconfiguration and access modifications
Stadium Road and Pohl Road	Significant eastbound/ westbound queues	Significant volumes in combination with inadequate lane capacity for an all-way stop condition	Traffic control improvement
TH 22 and Augusta Drive	Significant eastbound/ westbound queues	Limited mainline gaps in traffic	Traffic control improvement, Restrict access to mainline
TH 22 and Hoffman Road	Significant eastbound/ westbound queues	Limited mainline gaps in traffic, Inadequate lane capacity for signalized intersection	Added eastbound/westbound lanes, Traffic control improvement

Interchange Deficiencies

The interchange at US 169 and US 14 has been consistently identified by local officials and MnDOT as an issue area. This interchange provides a vital link between two corridors on the State's Interregional Corridor System (IRC), with each corridor providing significant regional mobility. Concerns related to this interchange are specific to the functionality and safety of the interchange, particularly as it relates to the spacing between the southern ramps and the signalized intersection at US 169 and Lind Street.

Currently US 14 functions as a freeway through a majority of the MAPO planning area, with access provided at grade-separated interchanges. US 169 functions as a hybrid freeway-expressway in the MAPO planning area, with access restricted to grade-separated interchanges through the urban core and at-grade (signalized and unsignalized) access points as the corridor extends radially from the urban core. The bullets below provide a summary of the deficiencies identified at or near the US 169/US 14 interchange or along the US 169 corridor:

Safety:

- Intersection crash rates exceed critical thresholds at the US 14 South Ramp and typical thresholds for like-type intersections at Lind Street
- Corridor crash rate exceeds the typical crash rate along US 169 from US 14 to Webster Avenue

Operations:

- Intersection capacity deficiencies at the US 14 South Ramp (existing and Year's 2020, 2030, 2045)
- Corridor capacity deficiency between US 14 and Webster Avenue (Year 2045 LOS E)

Access:

- Access spacing between US 14 South Ramp and Lind Street less than minimum requirements

A total of five design concepts have been reviewed by MnDOT and previous MATAPS efforts (MATAPS 2003) to address the operational, safety, and access concerns at the US 169/US 14 interchange. The concepts include the following design concepts: Butterworth Street right-in/right-out access, Webster Avenue buttonhook interchange (with overpass at Butterworth Street), Webster Avenue offset buttonhook interchange (no access at Butterworth Street), signalized intersection at Webster Avenue, and River Lane right-in/right-out with an overpass at Butterworth Street. It should be noted that the interchange will be modified to a free-flow full cloverleaf design and access will be closed at Lind Street under all concepts. These concepts offer increased spacing from the access points south of the interchange and eliminate at-grade intersection conflict points by reconfiguring to full cloverleaf interchange.

Figure 6-9 through Figure 6-13 display the five design concepts that have been proposed by MnDOT.

Figure 6-9: Butterworth Street Right-In/Right-Out

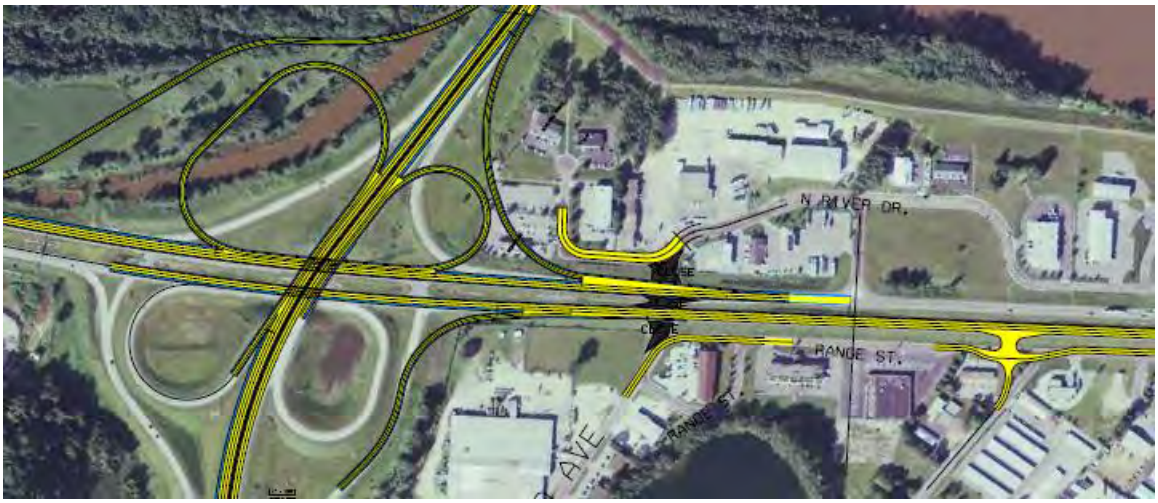


Figure 6-10: Webster Avenue Buttonhook Interchange (w/Butterworth Street Overpass)

Figure 6-11: Webster Avenue Offset Buttonhook Interchange (no Butterworth Street Overpass)

Figure 6-12: Webster Avenue Signalized Intersection

Figure 6-13: River Lane Right-in/Right-out and Overpass at Butterworth Street

Additional interchange deficiencies were identified at the 3rd Avenue (CSAH 5) and Riverfront Drive (CSAH 57) interchanges along the US 14 corridor. Previous engineering and planning studies indicated potential operational and safety issues related to intersection geometry and traffic control. Currently all of the ramp termini intersections operate as side-street stop intersections. It has been recommended that these interchanges be reconstructed as multi-lane roundabouts or equipped with traffic signals.

Low-Cost/High-Benefit Solutions

In an effort to address these critical infrastructure needs and reduced funding demands, a system management and preservation approach was applied. This approach evaluated major National Highway System corridors within the MAPO area, crafting low-cost/high-benefit (LCHB) solutions for TH 169 and TH 22. Through this process project programming was considered to preserve the principal arterial system, extend the capacity of current transportation facilities, and maximize highway efficiency.

Trunk Highway 169

A phased approach for improvements is recommended for the northern corridor of TH 169. Figure 6-14 depicts suggestions for improvements along this corridor in addition to those documented in MATAPS and by MnDOT. Initial modifications would consist of access control adjustments and

signalization. Implementations in later phases recommend larger improvements, such as overpass and interchange reconfigurations. Phasing the proposed modifications will allow for future land development, safety concerns, and traffic impacts.

The recommended low-cost/high-benefit improvements for the southern corridor of TH 169, shown in Figure 6-15, address at-grade safety concerns throughout the segment. Closing secondary access points, along with implementing right-in/right-out intersections will help direct traffic to central intersections, effectively reducing confusion and creating consistency throughout the corridor.

Trunk Highway 22

TH 22 provides north-south connectivity through the MAPO planning area. An overview of the recommended low-cost/high-benefit improvements along TH 22 is provided in the following figures. The northern (Figure 6-16) and southern (Figure 6-19) segment of this corridor should be monitored and studied for future interchange deficiencies and needed improvements as development occurs. Within the central segment, roundabouts are recommended at 277th Street and Victory Drive (Figure 6-17), as well as CSAH 60 (Figure 6-18). Reducing the number of signalized intersections will allow vehicles to move freely along this corridor, while minimizing queues and lowering emissions.

MAPO 2045 TRANSPORTATION PLAN

TH 169 Northern Corridor
Figure 6-14

0 1 2 Miles

SRF

HOUSTON ENGINEERING

TH 169 Southern Corridor

#7: Close existing access to CR 117 and CR 117 median opening.

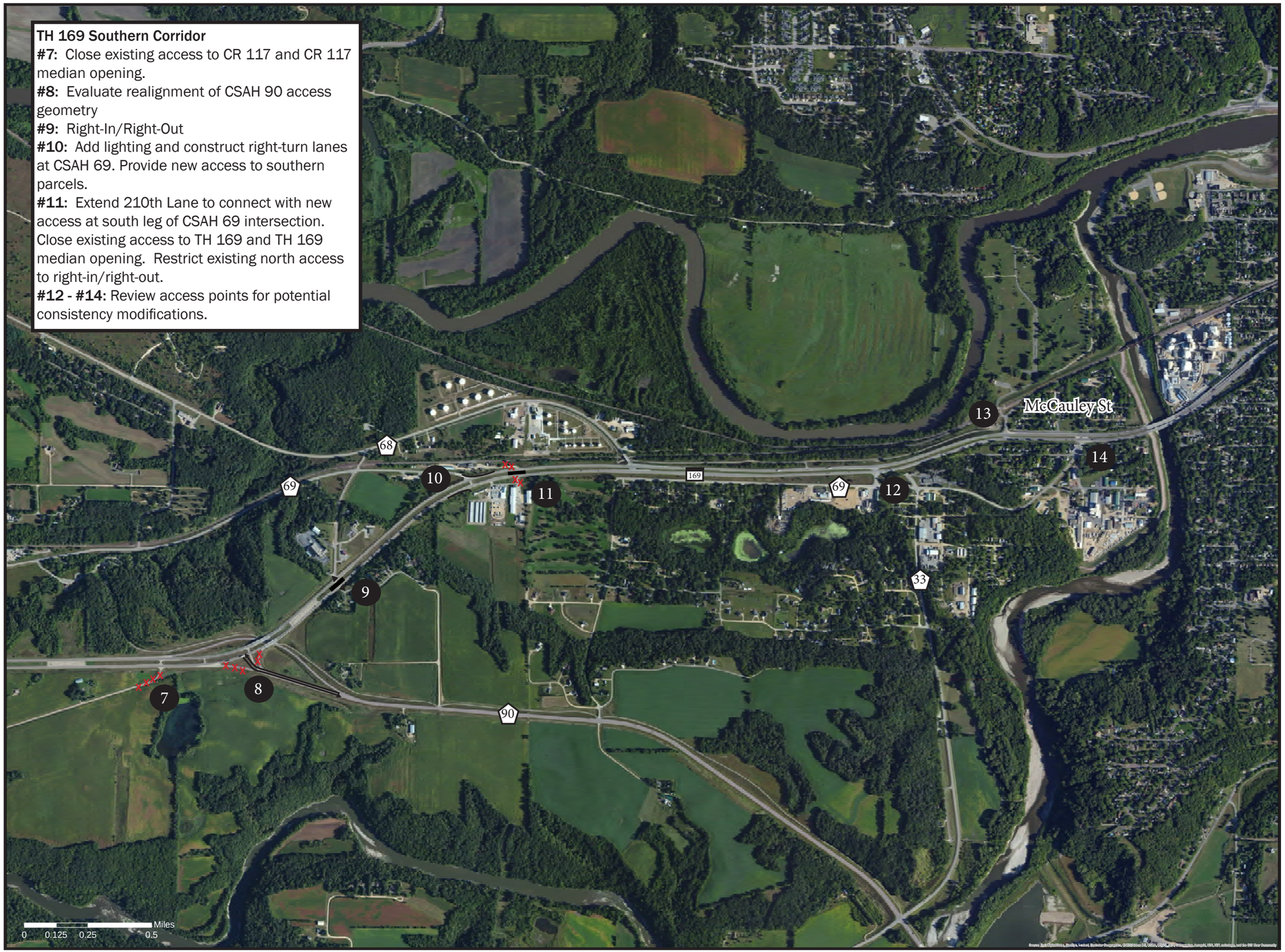
#8: Evaluate realignment of CSAH 90 access geometry

#9: Right-In/Right-Out

#10: Add lighting and construct right-turn lanes at CSAH 69. Provide new access to southern parcels.

#11: Extend 210th Lane to connect with new access at south leg of CSAH 69 intersection. Close existing access to TH 169 and TH 169 median opening. Restrict existing north access to right-in/right-out.

#12 - #14: Review access points for potential consistency modifications.



MAPO 2045 TRANSPORTATION PLAN

TH 169 Southern Corridor
Figure 6-15

0 1 2 Miles

SRF

Bolton & Menk

MAPO 2045 TRANSPORTATION PLAN

TH 22 Northern Corridor
Figure 6-16

MAPO 2045 TRANSPORTATION PLAN

TH 22 Central Corridor A
Figure 6-17

MAPO 2045 TRANSPORTATION PLAN

TH 22 Central Corridor B
Figure 6-18

MAPO 2045 TRANSPORTATION PLAN

TH 22 Southern Corridor
Figure 6-19

TH 22 Southern Corridor
#19: Roundabout
*Monitor corridor as development occurs and traffic increases.

Emergency and Disaster Response

Based on the existing and future system assessment, additional emergency and disaster response evaluation is provided below:

- Additional Evacuation Routes and High-Risk Areas Identification – The urbanized areas within MAPO communities continue to grow. Emergency service and disaster response planning must be updated to reflect these growth areas and changes to the MAPO region. MAPO jurisdictions should undertake an update to the Mankato Area Evacuation Traffic Management Plan to include the following (also identified on Figure 23):
    - Additional high-risk locations on the east side of Mankato including the Blue Earth County Justice Center, MnDOT District 7 Headquarters, the future East Middle School, and the Greater Mankato Transit Facility.
    - Additional evacuation and disaster response planning for MAPO areas including Eagle Lake and North Mankato. It is likely additional evacuation and disaster response planning has occurred within each of the MAPO jurisdictions.
- Traffic Management (Motorized and Pedestrian) – The 2008 Plan does not identify specific walking routes but has identified strategic transit pickup locations in relation to the evacuation footprint. Additional focus in a plan update should be placed on preparedness planning for pedestrian movements.
- Other: Lime Township – the Township has expressed concern with emergency service response to the western portion of the township near the 3rd Avenue (CSAH 5) intersection with the Union Pacific Railroad. Township officials noted at times rail traffic blocks 3rd Avenue (CSAH 5) as emergency vehicles are trying to access portions of the township south of the tracks. Emergency service for this part of Lime Township is provided by Kasota Fire Department. As such, it is most efficient for them to use 3rd Avenue (CSAH 5) for access to these areas but are sometimes stopped for minutes or longer as the railroad is switching trains, blocking the road completely. This issue should be investigated further with the railroad and in future emergency response planning to identify potential solutions.

Future Multimodal System Analysis & Considerations

Many communities are seeing an increase in non-motorized and multimodal transportation. People are walking, biking or combining these modes with transit as an alternative to driving cars for a variety of health or economic reasons. MAPO communities are working to provide transportation options that accommodate residents and visitors of all ages, incomes, and abilities.

Future Freight

The MAPO planning area is served by US 14, US 169, TH 22, TH 60, TH 83, and TH 68, as well as Union Pacific (UP) and Canadian Pacific (CP) railroads that serve local and regional freight movements. As demand for the movement of commodities continues to increase, the roadway and rail networks will need to continue to provide adequate capacity and safe travel to support the local

and regional economies. The metropolitan area's proximity to the Twin Cities and its position at the intersection of major regional trunk highways has made it an attractive location for regional freight activities and distribution hubs serving both the Twin Cities and rural Minnesota.

Seasonal Commodities and Distribution Centers

In addition to agricultural-based freight movements, the region has positioned itself to become a hub for distribution and manufacturing centers for major national companies. FedEx and Wal-Mart recently announced plans for major distribution centers, both will be constructed near the new CSAH 12 interchange at US 14. These new distribution centers are expected to result in large increases in truck traffic in addition to the traffic related to the estimated 350 new jobs that will be provided.

As the number of trucks increases in the study area due to local economic expansion, the truck volumes on the trunk highway system will continue to increase. Recent construction projects (e.g., CSAH 12 and CSAH 14 interchanges along US 14) have provided needed connections and capacity, but over time it will be important to monitor pavement conditions and roadway safety as traffic continues to grow along the major freight corridors. Congestion along the major freight corridors can result in slow-moving vehicles that are hard to pass or get around, leading to increased driver irritation.

The expansion of land for manufacturing and industrial uses is targeted on the fringes of the Mankato and North Mankato, areas that will be in direct competition with residential, commercial, and recreational uses. As the metro area continues to develop, it is critical that freight generators are situated near transportation facilities that can accommodate the resulting truck traffic to manage system resources efficiently and eliminate the potential for gaps in the freight system. Planning and enforcing the location and timing of freight generators ensures that roadways are not built to standards above or below what is needed.

Rail

Union Pacific (UP) and Canadian Pacific (CP) railroads currently operate within and serve the MAPO planning area. Operation of these lines through the community results in fairly significant number of at-grade crossings, only half of which are controlled by gates or flashing lights. As rail traffic increases, these at-grade intersections could become increasingly dangerous for automobile and pedestrian traffic. Improved at-grade facilities to reduce auto/rail conflicts are needed. Additional considerations should be given to improve quality of life and sustainability of rail (e.g., rail quiet zones and grade-separated crossings).

Intermodal Facility

With continued expansion of local industrial parks and the groundbreaking of the new FedEx and Wal-Mart distribution centers, the MAPO area transportation system may become stressed to meet the demand for regional freight movement on its trunk highway system.

An intermodal facility will allow for the transfer of freight containers between modes (e.g., rail, truck, etc.). Such a facility could reduce the cost of handling of cargo, allowing for the faster delivery of

goods, reduction of congestion on freight corridors, lower trucking costs, increased economic competitiveness for companies and reduced greenhouse gas emissions.

Future Transit Development

There have been a number of important transit studies completed for the MAPO area, including:

Mankato Area Transportation and Planning Study

Completed in March of 2011, the Mankato Area Transportation Plan Study (MATAPS) reviewed both multi- and inter-modal approaches to transportation. With public input and participation, MATAPS identified key recommendations for the future transit network in order to achieve an efficient and effective system which meets the needs of urban, rural and interregional travel. The following strategies were identified through the study:

Bus Rapid Transit (BRT)

Bus Rapid Transit (BRT) services high volumes of passengers, with limited stops and in its own right-of-way. This type of service incorporates fewer stops but has central hubs located throughout the MAPO planning area. These hub locations, called out by MATAPS, included downtown Mankato, North Mankato, Minnesota State University (MSU), Mankato, and River Hills Mall. Potential routes in downtown Mankato would include Madison Avenue, Balcerzak Drive, Warren Street, and 2nd Street. Opportunities for BRT in downtown North Mankato were proposed for Belgrade Avenue, Lee Boulevard, Lor Ray Drive, and Commerce Drive.

Branding Mankato Transit

Creating an identity for Mankato Transit within the community through marketing and branding was proposed to help create awareness and increase its importance within the MAPO planning area. Branding is a common marketing tool used to create familiarity among current and future riders. Developing such marketing materials will provide MAPO with an opportunity to promote Mankato Transit's vision, focus on improvement of quality of life, along with possibilities for alternative travel to events and regional destinations.

Integration of Non-Motorized Transportation

Identifying ways to increase bicycle and pedestrian connections with transit infrastructure and movements was proposed to increase ridership opportunities. To encourage these connections, land use planning and public infrastructure (i.e., sidewalks, park benches, street lighting) should be taken into consideration near transit stops. Additional accommodations on busses such as extra bicycle storage should be taken into considerations as opportunities arise.

County-Wide Transit

MATAPS identified an existing gap within Minnesota's county-wide transit network for both Blue Earth and Nicollet counties. In order to address this gap, MnDOT's Region 9 is working on a Quad-County Transit Interregional Project (QTIP). This project will work with Blue Earth, Nicollet, Le Sueur and Waseca counties to identify potential service and funding opportunities.

Regional Transit Connections

The MATAPS study recommended the implementation of commuter coach service in the short term and passenger rail in the long term between the Mankato area and the Twin Cities region. An intermodal transit hub in downtown Mankato was also recommended to accommodate both short- and long-term commuter service needs. Both of these developments will provide incentives for businesses, housing, and entertainment near the transit hub and along the commuter service.

Transit Education and Coalitions

MATAPS cited a lack of education as the main limitation to building trust and support. Therefore, educating partnering agencies, stakeholders, and the public will help Mankato Transit fulfill its mission and follow through on key study recommendations. Working with each of these agencies will allow Mankato Transit an opportunity to provide incentives to use transit throughout the MAPO planning area.

Local Human Service Transit Coordination Plan

The locally developed human services coordination plan identified several strategies for implementation. These strategies took a regional perspective and presented opportunities for involvement of MAPO. While MAPO does not directly operate transit services, it does serve as the metropolitan planning organization covering the geographic area; that allows it to coordinate lines of communication among various local transportation providers. Its role as the metropolitan planning organization also makes it a manager of federal transportation dollars and an agent in determining multimodal investment priorities. The following are coordination strategies that were identified in the human service coordination plan.

Cooperative Purchasing

Southern Minnesota is home to several urban and rural public transit providers. The federally compliant purchase of vehicles and equipment is often burdensome for small transit agencies. Establishing a cooperative purchasing program among providers can ease this administrative burden and allow for more favorable pricing due to the higher volume of goods being purchased. As the metropolitan planning organization continues to mature, opportunities for MAPO to provide a coordination role will emerge.

Mobility Management/One-Call Centers

The plan also recommended the centralization of dispatching and ride coordination functions, as well as the coordination of transit service. Regional trips can be made by sharing fleet resources, and the coverage areas of existing transit systems would be expanded. Coordinating trips also reduces operating costs by minimizing instances where a vehicle is not in revenue service, and is a more efficient use of labor and capital. Moreover, offering a single point of contact where people can obtain information on all transportation resources would be a marked improvement over navigating fragmented transportation programs that are often managed by agencies that make little contact with one another. MAPO may be able to support MTS efforts in planning and promoting materials in order to attain this objective.

Aggregating Funding Sources

As a regional entity, MAPO can play an important role in publicizing state, federal, and regional funding sources that support transportation programs. MAPO's geographic scope is conducive to partnering with public and nonprofit agencies in the region, and giving regular updates to them on funding opportunities.

Future Markets

Future transit markets were identified in three key areas:

- Improving service within Mankato and North Mankato to grow ridership and improve the efficiency and effectiveness of a coordinated transit system.
- Coordinating transit service to provide trips for a regional market.

Using its metropolitan planning funds, MAPO may be able to assist Greater Mankato Transit in route planning similar to many other Minnesota MPOs.

Greater Mankato Transit Redesign Study

Completed in 2012, the Greater Mankato Transit Redesign study evaluated the existing transit system, reviewed previous planning efforts and survey results, and solicited community feedback. The study focused on short- and long-term transit needs in greater Mankato and offered transit service recommendations and capital needs over a five- to seven-year time period.

While the scope and recommendations of this study were comprehensive, the following excerpt provides an overview of strategies that relate specifically to the metropolitan development of transit. Since the plan's adoption, many of the route restructuring strategies have already been implemented and are noted below.

Route Changes

Based on an evaluation of existing transit services, feedback from the community (via community surveys), and input from several technical and steering committees, primary goals were identified for transit service in the Mankato area. The study offered route improvements that could be undertaken under three scenarios:

- "Same cost improvements" are those which can be undertaken using the existing resources of the transit system. These improvements have been implemented.
- "Green fee improvements" are those which can be undertaken assuming the securement of the new funding source. A green fee was secured with MSU, Mankato, allowing improved service in the campus area, expanded Stomper Express evening service three additional days, and added evening Route 12 four days a week.
- "Enhanced bus service" includes improvements that can be undertaken assuming a significant increase in transit investment. This includes the introduction of express bus service, and recommends service and capital improvements that would establish a bus rapid transit system.

In developing each funding scenario, development decisions were made based on a set of core values. These include:

- Providing more direct service. It was strongly expressed by stakeholders that more direct service should be a priority over more frequent stops and greater service coverage.
- Route restructuring was completed to provide direct service between major destination points without the need for transfers. Where transfers are necessary, timed no wait transfers were implemented. The exception is to transfer from Route 5 to a route in Mankato requires a 15-minute wait. The North Mankato component of service continues to present challenges that are not easily resolved without additional service.
- Maintaining transfers between routes. The existing Greater Mankato Transit is well-timed to allow transfers between routes at multiple locations. None of the funding scenarios considered in this study would allow service frequencies to be improved to the point where riders would tolerate untimed transfers between routes. Thus, all alternatives maintain or improve timed transfers at as many points as possible throughout the system.
- Maintaining a strong level of service to MSU. Because MSU students, staff, and faculty account for a significant portion of transit ridership in the Mankato area, all alternatives respect this and maintain or improve transit service to the MSU campus.

In addition to setting these principles for developing local service, the plan details numerous service options for serving regional markets such as Rochester, Saint Peter, Le Sueur, and all of the surrounding counties.

Recommendations from this plan have begun to be implemented and a marked increase in ridership has been achieved. The "same cost" recommendations were implemented as a first

focus with full restructuring with a possibility in the future with the establishment of dedicated funding.

Passenger Rail Services

The Minnesota Comprehensive Statewide Freight and Passenger Rail Plan (MnDOT, 2009) focuses future passenger rail development on connections to a future high-speed rail corridor connecting Minneapolis-St. Paul to Chicago (greater than 110 miles per hour). Conventional passenger rail service (70-110 miles per hour) from Mankato to Minneapolis-St. Paul was identified as a potential corridor for connecting service. 2030 ridership forecasts showed a market that will support 100,000 to 300,000 annual trips as part of a regional rail network. To support this development, the rail corridor will need to be upgraded to a minimum of Class 4, with higher-class upgrades to be performed as warranted.

As a regional network develops, stakeholders in Mankato should continue to support studies and projects that advance the implementation of passenger rail service. These efforts should include guiding statewide planning efforts, supporting investment in multimodal facilities and services, and collaborating with stakeholders and regional agencies to promote future rail services.

Transit Conclusions

The Local Human Service Transit Coordination Plan and the *Greater Mankato Transit Redesign Study* presented many recommendations that have already been deployed. The result has been double-digit increases in ridership over recent years. Future development of transit in Mankato will yield outcomes associated with bus rapid transit service, and a high-frequency network of routes where transfers and trips require less planning. These outcomes are contingent upon increased investment in transit. Additionally, there are partnerships and opportunities to build passenger transportation connections in the broader region.

The following summarizes transit coordination opportunities that MAPO can assist its partnering jurisdictions with:

- **Continue implementation of Greater Mankato Transit Redesign Study**
  - Seek opportunities to fund high-quality transit.
  - Increase frequency and add service hours in areas where the greatest ridership returns will be realized. Target markets include service for people who rely on transit, university students and staff, and major retail and employment centers.
  - Seek opportunities to improve capital facilities and vehicles.
- **Increase regional services**
  - Invest in rural transit options, such as connections to Eagle Lake.
  - Invest in passenger transportation that connects Mankato and Rochester.
  - Improve intercity bus services, attract over-the-road coach bus service.

  - Pursue opportunities to develop passenger rail services between Mankato and the Twin Cities.

- **Leverage MAPO's position as metropolitan planning organization to coordinate transportation service**
  - MAPO can serve as a venue to coordinate urban, rural, and human service transportation issues, and facilitate discussion among numerous partner groups (businesses, health care providers, schools, transportation planners, etc.).

Airport Service

The regional airport is owned and operated by the City of Mankato and classified as a Key Airport[1] in Minnesota's State Aviation System Plan (SASP). The SASP notes that aviation is expected to grow in the future, but not as fast as previous years due to recent considerable change in the aviation industry and national economy.

Mankato Regional Airport Planning

One of the *Minnesota State Aviation System Plan's* performance measures is the percent of System Plan airports with up-to-date planning documents, with Key Airports required to have an Airport Master Plan updated or revisited at least every seven years. The airport master plan provides future direction and guidance to the airport owner, the city, regarding future airport preservation and development priorities.

The City of Mankato completed Airport Master Plans in 1993 and 2002. An update to the Mankato Regional Airport Master Plan is currently in process and is anticipated to be completed by the fall of 2015. The Airport Master Plan includes discussion of the existing inventory at the airport and the results of the airport user survey. The Plan will identify improvements that need to be addressed such as service area around the airport, forecasted aircraft activity, facility recommendations, facility alternatives, and an implementation plan.

Scheduled Passenger Service

A potential air carrier service and leakage study was completed in August of 1998, which indicated that Mankato's proximity to Rochester and Minneapolis-St. Paul make future scheduled airline passenger service in Mankato unlikely. The upfront costs for this type of service in Mankato are too large for airlines to be profitable. However, the Mankato airport does provide charter air service for corporate clients and has maintained its Federal Aviation Administration (FAA) Part 139 Certification for this type of service. This certification is required for airports serving scheduled air carrier operations in aircraft designed for more than nine passenger seats but less than 31 passenger seats.

[1] Designation of airports located near larger population and economic centers, serving as the primary landing facilities for business jets, and supporting regularly scheduled air service.

Regular Air Cargo Operations

The Mankato airport's infrastructure is considered sufficient to accommodate mid-size cargo jets that major freight users such as UPS and FedEx operate at airports with similar runway lengths. Currently, the Mankato Regional Airport does not provide regular air cargo operations, and a 2008 study showed that the Mankato Regional Airport is not a favorable location with the current models of air-to-ground facilities and competition in the region. There are a number of businesses and organizations in the Mankato region that use air cargo in the form of express carriers (e.g., FedEx Express and UPS), but this cargo is currently trucked to Minneapolis-St. Paul or Rochester International Airport.

Understanding the above two major factors influence airport operations, the Airport Master Plan Update will likely address the following issues, needs and opportunities:

- Evaluate opportunities to enhance the possibilities of "Air Charter" services for both business and pleasure use. Provide a possible "Casino charter" or charters to warm weather destinations from the Mankato Regional Airport, assuming the security costs/requirements are cost effective.
- Conduct another financial feasibility analysis to evaluate capital funding sources, net operating revenues, cash reserves, airport operating revenues/expenses, and evaluate projected operating revenues/expenses based on the chance of air cargo operations.
- Continue to monitor local business air cargo needs as well as new business needs, such as the addition of the Wal-Mart and the FedEx distribution centers in Mankato.
- Develop a public involvement plan to allow airport stakeholders and the general public opportunities to provide input on the future development at the airport.
- Continue to lobby the Department of Defense and National Guard (Army and Air) for the possibility of unit relocation that may have a "mission" change and/or training requirement justification. Reach out to units that require approach training and offer Mankato Regional Airport as a practice destination.
- Continue the current upward trend in the number of students and flight training in the MSU, Mankato aviation program. This upward trend is a positive sign in the aviation industry in light of the projected pilot shortage that will be impacting the airlines in the near future.

Monitoring and evaluating airport infrastructure and operations throughout the life of the plan will help influence the Airport Master Plan Update, along with future operation needs.

Future Bicycle and Pedestrian Facilities

MAPO and its planning partners have undertaken a number of actions to address bicycle and pedestrian issues. These efforts include: design guidelines, complete streets policies, ADA compliance, safe routes to school planning, and future system planning. Noted below is a summary of these activities.

Corridor Aesthetics

The City of Mankato has Urban Design Guidelines that address land development and streetscape design for key city districts. The guidelines were developed in the 1990's. Given the community's growth since that period and its forecasted growth, the City may want to consider updating the guidelines to reflect current and future conditions. Other communities within the MAPO planning area may also want to consider developing urban design guidelines to maintain a consistent level of design quality across the entire area.

Complete Streets/Policies

The City of Mankato has developed a Complete Streets Plan and Policy document that will guide the City as it transitions street right-of-ways away from being dominated by vehicles to environments that accommodate and balance the needs of multiple transportation modes, including pedestrians, bicyclists, transit, trucks and cars.

The City's Complete Street Policy states that bicycle, pedestrian, and transit facilities will be included in all street construction, reconstruction, rehabilitation, and pavement maintenance projects conducted by or on behalf of the City, subject to six exceptions. These exceptions determined by the City Engineer include:

- If a new facility will not be accommodated for within the existing right-of-way.
- If an extreme and unbalanced cost would result due to the inclusion of a new facility.
- If the public right-of-way would create safety concerns for the public and route users.
- If the project requires seasonal or routine maintenance activities.
- If legal restrictions prohibit use of the facility
- If current and future studies indicate the absence of a need for the indicated facility.

