SOURCE: Historical and Cultural Society of Clay County

Fargo-Moorhead Metropolitan Council of Government

2045 Fargo-Moorhead Metropolitan Transportation Plan

September, 2019

METRO GROW

Acronyms

ACS: American Community Survey
ATAC: Advanced Traffic Analysis Center
CAV: Connected and Autonomous Vehicles
CE: Categorical Exclusions
CFR: Code of Federal Regulations
CIP: Capital Improvement Program
CMP: Congestion Management Process
CPG: Consolidated Planning Grant
DTA: Dynamic Traffic Assignment
EA: Environmental Assessments
E+C: Existing-plus-committed
EIS: Environmental Impact Statements
EJ: Environmental Justice
FAST Act: Fixing America's Surface Transportation (FAST) Act
FHWA: Federal Highway Administration
FTA: Federal Transit Administration
HSIP: Highway Safety Improvement Program
LOS: Level of Service
LOTTR: Level of Travel Time Reliability
LWCF: Land and Water Conservation Fund
MaaS: Mobility-as-a-service
MAP-21: Moving Ahead for Progress in the 21st Century Act (MAP-21)
Metro COG: Fargo-Moorhead Metropolitan Council of Governments
MVMT: Million Vehicle Miles Traveled
MnDOT: Minnesota Department of Transportation
MPA: Metropolitan Planning Area
MPO: Metropolitan Planning Organization
MSA: Metropolitan Statistical Area
MTP: Metropolitan Transportation Plan
NDSU: North Dakota State University
NHPP: National Highway Performance Program
NHS: National Highway System
NPMRDS: National Performance Management Research Data Set
NWI: National Wetlands Inventory
O&M: Operations and Maintenance
PCI: Pavement Condition Index
PHED: peak hour excessive delay
PM: Performance Measure
NDDOT: North Dakota Department of Transportation
RTP: Recreational Trails Program
SOV: Single-Occupant Travel
SHPO: State Historic Preservation Office
STBG or STBGP: Surface Transportation Block Grant Program
STBG-TA: Surface Transportation Block Grant Program funding for transportation alternatives
STSAC: Surface Transportation Security Advisory Committee (STSAC)
TA: Transportation Alternatives Program
TAZ: Transportation analysis zone
TDM: Travel Demand Management or Travel Demand Model
TIM: Traffic Incident Management
TIP: Transportation Improvement Program
TMA: Transportation Management Area
TMC: Transportation Management Center
TNC: Transportation Network Company
TSMO: Transportation System Management and Operations
TTC: Transportation Technical Committee
TTTR: Truck Travel Time Reliability
USACE: United States Corps of Engineers
USFWS: U.S. Fish and Wildlife Service
UZA: Urbanized Area
V2I: Vehicle-to-Infrastructure
V2V: Vehicle-to-Vehicle
VHT: Vehicle Hours Traveled
VMT: Vehicle Miles Traveled

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METROGROW

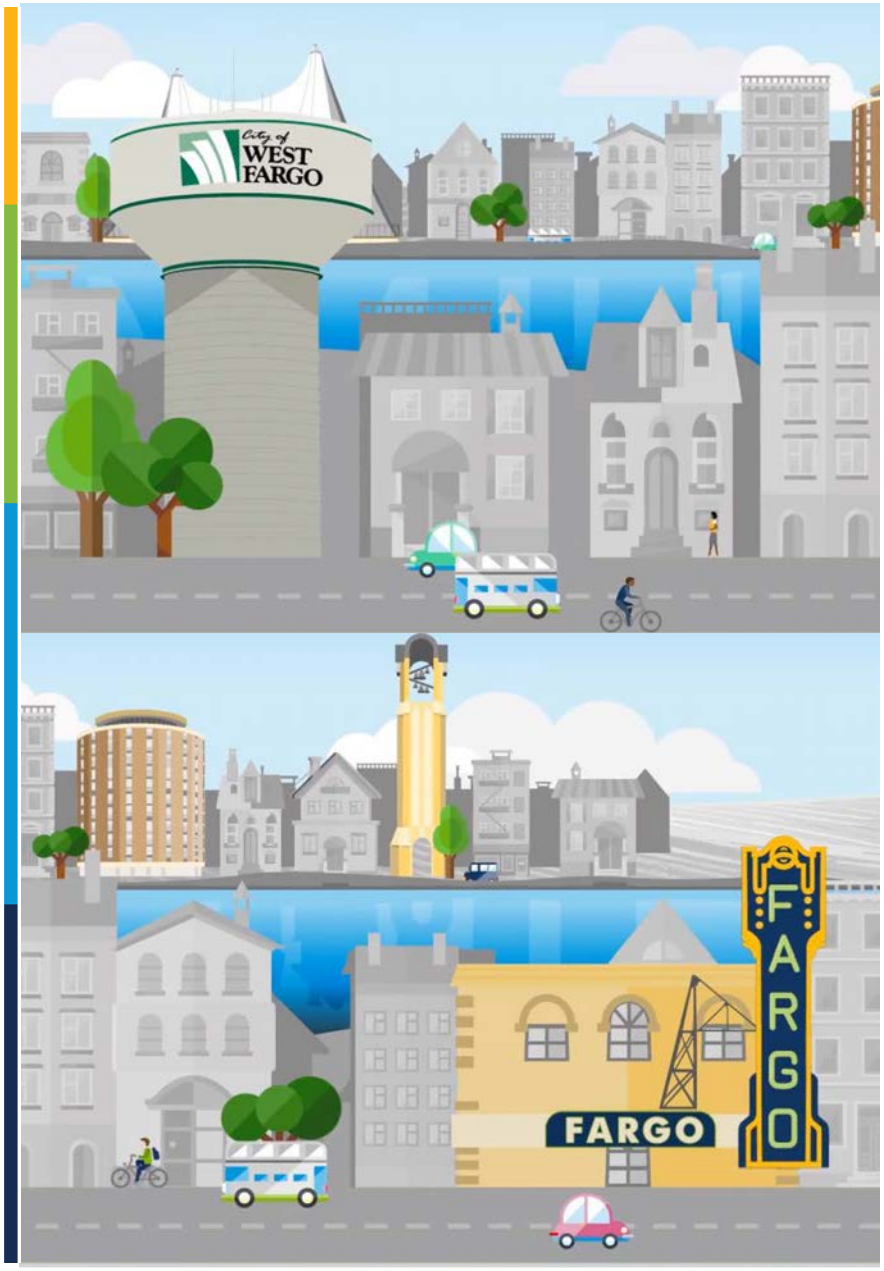


Table of Contents

Plan Overview

The 2045 Fargo-Moorhead Metropolitan Transportation Plan has been a collaborative effort of the Fargo-Moorhead Metropolitan Council of Governments and its member jurisdictions. The metropolitan transportation plan is called Metro Grow and is founded on performance assessments of the multimodal transportation system, has been shaped by the broad and multifaceted cross-section of input from across the community, and is constrained by the anticipated amount of transportation funding that will be available between today and 2045.

What is Metro COG?

The Fargo-Moorhead Metropolitan Council of Governments (Metro COG) is the Metropolitan Planning Organization (MPO) for the Fargo-Moorhead area. An MPO is a transportation policy-making organization made up of representatives from local government and transportation authorities. The Federal Surface Transportation Assistance Act of 1973 required that urban areas with a population greater than 50,000 form an MPO. The basis of MPOs' creation was to employ a comprehensive, cooperative, and continuing planning process for transportation expenditures in a region. Federal funding for transportation projects and programs is channeled through this planning process.

Metro COG was formed in 1963, to create a comprehensive growth plan and traffic study for the cities of the region. Over time, the mission of Metro COG has evolved to address the transportation planning requirements of the region, in coordination with the Federal Highway Administration (FHWA), Minnesota Department of Transportation (MnDOT), and North Dakota Department of Transportation (NDDOT).

The geographic boundary for the Metro COG planning area is shown in FIGURE 1.1 Metro COG serves a bi-state area with a planning area that covers 14 townships in Cass County, North Dakota and 16 townships in Clay County, Minnesota. There are seven (7) member jurisdictions and six (6) associate jurisdictions.

Member jurisdictions include:

- Cass County
- Clay County
- Fargo
- Moorhead
- West Fargo
- Horace
- Dilworth

Associate jurisdictions are:

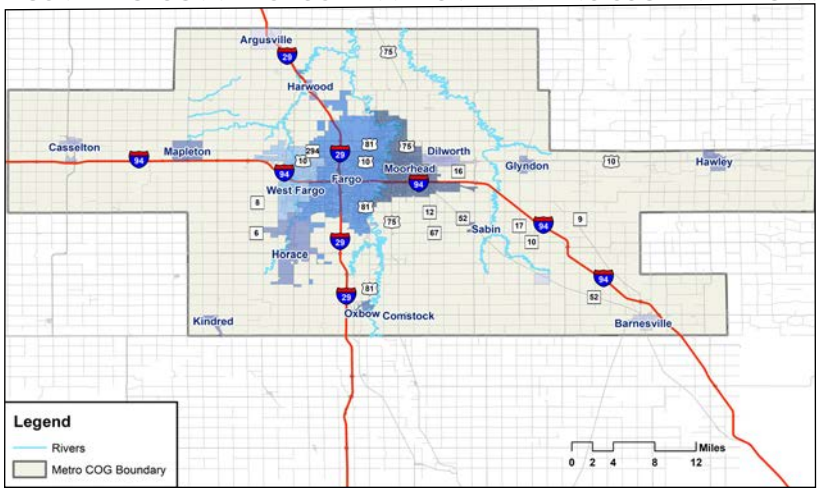
- Barnesville
- Casselton
- Glyndon
- Harwood
- Hawley
- Mapleton

Additional member agencies include the FHWA, MnDOT, and NDDOT.

Metro COG is governed by of two committees:

- The first is the **Policy Board.** The Policy Board is the executive body of Metro COG. The Policy Board is Metro COG's decision-making arm comprised of 16 voting members who represent the metropolitan planning area. The Policy Board consists of at least three-quarters elected officials, and each jurisdiction's voting power is based on its approximate share of the area's population. The current representation from each jurisdiction is:
  - Fargo - 7 members
  - Moorhead - 3 members
  - West Fargo - 2 members
  - Dilworth - 1 member
  - Clay County - 1 member
  - Cass County - 1 member
  - One Vacancy
- The second is the **Transportation Technical Committee (TTC).** The TTC advises the Policy Board on technical matters related to transportation planning in the region. The committee is made up of planning and engineering from local jurisdictions, transit agencies, and representatives from MATBUS, MnDOT and NDDOT.

FIGURE 1.1: GEOGRAPHIC BOUNDARY FOR THE METRO COG PLANNING AREA



Metro COG also operates four committees:

- Metropolitan Bicycle and Pedestrian Committee
- Traffic Operations Working Group
- GIS Committee
- Freight Advisory Committee.

Metro COG staff also participate in two other regional committees:

- Metro Area Transit Coordinating Board
- Cass Clay Food Commission

What is a Metropolitan Transportation Plan?

The metropolitan transportation plan (MTP) is a document that all MPOs are required to update every five years. The plan is required to have at least a 20-year planning horizon, and should support the Federal metropolitan transportation planning factors:

1. Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency
2. Increase the safety of the transportation system for motorized and non-motorized users
3. Increase the security of the transportation system for motorized and non-motorized users
4. Increase accessibility and mobility of people and freight
5. 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. Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight
7. Promote efficient system management and operation
8. Emphasize the preservation of the existing transportation system
9. Improve the resiliency and reliability of the transportation system and reduce or mitigate stormwater impacts of surface transportation
10. Enhance travel and tourism[1]

Performance-Based Transportation Planning Approach

The MTP is a performance-based document that supports Metro COG's ongoing system performance goals and targets. Performance-based planning is the application of performance management techniques to transportation planning. FHWA defines Transportation Performance Management (TPM) as a strategic approach that uses system information to make investment and policy decisions towards national performance goals. Part of an effective performance-based planning and programming approach is monitoring, an ongoing activity conducted by Metro COG that has been integrated into this MTP. This performance-based approach allows us to evaluate how well the planning activities, programs, and projects implemented in the Metro COG region are meeting metropolitan, state, and federal performance goals.

The performance-based approach applied by Metro COG and carried through into this document has established a link between regional vision and Federal performance requirements, system data and evaluation, policy, and investment decisions. This top-down approach to performance-based planning provides a regional vision that reflects locally-established priorities, that are consistent with Federal transportation goals, tied to performance measures and project prioritization metrics. This performance-based approach allows Metro COG to continually monitor progress towards its transportation vision, and identify the actions, policies, and projects that will best promote regional performance goals.

More on the goals, objectives, and performance measures for the MTP are provided in Chapter 6.

Transition to a Transportation Management Area

Fargo-Moorhead is a region that has seen steady growth, as illustrated in the Regional Trends in Chapter 2. American Community Survey population estimates for the Fargo-Moorhead UZA exceeded 200,000 people soon after the 2010 Decennial Census. It is anticipated that after the 2020 decennial census, the Fargo-Moorhead urbanized area (UZA) will have a population well over 200,000 people and when the UZA population is released (likely in 2022), the Metro COG planning area will be designated as a Transportation Management Area (TMA). As a TMA, Metro COG will:

- Need to have a congestion management system in place.
- Receive an annual direct allocation, also called a "sub-allocation" of some Federal dollars, meaning that they receive a consistent funding level for FHWA Surface Transportation Block Group (STBG) and Federal Transit Administration (FTA) Urban Formula Section 5307 funds.
- Have additional requirements related to policy board membership, to including local elected officials, appropriate state officials, and officials of major modes of transportation like MATBUS. While MATBUS is currently part of the Cities of Fargo and Moorhead, the potential to transition to a regional transit authority is being studied. Regardless of structure, it will be necessary to designate one MATBUS representative for the policy board.
- Select projects for implementation from the Transportation Improvement Program (TIP), with consultation with the State and MATBUS as relevant.
- Need to have their transportation planning process certified by FHWA and FTA once every three years.

This document begins to lay the groundwork for Metro COG's transition to TMA status which will happen during the five-year life of the Metro Grow plan.

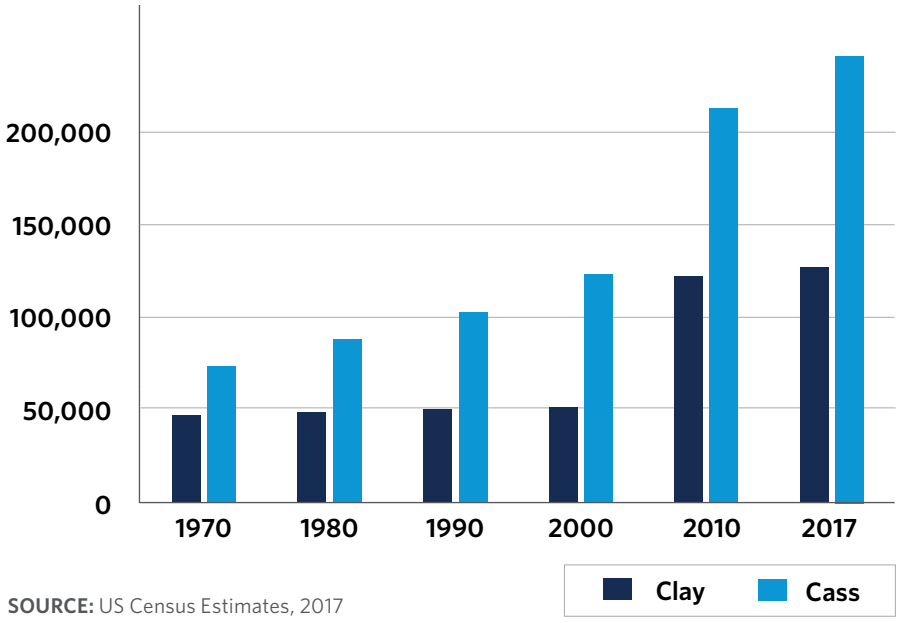
[1] 23 CFR § 450.306

Regional Trends

Population Trends

The population of the Fargo-Moorhead metropolitan region (which includes all of Cass and Clay Counties) is 241,356. According to the US Census Bureau's recent estimates, the region is one of the fastest growing metropolitan areas in the upper Midwest. Fargo-Moorhead expanded its population by 2.3% from 2014 to 2015, 1.9% from 2015 to 2016, and 1.6% from 2016 to 2017. Recent rates of population growth are more than twice average for US metropolitan areas in those years.

FIGURE 2.1 HISTORIC POPULATION BY COUNTIES



SOURCE: US Census Estimates, 2017

From 1970 to 2017, the rate of population growth for the Fargo-Moorhead metropolitan statistical area has averaged 1.5% annually. As shown in FIGURE 2.1, Cass County has historically been the recipient of the majority of the region's total growth. Since 1970:

- Clay County's population increased by 36.5% from 46,585 to 63,569.
  - Moorhead has more than half of Clay County's population, with a current population estimate of 43,349.
- Cass County grew by 141.4% from 73,653 to 177,787 residents.
  - Fargo and West Fargo have accounted for the majority of that growth, as 2017 populations for each city are:
    - 122,359 people in Fargo
    - 35,708 people in West Fargo

Current Demographics

Some highlights of current regional demographics are:

- Median age is 32.9, which is younger than the US population's median age of 38.1.
- 11.6% of the population is estimated to be over 65 years of age.
- Males are 51.2% and females are 48.8% of the population.
- 84.7% of regional residents identify as white non-Hispanic for their race and ethnicity.

A population pyramid that shows the distribution of the population by age and sex in the metropolitan area is shown on the next page in FIGURE 2.2.

Income and Employment

Unemployment in the Fargo-Moorhead metropolitan region is low compared to the Midwest and the nation, a trend that has been constant in recent years even during the Great Recession of 2008-2009. In 2017, the Bureau of Labor Statistics estimated the Fargo-Moorhead Metropolitan Statistical Area (MSA) annual average rate of unemployment was 2.4% in a labor force of 138,238. In the same year, unemployment in the Midwest averaged 4.1% and the national rate measured at 4.4%.

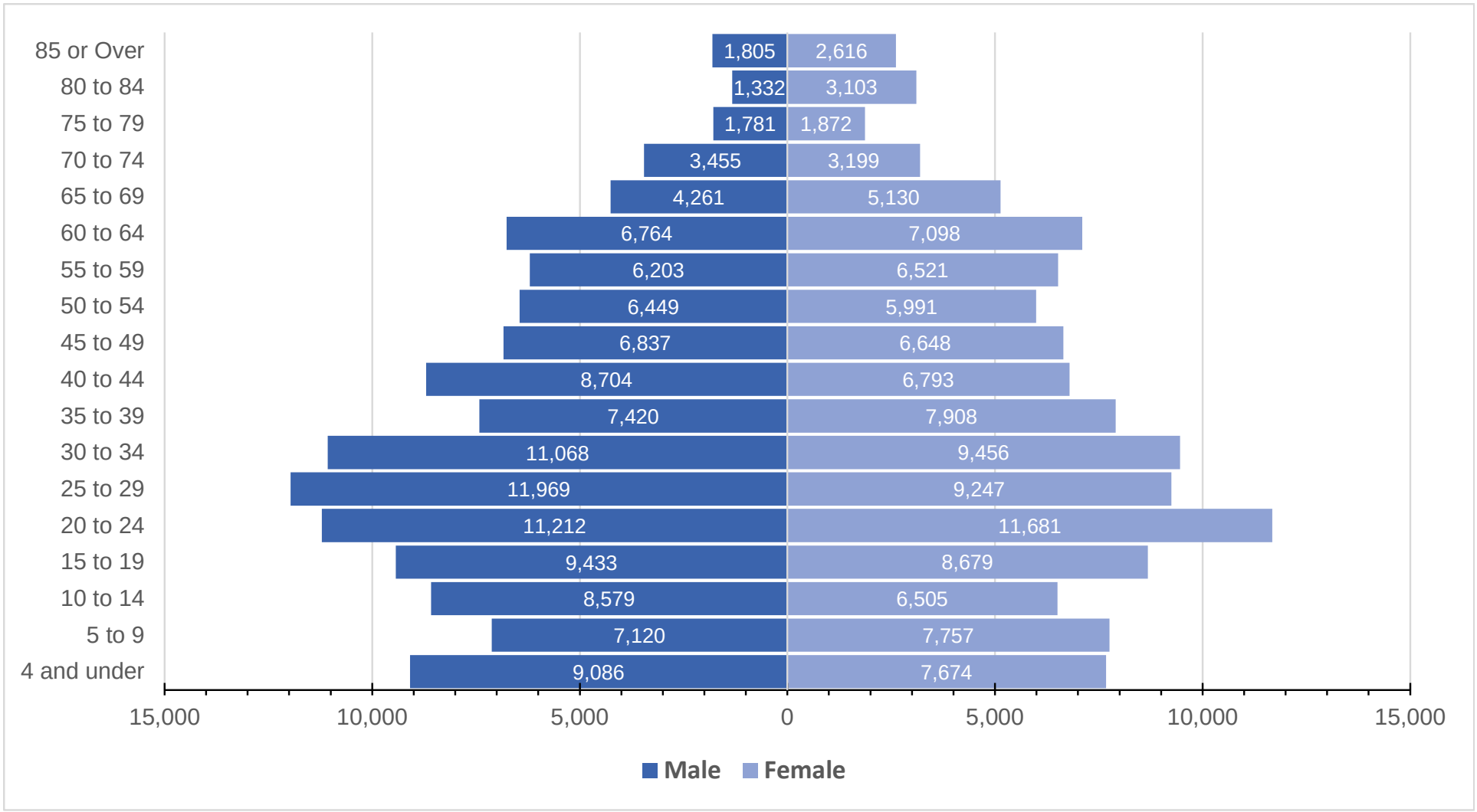
Income levels in the region in 2017 included:

- Median household income: $63,353
- Median family income: $84,140
- Per capita personal in income: $50,725[2]

The percentage of the Fargo-Moorhead's population estimated to be living below the poverty line was 9.7%. The poverty rate the region declined slightly since 2012, when it was measured as 10.6%.

[2] US Bureau of Economic Analysis (BEA), 2017

FIGURE 2.2 FARGO-MOORHEAD, ND-MN METRO AREA, 2017, AGE BY SEX



SOURCE: US Census Bureau, 2017

Age groups were combined to create equal ranges.

Housing

The number of housing units in the region grew by 18% from 92,197 to 108,958 between 2012 and 2017, according to the US Census. During the same five year period, the median value of owner occupied homes increased by $55,400 from $160,200 to $215,600. Median rents in the region were estimated to have increased from $665 to $793.

By census estimates, 58.4% of all occupied housing units are owner-occupied and 7.6% of all housing units are vacant. Surveys show the vacancy rates for rental units were 9.1% in 2017, up from 3.8% in 2014. Rental units built per year averaged 1,423 from 2014-2017, likely contributing to the change in trend from relatively low rental vacancy rates to higher rental vacancy rates.

The region's housing stock is made up of 58.5% single-family homes, 39.2% multi-family units, and 2.3% mobile homes. The ratio of single-family to multi-family in the region is 1.492.

School Enrollment

The region is home to eight colleges and universities and many public and private K-12 schools. The fast growing region is building and has recently build several new schools. School enrollment across all institutions in 2017 was:

- Kindergarten through 8th grade enrollment of 25,422
- High school enrollment of 11,540
- 6.7% of K-12 students attended private schools
- Students enrolled in the region's colleges and universities numbered 27,179

Journey-To-Work

The majority of workers living in the metropolitan region spend less than 25 minutes on their journey to work, as illustrated in TABLE 2.1. The average commute in the region is 16.7 minutes. By comparison, commuting in Fargo-Moorhead is roughly 10 minutes shorter than the national average of 26.4 minutes.

Most workers in the region drive to work alone. Out of workers who use a private vehicle to get their places of business, only 9.3% report carpooling. According to the same statistics from American Community Survey, based on a sample from 2013 to 2017, walking is the region's second most popular mode of transportation (at 3% of all trips) to work and only 1% of workers are using public transportation for their commute.

TABLE 2.1: TRAVEL TIME TO WORK FOR WORKERS AGES 16 AND OLDER NOT WORKING AT HOME

Travel Time to Work	Estimate	Margin of Error	Percent
Less than 5 minutes	5,073	+/-547	4.0%
5 to 9 minutes	19,591	+/-1,078	15.5%
10 to 14 minutes	30,590	+/-1446	24.2%
15 to 19 minutes	32,983	+/-1317	26.1%
20 to 24 minutes	18,953	+/-907	15.0%
25 to 29 minutes	4,638	+/-498	3.7%
30 to 34 minutes	6,872	+/-583	5.4%
35 to 39 minutes	1,215	+/-237	1.0%
40 to 44 minutes	1,311	+/-219	1.0%
45 to 59 minutes	2,133	+/-334	1.7%
60 to 89 minutes	1,912	+/-274	1.5%
90 or more minutes	1,081	+/-232	0.9%

SOURCE: US Census Bureau, 2013-2017 American Community Survey 5-Year Estimates, Table: B08303

TABLE 2.2: MEANS OF TRANSPORTATION TO WORK FOR WORKERS AGES 16 AND OLDER

Means of Transportation to Work	Estimate	Margin of Error	Percent
Car, truck, or van - drove alone	108,045	+/-1,513	82.0%
Car, truck, or van - carpooled	11,106	+/-961	8.4%
Public transportation (excluding taxicab)	1,267	+/-253	1.0%
Walked	4,010	+/-462	3.0%
Taxicab, motorcycle, bicycle, or other means	1,924	+/-302	1.5%
Worked at home	5,373	+/-119	4.1%

SOURCE: US Census Bureau, 2013-2017 American Community Survey 5-Year Estimates, Table: B08101

Commuting Inflow/Outflow Analysis

The Fargo-Moorhead region attracts more of its workforce than it exports, meaning it is a net importer of labor. As shown in TABLE 2.3, approximately 26,000 of the region's 125,000 primary jobs are done by workers living outside of its border, while 12,000 jobs outside of the region are done by workers living inside the region. Specifically, among workers' first (primary) jobs, the region imports a net 14,000 workers from outside the region.

TABLE 2.3: COMMUTING INFLOW/OUTFLOW ANALYSIS OF PRIMARY JOBS

Inflow/Outflow	Count	Share
Employed and Living in the Fargo ND-MN Metro Area	99,370	79.4%
Employed in the Fargo ND-MN Area but Living Outside	25,848	20.6%
Living in the Fargo ND-MN Metro Area but Employed Outside	12,116	-

SOURCE: US Census Bureau, LEHD Origin-Destination Employment Statistics Data, 2015

As noted in Table 2.3, the majority of Metro COG area workers also live in the area. There are three primary cities that exchange commuters with Fargo-Moorhead. This includes both Fargo-Moorhead area workers that come from outside the area, and Fargo-Moorhead area residents who commute to jobs outside the area. Those top three commuter markets for Fargo-Moorhead are: Grand Forks, Bismarck, and Minot.

Plan Engagement

Public and Stakeholder Engagement

Metro COG strives to engage regional citizens in the transportation planning process, and aims for a transparent and understandable engagement strategy in all of its plans. The Metro Grow plan was developed with Public and stakeholder engagement at its core. The goals of the engagement program were to build community awareness of Metro Grow and to provide a range of relevant and meaningful ways for the public to provide input on plan development. In order to guide the transportation planning and decision-making process, the study team sought public input to develop a community vision for the future transportation system. The public engagement program was conducted in accordance with Metro COG's Public Participation Plan which can be seen at: www.fmmetrocog.org/resources/public-participation-plan.

To solicit feedback from community members, Metro COG hosted a series of open house events that provided opportunities for residents to express their ideas, discuss concerns and opportunities, and get involved in the transportation planning process.

Grass Roots Event Kick-Offs

During the summer of 2018, Metro Grow staff attended a series of six different community events

- Fargo Downtown Street Fair, July 2018
- Dilworth Loco Daze, July 2018
- Movie Night in the Park, Rheault Farm, August 2018
- Horace Bean Days in Horace, September 2018
- Bridge Bash in Moorhead, September 2018
- Red River Market in Fargo, September 2018
- West Fest in West Fargo, September 2018

The goal of these events was to meet with community members during a broad range of community events, to promote and educate the public on Metro Grow. There were activities including an online survey and a large "Can You Show Us Your Way" activity shown below.

Social Media and Email

Metro COG's existing social media feed and an email list of interested residents, which grew over the course of the plan, were primary means of alerting the public to upcoming input opportunities and open houses. These supplemented the traditional approaches such as press releases, the public legal notice in The Forum newspaper, and posting of events on the Metro COG website.

Metro Grow Website

The project website, www.MetroGrow.org, was a primary means of providing information and receiving feedback. Key elements hosted on the website included:

- An informational video about the Metropolitan Transportation Plan, and about Metro COG itself.
- An online survey.
- Online comment mapping and input forms, utilized particularly early in the study to get input on areas where the study team should consider improvements.
- Summary of public input received at open houses.
- Links to additional information related to the Metro Grow plan.

The comments received via the website during the course of the projects, along with more summaries of public engagement effort, are included in APPENDIX A.

Open Houses

A series of open houses were held at different milestones to engage the public and get input on the direction of the plan. All open houses were advertised through traditional means, such as press releases and legal notices, Metro COG's website, and through newer means such as Facebook advertisements targeted to residents in the Fargo-Moorhead region.

Fall 2018 Open Houses

On October 24 and 25, 2018, public open houses were hosted by Metro COG to solicit public input regarding the transportation issues facing residents as well as the opportunities, vision, and funding priorities for the regional transportation system. These open houses were held at the Moorhead Public Library and Rustad Recreation Center in West Fargo.

The open house events utilized the following interactive activities to engage the public and stakeholders in sharing their concerns, vision, and ideas:

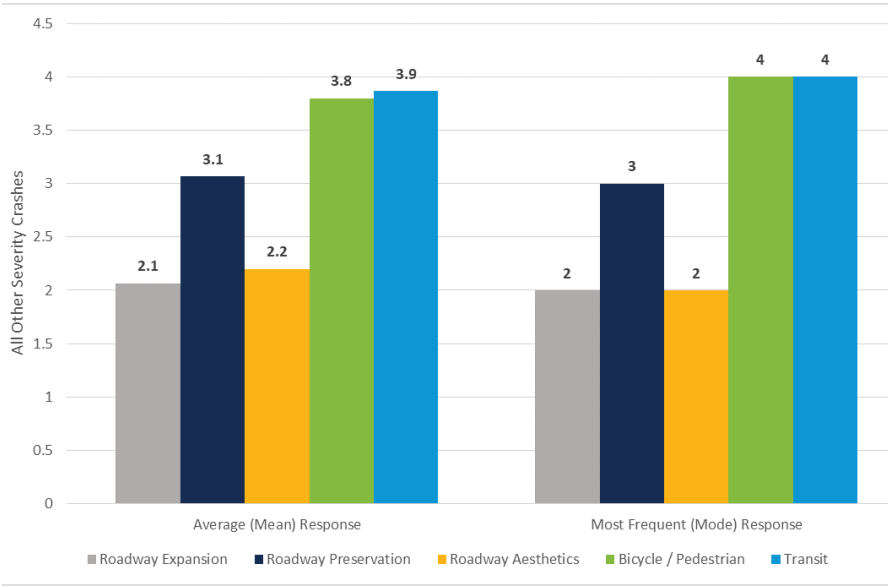
- **"Map Your Issues" Station:** Attendees were encouraged to identify the issues and opportunities they see for all modes of transportation and use color-coded stickers to identify the corresponding issues and/or challenges on one of two large plots of the Fargo-Moorhead metro area.
- **"Your Transportation Vision" Station:** A large white board was available for attendees to share their ideas, goals, and examples of best practices that other communities across the United States are using in order to help guide the development of the overarching goals and vision of Metro Grow 2045.
- **"Investment Emphasis" Station:** This station provided attendees an opportunity to express how they would allocate transportation funds by asking them to place a limited amount of magnets, representing blocks of transportation funds, across five categories—Roadway Preservation, Roadway Expansion (Widenings and Extensions), Roadway Aesthetics, Bike and Pedestrian System, and Bus and Transit System. Respondents had a series of choices for determining which investment decisions they saw best for the future transportation system, ranging from "Significantly Decrease Funding" to "Significantly More Funding."

Supplementing the three activities were two Technical Analysis Boards that oriented users to the technical analyses that had been completed up to the point of the open houses. The major types of input received through the open houses were:

- Opportunities to improve bicycle and pedestrian system connections
- Options to improve transit connectivity with major employment centers
- Potential areas for transportation safety improvements
- The desire to increase funding for bicycle, pedestrian, and transit modes

FIGURE 3.1 presents Vision Ideas that resulted from the "Your Transportation Vision" station for different modes as well as several non-location specific ideas stemming from the "Map Your Issues" station.

FIGURE 3.1: AVERAGE AND MOST FREQUENT RESPONSE BY INVESTMENT CATEGORY



Winter 2019 Open House

The second in the series of open houses was hosted by Metro COG on February 8, 2019 with the aim of gathering public input regarding potential vehicular, bike and pedestrian, and transit improvement strategies for addressing regional transportation needs. The open house consisted of two interactive activities for attendees to participate in and express their ideas for the transportation improvements they would like to see in the metro area:

- "Interactive Strategy" Station: Staff engaged participants in discussion regarding potential vehicular, bike and pedestrian, and transit strategies that could be implemented in the Fargo-Moorhead region, which included benefits and drawbacks of each strategy. After being given an overview of the various strategies presented by staff, attendees were able to vote on each strategy and state whether they supported, were neutral, or opposed each strategy.

- "Map Your Strategies" Station: Open house attendees were encouraged to select several strategies from the "Interactive Strategy" station and identify them in a large plot of the metro area.

Supplementing the two activities were two Technical Analysis Boards that oriented users to the technical analyses that had been completed up to the point of the open houses. The Technical Analysis Boards were comprised existing bicycle and pedestrian system maps, transit routes, and results of the traffic operations and safety analyses. Future conditions maps, including projected growth in household and employment, and future estimates of traffic congestion, were also displayed.

The goal of this open house event was to educate participants on the technical analyses and potential strategies for the Metro COG region as well as provide community members a forum to discuss the strategies and projects they feel would best benefit the region. Additionally, this open house event allowed Metro COG staff an opportunity to identify additional projects that were not identified as a part of the technical analyses.

TABLE 3.1 presents the voting results of the "Interactive Strategy" station.

TABLE 3.1: WINTER 2019 OPEN HOUSE STRATEGY PREFERENCE SURVEY RESULTS

Vehicular Strategy Voting	Like / Support	Neutral / Unsure	Dislike / Do Not Support
Active Traffic Management	11	1	0
New Signals and / or Improved Coordination	11	1	1
Grade Separation	9	3	0
Multi-way Boulevard Roadways	9	4	0
Ramp Metering	7	4	1
Innovative Intersection Types	7	5	2
Expressways	6	1	4
Travel Demand Management	6	2	0
More Travel Lanes	5	3	6
Hard Shoulder Running / Bus on Shoulder	3	5	0
Transit Strategy Voting	**Like / Support**	**Neutral / Unsure**	**Dislike / Do Not Support**
Local Bus Transit: Increased Hours of Service	10	1	0
Local Bus Transit: Extend Existing Routes or Add More Routes	9	2	0
Local Bus Transit: Increased Frequency of Service	7	3	0
Express Bus Transit	9	2	0
Bus Rapid Transit	8	2	2
Streetcar	6	2	4
Light Rail	5	4	3

Bike and Pedestrian Voting	Like / Support	Neutral / Unsure
Grade Separation	15	2
Raised Crosswalks and Intersections	14	5
Recreational Trail	14	1
Leading Pedestrian Interval	14	5
Sidepath	13	2
Curb Extensions / Bump Outs	12	3
Median / Pedestrian Refuge Islands	11	4
Bike Lanes	10	3
Actuated Pedestrian Signals at Mid-Block	10	6
Protected "Dutch Intersection"	7	7
Bike Boulevard	7	6
On-Street Shared Lane Markings or Sharrows	7	6
Cycle Tracks	5	1

Information packets with photos and diagrams of the strategies listed here were provided to inform participants about strategies with which they were not familiar.

Online Open House

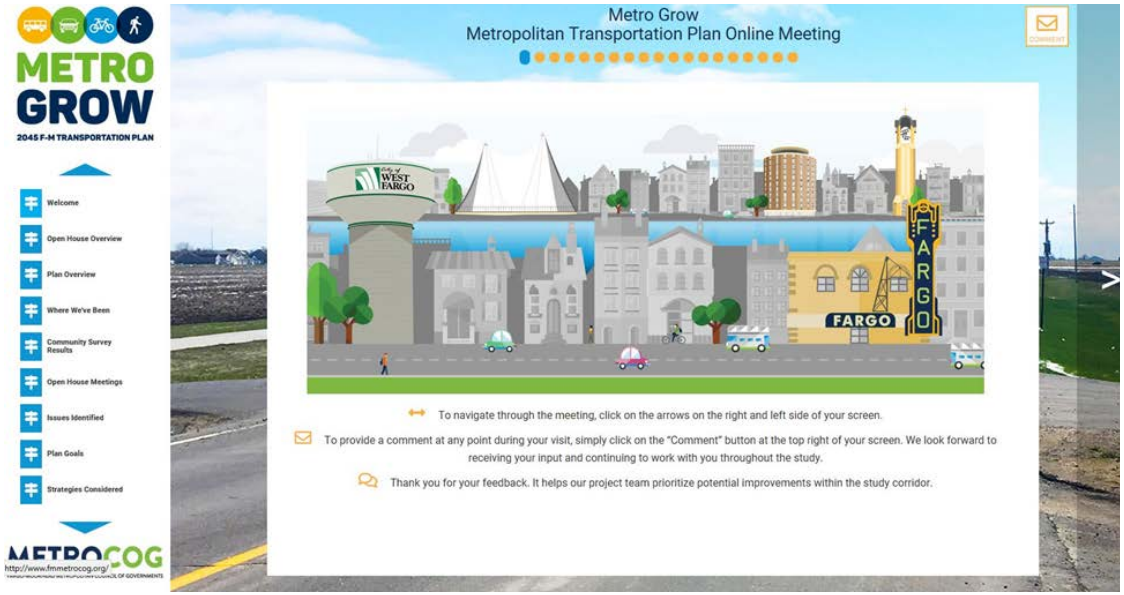
An online open house was designed by the study team to give community members an additional opportunity to share their ideas and input for the Metro Grow 2045 plan. This online open house was held from May 2, 2019 to May 24, 2019 and consisted of the following elements:

- General background on the previous elements of the plan.
- What the study team was asking of the public.
- The range of multimodal options being considered for inclusion.
- Mapping of the modal options.
- Surveys to gauge top priority projects wanted by the participants.

Four surveys were made available to the participants of the online open house. These surveys presented potential projects related to various modal options—bicycle and pedestrian, multi-modal, roadway, and transit—and asked respondents to select the projects they felt were Most Important, Second Most Important, and Third Most Important with regard to each mode. The results of the four surveys can be found in Appendix A.

Some of the projects receiving the most votes as "Most Important" project included:

- NP and Center from 10th St (Fargo) to 11th St (Moorhead); On-Street Bike Route and Road Diet
- Improved Interstate 94 operations
- 11th Street Grade separation (Moorhead)
- Extend bus transit service schedule to include Sunday service
- Increased bus transit frequency of service



Consultation with Other Agencies

Federal guidelines encourage ongoing consultation with applicable agencies for major planning activities, such as the MTP. During the project alternatives screening and prioritization step in May 2019, relevant environmental, resource, economic development, and various other relevant planning agencies were invited to provide input on any projects relevant to their agency. A website with interactive mapping (similar to the Online Open House) was dedicated to agency review and input. Appendix E provides the list of agencies contacted and the responses received to the projects being considered.

Summer 2019 Open House

A third open house was held on July 18 and July 19, 2019 at the Downtown Fargo Street Fair. The study team hosted a booth with three activities that offered community members a final opportunity to express their vision and ideas for investment in the future transportation system. The specific focus of this open house event was to better understand the desires of residents in the Metro COG region in terms of public expenditures for different modal options as well as identified roadway expansion, roadway preservation, and bicycle and pedestrian projects.

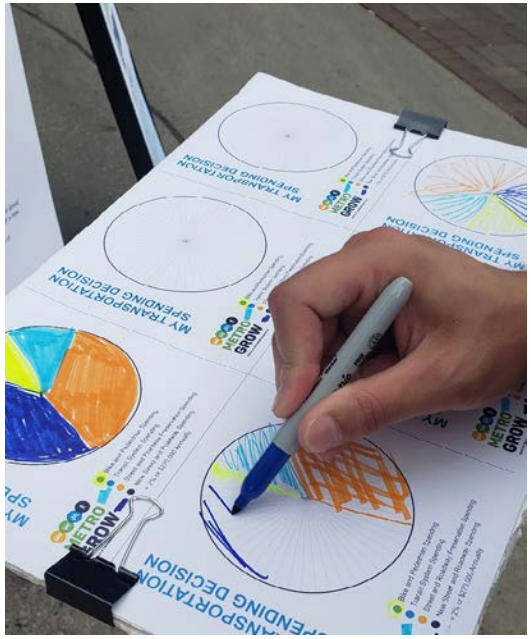
The three activities for the open house were:

- **"My Transportation Spending Decision":** Participants were shown a breakdown of the anticipated Metro COG allocation of $13.5 million in federal transportation funds on bike and pedestrian projects, transit projects, street and roadway preservation projects, and new street and roadway projects. Participants were then asked to allocate the $13.5 million by filling out a pie chart corresponding to their desired level of funding for each of the four categories. The purpose of this exercise was to get participants input on how they would spend limited STBG funds, with an understanding of what each level of modal funding would provide. This input was considered when Metro COG was evaluating potential modal splits for future Surface Transportation Block Grant (STBG) funding allocations.