The document will also include a tool kit and design guidelines for the incorporation of pedestrian, bicycle, and transit facilities. The implementation section of the document identifies near-term (2015 – 2018) and future bicycle, sidewalk, and trail facility projects. The City of Mankato's Complete Streets Plan and Policy document is intended to be a dynamic document that will be updated on a semi-annual basis.

With the adoption of a complete streets policy, Mankato is committing to provide bicycle and pedestrian facilities on all new and reconstructed streets. What constitutes a pedestrian and bicycle facility may require additional definition in order to avoid confusion and heightened expectations. For example, pedestrians and bicycles can be adequately accommodated by allowing them to share the street with vehicles on low-volume residential streets. MAPO may want to define what conditions, such a traffic volumes/speeds, truck volumes or topographic conditions, will trigger the need to construct designated pedestrian and bicycle facilities.

Further, it is this project development process that has been incorporated as the proposed project improvements were developed for the Long Range Transportation Plan (complete streets, where

applicable). Opportunities for synergy between a roadway improvement and pedestrian/bicycle improvement were taken into account as improvements were discussed amongst the TAC. Not only does this provide project development efficiency, it results in a more efficient transportation system for all users (multimodal/multipurpose improvement plans).

The City of Mankato's Complete Streets Plan and Policy document can be used as a guiding template for other jurisdiction within the MAPO planning area if they wish to develop similar policies specific to local area needs.

Pedestrian Facilities and ADA Compliance

Communities within the MAPO planning area are constructing new pedestrian facilities to be compliant with the current ADA Accessibility Guidelines and the United States Access Board's Proposed Guidelines for Pedestrian Facilities in the Public Right-of-Way (also commonly referred to as PROWAG). Existing pedestrian facilities are typically brought into compliance as these facilities are reconstructed, as part of street improvement projects.

Current Bicycle and Pedestrian System Planning Efforts

The City of North Mankato recently prepared a trail system plan and a Safe Routes to School (SRTS) plan, which was completed in May 2015. Additionally, a dedicated bicycle lane was recently constructed on southbound Sherman Street from Belgrade Avenue to the North Star Bridge. This is the first dedicated bicycle lane in the MAPO planning area and will serve as a demonstration project for the metropolitan area.

The City of Eagle Lake completed its SRTS plan in May 2015 and constructed new sidewalks, crosswalks, and traffic calming devices as part of a SRTS project. Mankato area schools also received SRTS funding that has allowed the community to hire a part-time SRTS coordinator to manage education and encouragement activities, develop walking maps, and assist with additional SRTS activities, including the City's Critical Link Sidewalk Plan. This plan depicts existing sidewalks and trails within the City, along with proposed sidewalks, trails, and safe routes to school.

The cities of Mankato and North Mankato have mapped existing and proposed bicycle facilities in relation to schools, parks, and entertainment destinations. The consolidated mapping helps highlight important connections between the communities to ensure convenient connectivity of the overall system. It also has helped identify gaps in the non-motorized system (see Figure 6-20). However, bicycle facility mapping developed by the individual MAPO communities does not use consistent terminology or design standards for classification of on- or off-street facilities. Consistent design standards are important for user safety and system wayfinding. In addition, while off-street trails are typically safe for all skill levels, the type of on-street facility used will likely determine which bicyclists will be comfortable using it. Inconsistent terminology between the communities may cause confusion for users and limit use by bicyclists who are either less skilled or are not as comfortable riding on the street.

Having future trail corridors mapped can provide a stronger case for these facilities when the community pursues competitive implementation funding. In addition, while the exact location of a future trail may shift from that shown on the map (as a result of future technical and feasibility studies), it is important to show the intent for a trail or route as a reminder when new streets are constructed or when adjacent streets are reconstructed.

Future Non-motorized System Issues, Opportunities and Plan

Using a combination of off-street trails and on-street bike facilities, the Mankato and North Mankato bike network plans offer connections to education destinations, along with major parks and entertainment destinations within the community.

Figure 6-21 and Figure 6-22 depict existing and future trails, respectively, as proposed by the TAC after consideration of public input and technical analysis. Being a river community, steep hills are a major obstacle for the integration of pedestrian and bicycle facilities. Many of the existing roadways up the hills have limited space to include additional non-motorized facilities without major impacts to vegetation and topography. In addition, people will be physically challenged to climb these hills. Yet, these connections, along with additional network connections, both below and above the river bluffs, are important to the creation of a convenient network of non-motorized facilities that will enable people to efficiently move around the community for a variety of trips. Such linkages are needed to encourage the use of non-motorized transportation. While physically challenging to begin with, once built, many bicyclists and pedestrians will develop the ability to traverse the hills.

One potential approach to incorporating bicycle facilities on street corridors that traverse the river bluffs is the use of "climbing lanes." This approach provides a dedicated bicycle facility, such as a bike lane, going up the hill and allowing the bicycles to share the travel lane with vehicles going down the hill. Given that bicyclists typically travel at a slower speeds and have greater horizontal movement as they ascend hills, the dedicated bike facility provides a safe space to perform the climb. While descending a hill, bicycles are typically traveling at higher speeds and can occupy or share the downhill travel lane without significantly impacting vehicle travel. The descending travel lane is typically marked with a sharrow symbol to communicate to bicyclists and vehicles that they should share the travel lane. See Figure 6-23 for a diagram of a climbing lane.

MAPO 2045 TRANSPORTATION PLAN

Identified Pedestrian and Bicycle Existing System Network Gaps

Figure 6-20

Trail Type

- Identified Bike Route Gap
- Identified Paved Trail Gap
- Sakatah Singing Hills State Trail
- Existing On-Street Bike Route
- Existing Paved Trail
- Existing Natural
- Existing Sidewalks
- Park / Open Space
- Public School Property
- Colleges
- PWI (Basin)
- PWI (Watercourse)
- Railroad
- MAPO Planning Area

Source: Blue Earth County, Nicollet County, MnDOT, North Mankato, Mankato, MnDNR, Esri Imagery

0 1 2 Miles

SRF

BOLTON & MENK

Map Document: J:\Maps\8573\mxd\Trails\MAPO_11x17_Trail Gaps_150929.mxd Date Saved: 9/29/2015 3:14:30 PM

MAPO 2045 TRANSPORTATION PLAN

Existing Pedestrian and Bicycle Facilities

Figure 6-21

SCHOOL	
1	Lincoln Community Center
2	Dakota Meadows
3	Eagle Lake
4	East High School
5	Franklin
6	Hoover
7	Jefferson
8	Kennedy
9	Monroe, Garfield
10	Roosevelt
11	Rosa Parks
12	Washington
13	West High School

- Sakatah Singing Hills State Trail
- On-Street Bike Route
- Paved Trail
- Natural
- Sidewalks
- Park / Open Space
- School Property
- Colleges
- Railroad
- MAPO Planning Area

Source: Blue Earth County, Nicollet County, MnDOT, North Mankato, Mankato, MnDNR, Esri Imagery

0 1 2 Miles

MAPO 2045 TRANSPORTATION PLAN

Proposed Pedestrian and Bicycle Network

Figure 6-22

Previously Identified Projects

- Proposed On-Street Bike Route
- Proposed Paved Trail
- Sidewalk
- Sakatah Singing Hills State Trail
- On-Street Bike Route
- Paved Trail
- Natural
- Sidewalks
- Park / Open Space
- Public School Property
- Colleges
- PWI (Basin)
- PWI (Watercourse)
- Railroad
- MAPO Planning Area

Source: Blue Earth County, Nicollet County, MnDOT, North Mankato, Mankato, MnDNR, Esri Imagery

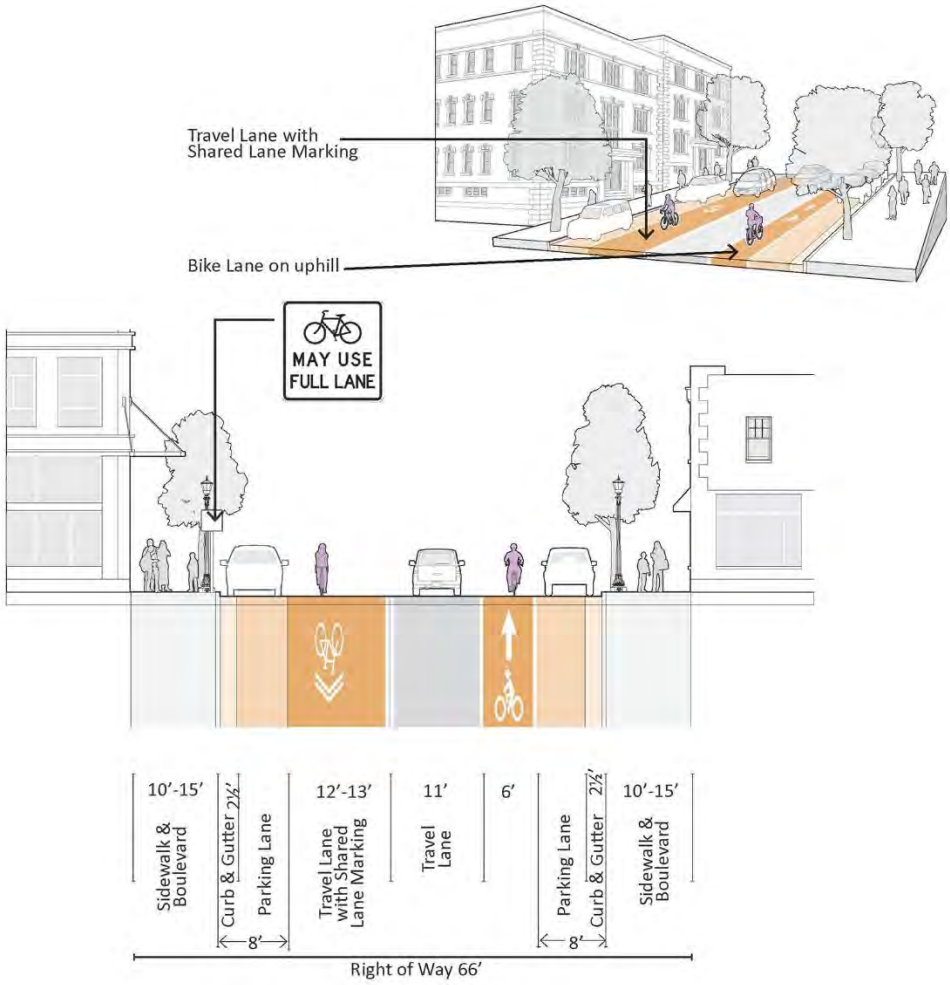
0 1 2 Miles

SRF

BOLTON & MENK

Map Document: J:\Maps\8573\mxd\Trails\MAPO_11x17_Future Trails_150929.mxd Date Saved: 9/29/2015 4:50:06 PM

Figure 6-23: Climbing Lane Diagram



Source: Saint Paul Street Design Manual (July 2014 Draft)

Figure 6-20 depicts additional bicycle system connections for the community's consideration. The proposed additions include routes that traverse the river bluff, as wells as bicycle routes/trails that would strengthen overall system connectivity, which promotes non-motorized travel. In addition to the proposed bicycle facilities shown here, MAPO should consider implementing a unified wayfinding system that will assist bicyclists and pedestrians to navigate safe and efficient routes to their desired destinations. MAPO may also want to field verify existing mapping to ensure that it accurately reflects existing conditions.

The Minnesota Department of Natural Resources (DNR) has developed a long range vision of establishing a state trail along the Minnesota River. MAPO should collaborate with the DNR to help facilitate the development of this state trail that would provide connections to St. Peter, New Ulm, and the broader Minnesota River Valley.

Range of Alternatives

The Mankato/North Mankato Area Planning Organization (MAPO) is charged with overseeing a diverse multimodal transportation system including roadway, bicycle and pedestrian, air, freight, and transit systems. The objective of the range of alternatives analysis is to develop a full menu of multimodal alternatives that address MAPO goals and objectives and identified system deficiencies and needs. However, the range of alternatives analysis was developed with the understanding that MAP-21 guidance dictates system preservation needs must be addressed prior to programming new construction or expansion needs. Therefore, a planning-level analysis of anticipated future system preservation needs was prepared for use in later chapters.

Next, previously identified projects along with new multimodal projects (identified from technical analysis) were compiled to encompass a full range of alternatives. This list of projects is not fiscally constrained because MAPO desired to comprehensively define the metro area's overall multimodal needs. Fiscal constraint was addressed later in the planning process; however, the multimodal project list was evaluated to determine any fatal flaws from an environmental scan or environmental justice standpoint.

Using this analysis of multimodal projects, scope, and estimated future project costs were prepared. These costs provided the basis for the fiscal constraint analysis and project prioritization process completed later in the Plan. Projects identified and agreed upon by the Technical Advisory Committee (TAC) were categorized into eight groups including corridor, intersection, bicycle and pedestrian, major rehabilitation (rehab)/reconstruction, safety, preservation, air, and freight types.

System Preservation Outline

In accordance with federal and state policies, funding must first be directed toward "state of good repair" activities in order to maintain the existing transportation system; only after system preservation needs are met on the primary system can such funds be used for capital expansion or new construction. Preservation improvements are defined by MAPO as 1) operation and maintenance (O&M) activities and 2) major rehabilitation and reconstruction projects.

O&M activities represent regular and routine pavement improvements that keep the transportation system in a safe and effective condition. Major rehabilitation and reconstruction projects are needed when roads and bridges have exceeded their functional lifespan.

Pavement Operation and Maintenance

Examining the condition of the MAPO's highway system was a critical element of the entire transportation planning process. The MAPO area's transportation system was evaluated by jurisdiction in order to determine the baseline inputs of lane miles by jurisdiction and surface types. Then life cycle calculations were used to establish by major jurisdiction the preservation needs over

varying timeframes. Importantly, federal, state, MAPO staff, and TAC members were involved in the development of these assumptions, calculations, and outputs.

The number of lane miles was obtained using MAPO's 2015 roadway centerline file, which contained information on the number of roadway miles by both jurisdiction and functional classification. Roadway surface type data was also obtained using MAPO's 2015 roadway centerline file. Three main roadway surface types (concrete, asphalt, and gravel) were analyzed by jurisdiction using this data, coupled together with information from MnDOT and local agencies. Table 7-1 shows the number of lane miles by surface type for each agency.

Table 7-1: MAPO Area Lane Mileage by Surface Type

Lane Miles	MnDOT	Mankato	North Mankato	Nicollet County	Blue Earth County
Concrete (Collectors or Above)	68	7.46	2.63	1.81	17.24
Asphalt (Collectors or Above)	136	116.27	32.32	48.44	183.88
Asphalt (Locals)	0	314.75	114.59	9.99	6.79
Gravel	0	8.58	0	0	11.01

To establish the needed operation and maintenance costs over the life of the plan, MAPO jurisdictions provided a list of average costs for four surface improvements associated with each type of maintenance strategy. Maintenance practices examined were:

- Concrete Pavement Repair
- Asphalt Overlay
- Chip Seal
- Crack Seal

Table 7-2 shows the approximate improvement cost by maintenance type for each jurisdiction.

Table 7-2: Approximate Improvement Cost by Maintenance Type

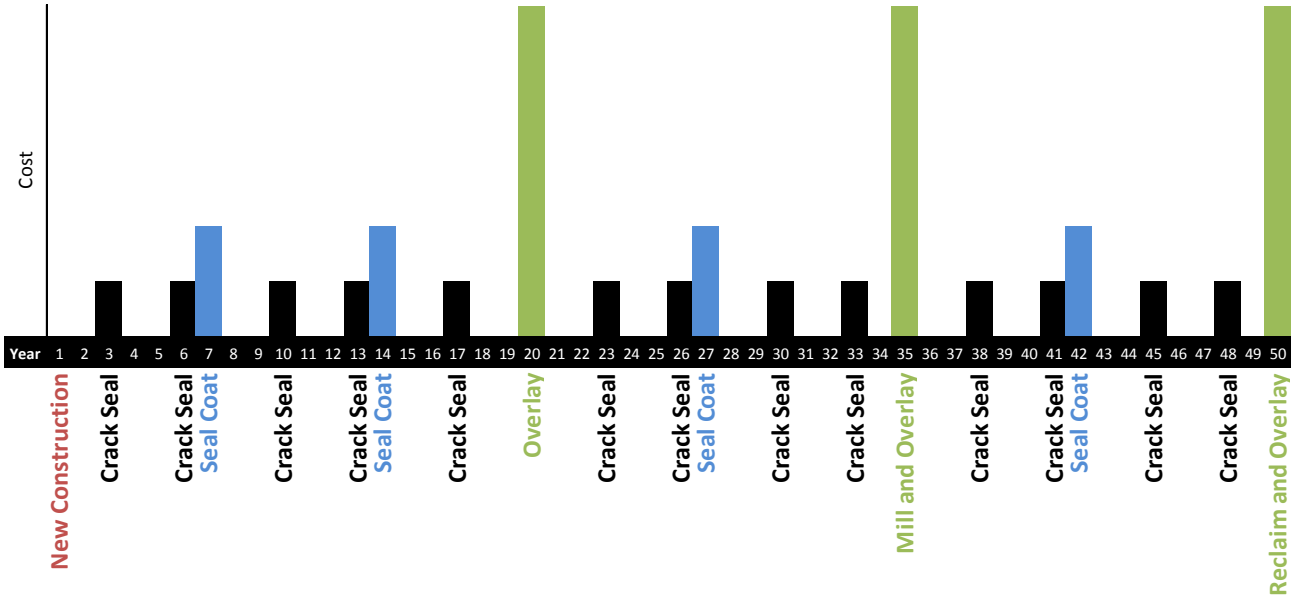
Maintenance Type	MnDOT/ Blue Earth County	Mankato	North Mankato	Nicollet County	Average
Concrete Pavement Repair	$90,000	$90,000	$90,000	$90,000	*$90,000*
Asphalt Overlay	$150,000	$85,000	$83,000	$60,000	*$95,000*
Chip Seal	$13,000	$7,600	$10,500	$12,000	*$11,000*
Crack Seal	$2,400	$2,200	$1,000	$5,000	*$3,000*

Using the costs and lane miles provided by jurisdictions, typical industry maintenance practices were used to determine the operation and maintenance life cycle costs throughout the MAPO planning area over the 30-year Plan horizon. The typical industry maintenance practices used for this analysis are shown in Table 7-3 and Figure 7-1. It was assumed a roadway had a 50-year life cycle, with an overlay every 15 to 20 years, seal coating every seven years, and crack sealing every three years.

Table 7-3: Lifecycle Expectancy for Surface Treatments

Treatment	Years
Concrete - State	10
Concrete - County/City	20
Asphalt M&O	20
Asphalt M&O Local	30
Chip Seal	7
Crack Seal	3

Figure 7-1: Typical Industry Practice over a 50-Year Maintenance Schedule



Using each of the above inputs, and an annual 4.5 percent inflation factor, the forecasted operation and maintenance cost was calculated for each jurisdiction by investment timeframe and is presented in Table 7-4. This table presents the forecast operation and maintenance costs for the short-, mid- and long-term timeframes.

Table 7-4: MAPO Forecasted Preservation Cost by Jurisdiction per Timeframe *

Jurisdiction	Short-Term 2016-2020	Mid-Term 1 2021-2025	Mid-Term 2 2026-2030	Long-Term 2031-2045	Total
MnDOT	$11,387,300	$13,890,000	$17,320,000	$86,181,000	$128,778,300
Mankato	$9,307,000	$12,375,000	$14,140,000	$70,366,000	$106,188,000
North Mankato	$2,978,000	$3,633,000	$4,526,000	$22,533,000	$33,670,000
Nicollet County	$1,924,000	$2,350,000	$2,926,000	$14,553,000	$21,753,000
Blue Earth County	$11,321,000	$13,810,000	$17,225,000	$85,710,000	$128,066,000
Total	**$30,070,000**	**$36,041,000**	**$68,617,000**	**$296,598,000**	**$431,326,000**

* Initial pavement preservation costs by timeframe if maintenance schedules are kept

The totals take into account the estimated cost of roadway improvements for each surface type based on standard surface life cycles and assumes that pavement preservation occurs in the timeframes assigned given the maintenance schedule. If pavement preservation is deferred at all, the costs will shift due to additional inflation and maintenance activities.

Transit Operation and Maintenance

Using inflation factors provided by Greater Mankato Transit and MnDOT Transit, future operating expenses were calculated for each time frame. It is understood that Greater Mankato Transit will continue to maintain or expand its operations based on available funding. Therefore, this exercise determined the amount of operating expenses and expenditures over the life of the plan (see Table 7-5). Operating expenses includes maintaining and keeping pace with expanded service to accommodate growing population; fleet capital expenses accounts for expenditures for bus fleet replacement; facility capital expenses account for maintenance facility expansion/construction.

Table 7-5: MAPO Transit Preservation

Expenses	Short-Term 2016-2020	Mid-Term 2021-2030	Long-Term 2031-2045	Total
Operating	$12,458,000	$13,687,000	$15,038,000	$54,618,000
Fleet Capital	$1,220,000	$3,611,000	$4,648,000	$14,860,000
Facility Capital	$8,000,000	$0	$0	$0

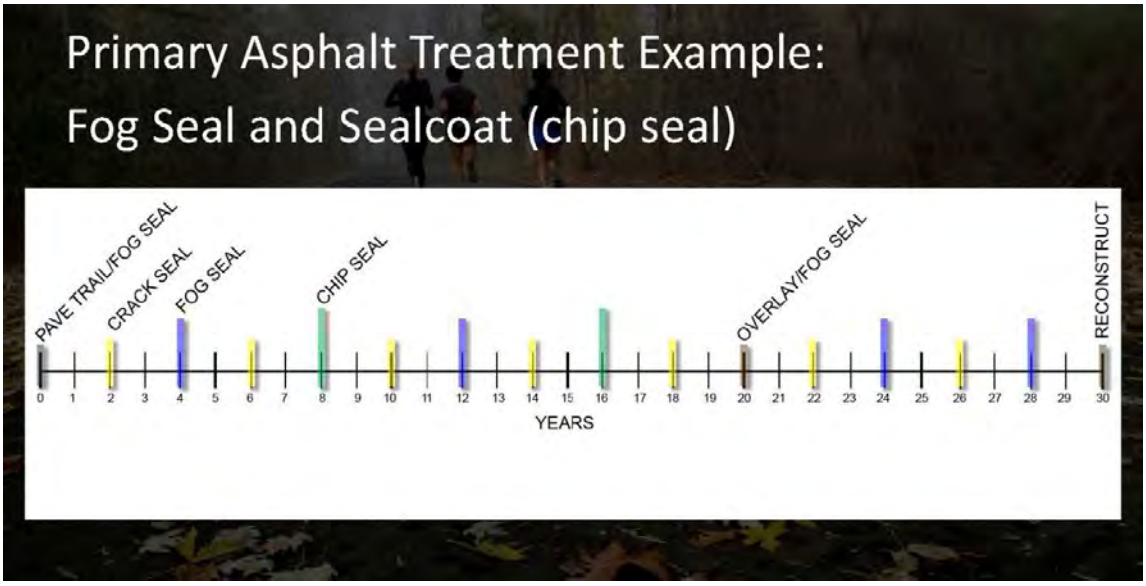
Trail Operation and Maintenance

Another aspect of the MAPO area's transportation network is maintenance of its trail system. Similar to roadways, trails deteriorate as they age but with planned maintenance strategies, the life expectancy of these trails can be extended. Communities and agencies are building more paved, multi-use trails to meet public demand for safe, off-road places to recreate and commute. Trail users, however, have a heightened awareness of the surface condition of trails. Bicyclists and in-line skaters, for example, are very sensitive to even the smallest cracks, and wheel chair users or those pushing strollers notice crumbling or pitted surfaces because uneven surfaces are harder to navigate. Trail maintenance and preservation is an important component of long-term infrastructure planning.

Agreements are often made between governing agencies such that one agency constructs a trail but the other agency will maintain it. Similar situations have occurred within the MAPO planning area. Figure 7-3 shows the agency responsible for maintaining the trails.

Maintaining trails on a regular basis is vital to increasing their longevity. Maintenance schedules will vary for each trail because surface conditions, environmental conditions, and use will be different. It is possible that maintenance needs may vary on the same trail given differing environmental conditions. Figure 7-2 illustrates a "typical" maintenance schedule that utilizes crack sealing, fog sealing, and chip sealing applied according to a pre-determined timeline. Because ultraviolet light begins breaking down a trail's surface immediately after construction, the timeline in Figure 7-2 includes a fog seal completed within one year of the original paving. This protects the asphalt from impacts from ultraviolet rays. Approximately every two years cracks are filled, and fog seal is applied at four years. This is followed by a chip seal at eight years. Subsequent two- and four-year maintenance practices follow the schedule of sealing cracks and applying fog seal or chip seal until the trail surface it twenty years of age. At that time, it may be necessary to overlay the trail with a 1.5-inch layer of new asphalt. Depending on local conditions, it may be possible to push the full reconstruction to 30 years.

Figure 7-2: Trail Primary Asphalt Treatment Example: Fog Seal and Sealcoat (Chip Seal)



MAPO 2045 TRANSPORTATION PLAN

Paved Trail Maintenance

Figure 7-3

Trail Maintenance

- Blue Earth County
- Eagle Lake
- Eagle Lake Maintained Owned by Other
- MNDOT
- Mankato
- Mankato Maintained Owned by Other
- Nicollet County
- North Mankato
- State Trail
- PWI (Basin)
- PWI (Watercourse)
- MAPO Planning Area

Source: Blue Earth County, Nicollet County, MnDOT, North Mankato, Mankato, MnDNR, Esri Imagery

0 1 2 Miles

SRF

BOLTON & MENK

Map Document: J:\Maps\8573\mxd\Trails\MAPO_Trails_Maintenance_150929.mxd Date Saved: 9/29/2015 1:41:49 PM

While no trail operation and maintenance cost estimates were developed for this Plan, the above information should help advance preservation activities among MAPO partners. In future Plan updates, as more trail condition data is assembled in a usable, consistent format by local jurisdictions, the operation and maintenance costs can be calculated.

Major Rehabilitation and Reconstruction

The MAPO partners have agreed that there will be a point during the 30-year planning horizon when portions of the transportation system will need more than what maintenance activities can provide. Portions of the roadway and bridge system will need major rehabilitation and reconstruction. American Association of State Highway and Transportation Officials (AASHTO) defines major rehabilitation as "…structural enhancements that both extend the service life of an existing pavement and/or improve its load-carrying capability." Whereas, pavement reconstruction is the replacement of the entire existing pavement structure by the placement of the equivalent or increased pavement structure. Reconstruction usually requires the complete removal and replacement of the existing pavement structure. Reconstruction is required when a pavement has either failed or has become functionally obsolete.

Bridges were considered in this category as well. Based on discussion with the MAPO project partners, and reference of the MnDOT Structure Inventory Report, bridges were identified for potential major rehabilitation or reconstruction within the planning horizon. MnDOT also referenced their most recent 10-year Capital Highway Investment Proposal (CHIP) for District 7 when stating bridge needs during the Plan's 30-year timeframe.

Review of this information with the project partners led to the Major Rehabilitation and Reconstruction project list, which like pavement operation and maintenance, must be addressed before new construction or expansion projects. A significant amount of roadway projects were identified; there are 35 span bridges and 12 major culverts under MnDOT jurisdiction within the MAPO planning area. MnDOT bridge planning indicates that preserving these existing structures with fixes that may include painting, overlays, redecking, rehabilitating and/or replacing will be significant. Blue Earth County was the only other jurisdiction to have a structure need within the planning horizon and the MAPO planning area.

Project Inventory and Scope

Existing Project Inventory

The range of alternatives analysis started with compiling an inventory of programmed, planned, and proposed projects. Projects were identified from various sources including Transportation Improvement Programs (TIPs)/State TIPs (STIPs), transit plans, previous Mankato Area Transportation Area and Planning Study (MATAPS), City and County Capital Improvement Programs (CIPs), other recent planning activities and recommendations from comprehensive, airport, recreation, safety, campus, downtown plans, Alternative Urban Areawide Reports (AUARs), and other studies. Many of these sources and studies have been previously discussed within the System

Forecasts, Operational Needs, and Modal Opportunities chapter of the Plan. This comprehensive inventory of projects within the MAPO planning area provided the foundation for each of the eight identified categories.

New Multimodal Projects

New multimodal projects, not identified by previous plans/studies, were generated from the previous chapters' technical analysis or were recommended by various agencies to improve the transportation system capacity. This analysis of multimodal projects was developed in order to scope and eventually prioritize projects.

Public participation and agency coordination was also an important element in identifying issues and needs. A number of public engagement tools were incorporated to engage key groups in the planning process. These included a series of stakeholder one-on-one meetings and public open houses. The open houses featured collaborative activities such as an interactive preference and online survey to engage the public. From this input additional projects were identified and evaluated prior to adding them to the universe of future multimodal projects.

Cost Estimates

With a comprehensive project list, MAPO staff and partnering agencies developed planning-level cost estimates for each project. Project costs from past studies were updated and current costs were developed by the partnering agencies for major rehabilitation and reconstruction project, and new projects. These construction costs were developed based on type of improvement, length, unit cost, and facility type. Table 7-6 shows a sampling of the planning-level cost assumptions used to calculate some of the project costs. Bridge costs were provided by the governing agency for each.

Table 7-6: MAPO Planning-Level Cost Estimate Assumptions

Project Task	Cost	Unit	Notes
New or Reconstruction	$10.00	Square Feet	Based on previous planning level estimates for bituminous pavement. Curb and drainage costs added separately.
Scab Extra Width	$12.50	Square Feet	Based on inflated reconstruction cost for bituminous pavement. Curb and drainage costs added separately.
Striping	$2,000.00	Intersection	Assumes epoxy striping 300' left and right turn lanes and pavement marking removal on all approaches.
Drainage	$95.50	Linear Feet	Extra cost for drainage (50% of bid price). Assumes $2,500 per structure, 40' roadway width, 2 structures every 100', 24" pipe at $32.50/LF.
Mill and Overlay	$110,000.00	Lane Mile	Based on MnDOT Pavement Design Manual. Assumes 12' lanes width, 2" mill, and 3.5" overlay.
Roundabout	$1,500,000	Single-lane Roundabout	Multi-lane roundabouts assumed to increase cost by $500,0000

Additional factors were also considered that have the potential to increase planning-level costs beyond typical assumptions. These factors included the need for retaining walls or substantial drainage improvements. To avoid redundancy, the proposed comprehensive multimodal future project list is presented in Chapter 9 – Implementation Plan as part of the fiscal constraint analysis.

Environmental Constraints and Cultural Resources

Federal and state policies require governmental agencies to examine the environmental impacts of projects they propose. Projects funded with federal dollars are required to comply with the requirements of the National Environmental Policy Act (NEPA). NEPA requires federal agencies to integrate environmental values into their decision making processes by considering the environmental impacts of their proposed actions and reasonable alternatives to those actions.

Incorporating NEPA into the Planning Process

The MAPO 2045 LRTP transportation planning effort expressly considered the early NEPA process so as to recognize corridor and intersection projects that may impact the environment or cultural resources. In such cases, even at this early transportation planning stage, MAPO sought to:

- Avoid the impact altogether
- Minimize impacts by limiting the degree or magnitude of the action and its implementation
- Rectify the impact by considering repair, rehabilitation, or restoration of the affected environment
- Reduce or eliminate the impact over time by preservation and maintenance operations during the life of the action, or:
- Compensate for the impact by replacing or providing substitute resources or environments.

Therefore, each corridor and intersection project identified in the MAPO 2045 LRTP underwent a planning-level assessment to determine the potential for negative impacts on social, economic, and environmental resources. The planning-level assessment included review of GIS datasets, aerial photography, and previous plans and studies. The results of the planning-level assessment were then displayed in a table (see Appendix 7-A) to depict the likelihood of impact to key environmental features, ranging from no impact to high likelihood of impact for both corridor and intersection projects identified in the MAPO 2045 LRTP.

The preliminary planning-level assessment was shared with local, regional, state, and federal agencies to gather feedback on the proposed improvements, timeframes, and additional improvements that may be needed and the assessment of potential environment impacts. The following agencies were contacted to gather feedback:

- Minnesota Pollution Control Agency (MPCA)
- Minnesota Department of Natural Resources (DNR)
- Water Management Organizations (WMO)
- State Historic Preservation Office (SHPO)
- Blue Earth County Historical Society
- Nicollet County Historical Society
- Natural Resources Conservation Services (NRCS)
- Blue Earth County Soil and Water Conservation District (SWCD)
- Nicollet County SWCD
- U.S. Army Corps of Engineers (USACE)
- City of Mankato Heritage Preservation Commission
- FHWA Minnesota Division

Listening sessions were also held as another opportunity for agencies to participate and provide feedback on the planning-level assessment and project list. No comments or concerns were expressed by agencies in writing or in person through participation at listening sessions.

Each of the environmental categories evaluated by the MAPO planning-level assessment are presented on the following pages.

Wildlife and Vegetation

The U.S. Fish and Wildlife (USFWS) identifies three categories of species at risk. Endangered species are those at the brink of extinction now. Threatened species are those that are likely to become an endangered species in the near future. The Candidate category is for species the USFWS has proposed for threatened and endangered status. Both Blue Earth and Nicollet counties contain one threatened species, the Northern long-eared bat.

States may also establish endangered and threatened species lists that are at risk of extinction for the state, even though they may not be on the national endangered or threatened list. The Minnesota Department of Natural Resources maintains an extensive database of rare plants, animals, native plant communities, and other rare features.

Wetlands

Federal and state laws protect aquatic resources, including wetlands, swamps, marshes, bogs, and similar areas. Any wetland that is proposed to be impacted by a project is required to undergo a wetland impact sequencing discussion by addressing three aspects: avoidance, minimization, and replacement of unavoidable impacts.

A preliminary screening using aerial photography was completed to identify potential wetland resources in relation to the MAPO 2045 LRTP project corridors and intersections. Given the proposed project locations, predominantly in urbanized areas, many of the projects are anticipated to have a low to no potential for wetland impacts.

Floodplains

If the project crosses or lies adjacent to any floodplain area an impact may exist[1]. Floodplain maps available through Federal Emergency Management Agency (FEMA) were reviewed to determine if any MAPO 2045 LRTP project corridors or intersections were within a floodplain. Four of the proposed projects are located within the 100-year or 500-year floodplain.

Water Resources

In addition to wetlands protected by federal and state laws, as mentioned above, water resources are also protected in regard to water quality. Water quality issues need to be addressed whenever a project will add additional impervious surfaces, which may funnel additional water to water resources, such as water runoff.

The MAPO 2045 LRTP project parameters were assessed in regard to the amount of increase in impervious surfaces. Projects that entail new construction result in the greatest increases in impervious

[1] Minnesota Department of Transportation HPDP Scoping Guidance: Floodplains
http://dotapp7.dot.state.mn.us/edms/download?docId=608948

surfaces, and therefore greatest impacts to water resources, while project reconstructions generally have less impact to water resources.

Farmland and Soils

Federal laws require projects to take into account any impacts to agricultural land to ensure they are minimized to the extent reasonable. Agricultural land includes prime farmland, unique farmland, and any farmland that is of statewide or local importance. State laws apply for acquisition of more than 10 acres of agricultural land although the definition of agricultural land is much broader and can be considered any land outside city limits.

Aerial photography and GIS datasets were reviewed to determine the potential for impacts to farmable soils within the project corridors and intersections. Projects that are new construction in more rural areas have greater potential for impacting farmland.

Potentially Contaminated Properties

Early identification of contaminated properties in and adjacent to proposed project limits can aid in avoiding, or minimizing impacts for contaminated property cleanups. If contaminated properties are unavoidable, early identification can allow time to determine the extent or magnitude of contaminants that may require any special provisions. Early identification can also prevent any possible construction delays or increased costs that may arise from inadvertent discoveries.

Potential for impacts from contaminated properties was reviewed using the Minnesota Pollution Control Agency's "What's in My Neighborhood" mapping tool. Quantifications were made on the number of potentially contaminated sites on, or adjacent to, a project corridor or intersection.

Parks and Trails

Federal and state laws are intended to prevent conversion of certain park, wildlife and waterfowl refuges, recreation areas or historic properties to transportation use.

Project assessments were first done by mapping existing parks, pedestrian and bicycle facilities in the MAPO planning area. This was done by incorporating park and trail GIS datasets. The MAPO 2045 LRTP project corridors and intersections were then compared to park and trail locations, with an assessment for potential project impacts, including the permanency of the impacts.

Environmental Justice

Environmental justice is a public policy goal ensuring that low-income or minority populations do not bear disproportionately high or negative impacts as a result of the policies, programs, and activities of federal agencies. It originates from Executive Order 12898 signed by President Clinton in 1994.

Project assessments were done by first mapping areas with high concentrations of minorities or low-income populations in the MAPO planning area. This was done by determining census tracts within the MAPO planning area with concentrations of minorities greater than the county averages, and

which census tracts have household incomes at or below the poverty level for Nicollet and Blue Earth Counties.

Geographic information system (GIS) software was then used to overlay the future transportation projects on top of this information, and special attention was given to those projects that involve expansion or significant alteration of the existing transportation system.

Refer to Appendix 7-A for a full analysis of the proposed corridor and intersection improvements reviewed and an assessment of their potential impacts.

Financial/Revenue Forecast

One of the most important components of the Long Range Transportation Plan is its Financial/Revenue Forecasts. The Financial/Revenue Forecasts provide an understanding of what resources will be available to partnering agencies over the life of the plan for preservation, major rehabilitation and reconstruction, corridor and intersection, trail, transit, and safety projects.

Additionally, the Plan also needs to be fiscally constrained by providing a reasonable outlook of anticipated revenue streams for the next 30 years. MAP-21 states a financial plan must demonstrate how the long range transportation plan can be implemented, indicate resources from public and private sources that can reasonably be expected to be available to carry out the plan, and recommend additional financial strategies for needed project and programs included in the plan (23 U.S.C. 134 (g)(2)(B), 49 U.S.C. 5303 (f)(B), and 23 CFR 450.322 (f)).

The financial analysis will provide an overview of the transportation funds available for jurisdictions within the Mankato/North Mankato Area Planning Organization (MAPO) planning area. The summarized revenue and cost forecasts contained in this chapter reflect reasonably expected system-level revenue estimates. This section also establishes a baseline of how transportation projects and activities can be implemented within the fiscally constrained budget over the life of the plan. Since not all of the transportation projects and activities (noted in the Range of Alternatives) can be fiscally constrained within the life of the plan, this chapter also serves as an implementation tool to foster coordination among decision makers partnering within the MAPO.

Transportation Funding

Transportation funding for the MAPO area flows from three major sources including federal, state, and local.

Federal Highway Funding

Federal-aid funding for eligible projects is primarily available through the Federal Highway Administration (FHWA) programs for roadways and the Federal Transit Administration (FTA) for transit-related projects. Distributed by Congress, the Federal Highway Trust Fund (HTF) provides project funding opportunities with federal contributions up to 80 percent, and a 20-percent minimum local funding share for federal-aid projects. Exceptions include safety (HSIP) and interstate maintenance (IM) identified freight projects, which contribute up to 90 percent and a minimum of a 10 percent local funding share. The HTF is supported by an 18.4 cent tax per gallon of gasoline and 24.4 cent per gallon tax on diesel fuel. Other special federal grant programs (i.e., ARRA, TIGER) or congressionally designated projects, or assistance from other federal programs (i.e., EDA, FEMA) periodically may assist in transportation infrastructure improvements.

State Highway Funding

To ensure the State maintains a safe, effective, and coordinated highway system, the State works closely with local levels of government. Minnesota state funding is almost exclusively distributed by the Department of Transportation (MnDOT). State revenue sources include primarily transportation bonds, state gas tax and license fees. MnDOT expends the majority of these revenues on its system, but it also distributes to local governments State grant programs (CIMS, TED, Corridors of Commerce, etc.), federal grant programs (often administered by the MnDOT ATPs or MnDOT Central Office), or county/municipal state-aid system funding. Based on a predetermined formula, MnDOT provides state-aid funds for construction and maintenance to all counties and cities over 5,000 population. These funds may be used to meet the local match required for federal funds or to fully fund transportation projects.

Local Highway Funding

Various local taxing and bonding mechanisms constitute sources of local transportation funding for MAPO jurisdictions. Local revenue sources include mill levies, general fund, gravel tax, special assessments, sales tax, county wheelage tax (counties only), bonds, or special transportation levies. These funds may be used to meet the local match required for federal funds or to fully fund transportation projects.

Transit funding for the MAPO planning area (Greater Mankato Transit System) comes from a combination of sources including federal (FTA), state (MnDOT Transit), and local (farebox and contracts, and local property tax levies) sources.

Funding Assumptions, Methodologies, and Estimates

In an effort to provide a reasonable forecast of anticipated future revenue streams for MAPO partners, a locally derived methodology and forecasting tool for estimating revenues were developed based on the steps outlined below:

- A six-year historical average (2009-2014) of past revenue streams (e.g., general mill levy, road and bridge levy, sales tax, permits, turnback funds, bonds, and assessments) was reviewed to determine the baseline for cities and counties. Inflation factors were used to bring all past revenue streams to 2014 dollars.

- Data for year 2015 was not available at the time this exercise was performed; therefore, year 2015 revenue estimates were calculated based on an average of the "year 2014" revenues. It was agreed by cognizant agencies and MAPO that year 2016 would serve as the baseline for future revenue projections. In addition, it was agreed that no inflation would be applied between year 2015 and year 2016.

- Special scrutiny of certain potential funding sources was completed by planning partners. For example, it was agreed that since various competitive federal grants or congressional "earmarks" were infrequent and unreliable, that it was not reasonable to use these sources in future revenue forecasts, even though such funds had in the past been received by local governments. Further, regarding STP and their federal funds allocated by the District 7 Area Transportation Partnership (ATP) to local governments, it was agreed that since the entities receive a documented annual allocation that these funds would be included in the future forecasts; however, since the cities do not receive a regular allocation, their random allocations would not be considered in future revenue streams. Finally, concerning the use of local bonding by cities and counties, it was agreed that if historically a jurisdiction regularly bonded over the past (i.e., Mankato, North Mankato, and Nicollet County) that it was reasonable to assume it would continue to do so in the future; therefore, use of bonds was included in the future forecasts (annual bond payments were deducted). On the other hand, if a jurisdiction did not use bonding at all (Blue Earth County) or only infrequently used bonding in the past, then either none or only the remaining term of the current outstanding bonds, as of 2015, were forecast.

- Historical data was not used to determine a 2016 baseline for MnDOT. Instead, the baseline was determined by using planned or programmed projects in the *District 7 Capital Highway Investment Plan (CHIP)* or in the *MnSHIP* document. Thus, the MnDOT forecasting baseline was set at 2015. This baseline level also included recently awarded HSIP funds and county bridge projects programmed in the ATP's 2015-2018 STIP.

- Growth factors were applied annually to each agency's baseline year (2016) in order to determine revenue forecasts for four time horizons: short-(2016-2020), mid 1-(2021-2025), mid 2-(2026-2030) and long-term (2031-2045). The growth factors were mutually agreed upon by MAPO and its cognizant review agencies and were determined to be different for local and state/federal sources, as noted below:

    - Cities and Counties = 3.2 percent
    - MnDOT = 1.9 percent
    - Federal = 1.9 percent

- Blue Earth and Nicollet county revenue forecasts were based on historic trends for the entire county. Therefore, this total revenue was reduced to reflect the probable share of future revenue that can be expected to be allocated to the county highways within the MAPO planning area based on county engineer experience, understanding that the remainder of the county revenue will be allocated outside of the MAPO area. An adjustment factor of 20 percent was applied to Blue Earth County, while an adjustment factor of 9 percent was applied to Nicollet County. These adjustment factors were developed in full cooperation with each county engineer, and after a number of alternatives were examined.

- A growth factor was also applied annually to transits baseline year (2015), in order to determine revenue forecasts for future time horizons. As with highways, the growth factor used for federal and state transit sources was 1.9 percent. However, local revenue sources used a growth rate of 1.0 percent for farebox and contract revenue, along with 3.2 percent applied to local property tax levy sources. These assumptions and methodologies were prepared by GMTS and MnDOT Transit staff, in consultation with MAPO. Table 8-2 provides a summary of MAPO's transit revenue forecasts by funding source.

- MAPO staff maintain, and have available, all revenue forecast data, including assumptions and the forecast tool results by jurisdiction.

Revenue Forecasts

Based on the revenue assumptions and methodology documented above, the MAPO planning area can reasonably anticipate approximately $817 million of highway revenue and $95 million of transit revenue over the next 30 years. These forecasted revenues have been allocated by the six partnering agencies into the appropriate four time horizons (see Table 8-1 and Table 8-2).

Table 8-1: MAPO Highway Revenue Forecasts Summary by Jurisdiction

Revenue Forecast Summary	Short-Term 2016-2020	Mid-Term 1 2021-2025	Mid-Term 2 2026-2030	Long-Term 2031-2045	Total
MnDOT	$23,101,046	$34,819,504	$30,081,874	$109,256,968	**$197,259,392**
Blue Earth County	$29,528,459	$22,078,663	$25,078,348	$97,938,840	**$174,624,310**
Nicollet County	$3,179,709	$3,588,144	$4,057,988	$15,705,150	**$26,530,992**
North Mankato	$7,589,194	$8,652,551	$9,874,479	$38,937,356	**$65,053,580**
Mankato	$38,348,438	$44,889,645	$52,546,604	$217,794,173	**$353,578,861**
Total:	**$101,746,846**	**$114,028,508**	**$121,639,293**	**$479,632,488**	**$817,047,135**

Table 8-2: MAPO Transit Revenue Forecast Summary by Funding Source

Revenue Forecast Summary	Short-Term 2016-2020	Mid-Term 1 2021-2025	Mid-Term 2 2026-2030	Long-Term 2031-2045	Total
State Revenue	$7,736,000	$8,499,000	$9,338,000	$33,914,000	**$59,486,000**
Federal Revenue	$3,302,000	$3,628,000	$3,986,000	$14,478,000	**$25,395,000**
Farebox and Contract Revenue	$2,014,000	$2,117,000	$2,225,000	$7,380,000	**$13,736,000**
Local Property Tax Levy *	-$594,000	-$557,000	-$511,000	-$1,154,000	**-$2,816,000**
Total:	**$12,458,000**	**$13,687,000**	**$15,038,000**	**$54,618,000**	**$95,802,000**

* Negative number = excess operating revenue

Enhanced Funding Opportunities

MAPO jurisdictions are well versed in how their funding programs are secured and actively seek a variety of funding sources to supplement their local funds. However, the funding picture will likely fluctuate many times over the next 30 years. Therefore, the respective leaders must employ a number of funding and implementation strategies to meet identified system preservation needs and expected growth.

Traditional sources of highway/bridge funding (e.g., motor fuel tax, motor vehicle excise tax or local levy) are insufficient to concurrently pay for both capacity expansion and maintenance of the existing network. Increases in vehicle fuel efficiency and a plateauing of vehicle miles traveled suggest that increases in the gas tax will not effectively raise revenue in the future. Thus, an important strategy is to seek new sources of revenue to address the needs of the transportation network.

Potential revenue enhancements can be considered as either external (federal and state) or internal (locally enacted) programs. External sources are generally grants and other programs that require a competitive application and allocation cannot be controlled. The internal sources represent funding mechanisms that may be implemented at any time, based on local decisions. Table 8-3 summarizes potential strategies and indicates whether they can be used for capital, reconstruction, or maintenance investments; require repayment (bond or loan); and whether or not they require a local match (grant). This list is not meant to be all inclusive, but instead highlights programs and strategies that may be available and applicable for desired improvements.

Table 8-3: Summary of Enhanced Funding Opportunities

Funding Source	Construction or Expansion	Reconstruction	Rehabilitation or Maintenance	Repayment Required	Match Required	Applicability to Preservation or Construction Needs	Probability of Securing
I. External Sources							
A. TIGER	Yes	Yes	Yes	No	Yes	Very Low	Very Low
B. HSIP	No	Yes	Yes	No	Yes	Medium	Medium
C. HPP	Yes	Yes	No	No	Yes	Medium	Very Low
D. TED	Yes	Yes	Yes	No	Yes	Very Low	Low
E. STP (road/bridge/ alternatives)	Yes	Yes	Yes	No	Yes	High	High
F. State Bonding	Yes	Yes	Yes	Yes	No	High	Medium
G. Local Road Improvement Program	Yes	Yes	Yes	No	Sometimes	High	Medium
H. Local Bridge Replacement	No	Yes	Yes	No	Sometimes	Medium	Medium
I. State-Aid Funds	Yes	Yes	Yes	No	No	High	High
J. Legacy Grants	Yes	Yes	Yes	No	Yes	Medium	Medium
II. Internal Sources (Taxing Tools)							
A. County Wheelage Tax	Yes	Yes	Yes	No	No	High	High
B. Dedicated Sales/ Use Tax	Yes	Yes	Yes	No	No	High	High
C. Gravel Tax	Yes	Yes	Yes	No	No	Medium	N/A
D. Ad Valorem Tax Levy	Yes	Yes	Yes	No	No	High	High
E. Tax Increment Financing (TIF)	Yes	Yes	Yes	No	No	Low	Medium
F. Tax Abatement	Yes	Yes	Yes	No	No	Low	Medium
G. Special Tax Levy for Transportation	Yes	Yes	Yes	No	No	Medium	Low
III. Internal Sources (Bonding Tools)							
A. Local Bonds (GO Bonds)	Yes	Yes	Yes	Yes	No	High	Medium
B. Special Reconstruction Bonds	Yes	Yes	Yes	Yes	No	High	Medium
C. Special Assessment/Special Assessment Bonds	Yes	Yes	Yes	Yes	No	Low	Low
IV. Internal Sources (Agreement)							
A. Negotiated Developer Fees for Specific Development	Yes	Yes	Yes	No	No	Medium	Low
B. Third Party Agreements	Yes	Yes	Yes	No	No	Medium	Medium
C. Cooperative/Cost Sharing Agreements	Yes	Yes	Yes	No	Yes	High	Medium

Implementation Plan

This chapter documents the process used to prepare the Mankato/North Mankato Area Planning Organization (MAPO) fiscally constrained program of projects for the MAPO planning area. This task included partnering agencies determining system preservation set asides, identifying remaining funds available for new construction and expansion needs, and prioritizing the projects into the appropriate time frames along with input from the public. During this fiscal-constraint and prioritization process, project costs were adjusted to account for year of expenditure (YOE) by considering construction and inflation costs.

The fiscally constrained project list was developed to be consistent with the Plan's goals, objectives, standards, and performance measures. A large component of this effort focused on preserving and maintaining the MAPO areas National Highway System (NHS) functionally classified roadways, and multimodal infrastructure.

This chapter documents the methodology used to prioritize projects and fiscally constrain the Plan. It also fully describes the evaluation process, documenting the various steps followed to achieve the ultimate study purpose – a performance-based, technically sound, financially feasible program of multimodal transportation projects that address MAPO's established key goals. Projects that were technically justified but could not be fitted into the fiscal constraints are presented as illustrative projects. At such time that additional funding becomes available, these illustrative projects, by plan amendment, may be advanced into the approved fiscally constrained program of projects.

Project Categories

During the range of alternative planning process, there were nine project categories identified: preservation, major rehabilitation/reconstruction, corridors, intersections, bicycle and pedestrian, safety, freight, airport, and transit. A description of these categories and the type of projects included in each is provided below.

Operations and Maintenance Projects – Projects that do not add capacity and are not major rehabilitation or reconstruction improvement projects. Operations and maintenance projects improve the efficiency and maintain the system. Such projects include re-striping, turn lanes, and traffic control modifications. These items are identified independent of the pavement preservation needs assessment as they can be singled out based on stakeholder input or other sources.

Major Rehabilitation/Reconstruction Projects – These include major infrastructure improvements (non-capacity expansion) that are needed when roads and bridges have exceeded their functional lifespan.

Corridor Capacity Expansion Projects – Expansion projects address capacity, safety, access, and turning movement concerns along each corridor identified.

Intersection Capacity Expansion Projects – Intersection capacity expansion projects seek to address the safety, capacity, and traffic concerns at each intersection identified. In many instances, further studies are needed to determine if a signal, roundabout, R-CUT, or other access modification is appropriate.

Bicycle and Pedestrian Projects – Non-motorized improvements seek to serve both recreational and commuter transportation as it is integrated into the comprehensive transportation network. Projects include both on- and off- street facilities, as well as pedestrian crossing improvements.

Safety Projects – Safety improvements to the transportation system that seek to reduce the number of crashes, fatalities, injuries, and conflicts.

Freight Projects – Improvements working to improve freight expansion needs and safety of at-grade intersections isolated for freight purposes.

Airport Projects – Various improvements ranging from runway maintenance to facility expansions.

Transit – Projects identified to maintain operations of the system and enhance the ability to deliver transit service (e.g. bus replacement).

Table 9-8 through Table 9-16 provide the specific projects listed within these categories, which met rigorous technical analysis and were considered justified for further evaluation. These lists were fundamental building blocks on which further project prioritization and fiscal constraint analysis was undertaken.

Project Coordination

As projects are implemented, coordination opportunities may occur among jurisdictions and between projects. In order to help coordination among agencies and projects, the prioritization analyses also determined if a project could be completed with another. If so, the complementary project was identified with the corresponding project number and project category such as: "C" corridor, "I" intersection, "R" major rehabilitation/reconstruction, "P" preservation, "S" safety, or "BP" bicycle/pedestrian project. Table 9-8 through Table 9-15 document these opportunities for multimodal integration.

Ranking Criteria

In order to ensure projects support the LRTP's goals, each project was initially considered against the five MAPO key performance focus goal areas of access and reliability, economic vitality, safety, preservation, and multimodal transportation. This analysis is documented in Table 9-8 through Table 9-14; additional ranking factors included average daily traffic, congestion, safety, crash rates, and multimodal aspects. The TAC used these criteria to develop preliminary project rankings by specific investment time frames.

Investment Time Frames and Initial Project Ranking

The implementation phases were defined early in the planning process by the TAC to correspond to the revenue forecasts. These included: short-(2016-2020), mid 1-(2021-2025), mid 2-(2026-2030), and long-term (2031-2045) time frames.

Early in the process, MAPO staff cooperatively identified initial time frames agencies would like each project to occur by using the ranking criteria and one-on-one work sessions with each partner agency. This analysis is documented for each project category in Table 9-8 through Table 9-15; projects meeting more project goal areas and ranking criteria tended to have an earlier desired timeframe.

Preservation Set-Aside

A critical step in the financial constraint evaluation process was to set aside sufficient funding to maintain the metropolitan area's transportation system in a "state of good repair." Funds for the set-aside were taken from forecasted revenue streams; thus, before "new or expansion" projects (often referenced as discretionary projects) could be programmed, system preservation improvements (i.e., system operations and maintenance, and major rehabilitation/reconstruction) needed to be accommodated, as identified on the project category lists and pavement operations and maintenance outline. MAP- 21 states that the metropolitan planning process shall emphasize the preservation of the existing transportation system (e.g., preservation needs)-(23 U.S.C. 134 (h)(1)(H)). Therefore, preservation needs must be met before discretionary system needs are addressed in the project programming process. This was a consistent theme throughout the LRTP. Consequently, the majority of the partnering agencies' draft programs of projects (presented later) consist mainly of operations and maintenance or major rehabilitation/reconstruction projects.

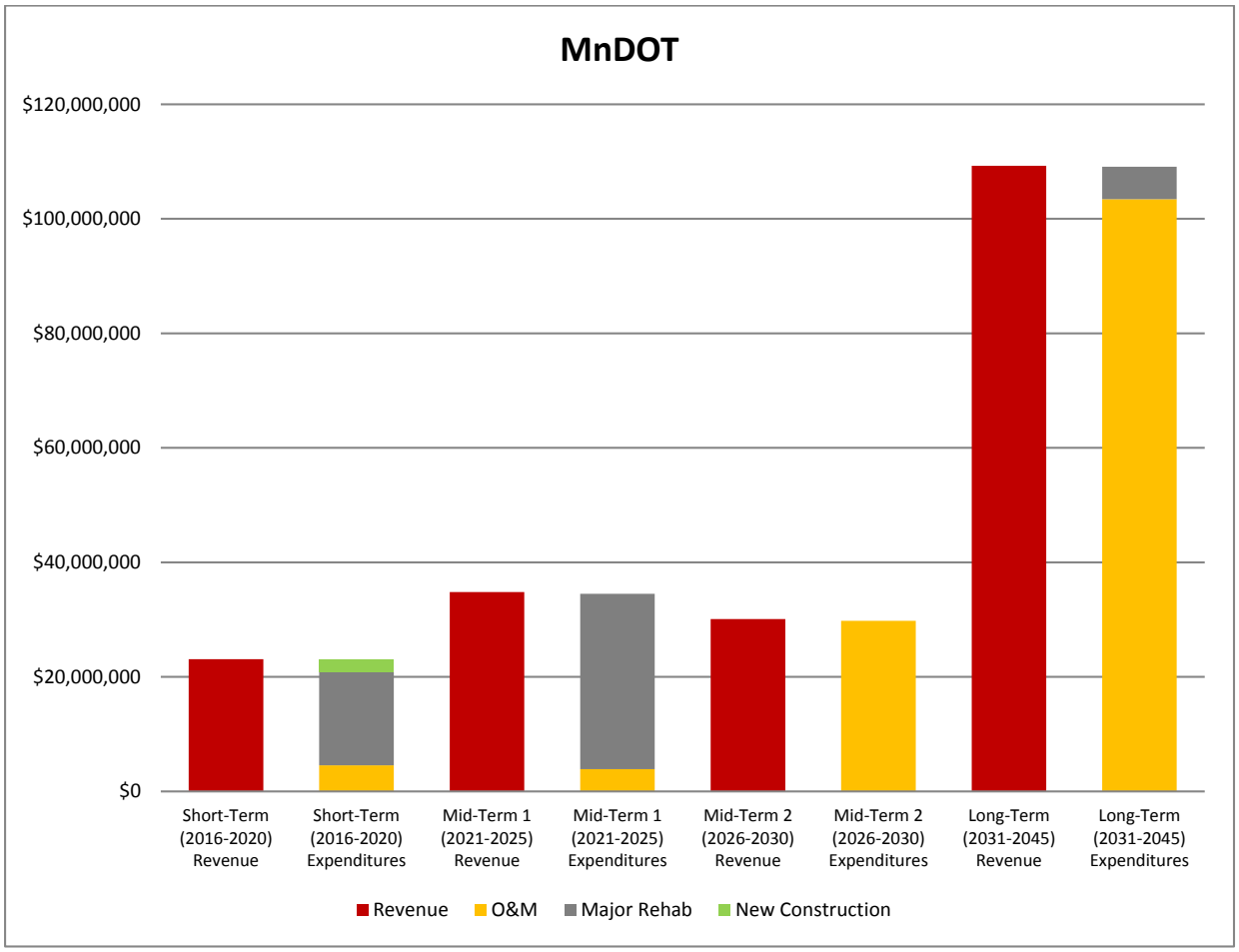
Figures 9-1 through 9-5 graphically document the preservation set-aside and discretionary funds remaining, by jurisdiction, for the investment timeframes. Additionally Tables 9-1 through 9-5 provide the estimated cost allocations for these items, again by jurisdiction and investment period.

Year of Expenditure Analysis and Project List Revisions

Using the initially desired time frames for the various projects in each category, an attempt was made to develop more realistic costs based on the anticipated year of expenditure (YOE). The YOE costs were estimated as midpoints of the respective time frames with an applied annual inflation rate of 4.5 percent.

A second set of one-on-one workshops with planning partners was held to again review the preliminary project lists after the preservation set-aside was determined and the YOE costs for remaining discretionary projects was presented. From this effort a preliminary fiscally constrained program of projects was developed by jurisdiction. Discretionary projects not anticipated to fall within the reasonably expected revenue sources were moved to an illustrative list.