- **"Priority Big Project":** This activity asked participants to review 9 potential major roadway projects for the metro area and vote for their top two by placing a blue bead, indicating their favorite big project, and a red bead, indicating their second favorite project, into jars labeled with the project name. It was understood that these were high cost projects, and would likely not fit within the fiscally-constrained project list.

- **"Spend Your Transportation Dollars":** Two large plots were presented to participants that depicted the locations of various projects that were proposed by Metro COG for implementation. Participants were then encouraged to review a packet that contained a description and estimated cost for each project; with a total budget of $102 million, participants were able to select projects they would like to see funded by placing stickers that represented either $1 million, $5 million, or $10 million next to their project selection so that they could share how their idea of how best to spend the $102 million on the region's transportation system.

Overall, it was found that community members would like to see a greater share of federal transportation funds be spent on bicycle and pedestrian and transit projects; community members also expressed an aversion to spending these dollars on new streets and roadways. In terms of major projects, the majority of respondents indicated interest in a railroad grade separations and the construction of highway bypass roads.



Online Survey

As part of the Metro Grow 2045 Metropolitan Transportation Plan, the Fargo-Moorhead Council of Governments disseminated a survey that aimed to capture information pertaining to resident's transportation preferences as well as their living and working locations so that the transportation habits of community members could be better understood and planned for.

The survey was open from July 2018 until November 2018, and during that time 287 individuals responded to the survey. The survey was promoted via the Metro COG Facebook page, MATBUS, City of Horace, NDDOT, City of Fargo, and Metro COG email listservs, local grass-roots events including the Downtown Street Fair and Dilworth Loco Daze, and at the two open house events held in Moorhead and West Fargo in October 2018.

As shown in FIGURE 3.2, the results of the survey indicate that the majority of community members commute via a single-occupant personal automobile, while 8% commute using the MATBUS system and another 8% carpool as means of traveling to work. It should be noted that the modal breakdowns in Figure 3.2 indicate that the respondents tended to be more representative of bicycle and transit modes than the overall population.

When asked to identify the top transportation issue facing the metro area, respondents listed the need to improve pedestrian infrastructure as the number one priority. Second was the condition of streets and bridges while a need to improve bicycle infrastructure was third. FIGURE 3.3 summarizes the breakdown of responses.

FIGURE 3.2: MODES OF TRAVEL USED BY SURVEY RESPONDENTS

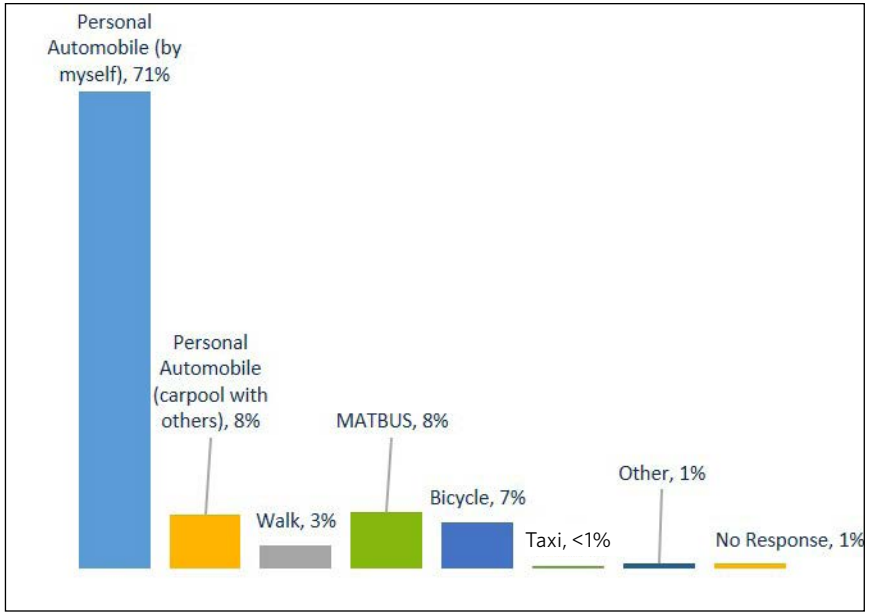


FIGURE 3.3: SURVEY RESPONSES FOR TOP TRANSPORTATION ISSUES

The survey also contained a section for open-ended responses to allow respondents to comment on any aspect of the transportation system that they'd like to. The results were analyzed by the travel mode they were associated with and are presented in FIGURE 3.4. Overall, transit received the highest number of comments with 45, while automobiles received the lowest with 20 comments.

FIGURE 3.5 illustrates the commuting pattern of the survey respondents.

Overall, the survey results indicated that residents of the region are interested in more bicycle, pedestrian, and transit options. Additional themes focused on maintaining the existing transportation system, putting a premium on traveler safety, and having a range of travel options.

FIGURE 3.4: COMMENTS BY MODE FOR OPEN-ENDED SURVEY RESPONSES

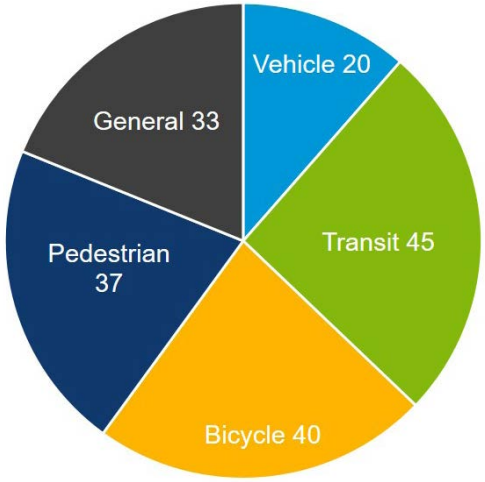
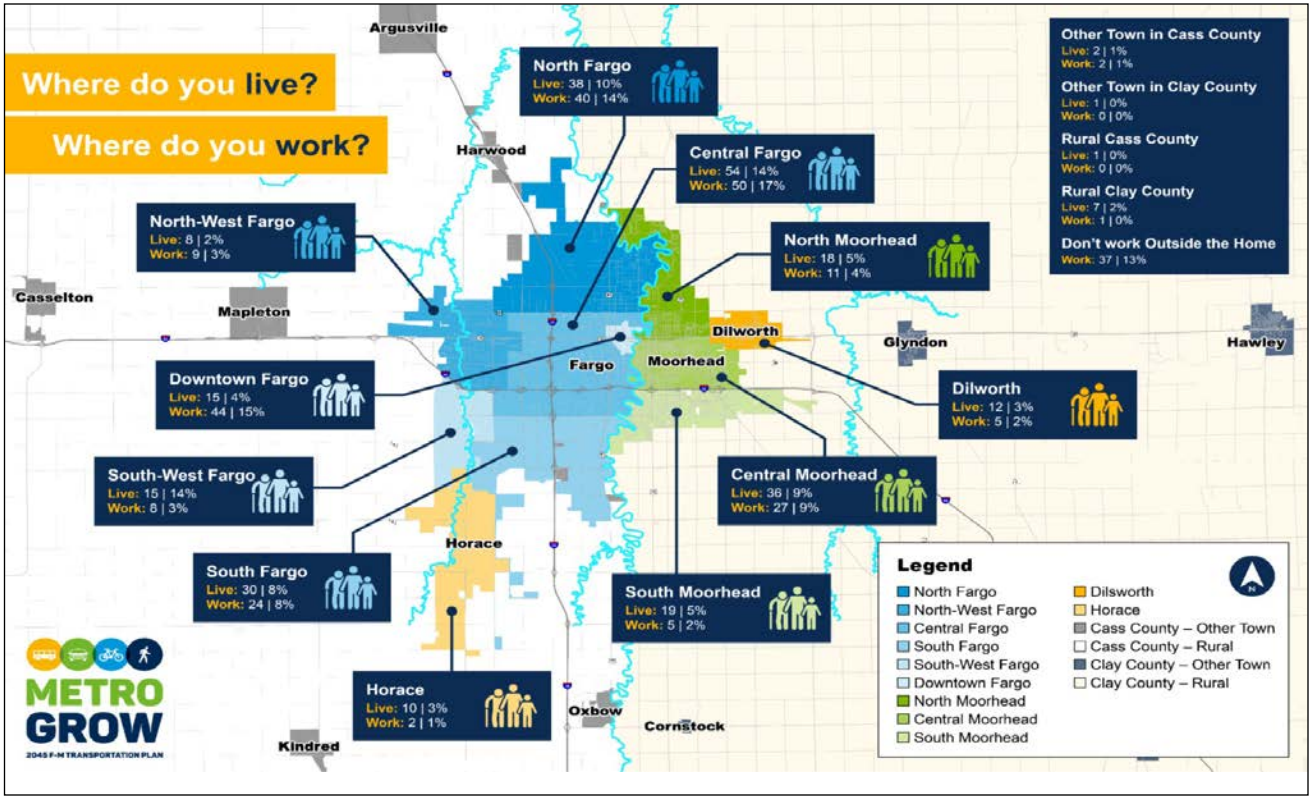


FIGURE 3.5: ON-LINE SURVEY COMMUTING RESULTS



System Performance

This existing system performance document focuses on how various elements of the multimodal transportation system currently operate, and ties those assessments back to Metro COG's performance measurement requirements.

Performance-Based Planning Approach

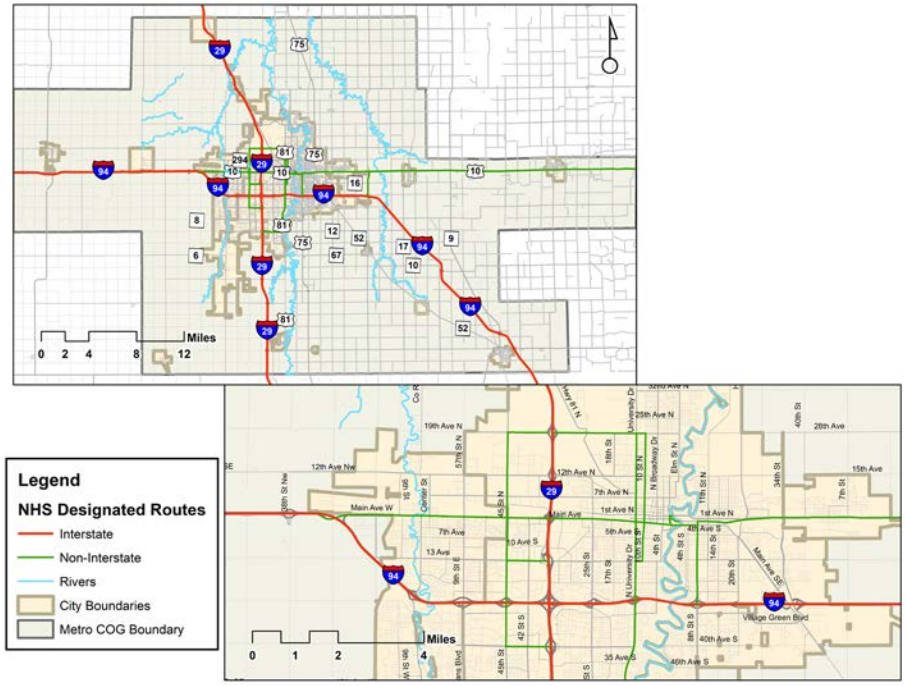
A performance-based approach to this MTP update provides the Fargo-Moorhead area a framework for identifying key issues and prioritizing decisions that align with Federal and regional transportation goals. It is important to incorporate performance-measures into the MTP not only for achieving the community's vision for the transportation system, but also address Federal performance-based planning requirements that have emerged over the past few years.

Federal performance measures became fully enacted with the passage of the Moving Ahead for Progress in the 21st Century Act (MAP-21) in 2012, and performance measures were reinforced with the passage and signing of Fixing America's Surface Transportation (FAST) Act in 2015. Since that time, the US Department of Transportation has gone through a lengthy rule-making process. The process of setting targets and reporting began during development of this plan.

Many of the Federal performance measures apply to roadways on the National Highway System (NHS). The roadways on the NHS within the Fargo-Moorhead metropolitan planning area are shown in FIGURE 4.1. Metro COG has begun adopting targets for each of the Federal performance measures, and those are reflected in each performance section.

Applying a performance-based decision-making framework in this MTP update is important to supporting the metropolitan area's performance goals. For this reason, the existing transportation system performance assessment is framed around the performance measures. For each performance area, the relevant performance measures are outlined, along with summaries of each performance measure, how each measure is generally calculated, and how it is applied.

FIGURE 4.1: NHS IN THE FARGO-MOORHEAD AREA



The next sections outline the system performance measures as related to:

- Safety (PM1),
- Pavement and Bridge Condition (PM 2), and
- Traffic Operations and Reliability, including Freight (PM 3).

Performance Measure Targets

As Metro COG is part of two states, it coordinates with MnDOT for the Minnesota portion of the Metropolitan Planning Area (MPA) and NDDOT for the North Dakota portion of the MPA. Each state has its own set of views, targets, and expectations regarding system performance. To support the Federal Regulations requirements, Metro COG must establish targets by either:

A. Agreeing to plan and program projects so that they contribute toward the accomplishment of each State's DOT safety target for that performance measure; or

B. Committing to a quantifiable target specific to the MPA for that performance measure; or

C. A combination of A and B.

Metro COG has signed agreements with each state when setting each performance measurement. For PM1 and PM2, Metro COG is supporting each state's performance targets. For PM 3, Metro COG has established consistent MPA consolidated targets for reliability. Those targets for 2018-2021 are shown in TABLE 4.1.

TABLE 4.1: CURRENT PERFORMANCE MEASURE TARGETS FOR METRO COG

Safety PM 1	MN	ND
Number of Fatalities	372.2 (statewide)	127.3 (statewide)
Rate of Fatalities	0.622 per 100 Million VMT	1.271 per 100 Million VMT
Number of Serious Injuries	1,711 (statewide)	486.2 (statewide)
Rate of Serious Injuries	2.854 per 100 Million VMT	4.848 per 100 Million VMT
Number of Non-Motorized Fatalities and Serious Injuries	267.5 (statewide)	34.6 (statewide)
Pavement and Bridge Condition PM 2	**MN**	**ND**
Percentage of NHS Bridges in Good Condition	50%	60%
Percentage of NHS Bridges in Poor Condition	4%	4%
Percentage of Interstate Pavement in Good Condition	55%	75.6%
Percentage of Interstate Pavement in Poor Condition	2%	3%
Percentage of Non-Interstate Pavement in Good Condition	50%	58.3%
Percentage of Non-Interstate Pavement in Poor Condition	4%	3%
NHS Performance and Freight PM 3	**MPA Consolidated**	
Percentage of Person Miles Traveled on the Interstate that are Reliable	80%	
Percentage of Person Miles Traveled on the Non-Interstate that are Reliable	75%	
Truck Travel Time Reliability Index	1.5	

System Safety

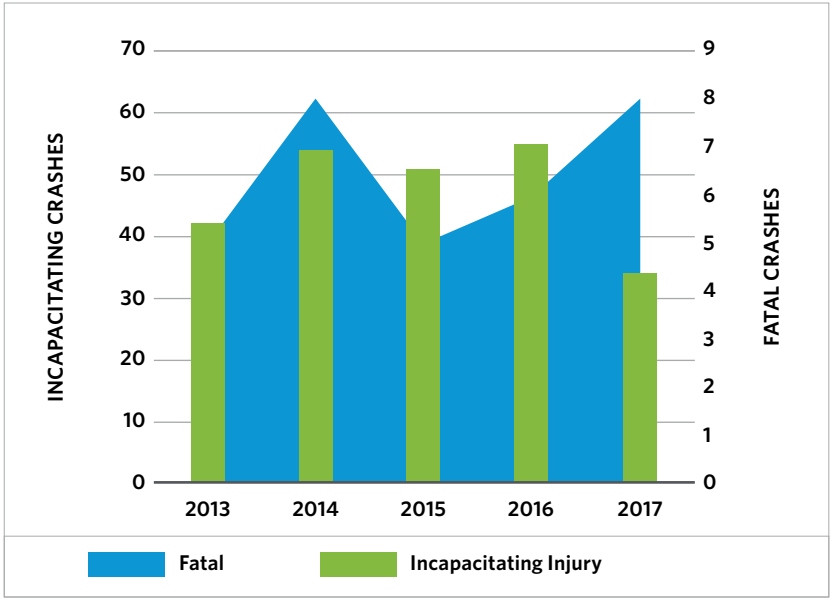
The objective of this safety analysis is to identify and document trends in motor vehicle crashes. It includes:

- High crash intersections
- Fatal and incapacitating injury crashes
- Combined pedestrian and bicycle crashes

The highest-crash intersections that have been identified based on these criteria will be prioritized for review. All crashes on all public roads within the MPA boundary for the years 2013 through 2017 were considered in this analysis.

Data were provided by both NDDOT and MnDOT for the years 2013 through 2017. The data were formatted for consistency. The data from NDDOT were limited to information pertaining to crash events, and do not include information on passengers or information on specifically who was injured in crash events.

FIGURE 4.2 FATAL AND INCAPACITATING INJURY CRASHES BY YEAR



North Dakota's primary traffic safety initiative is Vision Zero. Vision Zero has the mission of eliminating fatalities and incapacitating injuries caused by motor vehicle crashes. Minnesota's Toward Zero Deaths initiative is the state's cornerstone traffic safety program. The Minnesota Strategic Highway Safety Plan (SHSP) provides a goal of zero deaths on Minnesota roads. In order to prevent fatal and incapacitating injury motor vehicle crashes from occurring, it is necessary to understand where they are occurring and what factors are contributing to them.

Crash Overview

Within the Fargo-Moorhead metropolitan area, there was not a noticeable trend in the number of fatal and incapacitating injury crashes per year. These severe crashes are less frequent in the region, and can have variable rates from year-to-year due to small changes in crashes. These numbers are shown in FIGURE 4.2.

FIGURE 4.3 shows data for crash severity in the Fargo-Moorhead metropolitan area from 2013 through 2017.

FIGURE 4.3 CRASH SEVERITY, 2013-2017

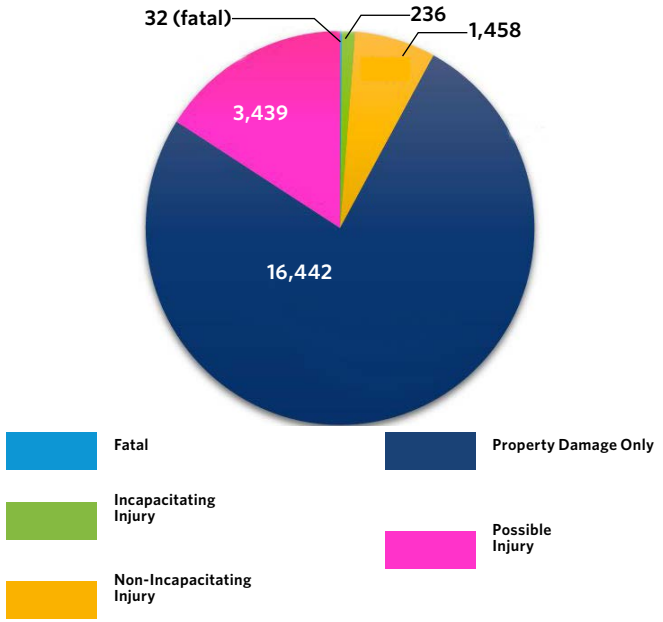
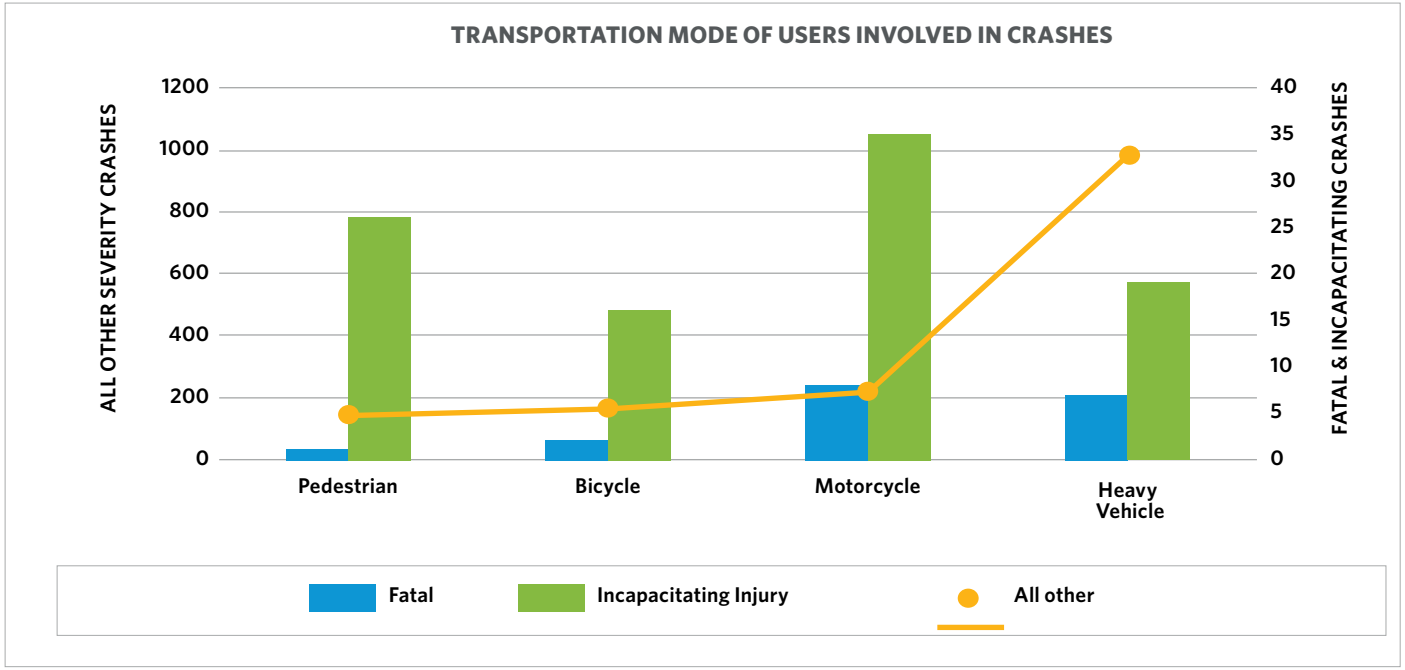


FIGURE 4.4 CRASHES AND SEVERITY BY MODE OF USER



Note that blue and green bars correspond with right axis numbers, and the orange all other crashes line corresponds with the left axis numbers.

Crashes By Transportation Mode

From 2013 through 2017, there were two bicyclists involved in fatal crashes and 16 bicyclists involved in incapacitating injury crashes. There was also one pedestrian involved in a fatal crash and 26 pedestrians involved in incapacitating injury crashes during this five year span. Additional data for transportation mode of users involved in crashes is shown in FIGURE 4.4.

Intersection Crashes

Intersections are a significant source of traffic crashes in urban areas, as they are the locations where conflicting traffic flows and movements come together. Thus, this analysis focused on identifying intersections with higher crash frequencies. Three safety metrics were selected to identify intersections with potential for safety improvements:

- **Crash Frequency:** The total number of intersection crashes of all severities.
- **Fatal and Serious Injury Crashes:** The number of crashes with a fatality or seriously injured person.
- **Combined Pedestrian and Bicycle Crashes:** The total number of crashes at an intersection that included a person type coded as pedestrian (includes person on foot, roller skater/skateboarder, wheelchair, flagger, roadway worker, and EMS personnel); or a person type coded as bicyclist or other cyclist.

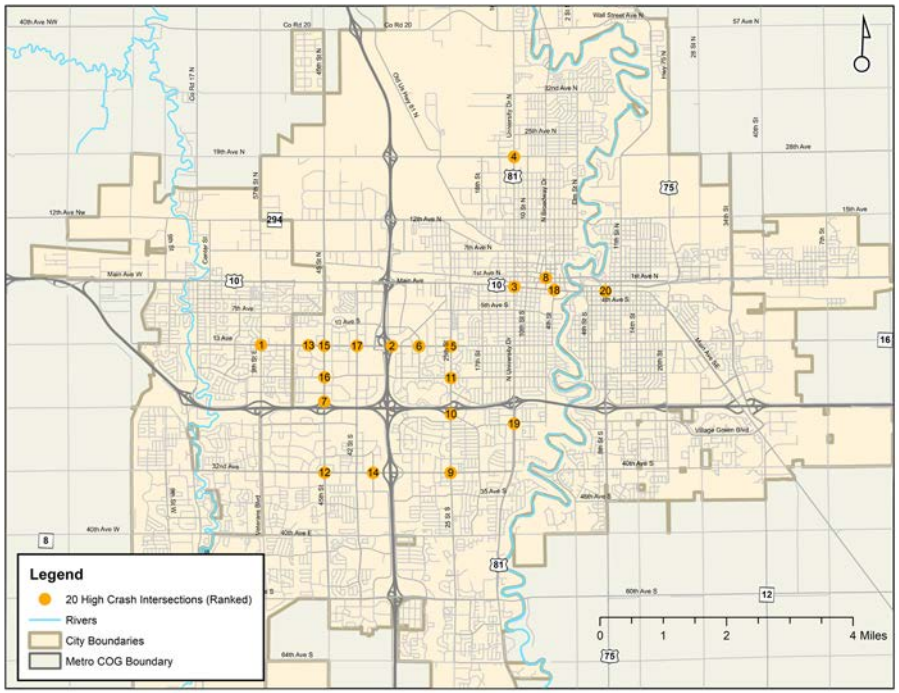
A crash was defined as an intersection crash if the crash occurred within 250 feet of the intersection. Each intersection was ranked according to the individual metrics and the rankings were added up to the combined score. The intersections were then ranked according to this combined score.

TABLE 4.2 shows the top 20 intersections, and how each ranked by the three metrics identified. FIGURE 4.5 illustrates those top 20 intersections.

TABLE 4.2 HIGH CRASH INTERSECTIONS BASED ON FREQUENCY, FATAL AND SERIOUS, AND BICYCLE AND PEDESTRIAN CRASHES (2013-2017)

Intersection	Traffic Control	Number of Crashes		Fatal and Serious Crashes		Bicycle and Pedestrian Crashes		Combined Rank
		Count	Rank	Count	Rank	Count	Rank	
13th Ave E & 9th St E	Signal	106	11	4	1	7	1	1
13th Ave S & I-29 N On/ Off-Ramp	Signal	132	5	2	2	3	9	2
Main Ave & S University Dr	Signal	126	7	2	2	3	9	3
19th Ave N & N University Dr	Signal	93	18	2	2	2	27	4
13th Ave S & 25th St S	Signal	105	12	1	28	4	8	5
13th Ave S & Westrac Dr	Signal	69	47	2	2	5	2	6
45th St S & I-94 W On/ Off-Ramp	Signal	119	9	1	28	2	27	7
1st Ave N & Broadway	Signal	79	30	1	28	3	9	8
32nd Ave S & 25th St S	Signal	87	19	1	28	2	27	9
25th St S & I-94 E Off-Ramp (18th St S)	Signal	72	40	1	28	3	9	10
17th Ave S & 25th St S	Signal	68	49	1	28	3	9	11
32nd Ave S & 45th St S	Signal	76	36	1	28	2	27	12
13th Ave S & 48th St S	Signal	59	75	1	28	2	27	13
32nd Ave S & 39th St S	Signal	58	80	1	28	2	27	14
13th Ave S & 45th St S	Signal	115	10	1	28	1	98	15
17th Ave S & 45th St S	Signal	100	13	1	28	1	98	16
13th Ave S & 42nd St S	Signal	99	14	1	28	1	98	17
Main Ave & 4th St S	Signal	51	110	1	28	2	27	18
25th Ave S & S University Dr	Signal	68	49	1	28	1	98	19
Main Ave & 8th St N	Signal	48	126	1	28	2	27	20

FIGURE 4.5 HIGH CRASH INTERSECTIONS BASED ON FREQUENCY, FATAL AND SERIOUS, AND BICYCLE AND PEDESTRIAN CRASHES (2013-2017)



Safety Trend Summary

- More male drivers were involved in crashes than female drivers. Those crashes tended to be more severe.
- Younger drivers (age 16-25) were involved in more crashes than other age groups.
- Crashes involving alcohol and/or drugs are more than 6 times more likely to lead to a fatal or incapacitating injury than crashes not involving alcohol and/or drugs.

Federal Safety Performance Measures (PM 1)

The **Federal Safety Performance Measures (PM 1)** are:

- **Number of Fatalities:** The total number of persons suffering fatal injuries in a motor vehicle crash during a calendar year.
- **Rate of Fatalities:** The ratio of total number of fatalities to the number of vehicle miles traveled (VMT, in 100 million VMT) in a calendar year.
- **Number of Serious Injuries:** The total number of persons suffering at least one serious injury in a motor vehicle crash during a calendar year.
- **Rate of Serious Injuries:** The ratio of total number of serious injuries to the number of VMT (in 100 million VMT) in a calendar year.
- **Number of Non-motorized Fatalities and Non-motorized Serious Injuries:** The combined total number of non-motorized fatalities and non-motorized serious injuries involving a motor vehicle during a calendar year.

TABLE 4.3 shows the 5-year rolling average for number of fatalities per year by state in the Fargo-Moorhead area. TABLE 4.4 shows the 5-year rolling average rate of fatalities per 100 million Vehicle Miles Traveled (VMT).

TABLE 4.3 5-YEAR MPA ROLLING AVERAGE ANNUAL FATAL CRASHES BY STATE

5-Year Period	Minnesota Fatal Crashes	North Dakota Fatal Crashes
2011-2015	2.4	4.6
2012-2016	2.4	4.2
2013-2017	2.4	4.4

TABLE 4.4 5-YEAR MPA ROLLING AVERAGE ANNUAL FATAL CRASH RATE BY

5-Year Period	Minnesota Fatal Crash Rate	North Dakota Fatal Crash Rate
2011-2015	0.275	0.232
2012-2016	0.269	0.199
2013-2017	0.255	0.196

TABLE 4.5 shows the 5-year rolling average for number of serious injuries per year by state in the Fargo-Moorhead area. TABLE 4.6 shows the 5-year rolling average rate of serious crashes per 100 million VMT.[7]

TABLE 4.5 5-YEAR MPA ROLLING AVERAGE ANNUAL SERIOUS INJURY CRASHES BY

5-Year Period	Minnesota Serious Injury Crashes	North Dakota Serious Injury Crashes
2011-2015	11.2	37.4
2012-2016	11.4	41.6
2013-2017	10.6	39.8

TABLE 4.6 5-YEAR MPA ROLLING AVERAGE ANNUAL SERIOUS INJURY CRASH RATE BY STATE

5-Year Period	Minnesota Serious Injury Crash Rate	North Dakota Serious Injury Crash Rate
2011-2015	1.242	1.862
2012-2016	1.199	1.985
2013-2017	1.068	1.820

TABLE 4.7 shows the 5-year rolling average for number of bicycle and pedestrian serious injury and fatal crashes by state in the Fargo-Moorhead area. As shown in Table 4.7, non-motorized serious injury and fatal crashes are relatively small numbers from a statistical perspective, and single incidents can have a significant impact on the regional bottom line. Because of this, year-to-year changes in these types of crashes may not be indicative of a trend or pattern.

[7] Metro COG has estimated planning-area VMT for the years 2011-2016, based on county-level data available from MnDOT and NDDOT. This analysis uses those Metro COG VMT estimates. Metro COG provided growth rates from MnDOT and NDDOT traffic reports for Cass and Clay Counties to apply to past VMT estimates to derive 2017 VMT estimates.

TABLE 4.7 5-YEAR MPA ROLLING AVERAGE ANNUAL BIKE AND PEDESTRIAN FATAL AND SERIOUS INJURY CRASHES BY STATE

5-Year Period	Minnesota Crashes	North Dakota Crashes
2011-2015	0.600	7.00
2012-2016	0.400	7.20
2013-2017	0.600	8.00

Targets have been established for each state for all five of the safety targets identified. Since the Fargo-Moorhead region represents only a fraction of the crashes in each state, the three "Number of Crashes" performance measures cannot be used to compare between local crash numbers and state targets. Metro COG tracks these numerical performance measures on a year-to-year basis to see if the number of fatal, serious injury, and non-motorized crashes increases or decreases. As shown in the data, the latest five-year rolling averages indicate that:

- Fatal crashes stayed the same in Minnesota, and increased slightly in North Dakota portions of Metro COG MPA
- Injury crashes decreased in both the Minnesota and North Dakota portions of Metro COG MPA
- Non-Motorized crashes increased in both the Minnesota and North Dakota portions of Metro COG MPA

For crash rates, Metro COG has adopted the targets for each state. FIGURE 4.6 shows the shows the 5-year rolling average rate of fatalities per 100 million VMT compared to the targets. FIGURE 4.7 shows the shows the 5-year rolling average rate of serious injuries per 100 million VMT compared to the targets. As shown, the crash rates in the Fargo-Moorhead area are significantly below the targets for both states.

Note that North Dakota target crash rates were recently adjusted. The crash rates in the Fargo-Moorhead area are still well below the current NDDOT target rates shown in Table 4.1 of 1.271 for fatal crashes and 4.848 for serious injury crashes.

FIGURE 4.6: 5-YEAR MPA ROLLING AVERAGE FATAL CRASH RATE BY STATE

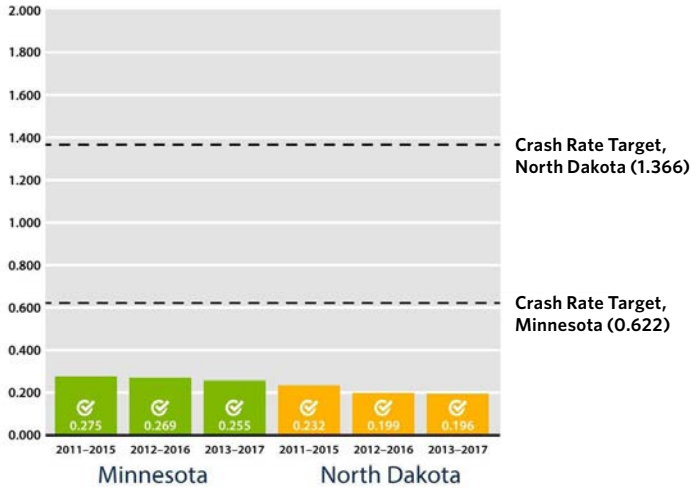
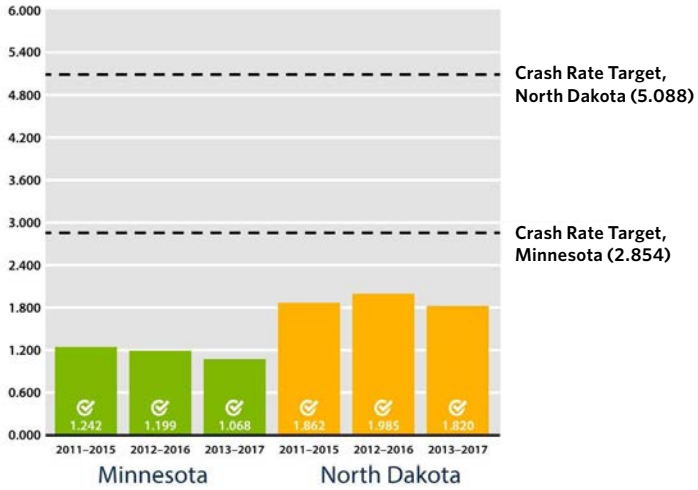


FIGURE 4.7: 5-YEAR MPA ROLLING AVERAGE SERIOUS INJURY CRASH RATE BY STATE



System Pavement and Bridge Condition

Assessing the condition of our current roads and bridges is an integral element of understanding how our current transportation system functions, and what future transportation system investments might be required. There are two primary performance measures that Metro COG and the states of Minnesota and North Dakota are required to apply in evaluating their system:

- Percentage of pavements in "good" or "poor" condition
- Percentage of bridges in "good" or "poor" condition

Pavement Condition

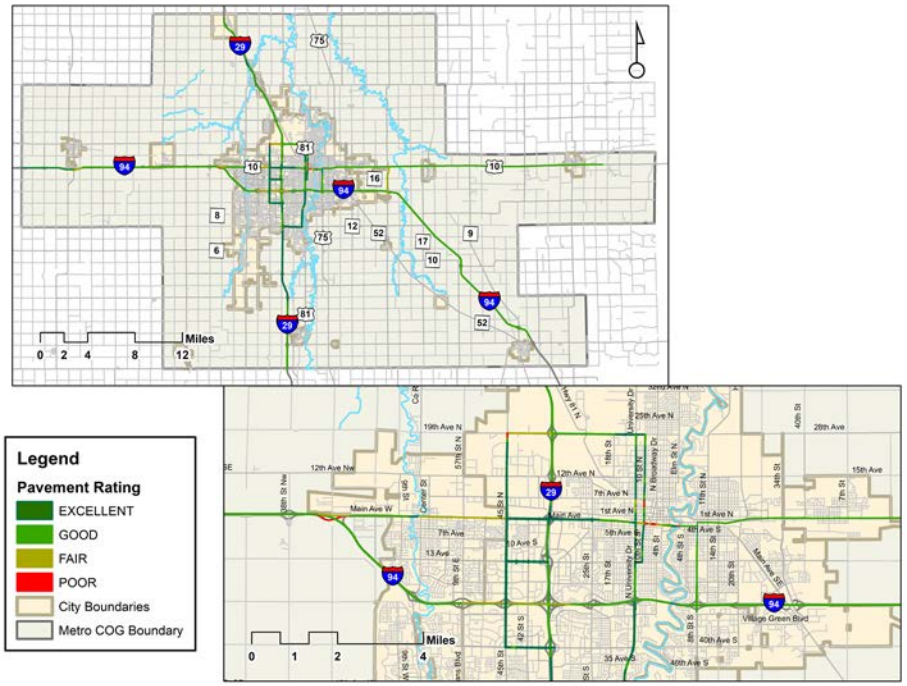
The majority of the agencies in the Metro COG urban area actively monitor the condition of their streets and roads. The entities that provided the latest available street and road pavement condition data were:

- City of Fargo
- City of Moorhead
- City of West Fargo
- Cass County
- Clay County
- MnDOT
- NDDOT

These agencies use a range of methods and tools to evaluate their street and road pavements. The goal of the analysis in this document is to combine the various ways each agency evaluates their pavements into a single system: the Pavement Condition Index (PCI). The PCI provides a numerical rating for the condition of segments within the road network, where 0 is the worst condition and 100 is the best. The PCI measures severity and extent of different types of pavement distresses. The PCI scale corresponds with classifications of "excellent", "good", "fair", and "poor".

FIGURE 4.8 shows the estimated pavement conditions for NHS streets and roadways in the metro area. This performance measure only applies to NHS roadways. Note that within the city of Fargo limits, pavement data for NHS non-interstate routes were provided by both the City of Fargo and NDDOT. The data from the City of Fargo were more granular, providing more geographic resolution than the NDDOT data. In some

FIGURE 4.8: PAVEMENT CONDITION RATINGS FOR NHS ROADWAYS, 2017



cases, the Fargo data appeared to be more up-to-date. For these reasons, the data shown for pavement condition on non-Interstate NHS routes in the city limits of Fargo are provided by the City of Fargo.

Federal Pavement Performance Measures (PM2)

The **Federal pavement performance measures** cover the percentage of:

- Interstate pavements in "good" (and "excellent) condition
- Interstate pavements in "poor" condition
- Non-Interstate NHS pavements in "good" (and "excellent") condition
- Non-Interstate NHS pavements in Poor condition

FIGURE 4.9 shows the Interstate system percentage of pavements by "good" and "poor" condition for each state, along with the targets adopted by Metro COG for each state. FIGURE 4.10 shows the non-Interstate NHS percentage of pavements by "good" and "poor" condition for each state, along with the adopted targets for each. As shown in FIGURE 4.9 and FIGURE 4.10, the pavements in the Fargo-Moorhead area currently meet the targets for Federal pavement performance measures.

FIGURE 4.9: PERCENTAGE OF MPA INTERSTATE PAVEMENTS BY CONDITION BY STATE

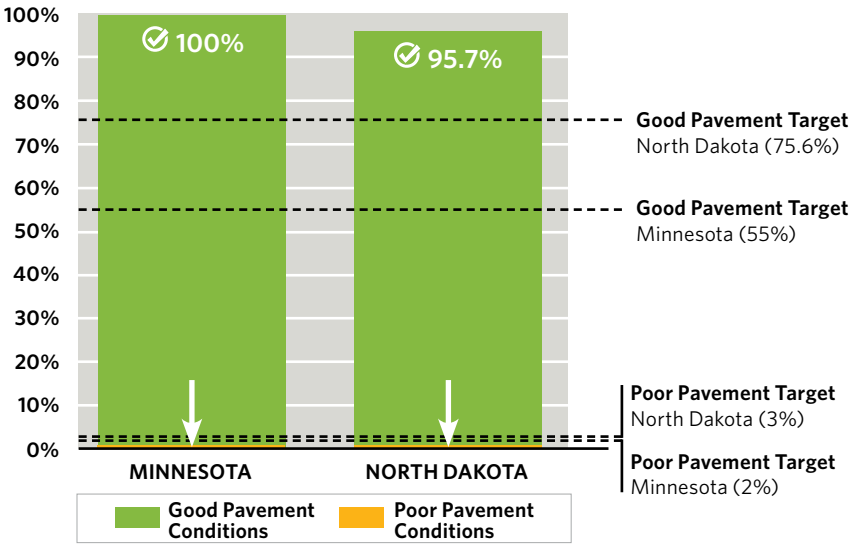
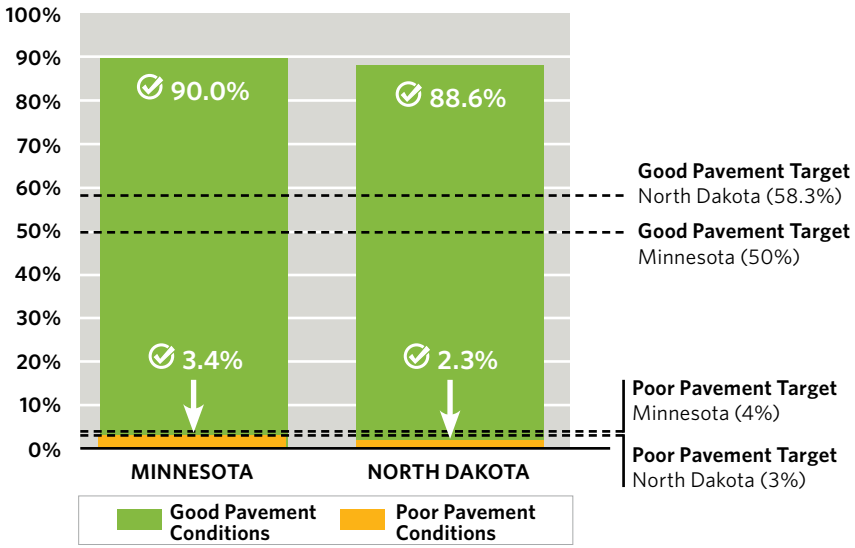


FIGURE 4.10: PERCENTAGE OF MPA NON-INTERSTATE PAVEMENTS BY CONDITION BY STATE



Bridge Condition (PM2)

Bridge conditions were evaluated based on the ratings provided by the National Bridge Inventory (NBI). The NBI is recorded annually and provides information on all bridges on public roads in the United States including their bridge condition. Bridges are scored on a 0 to 9 scale, based on the inspection ratings of their deck, superstructure, and substructure. Bridges are given an overall condition rating based on the lowest score of those three elements. Those scores are classified as "good" (7 to 9 score), "fair" (5 to 6 score), or "poor" (0 to 4 score).

Federal Bridge Performance Measures

The Federal performance rules apply to bridges on the NHS.

Federal bridge performance measures are:

- The percentage of NHS bridges (by deck area) in "good" condition
- The percentage of NHS bridges (by deck area) in "poor" condition

As shown in TABLE 4.8, the NBI indicates that there were 79 bridges on the NHS within the metropolitan planning area. These NHS bridges and their conditions are shown in FIGURE 4.11. The one identified NHS bridge in "poor" condition is the US 10 interchange bridge over I-94 in West Fargo.

FIGURE 4.12 shows the NHS percentage of bridge deck area by condition for each state, along with the adopted targets for each. As shown in FIGURE 4.12:

- The Minnesota bridges in the Fargo-Moorhead area currently meet the "good" and "poor" condition targets
- The North Dakota bridges in the Fargo-Moorhead area currently do not meet the "good" condition target
- The North Dakota bridges in the Fargo-Moorhead area currently meet the "poor" condition target

While not required by the national performance measures, it is important to understand the overall condition of all bridges on both the NHS and local system. FIGURE 4.13 shows a map of the condition rating of all bridges in the Metro COG area. As shown in TABLE 4.9, the majority of bridges in the metro area are in good condition, with 16 out of 376 (4%) in poor condition.

Many of the "poor" condition bridges shown in FIGURE 4.13 are on minor roads and some appear to be closed to traffic.

TABLE 4.8 NUMBER OF NHS BRIDGES BY CONDITION BY STATE

Bridge Condition	Minnesota	North Dakota	Total Region
Good	18	27	45
Fair	10	23	33
Poor	0	1	1
Total	**28**	**51**	**79**

TABLE 4.9 NUMBER OF BRIDGES (ALL ROADS) BY CONDITION BY STATE

Bridge Condition	Minnesota	North Dakota	Total Region
Good	100	100	200
Fair	62	98	160
Poor	5	11	16
Total	**167**	**209**	**376**

FIGURE 4.11 PERCENTAGE OF NHS BRIDGE DECK AREA BY CONDITION BY STATE

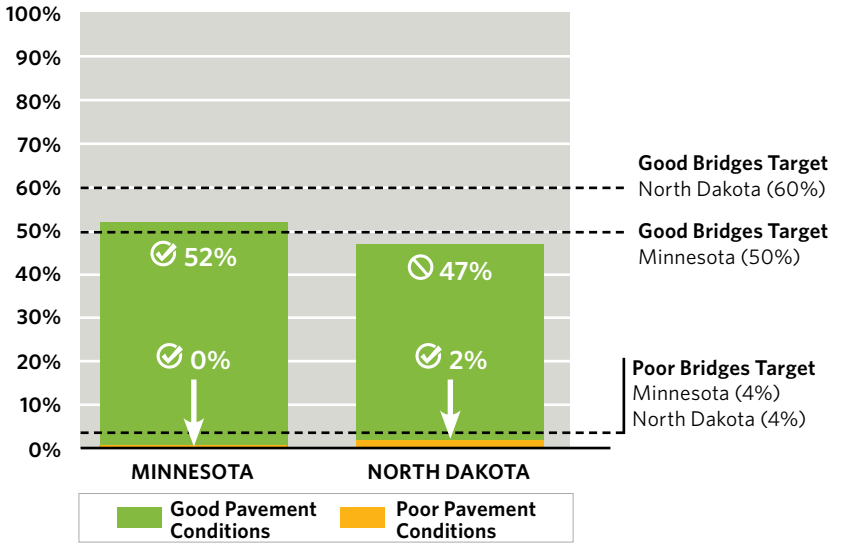


FIGURE 4.12 BRIDGE CONDITION RATINGS FOR NHS BRIDGES

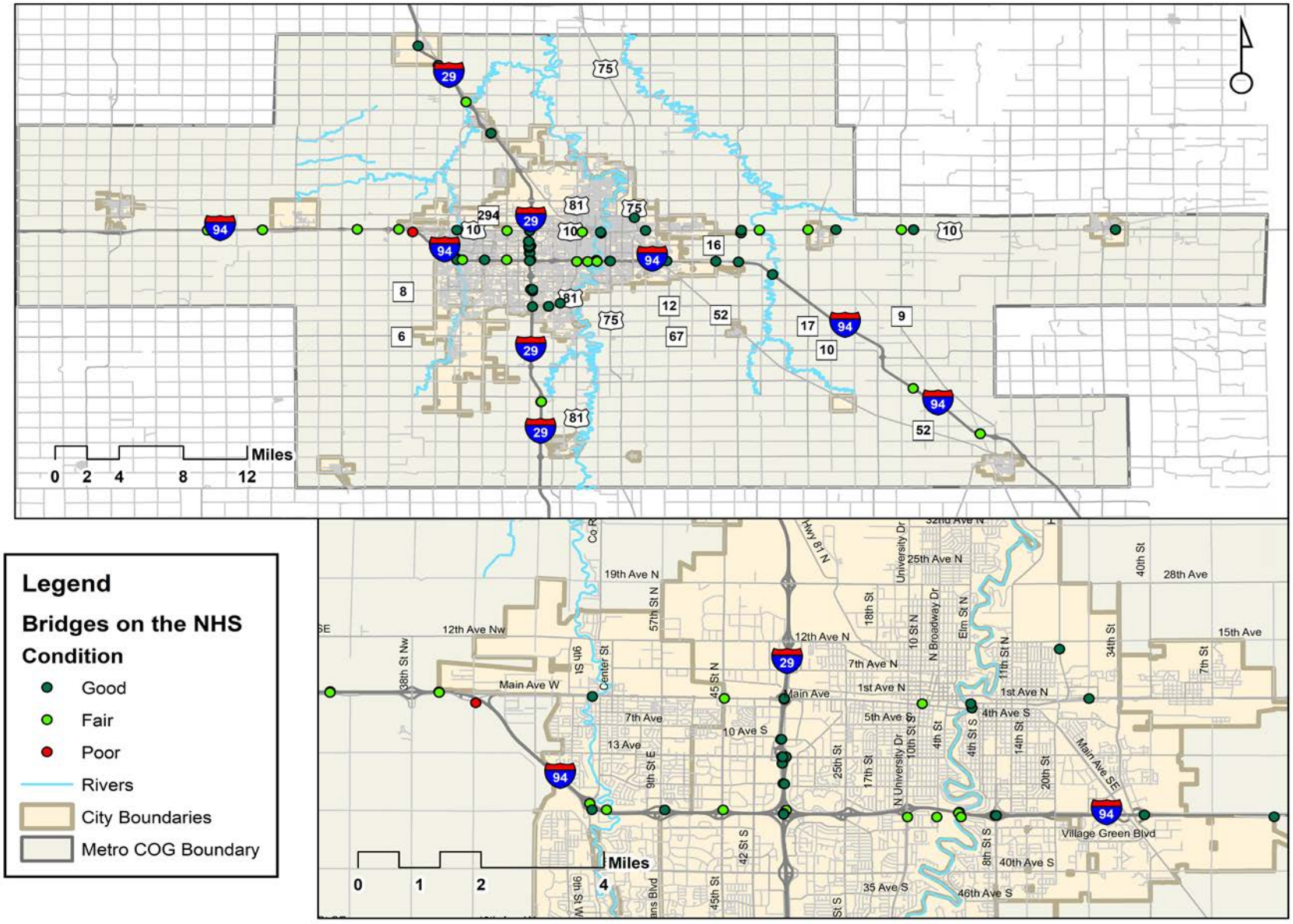
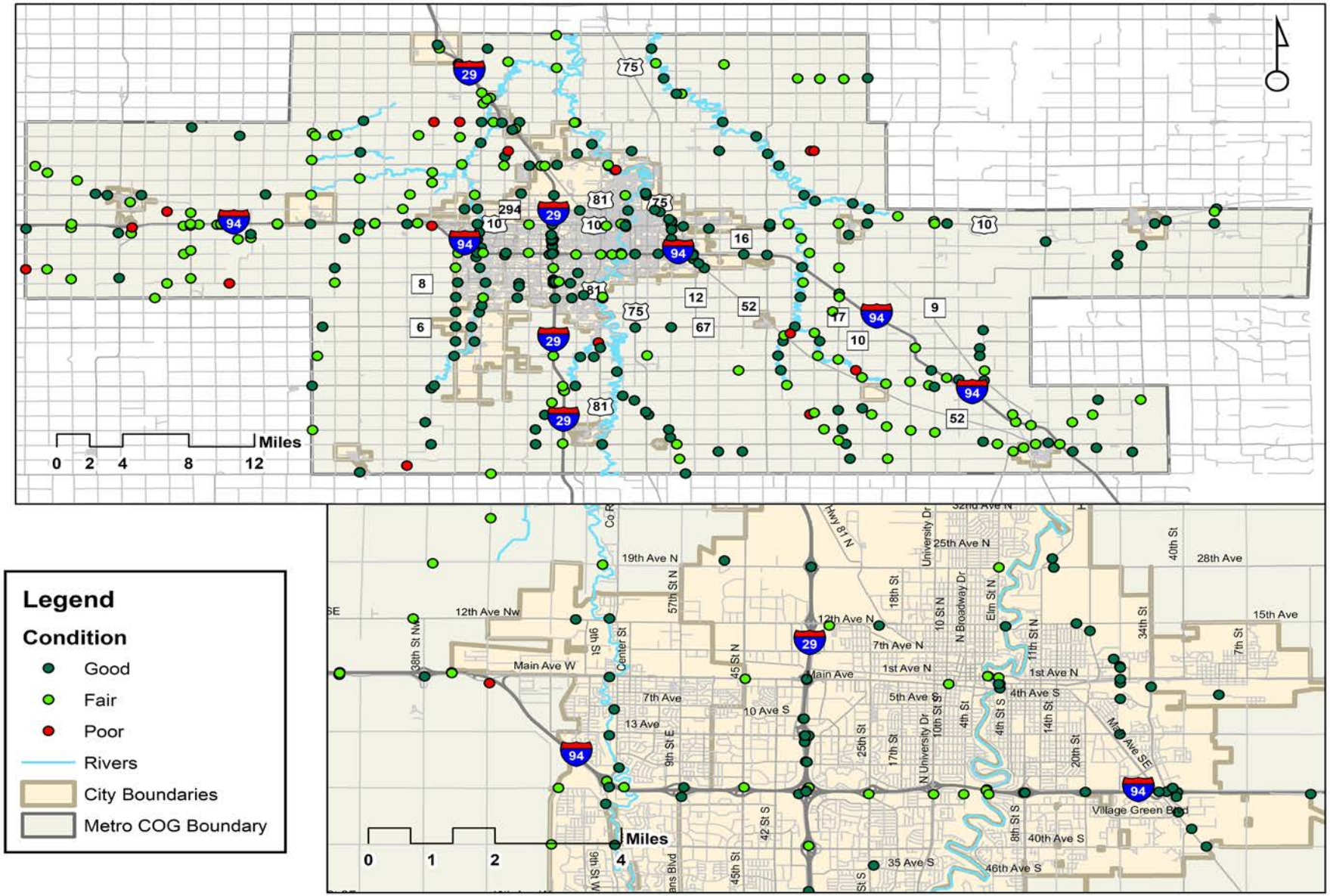


FIGURE 4.13 BRIDGE CONDITION RATINGS FOR ALL RATED BRIDGES



System Operations

Several types of system operations assessments were conducted to look at vehicular operations across the region, consistent with Federal performance measure guidelines.

Traffic Operations

The traffic operations section is intended to describe the quality of peak period traffic flow across the metropolitan area. Traffic operations in the Fargo-Moorhead area experience some periods of recurring travel delays, or congestion, during the morning and afternoon peak travel periods. To evaluate particular locations of travel delays, traffic operations were assessed from two different perspectives, described below.

Probe Data Travel Delays

Passive travel data are created when people carry their mobile devices or use in-vehicle navigation systems. These passive travel data are anonymous traces of how people travel. Not only does the data tell us what corridor these "probe vehicles" traveled on, but the mobile devices also tell us the rate or speed at which the probe vehicle traveled. This provides a rich, historical database of travel speeds through the major corridors of the Fargo-Moorhead area.

The US Department of Transportation has provided Metro COG access to this type of historical probe data in the National Performance Management Research Data Set (NPMRDS) for its use in performance measures. The NPMRDS is a monthly archive of average travel times, reported every 5 minutes when data is available, on the NHS. This data can be used to evaluate day-to-day variability or to see how much travel time increases (or conversely travel speeds decrease).

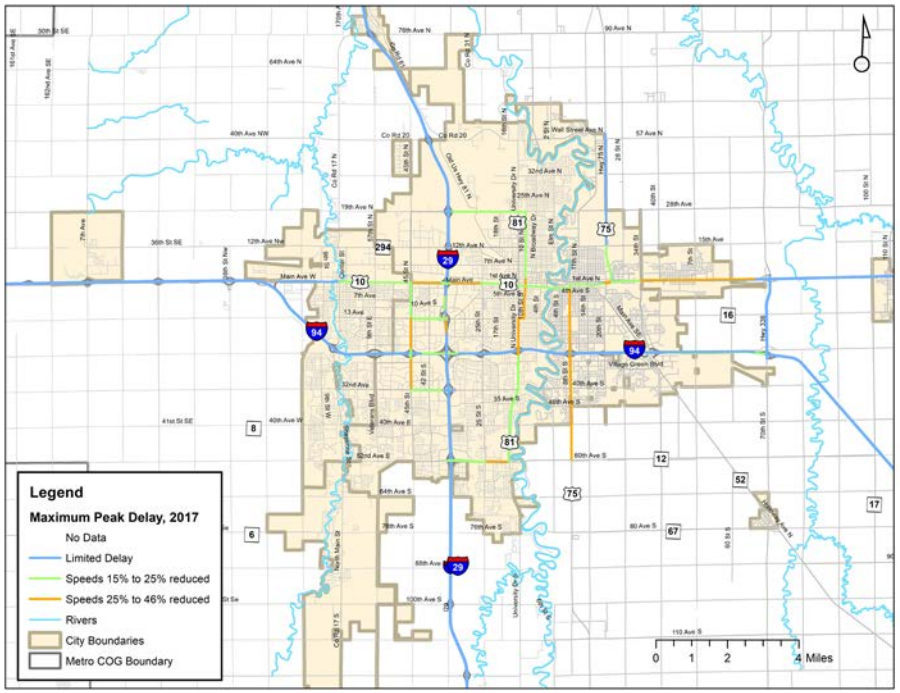
The **Federal Congestion Performance Measure** tracks the annual "peak hour excessive delay" (PHED) per capita for NHS routes. This measure only currently applies to urban areas: 1) with over 1 million people, and 2) are a designated air quality non-attainment area for ozone, carbon monoxide, or particulate matter. **Based on current designations, this performance measure does not apply to the Fargo-Moorhead area.** Starting in 2022, this measure will expand to all urban areas with populations over 200,000, which will potentially include the Fargo-Moorhead area.

The threshold for PHED is based on the amount of travel time at 20 miles per hour or 60% of the posted speed limit travel time, whichever is greater. The measure is also weighted according to vehicle occupancy and traffic volume.

FIGURE 4.14 illustrates how much average speeds drop during the peak hour compared to average speed conditions. As shown in the legend, the most speeds decrease on a typical day is by 46% compared to average non-peak conditions. This was on the University Avenue corridor adjacent to and just north of I-94. To illustrate, the average speed on this segment is 32 miles per hour. The typical speed reduction of 46% means that the average AM peak period's worst 15-minute travel speed in this corridor is about 17 to 18 miles per hour.

The probe data travel delays shown in Figure 4.16. were tailored to identify peak period speed decreases for Fargo-Moorhead conditions, and are not necessarily reflective of the methodology used for PHED. Note that no corridors in the region with this methodology experienced a 60% decrease, a threshold for the PHED measure.

FIGURE 4.14 PEAK HOUR SPEED DECREASES COMPARED TO AVERAGE SPEEDS



As shown in FIGURE 4.9, those corridors with the most delay include:

- Main Avenue / US 10 in Fargo, Moorhead and Dilworth
- US 75 in Moorhead
- University Avenue and 10th Street in Fargo between I-94 and Downtown
- 52nd Avenue S east of I-29 in Fargo
- 45th Street north and south of I-94 in Fargo
- Southbound I-29 between 13th Avenue S and I-94

Because the PHED performance measure is not currently required for the Metro COG area, it is not reported at the regional basis. However, based on the speed decreases shown in FIGURE 4.14, it is not anticipated that the PHED performance measure would currently be an issue in the Fargo-Moorhead area.

Planning-Level Operations

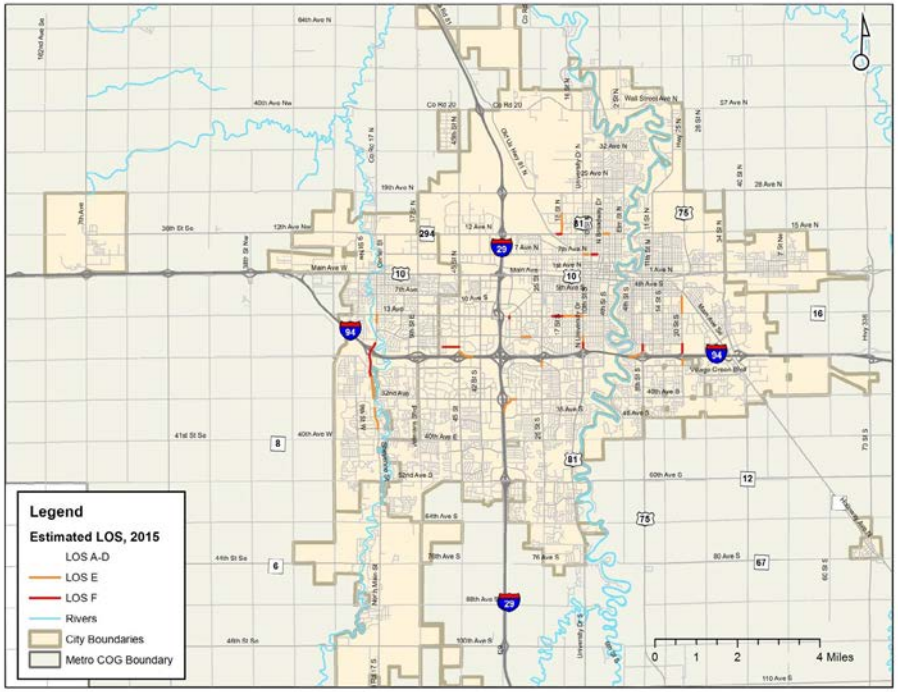
The regional street system was evaluated with a planning-level volume-to-capacity (V/C) methodology. Unlike the delay analysis, this planning-level operations analysis covered all functionally-classified streets in the Fargo-Moorhead area. The planning-level methodology is based on the Highway Capacity Manual methodology and uses readily available regional traffic data to estimate traffic operations with a volume-to-capacity approach. This approach uses daily traffic counts, locally-tailored estimates of peak-hour traffic characteristics, and estimates roadway carrying capacity based on roadway data available from the regional travel model. The planning-level traffic operations approach is intended as a screening approach that identifies corridors which potentially experience peak hour recurring congestion. FIGURE 4.15 illustrates the estimated traffic operations during peak conditions. Level of Service (LOS) conditions E and F are considered high levels of congestion in the Fargo-Moorhead area.

- LOS E is unstable flow at or near capacity levels.
- LOS F is traffic flow where traffic levels are at or exceed the amount that can be served. LOS F is characterized by stop-and-go waves, poor travel times.

As shown in FIGURE 4.15, the most significant locations of congestion not identified with the peak hour travel delays in the previous section were:

- Sheyenne Street in West Fargo from I-94 to 40th Avenue
- 13th Avenue west of University in Fargo
- 20th Street south of Main Avenue in Moorhead
- 18th Street and 12th Avenue North in Fargo

FIGURE 4.15 PLANNING-LEVEL ESTIMATE OF TRAFFIC OPERATIONS



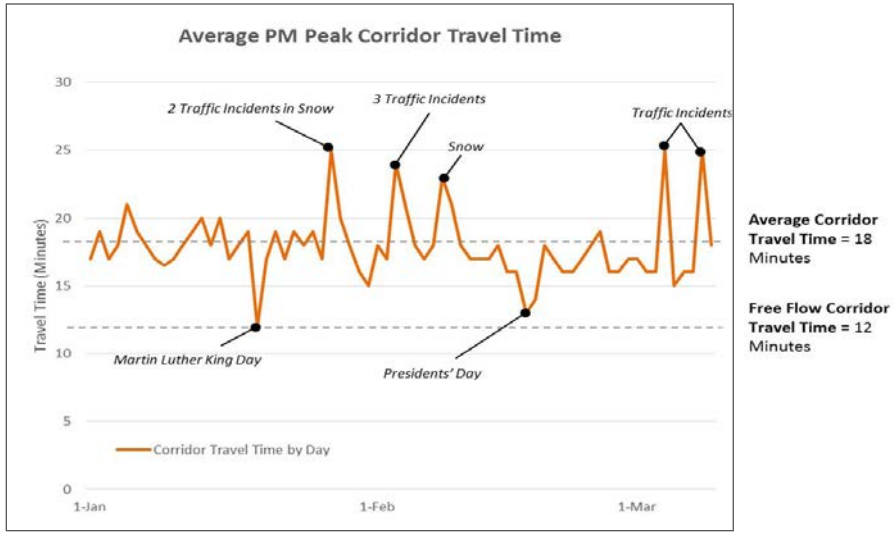
As shown in Figure 4.15, congestion in the region is relatively limited. With the recognition of limited capacity issues in the region, local planning initiatives have recently considered trading vehicular capacity in some corridors for more livable and walkable streets. The Main Avenue reconstruction and lane reduction project in downtown Fargo is an example of this being applied in the region.

Travel Reliability

Traditionally, transportation plans have identified locations where recurring congestion occurs during daily peak hours of traffic flow. The concept of travel reliability is relatively new in transportation planning. Travel reliability analysis evaluates corridors in the Fargo-Moorhead roadway system for how predictable and repeatable travel times are in a given corridor, and across the wider transportation system. Corridors with poor travel reliability can be impediments to freight and commerce, as the modern economy relies on just-in-time delivery.

FIGURE 4.16 illustrates the concept of travel reliability, how travel times across an example corridor change during weekday PM peak hours from day-to-day over the course of several weeks. As shown in the figure, typical congestion levels lead to travel times that routinely increase during peak periods compared to free-flow conditions. This is routine or "recurring" congestion. As noted, occasional weather and traffic incidents (crashes, stalled vehicles, etc.) can occur that lead to significantly increased delays and corridor travel times higher than typical peak conditions. These events illustrate "non-recurring" traffic congestion that lead to a corridor being deemed "unreliable".

FIGURE 4.16 ILLUSTRATION OF TRAVEL RELIABILITY IN A CORRIDOR



SOURCE: FHWA

Federal Travel Reliability Performance Measures (PM 3)

The NPMRDS was used for the Fargo-Moorhead area to identify how the overall roadway system performs in regards to travel reliability, and to identify corridors that were the most unreliable. The **Federal Travel Reliability Performance Measures** are:

- Percentage of person-miles traveled on the Interstate that are reliable
- Percentage of person-miles traveled on the non-Interstate NHS that are reliable

The Level of Travel Time Reliability (LOTTR) is defined as the ratio of the longer travel times (80th percentile) to a "normal" travel time (50th percentile) time to derive the LOTTR for four analysis periods: Morning Weekday, Midday Weekday, Afternoon Weekday, and Weekends. The LOTTR data indicate that reliability has actually improved between 2016 and 2017. The LOTTR for 2017 is shown for the worst of the four periods for each segment in FIGURE 4.17. As shown, the least reliable corridors were:

- 45th St through Fargo
- 32nd Avenue west of I-29 in Fargo
- US 75 south of I-94 in Moorhead
- US 75 north of US 10 in Moorhead
- Portions of Main Avenue / US 10 through Fargo, Moorhead, and Dilworth

FIGURE 4.17 LOTTR BY SEGMENT, REPORTED FOR WORST PERIOD

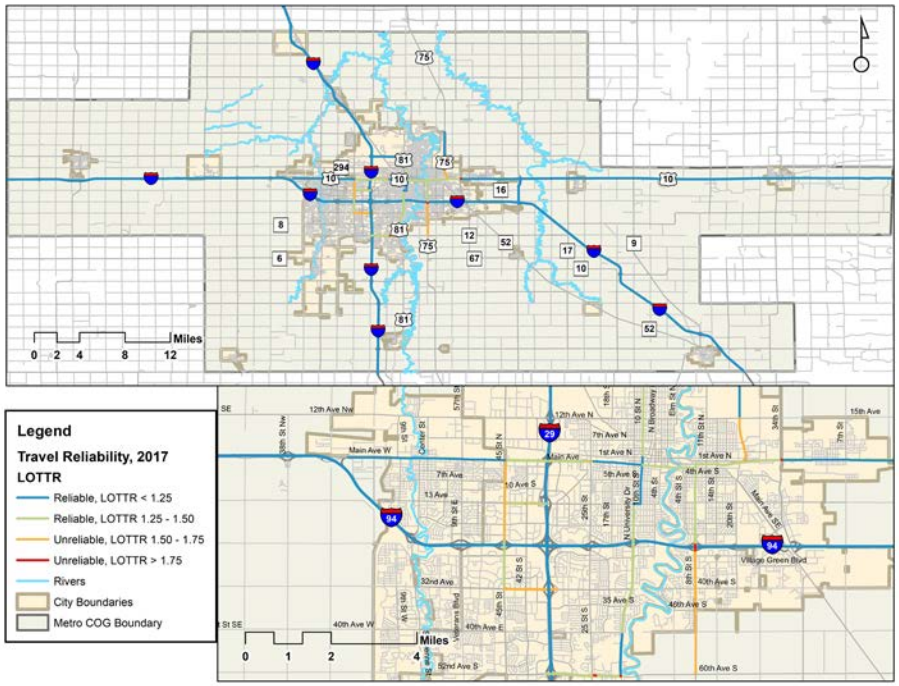


FIGURE 4.18 shows the percentage of person-miles traveled on the Interstate system that have LOTTRs below 1.50, by state for each year. FIGURE 4.19 shows the percentage of person-miles traveled on the non-Interstate NHS system that have LOTTRs below 1.50, by state for each year. As shown, the Interstate and Non-Interstate systems both meet the travel reliability targets for Federal travel reliability performance measures in 2017.

Note that Metro COG has recently adopted a consolidated set of LOTTR targets for both sides of the river: 80% reliable person miles traveled on the Interstate System and 75% reliable person miles traveled on the non-Interstate NHS system. As shown in the figures, with the current LOTTR reliability data indicate the targets would be met.

There is an interesting trend worth noting and tracking in the data. Reliability improved significantly between 2016 and 2017 for both states in the Metro COG area, particularly for North Dakota. This is possibly due to a change in the probe data vendor for the NPMRDS data during that time. It will be important for Metro COG to track reliability data in the next few years as the probe data results become more consistent and re-establish trends for the region to identify reliability issues as they emerge.

FIGURE 4.18 PERCENTAGE OF INTERSTATE SYSTEM LOTTR BELOW 1.50

Interstate Travel Time Reliability, Minnesota

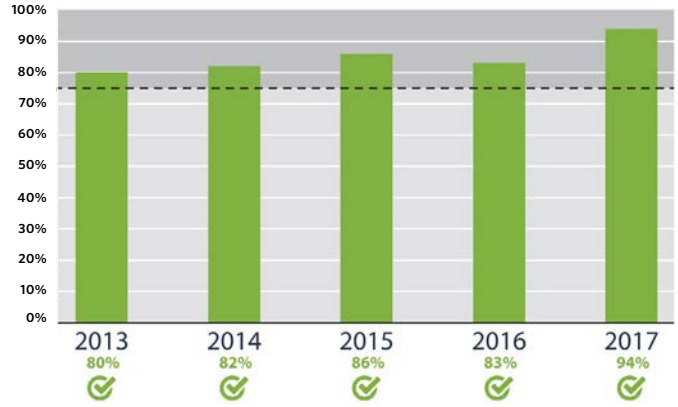
Target of at least 80% of the system should have LOTTR less than 1.50

Interstate Travel Time Reliability, North Dakota

Target of at least 85% of the system should have LOTTR less than 1.50

FIGURE 4.19 PERCENTAGE OF NON-INTERSTATE NHS LOTTR BELOW 1.50

Non-Interstate NHS Travel Time Reliability, Minnesota



Target of at least 75% of the system should have LOTTR less than 1.50

Non-Interstate NHS Travel Time Reliability, North Dakota

Target of at least 85% of the system should have LOTTR less than 1.50

Note that the NPMRDS data provider changed between 2016 and 2017, and the 2016 and earlier data may be overstating reliability issues.

Freight System

Historically, the region's economy has been tied to trade. In 1871, the development of the Great Northern Railroad made Fargo a major stop between the Midwest and the Pacific Northwest. Today, the region is served by an extensive multimodal freight network that supports the local and national economy:

- BNSF (Great Northern Corridor)
- I-94 and I-29 travel through and junction in the region
- Several pipelines cross the region, which convey energy products to the region and nation
- Hector International Airport supports small air cargo planes and belly-freight on passenger airline flights[1]

In terms of employment, freight-related industries (trade, transportation, and utilities) provide one-quarter of all jobs in the region.[2]

Freight Flows

The majority of regional freight flows are by truck (88%) and by rail (10%) by weight. The region's truck flows are slightly above average nationally, but that is not that uncommon for this region of the US because major rail and air cargo centers that service the region are located in the Twin Cities. Freight flows show that the region's major trading partners are located in the Rocky Mountain and Great Lakes regions of the US.[3]

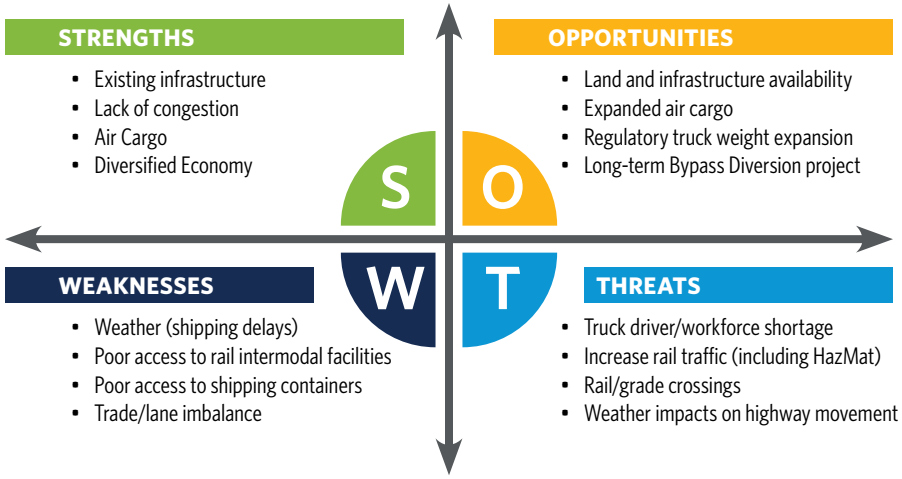
Freight System Opportunities And Challenges

The 2017 *Regional Freight Plan* was charged with identifying actionable policies, strategies, projects and program metrics that will address short and long-term freight needs of the region.

To support that effort, the plan undertook technical analysis supplemented with an extensive freight stakeholder involvement effort. The results of which was represented holistically in a SWOT analysis shown in FIGURE 4.20. Specific highway and multimodal gaps are identified in the next section.

[1] Regional Freight Plan, ES 10
[2] Regional Freight Plan, ES 3-4
[3] Regional Freight Plan, Pages ES 6-9

FIGURE 4.20 FREIGHT SYSTEM SWOT ANALYSIS



SOURCE: 2017 Fargo – Moorhead Regional Freight Plan

Highway Freight

Among the region's strengths is its existing highway network. The plan highlighted that "many of the stakeholders noted the region's lack of congestion as a regional strength, with recurring congestion during peak travel generally limited to short durations of roughly 15 minutes. Shippers and carriers report that interstates and major highways are generally in good condition and support efficient freight movements in both north-south and east-west directions." Specific infrastructure challenges were identified through truck driver break room surveys. The results of the survey focused on three areas:

- **7th Avenue (Fargo):** Drivers felt several additional traffic signals were needed along the corridor (35th, 40th, and 42nd Streets). Additionally, the intersection at 25th Street was identified as having geometric issues for trucks turning north or southbound.
- **9th Street NW (West Fargo):** Truck drivers identified a need for a traffic signal at 2nd Avenue NW and on Main Avenue (near the truck stop). Additionally, the drivers identified weight restrictions on 9th Street NW (County Road 19) between Main Avenue and 13th Avenue as a major impediment.
- **11th Avenue North (Moorhead):** Geometric issues were identified at US 10 and Main Avenue; particularly turning radii were too small and utility poles limited turning movements.[4]

[4] Regional Freight Plan, Pages 14-15

Multimodal Connectivity Challenges

While the existing highway system performs well, stakeholder were concerned about multimodal transportation options. Specifically, that the region does not have access to intermodal (rail) container and inland barge services. The nearest intermodal rail yard and barge access points are located in Minneapolis; over 200 miles away. Stakeholders highlighted that better access to these services would boost the regional economy.[5]

Rail/Highway Grade Crossing Issue - Downtown Moorhead

The 2017 Metro COG Regional Railroad Crossing Safety Study identified a significant bottleneck in Downtown Moorhead. Main and Center Avenues travel through downtown Moorhead, with the BNSF mainline located between the two avenues. While both lines also run through downtown Fargo, the lines are more of an issue in downtown Moorhead due to lack of grade separations. While the traffic signals operate so that traffic is preempted during train crossings, the lack of a grade separation causes several issues, including:

- Significant travel delays in downtown during frequent train crossings
- Emergency response and system resiliency impediments during train crossings
- Traffic queues that often extend across crosswalks and into intersections, impeding pedestrian and overall traffic flow downtown.

Freight Reliability

Freight reliability assesses how reliable truck travel times are on the Interstate system. This is a similar concept as the overall travel reliability discussed above, but relates to truck travel on the Interstate system only. This measure supports the modern just-in-time delivery economy, providing predictable goods movement to businesses. While the Fargo - Moorhead region has significantly more service jobs than manufacturing and industrial jobs, it does have some significant freight-producing businesses and is at a significant crossroads for the nation, making freight reliability important.

This evaluation also uses the NPMRDS for truck travel times on the Interstate system in 15-minute increments. This measure uses the Truck Travel Time Reliability (TTTR), which compares the 95th percentile truck travel time to the 50th percentile truck travel time. The TTTR is used for five analysis periods: Morning Weekday, Midday Weekday, Afternoon Weekday, Weekends, and Overnight.

FIGURE 4.21 TTTR BY SEGMENT

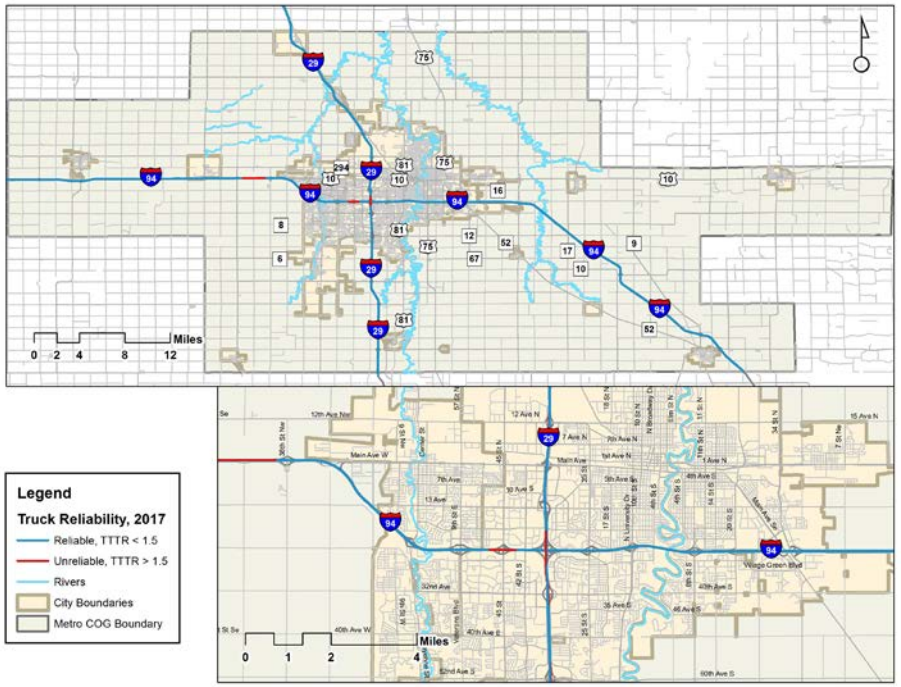


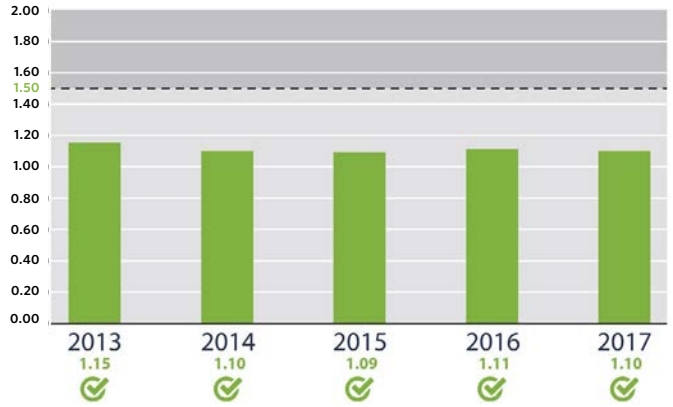
FIGURE 4.21 shows the travel reliability by segment in the study area. As shown, segments along I-29 and I-94 in the urban area have TTTRs that are above the 1.5 threshold considered "unreliable". However, the Federal performance measure is based on the overall regional system performance, discussed in the next section.