Figure 9-1: MnDOT Fiscal Constraint Summary within the MAPO Planning Area

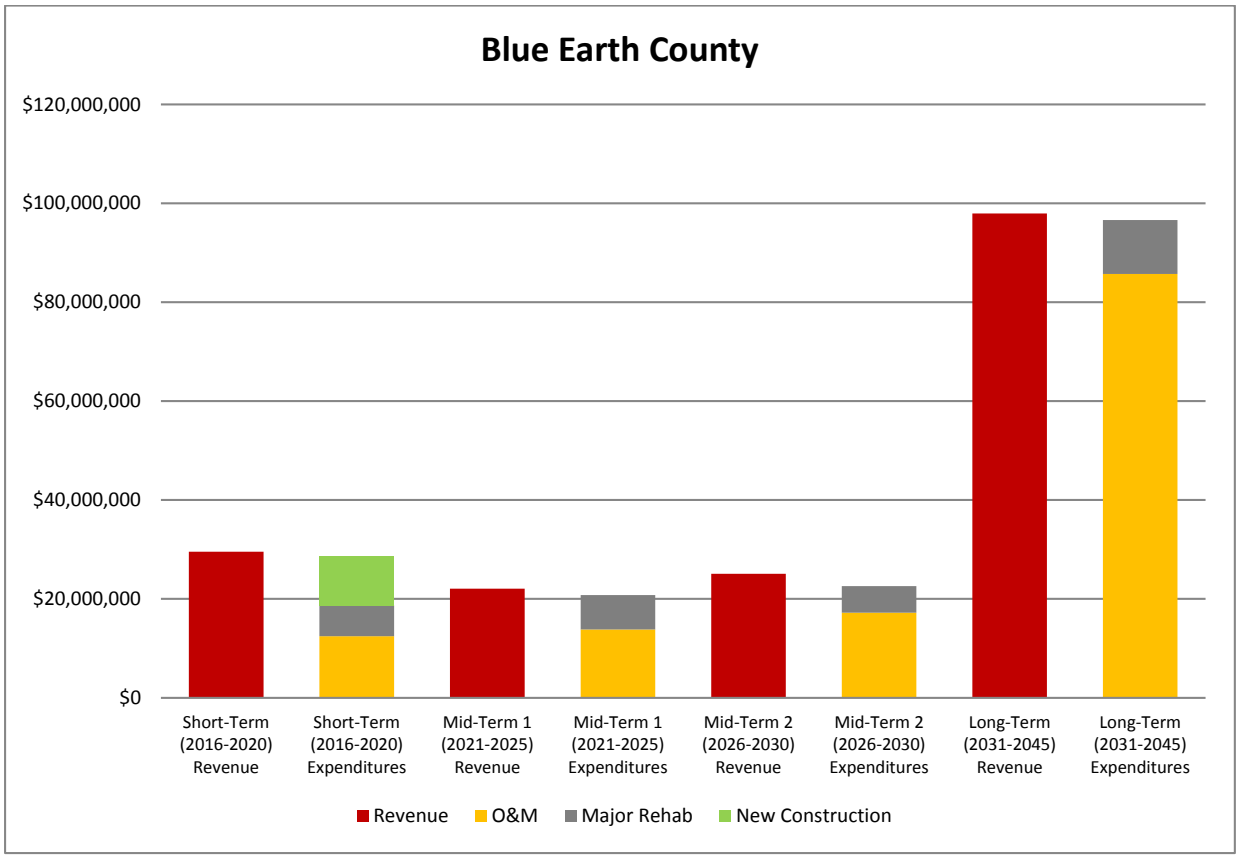


Note: The new construction project accounted for in the short-term timeframe was previously planned as part of MnDOT's Capital Highway Improvement Proposal (CHIP)

Table 9-1: MnDOT Fiscal Constraint Summary within the MAPO Planning Area

MnDOT	Short-Term (2016-2020)	Mid-Term 1 (2021-2025)	Mid-Term 2 (2026-2030)	Long-Term (2031-2045)
Revenue	$23,101,000	$34,819,500	$30,081,900	$109,257,000
Operation and Maintenance (Expenditure)	$4,540,000	$3,873,000	$29,800,000	$103,436,000
Major Rehabilitation (Expenditure)	$16,300,900	$30,630,300	$0	$5,668,000
New Construction (Expenditure)	$2,200,000	$0	$0	$0
Balance (Revenue - Expenditure)	**$60,100**	**$316,200**	**$281,900**	**$153,000**

Figure 9-2: Blue Earth County Fiscal Constraint Summary with the MAPO Planning Area



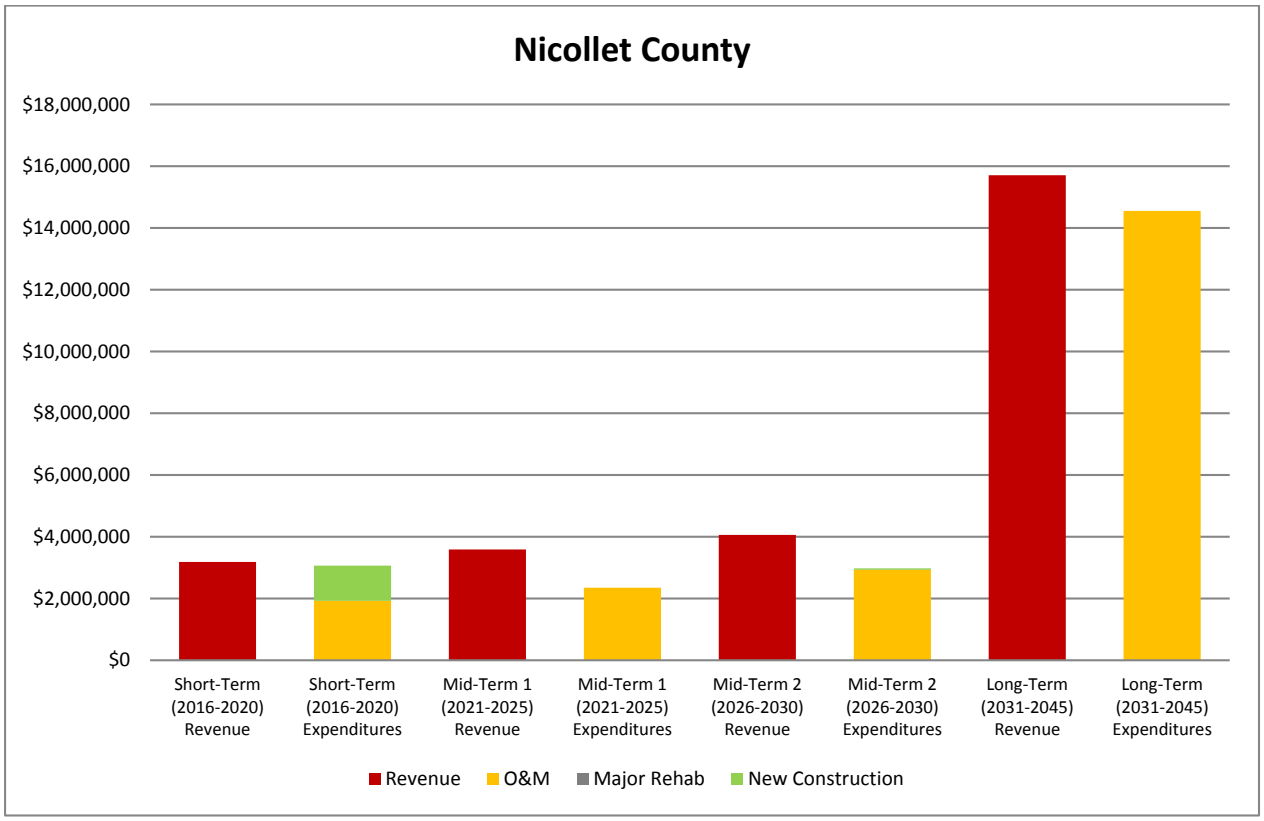
Notes: The new construction project accounted for in the short-term timeframe was previously planned as part of Blue Earth County's Capital Improvement Plan (CIP).

The revenue forecasts for Blue Earth County represent the amount of total county revenue (20%) to be spent within the MAPO planning area (see chapter 8).

Table 9-2: Blue Earth County Fiscal Constraint Summary within the MAPO Planning Area

Blue Earth County	Short-Term (2016-2020) Revenue	Mid-Term 1 (2021-2025) Revenue	Mid-Term 2 (2026-2030) Revenue	Long-Term (2031-2045) Revenue
Revenue	$29,528,500	$22,078,700	$25,078,300	$97,938,800
Operation and Maintenance (Expenditure)	$12,462,200	$13,810,000	$17,225,000	$85,710,000
Major Rehabilitation (Expenditure)	$6,238,800	$6,955,700	$5,356,900	$10,914,500
New Construction (Expenditure)	$10,000,000	$0	$0	$0
Balance (Revenue - Expenditure)	**$827,500**	**$1,313,000**	**$2,496,400**	**$1,314,300**

Figure 9-3: Nicollet County Fiscal Constraint Summary with the MAPO Planning Area



Note: The revenue forecasts for Nicollet County represent the amount of total county revenue (9%) to be spent within the MAPO planning area (see chapter 8).

Table 9-3: Nicollet County Fiscal Constraint Summary within the MAPO Planning Area

Nicollet County	Short-Term (2016-2020	Mid-Term 1 (2021-2025)	Mid-Term 2 (2026-2030)	Long-Term (2031-2045)
Revenue	$3,179,700	$3,588,100	$4,058,000	$15,705,200
Operation and Maintenance (Expenditure)	$1,924,000	$2,350,000	$2,926,000	$14,553,000
Major Rehabilitation (Expenditure)	$0	$0	$0	$0
New Construction (Expenditure)	$1,141,200	$0	$50,100	$0
Balance (Revenue - Expenditure)	**$114,500**	**$1,238,100**	**$1,081,900**	**$1,152,200**

Figure 9-4: Mankato Fiscal Constraint Summary

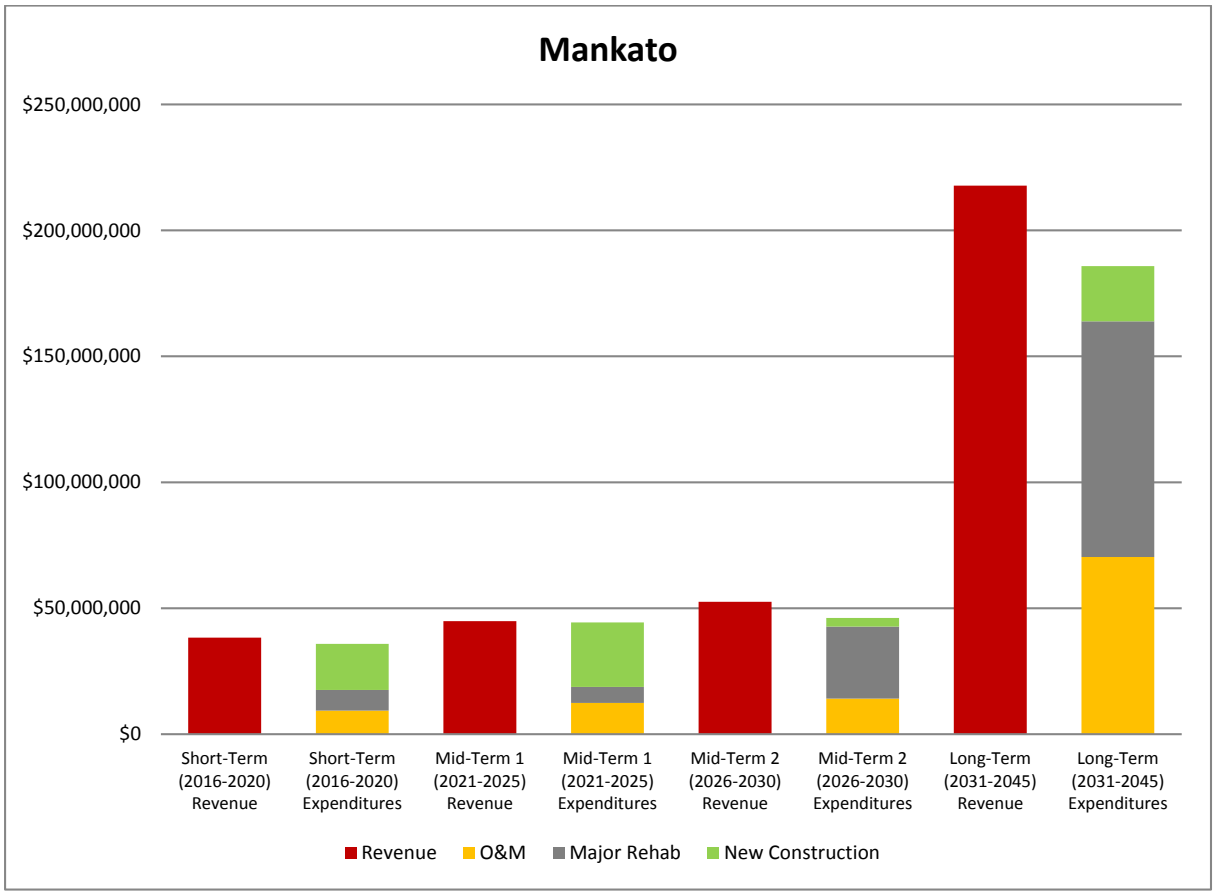


Table 9-4: Mankato Fiscal Constraint Summary

Mankato	Short-Term (2016-2020)	Mid-Term 1 (2021-2025)	Mid-Term 2 (2026-2030)	Long-Term (2031-2045)
Revenue	$38,348,400	$44,889,600	$52,546,600	$217,794,200
Operation and Maintenance (Expenditure)	$9,346,900	$12,416,700	$14,140,000	$70,366,000
Major Rehabilitation (Expenditure)	$8,232,600	$6,326,500	$28,558,300	$93,569,800
New Construction (Expenditure)	$18,279,300	$25,634,900	$3,467,200	$21,857,700
Balance (Revenue - Expenditure)	**$2,489,600**	**$511,500**	**$6,381,100**	**$32,000,700**

Figure 9-5: North Mankato Fiscal Constraint Summary

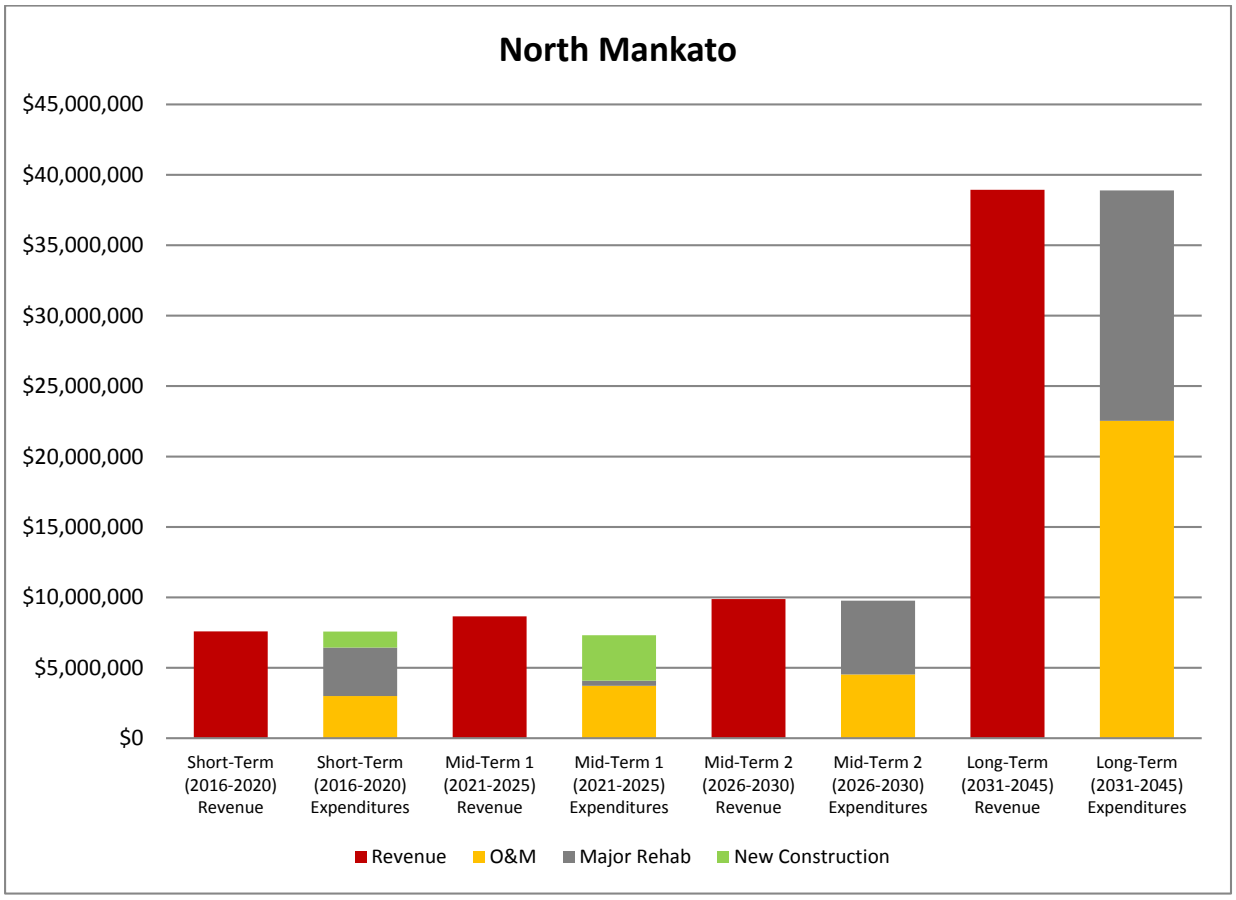


Table 9-5: North Mankato Fiscal Constraint Summary

North Mankato	Short-Term (2016-2020)	Mid-Term 1 (2021-2025)	Mid-Term 2 (2026-2030)	Long-Term (2031-2045)
Revenue	$7,589,200	$8,652,600	$9,874,500	$38,937,400
Operation and Maintenance (Expenditure)	$2,995,100	$3,716,500	$4,526,000	$22,533,000
Major Rehabilitation (Expenditure)	$3,443,700	$367,300	$5,242,400	$16,358,800
New Construction (Expenditure)	$1,135,400	$3,227,500	$0	$0
Balance (Revenue - Expenditure)	**$15,000**	**$1,341,300**	**$106,100**	**$45,600**

Public Review

The early draft of the preservation, fiscally constrained, and illustrative project lists were presented to the public during the second open house meeting in order to receive public input regarding expectations for improvements and appropriate timeframes. The requirements for preservation and fiscal constraint were explained to the public, along with the procedures used to incorporate these factors into the project prioritization process. An interactive engagement activity allowed the public to provide their insights on project prioritization. In general, there was consensus on the overall prioritization of projects. All comments were reviewed by the jurisdictions and the TAC before adjustments to the project priorities were made, and a few projects were shifted among timeframes. This revised set of projects was incorporated into the draft fiscally constrained and illustrative project lists and presented at the third open house meeting held on the draft LRTP. See Appendix 2-C for a detailed summary of public input regarding the project lists.

Discretionary Project Prioritization

As noted earlier, the extensive list of "state of good repair" activities is relative to the restrictive revenue forecasts that resulted in limited opportunities for discretionary projects (e.g., new or expansion projects outside the scope of regular maintenance activities). These discretionary projects were prioritized using a sound technical analysis and then coordinated with each planning partner and the TAC. Shaded on Table 9-8 through Table 9-16 are the discretionary projects selected, by jurisdiction.

Fiscally Constrained Program of Projects

Based on each planning agency's anticipated revenues and the selected operations and maintenance, major rehabilitation/reconstruction, and discretionary projects, a draft metropolitan area program of fiscally constrained projects was prepared. All transportation revenue and planned expenditures were balanced by jurisdiction for each timeframe.

While the figures and tables contained in this chapter document a fiscally-constrained plan, there are significant unmet needs for various project types; possibly most significant are the numerous MnDOT bridges noted in the major rehabilitation/reconstruction project list. This is covered in greater detail in the section(s) that follow.

Illustrative Project List

Projects that could not be included in the fiscally constrained program due to lack of funds were defined as "illustrative projects." Refer to Table 9-8 through Table 9-14 for a complete list of illustrative projects.

The illustrative project list contains mostly new or expansion discretionary projects, currently without reasonably expected funding from traditional sources. During the planning process, these projects were justified based on a variety of data sets including traffic forecasts, anticipated levels of congestion,

safety concerns, expected connectivity needs, existing planning studies, or public and partnering agency input. Illustrative projects should be considered "opportunity driven," as these projects may shift to a fiscally constrained time frame if funding becomes available in the future.

In addition, some preservation projects are included in the illustrative list due to limited funding availability; as previously stated, MAP-21 states that the metropolitan planning process shall emphasize the preservation of the existing transportation system (e.g., preservation needs)-(23 U.S.C. 134 (h)(1)(H)). Therefore, prior to new or expansion projects being shifted to a fiscally constrained time frame (for a particular jurisdiction), the preservation needs must be met.

Financial Gap Assessment – Unmet Needs

Thus far, the MAPO 2045 LRTP has defined a program of projects and demonstrated fiscal constraint. Review of the illustrative project list provides an indication of the significant needs that are unmet, and as such represents the area's financial gap by jurisdiction. The majority of the projects on this list have an associated present day cost value that can be summed to represent this gap. Table 9-6 presents the financial gap assessment by jurisdiction. This value is an estimation of the financial gap; it will likely be greater than what is shown below because not all illustrative projects have a present day cost value associated with them due to various uncertainties and project development needs.

Table 9-6: MAPO Financial Gap Assessment by Jurisdiction

Project Cash Flow	MnDOT	Blue Earth County	Nicollet County	Mankato	North Mankato
Projected Revenue	$197,259,400	$174,624,300	$26,531,000	$353,578,800	$65,053,700
Fiscally-Constrained Projects (O&M, Major Rehab, New Construction)	$196,298,200	$168,673,100	$22,944,300	$ 312,195,900	$63,545,700
Illustrative Projects	$126,399,162	$76,111,610	$-	$14,843,829	$15,321,000
Gap – Surplus/(Deficit)	($125,437,962)	($70,160,410)	$3,586,700	$26,539,071	($13,813,000)

Sample gap calculation: MnDOT → $197,259,400 - $196,298,200 = $961,200 - $126,399,162 = ($125,437,962)

As shown, some jurisdictions have greater needs than others (e.g., MnDOT and Blue Earth County have significant unmet needs and financial gaps); while others are either near, approximately equal to, or slightly under their revenue projections. This information underscores the need for additional revenue for, at a minimum, the two jurisdictions with significant gaps over the next 30 years. It is important to note that the values presented here are in present day cost values; if/when these projects are shifted to a fiscally-constrained timeframe their cost estimates will be revisited and projected for their respective year of expenditure.

Aviation and Transit Program of Projects

It is important to note that both aviation and transit priorities were excluded from this exercise because the Greater Mankato Transit System and the Regional Airport Authority's projects have already been screened using FTA and FAA preservation and fiscal constraint rules, as described below:

Aviation

The Mankato Regional Airport is funded through federal, state, and local funding sources. The City of Mankato Capital Improvement Program (CIP) has documented funding through various sources including the Federal Aviation Administration (FAA) to improve the runways, public parking, storage and grounds facilities. The City of Mankato CIP has accounted for aviation improvements through the year 2026. Updates to the LRTP should occur as changes to the City's CIP take place in order to maintain an all-inclusive list of aviation projects with secured funding.

Transit

Transit was also fiscally constrained by the Greater Mankato Transit System and MnDOT Transit. Funding for transit in the MAPO planning area is received from federal, state, and local sources. Such sources include the Federal Transit Administration Section 5307, the Greater Minnesota Transit Fund, MSU, Mankato, and advertising funds. Figure 9-6 and Table 9-7 document forecasted revenue and expenditure levels over the four investment periods. Operating expenditures and capital investments being utilized by the transit program include maintaining a reliable and cost-effective fleet and facility required to support operations and administration. It should be noted the Greater Mankato Transit System is in the process of constructing a new storage facility, and it will be fully operational in early 2016. Based on this analysis, forecasted revenue and expenditures will not be balanced sometime after year 2026.

It is understood that as the region increases in population and the population ages, transit will become more important in the future. At a minimum, the Greater Mankato Transit System will need to increase revenue to grow transit service hours and service miles as the population increases. These coordination, development, and integration needs should be explored further in the upcoming MAPO Transit Development Plan.

Figure 9-6: MAPO Greater Mankato Transit System Fiscal Constraint Summary

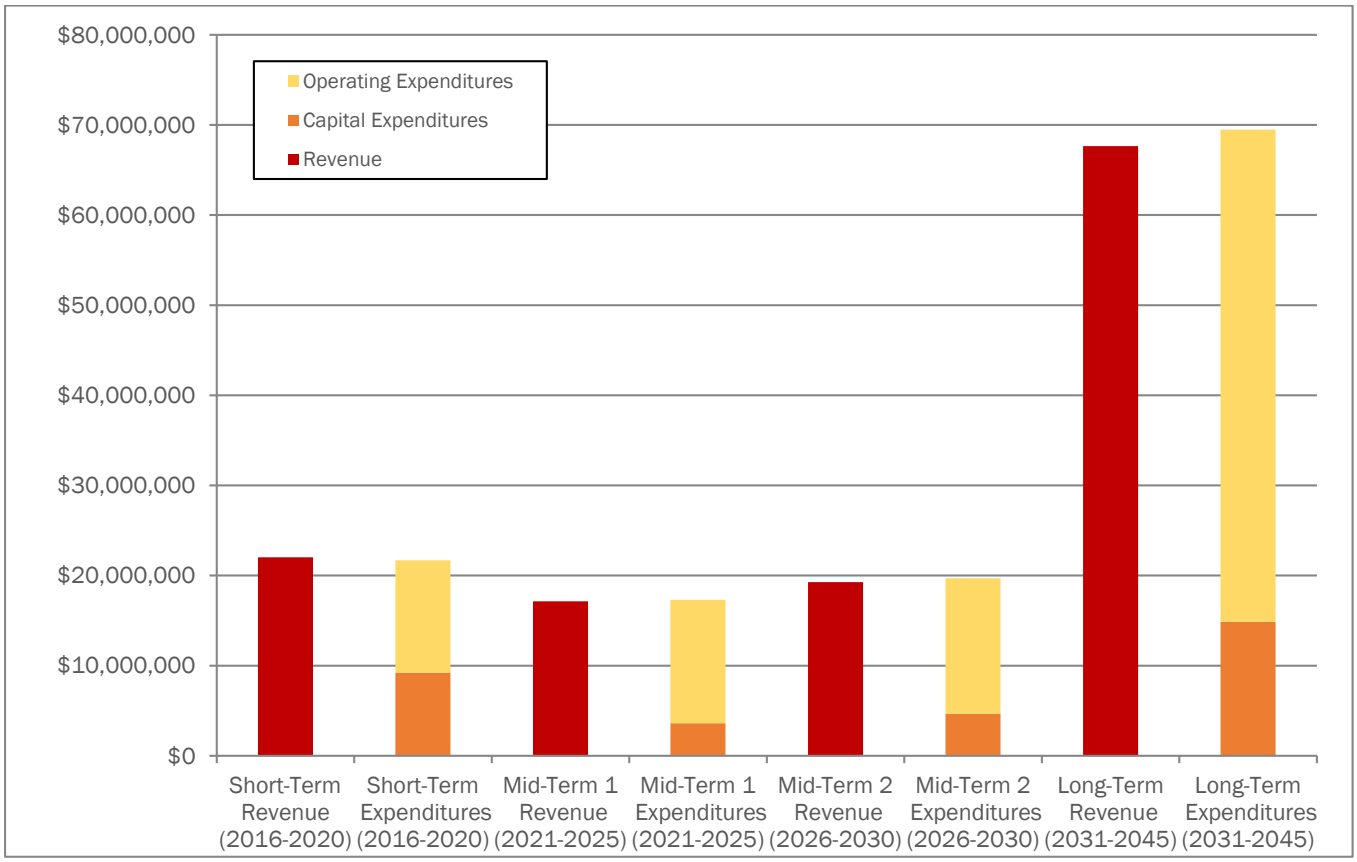


Table 9-7: MAPO Greater Mankato Transit System Fiscal Constraint Summary

		Short-Term (2016-2020)	Mid-Term 1 (2021-2025)	Mid-Term 2 (2026-2030)	Long-Term (2031-2045)
Revenue	Federal Revenue[1]	$3,302,000	$3,628,000	$3,986,000	$14,478,000
	State Revenue[2]	$7,736,000	$8,499,000	$9,338,000	$33,914,000
	State Grants[2]	$976,000	$2,889,000	$3,718,000	$11,888,000
	Farebox and Contracts[3]	$2,014,000	$2,117,000	$2,225,000	$7,380,000
	Other Revenue*	$8,000,000	$0	$0	$0
Expenditure	Operating Expenses	$12,458,000	$13,687,000	$15,038,000	$54,618,000
	Fleet Capital Expenses	$1,220,000	$3,611,000	$4,648,000	$14,860,000
	Facility Capital Expenses	$8,000,000	$0	$0	$0
	Surplus/Deficit	**$350,000**	**-$165,000**	**-$419,000**	**-$1,818,000**
	Surplus/Deficit (% Diff)	**1.6%**	**-1.0%**	**-2.2%**	**-2.7%**
	Annual Surplus/Deficit	**$70,000**	**-$16,500**	**-$41,900**	**-$121,200**

1. Federal Transit Admiration (FTA) Section 5307
2. Greater Minnesota Transit Fund
3. Minnesota State University, Mankato and Advertising

*STP, SOGR, GO Bond, and Local Taxes

Table 9-8: Identified Operations and Maintenance Projects

								MAPO Key Performance Focus Areas								
ID	Facility	Location/Termini	Project Description	Plan	Agency	Distance (Miles)	Project Coordination	Access and Reliability	Economic Vitality	Safety	Preservation	Multi-Modal Transportation	Estimated Cost (2015)	Initial Prioritization Timeframe	Fiscally Constrained Priority Timeframe	Y.O.E. Estimated Cost (Based on Timeframe)	Public Input Priority Preference (5/14/15)
1	Lee Blvd	Roe Crest Dr to Lor Ray Dr	Re-stripe as a 3-lane facility	MAPO 2045 LRTP	North Mankato	0.25	BP53 / R16				X		$ 15,000	Short	Short	$ 17,100	Mid: 1
2	May Street	Riverfront to N 6th	Traffic Control Modifications (All-way stop conversion at May St. & Broad St.)	MAPO 2045 LRTP	Mankato	0.32	R55	X		X	X		$ 5,000	Short	Short	$ 5,700	
3	Sioux Rd	Madison Ave to Adams St	Re-stripe as a 3-lane facility	MAPO 2045 LRTP	Mankato	0.25	R101				X		$ 15,000	Short	Short	$ 17,100	
4	Raintree Road	Madison Ave to River Hills Mall Entrance	Re-stripe as a 3-lane facility	MAPO 2045 LRTP	Mankato	0.25	BP34 / R32				X		$ 15,000	Short	Short	$ 17,100	
7	Stadium Rd (CSAH 60)	Stoltzman Rd to Victory Dr	Restripe to 3-Lane with median, turn lanes, bike lanes, and pedestrian islands	MATAPS	Blue Earth Co	2.81	I9 / BP3 / BP4 / BP6 / BP11 / BP37 / R12 / S10 / S16	X	X		X	X	$ 1,000,000	Short	Short	$ 1,141,200	
5	N 2nd St	Madison Ave to E Plum St	Re-stripe as a 3-lane facility	MAPO 2045 LRTP	Mankato	0.47	R35				X		$ 30,000	Mid 1	Mid 1	$ 41,700	
6	Belgrade Ave	Center St to Range St	Re-stripe as a 3-lane facility	MAPO 2045 LRTP	North Mankato	0.25	R17				X		$ 60,000	Mid 2	Mid 1	$ 83,500	Mid: 1

Time Frame:
Short (2016 - 2020) Mid 1 (2021 - 2025) Mid 2 (2026 - 2030) Long (2031 - 2045)

Project Coordination:
"C" - Corridor Project "I" - Intersection Project "R" - Rehabilitation/Reconstruction Project "P" - Preservation Project "S" - Safety Project "BP" - Bicycle/Pedestrian Project

MAPO 2045 TRANSPORTATION PLAN

Operations and Maintenance Projects

Figure 9-7

Timeframe

- Short
- Mid 1
- PWI (Basin)
- PWI (Watercourse)
- Adjusted Urbanized Boundary
- MAPO Planning Area

Source: Blue Earth County, Nicollet County, MnDOT, North Mankato, Mankato, MnDNR, Esri Imagery