[5] Regional Freight Plan, Pages ES 11-12

[6] Regional Railroad Crossing Safety Study, Page 4

FIGURE 4.22 PERCENTAGE OF INTERSTATE SYSTEM TTTR LESS THAN 1.50

Truck Travel Time Reliability, Minnesota



Target of system should have a TTTR less than 1.50

Truck Travel Time Reliability, North Dakota

Target of system should have a TTTR less than 3.00

Federal Freight Reliability Performance Measure (PM 3)

As with the travel reliability measures, the freight reliability measures use the NPMRDS, which provides truck travel times on the Interstate system in 15-minute increments. The **Federal Freight Reliability Performance Measures** use TTTR Index for the entire Interstate system in the Fargo-Moorhead area. This measure evaluates the travel reliability of the entire Metro COG Interstate system.

FIGURE 4.22 shows the overall system truck reliability performance measure for each year since 2013. As shown, the Interstate and Non-Interstate systems both meet the truck travel reliability targets for Federal freight travel reliability performance measures in 2017.

Note that Metro COG has recently adopted a consolidated TTTR target for both sides of the river: 1.5 truck reliability on the Interstate System. As shown in the figures, with the current TTTR truck reliability data indicate the target would be met.

Bicycle and Pedestrian

Current Facilities

The Fargo-Moorhead area bicycle and pedestrian network consists of several types of facilities – sidewalks, shared-use facilities, bike lanes, and sharrows – all collectively providing connectivity throughout the area. As the region has grown, investment in these facilities has followed.

Between 2010 and 2016, the network grew by over 30%. Many of the new facilities are on-street bike lanes and shared lane markings (sharrows). Because of this investment, the Fargo-Moorhead metropolitan area was first designated a Bicycle Friendly Community (Bronze Level) by the League of American Bicyclists in 2014. The current Bicycle and Pedestrian network is shown in FIGURE 4.23.

Fargo-Moorhead has a bike share program called Great Rides, with 11 bike share stations and 100 bikes available. The program has been relatively successful since its launch in 2015, with over 420,000 rides provided in its first four years of operation. The bikes can be checked out at each station via credit card for $4 an hour, and are free to North Dakota State University (NDSU) students. This system currently only operates on the North Dakota side, but agencies are working to expand it to Moorhead.

Impact of Bicycle and Pedestrian Facilities on Transit

Bicycle and pedestrian facilities play an important role in the delivery of transit service. All transit users begin and end their transit rides as a pedestrian or bicyclists. The availability of adequate bicycle and pedestrian facilities not only supports transit dependent users, can sometimes lead to increased ridership. MATBUS has recently expanded on-bus bikeracks from 2 bikes per bus to a carrying capacity of 3 bikes per bus.

Bike Safety

While bicycling and walking are generally safe modes of transportation – crashes that involve motor vehicles can have catastrophic consequences for users. As noted previously in the safety section, within the Fargo-Moorhead area there were 142 pedestrian and 166 bicycle crashes between 2013 and 2017. These incidents included three fatalities and 42 injury crashes.

Current Bike and Pedestrian Issues

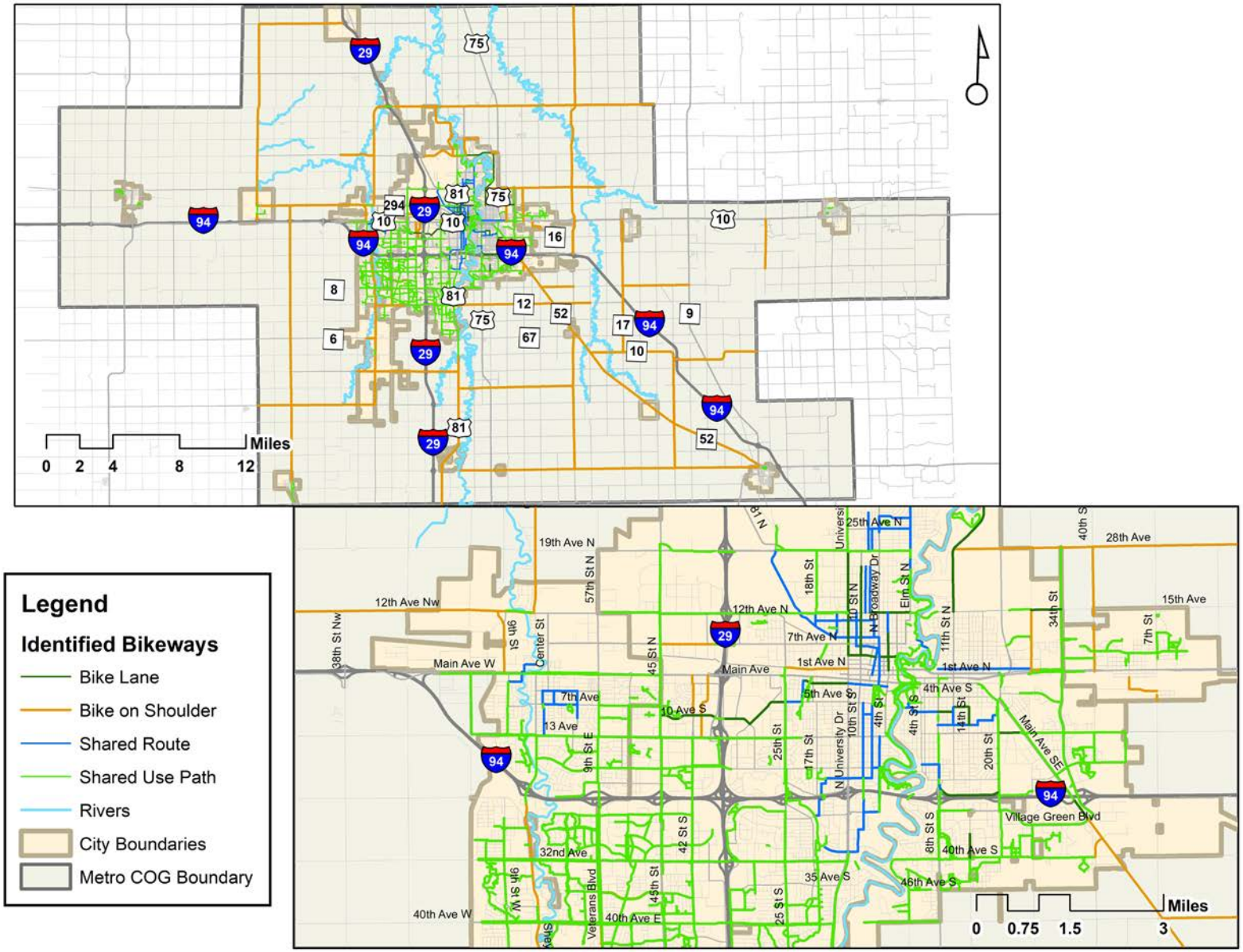
The Metropolitan Bicycle and Pedestrian Plan (2016) was designed to inform the long-range planning process by a more detailed and rigorous evaluation of the subject. The Metropolitan Bicycle and Pedestrian Plan identified current issues and needs as they relate to bicycling and pedestrian movement and focused on developing recommendations to enhance accommodations – regardless of the user.

In general, public input received during both the Metro Grow and Bike and Pedestrian Plan process was in favor of better connectivity, more bike lanes, and more river trails. The plan identified intersections with high rates of bike accidents and poor quality of pavement as a barrier to effective on-street biking.

The plan identified five priority areas based on existing issues:

- Priority 1: Bicycle and Motorist Education
- Priority 2: Safety
- Priority 3: Network Improvements
- Priority 4: Improved Maintenance
- Priority 5: Encouragement

FIGURE 4.23 BICYCLE AND PEDESTRIAN SYSTEM



Current Transit System Issues

Based on the input received in the survey and the public open houses, there were several transit system issues identified, including:

- Extending the hours of operation to include Sundays
- Providing improved access to jobs via extended routes
- More amenities at bus stops, like heated shelters
- Need for express service to suburban areas

Intercity Transportation

Air Travel

The Fargo-Moorhead Region is home to one commercial service airport and five general service airports:

- **Hector International:** Fargo, ND (commercial passenger service, 233 average daily operations, 196 aircraft based on field)
- **Moorhead Municipal:** Moorhead, MN (25 average daily operations, 46 aircraft based on field)
- **Hawley Municipal:** Hawley, MN (24 average daily operations, 30 aircraft based on field)

The Metro COG Bicycle and Pedestrian Committee plays an essential role in planning the bike and pedestrian system in Fargo-Moorhead. Additional advocacy groups, such as Streets Alive, promote walking and biking and special events. The Bicycle and Pedestrian committee was actively involved in developing the system priorities for the Metro Grow plan.

SOURCE: Great Rides

Walking Accessibility

Traditionally, transportation planning has focused on traffic-based and mobility questions of travel time and level of service. During development of Metro Grow, input received has indicated that new ways of measuring "how we get around" are necessary for the Fargo-Moorhead region. Accessibility is a metric that focuses on the ability to reach valued destinations. It ties the quality of the transportation network to land uses, and evaluates how well different people or portions of the metro area can reach desired places.

To evaluate the current accessibility conditions in the Fargo-Moorhead area, two different concepts were integrated:

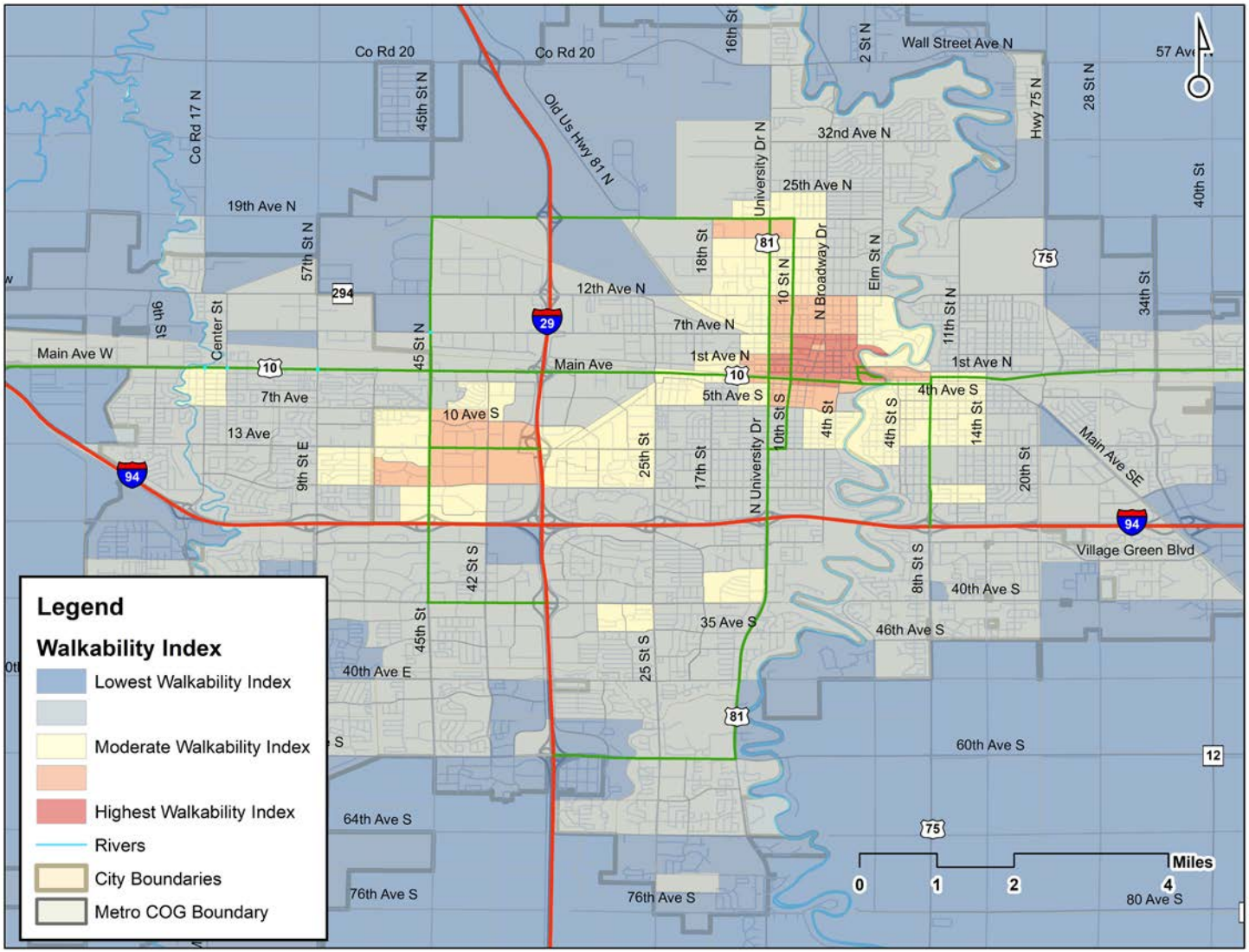
- **Street Network Connectivity.** Street network connectivity is often positively associated with more walkable and bikeable neighborhoods. A range of different approaches to evaluating network connectivity were reviewed. The Metro Grow team settled on the ratio of street intersections to street length as the explanation of street network connectivity.

- **Walk Accessibility.** Accessibility combines the pedestrian network connections with the amenities and destinations that can be reached. For this measure, we assessed different measures, thresholds, and data sources for determining the walk environment of various locations across the metropolitan area. We settled on identifying "walksheds" to employment and to services as the measure for accessibility.

We combined these two different concepts to create the walkability index used in the plan. The walkability index that combines network connectivity with walk access to services and jobs for the Fargo-Moorhead urban area is shown in FIGURE 4.26. The results are scaled, so that all neighborhoods are representing in a relative manner from other neighborhoods.

This measure was used to **assess the current walk environment** across the metro area, and where there are gaps in the current system, and were used to help prioritize **bicycle and pedestrian projects.** The benefits of walkable neighborhoods include improved public health, improved neighborhood economic development, and environmental benefits.

FIGURE 4.24 METRO GROW WALKABILITY INDEX BY ZONE



Transit

Transit in the Fargo-Moorhead area is provided by Metro Area Transit (MATBUS). MATBUS is collectively operated by the Cities of Fargo and Moorhead to provide fixed-route and paratransit service for Fargo, West Fargo, Moorhead, and Dilworth.

MATBUS operates Monday through Saturday in Fargo, Moorhead, Dilworth, and West Fargo.

Fixed bus route service changes have been instituted recently, and now service is provided on 22 bus routes. Seven routes are run in Moorhead and Dilworth and 15 routes in Fargo and West Fargo. The hours of operation are from approximately 6:15 AM to 11:15 PM on Monday through Friday and approximately 7:15 AM to 11:15 PM on Saturdays. TABLE 4.10 shows some key performance measures for the fixed route system since 2010. As shown in TABLE 4.10, total system ridership has gone up and down since 2010, with between approximately 1.9 million and 2.2 million riders annually. Service levels and operating expenses have steadily increased during that time.

The paratransit service is provided for persons with disabilities that are unable to use the fixed-route service. The paratransit operates within the city limits of Moorhead, Dilworth, Fargo, and West Fargo, provides door-to-door service, and offers the same hours of operation with reservations made one day in advance. TABLE 4.11 shows some key performance measures for the paratransit system since 2010. As shown in TABLE 4.11, total system ridership on the North Dakota side has decreased slightly since 2010, and increased steadily on the Minnesota side. Service levels and operating expenses have remained relatively stable on the North Dakota side, and increased steadily during that time on the Minnesota side.

The **Fargo-Moorhead Transit Development Plan,** completed in 2016, provided a comprehensive review of the existing system and an improvement plan moving forward. Some of the major issues identified through the planning process included:

- Desire for Sunday
- Add bus service to Hector International Airport
- Provide direct service from NDSU to West Acres
- Desire for direct service in Fargo on 25th Street between 13th Avenue and 32nd Avenue South
- Investigation into options to unify planning and administration of the currently two separate bus systems
- Potential to restructure MATBUS as a transit authority structure

TABLE 4.10 KEY FIXED ROUTE SERVICE OPERATING STATISTICS

	Measure	2010	2011	2012	2013	2014	2015	2016
North Dakota Service Area	Passenger Trips	1,570,055	1,772,443	1,604,693	1,682,267	1,741,524	1,627,916	1,486,051
	Revenue Hours	51,416	60,643	66,560	73,730	74,814	77,767	80,173
	Revenue Miles	639,047	782,983	857,329	927,601	951,662	957,777	957,430
	Operating Expense	$4,194,088	$4,422,374	$4,984,135	$5,631,208	$5,706,256	$5,748,174	$5,610,710
	Passenger Revenue	$629,167	$591,244	$658,311	$676,374	$704,887	$651,648	$614,530
Minnesota Service Area	Passenger Trips	376,697	433,676	436,285	452,620	482,177	459,288	445,074
	Revenue Hours	22,023	22,008	22,353	24,198	27,643	28,899	29,024
	Revenue Miles	293,246	293,663	303,693	328,771	394,485	396,894	399,666
	Operating Expense	$1,406,447	$1,495,653	$1,551,647	$1,656,857	$1,993,859	$1,964,125	$1,923,970
	Passenger Revenue	$225,277	$253,421	$279,077	$294,500	$310,456	$302,441	$300,455

SOURCE: Fargo – Moorhead Transit Development Plan (2016) and National Transit Database

TABLE 4.11 KEY DEMAND RESPONSE SERVICE OPERATING STATISTICS

	Measure	2010	2011	2012	2013	2014	2015	2016
North Dakota Service Area	Passenger Trips	57,850	58,995	54,543	53,426	43,855	51,439	52,373
	Revenue Hours	25,494	26,272	25,442	25,822	26,406	23,719	23,454
	Revenue Miles	341,699	347,222	336,514	344,491	336,647	316,469	320,998
	Operating Expense	$1,232,983	$1,226,319	$1,246,802	$1,366,465	$1,425,880	$1,260,234	$1,326,546
	Passenger Revenue	$305,132	$292,681	$306,396	$164,919	$158,986	$152,358	$154,853
Minnesota Service Area	Passenger Trips	5,961	7,471	7,492	8,042	10,038	10,143	10,765
	Revenue Hours	3,441	4,025	4,112	4,193	4,918	6,001	6,347
	Revenue Miles	37,201	49,685	51,121	55,054	67,154	73,708	77,999
	Operating Expense	$180,732	$195,991	$181,485	$211,707	$391,943	$384,669	$245,281
	Passenger Revenue	$15,888	$18,754	$21,568	$22,594	$52,435	$55,276	$60,895

SOURCE: Fargo – Moorhead Transit Development Plan (2016) and National Transit Database

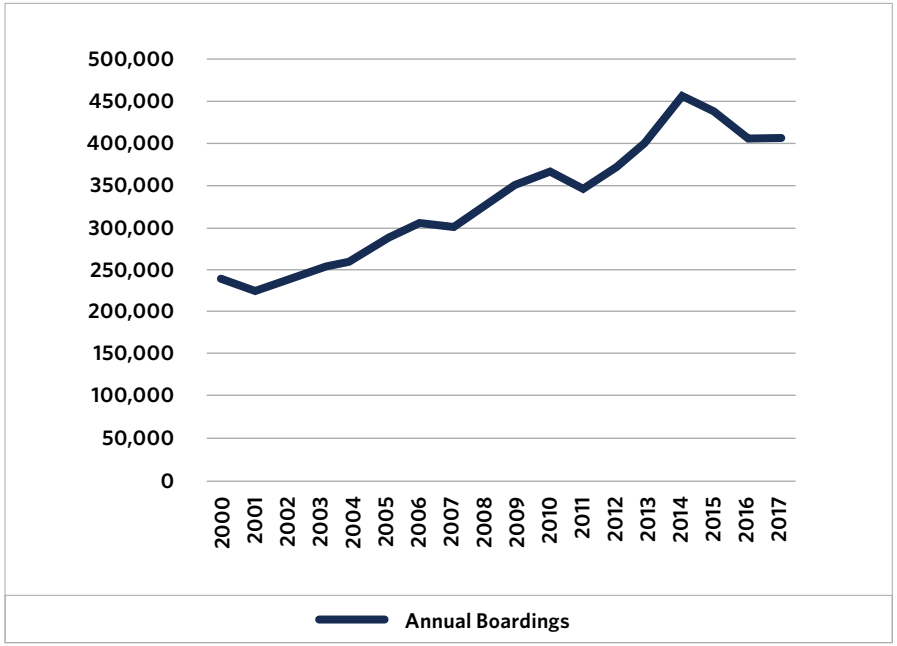
- **West Fargo Municipal:** West Fargo, ND (37 average daily operations, 40 aircraft based on field)
- **Robert Odegaard Field:** Kindred, ND (17 average daily operations, 40 aircraft based on field)
- **Casselton Robert Miller Regional:** Casselton, ND (38 average daily operations, 54 aircraft based on field)[8]

As travel to and from airport facilities in the region impact surface transportation networks, trends in passenger enplanements at the region's only commercial service airport, Fargo's Hector International, are illustrated in FIGURE 4.25. Passenger boardings at Hector fluctuated from 2013 to 2017 but remain above 400,000 annually, according to statistics reported by the Federal Aviation Administration. Boardings in 2017 were more than 70% higher than levels in 2000, growing at a compound rate of over 3% per year.

As of January of 2019, regular commercial passenger services extended from region on five carriers to ten cities, of which three are serviced seasonally.

- Allegiant with direct flights to Las Vegas, NV, Phoenix, AZ, Los Angeles, CA (seasonal), and Orlando, FL (seasonal)
- American with direct flights to Dallas, TX and Chicago, IL
- Delta with direct flights Minneapolis, MN and Atlanta, GA (seasonal)
- Frontier with direct flights to Denver, CO
- United with direct flights to Chicago, IL and Denver, CO

FIGURE 4.25 ANNUAL PASSENGER BOARDINGS AT HECTOR INTERNATIONAL AIRPORT, 2000-2017



SOURCE: Bureau of Transportation Statistics, T-100 Database

Air Freight

Air freight services have experienced a rapid expansion in the region at Hector International Airport. Companies FedEx and UPS use Fargo airport as a hub for the region. Combined, these companies are flying 20 or more flights a day.[9]

Intercity Bus Connections

The regional transportation network includes daily intercity bus service provided by the private company Jefferson Lines. Bus stops connecting to cities outside the region are located at Ground Transportation Center (GTC) and 1201 University Drive in Fargo, and at 615 14th Street S. in Moorhead. Connections from these stops include:

- Grand Forks, ND via I-29 North with service continuing into Minnesota via Highway 2
- Valley City, Jamestown, Bismarck and Dickinson via I-94 West with service continuing into Montana
- Highway 10 East into Minnesota towards Detroit Lakes
- I-94 East into Minnesota towards St. Cloud and Minneapolis[10]

[8] Source: AirNav

[9] Source: KFGO, "Freight flights on track to surpass passenger flights in Fargo", September 12, 2018.

[10] Source: Jefferson Lines, jeffersonlines.com

Intercity Rail Connections

Amtrak service is available in the Fargo-Moorhead area via the Empire Builder long-distance passenger line. This line runs from Chicago to the west coast (to both Seattle and Portland), with one train daily running westbound and eastbound. The Amtrak station is a waiting room in the old REA building adjacent to the former Great Northern Railway depot. Nearby stops to the Fargo station include Detroit Lakes, MN and Grand Forks, ND. A non-profit group is currently advocating for expanded Amtrak service on the Empire Builder line by adding another train.

Future Trends & Needs

An important element of the Metro Grow transportation plan is looking beyond what is currently happening, and anticipate emerging mobility issues and opportunities. New development and land use growth will lead to new travel demands on the Fargo-Moorhead multimodal system. Metro COG did a comprehensive evaluation of future growth trends prior to initiating the Metropolitan Transportation Plan update, based on demographic evaluations and review of jurisdictional land use plans. This chapter discusses the general patterns and level of growth anticipated for the Fargo-Moorhead region between today and 2045, and resulting transportation system challenges and opportunities that may arise over that time.

Regional Growth

As shown in the "Regional Trends" Chapter, the Fargo-Moorhead region has seen a sustained rate of growth over the past several decades. That backdrop of steady population, housing, and job growth, in addition to a detailed analysis of regional demographics, was the basis for estimating how the region would grow through 2045. It should be noted that the future land use estimates for Metro Grow are not an indication of zoning regulations or how development is likely to be phased. Rather this data is for travel estimation and infrastructure planning purposes.

Households and employment are the primary factors used to explain travel in the Fargo-Moorhead region, and used by Metro COG's travel demand model (TDM). Table 5-1 shows the 2015 estimates and 2045 projections of regional households and employment. This information was developed for use in the TDM in the *Demographic Forecast Study*, completed by Metro COG in 2017. More details on that study are available at the Metro COG website.

TABLE 5.1 BASE YEAR (2015) AND FUTURE YEAR (2045) REGIONAL HOUSEHOLD AND EMPLOYMENT TOTALS

	Households	Population	Employment
2015	92,019	222,366	127,305
2045	**128,769**	**315, 416**	**183,604**
Growth	+36,750	+93,050	+56,299
Percentage Growth	**40%**	**42%**	**44%**

As shown in TABLE 5.1, households are projected to increase by 40% , population by 42%, and the number of jobs by 44% by 2045. In addition to understanding how much growth is anticipated, it is important to assess where that growth is likely to occur. This helps provide an understanding of how transportation services might need to adapt to address future growth needs. The future household and job growth was allocated to the transportation analysis zone (TAZ) structure of the TDM. The allocated household growth is shown in FIGURE 5.1 and employment growth is shown in FIGURE 5.2. As shown in the figures, there is anticipated to be a mix of continued development in new areas on the urban fringe, and development within established portions of the city, including "infill" development in established neighborhoods like downtown.

FIGURE 5.1 ANTICIPATED LOCATIONS OF HOUSEHOLD GROWTH, 2015 THROUGH 2045

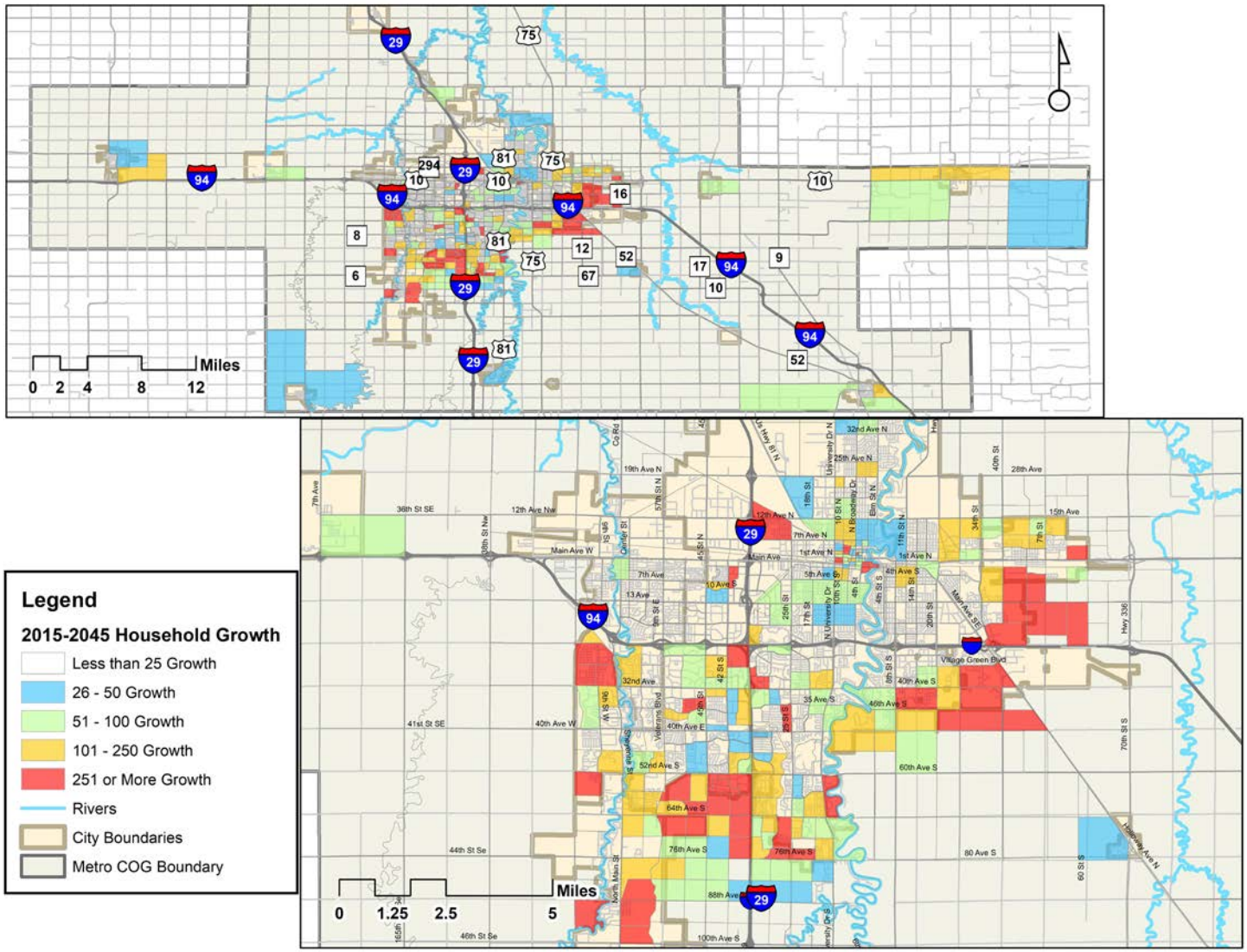
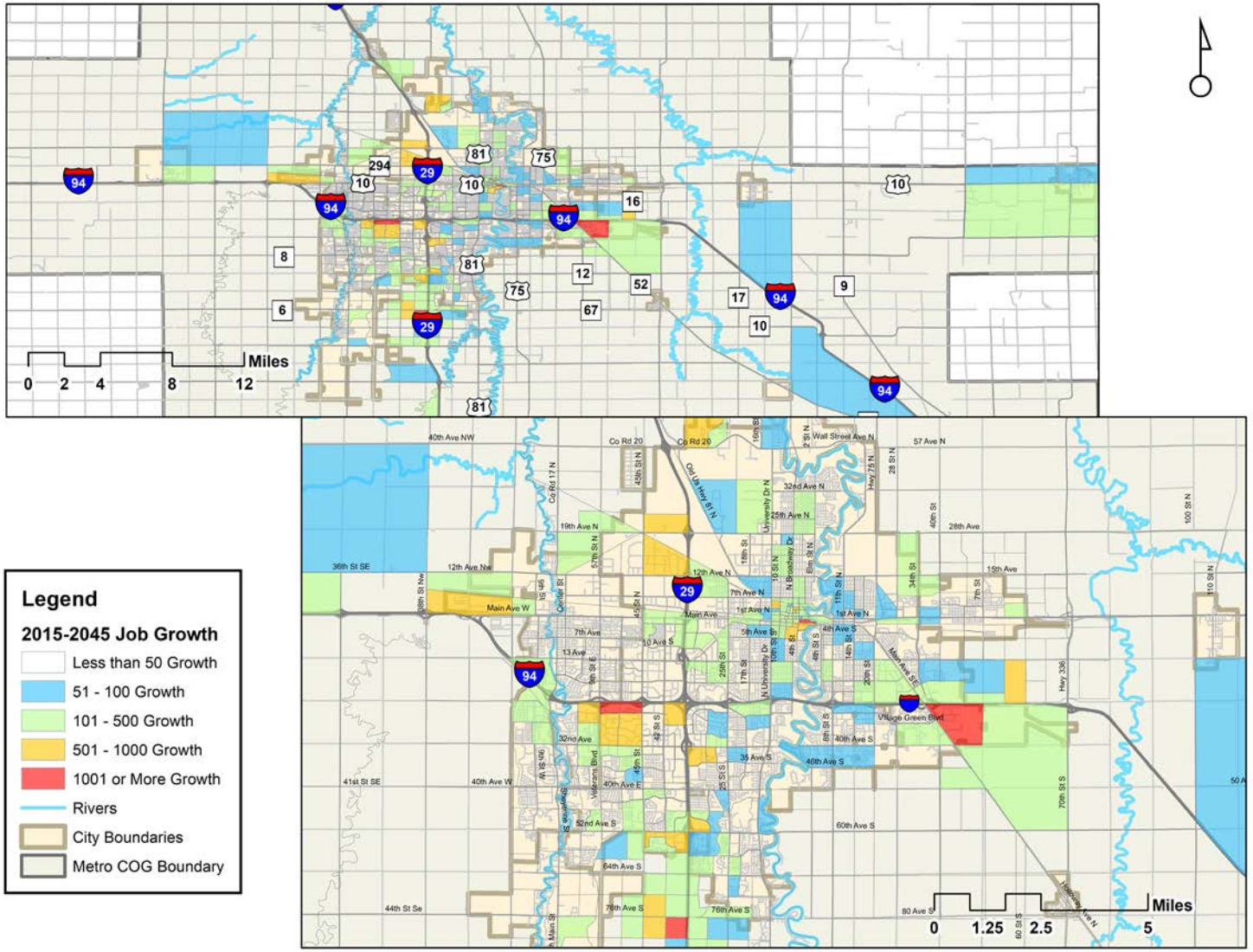


FIGURE 5.2 ANTICIPATED LOCATIONS OF EMPLOYMENT GROWTH, 2015 THROUGH 2045



Travel Demand Model

The Metro COG TDM was updated to reflect conditions representative of a base year 2015. The TDM is a computer simulation that evaluates the interaction of land development and the transportation system. The development levels shown above in Table 5-1, are provided at the TAZ level in more detail, including "socio-economic" data on:

- The number of people in each household
- The number of automobiles available to each household
- The types of jobs in the employment category (Industrial, Service, Retail, Manufacturing, etc.)
- School enrollment by school type

The model is the primary tool used for assessing future conditions on the Fargo-Moorhead regional transportation system, particularly the roadway network. The model estimates travel demand by evaluating the location and amount housing and employment, and understanding the capacity, travel speed and connectivity offered by the roadway system. The Metro COG TDM forecasts the number, purpose, origin and destination, and route of "trips" over the roadway network as a function of the input land use scenario. The Fargo-Moorhead TDM is a vehicular-based model that does not forecast transit, bicycle, or walking trips. More details on the Fargo-Moorhead TDM are available in Appendix B.

2045 Existing Plus Committed Future Baseline

The 2045 conditions used as the baseline for the future needs analysis in Metro Grow reflect an "existing-plus-committed" (E+C) roadway network scenario. The 2045 E+C scenario is the starting point for the plan, as it represents no improvements to the current roadway network beyond those projects currently under construction or included in Metro COG's Transportation Improvement Program (TIP) or in a member jurisdiction's Capital Improvement Program. These projects are considered "committed" as the required planning and engineering work is being completed, and funding is anticipated to be available for implementation over the next four years. The 2045 E+C scenario traffic forecasts assumed that in addition to the current roadway network, the major roadway projects would be complete by 2045 include:

- 45th Street between 52nd Avenue South and 64th Avenue South. (Fargo)
- 64th Avenue South between 45th Street and 25th Street, including an overpass of Interstate 29. (Fargo)
- Sheyenne Street widening between 32nd Avenue South and 40th Avenue South (West Fargo).
- Main Avenue reconstruction between Broadway and the Red River, including lane reductions. (Fargo)

Note that there are many other projects included in current capital programs not included on this list, but the majority of those projects do not impact roadway capacity or network travel times, so they were not included as significant "committed" projects.

Recent Roadway Projects

Several recent roadway projects have been completed since the 2040 transportation plan, and are included in the travel demand model. These projects include:

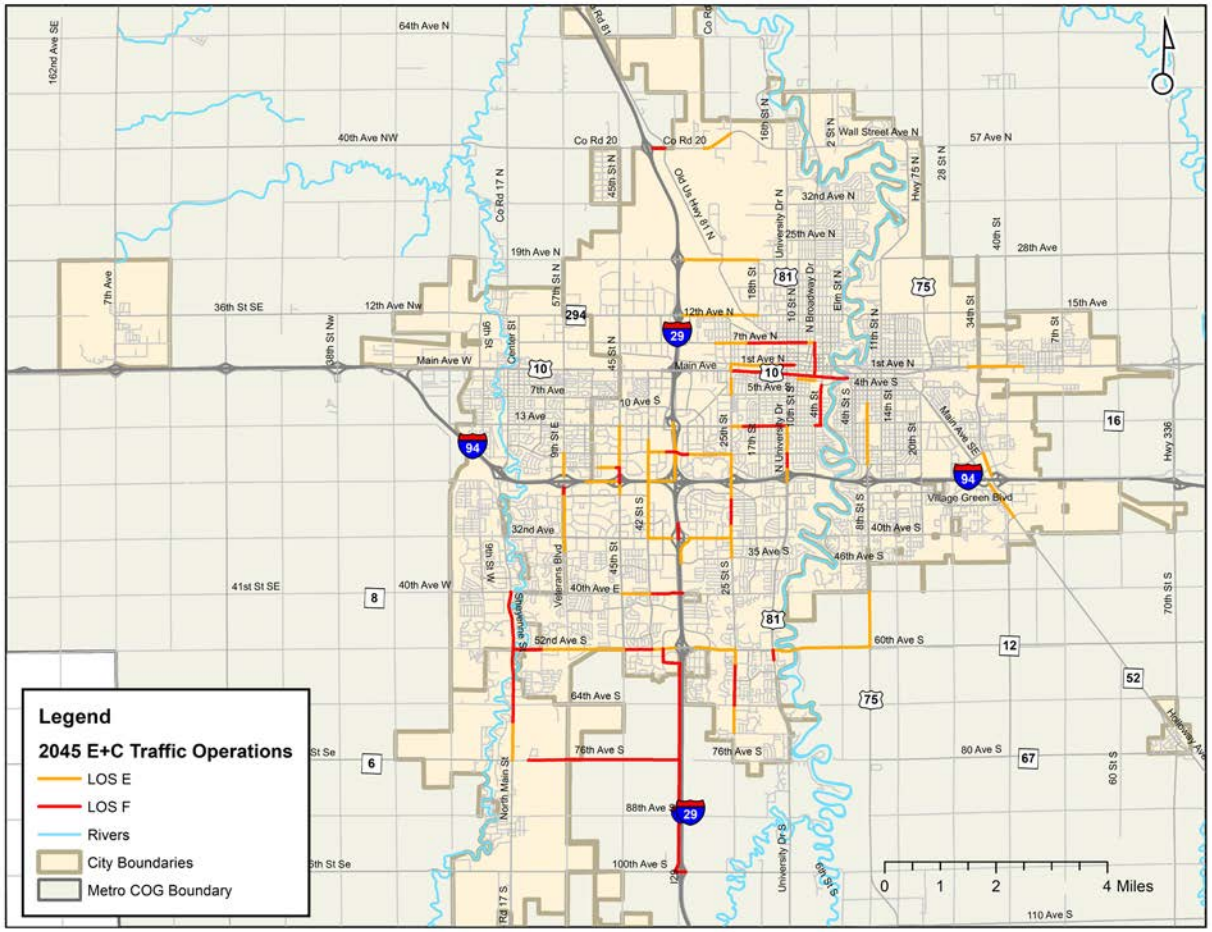
- 52nd Avenue widening between University and 45th Street
- 25th Street widening between I-94 and 17th Ave S
- Sheyenne Street Interchange and widening between I-94 and 32nd Avenue
- 32nd Avenue widening between 45th Street and Sheyenne

Future Traffic Operations, E+C Scenario

Traffic volume forecasts were developed by comparing output from the 2015 base travel model and 2045 E+C network scenario travel model. The socio-economic data used were those shown in FIGURE 5.1 and FIGURE 5.2. The resulting traffic operations for peak conditions in 2045 is shown in FIGURE 5.3. As shown in the traffic operations for FIGURE 5.3, several urban corridors are predicted to operate at LOS E or LOS F by 2045. Additionally, some currently rural corridors adjacent to development growth areas are expected to operate at LOS E or LOS F by 2045.

FIGURE 5.3 represents the future "do nothing" scenario as a starting point for identifying approaches and projects identified as strategies. Later chapters discuss Congestion Management strategies and the projects identified to address the traffic operations issues outlined in this chapter.

FIGURE 5.3 FUTURE 2045 FORECAST EXISTING-PLUS-COMMITTED TRAFFIC OPERATIONS



Future System Performance, E+C Scenario

The results of the traffic forecasting work were evaluated from a future system performance perspective, to look at how the overall travel in the region would change over the planning horizon. The scenario presented in this chapter is the Existing-plus-committed scenario; for the purposes of the MTP this is essentially a "no build" or do nothing scenario. This was reviewed from three different system performance perspectives:

- **Trip Growth:** the change in the number of trips made across the region between the base year and future 2045 conditions. Trip generation is forecasted to grow relatively consistent with the household growth in the region, at 39%.
- **Vehicle Miles Traveled (VMT) Growth:** VMT represents the total distance people drive in the Fargo-Moorhead region. VMT is a calculation of the number of study area trips multiplied by each trip's length in distance. VMT grows more than the number of trips grows, which means in the future the average trip will be longer distance than it is today.
- **Vehicle Hours Traveled (VHT) Growth:** VHT represents the total time spent driving in vehicles across the Fargo-Moorhead Region. VHT is a calculation of the number of study area trips multiplied by each trip's time duration. VHT grows more than the number trips grows, which means in the future the average trip will be take more time than it does today.

Based on these three key system performance metrics, two broader patterns emerged:

- **Average Trip Distances will Increase:** Average trip distances can be estimated by comparing the number of trips to the VMT. This comparison indicates that average VMT increases at a higher rate than trips, indicating that the average trip will be longer in 2045 than it was in 2015. These predicted longer trips are consistent with the TDM future land use scenario, where there is substantial future land use growth on the current fringes of the urban area. As the urban area spatially disperses, trips get longer.
- **Average Travel Speeds will Decrease:** Average vehicle speeds can be estimated by comparing VMT (distance traveled) to VHT (time traveled). This comparison indicates that average VHT increases at a higher rate than VMT, indicating that overall system speeds will be lower in the 2045 E+C scenario compared to 2015. Decreasing average speeds are consistent with increased levels of future congestion.

Trip Change	VMT Change	VHT Change	Average Trip Length	Average Speeds
39% ▲	65% ▲	69% ▲	18% ▲	3% ▼

Multimodal Opportunities

The development patterns and growth predicted for the Fargo-Moorhead area show that future housing and job growth will be a mixture of new development on the current urban fringe an in outlying communities, and infill development that adds more density into existing urban areas. Thus, there will be more demand for longer auto trips from suburban development, and new opportunities for new transit, bicycling, and walking trips from more dense and mixed-use development in the urban cores of the region.

Specific opportunities that are presented from the development concept include:

- **Increased demand for transit in existing service areas.** The infill development anticipated for already-developed portions of the urban area will create denser, mixed-use environments with higher travel densities. These developments will be both small, incremental developments like converting a vacant lot, and some will be more significant like the Block 9 project in downtown Fargo. A denser, mixed-use type of environment will provide more incentive to ride transit over time. Transit service and parking policies should be evaluated during the life of the Metro Grow plan to track how these new developments are progressing and if there are reasons to adjust transit services to meet new service demands.

- **Increased demand for walking.** Along with spurring an enhanced environment for transit ridership, the infill development along with the mixing of land uses will make walking more viable in many parts of the metropolitan area. Furthermore, Metro COG and local jurisdictions are working to implement town center concepts in the growth areas. These development types have the potential to provide high levels of accessibility between residential and commercial uses at the neighborhood level.

- **Increased Viability of Express Transit Services.** Express bus and commuter transit services are offered in many urban areas to provide a peak transit option for commuters. These are often offered on longer transit routes between suburban locations and major employment centers, with limited stops to make the travel time lower. Park and ride options are often offered with the express service. Two development trends will make express transit service potentially more attractive in the future:

    - Longer average commute trips – as more housing development occurs on the urban fringe and in outlying communities, travel distances get longer. The longer commutes predicted for Fargo-Moorhead will make express / commuter transit service a more viable option.

    - More centralized employment – as more employment occurs in one location, such as the central business district, express bus transit becomes a more viable option. The densification of employment in key areas of Fargo-Moorhead should make express / commuter transit a more viable option.

- **Walking and Biking Facilities in New Development Areas.** Metro COG is dedicated to supporting the development of a complete system of bikeways and pedestrian facilities. This is demonstrated by its Complete Streets Policy, and the Fargo-Moorhead area's Bronze-level designation as a Bicycle Friendly Community by the League of American Bicyclists. The new growth areas represent a blank slate from a transportation perspective, and provide the opportunity to develop bike lanes, side paths, sidewalks, trails, and other non-motorized facilities to link these new areas to the existing urban area and it's bicycle and walking network.

Transportation Goals & Objectives

The vision for how the Fargo-Moorhead system should perform was based on first establishing plan goals. The purpose of setting plan goals is to translate the values that the Fargo-Moorhead community places on transportation and to summarize them into a set of guiding principles. These goals are the framework through which the Metro Grow plan has been developed and measured. The goals were developed to reflect:

- National priorities, including the national planning factors outlined in CFR 450.306
- State goals outlined in state transportation plans for North Dakota and Minnesota
- Public input received through the various engagement efforts outlined in Chapter 3

Plan Goals

The plan goals that established the overall direction for the Metro Grow plan focused on eight areas:

SAFETY SYSTEM & SECURITY

Provide a transportation system that is safer for all users and provides a secure system that is resilient to incidents.

TRAVEL EFFICIENCY & RELIABILITY

Improve regional mobility by promoting strategies that limit travel delays and provide more continuous vehicular flows on the NHS and arterial streets, emphasizing more efficient connections for longer-distance trips.

WALKING & BIKING

Implement projects that increase walking and biking as transportation, promote modal connections, and create enhanced walking and bicycling environments.

TRANSIT ACCESS

Support the existing MATBUS system by providing enhanced access via walking and bicycling connections, transit amenities, and complete streets in transit corridors.

MAINTAIN TRANSPORTATION INFRASTRUCTURE

Provide a financial plan that supports maintaining transportation infrastructure in a state of good repair.

ENVIRONMENTAL SUSTAINABILITY

Provide a transportation system that provides access equitably and limits impacts to the natural and built environment.

ECONOMIC DEVELOPMENT & TRANSPORTATION DECISIONS

Promote transportation projects that support regional economic goals, support freight movement, and promote projects that can be financially sustained for the long-term.

EMERGING TRANSPORTATION TRENDS

Incorporate transportation trends and new technologies in regional transportation plans.

Plan Objectives and Prioritization Metrics

Objectives were established within each of the goal areas that created specific and measurable actions for the plan. One of the core applications of these goals and objectives was the establishment of prioritization metrics. The metrics were developed to directly tie national, state, and local priorities to how the plan would evaluate potential strategies and projects. The metrics were also designed to support the regional performance measures that Metro COG must report on, reflected in Chapter 4. This process thus ties regional vision to project implementation, and ultimately to regional transportation system performance.

Objectives and metrics were identified and applied if they had relevance to the community and ultimately supported the goals and performance vision for the region. This approach scored potential strategies and projects for the Metro Grow Plan so that the highest priority projects would best reflect the community vision, and ultimately support the performance measures and targets that the region set.

The objectives and prioritization metrics for each goal area are shown in TABLE 6.1.

TABLE6.1 OBJECTIVES AND PRIORITIZATION METRICS

	Objective	Prioritization Metric
SAFETY SYSTEM & SECURITY	*Reduce the number and rate of crashes.*	*Review crash modification factors to determine potential project impact on these individual safety categories.*
	Reduce the number and rate of serious injury and fatal crashes.	
	Reduce the number of bicycle and pedestrian crashes.	
	Reduce the number of bus-involved crashes.	*Project has potential to reduce bus-involved crashes along an existing bus route.*
	Identify strategies to make transportation infrastructure more resilient to natural and manmade events.	*Project has the potential to reduce flooding or other hazard risk.*
	Policy Objective: Collect better bicycle and pedestrian data for future planning efforts.	*Policy objective. Could provide bonus points to projects that include bike and pedestrian counting technology.*
	Policy Objective: Improve transit system security.	*Policy objective, no project scoring*
TRAVEL EFFICIENCY & RELIABILITY	*Improve travel reliability on the NHS and arterial roadways.*	*Project would improve safety or system management in a corridor with reliability issues. At a policy level, this would be part of the Congestion Management Plan and on-going system monitoring.*
	Limit recurring peak period delay on the NHS and arterial roadways.	*Project would improve traffic operations / improve forecasted level-of-service (use LOS E/F as deficiency). At a policy level, this would be part of the Congestion Management Plan and on-going system monitoring.*
	Improve the connectivity of the street network and promote a grid street pattern.	*Project would complete a street system connection where one does not currently existing, has the potential to reduce out-of-direction travel, and is context sensitive.*
	Promote the development of high-speed corridors for alternative routes.	*Project is a new corridor with potential to limit access levels, and provide high mobility without impacting urban neighborhoods.*
	Promote consistent corridor traffic flow with reduced starting and stopping.	*Project would reduce create less starting and stopping of traffic. Examples include: innovative intersections, minimize traffic signals, adaptive signals, freeway and arterial management technologies, and innovative street treatments (like multi-way boulevards).*

TABLE 6.1 OBJECTIVES AND PRIORITIZATION METRICS (CONTINUED)

	Objective	Prioritization Metric
WALKING & BICYCLING	*Improve walking and biking connections and reduce network gaps.*	*Review network connectivity measures (intersection density, walk scores) to determine project impact on connectivity.*
	Promote active, mixed use developments that mix residential, work, and entertainment uses.	*Related qualitative assessment of project elements that promote improved walking and biking.*
	Identify transportation projects that promote environments conducive to walking and biking.	
	Increase mode share for travel that is not single-occupant vehicle (SOV).	*Project would increase non-SOV travel. Examples include: bike / ped projects, transit improvements, travel demand management program and strategies. Policy-based objective, too.*
	Policy Objective: Make bicycling more competitive with automobile travel in the region.	*Policy objective, no project scoring.*
TRANSIT ACCESS	*Improve pedestrian and bicycle connections to transit corridors.*	*Bicycle and Pedestrian projects that improve safety or provide new connections to existing bus route corridors.*
	Implement streetscape elements that support transit.	*Project provides amenities that make transit usage more attractive and accessible. Examples include: ADA curbs, bike share stations, sidewalk improvements, and permanent stations.*
	Policy Objective: Develop transit-intensive corridors with supportive infrastructure.	*Policy objective, no project scoring. Potential to score transit projects.*
	Policy Objective: Develop designated transit stops.	*Policy objective, no project scoring.*
TRANSPORTATION INFRASTRUCTURE	*Policy Objective: Continue to maintain NHS routes in good condition, and minimize NHS routes in poor condition.*	*Policy and system performance objectives, no project scoring in Plan. Use pavement and bridge investment models to estimate long term asset management investment needs. Maintenance projects will be included in MTP project list.*
	Policy Objective: Identify sufficient financial resources to maintain all Federal-Aid streets in fair or good condition.	
	Policy Objective: Implement regional pavement management program.	

	Objective	Prioritization Metric
ENVIRONMENTAL SUSTAINABILITY	*Limit transportation impacts to natural resources.*	*Project avoids any regionally-known natural resources such as wetlands and floodway.*
	Provide transportation system that fits within its context.	*Project assessed for how well it fits within its context - is it consistent with neighborhood, does it fit with adjacent land uses, modes present in corridor, etc.*
	Improve transportation access for environmental justice and Title VI communities.	*Review if project provides improved access (more service, improved connections) to EJ populations, and if services are consistent with Title VI.*
	Reduce transportation system energy consumption.	*Evaluate project-level VMT / VHT for potential reduced energy, and consider projects that promote transportation technology (ITS, system management, autonomous vehicles). Air Quality is a secondary benefit of this objective.*
	Policy Objective: Ensure transportation system impacts are equally distributed, and do not disproportionately impact environmental justice and Title VI communities.	*Evaluated at Plan level. Projects should not disproportionately impact EJ populations and services should not negatively impact Title VI communities.*
	Policy Objective: Mitigate negative transportation system impacts.	*Policy objective, no project scoring.*
	Policy Objective: Promote stormwater management planning as a part of transportation decisions.	*Policy objective, no project scoring.*

TABLE 6.1 OBJECTIVES AND PRIORITIZATION METRICS (CONTINUED)

	Objective	Prioritization Metric
ECONOMIC DEVELOPMENT & TRANSPORTATION DECISIONS	*Improve freight reliability on the Interstate System to support regional and national commerce.*	*Project would improve freight safety or system management on Interstate system, per Federal performance measures.*
	Enhance the regional economy.	*Project is consistent with or directly supports regional economic development goals.*
	Promote financially sustainable transportation investments.	*Project reduces long-term operations and / or maintenance costs.*
	Manage access in commercial corridors to promote mobility.	*Project reduces number of access points along defined Commercial Arterial corridor (based on Parking & Access study, apply to Moorhead).*
	Project would improve "first mile / last mile" access.	*Project would improve bicycle, pedestrian, or other modal connection between a large generator (higher-density residential, commercial, or industrial) and a MATBUS transit stop.*
	Provide improvements to the truck freight system.	*Project would increase corridor load limits, or provide an alternate route that could be used by heavy trucks.*
	Promote complete streets improvements in corridors that would see economic benefits.	*Project improves walking or biking conditions in a defined Mixed Use Arterial, Mixed Use Collector, or Mixed Use Neighborhood corridor (based on Parking & Access study, apply to Moorhead).*
	Policy Objective: Improve reliability and reduce delay for freight operations.	*Policy objective, no project scoring.*
	Policy Objective: More closely coordinate regional land use and transportation investment decisions.	*Policy objective, no project scoring.*
	Policy Objective: Create places people want to live, work, shop, and recreate.	*Policy objective, no project scoring.*
EMERGING TRANSPORTATION TRENDS	*Policy Objective: Identify projects and strategies that can accommodate emerging transportation technologies.*	*"Does project improve system communications? Policy-based objective with MTP narrative."*
	Policy Objective: Identify intelligent transportation system (ITS) and other system management technologies used in other regions that would promote other regional goals.	*Policy objective, no project scoring in this goal area.*
	Policy Objective: Investigate the potential for new transit technologies in Fargo-Moorhead area.	*Policy objective, no project scoring.*

Emerging Transportation Trends & Technology

Our transportation system and travel options are in a time of flux. Several emerging trends and technologies have the potential to impact how we travel. The opportunities and disruption to existing travel options presented by these new transportation approaches are anticipated to accelerate over the life of the Metro Grow plan. The plan recognizes the need to prepare for these changes, and has identified the goal to "incorporate transportation trends and new technologies in regional transportation plans". This chapter discusses how these trends and technologies could potentially impact the transportation system and wider community, and potential policies and planning activities for Metro COG and its member jurisdictions to consider.

There are generally two categories of these trends and technologies that are re-shaping our transportation options: new "shared mobility" options and emerging transportation technologies. The remainder of this chapter describes these technologies and their potential impacts.

New Shared Mobility Options

New technologies have enabled several transportation trends to emerge that are changing how we travel. The emergence of smart phone technology has allowed some existing technologies to provide new types of flexible, on-demand shared mobility services that were not previously available. These new shared mobility options include ride-hailing services, microtransit, and micromobility services.

Ride-Hailing Services

The emergence of smart phones has allowed transportation network companies (TNCs) such as Uber or Lyft to offer private, for-profit personal transportation via ride-hailing apps. Typically these services are offered by private citizens in their own personal vehicles.

In just the past three years, the percentage of Americans who used a ride-hailing service grew from 15% in 2015 to 36% in 2018[1]. Ride-hailing services have become a significant form of travel in many different types of urban areas and in both suburban and central urban contexts. Ride-hailing has been available in the Fargo-Moorhead area since 2015.

Microtransit

Microtransit includes shared transportation systems that can offer fixed routes and schedules as well as flexible routes and on-demand scheduling. Microtransit is ideally suited for paratransit and door-to-door services. Companies such as Via, Lyft, and others are private microtransit operators. MATBUS has started to offer a similar service called TapRide, that provides on-demand service during the week on the NDSU campus. TapRide can be accessed via smartphone app.

According to the *Denver Mobility Choice Blueprint*, trials of microtransit occurred in at least 24 cities in 2018. In many microtransit deployments, public funds subsidize the use of private operators. Incorporating microtransit services into a region-wide application software tool allows for greater access by users. Investments in microtransit by a region often mirror those of ride-hailing.

Micromobility Services

Micromobility is a group of shared transportation modes, including bicycles (bike share), mopeds, and e-scooters that are paid for through an app. These transport devices can be used throughout a city/town, and are often an effective means of providing a first/last-mile function for transit lines. Great Rides Bike Share is a bike share service that operates in the region, but does not currently work via app.

[1] "More Americans are using ride-hailing apps", Pew Research Center, January 2019.

Companies such as Bird, Lime, Uber and Lyft are offering traditional and electric-assist bicycles and e-scooters through both docking and dockless systems. The rental of these devices occurs through a phone app. These privately-sourced services have emerged in dozens of urban areas around the country in the past two years. Hundreds of these vehicles can show up in a city, virtually overnight, and can cause some chaos along with the new mobility options they bring.

Metro COG has researched best practices and lessons learned from communities that currently have dockless bikeshare programs and e-scooters. After researching these best practices and lessons learned, Metro COG developed guidelines for local jurisdictions should dockless bikeshare programs, e-scooters, or other similar micromobility options emerge in the Fargo-Moorhead area.

Mobility-as-a-Service

Mobility-as-a-service (MaaS) is the concept of a seamless system of transportation options that a person can access and pay for on demand through use of smartphone technology. Users do not need to own a personal vehicle, or know the bus schedule to travel. They can open and app and tell it where they want to go, and the MaaS provides them a menu of modal options, travel times, and costs from which they can select. Often these apps provide a single payment account that allows a seamless transaction for both traveler and provider. The apps can offer a range of ride-hailing, microtransit, micromobility, and traditional public transit and bike sharing options. Metro COG is currently working with a major company that provides these services to share transportation data for users to access.

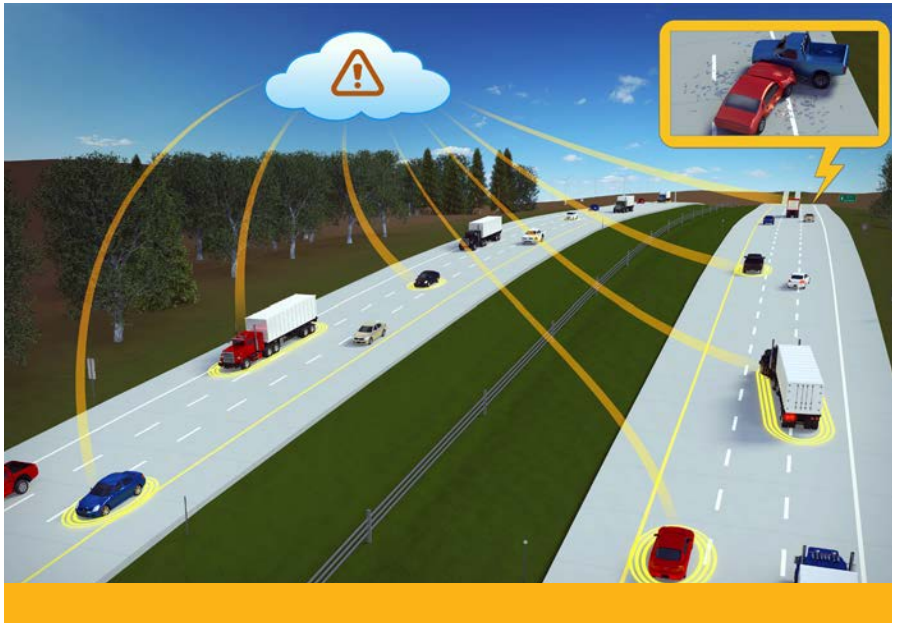
TRANSPORTATION SYSTEM IMPLICATIONS	
Decreased demand for traditional taxi services.	*Particularly in large cities, the more heavily regulated taxi industry has experienced lost ridership and revenue to ride-hailing services.*
Mixed impacts to public transit ridership.	*In some cities, ride-hailing services have negatively impacted transit ridership. In some situations, the micromobility services can bolster major transit lines by enhancing the first mile, last mile connections that are required. Additionally, there is some hope that partnerships that are being built between TNCs and transit agencies can work in tandem, with the ride-hailing service providing the "first mile, last mile" access to the transit stop, and the transit line providing the remainder of the trip.*
Increases to overall vehicle travel.	*Micromobility trips tend to be shorter, and usually just replace walking and biking trips. However, the ride-hailing services often lead to increased vehicle miles traveled (VMT) by increasing single-passenger rides and having empty vehicles circulating in search of new passengers. This increase in VMT leads to higher congestion.*
Safety concerns with some micromobility options.	*Some micromobility options, such as electric scooters, have safety concerns associated with them. With speeds up to 15 miles per hour, electric scooters operating characteristics make them inappropriate for sidewalks and many trails, but not necessarily fit for all city streets. A recent study from Austin, Texas found 193 injuries on electric scooters over a three month period in 2018, approximately half of which included "severe injuries"[2]. While there was no injury rate calculated with this study, the safety concerns as a part of the electric scooters is important to track as this new technology emerges.*

[2] Dockless Electric Scooter-Related Injuries Study, City of Austin, April 2019.

SOCIAL AND LAND USE IMPACTS	
Increased access for populations that cannot drive.	*Residents who cannot or do not have a driver's license due to factors such as age or disability, rideshare services are provided an efficient transportation option through shared mobility options, where one did not exist before. This is particularly crucial in auto-oriented portions of the metro area with limited walking and transit options.*
Equity issues.	*Equity issues are a concern with many shared mobility options, particularly ridehailing. These are private, for profit services with higher per-mile costs than public transit. For instance, a 2018 survey found that households with incomes over $75,000 used ride-hailing services at over twice the rate of households with annual incomes under $25,000 per year.*[3]
Decreased reliance on private vehicle ownership.	*For some urban residents, ride hailing services provide access to an automobile "on demand" and can eliminate the need for owning a car. This can result in net lower transportation costs for some households, and in reduced residential parking needs in some neighborhoods.*
Decreased demand for rental cars.	*Many of these services, particularly ride-sharing, have led to decreased utilization of rental cars in some cities.*
Decreased demand for parking in some districts.	*All of the "shared mobility" services have the potential to reduce parking demand in some parts of metro areas, including urban residential neighborhoods, airports, and entertainment districts. This can change not only how people travel, but over time have an impact on land use in the metropolitan area as land dedicated to parking can be converted to different uses.*

Implications of Shared Mobility Options

There are potential transportation system impacts that are predicted to accompany the shift to these new mobility options. In some cases these impacts are already being seen in some metropolitan areas. These secondary impacts are summarized in this section.



[3] "More Americans are using ride-hailing apps", Pew Research Center, January 2019.

Emerging Technologies

In addition to these new trends in transportation, there are several transportation technologies that have continued to develop and have the potential to radically change how we travel and live. These technologies include: Connected and Autonomous, electric vehicles, and smart cities.

Connected and Autonomous Vehicles

Connected vehicles are technology-enabled automobiles, trucks, and buses that can communicate with each other and infrastructure.

Automated vehicles are technology-enabled automobiles, trucks and buses where at least some vehicle movement and guidance functions are completed by the vehicle without human input.

Connected and Autonomous Vehicles (CAV), or Automated Vehicles, have received extensive attention, investment, and testing by private companies in the last few years. CAV represents a confluence of technology innovations and a collision of industries. Industries considered separate in the past – the automotive and high-tech industries – are now blurring into an overall automotive tech industry.

Vehicle Fleet Electrification

As the price and performance of electric batteries drops, electric vehicles are becoming more price and performance competitive with combustion-engine (gasoline-powered) vehicles. There are estimates that the cost of an electric passenger car's battery will drop quickly, from 57% of the vehicle cost in 2015 to 20% of vehicle cost in 2025. That same report indicates that the life-cycle cost of owning an electric vehicle and a combustion-engine vehicle will be equivalent in 2022 for larger commercial vehicles.[4] During the Metro Grow planning horizon, it is anticipated that electric vehicles will become a much larger percentage of the vehicle mix.

There will be benefits to this transformation, particularly for the environment as fewer

overall greenhouse gas emissions, and other regulated air pollutants, are emitted with the conversion to electric-powered vehicles.

One of the challenges of wider fleet electrification is the development of an effective charging network. Public and private entities will need to evolve and provide the infrastructure required to support these wide spread charging needs. In August 2019, there were eight public charging stations in the Fargo-Moorhead area identified by plugshare.com.

Another challenge the state and Federal governments will need to respond to in the near future is how this shift will affect transportation funding. Federal and state gas taxes pay for the majority of our transportation funding. If transportation transitions from motor fuel to electricity, we will need to find new ways to collect fees from the users of the transportation system.

Smart Cities

According to the National League of Cities, a "smart city" is one that has developed technological infrastructure that enables it to collect, aggregate, and analyze real-time data to improve the lives of its residents. In terms of transportation elements in a smart city, it might involve smart logistics and freight, vehicle fleet communications, vehicle congestion and speed sensors, smart parking, smart streetlights, and self-driving cars.[5]

[4] "Electric Car Price Tag Shrinks Along With Battery Cost", Bloomberg.com

[5] "National League of Cities, NLC.ORG

The City of Columbus, Ohio was successful in their bid for a US Department of Transportation Smart City Challenge Grant which awarded them $50 million to fund a number of projects. Columbus used a Public-Private Partnership to leverage that grant to over $500 million in funding for Smart City projects. Some of Columbus' projects include:

- **Connected Vehicle Environments,** by deploying connected vehicle safety applications on buses, first responders, and public and private fleets.
- **Multimodal Trip Planning / Common Payment System** that allows for usage across multiple transit and parking options.
- **Smart Mobility Hubs,** which enhance bus stops with kiosks that assist in travel planning and include mobility options such as bike- and car-sharing.
- **Event Parking Management** through integrating parking information from multiple providers into a single availability and reservation services application.
- **Mobility Assistance for Prenatal Health Trips and for People with Cognitive Disabilities,** combining solutions for the community's social goals with transportation solutions.
- **Connected Electric Autonomous Vehicles,** with planning to deploy a series of Level 4 autonomous vehicles pilots, which are intended to provide service like public transit for shorter trips.

Autonomous Freight

CAVs are not only predicted to impact the way individuals move through cities, but this technology is expected to change the way we move goods as well. With several companies testing freight CAV pilots, many believe that these vehicles could be operating on highways and in cities within the next 5 to 10 years.

Along with CAVs, safety is touted as the main benefit of freight CAVs. An additional business advantage of autonomous freight vehicles is what is driving the development of this transportation technology: freight CAVs might eventually not require a driver. Vehicles without drivers means that the operating costs for highway freight companies could potentially be reduced and thus, the total cost of shipping goods diminishes. Freight vehicles can "platoon" with two or more trucks coordinating cooperative adaptive cruise control, which allows for fuel savings, reduced congestion as following distances between vehicles is decreased, and improved safety as the freight vehicles are able to communicate to address potential collision risks.[6] Lower costs could in turn induce more demand for highway freight services as shipping costs decline.

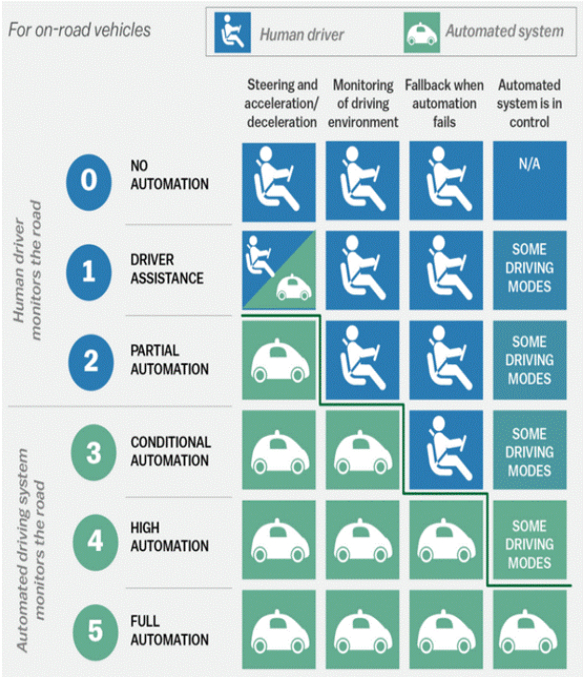
[6] "Truck Platooning: The State of the Industry and Future Research Topics", United State Federal Highway Administration.

With freight automation, there are concerns that freight CAVs will negatively impact labor needs of the freight industry. As freight CAVs become viable, the need for freight operators might potentially decrease. Industry might also be more accepting of freight CAVs as there is currently a shortage of freight operators in the United States in light of increasing demand for these services . Freight CAVs will require service and maintenance, which will require some workers with different skills.

As shipping costs decline, local retail establishments may see significant additional competition as individuals might be able to purchase an item online and have it delivered within a matter of days at cost that is comparable to visiting a retail location for the same item. Thus, future transportation networks may need to account for increased freight activities on both their highways and local roads.

Status of Connected and Autonomous Vehicles

The Society of Automotive Engineers has established six levels of vehicular automation, which has become the industry standard for discussing CAV technology. Levels 0, 1, and 2 are considered minimal automation and require the full engagement of the driver at all times while operating the



SOURCE: SAE International

vehicle. At Level 3, the majority of driving tasks are automated but the driver may still be required to take over in certain instances. Level 4 is considered full automation, where all driving tasks can be undertaken by the vehicle in most conditions. Finally, at Level 5, the vehicle is capable of driving everywhere in any condition without the need for human intervention.

The most advanced CAVs currently available employ Level 2 technology that offer drivers limited automated capabilities that still require the driver's full attention. While the current CAV technology is only at Level 2, the technology is rapidly developing and much discussion regarding the timeframe of when Level 4 CAVs will be commercially available. There are a range of forecasts predicting what level of market penetration Level 4 and 5 CAVs will see in the coming years. While those predictions have a wide range, many experts predict that we will see a significant number of autonomous cars on the road by 2045.

CAVs communicate with one another, called vehicle-to-vehicle (V2V), and with surrounding infrastructure, called vehicle-to-infrastructure (V2I). Through communication with the environment around them, connected vehicles (CVs) can help address traffic safety and efficiency concerns. Adopting CVs in local transportation systems will require new infrastructure to support them. V2V communication allows vehicles to share information like speed, direction, and location directly with other vehicles operating in the roadway. This information can then be used to alert other drivers of potential collision risk while traveling. V2V communication technology is expected to be available in cars, trucks, buses, and motorcycles, and many hope it will be extended to bicyclists and pedestrians to further enhance the safety of both motorized and non-motorized road users.

Safety is the major benefit anticipated with CAVs as these vehicles could reduce instances of human error that lead to automobile collisions by automating driving tasks and communicating with other vehicles and infrastructure. Through V2I and V2V communication, travelers would receive collision warnings instantly, while the infrastructure would help better manage traffic flows through more precise signaling and real time data collection. The National Highway Traffic Safety Association estimates that up to 80% of non-alcohol related vehicle collisions could be prevented through the application of V2V and V2I technology alone. Bicyclists and pedestrians could see a safer environment in the future, as CAVs are being designed with sensors, cameras, and other devices to aid in detecting bicyclists and pedestrians, along with the hope that mobile devices carried by non-motorized users could alert CAVs to their location for crash avoidance.

One challenge in planning for CAVs is the uncertainty of how these vehicles will be deployed: whether as publicly available shared fleets or as privately owned vehicles similar to today's car ownership model. This uncertainty has implications for infrastructure and land use decisions as CAVs are predicted to reduce parking demand in high cost locations, and thus the amount of land allocated for this use might be reduced.Should CAVs be deployed as publicly shared fleets, the parking requirements could be drastically lower than those necessary for a private ownership model.

Implications of New Transportation Technologies

The emerging trends being seen in transportation have the potential to offer some benefits, especially for those who are currently faced with mobility challenges. An increased number of relatively inexpensive and on-demand mobility services, such as ride-hailing and microtransit, can provide increased, on-demand mobility for elderly and disabled residents who do not or cannot have access to a personal automobile. These new mobility options can help disadvantaged and underserved individuals access all the economic opportunities and amenities their community has to offer.

Land Use

There are potential land use outcomes that might arise with the adoption of these transportation technologies. There are competing market forces with these potential land use outcomes, and there are still many uncertainties for planners to monitor.

- **Reduced Parking Demand:** The emergence of ride sharing has already been noted to reduce parking demand in some locations such as airports, universities, and entertainment districts. CAVs have the potential to alter the demand for

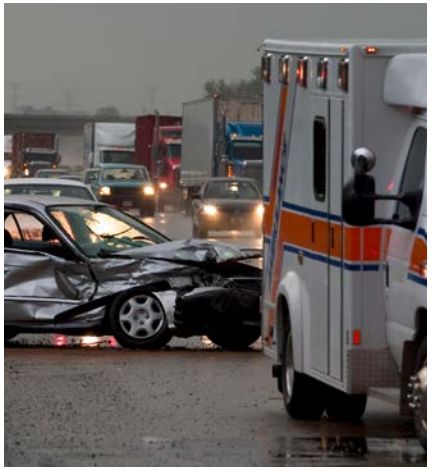
parking across metropolitan areas. CAVs can but will not need to park; under a ride share model they would circulate via the street system to their next rider. Under a private vehicle model they could drive themselves back to the commuter's home to park rather than park in high cost areas. This shift might mean that land currently dedicated to parking could potentially be reclaimed for other residential or commercial purposes. Parking garages across the country are being designed with adaptive reuse in mind, allowing these structures to be converted to offices or living spaces once their original use is no longer needed. However, in the short term, municipalities are met with the challenge of planning capital improvements like parking garages, to serve their immediate growth needs in face of the looming uncertainty of if and when CAVs will begin disrupting their transportation and land use systems. One method to addressing this challenge is to integrate shared mobility and establish these modes as first and last mile connectors to public transit, so that individuals are encouraged to use alternate modes of travel instead of a private vehicle.

- **Land Conversion:** Parking reuse and reductions cited above might also be a tool for encouraging density in urban areas. The aforementioned trend to design parking garages as adaptive reuse spaces for residential use can be a mechanism for constructing multi-family housing units and mixed use developments.
- **Productive Commutes and Potential Impact on Sprawl:** If fully deployed, CAVs will allow occupants to use their travel time for activities other than driving, such as work or leisure activities such as reading, sleeping, or using the internet. This potential outcome termed "productive commutes" and have some implications on future land use. As individuals realize the time-savings related to being disengaged from the task of driving, long commutes viewed as costly and an annoyance can now be viewed as an opportunity to be productive. This can lead to the development of a perception that longer commutes are no longer undesirable, which in turn could very likely encourage urban sprawl as individuals may elect to live further from city centers and their work places. However, shifting preferences for home locations among Americans shows that many individuals now prefer living in denser, more walkable urban centers.[7] While the concept of productive commutes does give rise to fears of urban sprawl, communities can leverage smart growth principles and encourage alternate transportation modes to preserve denser and more walkable cities.

Travel Safety

As previously noted, removing the driver from the driving task can greatly improve roadway safety. The increased efficiency and safety of roadways due to CAV technology can ultimately deliver significant benefits to society as the high costs of both congestion and traffic collisions can be alleviated.

While roadway safety is one of the most promising outcomes of integrating CAVs into transportation networks, there is a need to ensure that these vehicles will not be prioritized over pedestrians and other road users. The increased efficiency of CAVs due to their ability to communicate and coordinate with one another could see future roads as endless streams of these vehicles without adequate space for pedestrians and bicyclists. In planning for this technology, communities must prioritize the human experience by ensuring complete streets, retaining the human scale in developments, providing the appropriate amount of bicycle and pedestrian infrastructure, and revising zoning and subdivision regulations to encourage development that provides access to shared modes and public transit.



Traffic Congestion and Travel Reliability

Increased vehicular capacity attributing to shared CAVs can reduce congestion as the number of vehicles operating in public roadways declines. Fewer crashes and reduced bottlenecks can eventually lead to significantly higher levels of travel reliability.

[7] National Highway Traffic Safety Administration.

Transportation Trends & Technology Policies to Consider

One action that the region can take right now is establishing a multi-disciplinary "Transportation Trends and Technology Working Group". Other regions have established similar working groups, as a round table of transportation, engineering, planning and technology professionals to identify opportunities to promote beneficial technologies. First steps these groups can take include:

- Following trends and pilots, recognize steps the Fargo-Moorhead area can take for adapting and getting in front of technology and trends
- Identifying partnerships and opportunities to test trends and technology
- Working with local government staff to identify policies to manage potential impacts of transportation technology

Curbside Management

Curbside management is a policy for regulating shared modes (for transit, delivery service, ridehailing, etc.) in public right-of-way at the curb space for an orderly and efficient use of this valuable space. Communities across the US are looking towards pick-up and drop-off management plans for companies like Uber and Lyft so that the congestion and safety issues associated with their operation can be addressed. For example, the city of San Francisco adopted a program named "Colored Curbs" that utilizes a low-cost means of allocating curb space for different uses – paint. Certain curb space in the city is designated as an exclusive zone for a certain parking purpose and monitored to ensure compliance. Programs such as this might become a priority in downtown Fargo and downtown Moorhead during the life of Metro Grow.

An additional low-cost means of developing a curbside management program is to implement a "flex zone" program that takes existing commercial loading zones and expands their use to mobility providers such as Uber and Lyft. The idea behind this concept is that the loading zones are permitted to be used for commercial deliveries at mandated times of the day and when they are not in use for this purpose, shared mobility providers are allowed access to these curb spaces for their operations.

Data Sharing

Metro COG and its member jurisdictions should request data from new mobility providers that might begin operating in the region. As parts of agreements with micromobility and microtransit providers, many cities are requesting data sharing from the companies. This allows an understanding of how the technologies are used, and allows us to better plan and manage them.

Data sharing can greatly improve the ability of cities to understand and plan for shifting travel patterns of residents, mobility providers are often reluctant to share their data. In order to engage these private firms in data sharing agreements, cities must usually offer an incentive. The types of incentives vary, with some of the more common examples being exemptions from fees or permitting process to operate within the city, or the awarding of dedicated right of way for the providers' exclusive use for their own operations.

A consideration for cities who wish to design data sharing agreements with mobility providers is to review state enabling legislation surrounding the matter. State laws regarding data sharing vary widely, with some states being much less restrictive than others. For example, the state of Iowa adopted legislation that asserts a statewide uniform code for regulating TNCs and does not allow cities to adopt any regulations inconsistent with that code. [9] North Dakota Century Code currently requires TNCs to report where they operate, the number of crashes that occur, and number of traffic violations reported. Both Minnesota and North Dakota have laws that require insurance coverages and certain information be provided to passengers.

[9] "The Regulation of Transportation Network Companies—Rights, Requirements, and Limitations", State of Iowa Legislative Services Agency.

Equity Considerations

As these technologies evolve, the community should continue monitoring the equity implications and its impact on the mobility of all citizens. Public transportation should be maintained, and where possible these emerging transportation options should be oriented to support and benefit existing transit services and lines. As needed, the municipalities should remove barriers to these new mobility options for low-income populations so that the benefits can be equally shared.

Micromobility

Current regulatory or public policies related to shared mobility should be reviewed and updated to encourage the deployment of these technologies. Metro COG has recently worked to provide local jurisdictions guidance on best practices for these policies. Metro COG has recently worked to provide local jurisdictions guidance on best practices for these policies. Policies on the facilities where these devices can be used, what areas / neighborhoods they can and cannot be deployed and used, hours of operation, and other safety considerations should be established.

MaaS Applications

Incorporating the range of shared mobility services into a region-wide transportation application could be a good investment for the region. The MaaS application allows users to plan and pay for trips across the metropolitan area with a range of modal options (such as transit, bikeshare, ride hailing, micromobility, etc.)

CAV Operating Parameters

As Level 4 and Level 5 technologies emerge, cities and regions can get ahead of the potential issues by establishing operating parameters for these technologies in our urban areas. These regulations on CAVs can preserve and develop the types of places that meet the region's livability goals. This includes issues like operating speeds, establishing right-of-way for pedestrians, permitted corridors for operations, and lane and curb management considerations. An effective approach to this is to overlay these operating parameters with our street typologies from the Fargo and West Fargo Parking and Access Study, and expanding these definitions to the remainder of our area.

[9] "The Regulation of Transportation Network Companies—Rights, Requirements, and Limitations", State of Iowa Legislative Services Agency.