0 1 2 Miles

Table 9-9: Identified Major Rehab/Reconstruction Projects

							MAPO Key Performance Focus Areas								
ID	Facility	Location/Termini	Project Description	Plan	Agency	Length (Miles)	Project Coordination	Access and Reliability	Economic Vitality	Safety	Preservation	Multi-Modal Transportation	Estimated Cost (2015)	Initial Prioritization Timeframe	Fiscally Constrained Priority Timeframe	Y.O.E. Estimated Cost (Based on Timeframe)	Public Input Priority Preference (5/14/15)
1	TWP 456 Bridge Over Stream	0.1 Miles SW of JCT CSAH 5	Box Culvert Replacement (ID L5675)	MAPO 2045 LRTP	Blue Earth Co	-					X		$ 5,000	Short	Short	$ 5,700	
20	Commerce Dr	Lookout Drive to Lor Ray Dr	Three-Lane Urban Reconstruct	MAPO 2045 LRTP	North Mankato	0.98					X		$ 1,472,000	Mid 1	Short	$ 1,679,800	
25	Stoltzman Rd (CSAH 16)	Stadium Rd to W Pleasant St	Corridor Reconstruction with intersection improvements Explore Low-Cost, High-Benefit Solutions	MATAPS	Blue Earth Co	1.07	S10 / S18 / BP8	X	X		X		$ 1,770,000	Short	Short	$ 2,019,900	
27	Belle Ave	Victory Dr to Bassett Dr	Two-Lane Urban Reconstruct	MAPO 2045 LRTP	Mankato	0.31		X	X		X		$ 674,100	Short	Short	$ 769,300	
28	Glenwood Ave	Parkway Ave to Victory Dr	Two-Lane Urban Reconstruct	Mankato 2016 CIP*	Mankato	0.71		X	X		X		$ 1,103,400	Short	Short	$ 1,103,400	
55	May St	Riverfront Dr to 6th St	Two-Lane Urban Reconstruct	Mankato 2016 CIP*	Mankato	0.33	P2	X	X		X		$ 701,400	Short	Short	$ 917,100	
56	TH 169	TH 14 to MAPO Boundary	Grade, surface, and median work	MnDOT 2016-2019 ATIP*	MnDOT	5.45	I1				X		$ 14,078,700	Short	Short	$ 14,078,700	
57	CSAH 12	CSAH 26 to MAPO Boundary	Three-Lane Rural Reconstruct	MAPO 2045 LRTP	Blue Earth Co	3.00		X			X		$ 3,000,000	Short	Short	$ 3,423,500	
58	CSAH 5	Three Bridges Located on CSAH 5	Bridge Desk Replacement	MAPO 2045 LRTP	Blue Earth Co	-	R4				X		$ 692,000	Short	Short	$ 789,700	
59	Fourth Street	Main to Madison	Two-Lane Urban Reconstruct	MAPO 2045 LRTP	Mankato	0.63		X	X		X		$ 1,643,300	Short	Short	$ 1,875,300	
60	Fourth Street	Warren to Main	Two-Lane Urban Reconstruct	MAPO 2045 LRTP	Mankato	0.40		X	X		X		$ 1,048,300	Short	Short	$ 1,196,300	
61	Long Street	Main to Madison	Two-Lane Urban Reconstruct	MAPO 2045 LRTP	Mankato	0.42		X	X		X		$ 1,075,700	Short	Short	$ 1,227,600	
62	Main Street	Plainview to Kennedy	Two-Lane Urban Reconstruct	MAPO 2045 LRTP	Mankato	0.47	C14 / BP24	X	X		X		$ 1,002,100	Short	Short	$ 1,143,600	
63	Webster Ave	Lake St to TH 169	Two-Lane Urban Reconstruct	MAPO 2045 LRTP*	North Mankato	0.64		X	X		X		$ 1,280,000	Short	Short	$ 1,280,000	
65	Pleasant View Dr	350' East of Peregrine Ln to North Ridge Dr	Two-Lane Urban Reconstruct	MAPO 2045 LRTP	North Mankato	0.69		X	X		X		$ 424,000	Short	Short	$ 483,900	
66	TH 14	RP 130.94 to 133.33	State Highway Medium Mill/Overlay	MnDOT 2015 CHIP*	MnDOT	2.39	C6 / I3				X		$ 1,912,000	Short	Short	$ 1,912,000	
2	CSAH 41 Bridge Over Le Sueur River	0.7 Miles S of JCT CR 183	Bridge Replacement (ID 7274)	MAPO 2045 LRTP	Blue Earth Co	-					X		$ 1,000,000	Short	Mid 1	$ 1,391,100	
15	Lee Boulevard	Lookout Dr to Belgrade Ave	Three-Lane Urban Reconstruct	MAPO 2045 LRTP	North Mankato	0.10	I8 / BP52	X	X		X		$ 264,000	Mid 2	Mid 1	$ 367,300	
26	Victory Dr (CSAH 82)	Main St to Stadium Rd	Four-Lane Urban Reconstruct including trail and intersection improvements at Hoffman Rd and Balcerzak Dr	MAPO 2045 LRTP	Blue Earth Co	0.98	BP12	X	X		X		$ 4,000,000	Mid 1	Mid 1	$ 5,564,600	
29	Cherry Street	Riverfront Dr to Glenwood Ave	Two-Lane Urban Reconstruct	MAPO 2045 LRTP	Mankato	0.48		X	X		X		$ 1,278,900	Mid 1	Mid 1	$ 1,779,100	
30	Glenwood Ave	Cherry St to Hanover St	Two-Lane Urban Reconstruct	MAPO 2045 LRTP	Mankato	0.06	C13	X	X		X		$ 130,700	Mid 1	Mid 1	$ 181,800	
32	Raintree Rd	Bassett Dr to Adams St	Four-Lane Urban Reconstruct	MAPO 2045 LRTP	Mankato	0.35	BP34	X	X		X		$ 915,400	Mid 1	Mid 1	$ 1,273,500	
40	Hoffman Rd	Agency Rd to Hilltop Ln	Four-Lane Urban Reconstruct	MAPO 2045 LRTP	Mankato	0.27	BP46	X	X		X		$ 669,800	Mid 1	Mid 1	$ 931,800	Short: 1 / Mid: 1
68	Second Street	Lincoln to Cherry	Two-Lane Urban Reconstruct	MAPO 2045 LRTP	Mankato	0.26		X	X		X		$ 745,900	Mid 1	Mid 1	$ 1,037,700	
69	Byron Street	Pleasant to Lincoln	Two-Lane Urban Reconstruct	MAPO 2045 LRTP	Mankato	0.08		X	X		X		$ 161,300	Mid 1	Mid 1	$ 224,400	
70	Division Street	Main to Marsh	Two-Lane Urban Reconstruct	MAPO 2045 LRTP	Mankato	0.22	BP26	X	X		X		$ 530,300	Mid 1	Mid 1	$ 737,700	
71	Itasca Drive	Hosanna Dr to Fair St	Two-Lane Urban Reconstruct	MAPO 2045 LRTP	Mankato	0.05		X	X		X		$ 115,400	Mid 1	Mid 1	$ 160,500	
75	TH 169 / TH 22 / TH 14	Multiple Bridges	Rehabilitation	MnDOT 2015 CHIP*	MnDOT						X		$ 15,472,000	Mid 1	Mid 1	$ 15,472,000	
109	TH 14	RP 127.527 to RP 128.097, WB	State Highway Medium Mill/Overlay	MnDOT 2015 CHIP*	MnDOT	0.57					X		$ 310,194	Short	Short	$ 310,194	
72	TH 169	RP 51.238 to RP 52.928	State Highway Medium Mill/Overlay	MnDOT 2015 CHIP*	MnDOT	1.69	I11				X		$ 1,532,953	Mid 1	Mid 1	$ 1,532,953	
73	TH 22	RP 50.599 to 52.075	State Highway Medium Mill/Overlay	MnDOT 2015 CHIP*	MnDOT	1.48	I5 / S12 / BP15				X		$ 832,990	Mid 1	Mid 1	$ 832,990	
74	TH 22	RP 55.366 to 63.592	State Highway Medium Mill/Overlay	MnDOT 2015 CHIP*	MnDOT	3.43	S13 / C11				X		$ 1,511,945	Mid 1	Mid 1	$ 1,511,945	
76	TH 169	RP 52.928 to 55.933	State Highway Medium Mill/Overlay	MnDOT 2015 CHIP*	MnDOT	3.01	C9 / I1				X		$ 3,240,400	Mid 1	Mid 1	$ 3,240,400	
77	TH 14	RP 133.615 to RP 140.41 (EB)	Major CPR	MnDOT 2015 CHIP*	MnDOT	6.76	I6 / S7 / S8 / S9				X		$ 5,671,200	Mid 1	Mid 1	$ 5,671,200	
78	TH 14	RP 125.224 to RP 125.75	State Highway Medium Mill/Overlay	MnDOT 2015 CHIP*	MnDOT	0.23					X		$ 327,300	Mid 1	Mid 1	$ 327,300	
79	TH 169	RP 47.410 to 51.238 (SB)	State Highway Medium Mill/Overlay	MnDOT 2015 CHIP*	MnDOT	3.83	R15				X		$ 2,041,500	Mid 1	Mid 1	$ 2,041,500	
9	CSAH 34	CSAH 33 to MAPO Boundary	Two-Lane Rural Reconstruct	MAPO 2045 LRTP	Blue Earth Co	2.06					X		$ 3,090,000	Mid 2	Mid 2	$ 5,356,900	
16	Lee Boulevard	Lookout Dr to Lor Ray Dr	Two-Lane Urban Reconstruct	MAPO 2045 LRTP	North Mankato	0.79	I8 / P1 / BP53	X	X		X		$ 1,512,000	Mid 2	Mid 2	$ 2,621,200	Short: 1
21	Howard Dr	Lookout Dr to Lor Ray Dr	Two-Lane Urban Reconstruct	MAPO 2045 LRTP	North Mankato	0.79	BP54	X	X		X		$ 1,512,000	Mid 2	Mid 2	$ 2,621,200	
31	Madison Ave	Second St to Seventh St	Four-Lane Urban Reconstruct	MAPO 2045 LRTP	Mankato	0.38		X	X		X		$ 1,402,100	Mid 2	Mid 2	$ 2,430,700	
33	Riverfront Dr	Main St to Washington St	Four-Lane Urban Reconstruct	MAPO 2045 LRTP	Mankato	0.24		X	X		X		$ 850,300	Mid 2	Mid 2	$ 1,474,100	
34	Warren St	Riverfront Dr to Fifth St	Four-Lane Urban Reconstruct	MAPO 2045 LRTP	Mankato	0.39		X	X		X		$ 1,100,400	Mid 2	Mid 2	$ 1,907,700	
35	Second St	Plum to Madison Ave	Two-Lane Urban Reconstruct	MAPO 2045 LRTP	Mankato	0.47	P5	X	X		X		$ 1,342,100	Mid 2	Mid 2	$ 2,326,700	
36	Second St	Warren Ave to Main St	Three-Lane Urban Reconstruct	MAPO 2045 LRTP	Mankato	0.40		X	X		X		$ 1,292,100	Mid 2	Mid 2	$ 2,240,000	
37	Adams St	Cree Ct to Star St	Three-Lane Urban Reconstruct	MAPO 2045 LRTP	Mankato	0.19	BP43	X	X		X		$ 494,600	Mid 2	Mid 2	$ 857,400	
38	Balcerzak Dr	Warren Ave to Victory Dr	Four-Lane Urban Reconstruct	MAPO 2045 LRTP	Mankato	1.21	S17 / BP30	X	X		X		$ 3,465,000	Mid 2	Mid 2	$ 6,007,000	
39	Front St	Marshall St to Liberty St	Three-Lane Urban Reconstruct	MAPO 2045 LRTP	Mankato	0.31		X	X		X		$ 1,030,900	Mid 2	Mid 2	$ 1,787,200	
41	Marshall St	Riverfront Dr to Front St	Two-Lane Urban Reconstruct	MAPO 2045 LRTP	Mankato	0.03		X	X		X		$ 77,800	Mid 2	Mid 2	$ 134,900	
42	Warren St	Haynes St to Stadium Rd	Three-Lane Urban Reconstruct	MAPO 2045 LRTP	Mankato	0.74	C16 / BP3 / BP5 / BP7	X	X		X		$ 1,822,100	Mid 2	Mid 2	$ 3,158,800	
80	Broad Street	Main to Madison	Two-Lane Urban Reconstruct	MAPO 2045 LRTP	Mankato	0.63		X	X		X		$ 1,639,100	Mid 2	Mid 2	$ 2,841,600	
81	Broad Street	Warren to Main	Two-Lane Urban Reconstruct	MAPO 2045 LRTP	Mankato	0.40		X	X		X		$ 1,216,700	Mid 2	Mid 2	$ 2,109,300	
82	Pfau Street	Madison to Adams	Two-Lane Urban Reconstruct	MAPO 2045 LRTP	Mankato	0.35		X	X		X		$ 740,000	Mid 2	Mid 2	$ 1,282,900	
14	CSAH 86	TH 83 to CSAH 26	Two-Lane Rural Reconstruct	MAPO 2045 LRTP	Blue Earth Co	2.53	C23 / I6				X		$ 3,795,000	Long	Long	$ 10,914,500	
17	Belgrade Ave	Lee Boulevard to Range St	Two-Lane Urban Reconstruct	MAPO 2045 LRTP	North Mankato	0.93	I8 / P6	X	X		X		$ 1,624,000	Mid 2	Long	$ 4,670,600	
18	Belgrade Ave	Range St to TH 169	Four-Lane Urban Reconstruct	MAPO 2045 LRTP	North Mankato	0.22		X	X		X		$ 504,000	Long	Long	$ 1,449,500	

Table 9-9: Identified Major Rehab/Reconstruction Projects

							MAPO Key Performance Focus Areas								
ID	Facility	Location/Termini	Project Description	Plan	Agency	Length (Miles)	Project Coordination	Access and Reliability	Economic Vitality	Safety	Preservation	Multi-Modal Transportation	Estimated Cost (2015)	Initial Prioritization Timeframe	Fiscally Constrained Priority Timeframe	Y.O.E. Estimated Cost (Based on Timeframe)	Public Input Priority Preference (5/14/15)
23	Lor Ray Dr	Howard Dr to Carlson Dr	Three-Lane Urban Reconstruct	MAPO 2045 LRTP	North Mankato	0.52	S11	X	X		X		$ 960,000	Long	Long	$ 2,761,000	
43	Adams St	Star St to TH 22	Three-Lane Urban Reconstruct	MAPO 2045 LRTP	Mankato	0.59	BP42 / BP43	X	X		X		$ 1,733,000	Long	Long	$ 4,984,100	
44	Bassett Dr	Raintree to TH 22	Three-Lane Urban Reconstruct	MAPO 2045 LRTP	Mankato	0.39		X	X		X		$ 1,015,000	Long	Long	$ 2,919,200	
45	Blue Earth St	Baker Ave to Carney Ave	Two-Lane Urban Reconstruct	MAPO 2045 LRTP	Mankato	0.38		X	X		X		$ 816,200	Long	Long	$ 2,347,400	
46	Main St	Fourth to Sixth	Four-Lane Urban Reconstruct	MAPO 2045 LRTP	Mankato	0.16		X	X		X		$ 450,500	Long	Long	$ 1,295,600	
47	Pleasant St	Stoltzman to Morningside Heights	Two-Lane Urban Reconstruct	MAPO 2045 LRTP	Mankato	0.17	S18 / BP23	X	X		X		$ 373,800	Long	Long	$ 1,075,100	
48	Riverfront Dr	Washington St to US 14	Four-Lane Urban Reconstruct	MAPO 2045 LRTP	Mankato	1.54	I3	X	X		X		$ 4,950,800	Long	Long	$ 14,238,600	
49	Riverfront Dr	Sibley St to Main St	Four-Lane Urban Reconstruct	MAPO 2045 LRTP	Mankato	1.30	I7 / I11	X	X		X		$ 4,541,200	Long	Long	$ 13,060,600	
50	Sibley St	Riverfront Dr to Blue Earth St	Two-Lane Urban Reconstruct	MAPO 2045 LRTP	Mankato	0.24	I7	X	X		X		$ 577,800	Long	Long	$ 1,661,800	
51	Val Imm Dr	Ellis Ave to Ellis Ave	Two-Lane Urban Reconstruct	MAPO 2045 LRTP	Mankato	0.65	BP21	X	X		X		$ 1,235,900	Long	Long	$ 3,554,500	
52	Victory Dr	TH 22 to Stadium Rd	Four-Lane Urban Reconstruct	MAPO 2045 LRTP	Mankato	0.79		X	X		X		$ 2,164,500	Long	Long	$ 6,225,100	
53	Warren St	Fifth St to Cedar St	Two-Lane Urban Reconstruct	MAPO 2045 LRTP	Mankato	0.44	C15	X	X		X		$ 1,132,600	Long	Long	$ 3,257,400	
54	Warren St	Cedar to Haynes	Two-Lane Urban Reconstruct	MAPO 2045 LRTP	Mankato	0.07	C16	X	X		X		$ 158,800	Long	Long	$ 456,700	
64	Pleasant View Dr	CSAH 41 to 350' East of Peregrine Ln	Two-Lane Urban Reconstruct	MAPO 2045 LRTP	North Mankato	0.32		X	X		X		$ 1,360,000	Short	Long	$ 3,911,400	
67	Lake St	Belgrade Ave to Webster Ave	Two-Lane Urban Reconstruct	MAPO 2045 LRTP	North Mankato	0.80		X	X		X		$ 1,240,000	Mid 1	Long	$ 3,566,300	
85	Fourth Street	Madison Ave to Adams St	Two-Lane Urban Reconstruct	MAPO 2045 LRTP	Mankato	0.16		X	X		X		$ 374,800	Long	Long	$ 1,077,900	
86	Adams Street	Broad St to Mayvis Blvd	Two-Lane Urban Reconstruct	MAPO 2045 LRTP	Mankato	0.83	BP41	X	X		X		$ 1,786,300	Long	Long	$ 5,137,400	
87	Adams Street	TH 22 to E HyVee Driveway	Four-Lane Urban Reconstruct	MAPO 2045 LRTP	Mankato	0.24		X	X		X		$ 738,100	Long	Long	$ 2,122,800	
88	Agency Road	Main to Glenwood	Two-Lane Urban Reconstruct	MAPO 2045 LRTP	Mankato	0.27		X	X		X		$ 570,800	Long	Long	$ 1,641,600	
89	Bassett Drive	Madison to Tullamore	Three-Lane Urban Reconstruct	MAPO 2045 LRTP	Mankato	0.09		X	X		X		$ 283,400	Long	Long	$ 815,100	
90	Broad Street	Madison to Adams	Two-Lane Urban Reconstruct	MAPO 2045 LRTP	Mankato	0.16	BP19	X	X		X		$ 451,000	Long	Long	$ 1,297,100	
91	Fair Street	Itasca to Bassett	Two-Lane Urban Reconstruct	MAPO 2045 LRTP	Mankato	0.11		X	X		X		$ 232,700	Long	Long	$ 669,200	
92	Heron Drive	Killdeer to Homestead	Two-Lane Urban Reconstruct	MAPO 2045 LRTP	Mankato	0.11		X	X		X		$ 234,200	Long	Long	$ 673,600	
93	Homestead Road	Monks to Pohl	Two-Lane Urban Reconstruct	MAPO 2045 LRTP	Mankato	0.58		X	X		X		$ 1,245,900	Long	Long	$ 3,583,200	
94	Hosanna Drive	Hosanna Ct to Itasca Dr	Two-Lane Urban Reconstruct	MAPO 2045 LRTP	Mankato	0.07		X	X		X		$ 144,600	Long	Long	$ 415,900	
95	Kennedy Street	Main St to Celestine Cir	Two-Lane Urban Reconstruct	MAPO 2045 LRTP	Mankato	0.25		X	X		X		$ 539,300	Long	Long	$ 1,551,000	
96	Main Street	Victory to Plainview	Two-Lane Urban Reconstruct	MAPO 2045 LRTP	Mankato	0.05	C14 / BP24	X	X		X		$ 102,500	Long	Long	$ 294,800	
97	Main Street	Kennedy to Hosanna	Two-Lane Urban Reconstruct	MAPO 2045 LRTP	Mankato	0.38	C14 / BP24	X	X		X		$ 906,300	Long	Long	$ 2,606,500	
98	Pleasant Street	Bryon to Highland	Two-Lane Urban Reconstruct	MAPO 2045 LRTP	Mankato	0.43		X	X		X		$ 707,600	Long	Long	$ 2,035,100	
99	Pleasant Street	Stoltzman to Byron	Two-Lane Urban Reconstruct	MAPO 2045 LRTP	Mankato	0.37		X	X		X		$ 782,200	Long	Long	$ 2,249,600	
100	Pohl Road	Glenwood to Oak Marsh	Four-Lane Urban Reconstruct	MAPO 2045 LRTP	Mankato	0.92	I9 / S17 / BP31	X	X		X		$ 2,410,800	Long	Long	$ 6,933,500	
101	Sioux Road	Madison to Adams	Four-Lane Urban Reconstruct	MAPO 2045 LRTP	Mankato	0.25	P3	X	X		X		$ 651,200	Long	Long	$ 1,872,900	
102	Tullamore Street	Victory to end	Four-Lane Urban Reconstruct	MAPO 2045 LRTP	Mankato	0.50		X	X		X		$ 1,222,700	Long	Long	$ 3,516,500	
111	TH 169 / TH 22 / TH 14	Multiple Bridges	Rehabilitation	MnDOT Bridge Inventory*	MnDOT	-					X		$ 667,975	Long	Long	$ 667,975	
113	TH 169 / TH 22 / TH 14	Multiple Bridges	Rehabilitation	MnDOT Bridge Inventory*	MnDOT						X		$ 5,000,000	Mid 1	Long	$ 5,000,000	
3	CSAH 27	MAPO Boundary to CSAH 28	Two-Lane Rural Reconstruct	MAPO 2045 LRTP	Blue Earth Co	4.21	S7				X		$ -	Short	Illustrative	$ -	
4	CSAH 5	MAPO Boundary to Riverfront Dr	Two-Lane Rural Reconstruct	MAPO 2045 LRTP	Blue Earth Co	4.66	I2				X		$ -	Mid 1	Illustrative	$ -	
5	CSAH 26 West	CSAH 12 to CSAH 5	Two-Lane Urban Reconstruct	MAPO 2045 LRTP	Blue Earth Co	3.71	S14	X	X		X		$ -	Mid 1	Illustrative	$ -	
6	CSAH 41	TH 83 to CSAH 90	Two-Lane Rural Reconstruct	MAPO 2045 LRTP	Blue Earth Co	2.89					X		$ -	Mid 1	Illustrative	$ -	
7	CSAH 28	TH 83 to MAPO Boundary	Two-Lane Rural Reconstruct	MAPO 2045 LRTP	Blue Earth Co	4.21					X		$ -	Mid 1	Illustrative	$ -	
8	CSAH 33	TH 169 to MAPO Boundary	Two-Lane Rural Reconstruct	MAPO 2045 LRTP	Blue Earth Co	4.12					X		$ -	Mid 2	Illustrative	$ -	
10	CSAH 16 South of Twnp Rd 167	Twnp Rd 167 to MAPO Boundary	Two-Lane Rural Reconstruct	MAPO 2045 LRTP	Blue Earth Co	1.00	S3				X		$ -	Mid 2	Illustrative	$ -	
11	CSAH 8 (Monks Ave)	CSAH 60 to MAPO Boundary	Two-Lane Rural Reconstruct	MAPO 2045 LRTP	Blue Earth Co	3.43	C19 / S2				X		$ -	Mid 2	Illustrative	$ -	
12	CSAH 60 (Stadium Rd)	CSAH 16 to Victory Dr	Three-Lane Urban Reconstruct	MAPO 2045 LRTP	Blue Earth Co	2.81	C18 / I9 / P7 / S10 / S16 / BP3 / BP4 / BP6 / BP11 / BP37	X	X		X		$ -	Mid 2	Illustrative	$ -	
13	CSAH 69	TH 169 to TH 169	Two-Lane Rural Reconstruct	MAPO 2045 LRTP	Blue Earth Co	2.28					X		$ -	Long	Illustrative	$ -	
19	Range St	Belgrade Ave to Webster Ave	Two-Lane Urban (with Parking) Reconstruct	MAPO 2045 LRTP	North Mankato	0.75		X	X		X		$ -	Long	Illustrative	$ -	
22	Lookout Dr	Lee Boulevard to Carol Ct	Five-Lane Urban Reconstruct	MAPO 2045 LRTP	North Mankato	0.50	BP50	X	X		X		$ -	Long	Illustrative	$ -	
24	Lookout Dr	Carol Ct to Commerce Dr	Five-Lane Urban Reconstruct	MAPO 2045 LRTP	North Mankato	0.87	BP50	X	X		X		$ -	Long	Illustrative	$ -	
83	Center St	TH 169 to Webster Ave	Two-Lane Urban Reconstruct	MAPO 2045 LRTP	North Mankato	0.17		X	X		X		$ -	Mid 2	Illustrative	$ -	
84	Carlson Dr	Lookout Drive to Lor Ray Dr	Three-Lane Urban Reconstruct	MAPO 2045 LRTP	North Mankato	0.75	S11	X	X		X		$ -	Mid 2	Illustrative	$ -	
103	Lor Ray Dr	Carlson Dr to Timm Rd	Three-Lane Urban Reconstruct	MAPO 2045 LRTP	North Mankato	0.39	S11	X	X		X		$ -	Illustrative	Illustrative	$ -	
104	Howard Dr	CSAH 41 to Lookout Dr	Two-Lane Rural Reconstruct	MAPO 2045 LRTP	North Mankato	0.74		X	X		X		$ -	Illustrative	Illustrative	$ -	
105	Lor Ray Dr	Lee Boulevard to James Ave	Three-Lane Urban Reconstruct	MAPO 2045 LRTP	North Mankato	0.25		X	X		X		$ -	Illustrative	Illustrative	$ -	
106	Lor Ray Dr	James Ave to Commerce Dr	Three-Lane Urban Reconstruct	MAPO 2045 LRTP	North Mankato	0.14		X	X		X		$ -	Illustrative	Illustrative	$ -	
107	Lor Ray Dr	Commerce Dr to US 14	Five-Lane Urban Reconstruct	MAPO 2045 LRTP	North Mankato	0.17	BP51	X	X		X		$ -	Illustrative	Illustrative	$ -	

Table 9-9: Identified Major Rehab/Reconstruction Projects

								MAPO Key Performance Focus Areas								
ID	Facility	Location/Termini	Project Description	Plan	Agency	Length (Miles)	Project Coordination	Access and Reliability	Economic Vitality	Safety	Preservation	Multi-Modal Transportation	Estimated Cost (2015)	Initial Prioritization Timeframe	Fiscally Constrained Priority Timeframe	Y.O.E. Estimated Cost (Based on Timeframe)	Public Input Priority Preference (5/14/15)
108	Lor Ray Dr	US 14 to Howard Dr	Five-Lane Urban Reconstruct	MAPO 2045 LRTP	North Mankato	0.25	BP51	X	X		X		$ -	Illustrative	Illustrative	$ -	
110	TH 169 / TH 22 / TH 14	Multiple Bridges	Rehabilitation	MnDOT Bridge Inventory	MnDOT	-					X		$ -	Mid 2	Illustrative	$ -	
112	TH 169 / TH 22 / TH 14	Multiple Bridges	Rehabilitation	MnDOT Bridge Inventory	MnDOT						X		$ -	Mid 1	Illustrative	$ -	

Time Frame:
Short (2016 - 2020) **Mid 1 (2021 - 2025)** **Mid 2 (2026 - 2030)** **Long (2031 - 2045)**

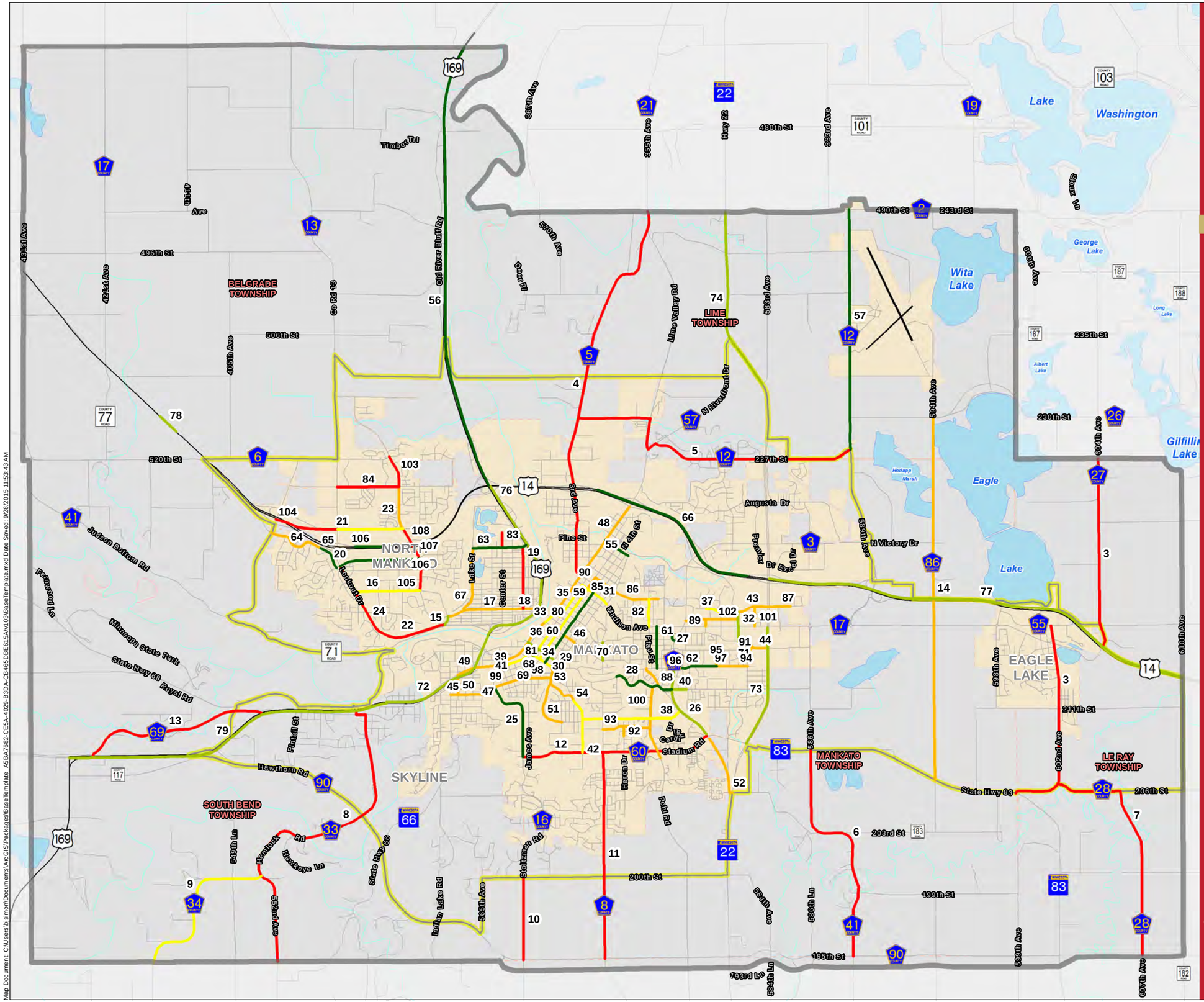
Project Coordination:
"C" - Corridor Project **"I" - Intersection Project** **"R" - Rehabilitation/Reconstruction Project** **"P" - Preservation Project** **"S" - Safety Project** **"BP" - Bicycle/Pedestrian Project**

***Project costs indicate year of expenditure costs.**

MAPO 2045 TRANSPORTATION PLAN

Major Rehabilitation/ Reconstruction Improvements

Figure 9-8



Timeframe

- Short
- Mid 1
- Mid 2
- Long
- Illustrative
- PWI (Basin)
- PWI (Watercourse)
- Adjusted Urbanized Boundary
- MAPO Planning Area

Source: Blue Earth County, Nicollet County, MnDOT, North Mankato, Mankato, MnDNR, Esri Imagery

0 1 2 Miles

SRF

BOLTON & MENK

Map Document: C:\Users\bjsimon\Documents\ArcGIS\Packages\BaseTemplate_A5BA7682-CE5A-4029-B3DA-CB465DBE615A\v103\BaseTemplate.mxd Date Saved: 9/28/2015 11:53:43 AM