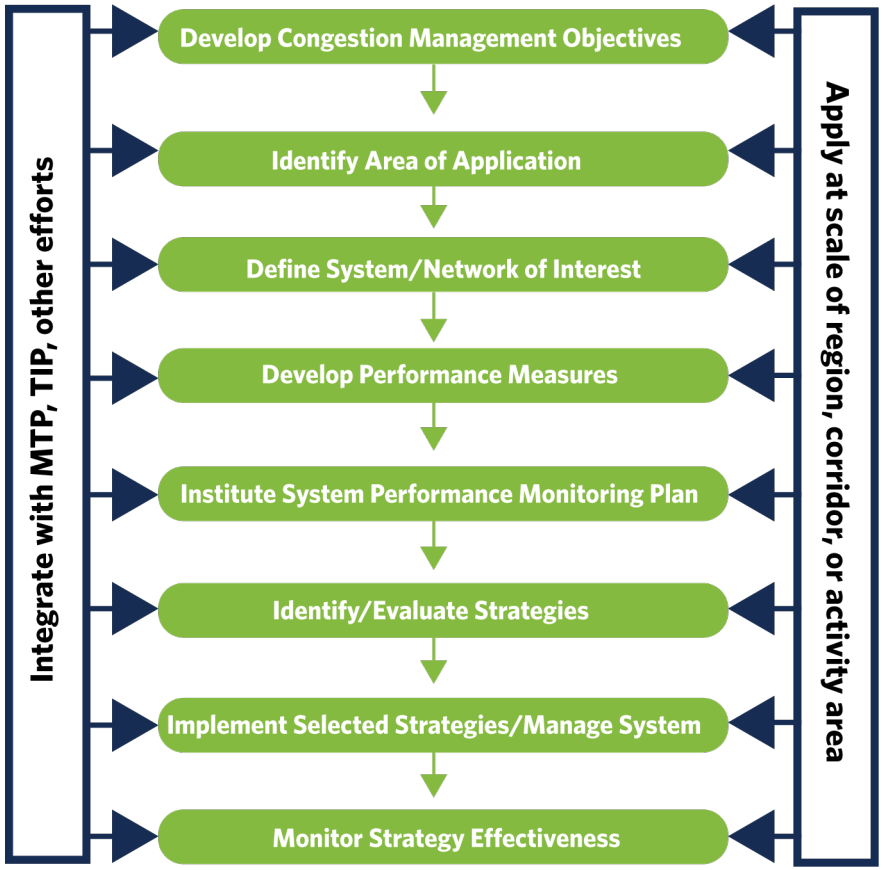
Congestion Management—Fargo-Moorhead Metro COG

Introduction

The Fargo-Moorhead metropolitan region has seen a rapid rise in population over the past several decades, as indicated by population and employment trends included in Metro Grow. As the region and its transportation system have expanded outward to accommodate this recent growth, the cities within the metropolitan area have emphasized infill-style development; the focus on this approach is to balance creating livable streets and neighborhoods with providing safe regional mobility. Although roadway congestion has not manifested as a significant issue for the Fargo-Moorhead metropolitan region to this point, there is a concern to find a balance between accommodating traffic and travel demands while making efficient infrastructure investments and managing our existing system.

The overarching goal of the Fargo-Moorhead Metro COG regarding the transportation network is to capitalize on system efficiency rather than adding roadway capacity, while facilitating regional growth. To help guide future policies towards this goal, this Congestion Management Process (CMP) will present a series of strategies for improving transportation system performance and reliability while mitigating congestion issues and reducing the need for investment in roadway expansion.

Congestion Management Process (CMP) Framework



SOURCE: *Advancing Metropolitan Planning for Operations: An Objectives-Driven, Performance-Based Approach – A Guidebook*

Background

A Congestion Management Process (CMP) is a systematic approach to managing congestion based on regional transportation system performance. Using a number of analytic tools to define and identify congestion within the region, the CMP guides the development and selection of appropriate strategies to reduce congestion or mitigate the impacts of congestion. The strategies for congestion management identified by the CMP are tied to the needs of state and local jurisdictions, and help guide these agencies through the selection and implementation process.

The CMP is intended to serve as a process that provides for safe and effective integrated management and operation of the multimodal transportation system. However, given the local environment and regional perception of congestion, this CMP has been designed to assist in organizing this process and local decision making.

Under federal guidelines, a CMP is required for metropolitan areas with populations over 200,000. These areas are considered Transportation Management Areas (TMAs) and a CMP is required as part of the metropolitan transportation planning process. Although the Fargo-Moorhead metropolitan region is not yet designated as a TMA, MPOs who are close can benefit from the development of a CMP in preparation of becoming a TMA.

Although a CMP is required in every TMA, federal regulations are not prescriptive regarding the methods and approaches that must be used to implement a CMP. This flexibility has been provided in recognition that different metropolitan areas may face different conditions regarding traffic congestion and may have different visions of how to deal with congestion. As a result, TMAs across the country have demonstrated compliance with the regulations in different ways. The Fargo-Moorhead region is choosing an approach that focuses on managing the established portions of the transportation system and promoting a connected and livable street system.

The flexibility in the development of the CMP allows MPOs to design their own approaches and processes. The CMP is an on-going process, continuously progressing and adjusting over time as goals and objectives change, new congestion issues arise, new information sources become available, and new strategies are identified and evaluated. This is just the first step in the CMP process for Metro COG.

8 Steps of a Congestion Management Process

The US DOT published the *Advancing Metropolitan Planning for Operations: An Objectives-Driven, Performance-Based Approach* guidebook that provides guidance for MPOs in developing objectives and strategies to improve performance of their traffic operations. Within this guidebook are the recommended 8 steps to developing a CMP[1], which are presented below:

1. Develop Regional Congestion Management Objectives
2. Identify the Area of Application
3. Define the Area of Interest for the CMP
4. Develop Multimodal System Performance Measures
5. Institute System Performance Monitoring Plan and Collect System Performance Data
6. Identify and Evaluate Congestion Management Strategies
7. Implement Selected Strategies and Manage the System
8. Monitor and Evaluate Strategy Effectiveness

[1] United States Department of Transportation, February 2010.

Overview of Fargo-Moorhead Congestion Process

Metro Grow is the first step in establishing the Congestion Management Process for the region. This initial CMP establishes:

- An initial set of congestion management objectives.
- Performance measures to be used on the congestion management network.
- Data sources to support performance measures.
- Congestion management strategies for the region.
- Recommendations for future activities.

Fargo-Moorhead Congestion Management Objectives

Fargo-Moorhead Metro COG has identified a series of objectives aimed at measuring and managing congestion in the region. They all relate to the MTP goal of providing travel efficiency and reliability. The objectives are listed below:

Travel reliability: Improve safety and system management in corridors with reliability issues, including on the National Highway System (NHS) and arterial roads

Peak period delay: Improve traffic operations and forecasted level-of-service (LOS) on the National Highway System (NHS) and arterial roads

Network connectivity: Complete street system connections where they do not currently exist. This includes improving the connectivity of the street network and promote a grid street pattern.

High-speed corridors: Promote the development of new high-speed corridors that limit access levels and provide high mobility. These corridors should be targeted for areas with limited land use impacts.

Consistent traffic flows: Promote technology and design strategies that reduce vehicle starting and stopping through corridors.

In addition to these congestion-specific objectives, the Metro Grow plan lays out a comprehensive set of objectives and performance measures that support the CMP. These key goal areas with supporting objectives and strategies include:

- **System Safety and Security**
- **Walking and Bicycling**
- **Transit Access**

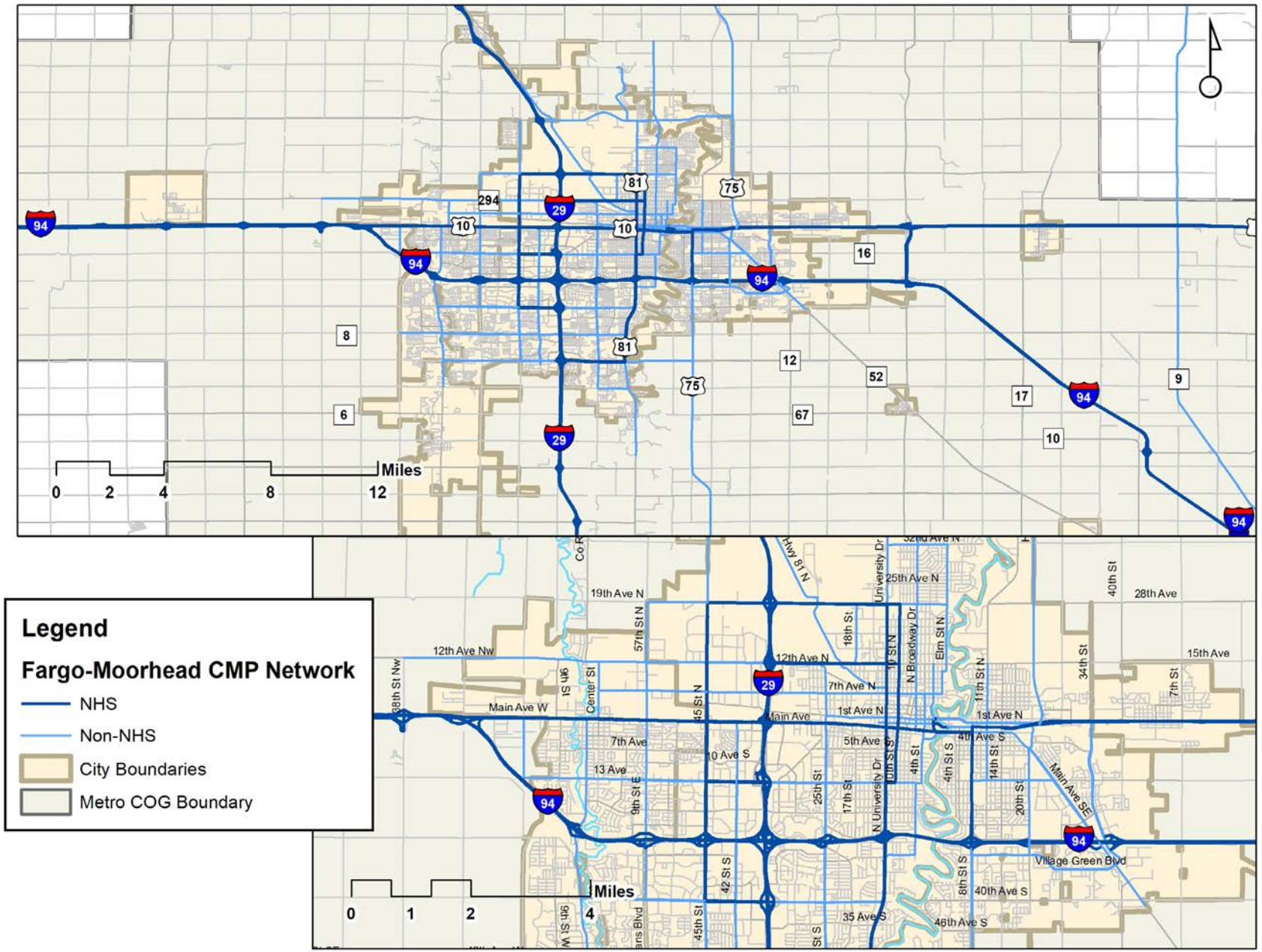
Congestion Management Network

The CMP network for the Fargo-Moorhead region consists of the National Highway System and the remainder of the arterial road network. The current CMP network consists of 959 lane miles. TABLE 8.1 shows the lane miles for each facility type within the Fargo-Moorhead CMP network. FIGURE 8.1 shows the extent of the CMP network within the Fargo-Moorhead Metro COG region. The CMP network is a two-tiered network, recognizing the importance of the NHS as the first network tier, and non-NHS arterials acting as the second network tier.

TABLE 8.1 NUMBER OF LANE MILES PER FUNCTIONAL CLASSIFICATION

Facility Type	Lane Miles
Interstate	513.37
Principal Arterial	229.56
Minor Arterial	216.11
Total	959.04

FIGURE 8.1 CONGESTION MANAGEMENT NETWORK, FARGO-MOORHEAD METRO COG REGION



CMP Performance Measures

Performance measures allow us to understand the current performance of the CMP network, and how that performance will change over time. Performance measures, as required under Federal Highway Administration (FHWA) guidelines, accomplish this goal through utilizing quantitative measures to define the level of progress made towards specified objectives. As the CMP process evolves in the region, it is anticipated that the data and measures will change as well. The initial set of Fargo-Moorhead CMP performance measures will include four different categories of measures outline below.

Reliability Measures

These measures identify how the overall roadway system performs with regard to travel reliability. Reliability measures include:

- **Level of Travel Time Reliability (LOTTR):** This measure looks at the percentage of person-miles traveled on both the Interstate and Non-Interstate NHS systems that are reliable. The LOTTR is defined as the ratio of the longer travel times (80th percentile) to a "normal" travel time (50th percentile) time.

- **Truck Travel Time Reliability (TTTR):** This measure supports freight movement by evaluating the travel time reliability on the Interstate System. The TTTR evaluates the ratio of the 95th percentile truck travel time by the "normal" travel time (50th percentile) time.

Street Network Connectivity Measure

These measures assess the level of connectivity between streets within the network as proxy for multimodal access. The initial performance measure used for street network connectivity is the **ratio of intersections to street length.** The long-term intent of this measure is to encourage future land development to provide high-levels of street network connectivity.

Street connectivity is important given the Metro COG policy focus on providing a highly-connected multimodal network. This focus includes identifying connections across barriers like drains and the Interstate system, addressing issues with development layout and street discontinuity, defining a collector network in future development areas that is continuous, and encouraging smaller block sizes.

Peak Hour Congestion Measures

Metro COG will track peak hour congestions measures as a part of the CMP. Moving forward, Metro COG will place more emphasis than it has in the past on managing corridor operations through technology implementation and through travel demand management strategies. These measures evaluate levels of travel delays on the street network during peak periods of the day. Performance measures include:

- **Peak Period Speed Reduction:** This measure uses the National Performance Management Research Data Set (NPMRDS) probe data to evaluate the percentage difference on segments between peak period speeds and average daily speeds.

- **Level of Service:** This measure evaluates segments operating at level of service (LOS) E or worse.

A future measure to incorporate is **Peak Hours Excessive Delay (PHED)** Measure. PHED measures how much travel is spent at 20 miles per hour or 60% of the posted speed limit travel time, whichever is greater. Under current FHWA designations, PHED does not apply to Fargo-Moorhead Metro COG region. In 2022, it is anticipated that Metro COG will begin reporting PHED.

Metro COG is also placing more emphasis on evaluating traffic and travel demand across the entire day, and not just focusing on the relatively short peak periods. There is available street capacity throughout the majority of the day, and Metro COG intends to explore strategies to take advantage of it.

Current system performance is documented in *Chapter 4: System Performance*. *Key* baseline system performance metrics and associated results are shown in the remainder of this section:

- **Level of Travel Time Reliability** is shown in **Figure 8.2.** As shown in Figure 8.2, the Interstate System is relatively reliable, and several of the NHS arterials with data available have less reliability. These include 45th Street and 32nd Avenue in Fargo, and 8th Street in Moorhead.
- **Truck Travel Time Reliability** is shown in **Figure 8.3.** As shown in Figure 8.3, the freight reliability on the Interstate System is relatively good, with portions of the system on the North Dakota side experiencing some less reliable conditions, including I-29 at I-94, I-94 at 45th Street, and I-94 west of Main Avenue.
- **Street Network Connectivity** is shown in **Figure 8.4.** As shown in the Street Connectivty results, the highest concentrations of network connections are:
  - Downtown Moorhead
  - Downtown Fargo
  - Northwest of 13th Ave S and 25th St in Fargo
  - Southwest of 11th Street and 15th Ave N in Moorhead
- **Peak Period Speed Reduction** is shown in **Figure 8.5.** As shown in Figure 8.5, there are short periods of time during the peaks with speed reductions along many arterial corridors, including University, 45th Street, and Main Avenue in Fargo and 8th Street and Highway 10 in Moorhead.
- **Level of Service** is shown in **Figure 8.6.** As shown in Figure 8.6, there are short segments of level of service E or F operations, particularly adjacent to Interstate interchanges, but these are relatively isolated occurrences.

Traffic Incident Management Measures

Traffic incidents represent a significant source of non-recurring congestion for the region, and clearing these incidents quickly and safely represent an opportunity to effectively manage system operations. There are performance measures that Metro COG has identified in its *Alternate Route and Traffic Incident Management* plan, including:

- **Roadway clearance time (including detection, response and clearance times)**
- **Number of secondary incidents**
- **Amount of time first responders are on scene (and exposed to traffic)**

FIGURE 8.2 LOTTR BY INTERSTATE AND NON-INTERSTATE NHS SEGMENT

FIGURE 8.3 TRUCK TRAVEL TIME RELIABILITY BY INTERSTATE SEGMENT

FIGURE 8.4 INTERSECTION DENSITY BY TRANSPORTATION ANALYSIS ZONE

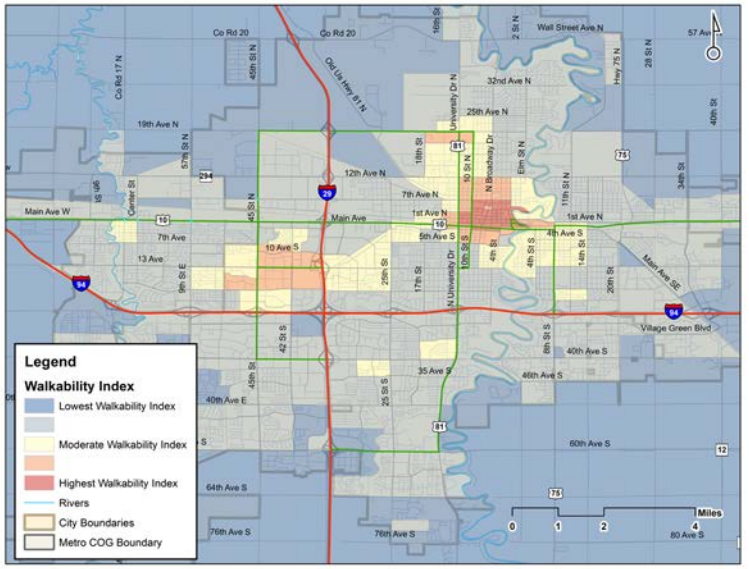


FIGURE 8.5 PEAK PERIOD SPEED REDUCTIONS BY SEGMENT

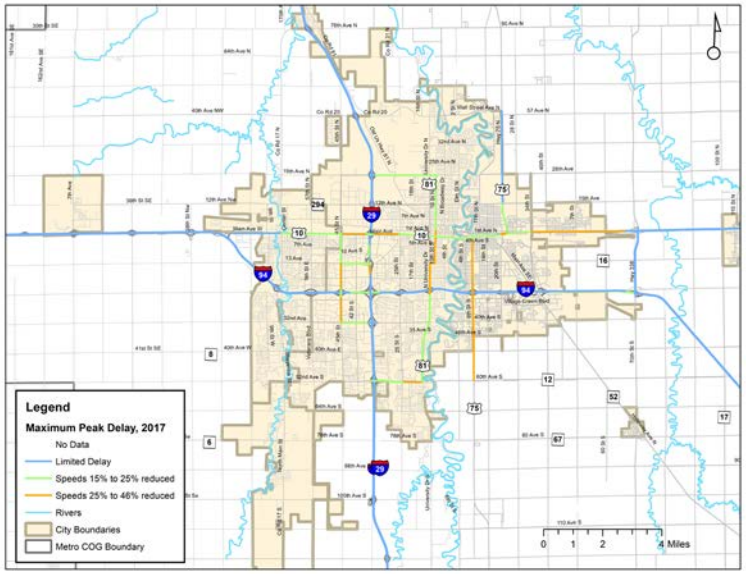
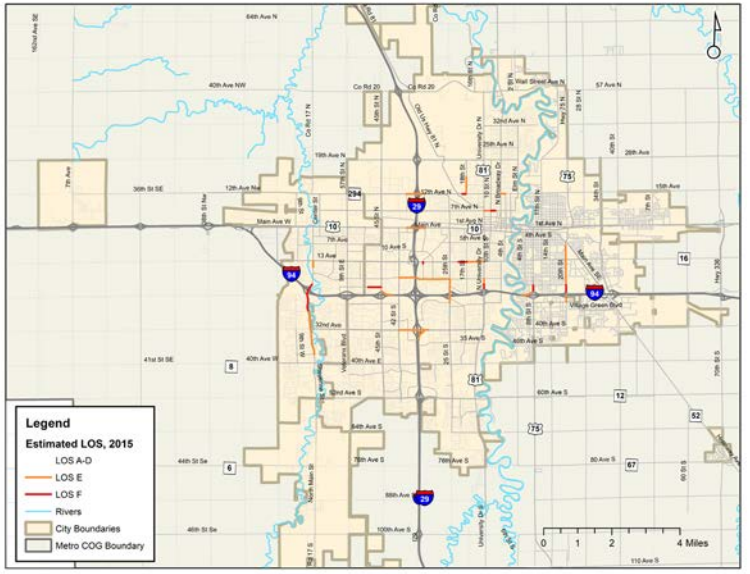


FIGURE 8.6 ESTIMATED LEVELS OF SERVICE (2015)



Data Collection to Support CMP

The use of performance measures requires the collection and management of data related to the transportation system and traffic operations. For the Fargo-Moorhead CMP, this data was sourced from a range of agencies at the federal, state, and local level depending on the specific performance measure. This section provides a summary of current data sources, current data limitations, and potential options to enhance data opportunities to support the CMP.

Vehicle Probe Data

Probe data represents a key data source for determining travel reliability and congestion measures, including:

- Level of Travel Time Reliability (LOTTR)
- Truck Travel Time Reliability (TTTR)
- Peak Period Speed Reduction

As noted earlier, the source of the data for delineating travel time reliability was the NPMRDS. The NPMRDS is a monthly archive of travel times reported in 5 minute increments when data is available, provided by FHWA to MPOs and States for performance measures.

Data Discussion: A key limitation of the NPMRDS is that these data are only available on the National Highway System. The Fargo-Moorhead CMP Network includes all Interstate and arterials, which include both NHS and non-NHS roads. Thus, with existing data sources there are gaps in the ability to monitor reliability and travel speeds on portions of the CMP network.

Data Enhancement Opportunities: In the coming years, Metro COG and its partners should consider identifying additional travel time data sources to expand the scope of the available travel data for the metropolitan area. Enhanced data sources might include:

- The University of Maryland CATT Lab's MAP-21 Analytics Tools, which provide more roadway coverage than just the NHS and additional tools for analyzing and visualizing the wealth of probe data.
- There is the potential that additional data can become available via sensors and other data sources by collaborating with the Advanced Traffic Analysis Center (ATAC) at North Dakota State University. Metro COG already collaborates with ATAC, and staff members are part of the Traffic Operations Group, as one of ATAC's primary roles is to provide support to public transportation decision makers.

Traffic Volume Data

Traffic volume data helps support estimates of current traffic operations, including LOS. The CMP implemented a planning-level volume-to-capacity approach based on available average daily traffic (ADT) count data, with input from Metro COG's Traffic Operations Group to help refine the analysis.

Data Discussion: Since congestion happens during peak periods only, it is important to understand traffic patterns during those peak times. This study has worked to correlate ADT volumes with peak travel conditions, such as the percentage of daily travel and directional distribution of travel that occurs during peak periods. There were some peak hour counts available to help tailor the LOS analysis completed for this study.

Data Enhancement Opportunities: A wider coverage of peak hour traffic counts could be used to enhance the current traffic volume data used to estimate LOS analysis for the region. More extensive peak hour counts could provide more refinement to the regional LOS analysis.

Additional data opportunities are currently being explored on two different local initiatives. The first is the **Intersection Traffic Data Collection and Reporting project**. The primary purpose of this project is to develop the connections and build a traffic analysis tool-compatible database for the FM Metro COG to collect data from various intersections operated by Fargo, West Fargo, NDDOT, Moorhead, and MnDOT. The second is the **Automated Traffic Signal Performance Measures (ATSPMs) project**. The ATSPMs project the City of Fargo the ability to proactively manage the signal system through signal-performance measures. This intended benefits of this project area to provide streamlined operations, enhanced maintenance, and improved safety.

Multimodal System Data

As Congestion Management requires a multimodal approach, it is important to monitor usage of transit and bicycle and pedestrian systems. The Metro Grow plan has a set of objectives and strategies for providing a more complete bicycle and pedestrian system so that non-motorized and transit trips can more effectively compete with automobile trips in the metro area.

Data Discussion: MATBUS currently monitors and collects ridership data on its buses. Metro COG also conducts some counts of bicycles and pedestrians at locations throughout the Fargo-Moorhead area. These data will allow for ongoing system performance evaluations, providing Metro COG and its partners information to evaluate how well strategies that promote non-Single Occupant Vehicle (SOV) travel are performing.

Data Enhancement Opportunities: A long term enhancement to consider is deployment of pedestrian and bicycle counting devices on facilities to supplement the manual counts that Metro COG currently conducts.

Traffic Safety and Incident Data

A critical element in providing a reliable system is minimizing traffic crashes, as vehicle collisions can play a significant role in delaying travel and causing system reliability issues. An analysis of the safety conditions of the region was performed using the previous 5-year crash data from NDDOT and MnDOT.

Data Discussion: The crash data that Metro COG receives from each state are relatively standard, and allow for ongoing system safety performance measures, and to identify safety hot spots.

Data Enhancement Opportunities: Through the TIM process outlined above, there are some formalized data to support performance measures that could begin to be reported. A comprehensive TIM process is in place, area agencies can begin monitoring and reporting data on:

- **Roadway incident detection time**
- **Roadway incident response time**
- **Roadway incident clearance time**
- **Secondary incidents**
- **Time first responders spend on scene at incidents**

Congestion Management Strategies

The following section presents range of CMP strategies for the Fargo-Moorhead Metro COG so that solutions to congestion issues beyond through-lane capacity projects can be encouraged throughout the region.

The strategies contained within the toolbox fall within four categories:

1. New Infrastructure
2. Transportation System Management and Operations (TSMO)
3. Travel Demand Management
4. Other Policy Approaches / Strategies

New Infrastructure

Metro Grow lays out a fiscally-constrained capital program for new infrastructure. These new infrastructure projects include:

- **Technology and system management approaches in mature urban corridors.** These include deployment of adaptive signal systems and improved street geometrics at key locations to improve traffic flow and safety with minimal investment.
- **New roadway connections in growth areas.** These capital investments will include new arterial streets and to facilitate improved traffic access as the metropolitan area continues to grow.
- **New trail and on-street bike route connections.** These projects fill critical gaps in the current non-motorized system to provide a more extensive complete streets network across the region, allowing pedestrian and bicycle modes to better compete with automobile on some trips.
- **Support for continued transit operations.** MATBUS provides a solid transit backbone to support non-SOV travel options in the metropolitan area. Metro Grow has identified potential future transit strategies, and funding levels allow.

SOURCE: VIRGINIA DOT

SOURCE: FHWA

(LEFT) EXAMPLE INTERSTATE MANAGEMENT APPLICATION

(RIGHT) EXAMPLE ARTERIAL CANDIDATE FOR ADAPTIVE SIGNAL DEPLOYMENT

Transportation System Management and Operations (TSMO)

A Transportation Systems Management and Operations (TSMO) process can supplement the capital projects and strategies outline in Metro Grow. It should be noted that the TSMO process and Congestion Management process are closely aligned, and Metro COG would likely implement both processes in tandem to support one another. TSMO approaches are collaborative efforts of regional transportation professionals to provide solutions that attempt to optimize the performance of our existing transportation system. While some types of congestion are caused by typical morning and evening peak "rush hour" periods of traffic, a significant amount of congestion comes from non-recurring incidents including crashes, stalled vehicles, construction work zones, special events, and changed road conditions due to inclement weather. In many cases, congestion arises from these unexpected, yet regular events. TSMO approaches can be cost-effective in combating these events.

In designing a TSMO program, there should be three key elements included:

- **Strategic elements:** A strategic foundation for a TSMO program and involves clearly defining the relationship of TSMO to the regional vision. The strategic aspect of TSMO program planning provides answers to questions of "why" TSMO is important, and a high-level vision of "what" the agency seeks to achieve, along with strategic goals and objectives.

- **Programmatic elements:** The programmatic elements of TSMO program planning addresses issues surrounding organizational structure and business processes for implementing TSMO activities. This level of planning addresses "how" the program operates, resource and workforce needs, and internal and external coordination and collaboration arrangements. It identifies responsibilities of organizational units for specific TSMO services, projects, and activities, as well as use of analysis tools to guide investment decision-making.

- **Tactical elements:** The tactical elements are the next step in the TSMO program, and focus on how to address specific services, programs, and priorities.[2]

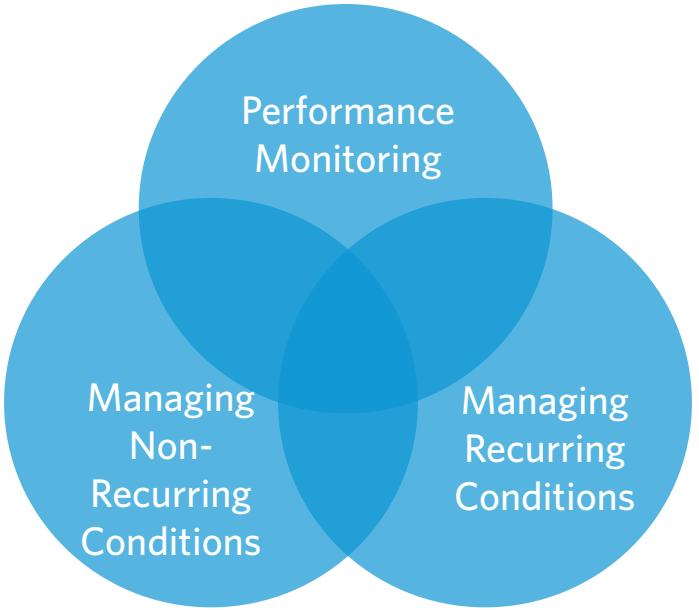
[2] Developing and Sustaining a Transportation Systems Management & Operations Mission for Your Organization: A Primer For Program Planning, US DOT, September 2017.

When in place, the TSMO program would involve:

- **System Performance Monitoring:** Information and data described above provide the ability to monitor system performance in real time. This information coupled with data analytics and information management systems can support regional system decision making. This includes activities at a Transportation Management Center (TMC), system monitoring, and traveler information dissemination. A regional TMC is an improvement that might be considered in the long term for the Fargo-Moorhead region. The probe data described above is one of the first steps to more effective system performance monitoring.

- **Managing Recurring Issues:** Recurring congestion can be addressed through system management strategies beyond just capital investments. Freeway management, arterial management and traffic signal operational, and non motorized / demand management strategies for pedestrian and bicycle mobility and safety are all cost-effective means for addressing recurring congestion in Metro areas across the US.

- **Managing Non-Recurring Issues:** Reliability issues are another area of operational concern that system management can address through a range of strategies, including: Situations - Traffic Incident Management, Road Weather Management, Planned Special Event Management, and Work Zone Management.



TIM is an especially useful TSMO strategy for addressing non-recurring issues, and one that Fargo-Moorhead Metro COG has already initiated with the development of the *Alternate Route and TIM Guidebook*. Part of the process of developing the guidebook was to identify project recommendations to enhance the TIM environment in the region. The desired TIM project recommendations selected by stakeholders were:

1. Ownership and responsibility to maintain the Alternate Route and TIM guidebook maps and documents rests with the Safety Committee of the Fargo-Moorhead Metro COG
2. Develop and monitor TIM performance measures in the region
3. Engage the Fargo-Moorhead region's vehicle towing industry in TIM exercises, event planning, and regional safety committees
4. Install alternate route signage along key designated alternate routes in North Dakota, similar to signage installed in Minnesota
5. Identify locations for future Dynamic Message Signs (DMS) that provide for increased notice to drivers of interstate closures and alternate route availability
6. Develop a regional Traffic Operations Center/Transportation Management Center or coordinate operations regionally between individual traffic and transportation management centers
7. Develop Memorandum of Understandings (MOUs) and partnership agreements between agencies, cities, counties, and states that allow for shared use of first responder resources and the use of local roads as an alternate route for interstate traffic
8. Enhance the coverage of CCTV cameras and vehicle detection capability throughout the Fargo-Moorhead region
9. Engage in a TIM Capability Maturity Self-Assessment exercise

Travel Demand Management

Rather than approach congestion from the supply-side of the transportation system, travel demand management (TDM) strategies represent opportunities for Fargo-Moorhead Metro COG to implement solutions that alter how and when travel is made. Travel demand management strategies seek to maximize existing infrastructure through influencing travel behaviors of residents and employers. Multiple TDM strategies are often implemented at once to provide a comprehensive demand management package. TDM strategies that have been implemented in communities across the United States include bikesharing, carsharing, congestion pricing, system management, land use regulations, parking policy, employer-organized van pools, and flexible work schedules.

As travel increases through 2045, and congestion levels across the Fargo-Moorhead area increase, a comprehensive and multi-jurisdictional Travel Demand Management program might be warranted in the future. A regional study could provide specific recommendations for programs that would support the Congestion Management objectives of Metro COG. It is assumed that the multifaceted TDM approach might include:

- Carpool or vanpool coordination program.
- System management tools like adaptive signalization and ramp metering.
- Organization of an employer association for travel management, including coordination across major employers of potential commute time shifts and rideshare matching.
- Expanded park and ride lots in tandem with express route transit service.
- Potentially expanded parking management in the downtown areas.

Travel Demand Management Benefits

FIGURE 8.7 illustrates the hourly levels of traffic through a typical 4-lane arterial corridor that experiences short periods of congestion during the day. The volume patterns are based on national survey data, and are likely representative of conditions along an arterial corridor that residents in Fargo-Moorhead would consider "congested". As shown in Figure 8.7, in this corridor there are short periods of time during the AM peak and PM peak travel periods where the level-of-service at signalized intersections range between LOS D (35 to 55 seconds of delay per signalized intersection) and LOS F (more than 80 seconds of delay per signalized intersection). However, during the vast majority of the day, there are no delays associated with traffic volumes approaching roadway capacity.

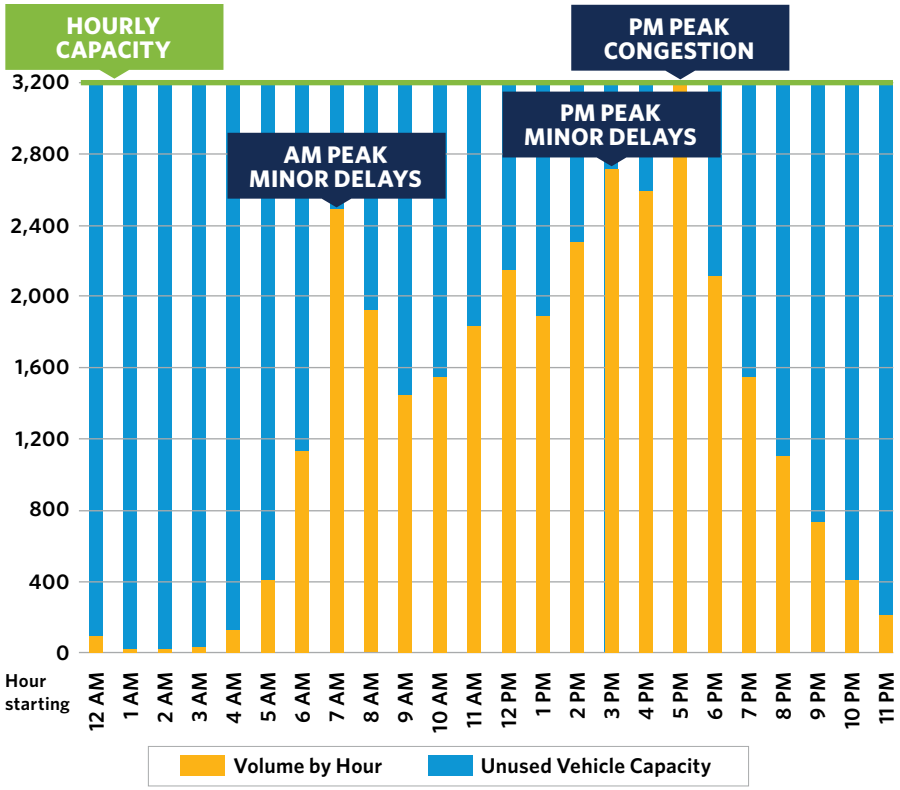
There are two important opportunities related to TDM that this concept illustrates:

- **Changing the number of travelers per vehicle.** FIGURE 8.7 focuses on the number of vehicles served in a corridor, not the number of people that it serves. Considering all modes of travel, there are about 1.6 people transported per vehicle through an average corridor in the Fargo-Moorhead region. An effective TDM policy encourages increasing the average number of people per vehicle through increased carpooling, public transit usage, and walking and biking. For instance, increasing the average travelers per vehicle to 1.75 from 1.6 would allow the same number of people to use the corridor with 10% fewer vehicles.

- **Changing when people travel.** As shown in FIGURE 8.7, even though this corridor is at vehicular capacity for a short period of the day, less than half of the corridor's true daily vehicular capacity is used. An effective TDM policy encourages peak period trips to shift travel times slightly to the "shoulders" of the peak period, potentially moving up to 10% of PM peak trips.

In either of the scenarios above, a 10% drop in the 5 PM peak vehicle volumes could lead to approximately 50% less signalized delay in the example corridor.

FIGURE 8.7: 4-LANE ARTERIAL VOLUME & CAPACITY USAGE BY TIME OF DAY



Daily Traffic = 32,000 vehicles
Hourly Capacity = 3,200 vehicles per hour
Unused Daily Capacity = 44,800 vehicles

Policy Approaches / Strategies

There are a range of policies and strategies that are used across the country and world to better manage congestion. Two potential strategies that are not directly under Metro COG's control which would potentially be effective in managing congestion over the long term might include land use and parking management.

Land Use Management

Land use and transportation are inextricably linked and impact one another. Transportation access allows for land development, and conversely land use, density, and mix directly impacts that types of travel that will be made. Land use and strategies to guide development and redevelopment can directly and significantly impact the demand for transportation. Strategies can range from limiting the amount of land that can be developed in some locations, to encouraging development mixes and densities that are more supportive of public transit, walking, and biking. Targeted land use strategies can help shape the required transportation investments and may help manage the level of vehicle miles traveled, a key metric that is correlated with congestion. In tandem with transit investments, these types of strategies are referred to as transit-oriented development.

One of the challenges to effective land use strategies is the that transportation planning and land use planning have traditionally been separate functions "siloed" under different agencies. Metro COG has begun talking with partner agencies about taking a more regional approach to transportation and land use planning to better coordinate the efforts. Approaches like this would fit well with an initiative to implement a regional street typology, which would define the function of streets in terms of multimodal use and land use context.

Parking Management

Parking management is a comprehensive approach to the pricing, supply, and regulation of parking. Abundant and free parking leads to significantly higher automobile use compared to areas and regions where parking is priced and supply is more limited. Parking management strategies can be used to decrease automobile trips for both work and non-work purposes, often within the context of other demand management and alternative mode strategies. One limitation to this approach is that North Dakota law (Century Code 39-01-09) does not currently allow jurisdictions to charge a fee for on-street parking.

Travel Benefits of Dense and Mixed Land Uses

Increased density and land use mix tends to reduce per capita vehicle travel and increases use of alternative modes.

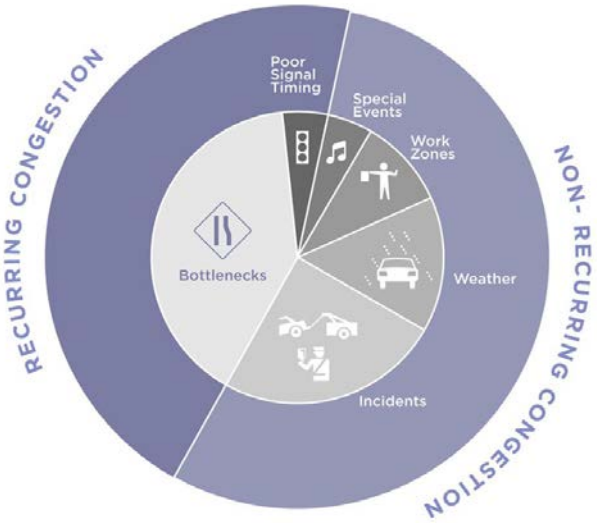
- Each 10% increase in urban densities typically reduces per capita VMT by 2-3%.
- Neighborhoods with good land use mix typically have 5-15% lower vehicle-miles.

SOURCE: Victoria Transport Policy Institute's TDM Encyclopedia

Congestion Management Recommendations

Use the Metro COG Traffic Operations Committee as the regional Congestion Management Committee. The current Traffic Operations Group represents a range of organizations that work together with the goal of addressing regional traffic operations issues. This group, which is constituted of regional City, County, and State staffs, along with transportation researchers at ATAC, should transition into the role of supporting Congestion Management planning for the region. The committee's roles would be to:

- Agree upon and formalize regional CMP goals and objectives, once a TMA has been established in Fargo-Moorhead.
- Identify sources of data to support existing CMP performance measures.
- Identify and work to implement regionally-supported strategies for congestion management.
- Meet and assess CMP effectiveness.



SOURCE: FHWA, Incorporating Travel-Time Reliability into the Congestion Management Process (CMP): A Primer

Continue to Evaluate Congestion Strategy Effectiveness. The evaluation of the CMP strategies begins with the implementation of Metro Grow. Through the plan's implementation, the necessary policy goals and objectives are defined and the methods for evaluating them identified. Within the context of the CMP, this means that a regional definition of congestion is agreed upon by all jurisdictions, and the tools for evaluating system congestion are selected. It is also important to note that the effectiveness of the CMP strategies is contingent upon them being consistent with the CMP objectives. It should be noted that as the region continues to grow, some level of congestion is to be expected. Metro COG anticipates that the region will become more accustomed to congestion over time, and the regional definition of congestion will evolve with it.

Measuring the effectiveness of the identified strategies requires reliable data. The data sources discussed in this document serve as a starting point for Fargo-Moorhead to explore in monitoring congestion within the transportation system. The use of performance measures not only provides quantitative metrics for measuring congestion, but also serves as guide for thinking about solutions to congestion.