Table 9-10: Corridor Capacity Expansion Projects

								MAPO Key Performance Focus Areas									
ID	Facility	Location/Termini	Project Description	Plan	Primary Agency	Distance (Miles)	Project Coordination	Access and Reliability	Economic Vitality	Safety	Preservation	Multi-Modal Transportation	Estimated Cost (2015)	Initial Prioritization Timeframe	Fiscally Constrained Priority Timeframe	Y.O.E. Estimated Cost (Based on Timeframe)	Public Input Priority Preference (5/14/15)
3	Adams Street	Roosevelt Circle to CSAH 12	Construct 3-lane section with turn lanes as warranted (Includes RAB at Haefner/Adams)	Mankato CIP/ ATP Application 2019	Mankato	0.74		X	X				$ 5,212,925	Short	Short	$ 5,948,800	Short: 9
4	Adams Street	CSAH 12 to CSAH 17	Construct 4 lane section with turn lanes as warranted	Mankato CIP	Mankato	0.31		X	X				$ 3,809,784	Short	Short	$ 4,347,600	Short: 7
5	CSAH 12	CSAH 17 to MN 83	Construct 4 lane section with turn lanes (CSAH 17 to Hoffman Rd); Construct 3-lane section (Hoffman Rd to MN 83)	MnDOT STIP, AUAR, ICE Report, CSAH 12 EAW*	Blue Earth Co	1.76		X	X	X		X	$ 10,000,000	Short	Short	$ 10,000,000	Short: 6 / Mid: 1
7	Hoffman Road	Prairie Winds Drive to CSAH 12	Construct 4 lane section with turn lanes as warranted	AUAR	Mankato	0.41		X	X			X	$ 1,142,829	Short	Short	$ 1,304,200	Short: 4
21	Timm Road (CSAH 6)	CSAH 41 to Lookout Drive	Construct urban roadway	MAPO 2045 LRTP	Nicollet County	0.50	BP9	X	X	X		X	$ 1,000,000	Illustrative	Short	$ 1,141,200	
1	Bassett Drive	Carver Rd to CSAH 12	Construct 4 lane section with turn lanes as warranted	AUAR, ICE Report	Mankato	0.45		X	X				$ 5,116,968	Mid 1	Mid 1	$ 7,118,400	Short: 2
2	Bassett Drive	CSAH 12 to CSAH 86	Construct 4 lane section with turn lanes as warranted	AUAR, ICE Report	Mankato	1.06		X	X				$ 13,124,202	Mid 2	Mid 1	$ 18,257,700	Short: 2 / Mid: 2 / Long: 1
8	Hoffman Road	CSAH 12 to CSAH 86	Construct 4 lane section with turn lanes as warranted	AUAR	Mankato	1.50		X	X				$ 6,480,000	Mid 2	Long	$ 18,636,600	Short: 1 / Long: 1
17	200th St.	MN 22 to CSAH 16	Pave gravel roadway - Reconstruct	MAPO 2045 LRTP	Mankato Township	2.46			X	X			$ 1,500,000	Long	Long	$ 4,314,000	Mid: 1
6	US 14	US 169 to MN 22	Expansion to six lanes (may include new river bridge) (Further study warranted) (Explore low-cost, high-benefit solutions)	MATAPS, Draft Mankato Complete Streets Plan	MnDOT	3.74	I1 / I2 / I3 / R66		X		X		$ -	Illustrative	Illustrative	$ -	Long: 1
9	US 169	US 14 to Webster Ave	Access/Intersection/Interchange Improvements (Further study warranted) (Explore low-cost, high-benefit solutions)	MATAPS	MnDOT	0.84	I1 / R77	X		X			$ -	Illustrative	Illustrative	$ -	Short: 1 / Mid: 1
10	MN 22	CSAH 90 to north of Victory Drive	Construct passing lanes and turning lanes (Further study warranted)	MATAPS	MnDOT	1.99	BP47 / S19	X					$ -	Mid 2	Illustrative	$ -	Mid: 3
11	MN 22	CSAH 57 to CSAH 2	Construct passing lanes and turning lanes (Further study warranted)	MATAPS	MnDOT	1.54	S13 / R74	X					$ -	Mid 2	Illustrative	$ -	Mid: 1
12	Lee Blvd	Lor Ray Dr to Belgrade Ave	Expand to 4-Lane.	MAPO 2045 LRTP	North Mankato	0.55	I8 / BP52	X	X	X		X	$ -	Long	Illustrative	$ -	
13	Glenwood Ave	Highland Ave to Monks Ave	Expand to 3-Lane.	MAPO 2045 LRTP	Mankato	0.56	R30	X	X	X		X	$ -	Illustrative	Illustrative	$ -	
14	Main St.	Victory Dr to Hosanna Dr	Expand to 3-Lane	MAPO 2045 LRTP	Mankato	1.22	BP24 / BP58 / R62 / R96 / R97	X	X	X			$ -	Illustrative	Illustrative	$ -	
15	Cedar St	Highland Ave to Warren St	Expand to 3-Lane	MAPO 2045 LRTP	Mankato	0.09	R53	X	X	X			$ -	Illustrative	Illustrative	$ -	
16	Warren St	Cedar St to Malin St	Expand to 3-Lane	MAPO 2045 LRTP	Mankato	0.24	R42 / R54	X	X	X			$ -	Illustrative	Illustrative	$ -	
18	Monks Ave	Stadium Rd to Woodhaven Cir	Access modifications (e.g., median, closures and right-in/right-out)	MAPO 2045 LRTP	Blue Earth Co	0.26	BP10 / R11	X		X			$ -	Illustrative	Illustrative	$ -	
19	Doc Jones Rd	Stoltzman Rd to T-174	Construct urban roadway	MAPO 2045 LRTP	Mankato Township	1.07	BP38	X	X	X			$ -	Illustrative	Illustrative	$ -	Mid: 1
20	Hoffman Road	CSAH 86 to CSAH 27	Construct 2 lane section with turn lanes as warranted	MAPO 2045 LRTP	Eagle Lake	1.50		X		X			$ -	Illustrative	Illustrative	$ -	Short: 1 / Mid: 1 / Long: 4
22	Le Sueur Ave	598th Ave (Eagle Lake) to Bassett Drive (Mankato)	Construct urban roadway	MAPO 2045 LRTP	Eagle Lake	2.30		X	X	X			$ -	Illustrative	Illustrative	$ -	
23	CSAH 86	Madison Ave to Hoffman Rd Future Alignment	Construct urban roadway	MAPO 2045 LRTP	Blue Earth Co	0.75	R14	X	X	X			$ -	Illustrative	Illustrative	$ -	Long: 1

Time Frame:
Short (2016 - 2020) Mid 1 (2021 - 2025) Mid 2 (2026 - 2030) Long (2031 - 2045)

Project Coordination:
"C" - Corridor Project "I" - Intersection Project "R" - Rehabilitation/Reconstruction Project "P" - Preservation Project "S" - Safety Project "BP" - Bicycle/Pedestrian Project

***Project costs indicate year of expenditure costs.**

MAPO 2045 TRANSPORTATION PLAN

Corridor Improvements

Figure 9-9

Timeframe

- Short
- Mid 1
- Mid 2
- Long
- Illustrative
- PWI (Basin)
- PWI (Watercourse)
- Adjusted Urbanized Boundary
- MAPO Planning Area

Source: Blue Earth County, Nicollet County, MnDOT, North Mankato, Mankato, MnDNR, Esri Imagery

0 1 2 Miles

SRF

BOLTON & MENK

Table 9-11: Intersection Capacity Expansion Projects

ID	Facility	Location/Termini	Project Description	Plan	Agency	Project Coordination	Table 9-8: MAPO Key Performance Focus Areas					Estimated Cost* (2015)	Initial Prioritization Timeframe	Fiscally Constrained Priority Timeframe	Y.O.E. Estimated Cost (Based on Timeframe)	Public Input Priority Preference (5/14/15)
							Access and Reliability	Economic Vitality	Safety	Preservation	Multi-Modal Transportation					
3	US 14/N Riverfront Drive	Ramp Intersections	Traffic Control Improvement (ICE Completed)	ICE Report 2009	**Mankato**, Blue Earth Co, MnDOT	C6/ R48 / R66	X	X	X			$ 5,000,000	Short	Short	$ 5,705,800	Short: 3 / Long: 1
8	Lee Blvd	Belgrade Ave	Traffic Control Improvement (ICE Needed)	North Mankato Comp Plan	North Mankato	C12 / R15 / R17 / BP52	X	X	X	X		$ 2,000,000	Mid 1	Mid 1	$ 2,782,300	Short: 1
7	S Riverfront Drive	Sibley Street	Consider traffic control improvement, bump-outs, medians and conversion from 4-lane to 3-lane	Mankato SRTS Plan	Mankato	R50 / R49	X		X		X	$ 1,120,000	Long	Long	$ 3,221,100	Mid: 1
1	US 169	US 14 Interchange	Interchange Reconfiguration (Further study warranted)	MATAPS 1996, 2003, 2010	MnDOT	C6 / C9 / R56 / R76	X		X			$ -	Illustrative	Illustrative	$ -	Short: 2
2	US 14/3rd Ave (CSAH 5)	Ramp Intersections	Traffic Control Improvement (ICE Completed)	ICE Report 2010	Mankato, **Blue Earth Co**, MnDOT	C6 / R4	X	X	X			$ -	Mid 1	Illustrative	$ -	Mid: 1
4	MN 22	N Victory Dr (CSAH 3)	Traffic Control Improvement (ICE Needed)	AUAR	**MnDOT,** Blue Earth Co		X	X	X	X		$ -	Mid 2	Illustrative	$ -	Mid: 1 / Long: 1
5	MN 22	Hoffman Road	Traffic Control Improvement (ICE Needed)	AUAR	MnDOT, **Mankato**	BP15 / BP47 / R73	X	X	X	X		$ -	Mid 1	Illustrative	$ -	Short: 3
6	CSAH 86	US 14	Construct Overpass (Further study warranted) (potential closure if not overpass)	AUAR	**MnDOT**, Blue Earth Co	R14 / R77	X		X			$ -	Illustrative	Illustrative	$ -	
9	Stadium Rd (CSAH 60)	Pohl Road	Traffic Control Improvement (ICE Needed)	MAPO 2045 LRTP	**Blue Earth County,** Mankato	P7 / BP11 / R12 / R100	X	X	X	X		$ -	Mid 1	Illustrative	$ -	Short: 1 / Mid: 1
10	MN 22	Augusta Drive	Traffic Control Improvement (ICE Completed)	MAPO 2045 LRTP	MnDOT, **Mankato**	BP27 / BP56	X	X	X	X		$ -	Mid 1	Illustrative	$ -	Mid: 1
11	Riverfront Dr	US 169	Traffic Control Improvement (ICE Needed)	MAPO 2045 LRTP	Mankato	R49 / R72	X	X	X	X		$ -	Illustrative	Illustrative	$ -	Long: 1
12	Lor Ray Dr	Howard Dr	Roundabout	MAPO 2045 LRTP	North Mankato	BP51 / BP54	X	X	X			$ -	Illustrative	Illustrative	$ -	

Time Frame:
Short (2016 - 2020) Mid 1 (2021 - 2025) Mid 2 (2026 - 2030) Long (2031 - 2045)

Project Coordination:
"C" - Corridor Project "I" - Intersection Project "R" - Rehabilitation/Reconstruction Project "P" - Preservation Project "S" - Safety Project "BP" - Bicycle/Pedestrian Project

MAPO 2045 TRANSPORTATION PLAN

Intersections Improvements

Figure 9-10

Timeframe

- Short
- Mid 1
- Mid 2
- Long
- Illustrative
- PWI (Basin)
- PWI (Watercourse)
- Adjusted Urbanized Boundary
- MAPO Planning Area

Source: Blue Earth County, Nicollet County, MnDOT, North Mankato, Mankato, MnDNR, Esri Imagery

0 1 2 Miles

SRF

BOLTON & MENK

Map Document: C:\Users\jsimon\Documents\ArcGISPackages\BaseTemplate_A5BA7682-CE5A-4029-B3DA-CB465DBE615A\v103\BaseTemplate.mxd Date Saved: 9/28/2015 11:53:43 AM

Table 9-12: Bicycle and Pedestrian Projects

								MAPO Key Performance Focus Areas								
ID	Facility	Location/Termini	Project Description	Plan	Agency	Distance (Miles)	Project Coordination	Access and Reliability	Economic Vitality	Safety	Preservation	Multi-Modal Transportation	Estimated Cost* (2015)	Initial Prioritization Timeframe	Fiscally Constrained Priority Timeframe	Y.O.E. Estimated Cost (Based on Timeframe)	Public Input Priority Preference (5/14/15)
5	Warren St	at Maywood Ave	Implement diagonal pedestrian crossings and gateway element (2018)	MSU Facilities Master Plan	Mankato	-	R42		X	X		X	$ 25,000	Short	Short	$ 28,500	Short: 1
7	Warren St	Balcerzak Dr to Stadium Rd	Ped/bike improvements (2018)	MnDOT STIP*/Mankato CIP	Mankato	0.41	R42					X	$ 145,000	Short	Short	$ 145,000	Long: 1
17	Pohl Rd	Stadium Rd to Balcerzak Dr (2016)	New On-Street Route	Mankato Complete Streets Plan	Mankato	0.42	R100					X	$ 12,500	Short	Short	$ 14,300	
18	Van Brunt St	Stoltzman Rd to Cherry St (2016)	New On-Street Route	Mankato Complete Streets Plan	Mankato	0.65						X	$ 19,000	Short	Short	$ 21,700	
19	Broad St	Madison Ave to Thompson St (2016)	New On-Street Route	Mankato Complete Streets Plan	Mankato	0.22	R90					X	$ 12,000	Short	Short	$ 13,700	Short: 1
20	Good Counsel Dr	TH 14 to Mable St (2016)	New Trail	Mankato Complete Streets Plan	Mankato	0.64						X	$ 101,500	Short	Short	$ 115,800	Short: 1
21	Val Imm Dr	Broad St to Ellis Ave (2017)	New On-Street Route	Mankato Complete Streets Plan	Mankato	1.02	R51					X	$ 18,000	Short	Short	$ 20,500	Short: 1
22	Broad St	Thompson St to Mabel St (2017)	New On-Street Route	Mankato Complete Streets Plan	Mankato	0.53						X	$ 10,500	Short	Short	$ 12,000	Short: 1
23	Pleasant St	Stoltzman Rd to Owatona St (2018)	New On-Street Route	Mankato Complete Streets Plan	Mankato	0.31	R47					X	$ 8,500	Short	Short	$ 9,700	
24	Main St	Victory Dr to Hosanna Ct (2018)	New On-Street Route	Mankato Complete Streets Plan	Mankato	1.01	C14 / R62 / R96 / R97					X	$ 15,000	Short	Short	$ 17,100	
25	Diamond Creek Rd	Stadium Rd to Hosanna Dr (2018)	New On-Street Route	Mankato Complete Streets Plan	Mankato	0.82						X	$ 15,000	Short	Short	$ 17,100	
26	Marsh/N. Division/Belle Ave	Main St to Victory Dr (2019)	New On-Street Route	Mankato Complete Streets Plan	Mankato	1.18	R70					X	$ 9,000	Short	Short	$ 10,300	
27	Augusta Dr	Country Club Dr to Trail Creek Park (2019)	New On-Street Route	Mankato Complete Streets Plan	Mankato	1.56	I10					X	$ 27,000	Short	Short	$ 30,800	
50	Lookout Drive	Lee Boulevard to Commerce Drive	New Trail	MAPO 2045 LRTP	North Mankato	1.80	R22 / R24					X	$ 530,000	Mid 2	Short	$ 604,800	
51	Lor Ray Drive	Commerce Drive to Howard Drive	New Trail	MAPO 2045 LRTP	**North Mankato**/MnDOT	0.43	R107 / R108 / I12					X	$ 300,000	Mid 2	Short	$ 342,300	Short: 1
54	Howard Drive	Lookout Drive to Lor Ray Drive	New Trail	MAPO 2045 LRTP	North Mankato	0.80	R21 / I12					X	$ 160,000	Mid 1	Short	$ 182,600	Short: 1
58	Main St / Dane St / Division / Capital Dr / McConnell St / Pfau St	Along each roadway	New Sidewalk	MnDOT 2016-2019 ATIP*	Mankato	1.40	C14					X	$ 516,400	Short	Short	$ 516,400	
1	Minnesota River Trail	Mankato to St. Peter	Finalize alignment and construct trail	MATAPS	**DNR,** MnDOT	-						X	$ 1,500,000	Mid 1	Mid 1	$ 2,086,700	Short: 4 / Mid: 1
2	Minnesota River Trail	Near Warren Creek pumping station	Correct safety issue	MATAPS	DNR, **Mankato**	-				X		X	$ 50,000	Mid 1	Mid 1	$ 69,600	
9	Timm Road (CSAH 6)	CSAH 41 to Lookout Drive	New Trail (separated facility - in the short term the shoulder space could be used as an on-street trail)	North Mankato Trail Plan	**North Mankato**/ Nicollet Co.	0.50	C21			X		X	$ 150,000	Long	Mid 1	$ 208,700	
28	Woodland Ave	Riverfront Dr to Park Ln	New Trail	Mankato Complete Streets Plan	Mankato	0.17						X	$ 27,000	Mid 1	Mid 1	$ 37,600	
29	Maywood Ave	Birchwood St to Warren St	New On-Street Route	Mankato Complete Streets Plan	Mankato	0.38						X	$ 11,500	Mid 1	Mid 1	$ 16,000	
30	Balcerzak Dr	Warren to Pohl Rd	New On-Street Route	Mankato Complete Streets Plan	Mankato	0.82	R38					X	$ 24,500	Mid 1	Mid 1	$ 34,100	
31	Pohl Rd	Balcerzak Dr to Glenwood Ave	New On-Street Route	Mankato Complete Streets Plan	Mankato	0.38	R100					X	$ 11,500	Mid 1	Mid 1	$ 16,000	
32	Jackson St	Broad St to Cherry St	New On-Street Route	Mankato Complete Streets Plan	Mankato	0.24						X	$ 7,500	Mid 1	Mid 1	$ 10,400	
33	Elm St	Minnesota River Trail to Broad St	New On-Street Route	Mankato Complete Streets Plan	Mankato	0.42						X	$ 12,500	Mid 1	Mid 1	$ 17,400	Short: 4
34	Raintree Rd	Adams St to Victory Dr	New On-Street Route	Mankato Complete Streets Plan	Mankato	0.96	P4 / R32					X	$ 29,000	Mid 1	Mid 1	$ 40,300	
35	St Andrews Dr	Augusta Dr to Victory Dr	New On-Street Route	Mankato Complete Streets Plan	Mankato	0.42						X	$ 12,500	Mid 1	Mid 1	$ 17,400	
49	Lookout Drive (CSAH 13)	Carlson Drive to Timm Road (CSAH 6)	New Trail	MAPO 2045 LRTP	**North Mankato**/ Nicollet Co.	0.33						X	$ 80,000	Long	Mid 1	$ 111,300	
53	Lee Boulevard	Lookout Drive to Lor Ray Drive (upper segment)	New Trail	MAPO 2045 LRTP	North Mankato	0.42	P1 / R16					X	$ 90,000	Mid 2	Mid 1	$ 125,200	
3	Stadium Rd (CSAH 60)	at Warren St	Consider Pedestrian Crossing Improvement (Diagonal Crossing)	MSU Facilities Master Plan	Blue Earth Co	-	P7 / R12 / R42		X	X		X	$ -	Short	Illustrative	$ -	Short: 2
4	Stadium Rd (CSAH 60)	at Ellis Ave	Consider Pedestrian Crossing Improvement (Diagonal Crossing)	MSU Facilities Master Plan	Blue Earth Co	-	P7 / R12		X	X		X	$ -	Short	Illustrative	$ -	Short: 1
6	Stadium Rd (CSAH 60)	at Ellis Ave	Pedestrian bridge over Stadium Road west of Ellis Ave	MSU Facilities Master Plan	Blue Earth Co	-	P7 / R12		X	X		X	$ -	Illustrative	Illustrative	$ -	
8	Stoltzman Rd (CSAH 16)	Stadium Rd to W Pleasant St	New Trail	Mankato Complete Streets Plan; City of Mankato	Blue Earth Co	1.00	R25 / S10 / S18					X	$ -	Short	Illustrative	$ -	Short: 1
10	Monks Ave (CSAH 8)	200th St to Stadium Rd	New On-Street Route	Mankato Complete Streets Plan	Blue Earth Co	1.50	C18 / R11					X	$ -	Short	Illustrative	$ -	
11	Stadium Rd (CSAH 60)	Warren St to S Victory Dr	New On-Street Route	Mankato Complete Streets Plan	Blue Earth Co	1.49	P7 / I9 / R12					X	$ -	Short	Illustrative	$ -	Short: 1
12	S Victory Dr (CSAH 3)	Hoffman Rd to Stadium Rd	New Trail	Mankato Complete Streets Plan	**Blue Earth Co** / Mankato	0.71	R26					X	$ -	Short	Illustrative	$ -	
13	Stadium Rd (CSAH 60)	Foley Rd to MN 22	New Trail	Mankato Complete Streets Plan	Blue Earth Co	0.20	S12					X	$ -	Mid 1	Illustrative	$ -	
14	MN 83	MN 22 to 586th Ave	New Trail	Mankato Complete Streets Plan	MnDOT	0.82	S12					X	$ -	Mid 2	Illustrative	$ -	
15	MN 22 (East Side)	Hoffman Rd to Kohl's Pond	New Trail	Mankato Complete Streets Plan	MnDOT	0.24	I5 / R73					X	$ -	Mid 2	Illustrative	$ -	
16	Blue Earth River Ped/Bike Bridge	Land of Memories Park to Sibley Park	New pedestrian/bicycle bridge across the river	Minnesota River Trail Master Plan	DNR, **MnDOT**, Mankato	-				X		X	$ -	Illustrative	Illustrative	$ -	Short 1: Mid: 2
36	CSAH 17 (South Side)	MN 22 to 598th Ave	New Trail	MAPO 2045 LRTP	Blue Earth Co	2.76						X	$ -	Illustrative	Illustrative	$ -	
37	Stadium Rd (CSAH 60)	Ellis Ave to Stoltzman Rd	New On-Street Route	MAPO 2045 LRTP	**Blue Earth Co**/Mankato	0.49	P7 / R12					X	$ -	Illustrative	Illustrative	$ -	

Table 9-12: Bicycle and Pedestrian Projects

								MAPO Key Performance Focus Areas								
ID	Facility	Location/Termini	Project Description	Plan	Agency	Distance (Miles)	Project Coordination	Access and Reliability	Economic Vitality	Safety	Preservation	Multi-Modal Transportation	Estimated Cost* (2015)	Initial Prioritization Timeframe	Fiscally Constrained Priority Timeframe	Y.O.E. Estimated Cost (Based on Timeframe)	Public Input Priority Preference (5/14/15)
38	Doc Jones Rd	Stoltzman Rd to Red Jacket Trailhead	New On-Street Route	MAPO 2045 LRTP	South Bend Township	1.06	C19					X	$ -	Illustrative	Illustrative	$ -	
39	Marsh St/6th St	Division St to Washington St	New On-Street Route	MAPO 2045 LRTP	Mankato	0.33						X	$ -	Illustrative	Illustrative	$ -	
40	Washington St	6th St to Broad St	New On-Street Route	MAPO 2045 LRTP	Mankato	0.24						X	$ -	Illustrative	Illustrative	$ -	
41	Adams St	Victory Dr to Broad St	New On-Street Route	MAPO 2045 LRTP	Mankato	1.23	R89					X	$ -	Illustrative	Illustrative	$ -	
42	Adams St	Raintree Rd to MN 22	New On-Street Route	MAPO 2045 LRTP	Mankato	0.36	R43					X	$ -	Illustrative	Illustrative	$ -	
43	Adams St	Victory Dr to Raintree Rd	New Trail	MAPO 2045 LRTP	Mankato	0.65	R37 / R43					X	$ -	Illustrative	Illustrative	$ -	
44	Star St/Bassett Dr	Adams St to Kennedy St	New Trail	MAPO 2045 LRTP	Mankato	0.34						X	$ -	Illustrative	Illustrative	$ -	
45	Kennedy St	Bassett Dr to Main St	New Trail	MAPO 2045 LRTP	Mankato	0.37						X	$ -	Illustrative	Illustrative	$ -	
46	Hoffman Rd	Agency Rd to Thomas Park Ct	New Trail	MAPO 2045 LRTP	Mankato	0.76	R40					X	$ -	Illustrative	Illustrative	$ -	Long: 1
47	MN 22	Hoffman Rd to CSAH 90	New Trail	MAPO 2045 LRTP	MnDOT	3.32	C10 / I5 / I7 / S12 / S19					X	$ -	Illustrative	Illustrative	$ -	
48	Stoltzman Rd (CSAH 16)	Doc Jones Rd to Catalina Dr (2016)	Bermuda Drive Improvements/New Trail	MAPO 2045 LRTP	Blue Earth Co	0.26						X	$ -	Illustrative	Illustrative	$ -	
52	Lee Boulevard	Lookout Drive to Lor Ray Drive (hill segment)	New Trail	MAPO 2045 LRTP	North Mankato	0.63	C12 / I8 / R15					X	$ -	Illustrative	Illustrative	$ -	
55	Lor Ray Drive	Approx. 700' N. of Timm Rd to Twsp Rd. 121	New Trail	MAPO 2045 LRTP	North Mankato	0.80						X	$ -	Illustrative	Illustrative	$ -	Long: 1
56	MN 22	Augusta Dr to Sakatah State Trail	New Trail	MAPO 2045 LRTP	MnDOT	0.47	I10 / S14					X	$ -	Illustrative	Illustrative	$ -	
57	Blue Earth Street	Woodland Ave to Owatonna St	New Sidewalk	MnDOT 2016-2019 ATIP*	Blue Earth Co	0.39						X	$ -	Short	Illustrative	$ -	

Time Frame:
Short (2016 - 2020) Mid 1 (2021 - 2025) Mid 2 (2026 - 2030) Long (2031 - 2045)

***MnDOT 2016-2019 ATIP and MnDOT STIP projects indicate inflated year of expenditure costs.**

Project Coordination: "C" - Corridor Project "I" - Intersection Project "R" - Rehabilitation/Reconstruction Project "P" - Preservation Project "S" - Safety Project "BP" - Bicycle/Pedestrian Project

MAPO 2045 TRANSPORTATION PLAN

Pedestrian and Bicycle Improvements

Figure 9-11

Timeframe

- Short
- Mid 1
- Mid 2
- Long
- Illustrative
- Colleges
- School Property
- Park \ Open Space
- PWI (Basin)
- PWI (Watercourse)
- Adjusted Urbanized Boundary
- MAPO Planning Area

Source: Blue Earth County, Nicollet County, MnDOT, North Mankato, Mankato, MnDNR, Esri Imagery

0 1 2 Miles

SRF

BOLTON & MENK

Table 9-13: Safety Projects

ID	Facility	Location/Termini	Project Description	Plan	Agency	Project Coordination	MAPO Key Performance Focus Areas: Access and Reliability	Economic Vitality	Safety	Preservation	Multi-Modal Transportation	Estimated Cost (2015)	Initial Prioritization Timeframe	Fiscally Constrained Priority Timeframe	Y.O.E. Estimated Cost (Based on Timeframe)	Public Input Priority Preference (5/14/15)
1	Main Street	Washington School Area	Bump-outs, signage, crosswalks and medians to calm traffic	Mankato SRTS Plan	Mankato			X	X		X	$ -	Short	Short	$ -	Short: 1
7	CSAH 27	US 14	Restricted Crossing U-Turn (RCUT) intersection	HSIP Application (2014)	**MnDOT**/Blue Earth Co	R3 / R77	X		X			$ 600,000	Short	Short	$ 600,000	
8	LeRay Ave (CSAH 55)	US 14	Median revisions to construct a three-quarter intersection (right-in, right-out, left-in)	HSIP Application (2014)	**MnDOT**/Blue Earth Co	R77	X		X			$ 600,000	Short	Short	$ 600,000	
9	CSAH 56	US 14	Westbound acceleration lane and extension/offsetting of eastbound US 14 right turn lanes.	HSIP Application (2014)	**MnDOT**/Blue Earth Co	R77	X		X			$ 600,000	Short	Short	$ 600,000	Short: 1
11	Lor Ray Drive	Carlson Drive	Remove sight distance obstructions near intersection	MAPO 2045 LRTP	North Mankato	R23 / R84 / R103			X			$ 5,000	Short	Short	$ 5,700	
6	CSAH 13	North Mankato CL to CSAH 5	Rumble Strip (7.1 mi); 6" Centerline Latex (11.8 mi)	Nicollet County Hwy Safety Plan	Nicollet Co				X			$ 28,910	Mid 2	Mid 2	$ 50,100	
17	Balcerzak Rd	Pohl Rd	Traffic Control Improvement (ICE Needed)	MAPO 2045 LRTP	Mankato	R38 / R100	X	X	X	X		$ 2,000,000	Mid1	Mid 2	$ 3,467,200	Short: 2 / Mid: 1
2	CSAH 8	CSAH 90 to Mankato CL	Rumble Stripes (5.7 mi); 6" Centerline Latex (5.7 mi)	Blue Earth County Hwy Safety Plan	Blue Earth Co	R11			X			$ -	Mid1	Illustrative	$ -	
3	CSAH 16	CSAH 90 to Mankato CL LT	Rumble Stripes (8.7 mi); 6" Centerline Latex (8.7 mi)	Blue Earth County Hwy Safety Plan	Blue Earth Co	R10			X			$ -	Mid1	Illustrative	$ -	
4	CSAH 90	US 169 and MN 60 to MN 22	6" Centerline Latex (7.6 mi)	Blue Earth County Hwy Safety Plan	Blue Earth Co				X			$ -	Mid1	Illustrative	$ -	
5	CSAH 2	MN 22 to MAPO Limits	Rumble Stripes (4.9 mi); 6" Centerline Latex (4.9 mi)	Blue Earth County Hwy Safety Plan	Blue Earth Co				X			$ -	Mid1	Illustrative	$ -	
10	Stadium Rd (CSAH 60)	Stoltzman Rd (CSAH 16)	Traffic Control Improvement (ICE Needed)	MAPO 2045 LRTP	Blue Earth Co	R12 / R25 / P7 / BP8	X	X	X	X		$ -	Short	Illustrative	$ -	
12	MN 22	MN 83	Traffic Control Improvement (ICE Needed)	MAPO 2045 LRTP	MnDOT	BP13 / BP14 / BP47 / R73	X	X	X	X		$ -	Mid 2	Illustrative	$ -	Mid: 1
13	MN 22	CSAH 57 (N Riverfront Dr)	Traffic Control Improvement (ICE Needed)	MAPO 2045 LRTP	**MnDOT**/Blue Earth Co	C11 / R74	X	X	X	X		$ -	Mid 2	Illustrative	$ -	
14	MN 22	CSAH 26 (227th St)	Traffic Control Improvement (ICE Needed)	MAPO 2045 LRTP	**MnDOT**/Blue Earth Co	R5 / BP56	X	X	X	X		$ 2,000,000	Long	Illustrative	$ -	
15	US 169	Blue Earth River to CSAH 90	Corridor Study	MAPO 2045 LRTP	**MnDOT**/Mankato/ Blue Earth Co	R79	X	X	X	X	X	$ 10,000	Long	Illustrative	$ -	
16	Stadium Rd (CSAH 60)	James Ave	Traffic Control Improvement (ICE Needed)	MAPO 2045 LRTP	Blue Earth Co	R12 / P7	X	X	X	X		$ -	Long	Illustrative	$ -	Long: 1
18	Stoltzman Rd (CSAH 16)	Pleasant St	Traffic Control Improvement (ICE Needed)	MAPO 2045 LRTP	**Blue Earth Co**/Mankato	R25 / R47 / BP8	X	X	X	X		$ -	Mid 2	Illustrative	$ -	Mid: 2 / Long: 1
19	MN 22	CSAH 90	Single-Lane RAB (ICE already completed)	Blue Earth County CIP	Blue Earth Co	C10 / BP47	X		X			$ -	Short	Illustrative	$ -	Short: 1