The long-term scope of Metro Grow means that Metro COG can identify solutions to congestion through a range of timeframes. This can aid the MPO in prioritizing projects and investment so that the appropriate solutions to the most pressing problems are implemented first, while continued monitoring and evaluation of the transportation system's performance is carried on.

Complete a Comprehensive Interstate System Operations Study. The last comprehensive study of Interstate Operations was completed in 2012. A lot has changed since that time.

- **Growth:** The metropolitan area has continued to grow with new travel demands emerging.
- **New Data:** New data sources are available to evaluate system performance, including wide spread probe data. These probe data not only provide insights into corridor travel time and reliability, but also can provide insights into travel patterns that provide the origins and destinations of trips.
- **Performance Measures:** There are new performance measure requirements and opportunities to evaluate the system in new ways since the last plan.
- **Strategies:** There are new system management strategies that have continued to gain traction both locally and nationally since the last study. These strategies can be considered on both the Interstate and arterial system that can reduce congestion and improve reliability, and could include regional solutions like a traffic management center (TMC).

Facilitate Local Implementation of Short-Term System Management Projects. Metro Grow has outlined a number of short-term projects that will address operational issues on the arterial system. These projects are supported by recent investments on both sides of the river in improved signal communications and software. The short-term system management projects include implementation of adaptive signal systems in Fargo and signal timing improvements and minor geometric improvements in other urban corridors. These management projects should evaluate if traffic signals are the most effective strategy in all locations. Through the lens of CMP goals and objectives, in some locations alternative intersection treatments (like two-way stop control or roundabouts) might be an operational and safety improvement over existing signals. These strategies can be implemented relatively quickly and at a lower cost, and have been identified in the short-term of the Metro Grow time frame for local funding.

Additional opportunities for short-term solutions include integrated corridor management and Special Event Management.

Consider Additional Mid-to Long Term Solutions. In addition to the short-term solutions presented above, with additional study and regional coordination there are several opportunities for mid-term and long-term solutions in the Fargo-Moorhead region, including:

Potential Strategies
Development of a Traffic Operations Center / Traffic Management Center
Ramp Metering
Active traffic management on the freeway system
Evaluate express bus service and potentially bus-on-shoulder as a part of longer-term interstate operations strategy

SOURCE: MnDOT

The regional travel demand model was utilized to evaluate the projects included in the Metro Grow plan. The model could potentially be used to assess the regional travel benefits of additional strategies such as travel demand management and interstate system management.

Continue to Identify Ways to Implement Metro COG Policies. Metro Grow has outlined policies for Metro COG in Chapter 11. Many of those policies can directly support the objectives of long-term congestion management in the region, including:

- Travel Behavior, including managing peak hour travel decisions
- System Connectivity, including promoting development of a Grid Street Network
- Land Use, including transit-supporitve corridors
- Complete Streets

Revisit the Congestion Management Process after TMA Status. After Metro COG becomes a Transportation Management Area (TMA), Metro COG and member jurisdictions should revisit the Congestion Management Process. There will have been several years since the establishment of this original CMP, and the processes, data, metrics, and strategies will evolve over that time. This will include continuing to **utilize and refine the performance-based project selection process** outlined in Metro Grow. The Metro Grow plan established a process for prioritizing projects based on how well they reflected the regional safety, mobility, and access goals. The CMP process benefits from this performance-based approach. As the CMP is implemented by Metro COG, it is recommended that staff continue to review and adjust project prioritization metrics to reflect the region's CMP vision.

Financial

Overview

This chapter provides an overview of funding levels for various programs and sources, and establishes the baseline for determining fiscal constraint for the MTP. Both Federal funding sources and local jurisdiction funding sources are included. For the local jurisdiction funding analysis, expenditures are tracked separately for operations and maintenance budgets, including system maintenance, and for capital projects (such as major reconstructions and capacity expansion).

Use of Time Frames

Revenues and costs in the MTP are presented in short-term, mid-term, and long-term time frames. There are three time frames used:

- **Short-Term:** Years 2023-2025
- **Mid-Term:** Years 2026-2035[1]
- **Long-Term:** Years 2036-2045

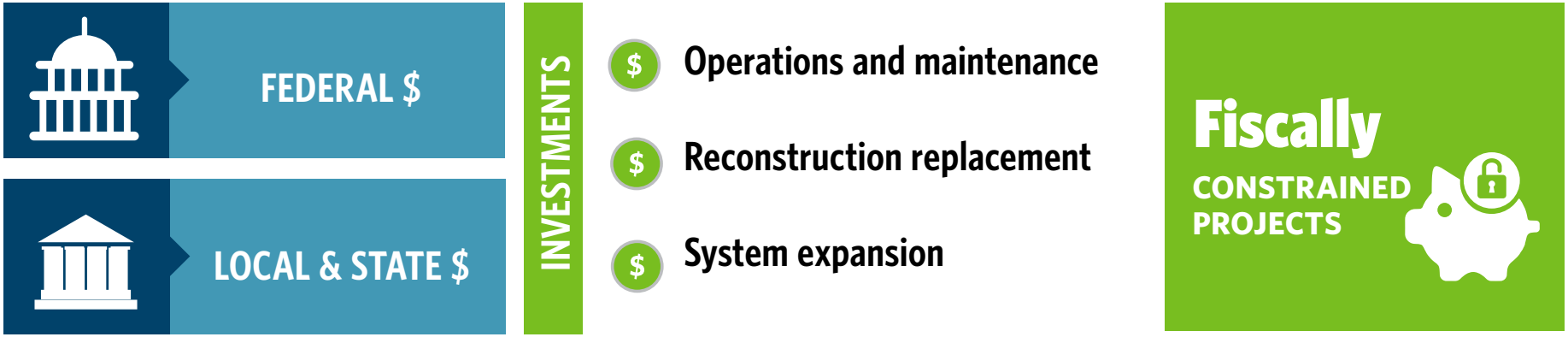
Revenues and costs for future years are presented in "year of expenditure" (YOE) terms. Costs and revenues are grown by the assumptions shown in this chapter to the midpoint of those time frames: Short-term midpoint of the year 2022, Mid-Term midpoint of the year 2030.5, and Long-Term midpoint of the year 2040.5.

Federal Programs and Funding Levels

Overview of Federal Programs

In the past, projects in the Metro COG region have received Federal funding from a range of programs. The major Federal funding programs include:

- **Surface Transportation Block Grant Program (STBGP):** the STBGP, or simply "STBG", is the primary source of funding provided to projects in the region. The STBG funds are quite flexible, and can be used for projects to preserve and improve the conditions and performance on any Federal-aid highway, bridge on any public road, pedestrian and bicycle infrastructure, and transit capital projects. STBG funds can be flexed and used for other functions like transportation planning. STBG projects are typically 80% Federal / 20% State and Local share, but can also be a higher local share than 20%..
- **STBG program funding for transportation alternatives (TA):** the STBG-TA, or TA program, provides funding for a range of projects such as pedestrian and bicycle facilities, recreational trails, safe routes to school projects, community improvements such as historic preservation and vegetation management, and environmental mitigation related to stormwater and habitat connectivity. TA projects are 80% Federal / 20% Local share.
- **National Highway Performance Program (NHPP):** the NHPP funds projects that improve the condition and performance of the NHS and for the construction of new facilities on the NHS. Projects on the Interstate system are 90% Federal / 10% State share.
- **Highway Safety Improvement Program (HSIP):** the HSIP funds projects to achieve a significant reduction in traffic fatalities and serious injuries on all public roads, including non-State-owned public roads and roads on tribal lands. HSIP projects are 90% Federal / 10% Local share.



[1]The Mid-Term is divided into two sub-categories for project implementation timing in Chapter 12: the near mid-term (2026-2029) and far mid-term (2030-2035)

- **Recreational Trails Program (RTP):** the RTP funds projects to develop and maintain recreational trails and trail-related facilities.
- **FTA Section 5307 Urbanized Area Formula Program:** Section 5307 provides funds to urbanized areas for transit capital, operating assistance, and transit related planning. The City of Fargo and the City of Moorhead both receive Section 5307 funds.
- **FTA Section 5339 Bus and Bus Related Facilities:** Section 5339 provides federal funds for transit capital projects, and are apportioned to States based on population.
- **Section 5310 Enhanced Mobility for Seniors and Individuals with Disabilities:** Section 5310 provides formula funding for the transportation needs of elderly and persons with disabilities when the transit services provided is not able to meet these needs.

Forecasts of Future Federal Funding Levels

When Metro COG transitions to Transportation Management Area (TMA) status, the agency will receive a direct suballocation of Federal funds for STBGP, rather than competing for the funds statewide in Minnesota and North Dakota. The direct suballocation to Metro COG will be based on state-level STBG funding and Metro COG's share of each state's urban population. To estimate that STBG funding level that Metro COG will receive, data from the 2010 Census and 2013-2017 American Community Survey were reviewed and trends established for the year 2020. TMA status provides a sub-allocation level based on:

- The total STBG money allocated to each state. Those totals are shown in the footnote on this page.
- Each state is directed to provide 55 percent of STBG funds to urban areas (by 2020).
- The TMA's direct suballocation of STBG funds is then based on its percentage of state urban population.

The annual STBG suballocation is calculated as the product of the 55% urban share and the TMA share of state urban population, multiplied by the STBG state allocations. NDDOT provided direct guidance to Metro COG on assumptions for the North Dakota side funding, based on this methodology.

Assumptions for STBG Sub-Allocation

Sub-Allocation of STBG funding is based on the percentage of urban population in each state. It is estimated that in 2020:

- Metro COG's North Dakota communities will represent 34.3% of North Dakota's urban population
- Metro COG's Minnesota communities will represent 1.1% of Minnesota's urban population

Given the assumed portion of urban population within each state and guidance provided by NDDOT, the following STBG allocations are assumed[2]:

- **Minnesota:** $1,085,000 STBG funds annually (in 2020 dollars)
- **North Dakota:** $12,500,000 STBG funds annually (in 2020 dollars)

At the time of development of this MTP, there is some uncertainty if the TA funds for each state will be directly suballocated to Metro COG. Thus, future levels of Transportation Alternatives funding and other programs was based on historical funding levels. An analysis of the most recent 10 years of Transportation Improvement Programs (TIPs) was completed to estimate funding levels for other Federal programs. The historical funding levels for NHPP, HSIP, TA and RTP programs are shown in TABLE 9.1. Historical STBG funding levels are shown in TABLE 9.2. Transit funding levels by program were evaluated back to 2013 and average funding levels shown in TABLE 9.3 (in 2019 $).

Based on recent trends and assumptions used for similar MTPs, it is assumed that Federal funding levels will grow at 1.5% annual rate beyond the current TIP. Note that project costs are assumed to grow at 4% annual rate, significantly cutting into the purchasing power of Federal funds.

Based on the Funding levels and growth rates identified above, TABLE 9.4 presents the projected future Federal funding levels for each state by time period band, in year of

[2] Based on a total Minnesota STBG allocation of $174,330,319 in 2020 (same as 2018), with $95,881,675 allocated to urban areas (55% of state total). North Dakota's total STBG allocation is expected to be $69,047,796 in 2020 (same as 2018). Source: www.fhwa.dot.gov/fastact/comptables/table4p1-1.cfm

TABLE 9.1 HISTORICAL FUNDING LEVELS FOR NHPP, HSIP, TA, AND RTP PROGRAMS

Year	Minnesota				North Dakota			
	NHPP[3]	HSIP	TA[4]	RTP	NHPP[3]	HSIP	TA[4]	RTP
2009	$3,102,030	$0	$170,000	$0	$9,442,250	$0	$0	$0
2010	$6,822,500	$0	$0	$0	$10,970,000	$0	$0	$0
2011	$0	$0	$0	$0	$460,000	$0	$0	$0
2012	$0	$0	$0	$0	$0	$0	$280,000	$0
2013	$0	$0	$0	$0	$6,895,000	$0	$485,000	$200,000
2014	$3,227,000	$0	$600,000	$0	$20,751,000	$1,169,000	$196,000	$0
2015	$2,630,096	$1,840,000	$0	$0	$24,142,000	$0	$192,000	$0
2016	$9,527,039	$0	$146,873	$0	$1,835,000	$0	$321,026	$200,000
2017	$5,675,000	$958,118	$420,000	$0	$7,118,660	$1,696,275	$250,000	$0
2018	$1,333,330	$1,440,310	$375,000	$0	$12,782,000	$1,012,000	$227,334	$200,000
Average (YOE $)	$3,231,700	$423,843	$171,187	$0	$9,439,591	$387,728	$195,136	$60,000
Average (2019 $)	$3,483,077	$440,190	$181,056	$0	$10,176,311	$403,407	$208,000	$83,693

SOURCE: Metro COG Transportation Improvement Programs, 2009-2018

[3] Includes Interstate Maintenance (IM) and National Highway System (NHS) funding programs

[4] Includes former Transportation Enhancements (TE), Transportation Alternatives Program (TAP), and STBG-TA funding

TABLE 9.2 HISTORICAL FUNDING LEVELS FOR STBG PROGRAMS[5]

	Minnesota	North Dakota			
Year	STBG	STBG Urban	STBG Regional	STBG (Other)	Total
2009	$808,240	$0	$26,300,000	$1,200,000	$27,500,000
2010	$1,734,750	$8,000,000	$6,928,000	$0	$14,928,000
2011	$4,358,500	$5,000,000	$2,000,000	$0	$7,000,000
2012	$10,201,200	$0	$18,240,000	$0	$18,240,000
2013	$3,256,600	$428,000	$0	$0	$428,000
2014	$18,055,000	$8,825,000	$0	$125,000	$8,950,000
2015	$3,155,000	$9,163,250	$13,000,000	$0	$22,163,250
2016	$5,480,988	$190,400	$0	$0	$190,400
2017	$740,759	$3,623,804	$0	$0	$3,623,804
2018	$3,628,332	$0	$8,540,610	$5,680,000	$14,220,610
Average (YOE $)	$5,141,937	$3,523,045	$7,500,861	$700,500	$11,724,406
Average (2019 $)	$5,569,019	$3,841,258	$8,340,663	$729,251	$12,911,172

SOURCE: Metro COG Transportation Improvement Programs, 2009-2018

[5] Includes former Surface Transportation Program (STP) funding

TABLE 9.3 HISTORICAL FUNDING LEVELS FOR FTA PROGRAMS

Minnesota							
Year	FTA 5307	FTA 5309	FTA 5316	FTA 5317	FTA 5310	FTA 5311	FTA 5339
2013	$456,000	$0	$0	$23,000	$0	$850,000	$0
2014	$734,000	$0	$0	$24,000	$0	$876,000	$0
2015	$1,004,210	$0	$0	$0	$26,400	$901,000	$0
2016	$645,830	$0	$0	$0	$0	$0	$0
2017	$1,642,400	$0	$0	$0	$0	$0	$0
2018	$437,400	$0	$0	$0	$0	$0	$0
2019	$496,440	$0	$0	$0	$0	$0	$68,000
Average (YOE $)	$773,754	$0	$0	$6,714	$3,771	$375,286	$9,714
Average (2019 $)	$808,992	$0	$0	$7,286	$4,003	$404,202	$9,714

North Dakota							
Year	FTA 5307	FTA 5309	FTA 5316	FTA 5317	FTA 5310	FTA 5311	FTA 5339
2013	$2,553,000	$0	$0	$0	$128,000	$850,000	$376,000
2014	$2,270,000	$0	$156,000	$0	$184,000	$876,000	$2,516,000
2015	$2,392,000	$0	$0	$0	$80,000	$0	$240,000
2016	$2,487,700	$0	$0	$0	$233,792	$0	$0
2017	$2,587,400	$0	$0	$0	$0	$0	$0
2018	$2,692,240	$0	$0	$0	$0	$0	$0
2019	$2,685,000	$0	$0	$0	$40,000	$0	$120,000
Average (YOE$)	$2,523,906	$0	$22,286	$0	$95,113	$246,571	$464,571
Average (2019 $)	$2,637,191	$0	$24,008	$0	$101,080	$267,590	$499,473

TABLE 9.4 PROJECTED FUTURE FUNDING LEVELS FOR FEDERAL PROGRAMS IN METRO COG AREA, 2023-2045 (IN YEAR OF EXPENDITURE DOLLARS)

Minnesota							
Time Frame / Years		STBG	FTA	NHPP	HSIP	TA	Recreational Trail
Short-Term (Beyond TIP)	2023-2025	$3,506,819	$4,291,121	$11,257,621	$1,422,734	$585,189	$0
Mid-Term	2026-2035	$12,888,022	$15,770,437	$41,373,247	$5,228,736	$2,150,649	$0
Long-Term	2036-2045	$14,957,076	$18,302,236	$48,015,342	$6,068,161	$2,495,915	$0
	Total	$31,351,916	$38,363,794	$100,646,210	$12,719,631	$5,231,753	$0

North Dakota							
Time Frame / Years		STBG	FTA	NHPP	HSIP	TA	Recreational Trail
Short-Term (Beyond TIP)	2023-2025	$40,401,135	$9,982,574	$32,890,761	$1,303,848	$672,275	$270,503
Mid-Term	2026-2035	$148,479,515	$36,687,281	$120,877,898	$4,791,814	$2,470,699	$994,136
Long-Term	2036-2045	$172,316,539	$42,577,087	$140,283,735	$5,561,096	$2,867,347	$1,153,735
	Total	$361,197,189	$89,246,942	$294,052,394	$11,656,758	$6,010,321	$2,418,374

Local Funding Levels

Current estimates of City and County transportation revenue were developed based on interviews with staffs, recent Capital Improvement Programs (CIPs), and budgets. Different types of funding information were available for each jurisdiction, so the tabular information are presented in slightly different ways for each jurisdiction based on the information available. This local funding analysis evaluated levels of spending for operations and maintenance activities were compared to their levels of spending on capital projects like roadway reconstruction and system expansion projects like road widening / capacity improvement and signal improvements.

Many Federal Aid-eligible projects in the Metro COG area were funded entirely with local funds. Thus, it is important to consider both the Federal funding levels and the locally-sourced transportation funds. Local funds are also required to provide matching funds for Federal-aid projects.

Funding of projects is a rather complex assessment for the cities in the region, as a significant share of city funding for transportation projects comes from special assessments. The analysis of funding levels for the cities treat monies from relatively consistent city sources (property taxes and sales taxes) separately from special assessment sources. The share of special assessments can vary quite a bit by project type, and from city to city depending on assessment policy. Efforts were made to estimate typical assessment-based funding levels for different project types by jurisdiction, to help with understanding the assessment-based and non-assessment based funding sources when projects are included in the fiscally-constrained plan.

City of Moorhead

Funding for the City of Moorhead street projects comes from a variety of sources:

- **Special Assessments:** the City of Moorhead collects assessments for street projects on collectors and minor arterials. Assessments typically account for approximately 40% of City project funding.
- **Property Taxes**
- **State Aid Funds:** these include highway user tax distribution funds and Municipal State Aid (MSA) street funds. Reviewing past CIPs and adjusting funding levels to 2019 dollars, Moorhead averaged approximately $2.3M annually in MSA funding in the most recent CIPs, and approximately $3.9M annually in other state funding.
- **Wheelage Tax:** Moorhead receives a portion of the Clay County Wheelage tax, designated at 15.3% of the Wheelage Tax revenues (70% is designated to the County, with the remaining 14.7% designated for other Clay County cities and towns). The wheelage tax started in 2016.

Moorhead has historically received limited Federal funding for the roadway network. Based on a review of available CIPs (2012 and 2014-2018), historical funding levels are provided below in TABLE 9.5.

TABLE 9.5 CITY OF MOORHEAD HISTORICAL FUNDING LEVELS

Year	State Funds	City Funds	Other Funds
2014	$11,226,200	$10,760,000	$600,000
2015	$5,165,300	$9,674,300	$500,000
2016	$10,901,000	$13,965,000	$2,200,000
2017	$581,200	$6,697,000	$0
2018	$1,038,447	$4,492,700	$0
Average (in 2019 $)	$6,243,569	$9,744,311	$707,664

SOURCE: City of Moorhead CIPs

For local and state funding levels, it is estimated that the city annually receives (in 2019 dollars):

- Approximately $9.7M in local funding for streets
  - This was approximately 41% assessments and 59% other local sources
- Approximately $6.2M in state funding

Project spending levels on maintenance projects (routine maintenance and overlays) and on capital projects (new capacity, reconstruction, traffic signals) were evaluated and the typical project annual spending levels for local and State funds are (in 2019 dollars):

- Preventative Maintenance Projects: $6,820,000
- Capital Projects: $9,080,000

Clay County

Funding for Clay County road projects include State, Local, and Federal Aid Sources and are based on reviews with past CIPs and interviews with county staff. Particular sources of note include (in 2019 dollars):

- **Clay County Wheelage Tax:** the Wheelage tax came into effect in 2015, and funds can only be used for construction or maintenance projects on roads and bridges. The County receives 70% of the Wheelage Tax assessed in the county, with 30% going to the Cities in the County. For capital programs from 2016 to 2022, the County has used or anticipates using approximately $372,000 annually for road projects in Wheelage Tax revenues.
- **State Aid Funds:** Reviewing Improvement Plans between 2008 and 2018, State Aid Funds include:
  - County State Aid Highway Fund – Historically about $3.7M annually
  - State Aid Municipal funds – historically about $260,000 annually
  - State Bridge funds – vary from year-to-year, but on average the County receives about $400,000 annually
- **County Levy funding sources:** Reviewing Improvement Programs between 2008 and 2018, County funding has accounted for approximately $400,000 annually.

TABLE 9.6 shows the breakdown in funding sources for Clay County from the current County Program.

TABLE 9.6 CLAY COUNTY PROGRAMMED NON-FEDERAL CAPITAL FUNDING LEVELS

CIP Year	State Aid Regular Funding	State Aid Municipal Funding	State Aid Bridge Funding	County Funding	Local Funding
2018	$4,694,943	$1,330,057	$1,195,000	$690,000	$4,380,000
2019	$2,110,000	$0	$760,000	$400,000	$0
2020	$3,691,000	$0	$160,000	$400,000	$1,396,000
2021	$2,300,000	$390,000	$150,000	$400,000	$910,000
2022	$4,909,000	$96,000	$500,000	$400,000	$1,756,000
Total	$17,704,943	$1,816,057	$2,765,000	$2,290,000	$8,442,000

SOURCE: Clay County 5-Year Program

The County also has an operations budget of approximately $2.75M annually that goes towards equipment, wages, and minor repairs on the system.

Based on the current budget, interviews with County staff, and review of the historical improvement plan data provided, the county is currently spending the following levels (in 2019 $):

- $4.7 M annually on mill and overlay and reconstruction projects
- $200,000 annually for routine system maintenance (sealing, etc.)
- $400,000 annually for bridge replacements. Note that future levels of required bridge investments are anticipated to be higher than current levels.

City of Fargo

Funding for the City of Fargo streets comes from a variety of sources, including these three primary sources:

- **Sales Tax:** The City of Fargo has a 2% sales tax to City programs, with 1% going to infrastructure and 1% going to flood control. In addition to these City-destined sales taxes, Cass County collects a 0.5% sales tax and the state of North Dakota an additional 5% sales tax.
- **Special Assessments:** the City of Fargo collects assessments for the development of new streets and street maintenance. The City of Fargo's special assessment policy allows for 100% of the costs of new streets and collectors to be paid for with special assessments, and a varying, yet significant portion of street rehabilitation and reconstruction. A review of past CIPs and interviews with Fargo staff indicate that on average:
  - Special assessments represent about 90% of local share on arterial improvement project funding
  - Special assessments represent about 70% of traffic project funding
  - Special assessments represent about 35% of street reconstruction costs

Additional funding has come from State and Federal sources. Based on recent CIPs, City of Fargo projects received about $7.8M annually in Federal aid and about $4.5M annually in State Aid (in 2019 dollars). A summary of the past six years of CIPs for the City of Fargo are shown in TABLE 9.7.

TABLE 9.7 CITY OF FARGO NON-FEDERAL TRANSPORTATION PROJECT FUNDING SOURCES

Year	State Funds	City Funds	Other Funds
2013	$2,733,679	$70,970,086	$0
2014	$7,895,228	$97,962,787	$0
2015	$10,696,907	$58,314,741	$0
2016	$435,195	$65,051,213	$0
2017	$2,091,789	$65,453,941	$100,000
2018	$1,228,815	$65,276,147	$123,654
Average (in 2019 $)	$4,544,289	$70,504,819	$38,361

SOURCE: City of Fargo CIPs, 2013-2018

For programs, the City of Fargo allocates funding to various street activities, including:

- Building new development streets and preserving existing subdivision Streets through assessments.
- Pavement preservation work on functionally-classified streets to maintain the existing system.
- Transportation capacity improvements on functionally-classified streets, often without any Federal or State dollars.
- Street reconstruction projects that rebuild deteriorated sections of streets and roadways. These also involve water and waste water projects at the same time, and utilize those separate funding sources for that work.

Based on the last six years of CIPs, in 2019 dollars the City of Fargo has spent approximately:

- $7.5M annually on pavement preservation and maintenance.
- $37.0M annually on new development projects (majority dedicated to non-Federal Aid eligible projects).
- $31.2M on Federal-Aid eligible projects, including the following historical funding levels:
  - $12.7M annually on street reconstruction
  - $8.6M annually on locally-funded capacity expansion projects
  - $5.8M annually on local match for Federal projects
  - $4.1M annually on traffic projects

Cass County

Available planning documents and interviews with Cass County staff were conducted to identify current funding levels for Cass County transportation. The funding data for Cass County come from the Cass County Comprehensive Highway Plan (2018-2022). The majority of funding sources include:

- State Aid funding comes from the Highway Distribution Tax and Additional State Funding, including gas taxes and motor vehicle licensing fees.
- Local Funding is from property taxes and sales taxes.
- Federal funding for highways and bridges.

TABLE 9.8 shows current and anticipated Cass County funding levels, including levels for county operations. TABLE 9.9 shows anticipated Cass County transportation expenditures.

TABLE 9.8 CASS COUNTY ANTICIPATED LOCAL AND STATE TRANSPORTATION FUNDING LEVELS

Funding Source	Property Tax	State Funding	Other	Total Revenues
2019	$8,374,927	$7,500,000	$193,906	$16,068,833
2020	$8,542,426	$7,650,000	$197,784	$16,390,210
2021	$8,713,274	$7,803,000	$201,740	$16,718,014
2022	$8,887,540	$7,959,060	$205,775	$17,052,374
2023	$9,065,290	$8,118,241	$209,890	$17,393,422
Average (2019 $)	$8,370,000	$7,500,000	$190,000	$16,070,000

SOURCE: Cass County Comprehensive Highway Plan, 2018-2022

TABLE 9.9 CASS COUNTY ANTICIPATED TRANSPORTATION EXPENDITURES

Year	Operations and Maintenance Expenses	Capital Project Expenses
2018	$6,628,232	$13,000,601
2019	$6,893,361	$9,976,849
2020	$7,169,096	$10,799,918
2021	$7,455,860	$10,215,725
2022	$7,754,094	$11,144,845
Average (2019 $)	$6,620,000	$11,100,000

SOURCE: Cass County Comprehensive Highway Plan, 2018-2022

Based on the current budget, over the next 5 years Cass County is currently spending (in 2019 dollars) approximately:

- $6.6M annually on system operation and routine maintenance.
- $9.5M annually in local and state funding on capital and routine maintenance projects, including roadway overlay, reconstruction and paving projects.
  - The pavement maintenance projects are approximately $1.3M annually.
- $480,000 annually in bridge replacements (from Federal Aid sources). The future levels of bridge investments are anticipated to be higher than current levels.

Note that these levels are for the entire county, including portions of Cass County outside of Metro COG's jurisdiction.

City of West Fargo

Funding for City of West Fargo transportation projects involves the following sources:

- **Property Tax:** property taxes are major source of revenue for the City of West Fargo.
- **Sales Tax:** the City of Fargo has a 2% sales tax to City programs, with 75% of those revenues dedicated to infrastructure improvements. In addition to these City-destined sales taxes, Cass County collects a 0.5% sales tax and the state of North Dakota an additional 5% sales tax.
- **Special Assessments:** the City of West Fargo collects assessments for constructing sidewalks, new streets and street maintenance (along with other non-transportation uses). Assessments constitute a large percentage of funding on typical capital projects, with special assessments representing an average of 75% of funding of capacity projects in the CIP.

Based on discussion with City staff, the latest CIP, and budget from West Fargo, street funding for the City generally has:

- $2.9M for department operations and maintenance.
  - $1.7M of this budget is state aid funding
- $7.5M annually in City (non-assessment) funding for transportation capital projects, including capacity and reconstruction projects.
- $5.6M annually in special assessments funding for transportation capital projects, including capacity and reconstruction projects.

TABLE 9.10 shows the estimate of current funding sources and levels for West Fargo streets.

TABLE 9.10 ESTIMATED 2019 CITY OF WEST FARGO TRANSPORTATION FUNDING LEVELS

Funding Source	Funding in 2019 $
Operations and Maintenance	$2,900,000
Streets Capital Projects	$7,500,000
Special Assessments for Capital Projects	$5,625,000
Total Streets Funding	$9,400,000

SOURCE: City of West Fargo CIP, 2018

City of Horace

The City of Horace is growing quickly, and the City budget is evolving rapidly with this growth. Interviews with City staff were conducted to identify current funding levels in the City. Funding for City of Horace transportation projects involves the following sources:

- **City Street funding from Property Taxes:** this is the portion of property taxes allocated to transportation projects. This is estimated to be $225,000 annually in 2019.
- **Sales Tax:** this is the estimated portion of sales tax revenues that would go toward transportation projects. This is estimated to be $200,000 annually in 2019.
- **State Aid Highway funding:** this is based on current levels of state aid funding for Horace, which is estimated to be $200,000 annually in 2019.
- **Special Assessments:** Assessments can fund up to 100% of new development street projects. The City is working towards typically paying 50% of reconstruction projects with assessments, and the remainder from other City funding sources. Typical levels are about 60% of project costs, for approximately $637,000 annually in 2019.

Horace's current population is below 5,000 and all Federal funding rquest need to go through Cass County.

Based on a review the current CIP and discussions with City staff, the City is currently spending the following levels (in 2019 $):

- $525,000 annually in City (non-Assessment) and State funds for Capital Projects.
- $250,000 annually in City (non-Assessment) and State funds for street maintenance.
- Current special assessment funding levels for transportation projects are skewed by a large amount of one-time funding from the school district for roadway improvements. As noted above, typical special assessment funding levels for capital projects are in line with non-assessment city funding sources. For the purposes of estimating future street funding levels, it is assumed that annual special assessment funding levels are $637,000 in 2019 dollars.

These are relatively conservative estimates of local funding as long-term sales tax revenues are anticipated to increase at a greater rate in the mid-term and long-term. TABLE 9.11 shows the estimate of current funding sources and levels for Horace streets.

TABLE 9.11 ESTIMATED 2019 CITY OF HORACE TRANSPORTATION FUNDING SOURCES

Funding Source	Funding in 2019 $
State Aid Highway	$200,000
City Streets (from Property Taxes)	$225,000
City Sales Tax (estimated for Transportation)	$200,000
Special Assessments	$638,000
Total Streets Funding	$1,263,000

SOURCE: City of Horace

Based on the analysis above, TABLE 9.12 shows the estimate of current spending levels for Horace streets.

TABLE 9.12 ESTIMATED 2019 CITY OF HORACE TRANSPORTATION FUNDING SOURCES

Streets Spending	Funding in 2019 $
Maintenance Projects	$250,000
Capital Projects	$1,013,000
Total Streets Spending	$1,263,000

SOURCE: City of Horace

Pavement data was not available for Horace. Based on current programmed spending patterns, it was estimated that 30% of budgets were spent on reconstruction projects and 70% spent on expansion projects.

City of Dilworth

The City of Dilworth does not have a formal transportation budget or capital plan for streets. Current funding levels of $594,000 annually for Dilworth were estimated based on current O&M levels identified in the Metro COG TIP.

Operation Prairie Dog Infrastructure Funding

In March 2019, "Operation Prairie Dog" became law in North Dakota. The program adds new sources of infrastructure funding for Cities, Counties, and Airports in North Dakota from oil tax revenues. The program is intended to be a continual funding source, providing funds for infrastructure projects directly to these jurisdictions on a bi-annual basis. The funding levels will change each cycle according to oil tax revenues.

At the time of the Metropolitan Transportation Plan development, it was not known how this new funding would impact local jurisdiction budget decisions. As the agencies on the North Dakota side of the metro area develop policies to accommodate this new funding source, the local funding analysis shown in this document might need to be adjusted to reflect any net changes in transportation funding that would result from this new funding program.

Future Local System Revenues

The revenue / funds available to local jurisdictions were assembled and projected into future years, based on the local budget and capital program information presented in this section, and the data provided in TABLES 9.4 through 9.12. TABLE 9.13 provides an overview of the total local anticipated revenues for each local jurisdiction by time period. Local revenues are projected to grow at 4% annually and state aid funding for local jurisdictions are projected to grow at 2% annually, consistent with current assumptions in the Metro COG area.

TABLE 9.13 ANTICIPATED LOCAL REVENUES THROUGH 2045

Jurisdiction	Short-Term 2019-2025	Mid-Term 2026-2035	Long-Term 2036-2045
Moorhead	$122,710,000	$231,230,000	$321,910,000
Dilworth	$4,690,000	$9,390,000	$13,890,000
Clay County*	$60,710,000	$103,020,000	$129,070,000
Fargo	$246,790,000	$493,660,000	$730,740,000
West Fargo	$102,860,000	$201,760,000	$292,940,000
Cass County* **	$109,240,000	$195,940,000	$238,840,000
Horace	$8,870,000	$18,370,000	$25,880,000

* Revenues for Cass and Clay County reflect the entire county, not just the Metro COG area.

** Cass County revenues come from Cass County Comprehensive Highway Plan

Future System Investment Requirements

Before "new" projects such as capacity expansion on system management enhancements can be considered, costs associated with maintaining our current system need to be identified and have funding sources associated with them. At the Metro Grow plan's core is the goal of preserving our current transportation system, and the funding analysis effort considers maintaining and rehabilitating our current system first. The majority of transportation preservation and rehabilitation projects in the region use local funding. It is critical that the MTP address the **Operations and Maintenance (O&M)** of transportation system in identifying the future investment requirements on the system. The O&M costs were developed by reviewing current local budgets and CIPs where available, using budgeted and historic pavement and bridge spending levels. The current 2019-2022 TIP also provides O&M estimates, based on a planning-level methodology developed in the 2040 transportation plan. If both were available, the more conservative of the two numbers was used. Current O&M costs for each jurisdiction are shown in TABLE 9.14.

TABLE 9.14 ANNUAL O&M COSTS (IN 2019 DOLLARS)

Jurisdiction	2019 Annual O&M Cost Estimate
MnDOT	$3,836,000
Moorhead	$6,820,000
Dilworth	$594,000
Clay County	$2,950,000
NDDOT	$2,540,000
Fargo	$8,616,000
West Fargo	$2,900,000
Cass County	$8,828,000
Horace	$250,000[6]

SOURCES: City of Moorhead CIPs, Clay County 5-year program, City of Fargo CIPs, City of West Fargo 2018 CIP, Cass County Highway Comprehensive Plan (2018-2022), City of Horace CIP, 2019-2022 Metro COG Transportation Improvement Program

[6] Horace has a relatively new street system and has lower current costs. Due to Horace's fast growth, the city's O&M costs are projected to increase at a faster rate of 5% per year in the future.

In addition to understanding the costs associated with the O&M of the system, it is critical to understand the major capital investments required to preserve the street and roadway system, including **reconstruction and major rehabilitation projects.** As the system ages, assets deteriorate to a point where major capital spending is required. This effort of estimating the reconstruction and major rehabilitation requirements was completed through:

- Identification of future pavement investment needs through a planning-level pavement model. This model used the available pavement data from the jurisdictions, was adjusted with locally-available parameters, and estimated when major rehabilitation and reconstruction projects would be required.
- Verification of projects through interviews with jurisdiction staff. The model was rather complex due to the multiple jurisdictions datasets, and these interviews provided project-level verification of reconstruction and major rehabilitation projects for each jurisdiction.
- Application of a planning-level bridge model that used at the national bridge inventory to identify generalized bridge rehabilitation and replacement needs over the planning horizon. The bridge model used locally-tailored bridge costs and applied them over the planning horizon.

The identified major street reconstruction projects are shown by Jurisdiction in Appendix C. TABLE 9.15 provides the total required highway expenditures by time period for each jurisdiction.[7]

[7] O&M and reconstruction and major rehabilitation project costs are assumed to grow at 4% per year.

TABLE 9.15 PROJECTED JURISDICTIONAL STREET AND HIGHWAY EXPENDITURE REQUIREMENTS BY TIME BAND (IN YEAR OF EXPENDITURE DOLLARS)

	Short-Term 2019-2025			Mid-Term 2026-2035		Long-Term 2036-2045	
Jurisdiction	O&M	TIP Spending (2019-2022)	Reconstruct and Major Rehabilitation*	O&M	Reconstruct and Major Rehabilitation	O&M	Reconstruct and Major Rehabilitation*
MnDOT	$30,300,000	$13,530,000	$17,280,000	$60,610,000	$206,030,000	$89,720,000	$112,940,000
Moorhead	$53,870,000	$3,880,000	$19,770,000	$107,750,000	$55,400,000	$159,500,000	$118,550,000
Dilworth	$4,690,000	$0	$0	$9,390,000	$0	$13,890,000	$0
Clay County	$23,300,000	$4,820,000	$10,850,000	$46,610,000	$49,770,000	$68,990,000	$49,570,000
NDDOT	$20,060,000	$66,020,000	$0	$40,130,000	$131,450,000	$59,410,000	$324,940,000
Fargo	$68,050,000	$28,820,000	$59,960,000	$136,130,000	$258,580,000	$201,510,000	$328,520,000
West Fargo	$22,910,000	$16,250,000	$1,640,000	$45,820,000	$63,470,000	$67,820,000	$88,210,000
Horace	$2,040,000	$0	$2,660,000	$4,980,000	$5,510,000	$7,370,000	$7,760,000
Cass County	$61,520,000	$770,000	$35,800,000	$122,290,000	$45,790,000	$181,010,000	$55,860,000

* Note – Local matching funds included in current TIP for reconstruction projects are removed from this total.

Local Funding Available for New Projects

As noted earlier, many new Federal-Aid eligible projects in the region are funded completely with local funds, or are funded with a larger portion of local share than required. To get a complete picture of funding, it is critical to identify a reasonable level of locally-available funding for new projects and for local matching dollars for Federal funds. To determine the levels of local funding available for new projects, the anticipated local revenues through 2045 (shown in TABLE 9.13) were compared to the anticipated system costs for the required O&M, current 2019-2022 TIP spending, and reconstruction and major rehabilitation projects by jurisdiction (shown in TABLE 9.15). TABLE 9.16 shows the comparison of Local and State system funds available for new projects after system maintenance and preservation requirements are factored in. The deficits shown for MnDOT and NDDOT in TABLE 9.16 reflect projected future NHPP levels (based on funding trends for the past 10 years) compared to anticipated maintenance and preservation requirements.

Based on the comparison of anticipated local revenues and required O&M and reconstruction projects, it is determined that:

- Both Minnesota and North Dakota will need funding levels higher than recent levels spent in the Metro COG area to preserve and maintain the existing State roadway system, particularly NHS routes. Based on the need to reconstruct the Interstate system on both the Minnesota and North Dakota side, historical NHPP funding levels are not anticipated to be sufficient to match anticipated future needs, particularly in the mid-term and long-term. Funding for the state highway system is cyclical by region throughout both states, and the need for a major reconstruction of the system arises in each region every few decades. Anticipated NHPP funding shown in this document was based on the past 10 years of funding, which was a period of limited major reconstruction of the system. It is assumed that the states of Minnesota and North Dakota will identify more funding to address these major system preservation needs in the Metro COG area. However, it is assumed that no new state system expansion projects will be included on the fiscally-constrained plan given these significant reconstruction investments.

- Cass and Clay County will likely need all current revenues in the Metro COG area for system maintenance and preservation. Both counties had moderate surpluses when county-wide revenues were compared to the maintenance and preservation needs of just the Metro COG area of their jurisdictions. However, if the preservation needs of the Metro COG area were extrapolated to the remainder of their system, the preservation costs would likely consume their remaining future revenues.
- Fargo, Moorhead, West Fargo, and Horace are anticipated to have sufficient funding levels through 2045 to participate in new projects. In particular, current funding capacity compared to anticipated long-term pavement and bridge needs, indicates that the cities of Fargo, West Fargo and Moorhead are well-positioned to be able to use local funding to match funding on Federal-Aid projects.
- Dilworth is anticipated to have funding for maintaining the current system, but limited funds and likely not enough to pay for any system expansion projects.