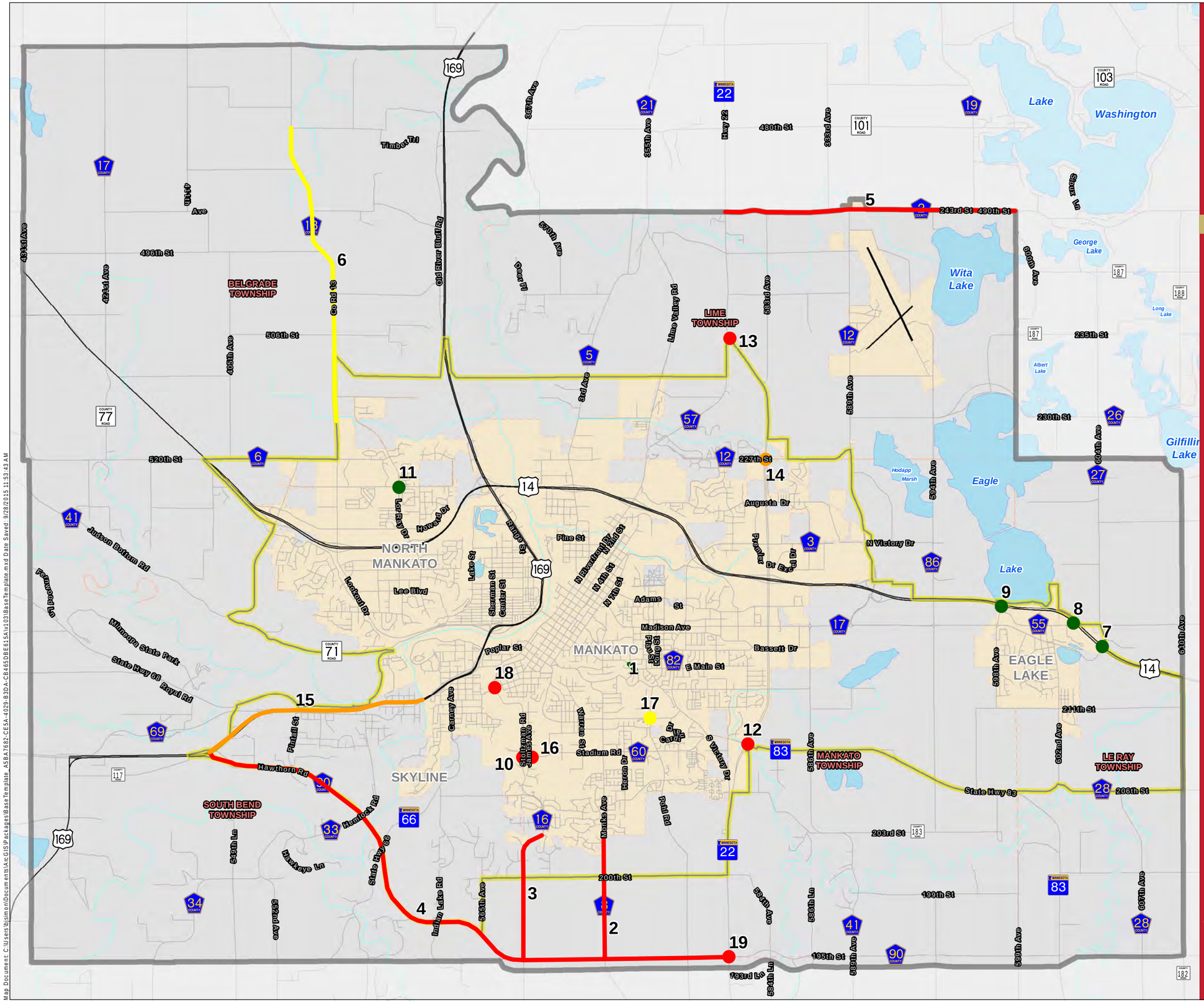
Time Frame:
Short (2016 - 2020) Mid 1 (2021 - 2025) Mid 2 (2026 - 2030) Long (2031 - 2045)

Project Coordination:
"C" - Corridor Project "I" - Intersection Project "R" - Rehabilitation/Reconstruction Project "P" - Preservation Project "S" - Safety Project "BP" - Bicycle/Pedestrian Project

MAPO 2045 TRANSPORTATION PLAN

Safety Improvements

Figure 9-12



Timeframe

- Short
- Mid 1
- Mid 2
- Illustrative
- PWI (Basin)
- PWI (Watercourse)
- Adjusted Urbanized Boundary
- MAPO Planning Area

Source: Blue Earth County, Nicollet County, MnDOT, North Mankato, Mankato, MnDNR, Esri Imagery

0 1 2 Miles

SRF

BOLTON & MENK

Table 9-14: Freight Projects

ID	Facility	Location/Termini	Project Description	Plan	Agency	MAPO Key Performance Focus Areas: Access and Reliability	Economic Vitality	Safety	Preservation	Multi-Modal Transportation	Estimated Cost* (2015)	Fiscally Constrained Priority Timeframe	Y.O.E. Estimated Cost (Based on Timeframe)	Public Input Priority Preference (5/14/15)
2	3rd Avenue (CSAH 5)	Railroad Crossing	Study possible grade separation and sound abatement alternatives.	MAPO 2045 LRTP	Blue Earth Co			X		X	$ 400,000	Short	$ 400,000	Long: 1
6	CSAH 26 / 589th Ave	Railroad Crossing	Install gates	MnDOT 2016-2019 ATIP*	Blue Earth Co			X		X	$ -	Illustrative	$ -	Short: 1 / Mid: 1
1	Main Street	Railroad Crossing	Security gate at floodwall opening, sound abatement wall with landscape screening	Railroad Corridor Mitigation Plan	Mankato			X		X	$ -	Illustrative	$ -	
3	US 14	Railroad Crossing	Additional bridge spans to accommodate expanded rail line	Railroad Corridor Mitigation Plan	MnDOT		X	X		X	$ -	Illustrative	$ -	
4	Industrial Road (CSAH 26)	Railroad Crossing	Study corridor re-alignment options from crossing to CR 57. Implement safe railroad crossing rather than closure.	Railroad Corridor Mitigation Plan	Blue Earth Co			X		X	$ -	Illustrative	$ -	
5	Sibley Parkway	Railroad Crossing	Expand railroad bridge to allow roadway expansion.	MAPO 2045 LRTP	Mankato/MnDOT		X	X		X	$ -	Illustrative	$ -	Short: 1

Time Frame:
Short (2016 - 2020) Mid 1 (2021 - 2025) Mid 2 (2026 - 2030) Long (2031 - 2045)

***Project costs indicate year of expenditure costs.**

MAPO 2045 TRANSPORTATION PLAN

Freight Projects

Figure 9-13

Timeframe

- Short
- Illustrative
- Railroad
- PWI (Basin)
- PWI (Watercourse)
- Adjusted Urbanized Boundary
- MAPO Planning Area

Source: Blue Earth County, Nicollet County, MnDOT, North Mankato, Mankato, MnDNR, Esri Imagery

0 1 2 Miles

SRF

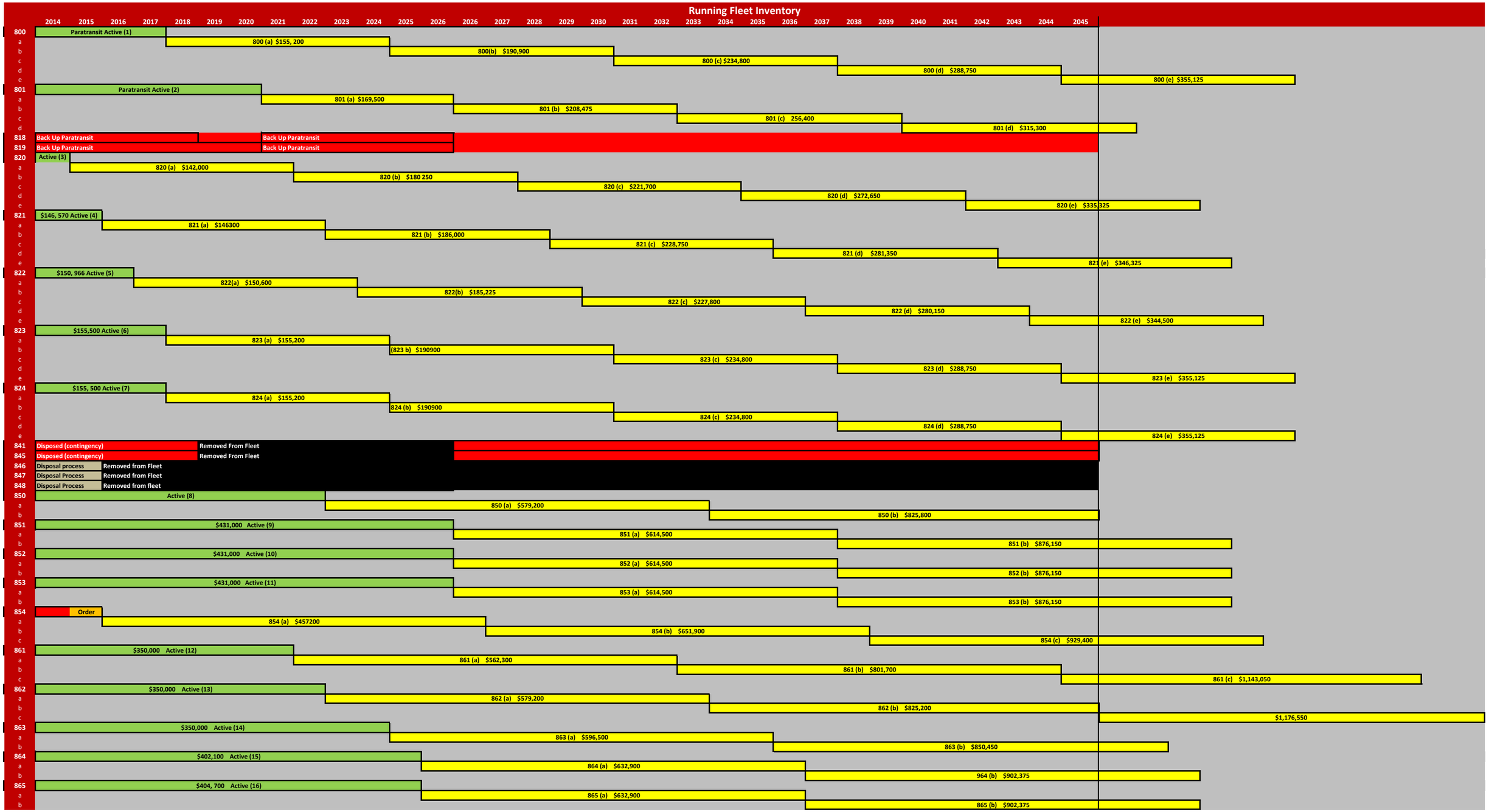
BOLTON & MENK

Map Document: J:\Maps\8573\mxd\MAPO Projects\Mankato_Projects_Freight_150929.mxd Date Saved: 9/29/2015 10:33:32 AM

Table 9-15: Aviation Projects

ID	Facility	Location/Termini	Project Description	Plan	Agency	MAPO Key Performance Focus Areas: Access and Reliability	Economic Vitality	Safety	Preservation	Multi-Modal Transportation	Estimated Cost	Notes
1	Mankato Regional Airport	Mankato Regional Airport	Comm Development Apron Expansion - Phase 1/2	City of Mankato CIP (2016)	Mankato					X	$ 430,000	State Funds = $344,000; Local = $86,000
2	Mankato Regional Airport	Mankato Regional Airport	Fuel Farm Compliance Update	City of Mankato CIP (2016)	Mankato					X	$ 35,000	State Funds = $21,000; Local = $14,000
3	Mankato Regional Airport	Mankato Regional Airport	Pavement Drainage - Heat Tape (Hangar 3130 & 3140)	City of Mankato CIP (2016)	Mankato					X	$ 35,000	State Funds = $17,500; Local = $17,500
4	Mankato Regional Airport	Mankato Regional Airport	Repair Existing T-Hanger (Re-Roof 3140 & 3150)	City of Mankato CIP (2016)	Mankato			X		X	$ 87,500	State Funds = $43,750; Local = $43,750
5	Mankato Regional Airport	Mankato Regional Airport	Terminal Interior Remodel	City of Mankato CIP (2016)	Mankato		X			X	$ 350,000	State Funds = $280,000; Local = $70,000
6	Mankato Regional Airport	Mankato Regional Airport	Hanger Partition and Floor (Hanger 3130)	City of Mankato CIP (2017)	Mankato					X	$ 65,000	State Funds = $32,500; Local = $32,500
7	Mankato Regional Airport	Mankato Regional Airport	Land Acquisition - Runway Protection Zone (FFY 2016)	City of Mankato CIP (2017)	Mankato		X			X	$ 275,000	FAA Funds = $247,500; State Funds = $13,750; Local = $13,750
8	Mankato Regional Airport	Mankato Regional Airport	Repair Existing T-Hanger (Re-Roof 3170 & 3174)	City of Mankato CIP (2017)	Mankato					X	$ 280,000	State Funds = $140,000; Local = $140,000
9	Mankato Regional Airport	Mankato Regional Airport	Replace Runway Directional Signs (FFY 2016)	City of Mankato CIP (2017)	Mankato			X		X	$ 50,000	FAA Funds = $45,000; State Funds = $2,500; Local = $2,500
10	Mankato Regional Airport	Mankato Regional Airport	Slurry Seal Runway 4/22 & Parking Aprons	City of Mankato CIP (2017)	Mankato			X		X	$ 250,000	State Funds = $200,000; Local = $50,000
11	Mankato Regional Airport	Mankato Regional Airport	Seal Coat Access Road	City of Mankato CIP (2017)	Mankato			X		X	$ 45,000	State Funds = $36,000; Local = $9,000
12	Mankato Regional Airport	Mankato Regional Airport	T-Hanger Design and Specs	City of Mankato CIP (2017)	Mankato					X	$ 75,000	State Funds = $37,500; Local = $37,500
13	Mankato Regional Airport	Mankato Regional Airport	Expand Commercial hanger Development Area	City of Mankato CIP (2018)	Mankato		X			X	$ 750,000	State Funds = $375,000; Local = $375,000
14	Mankato Regional Airport	Mankato Regional Airport	MALSR Rwy 15	City of Mankato CIP (2018)	Mankato					X	$ 300,000	State Funds = $240,000; Local = $60,000
15	Mankato Regional Airport	Mankato Regional Airport	Repair Existing T-Hanger (3180 & 3200)	City of Mankato CIP (2018)	Mankato			X		X	$ 270,000	State Funds = $135,000; Local = $135,000
16	Mankato Regional Airport	Mankato Regional Airport	Rwy 15/33, Concrete Crack Repair (FFY 2017)	City of Mankato CIP (2018)	Mankato					X	$ 50,000	FAA Funds = $45,000; State Funds = $2,500; Local = $2,500
17	Mankato Regional Airport	Mankato Regional Airport	SRE Storage Building Addition (FFY 2017)	City of Mankato CIP (2018)	Mankato					X	$ 800,000	FAA Funds = $720,000; State Funds = $40,000; Local = $40,000
18	Mankato Regional Airport	Mankato Regional Airport	Taxiway B Lighting - Rewire/Conduit	City of Mankato CIP (2018)	Mankato					X	$ 350,000	State Funds = $245,000; Local = $105,000
19	Mankato Regional Airport	Mankato Regional Airport	T-Hanger Construction	City of Mankato CIP (2018)	Mankato			X		X	$ 600,000	Local = $120,000
20	Mankato Regional Airport	Mankato Regional Airport	Convential Hanger Construction	City of Mankato CIP (2019)	Mankato					X	$ 1,700,000	Local = $850,000
21	Mankato Regional Airport	Mankato Regional Airport	Runway 15/33, Concrete Crack Repair (FFY 2018)	City of Mankato CIP (2019)	Mankato			X		X	$ 150,000	FAA Funds = $135,000; Local = $15,000
22	Mankato Regional Airport	Mankato Regional Airport	Wildlife Perimeter Fencing 10' (FFY 2018)	City of Mankato CIP (2019)	Mankato					X	$ 382,000	FAA Funds = $343,800; Local = $38,200
23	Mankato Regional Airport	Mankato Regional Airport	Building Entrance Canopies (Front/Rear)	City of Mankato CIP (2020)	Mankato					X	$ 240,000	State Funds = $216,000; Local = $24,000
24	Mankato Regional Airport	Mankato Regional Airport	Expand Airport Public Parking (2020)	City of Mankato CIP (2020)	Mankato	X				X	$ 482,000	State Funds = $337,400; Local = $144,600
25	Mankato Regional Airport	Mankato Regional Airport	Fuel Farm - Replace Underground Storage Tanks	City of Mankato CIP (2021)	Mankato					X	$ 200,000	State Funds = $140,000; Local = $60,000
26	Mankato Regional Airport	Mankato Regional Airport	Interior Passenger Security Installation (FFY 2020)	City of Mankato CIP (2021)	Mankato			X		X	$ 600,000	FAA Funds = $540,000; Local = $60,000
27	Mankato Regional Airport	Mankato Regional Airport	Mid-Cycle Master Plan Update	City of Mankato CIP (2022)	Mankato					X	$ 125,000	FAA Funds = $112,500; Local = $12,500
28	Mankato Regional Airport	Mankato Regional Airport	Student Hanger	City of Mankato CIP (2026)	Mankato					X	$ 394,836	FAA Funds = $355,352.40; Local = $39,483.60

Table 9-16: Great Mankato Transit 30-Year Capital Projects (Bus Replacement Program)



Vehicle is ordered but not delivered until the following year
Vehicles that will be ordered
Vehicles currently in service
a, b, c, d, e under each vehicle number is each replacement for the initial vehicle

Capital vehicle costs are projected to be split 80% State and or Federal sources / 20% local sources

Recommended Future Network

This chapter of the Plan presents the Mankato/North Mankato Area Planning Organization's (MAPO) proposed future functional classification and identifies a number of potential jurisdictional transfers. These specific elements constitute critical components of the planning area's future transportation system.

Future Functional Classification

The roadway functional classification defines the function and role of all key highways within the hierarchy of MAPO's 2045 transportation system. The future functional classification enables state, county, and local planning officials to better manage access and the design of roadways. The future functional classification analysis was developed to address MAPO's future system needs. It was completed by evaluating the current functional classification system, assessing anticipated changes in land use and development patterns, addressing inconsistencies and misaligned routes related to established guidelines, and providing appropriate connections to adjacent areas.

As shown in the Existing Conditions chapter, MAPO's mileage is on the low end of the FHWA's guidelines for urban minor arterials and major collectors and rural major collectors. Thus, MAPO will have the ability to increase mileage on the arterial and collector system as the metropolitan area transportation network expands. This is important because the area is expecting growth at the peripheral of the urban area and will need additional connectivity to enhance mobility. It is also important to note that the arterials, and in some cases collectors, are eligible for federal funding, which can help offset costs associated with expansion and maintenance projects.

Future Functional Classification Analysis and Coordination

The goal of a future functional classification plan is to achieve a better performing system that aligns the functional classification of routes to current and future land uses and the intended purpose of roadways. In order to begin the process of developing a future functional classification plan, the current and future roadway systems were evaluated to identify inconsistencies, or needs, using a number of factors, including:

- Trip characteristics: length of route, type and size of traffic generators served, and route continuity
- Access to regional population centers, activity centers, and major traffic generators
- Spacing of routes to serve different functions
- Proportional balance of access and mobility
- Continuity between or through travel sheds
- Linkages to contiguous land uses and future growth areas
- FHWA functional classification mileage guidelines

These factors provided the overall framework for establishing the future classification update. Using these characteristics and factors as the foundation for the future functional classification analysis, the current functional classification was reviewed and a year 2045 functional classification map was developed.

As shown in Table 10-1, future regional connectivity and connections to planned growth areas were the most dominant reasons for future functional classification changes. With the suggested future changes determined, coordination among the appropriate local agencies and MnDOT took place. Working with Technical Advisory Committee (TAC) members, the analysis process yielded a preliminary future functional classification system, including a list of changes, rationale for change, and a map. This preliminary data was then refined using an iterative process that included public stakeholder input and coordination with other future system elements (i.e., jurisdiction, priority freight routes, and preservation and maintenance strategies). Based on this information, further modifications to the preliminary results were made.

It is important to note that the future functional classification outline is for the next 30-year planning period, and the pace of these changes will be dictated by MAPO's policies, growth, need, and opportunities.

Figure 10-1 presents the future functional classification system proposed to be achieved by 2045.

Table 10-1: Proposed Future Functional Classification Changes

Roadway	From	To	Existing Functional Classification	Future Functional Classification	Rationale
US 169	US 14	Planning Boundary	Principal Arterial Other	Principal Arterial Expressway	Regional Connectivity
US 14	CSAH 41	Planning Boundary	Principal Arterial Other	Principal Arterial Expressway	Regional Connectivity
Carlson Dr	CSAH 41	CSAH 13	Local	Minor Collector	Future Growth Area (Industrial)
Timm Rd	CSAH 13	Lor Ray Dr	Local	Minor Collector	Future Growth Area (Industrial)
Lor Ray Rd / Township Rd 121	Timm Rd	CSAH 13	Local	Minor Collector	Future Growth Area (Residential)
CSAH 5	US 15	TH 22	Major Collector	Minor Arterial	Future Growth Area (Industrial) & Connectivity between US 14 & TH 22
Premier Dr	Augusta Dr	CSAH 3	Local	Minor Collector	Future Growth Area (Commercial/Residential)
Energy Dr	Power Dr	CSAH 3	Local	Minor Collector	Future Growth Area (Commercial)
Adams St	6th St	CSAH 3	Minor Collector	Major Collector	Future Growth Area (Commercial)
Adams St	CSAH 3	TH 22	Major Collector	Minor Arterial	Future Growth Area (Commercial)
Adam St	TH 22	CSAH12	Minor Collector	Major Collector	Future Growth Area (Commercial)
Adam St	CSAH 12	CSAH 17	N/A	Minor Collector	Future Growth Area (Commercial)
Bassett Dr	Carver Rd	598th Ave	N/A	Minor Collector	Future Growth Area (Commercial) & Connectivity to Eagle Lake
CSAH 12	CSAH 3	TH 83	Local/Major Collector	Minor Arterial	Future Growth Area & Connectivity between US 14 & TH 83
Hoffman Rd	TH 22	CSAH 12 (Extension)	Local	Minor Arterial	Future Growth Area (Commercial)
Hoffman Rd	CSAH 12 (Extension)	598th Ave	N/A	Major Collector	Future Growth Area (Commercial) & Connectivity to Eagle Lake
598th Ave	CSAH 17	Hoffman Rd (Extension)	Local	Minor Collector	Connectivity & Coordination with Future Roadway Extensions
211th St	Hoffman Rd (Extension)	CSAH 27	Local	Minor Collector	Connectivity & Coordination with Future Roadway Extensions
Le Sueur Ave	598th Ave	CSAH 27	Local	Minor Collector	Connectivity & Coordination with Future Roadway Extensions
CSAH 17	TH 22	CSAH 12	Major Collector	Minor Arterial	Future Growth Area (Commercial)
200th St	Stoltzman Rd	TH 22	Local	Minor Collector	Future Growth Area (Residential)
US 14	CSAH 56	Planning Boundary	Principal Arterial Other	Principal Arterial Expressway	Regional Connectivity
CR 183	CSAH 41	TH 83	Local	Minor Collector	All County Roads Classified Collector or above

MAPO 2045 TRANSPORTATION PLAN

Proposed 2045 Future Functional Classification

Figure 10-1

2045 Future Functional Classification

- Principal Arterial Freeway Expressway
- Principal Arterial Other
- Minor Arterial
- Major Collector
- Minor Collector
- Local
- Outside Planning Area
- Proposed 2045 Roadway Network
- PWI (Basin)
- PWI (Watercourse)
- MAPO Planning Area

Source: Blue Earth County, Nicollet County, MnDOT, North Mankato, Mankato, MnDNR, Esri Imagery

0 1 2 Miles

SRF

BOLTON & MENK

Map Document: J:\Maps\8573\mxd\Future Network\MAPO_2040_FutureFunctionalClass_150929.mxd Date Saved: 9/29/2015 1:03:17 PM

Using the potential future 2045 system, the future urban and rural functional classification mileage was compared to FHWA guidelines to determine if each functional classification group will be consistent with the federal guidance (Table 10-2 and Table 10-3).

Table 10-2: Future Urban Functional Classification Mileage

Functional Classification		Miles	System %	FHWA Guidelines		Range
Principal Arterials	Interstate	-	0%	1-3%	5-14%	Within
	Other Freeway & Expressways	20.9	5%	0-2%		
	Other Principal Arterials	28.0	6%	4-9%		
Minor Arterials		48.2	11%	7-14%		Within
Major Collectors		41.8	9%	3-16%	6-32%	Within
Minor Collectors		44.8	10%	3-16%		
Local		272.5	60%	62-74%		Lower
Total		456.2	100%			

Table 10-3: Future Rural Functional Classification Mileage

Functional Classification		Miles	System %	FHWA Guidelines		Range
Principal Arterials	Interstate	-	0%	1-3%	5-14%	Within
	Other Freeway & Expressways	7.9	4%	0-2%		
	Other Principal Arterials	7.1	4%	4-9%		
Minor Arterials		14.2	7%	7-14%		Within
Major Collectors		27.8	14%	3-16%	6-32%	Within
Minor Collectors		24.8	13%	3-16%		
Local		112.2	58%	62-74%		Lower
Total		193.9	100%			

As presented in Tables 10-2 and 10-3, the proposed future functional classification system for the MAPO will be consistent with federal guidelines.

Future Jurisdictional Alignment

The jurisdiction of roads is an important element of the future system plan because it affects a number of organizational functions and obligations (e.g., regulatory, maintenance, construction, and financial).

The hierarchy of jurisdictional classification is typically established so that higher-volume corridors carrying regional traffic are maintained by MnDOT (e.g., US highways and state trunk highways), while intra-county intermediate volume corridors with more limited travel sheds (e.g., County State Aid and County Highways) are maintained by the County. Roadways serving local traffic (e.g., Municipal State Aid Streets/city streets and township roads) should be maintained by each municipality or township. Jurisdictional classification is intended to maintain a balance of responsibility among state, county, municipal, and township agencies.

Roadways that are misaligned (i.e., not owned by the most appropriate jurisdiction) can result in a number of problems for the transportation system. These include:

- Having a roadway system that contains segments that are not "jurisdictionally appropriate" for current and future functions.
- Setting design and condition standards that exceed actual roadway function.
- Directing critical financial resources away from appropriately aligned roadways.
- Providing a level of service, in terms of capacity and expectations (i.e., safety, ride quality, and maintenance), that does not match the actual roadway conditions or ownership.

The goal of the MAPO jurisdiction realignment analysis was to match the management of roadways with their intended future function and with the jurisdiction best suited to maintain them.

Future Jurisdictional Analysis and Coordination

MAPO's future jurisdictional analysis was, in part, developed using a "typical jurisdictional profile" of key characteristics, provided below:

State System

- Statewide function
- Multi-county facilities
- Regional connectivity
- Higher travel speeds

County Roadway System

- Regional connectivity
- Moderate traffic volumes
- Connect urban and outlying rural areas
- Paved or gravel routes

City Routes

- Short segments with small travel sheds
- Serve local land access needs
- Moderate traffic volumes
- Limited continuity with rural areas

Township Routes

- Limited travel sheds
- Lack of continuity
- Low traffic volumes
- Provide access to adjacent property

These general characteristics, along with rules defined in the Minnesota State Statute 163.11, provided the overall framework for establishing the future jurisdictional update. The current jurisdictional classification was reviewed and a year 2045 jurisdiction map was developed for presentation to the TAC.

A workshop was held with the TAC to discuss and develop a revised future jurisdiction map. The workshop explained the analysis and recommendation process, responded to questions, listened to comments, and made adjustments based on input. Figure 10-2 presents the future jurisdiction map proposed to be achieved by 2045. It is recommended that the suggested jurisdictional transfers be implemented as opportunities arise. Examples of appropriate times for advancing jurisdictional issues are:

- When municipalities reach a population of 5,000 and create their own municipal state aid system.
- When a new roadway segment is constructed that replaces the function of the current roadway.
- During improvements or major rehabilitation of a facility that is identified as a potential transfer candidate.

MAPO 2045 TRANSPORTATION PLAN

Proposed 2045 Future Roadway Jurisdiction

Figure 10-2

2045 Future Roadway Jurisdiction

- US Highway
- State Highway
- County
- Township
- City
- Proposed 2045 Roadway Network
- PWI (Basin)
- PWI (Watercourse)
- MAPO Planning Area

Source: Blue Earth County, Nicollet County, MnDOT, North Mankato, Mankato, MnDNR, Esri Imagery

0 1 2 Miles

SRF

BOLTON & MENK

System Management

The MAPO 2045 Long Range Transportation Plan (LRTP) should be considered a living document, and a number of monitoring and planning activities should be carried forward following its adoption. This chapter summarizes system management tools that can assist the Mankato/North Mankato Area Planning Organization (MAPO) to achieve its goals and overall vision for the future transportation system. These tools include guidelines for access management, traffic control devices, and right-of-way (ROW) preservation. MAPO staff and decision makers can use these tools to maximize the efficiency and safety of their current system and preserve corridors for their future system.

Access Management

Unrestricted or unmanaged access is a direct contributor to roadway congestion and safety problems. It is important that the current MAPO LRTP provide a solid foundation for acknowledging and addressing effective access management measures.

Access Management Purpose and Goals

Access management is a strategic, multi-dimensional set of policies, methods and tools to manage connectivity to public roadways from various types of land uses. Access management seeks to provide an appropriate balance between mobility needs and connections to property. Good access management supports a wide array of transportation system goals. These goals include creating a safe travel environment for all modes and users of transportation systems, encouraging a balance between roadway capacity and accessibility, and encouraging an active transportation system (i.e., integration of multimodal facilities, context sensitive design principles, etc.).

Benefits of Access Management

Transportation staff in a metropolitan area regularly receive requests for additional access (e.g. new public streets, commercial driveways, residential and field accesses), which are often evaluated by numerous affected agencies. Because of the number of individuals and agencies involved, it is easy to have an inconsistent application of access policies. This can result in confusion between agencies, developers and property owners, as well as long-term safety and mobility problems. Standard access guidelines uniformly interpreted and implemented in the MAPO area can be used to improve communication, enhance safety, and maintain the capacity and mobility of the transportation corridors.

Providing access management in some form (whether it is through grade-separated crossings, frontage roads or right-in/right-out access) reduces the number of intersection conflict points, which results in improved safety. Many studies have demonstrated a direct relationship between the number of full access points and the rate of crashes. Access management also plays an important role in maintaining

roadway capacity and maximizing mobility while supporting the jurisdictions functional classification system plans.

Legal Basis for Access Management

Chapter 8810 in the Minnesota State Statutes directs public road authorities to provide "reasonable, convenient, and suitable" access to property unless these access rights have been purchased. Courts have interpreted this to allow:

- Restrictions of access to right-in/right-out
- Redirection of access to another public roadway if the roadway is reasonable, convenient, and suitable

In special circumstances, broader authority (police power) has been given to public agencies if the situation is deemed to jeopardize public safety. However, this is a very high standard to meet and is seldom used by public agencies. In addition to the above, land use authorities may exercise additional authority in limiting access through development rules and regulations. Land use authorities may require:

- Dedication of public rights-of-way
- Construction of public roadways
- Mitigation of traffic and/or other impacts
- Change in and/or development of new access points

Access Management - A City, County, State, and MAPO Issue

At the city and county level, the management of the number, location, design, and operation of access features, such as driveways and street intersections, is accomplished through municipal and county land use and access management policies, zoning and subdivision ordinances, and site plan review processes. At the state level, the Minnesota Department of Transportation (MnDOT) regulates access using its *Access Management Manual*, developed in 2008. The guidelines in this manual address the spacing of public street connections, traffic signals, and the allowance of driveways to the state trunk highway system.

However, access management is best accomplished through intergovernmental coordination on an area-wide basis, rather than trying to create solutions on a site-by-site or city-by-city basis. A set of comprehensive, system-wide access spacing guidelines will assist local governments within the MAPO planning area to cooperatively manage access. The access guidelines proposed for the MAPO area integrate some elements of the aforementioned MnDOT Access Management Manual but have been refined to provide a customized framework for the MAPO local partners. Table 11-1 presents the MAPO Access Management Guidelines.

Table 11-1: MAPO Access Management Guidelines

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

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

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

Primary Intersection – Primary intersection refers to full-movement intersections that may be considered for signalization if the appropriate signal warrants have been met. The spacing of primary intersections is governed by the need to provide uniform spacing for effective signal coordination in urban/urbanizing areas and adequate spacing for left-turn lanes on unsignalized highways in both urban and rural areas.

Secondary Intersection – Secondary intersection refers to intersections that may be accommodated midway between primary intersections if they do not create a high-risk conflict condition.

Access Management Guidance

In order to fully understand the MAPO Access Management Guidelines table, each of the major components and their relevance to access management is discussed below. The intent is for these guidelines to be used as a reference for local partners and county officials as they seek to incorporate the access management into their respective transportation planning processes and regulatory procedures.

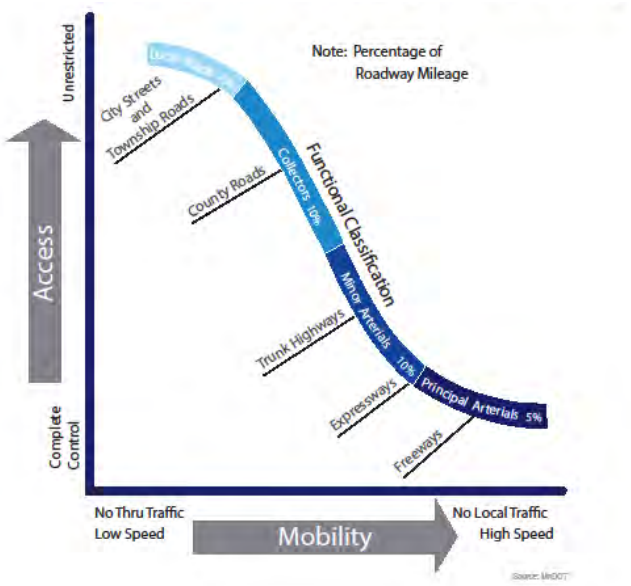
Functional Classification and Mobility

In an efficient roadway network, the various roadway facilities work together to serve the needs of the traveling public; as the proportion of arterials, collectors, and local streets is balanced to provide system continuity and connectivity. Table 11-2 describes each of the various roadway functional classifications in greater detail, as well as how each generally fits into a mobility/access hierarchy. Figure 11-1 graphically summarizes the direct relationship between functional classification and roadway mobility and access.

Table 11-2: Role of Functional Classification in Access Management

Functional Class	Intended Mobility/Accessibility Role	Primary Function	Typical Trip Length	Typical Intersection Control	MAPO Roadway Examples
Principal Arterials	Emphasizes mobility and employs very strict access control	Serves major activity centers and supports high traffic volumes	Through traffic (longest trips)	Interchanges	TH 169 TH 22 TH 14 Madison Ave
Minor Arterials	Less access control than a Principal Arterial; however, access is still limited to allow for strong mobility	Serves smaller activity centers, connects to Principal Arterials, and carries moderate traffic volumes	Short to medium trips	Signalized Intersections and/or Roundabouts	Hoffman Rd Monks Ave Stoltzman Rd
Collector Streets	Emphasizes a balance between mobility and access needs	Moves traffic from local streets to arterials and serves moderate traffic volumes	Short trips	Controlled Intersections (Stop signs; signal/roundabout, if warranted)	CSAH 12 CSAH 13 TH 66
Local - City Streets	Emphasizes access over mobility	Serves local, neighborhood-level trips, connects to collectors, and supports low traffic volumes	Short trips	Controlled and uncontrolled intersections	Augusta Dr Maplewood Ave N 5th St
Local - Township Roads	Balance of access and mobility is more subjective, as these roads serve both local and through traffic needs	Moves rural traffic, which is typically low-volume; however, some facilities carry moderate volumes	Trips may be limited to small subarea traffic or may serve as collectors and minor arterials	Controlled and uncontrolled intersections	Indian Lake Rd Lime Valley Rd Pohl Rd

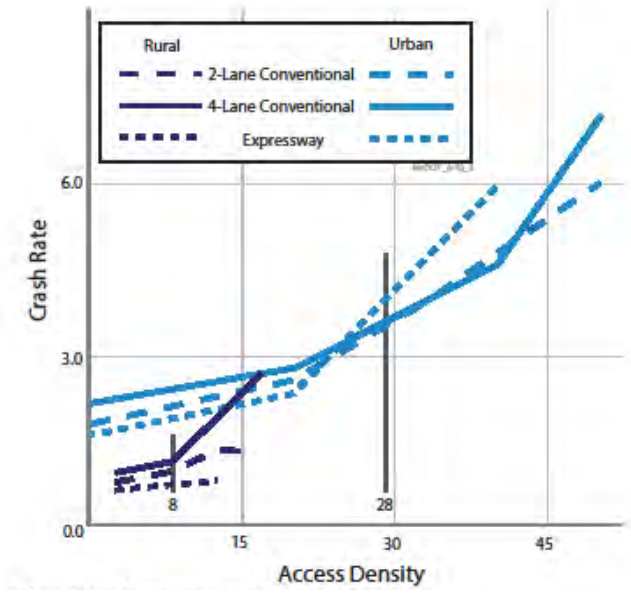
Figure 11-1: Access and Mobility Relationship



Intersection/Driveway Spacing/Conflict Points

As the number of roadway intersections per mile increases, the opportunity for crashes increases. The existence of too many intersections per mile also increases delay and congestion for automobiles, transit, and freight. **Figure 11-2**, from MnDOT's *Traffic Safety Fundamentals Handbook 2008*, describes the positive relationship between lower access density and reduced crash rates.

Figure 11-2: Access/Mobility Relationship

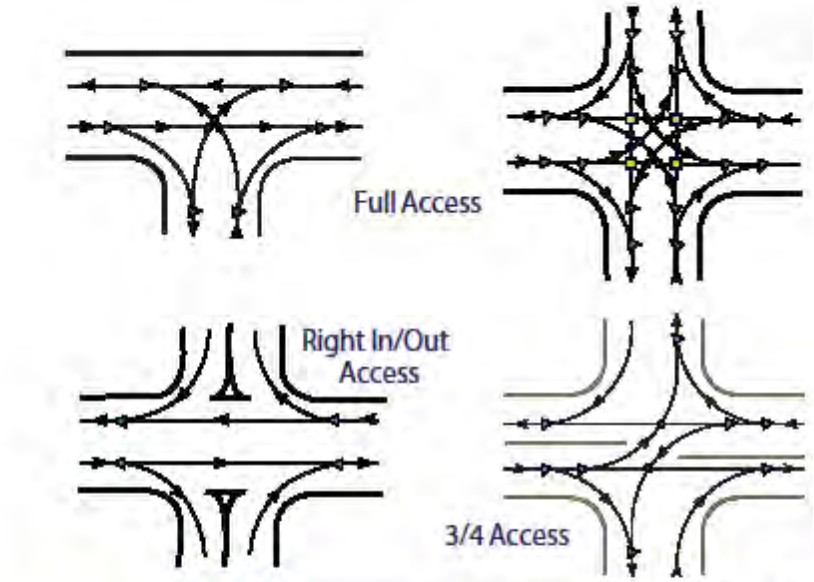


Note: "Rural Refers to a non-municipal area and cities within a population less than 5,000
Source: MnDOT Traffic Safety Fundamentals Handbook 2008

Driveways for residential or commercial properties can also be considered a special type of intersection. Driveways should not be located within the functional area of an intersection. The functional area of an intersection is that area beyond the physical intersection of two roadways that comprises decision and maneuvering distance. Driveways located within the functional area may create too many conflict points within too small an area for motorists to safely negotiate. Driveway access should be limited in general.

Safety is also related to the number of conflict points at an intersection. Conflict points occur at access approaches where the intersection paths of two through or turning vehicles merge, diverge, or cross. Each of these conflict points is a potential location for a crash (see Figure 11-3).

Figure 11-3: Conflict Point Diagram



	Crossing	Turning	Merge/ Diverge	Total	Typical Crash Rate (crashes per mil. entering vehicles)
Full Access +	4	12	16	32	0.3 (1)
Full Access T	0	3	6	9	0.3 (2)
3/4 Access	0	2	8	10	0.2 (2)
Right In/Out Access	0	0	4	4	0.1 (3)

(1): 2004-2006 Minnesota TIS Crash Data
(2): Estimated based on Publication FHWA – RD – 91 – 048
(3): Estimated based on a limited sample of MnDOT data
Source: MnDOT Traffic Safety Fundamentals Handbook 2008

Application of MAPO Access Management Guidelines

The MAPO Technical Advisory Committee (TAC) requested these guidelines be applied to three key metro corridors to understand their effectiveness:

- TH 169 – TH 14 South Ramps to Veterans Bridge
- Stadium Road (CSAH 60) – Stoltzman Road (CSAH 16) to Victory Drive (CSAH 82)
- TH 22 – 227th Street (CSAH 26) to Victory Drive

TH 169 between TH 14 and Veterans Bridge is classified as an urban/urbanizing principal arterial (freeway expressway) by MnDOT. Seven access points were identified along this 1.7-mile segment, an average of four access points per mile. The access through this area are compliant with the access management guidelines; however, some of the intersection's spacing did not meet the minimum intersection spacing on case-by-case basis (1/2 mile full access – Lind Street is inside of 1/2 mile spacing to the full access TH 14 South Ramp).

Stadium Road (CSAH 60) is classified by MnDOT as an urban/urbanizing minor arterial between Stoltzman Road (CSAH 16) and Victory Drive (CSAH 82). This 2.3-mile segment has a total of 24 access points, which equates to 11 access points per mile, which is non-compliant with the access management guidelines. The amount of private access points along this corridor contributes to its poor mobility and significant amount of conflict.

TH 22 is classified as an urban/urbanizing principal arterial (other) between 227th Street (CSAH 26) and Victory Drive. A total of 14 access points were identified within the 4.1-mile segment, an average of approximately four access points per mile. This corridor is near the access per mile thresholds and slightly out of compliance. Access along this corridor has been managed well to this point and should continue in the future. See Table 11-3 for a more detailed evaluation of the access types by corridor.

Table 11-3: MAPO Key Corridor Access Management Analysis

Key Corridor	Length (miles)	Area	Existing Functional Classification	Access Land Use							Access Density		Compliant With MnDOT
				Public Streets	Residential	Commercial	Institution (School, Government, Church)	Ramp	Median Turnaround	Multiple Land Uses	Total Access	Average Access/ Mile	
TH 169 between TH 14 South Ramps and Veterans Bridge	1.7	Urban/ Urbanizing	Principal Arterial (Freeway Expressway)	4	--	--	--	2	1	--	7	4	Compliant
Stadium Road (CSAH 60) between Stoltzman Rd (CSAH 16) and Victory Dr (CSAH 82)	2.3	Urban/ Urbanizing	Minor Arterial	12	4	6	1	--	--	3	24	11	Non-Compliant
TH 22 between 227th St (CSAH 26) and Victory Dr	4.1	Urban/ Urbanizing	Principal Arterial (Other)	10	1	--	1	2	--	--	14	4	Slightly Non-Compliant

Recommended Access Management Implementation Activities

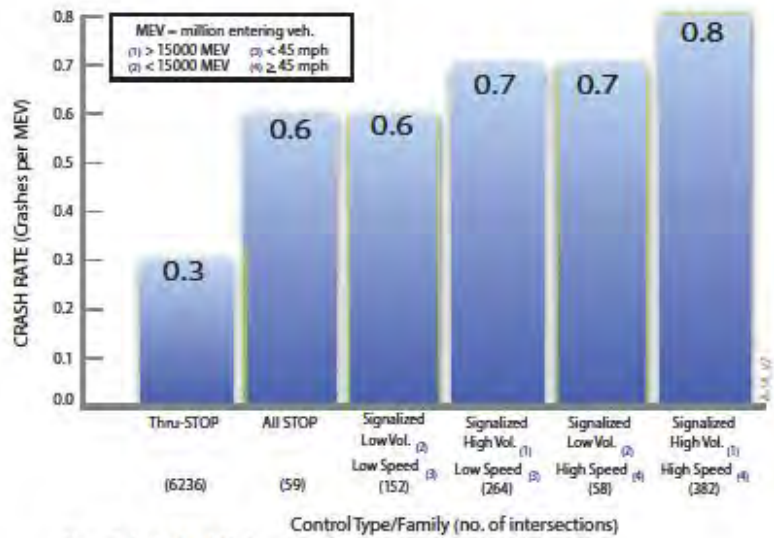
Moving forward, the following action items are recommended to implement the proposed MAPO Access Management Guidelines:

1. Continue to work with local jurisdictions and encourage adoption of these guidelines to establish an integrated metro access management program.
2. Create an access management education plan and commit MAPO staff resources to an ongoing outreach program.
3. Encourage local agencies to establish and apply a traffic impact analysis process for all major development and site planning to ensure access management principles are considered in the planning of these projects.
4. Integrate access management performance measures into MAPO's planning process.
5. Consider asking local governments to approve MAPO playing an advisory site design review role to ensure uniform access management across the metropolitan planning area.

Traffic Control Device Spacing

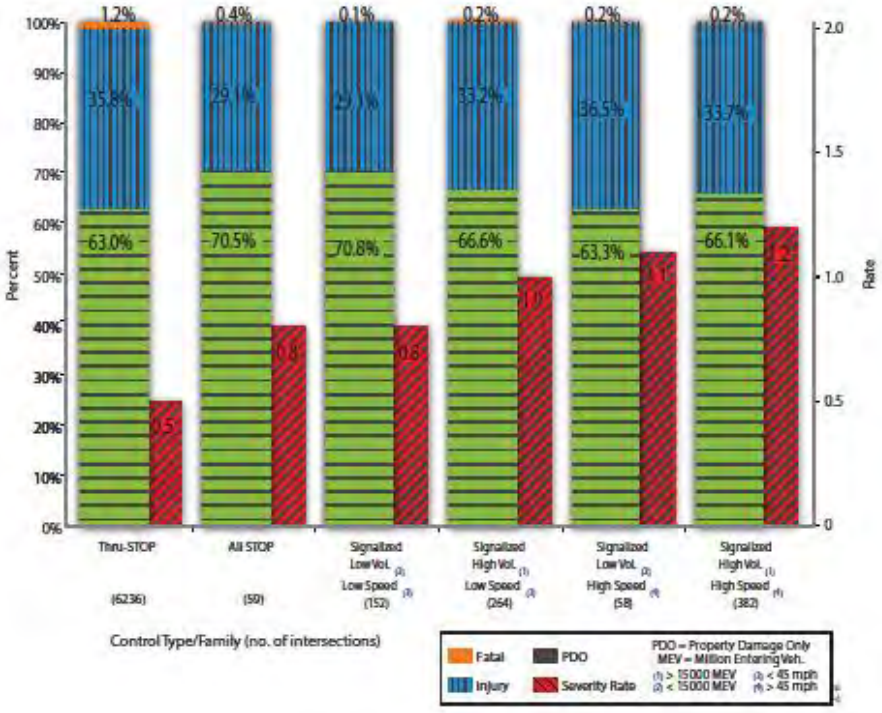
Research clearly indicates that access, safety, and type of traffic control are all highly correlated. Furthermore, comparative accident rates document that a greater number of access points and traffic signals per mile translate into increases in crash rates. For example, the average crash rate at signalized intersections is more than 150 percent higher than average crash rate at other controlled intersections (see Figure 11-4). Additionally, the severity rate at signalized intersections is approximately 120 percent higher than intersections with other control types (see Figure 11-5).

Figure 11-4: Intersection Crash Rate by Control Type



Note: Only for Trunk Highway Intersections
Source: MnDOT Traffic Safety Fundamentals Handbook 2008

Figure 11-5: Intersection Crash Severity by Control Type



Note: Only for Trunk Highway Intersections
Source: MnDOT Traffic Safety Fundamentals Handbook 2008

Traffic control devices regulate, warn, and guide roadway users. Therefore, it is important that MAPO area governing agencies place and operate traffic control devices according to standards as stated in the *Highway Traffic Regulation Act (MS Chapter 169)* and *Minnesota Manual on Uniform Traffic Control Devices (MMUTCD)*. Intersection traffic controls include through-stop operation, all-way stop control, roundabouts, and traffic signals. Each device has appropriate uses based on traffic volumes and operating conditions (e.g., higher volumes through intersections with through-stop operation and all-way stop control may result in unacceptable delays/operations, rendering them not applicable). However, often local officials mainly focus on traffic signals, roundabouts, or increasing the number of traffic control devices.

A proliferation of traffic signals/roundabouts, or conversely improved spacing of these devices along a corridor can affect crash rates and severity. Uniform spacing and coordinated signal timing can accommodate traffic, both during peak and non-peak periods of the day. The Traffic Control Spacing Guidelines that follow include recommendations based on accepted engineering standards and MnDOT's guidelines for signal spacing. Table 11-4 provides the recommended spacing guidelines for the Interregional Corridors (IRC) and US Highways and Table 11-5 present all Non-IRC Highways within the MAPO planning area based off MnDOT's guidelines.

Table 11-4: Traffic Control Device Spacing for Interregional Corridors

Functional Class	Facility Type	MnDOT Category	Device Spacing	Notes
Principal Arterial	Urban/Urbanizing	High-Priority IRC	1/2 mile	New traffic control may be considered if traffic volumes warrant; however, these should be uniformly spaced and consistent with adjacent signalization along the corridor.
		Medium-Priority IRC	1/2 mile	
Principal Arterial	Rural	High-Priority IRC	N/A	New traffic control may be considered if traffic volumes warrant; however, these should be uniformly spaced and consistent with adjacent signalization along the corridor. An interim signal may be considered for needed safety if cost-effective alternatives are not feasible.
		Medium-Priority IRC	N/A	

Table 11-5: Traffic Control Device Spacing for Non-Interregional Corridors

Functional Class	Facility Type	MnDOT Category	Device Spacing	Notes
Principal Arterial	Rural	Regional Corridor	1/2 mile	Spacing of one-half mile may occur in rare cases. Traffic signals should be coordinated to minimize impacts in these cases.
		Non-IRC	1/2 mile	
Minor Arterial		Minor Arterial	1/2 mile	
Collector		Collector	1/2 mile	
Principal Arterial	Urban/Urbanizing	Regional Corridor	1/2 mile	-
		Primary Arterial	1/2 mile	
Minor Arterial		Minor Arterial	1/4 mile	
Collector		Collector	1/4 mile	
Principal Arterial	Urban Core	Regional Corridor	1/4 mile	-
		Primary Arterial	1/4 mile	
Minor Arterial		Minor Arterial	1/4 mile	
Collector		Collector	1/8 mile	

In the future, the MAPO agencies should evaluate the appropriate traffic control device at intersections on a case-by-case basis using these traffic control device guidelines to determine the most appropriate traffic control.

Right-of-Way

Right-of-way (ROW) is a valuable public asset. Therefore, it needs to be preserved and managed in a way that respects the roadways' intended function while serving the greatest public good. A number of corridors have been identified in the Plan as needing future reconstruction, additional traffic lanes, or new alignments.

Many of these future improvements will require that adequate ROW be maintained or secured. To ensure consistency and wise use of taxpayer dollars, a set of metropolitan ROW guidelines is provided below. Table 11-6 presents these ROW guidelines by functional classification and facility type for use in future roadway, roadway expansion, or reconstruction planning and project development. Upon adoption of the LRTP, and by referencing these guidelines, it is recommended that partnering agencies including the cities of Mankato and North Mankato public works, planning and zoning staff, along with Nicollet and Blue Earth counties planning and engineering staff, familiarize themselves with these guidelines so that they can be administered in a uniform manner across the metropolitan area. Use of these guidelines during the ROW acquisition, or corridor/interchange preservation process will, over time, reduce cost and streamline project development.

Table 11-6: MAPO Right-of-Way Guidelines

Functional Class	ROW Width	Facility Type
Principal Arterial	120 ft.	2-lane Rural
	150 ft.	4-lane Urban
	300 ft.	4-lane Rural
Minor Arterial	100 ft.	2-lane Urban
	120 ft.	2-lane Rural
	120 ft.	3-lane Urban
	150 ft.	4-lane Urban
	220 ft.	4-lane Rural
Collector	80 ft.	2-lane Urban
	80 ft.	2-lane Rural
	80 ft.	3-lane Urban

- ROW width can typically accommodate potential parking on roadway and adjacent sidewalk/trail facilities.
- Due to certain development conditions or physical features of a site, ROW greater than shown may be requested.
- Reduced ROW widths may be considered as need warrants.
- Rural and Urban refers to typical section design, not geographic area.

In order to establish the appropriate ROW needs, special considerations should be taken as roadways transition from urban to rural settings. The use of a consistent set of guidelines during the ROW acquisition or corridor/interchange preservation process will, over time, reduce cost and streamline project development.

Right-of-Way Preservation

When future expansion or realignment of a roadway or a new interchange is proposed, but not immediately programmed, agencies should consider ROW preservation actions to reduce future costs and protect the feasibility of the proposed improvement. Several different methods can be used to preserve ROW for future construction, including advanced purchase, zoning and subdivision techniques, and official mapping.

Before implementing any ROW preservation activities, local agencies should weigh the risks of proceeding with ROW acquisition or preservation without environmental documentation. (Note: MnDOT policy requires environmental documentation prior to purchase.) If environmental documentation has not been completed, agencies risk preserving a corridor or parcel that may have environmental issues.

Direct Purchase

The best ways to preserve ROW is to purchase it. Unfortunately, agencies rarely have the necessary funds to purchase ROW in advance, and the public benefit of purchasing ROW is not realized until a roadway or transportation facility is built. Most typically, local jurisdictions utilize various corridor preservation methods prior to roadway construction and then purchase the ROW if it has not already been previously dedicated, at the time of design and construction.

Planning and Zoning Authority

Local agencies have the authority to regulate existing and future land use. Under this authority, agencies have a number of tools for preserving ROW for transportation projects. These tools include:

- **Zoning**

  If the property is in a very low-density area (e.g., agricultural district), MAPO partnering agencies should maintain the existing zoning classification. A low zoning classification limits the risk for significant development and can help preserve land for potential ROW until funding becomes available for roadway construction.

- **Platting and Subdivision Regulations**

  Cities and counties can require ROW dedication as part of the platting and subdivision process. The respective agencies platting and subdivision regulations provide authority to consider future roadway alignments during the platting process because most land must be platted before it is developed. Each local agency can use this authority to regulate land development and influence plat configuration and the location of proposed roadways. Planning and engineering staff work with developers to formulate a plat that meets development objectives and that conforms to a long-term community vision and/or plans.

- **Official Mapping**

A final strategy to preserve ROW is to adopt an Official Map. An Official Map is developed by the local governmental unit and identifies the centerline and ROW needed for a future roadway. The local agency then holds a public hearing showing the location of the future roadway and incorporates the official map into its thoroughfare or community facilities plan.

The official mapping process allows agencies to control proposed development within an identified area, and to influence development on adjacent parcels. However, if a directly affected property owner requests to develop his/her property, agencies have six months to initiate acquisition and purchase of the property to prevent its development. If the property is not purchased, the owner is allowed to develop it in conformance with current zoning and subdivision regulations. As a result, the official mapping process should only be used for preserving key corridors in areas with significant growth pressures.

Corridor Signing Program

In addition to land use regulations, some jurisdictions have used a corridor signing program to identify arterial roadways that are planned for expansion projects. This signage program notifies residents and potential developers that the particular roadway is planned to be upgraded or a new roadway is planned to be constructed. This often makes negotiations with residents/developers easier, since they have been given advanced notice of major roadway expansion projects. Further, this advanced information aids developers plan agreeable land uses and access management measures into their subdivisions. Signs are generally placed along roads on the urban fringe near the city limits or within a city's extraterritorial expansion area.

Next Steps

The chapter identifies important future ongoing activities, multimodal planning studies, and supplemented MPO plan elements that should be undertaken by MAPO staff and its planning partners. These efforts were identified as priorities that will add value to the Plan, increase its usefulness, and assist in implementing its recommendations.

Ongoing Activities

Several monitoring and planning activities are recommended to be undertaken by MAPO staff over the next five years following the Plan's adoption. These activities are intended to enhance metropolitan planning, facilitate future updates of the Plan, and monitor performance on the impact of policy recommendations, as identified in the Plan.

Policies, Standards and Strategies

Educate planning partners on the importance of the Plan's transportation policies and standards, and encourage them to maintain a consistent approach and use of key transportation tools:

- Access Management
- Signal Spacing
- Right-of-Way

Data Maintenance

Commit staff resources to:

- Collect and share GIS information to promote the regularity, compatibility, and reliability of data inputs.
- Establish a uniform metro wide pavement management system to maintain the transportation system and facilities, and guide operation and maintenance investments.
- Establish a protocol to maintain and update MAPO's regional travel forecast to enhance forecast methods, identify new techniques, review development assumptions, and identify data needs.

System Performance Monitoring

Commit staff resources to:

- Develop an annual surveillance and monitoring program to evaluate the status of the Plan's short-term, mid-term, and long-term projects and track progress toward project completion.

- Establish performance targets that conform to state and federal guidance to monitor and assess the effectiveness of transportation investments and progress towards the Plan's long-term goals.

Future Studies

Commit financial resources and coordinate with partnering agencies to:

- Conduct sub-area traffic and corridor studies to address specific transportation needs and urban growth issues in more detail as they have been identified in the Plan.

Project Prioritization Updates

Commit staff resources to:

- Continue to evaluate ongoing developments, planned roadway improvements, and maintenance needs leading to project prioritization to efficiently manage the transportation system.
- Monitor short-term, mid-term, and long-term project needs and prepare plan amendments, if justified by additional funding availability or new information affecting priorities or evaluation criteria.

Planning Studies for Future Consideration

During the long-range planning process, a number of major transportation corridor studies were identified as having regional significance and required further analysis. Each of the corridors were evaluated in some way during the LRTP process, but more detailed study will be needed to assess feasibility and environmental impacts, or to initiate preliminary design, or project sequencing/phasing. It is customary, prior to the inclusion of projects in an MPO's Transportation Improvement Program (TIP) or the MnDOT's STIP, that prerequisite studies be completed (i.e., corridor or subarea studies, intersection analysis, freight movement studies, non-motorized or safety analysis, early environmental documentation, etc.).

Below is a list of studies that were identified during the planning process for further consideration (note the numbers following the recommended studies correspond to the identification numbers found in the universe of alternatives list, where appropriate):

Corridor Studies: Corridor studies evaluate all aspects of the corridor, from safety to mobility, in order to meet the existing and future travel needs.

- US 169 from US 14 to Webster Avenue (assess access / intersection / interchange improvements, explore low-cost / high-benefit solutions) #C9
- US 169 from Blue Earth River to CSAH 90 (review potential safety improvements, including access modifications) #S15
- MN 22 from Mapleton to St. Peter (assess access, safety, mobility and land use considerations throughout the corridor) #C10 & C11

- Riverfront Drive from US 169 to TH 14 (examine deficiencies and improve safety and travel along corridor)
- Warren Street from Riverfront Drive to Balcerzak Drive (improve safety and travel along corridor)
- Minnesota State University, Mankato campus area Warren Street/Balcerzak Drive area (examine existing/future improvements for all modes of transportation around campus)
- Belgrade Avenue from Lee Boulevard to US169 Bridge (improve safe and efficient travel for all users / implement pedestrian infrastructure such as crosswalks and sidewalk bump outs to improve pedestrian safety)

Interchange Studies: Interchange studies examine existing and future safety and roadway operations through an interchange area, including adjacent intersections, in the MAPO planning area.

- US 14/ CSAH 86/ (potential to construct overpass / close access to US 14 if not an overpass) #I6
- US 169/US 14 (potential interchange reconfiguration) #I1

Freight Studies: Freight studies survey possible safety measures that may be undertaken to improve the transportation network as a whole.

- 3rd Avenue (CSAH 5) (study possible grade separation and sound abatement alternatives) #F2
- Industrial Road (CSAH 26) (evaluate corridor realignment options from the crossing location to CR 57; assess safe railroad crossing versus closure) #F4

Intersection Control Evaluation (ICE) Studies: ICE studies gather and analyze information about an intersection, which is then used to consider viable alternatives such as stop signs, traffic signals, or roundabouts.

- MN 22/North Victory Drive (CSAH 3) #I4
- MN 22/Hoffman Road #I5
- Lee Boulevard/Belgrade Avenue #I8
- Stadium Road (CSAH 60)/Pohl Rd #I9
- MN 22/Augusta Drive #I10
- Riverfront Drive/US 169 #I11
- Stadium Road (CSAH 60)/Stoltzman Road (CSAH 16) #S10
- MN 22/MN 83 #S12
- MN 22/CSAH 57 (N Riverfront Drive) #S13
- MN 22/CSAH 26 (227th Street) #S14
- Stadium Road (CSAH 60)/James Avenue #S16
- Stoltzman Road (CSAH 16)/Pleasant Street #S18
- Lor Ray/Howard Drive

Low-Cost/High-Benefit Solutions (LC/HB): LC/HB solutions provide cost-effective alternatives while still providing the most benefit possible.

- Stoltzman Road (CSAH 16) from Stadium Rd to W Pleasant St #R25

- US 169/CSAH 69 (consider right-in/right-out)
- US 169/McCauley Street (consider right-in/right-out)
- US 169/CSAH 33 (consider Restricted Crossing U-Turn (RCUT) intersection)
- US 169/CR 120 (consider RCUT intersection)
- US 169/CSAH 90 (consider re-configuring westbound US 169 to eastbound CSAH 90 access)

Pedestrian Crossing Improvement Studies: Pedestrian crossing improvements focus on how pedestrians interact with other modes of transportation and how safety can be improved at these locations.

- Stadium Road (CSAH 60)/Warren Street #BP3
- Stadium Road (CSAH 60)/Ellis Avenue #BP4/#BP6

Supplemental Metro Planning Elements

The LRTP serves as a metro planning document that sets priorities for the entire MAPO planning area. There are a number of multimodal plan elements that require additional study, including:

- MAPO Area Bicycle and Pedestrian Master Plan (add definition to the comprehensive on-street and off-street system framework documented in the Plan)
- MAPO Area ITS Operations System Plan (develop an ITS Architecture System Plan to document and guide development of intelligent transportation systems through the MAPO area)
- MAPO Transit Development Plan (develop an understanding of current and future transit needs throughout the MAPO planning area and identify potential funding opportunities available).
- MAPO Area Pavement Management Study (develop an understanding of the current and future pavement condition of all roadways classified as a minor collector or higher, better identify the current pavement needs, and review and select a path to address the needs).
- MAPO Regional Travel Model (develop a regional travel demand model to represent existing and future forecasted traffic conditions based on socio-economic data available from comprehensive land use planning).