TABLE 9.16 BALANCE OF FUNDS AVAILABLE FOR FUTURE NEW TRANSPORTATION PROJECTS WITH LOCAL FUNDS

Jurisdiction	Short-Term 2019-2025	Mid-Term 2026-2035	Long-Term 2036-2045
MnDOT*	Funding higher than historical levels required		
Moorhead	$45,190,000	$68,080,000	$43,860,000
Dilworth	$0	$0	$0
Clay County**	$21,740,000	$6,640,000	$10,510,000
NDDOT*	Funding higher than historical levels required		
Fargo	$89,960,000	$98,950,000	$200,710,000
West Fargo	$62,060,000	$92,470,000	$136,910,000
Cass County**	$11,150,000	$27,860,000	$1,970,000
Horace	$4,170,000	$7,880,000	$10,750,000

* Note – During the 2008-2018 analysis period, MnDOT and NDDOT directed NHPP project funding levels to the Metro COG area that are lower than will be required for future system maintenance and reconstruction needs.

**Note – It was assumed that the preservation requirements for Clay and Cass Counties outside of the Metro COG area would use the remaining revenues in each county.

Potential Strategies and Priorities

Based on the transportation system performance assessments completed in Chapter 4, and the future trends and needs identified in Chapter 5, a range of potential system strategies were screened and prioritized for potential inclusion in the Metro Grow plan. Several other studies contributed to the development of these strategies, including:

- Metropolitan Bicycle and Pedestrian Plan (2016)
- 2016-2020 Transit Development Plan
- Southwest Metro Transportation Plan (2016)
- Regional Freight Plan (2017)
- Alternate Route & Traffic Incident Management (2017)

Strategy Development and Prioritization

A range of strategies were identified, and tailored based on previous studies and input received during plan development. Some guiding principles were established during strategy development. Those guiding principles are shown in the call out box on the right side of this page.

Complete critical connections in the bicycle and pedestrian network

Critical network gaps were identified in the 2016 Regional Bicycle and Pedestrian Study. The Metro Grow Plan should promote strategies to complete those connections.

Promote system management strategies in currently-developed corridors

Streets within mature, urban corridors that are already 4-lanes or 6-lanes wide should focus on management strategies (like technology, alternative intersection treatments, and minor geometry improvements) to improve traffic flow and provide a more multimodel environment.

Provide new street network and multimodal connections to future growth areas

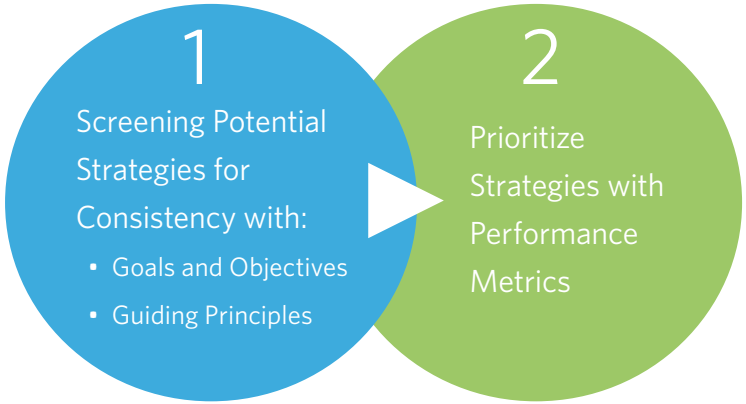
In new growth areas on the urban fringe, the plan should identify and preserve corridors for multimodal connections. This includes providing sidepaths and / or bike lanes when new arterial and collector corridors are constructed, and building right-sized streets that can be expanded with minimal impacts as travel demand increase in the future.

Identify potential transit strategies for the next Transit Development Plan to consider

The Metro Grow plan is relatively constrained in the level of transit improvements that can be included. This plan will carry forward transit strategies that support the multimodal regional vision for later consideration by the Transit Development Plan.

The strategy development process is shown below in FIGURE 10.1. As shown, the first step screened potential strategies for consistency with the regional goals and objectives, and the guiding principles outlined above. The second step was a prioritization process that developed project-level metrics that were based on the regional performance objectives. This performance-based approach used metrics that were tied to overall plan goals and performance measures.

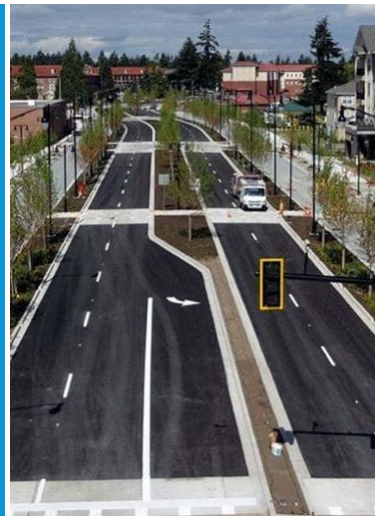
FIGURE 10.1 STRATEGY DEVELOPMENT AND PRIORITIZATION PROCESS



The range of strategies considered included:

Roadway

- Widening
- Signal Improvements
- Innovative Intersections
- Multiway Boulevards
- Expressway / Belt Routes
- Interstate Management:
- Ramp Metering
- Queue Warnings
- Traveler Information
- Dynamic Speed Limits
- Hard Shoulder Running
- Travel Demand Management



Bicycle and Pedestrian

- Sidepaths
- Multiuse Trails
- Shared Lanes
- Bike Lanes
- Cycle Tracks
- Grade Separations
- Curb Extensions / Bump Outs
- Median Pedestrian Refuge Islands
- Leading Pedestrian Interval at Signals
- Raised Crosswalks and Intersections
- Protected Intersections / "Dutch" Intersections
- Bike Boulevards

Transit

- Local Bus Strategies
- Express Bus Transit
- Bus Rapid Transit
- Street Car
- Microtransit (e.g., MATBUS Tap ride)

Travel Demand Management

- Alternative Work Schedules
- Car Sharing / Ridesharing / Vanpools
- Bike Sharing
- Parking Policy
- Telecommuting
- Public Transit, Biking and Walking Incentives and System Improvements

Prioritization Process

A multimodal prioritization process was developed, based on the public engagement received during plan development, Metro COG's performance measure requirements, and with direction from the Metro COG TTC. This prioritization process focused on bicycle / pedestrian and roadway projects, the primary project types that the Metro Grow plan was putting into implementation time frames. It is recommended that a similar performance-based prioritization process be used on the upcoming Transit Development Plan for multimodal consistency across the region.

TABLE 10.1 shows the bicycle and pedestrian project prioritization metrics, and TABLE 10.2 shows the street project prioritization metrics. As shown, each metric ties direction to a defined Metro Grow goal and objective. Details on project prioritization results are shown in Appendix D.

FIGURE 10.1 BICYCLE AND PEDESTRIAN PRIORITIZATION METRICS

Goal	Objectives	Prioritization Metrics
System Safety Goal	Reduce the number of bicycle and pedestrian crashes.	Project has potential to improve pedestrian safety in corridor with bicycle and pedestrian crash history.
		Project would improve the safety of bicycling or walking within 1/2 mile radius of a K-8 public school.
Travel Efficiency and Reliability Goal	Improve the connectivity of the street network and promote a grid street pattern.	Project would complete a street system connection where one does not currently existing, has the potential to reduce out-of-direction travel, and is context sensitive.
Walking and Bicycling Goal	Improve walking and biking connections and reduce network gaps.	Improves bicycle and / or pedestrian corridors in a zone which currently has low or moderate levels on walkability index.
	Promote active, mixed use developments that mix residential, work, and entertainment uses.	Project would be a significant new bicycle and pedestrian facility in an area / corridor with current or planned mixed land uses; or is consistent with recommendation of a corridor, comprehensive, or other planning study.
	Identify transportation projects that promote environments conducive to walking and biking.	Project would connect residential area to commercial or industrial center.
	Increase mode share for travel that is not single-occupant vehicle (SOV).	Project would increase non-SOV travel. Examples include: bike / ped projects, transit improvements, travel demand management program and strategies. Policy-based objective, too.
Economic Development and Transportation Decisions	Project would improve "first mile / last mile" access	Project would improve bicycle, pedestrian, or other modal connection between a large generator (higher-density residential, commercial, or industrial) and a MATBUS transit stop.
	Promote complete streets improvements in corridors that would see economic benefits.	Project improves walking or biking conditions in a defined Mixed Use Arterial, Mixed Use Collector, or Mixed Use Neighborhood corridor (based on Parking & Access study, apply to Moorhead).

FIGURE 10.2 ROADWAY PRIORITIZATION METRICS

Goal	Objective	Prioritization Metrics
System Safety and Security Goal	Reduce the number and rate of crashes.	Project has potential to reduce vehicular crashes.
	Reduce the number and rate of serious injury and fatal crashes.	Project has potential to reduce serious injury and fatal vehicular crashes.
	Identify strategies to make transportation infrastructure more resilient to natural and manmade events.	Project has potential to reduce flooding impact to connections, or provides a more resilient system to other hazards.
Travel Efficiency and Reliability Goal	Improve travel reliability on the National Highway System.	Project would improve safety or system management in a corridor with reliability issues. At a policy level, this would be part of the Congestion Management Plan and on-going system monitoring.
	Improve travel reliability on arterials.	
	Limit recurring peak period delay on the National Highway System.	Project would improve traffic operations / improve forecasted level-of-service (use LOS E/F as deficiency).
	Limit recurring peak period delay on arterial roadways.	
	Improve the connectivity of the street network and promote a grid street pattern.	Project would improve safety or system management in a corridor with reliability issues. At a policy level, this would be part of the Congestion Management Plan and on-going system monitoring.
	Promote the development of high-speed corridors for alternative routes.	Project would complete a street system connection where one does not currently exist, has the potential to reduce out-of-direction travel, and is context sensitive.
	Promote consistent corridor traffic flow with reduced starting and stopping.	Project would reduce create less starting and stopping of traffic. Examples include: corridor management, adaptive signals, freeway and arterial management technologies, and innovative intersections and street treatments.
Walking and Bicycling Goal	Promote active, mixed use developments that mix residential, work, and entertainment uses.	Related qualitative assessment of project elements that promote improved walking and biking.
Transit Access	Implement streetscape elements that support transit.	Project provides amenities that make transit usage more attractive and accessible. Examples include: ADA curbs, bike share stations, sidewalk improvements, and permanent stations.
Economic Development and Transportation Decisions	Improve freight reliability on the Interstate System to support regional and national commerce.	Project would improve freight safety or system management on Interstate system, per Federal performance measures.
	Enhance the regional economy.	Project is consistent with or directly supports regional economic development goals, or provides enhanced access to major employment centers.
	Promote financially sustainable transportation investments.	Project reduces long-term operations and / or maintenance costs.
	Manage access in commercial corridors to promote mobility.	Project reduces number of access points along defined Commercial Arterial corridor (based on Parking & Access study, apply to all cities). Also include TSMO and widening projects that improve mobility in Commercial Arterial corridors.
	Provide improvements to the truck freight system.	Project would increase corridor load limits, or provide an alternate route that could be used by heavy trucks.

MTP Policies

Introduction

One of the primary purposes of the MTP is to establish direction for how the region will manage and operate its transportation system over the long term. In addition to a rigorous exercise in setting regional vision and identifying projects for future implementation, the plan establishes transportation policy direction for the region.

This chapter presents a range of policies and considerations for Metro COG and its partner agencies. The policies are established around a range of topics related to the multimodal system. The plan articulates a vision for the future transportation system in light of projected growth in population and emerging transportation trends and technologies. The implementation of these policies will help guide the Fargo-Moorhead region towards the goals and objectives defined in this MTP. These policy goals aim to leverage the existing transportation system assets to develop a more efficient, equitable, and sustainable system that offers each resident of Fargo-Moorhead a range of options for safe and reliable mobility.

Roadway Congestion

Goal Area: Travel Efficiency and Reliability
Policy Objective: Manage roadway congestion through policies and actions that seek to utilize technical solutions and travel demand strategies rather than focusing only on investment in roadway expansion.

Roadway Congestion Policies

- Most of the roadway network in the metropolitan area operates at a high LOS and congestion is minimal. The Fargo-Moorhead area acknowledges that financial limitations may make it infeasible to eliminate short time frames of congestion or limited segments of peak hour congestion. Travel times and/or roadway congestion will increase as our metropolitan area grows. Short peak periods of congestion will be increasingly commonplace in situations where capacity-oriented roadway design is forgone or delayed in favor of providing roadways with characteristics that improve economic activity, economic development, and livability.

- Assessing and addressing roadway capacity and congestion must seek out a balance between peak hour traffic, daily traffic, travel times, travel demand (i.e. when trips are made), and the level of investment in the transportation network.
- Technical solutions, such as signal coordination, system management, intelligent transportation solutions (ITS) and travel demand management shall be studied and potentially implemented before resorting to six-lane roadways.
- Consolidated Planning Grant (CPG) funded planning projects shall be aimed at analyzing a broad array of transportation system management and operations (TSMO) strategies for handling traffic, rather than simply studying the number of travel lanes that will be needed in the future.
  - Evaluate 24 hour traffic, placing less emphasis on peak hour.
  - Document what peak "hour" really means in our area as far as LOS is concerned (i.e. peak traffic volumes are typically 15-30 minutes at many locations in the metropolitan area).
  - Investigate other methods of analyzing system performance other than LOS.
- Six-lane roadways, in particular, shall be implemented only a last resort after studying and implementing TSMO strategies and technologies aimed at maximizing roadway network efficiency, utility, and safety. The transportation network should be analyzed in order to identify feasible alternate routes along with corridor functionality and corresponding characteristics such as speed, stop control, livability, and size.

Travel Behavior

Goal Area: Travel Efficiency and Reliability
Policy Objective: Address peak hour traffic concerns through engaging with regional employers and educational institutions to promote flexible work start and end times.

Travel Behavior Policy

- Work towards a region where flexibility is provided to employees and students to begin and end work at a variety of times will reduce peak hour traffic volumes and make traffic easier to manage without capacity improvements. Educating employers and leaders of educational institutions in the region will help promote the message that spreading peak hour travel demand will help maintain lower travel times without implementing costly roadway expansion projects.

System Connectivity

Goal Area: Travel Efficiency and Reliability
Policy Objective: A high level of system connectivity is a priority for the metropolitan area's expanding fringe area road network.

System Connectivity Policies

Maintain and promote a highly-connected multimodal system in the metropolitan area. Specifically:

- A fine-grained and highly-connected local roadway network helps disperse traffic and spread the burden of traffic more evenly across neighborhood streets.
  - Smaller, connected blocks, higher density of development, mixed land use including neighborhood commercial and/or lifestyle centers (i.e. mini-downtowns), and walkability that does not involve high volume arterial roadways and intersections are desirable characteristics of new neighborhoods.
- Collector street connectivity is vital to dispersing traffic within the arterial framework. Collector streets support the arterial roadways and a well-connected collector street system can help prevent the need for costly capacity expansion on arterial roadways. Money spent to improve collector street connectivity will help reduce heavy investments in arterial capacity expansion.
  - Preserve collector street connectivity at barriers such as interstates and drains (i.e. off-section line roadways) with bridges, particularly in new growth areas.
- Arterial roadways are vital to the metropolitan area's roadway framework, carrying the highest volumes of traffic. Where feasible, section line roadways shall continue to be designated as arterials. When not feasible, alternative alignments shall be pursued.
  - Local jurisdictions shall carefully manage the locations and spacing of access points and intersections along arterial roadways, minimizing signalization wherever possible.
  - Uninterrupted flow is the priority for arterial roadways, and is more important to functionality than high rates of speed (i.e. over 45 mph).
- Interstate Highways 94 and 29 are primarily aimed at serving regional traffic entering, exiting and traveling through the metropolitan area. Metro COG and local jurisdictions will collaborate with NDDOT and MNDOT to improve or preserve uninterrupted traffic flow on the interstate highways and identify optimal locations for interchanges.
- State routes will continue to be important to our metropolitan area, and the state route network should grow as the metropolitan area grows.

Growth Areas

Goal Area: Economic Development and Transportation Decisions
Policy Objective: Improve coordination between local jurisdictions in the FM Metro COG region regarding future land use and transportation system decisions.

Growth Area Policy

In its growth areas, our metropolitan area will work toward updating plans and ordinances that seek to:

- Prevent sprawl by promoting orderly growth with increased density.
- Plan for and implement access control to ensure smooth flow of traffic on the expanded roadway network.
- Ensure that land use plans, ordinances, and developer agreements are in place and have established development expectations prior to extending roadways into new growth areas.

Walking and Bicycling

Goal Area: Walking and Bicycling
Policy Objective: Promote bicycling and pedestrian facilities in future roadway developments and encourage non-motorized transport connections within all FM Metro COG jurisdictions.

Walking and Biking Policies

- Bicycle and pedestrian facilities shall be considered of equal importance as vehicular mobility when studying metropolitan area roadway corridors, and as part of subsequent environmental review, design, and on-going maintenance. Complete Streets is the accepted policy for all local, collector, and arterial roadways with the exception of interstate highways.
- Metropolitan area jurisdictions acknowledge that the product of new growth areas, and the extent to which they create an environment that supports walking and bicycling, is the direct result of urban form, density, land use combinations, connectivity of bicycle/pedestrian infrastructure and street connectivity, and that non-motorized transportation will not be increased only through implementation of Complete Streets.
- In our planning, design, programming of funds, and maintenance of facilities, the connectivity of bicycle and pedestrian facilities must be given equal priority to the vehicular roadway network throughout the metropolitan area.
- Metro COG supports bicycle and pedestrian amenities for transportation purposes that exist separate from auto facilities. Ideally, such bicycle and pedestrian facilities would be integrated into urban environment in such a way that non-motorized transportation competes favorably with driving when it comes to localized travel.

Transit

Goal Area: Transit Access
Policy Objective: Foster a transit-supportive environment through future land use, zoning, and urban design decisions so that transit serves as a strong alternative to private vehicle use.

Transit Policies

- Metropolitan area jurisdictions acknowledge that the product of new growth areas, and the extent to which they create a transit supportive environment, is directly tied to urban form, density and land use combinations. Land use, zoning, and urban design must be carried out in concert with transit route planning, to ensure development of transit supportive corridors, along which transit is a feasible, easily accessible form of transportation in future growth and infill areas.
- As our metropolitan area grows, and our population continues to diversify, use of transit as a choice and as a need is expected to grow. Our citizens will benefit when all regional and municipal efforts, ranging from transportation planning, land use planning, urban design, workforce housing, education, healthcare and childcare, work together to create a transit supportive environment.

Freight

Goal Area: Economic Development and Transportation Decisions
Policy Objective: Maintain the current land use and transportation facilities that support freight activities as freight services are a critical aspect of the regional economy.

Freight Policy

- Our metropolitan area's land use patterns and transportation facilities are currently "freight friendly". It is our policy to continue facilitating the movement of goods into and out of our metropolitan area, as we recognize that reliable freight services are vital to economy and our quality of life.

Preservation and Maintenance

Goal Area: Transportation Infrastructure
Policy Objective: Prioritize investments in our roadway network that preserve and maintain existing facilities rather than the construction of new ones.

Preservation and Maintenance Policies

- Preserving and maintaining our existing network takes a higher priority than expanding the network.
- Maintenance of roadways is essential to safe bicycling on roadways, and therefore encourages non-motorized transportation.
- Our region looks for ways to improve corridors from a multi-modal perspective when planning and implementing rehabilitation and reconstruction projects.

Emerging Trends

Goal Area: Emerging Transportation Trends
Policy Objective: Consider and plan for the role of emerging transportation technologies in future roadway projects so that the metropolitan area can seamlessly integrate them into the future transportation system.

Emerging Trends Policies

- New projects should incorporate technology components that allow our metropolitan area to be ready for new technologies such as connected vehicles, autonomous vehicles, drones, and forms of micro mobility such as electric scooters and bike share.
- To prepare for micro mobility features such as electric scooters, local governments are encouraged to prepare and adopt ordinances to ensure they are an asset to transportation and prevent them from becoming a hazard or nuisance.

Economic Development

Goal Area: Economic Development and Transportation Decisions
Policy Objective: Stimulate economic development through planning more walkable and livable neighborhoods that improve residential quality of life.

Economic Development Policy

- Transportation is tied to economic development in a variety of ways. Higher volumes and speeds do not consistently equate to higher levels of investment. Lower speeds and higher levels of walkability equate to greater investment, higher levels of vitality, and improved neighborhood quality of life in many situations.

Metro COG will continue working with member agencies to designate livable corridors, where complete street and quality of life amenities outweigh vehicular movements.

Land Use

Goal Area: Environmental Sustainability
Policy Objective: Enact transportation-supportive land use policies that maintain system connectivity and accessibility as the metropolitan region's population and employment levels increase.

Land Use Policies

- Metro COG serves as a regional supporter and, to some extent, steward of land use and urban form, due to the inseparable relationships between land use and transportation.
- Metro COG will continue to advocate for inclusion in conversations with local agencies on land use decisions that will have significant impacts on the transportation network, and advocate for the ability to provide input on these decisions.
- In the interest of managing the transportation network, Metro COG's transportation-supportive land use policies are aimed at:
  - High levels of system connectivity
  - Higher-density transit-supportive corridors
  - Master planning of new growth areas with strong guidance toward higher densities and mixed use
  - Strong policies and practice of right-of-way preservation for all levels of the roadway hierarchy to ensure optimal connectivity

Complete Streets

Multiple Goal Areas
Policy Objective: Utilize the adopted Complete Streets Policy to ensure future roads are planned and designed in the appropriate context that maximizes their connectivity and accessibility.

Complete Streets Policy

- Metro COG's adopted Complete Streets Policy calls for the incorporation of multimodal features and accommodations on the roadway network within the metropolitan area. It is understood that not all roadways are or will be suitable to all modes of transportation, but each street should be planned and designed to accommodate the modes for which that roadway is critical for system connectivity and accessibility.

Future Transportation System

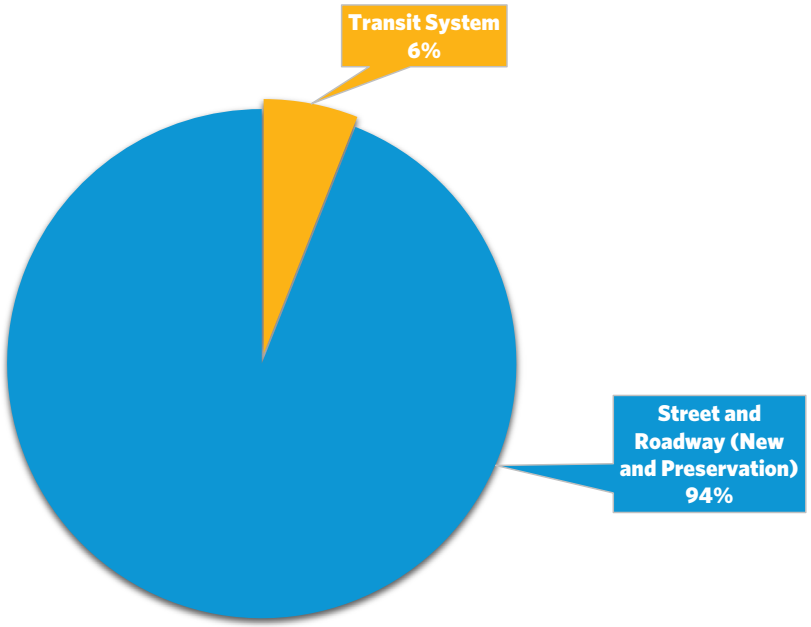
Future Funding Allocations

STBG funds are a flexible funding source that are eligible to be spent on a range of transportation improvements, including roadway, bicycle and pedestrian, and transit capital. As previously noted, it is anticipated that in 2023 Metro COG will be provided a direct sub-allocation of STBG funds. Through development of the Metro Grow plan, it became clear that some shift in regional funding levels was warranted to meet regional mobility and safety goals.

In recent years, the use of STBG funds in the Metro COG region had been for nearly only roadway maintenance and improvement projects. Over the past three years, some STBG funding had gone towards bus purchases for MATBUS, so that the allocation of funding has recently been: 94% roadway and 6% transit. The past trends of STBG funding is shown in FIGURE 12.1.

It was noted that the North Dakota side had typically spent more of their STBG roadway monies on expansion, and the Minnesota side had typically spent more of their STBG roadway monies on preservation. The combined Metropolitan totals were approximately 60% new and widening projects and 34% preservation projects (with 6% going to transit capital).

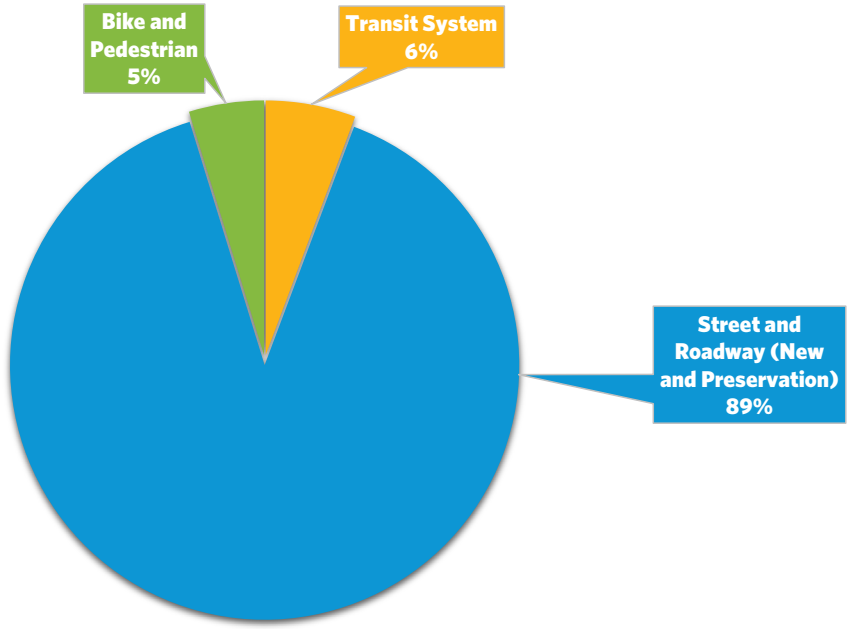
FIGURE 12.1: HISTORICAL METRO COG STBG SPENDING ALLOCATION



Through the Metro Grow planning process, the future modal spending targets have been shifted to support the multimodal goals, performance measures, and congestion management objectives. As shown in FIGURE 12.2, future modal funding levels for both states' STBG monies are:

- 89% Roadway Expansion and Preservation
- 6% Transit
- 5% Bicycle / pedestrian

FIGURE 12.2: FUTURE METRO COG STBG SPENDING ALLOCATION



The result of this funding target is shown in TABLE 12.1 and TABLE 12.2 shows the Minnesota side STBG funding levels and TABLE 12.2 shows the North Dakota side STBG funding levels. These funding allocations will move Metro COG closer to its performance, policy, and congestion management goals by providing a more extensive, connected, and safe bicycle and pedestrian system. At the same time, it will allow the region to continue meeting its system preservation targets as demonstrated in the Performance and Financial Chapters, as the local jurisdictions have the financial resources to continue meeting the system preservation needs of the system.

Based on the target established by the committee, the following STBG funding levels were established for the MTP's 2023-2045 periods:

- Short-Term (2023-2025 – beyond current 2019-2022 TIP)
- Near Mid-Term (2026-2029)
- Far Mid-Term (2030-2035)
- Long-Term (2036-2045)

Note that for the future system implementation plan, the Mid Term period has been broken down into Near Mid-Term and Far Mid-Term. This refinement to timing was completed so the MTP would provide Metro COG a fiscally-constrained project list that covers the necessary time periods (2023-2029) that would identify projects for inclusion in all TIPs (2019-2024) during Metro Grow's life cycle.

The next section describes the future roadway network projects included in the Metro Grow plan.

TABLE 12.1: TOTAL STBG FUNDING LEVELS - MINNESOTA

Time Frame	Roadway	Transit	Bike / Ped	Total
Short Term	$3,121,068	$210,409	$175,341	$3,506,819
Near Mid Term	$4,384,310	$295,571	$246,310	$4,926,191
Far Mid Term	$7,086,029	$477,710	$398,092	$7,961,831
Long Term	$13,311,797	$897,425	$747,854	$14,957,076
Total	$27,903,205	$1,881,115	$1,567,596	$31,351,916

TABLE 12.2: TOTAL STBG FUNDING LEVELS – NORTH DAKOTA

Time Frame	Roadway	Transit	Bike / Ped	Total
Short Term	$35,957,010	$2,424,068	$2,020,057	$40,401,135
Near Mid Term	$50,510,485	$3,405,201	$2,837,668	$56,753,354
Far Mid Term	$81,636,283	$5,503,570	$4,586,308	$91,726,161
Long Term	$153,361,720	$10,338,992	$8,615,827	$172,316,539
Total	$321,465,498	$21,671,831	$18,059,859	$361,197,189

Future Roadway Plan

The future roadway plan is a combination of STBG-Funded projects, locally- and state-funded projects, and NHPP-funded projects on the Interstate and other National Highway System routes. Potential safety projects were identified in the safety section of Chapter 13, depending on the availability of HSIP and / or local funding to implement them. The roadway projects included in the fiscally-constrained plan are shown in Figure 12-3 (urban view) and Figure 12-4 (regional view) along with their project ID that matches up with the project tables..

STBG-Funded Projects

The STBG program is the primary source of Metro COG-controlled funding for the roadway plan. Based on the project prioritization, the highest need on Federally-eligible roadway preservation projects, and input from agency staff on project timing requirements, the fiscally-constrained roadway project plan was established. TABLES 12.3 through 12.8 provide a summary of the draft roadway projects selected in the workshop by implementation period.

Locally-Funded and State-Funded Projects

There were several key projects identified for the short term and near-mid term that are anticipated to be funded with non-Federal funds. These projects are shown in FIGURES 12.3 and 12.4, and include key elements such as:

- System management projects, particularly signal improvements and adaptive signal implementation in key arterial corridors in Fargo.

- Reconstruction projects along US 10 (Center Ave) and US 75 (8th Street), which will include some corridor management improvements.

The remainder of this section provides a breakdown of roadway projects identified for STBG funding. The tables include:

- Project number and description
- Anticipated project cost (in 2019$ and year-of-expenditure$)
- STBG funding levels
- Local match funding levels
- Breakdown of costs and funding by state

FIGURE 12.3: FUTURE ROADWAY PLAN, FISCALLY-CONSTRAINED PROJECTS, URBAN VIEW

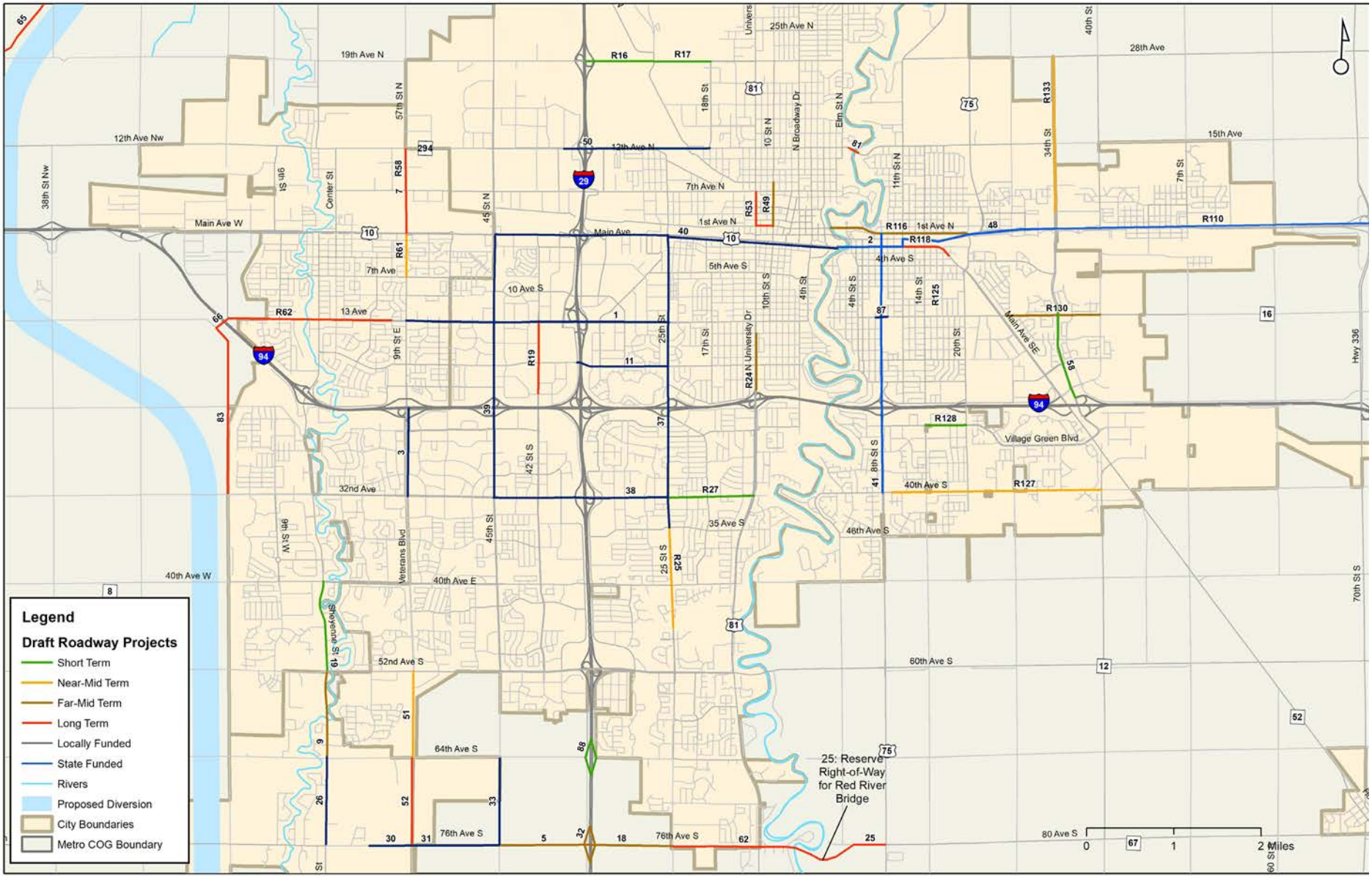


FIGURE 12.4: FUTURE ROADWAY PLAN, FISCALLY-CONSTRAINED PROJECTS, REGIONAL VIEW

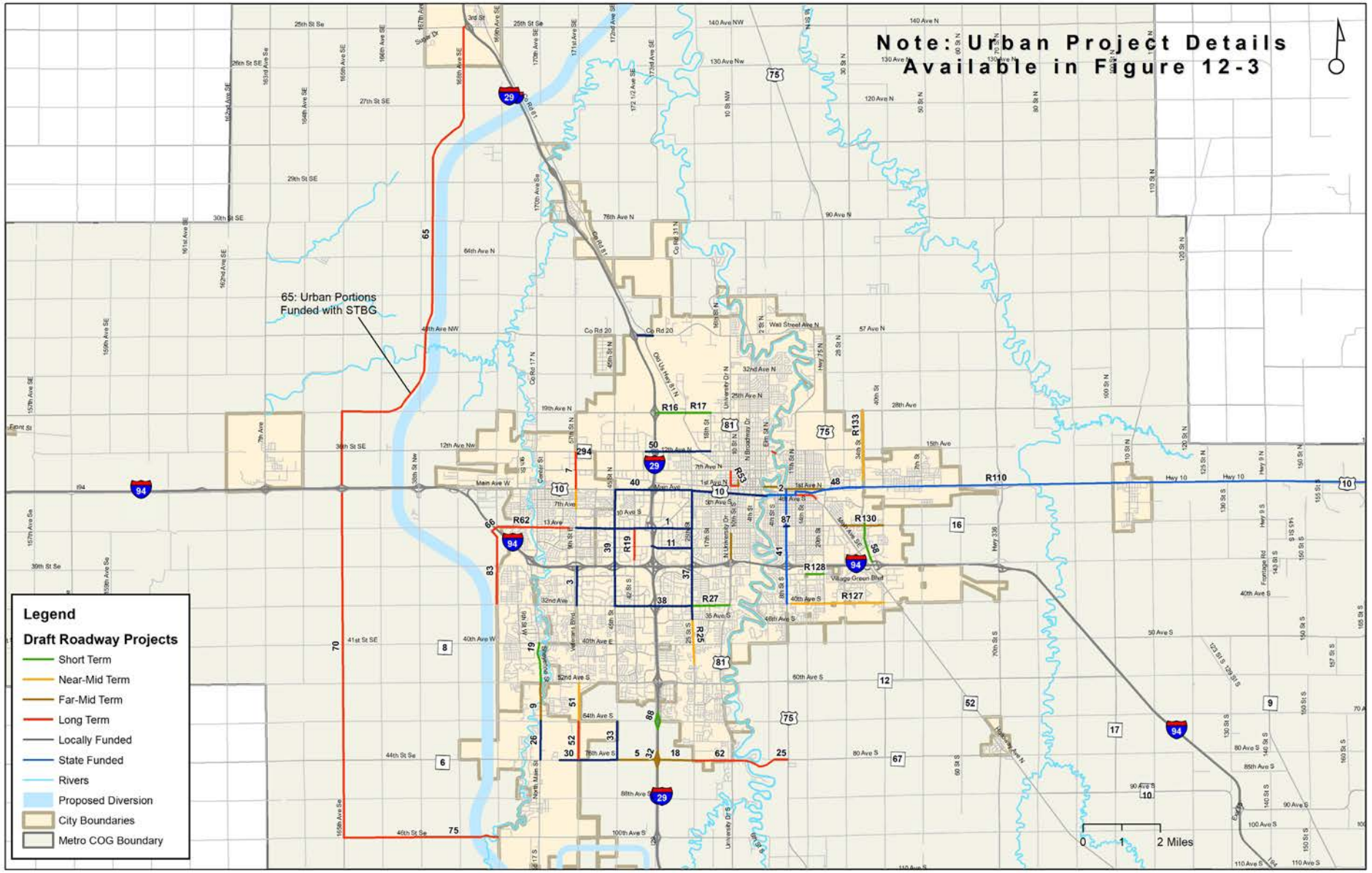


TABLE 12.3: SHORT TERM (2023-2025) ROADWAY PROJECTS BY JURISDICTION

Project ID	Corridor	From	To	Project Type	Project Jurisdiction	Cost Estimate (2019)	Short Term (2023-2025) Costs	STBG Funds	Local Funds
Minnesota Projects									
58*	34th St	I-94	12th Ave S	Corridor Management/ Preservation*	Moorhead	$3,300,000	$4,010,000	$1,888,710	$2,121,290
R128	S 30th Ave	S 14th St	S 20th St	Preservation	Moorhead	$1,868,000	$2,610,000	$1,229,310	$1,380,690
North Dakota Projects									
19	Sheyenne St	40th Ave S	52nd Ave S	Roadway Widening	West Fargo	$7,725,000	$9,400,000	$7,520,000	$1,880,000
88	I-29	at 64th Ave S		Interchange	Fargo/NDDOT	$18,000,000	$21,900,000	$12,797,000	$9,103,000
R16	19th Ave N	I-29	Dakota Dr N	Preservation	Fargo	$5,000,000	$6,080,000	$4,864,000	$1,216,000
R17	19th Ave N	Dakota Dr N	18th St N	Preservation	Fargo	$4,200,000	$5,110,000	$4,088,000	$1,022,000
R27	32nd Ave S	25th St	University	Preservation	Fargo	$7,900,000	$9,610,000	$6,688,000	$2,922,000
Total							$58,720,000	$39,075,020	$19,644,980
Minnesota							$6,620,000	$3,118,020	$3,501,980
North Dakota							$52,100,000	$35,957,000	$16,143,000

* Note that the 34th Street project is a roadway preservation project that includes some corridor management elements like correcting turn lane offsets and signal retiming.

TABLE 12.4: NEAR MID TERM (2026-2029) ROADWAY PROJECTS BY JURISDICTION

Project ID	Corridor	From	To	Project Type	Project Jurisdiction	Cost Estimate (2019)	Near Mid Term (2026-2029) Costs	STBG Funds	Local Funds
Minnesota Projects									
R127	40th Ave S	9th St S	40th St S	Preservation	Moorhead	$3,900,000	$5,400,000	$2,300,000	$3,100,000
R133	34th St N	3rd Ave NW	28th Ave N	Preservation	Moorhead	$3,500,000	$4,900,000	$2,080,000	$2,820,000
North Dakota Projects									
51	Veterans Blvd	52nd Ave S	64th Ave S	New Street	Fargo / Horace	$7,425,000	$10,400,000	$8,320,000	$2,080,000
R25	25th St S	25th St 0.13 mi N Rose Creek	23rd Ave	Preservation	Fargo	$18,400,000	$25,700,000	$20,560,000	$5,140,000
R58	9th St NE	Main Ave E	12th Ave NE	Preservation	West Fargo	$5,500,000	$7,700,000	$6,160,000	$1,540,000
R61	9th St E	7th Ave E	Main Ave E	Preservation	West Fargo	$3,300,000	$4,600,000	$3,680,000	$920,000
Total							$53,300,000	$43,100,000	$12,500,000
Minnesota							$4,900,000	$4,380,000	$2,820,000
North Dakota							$48,400,000	$38,720,000	$9,680,000

TABLE 12.5: FAR MID TERM (2030-2035) ROADWAY PROJECTS BY JURISDICTION

Project ID	Corridor	From	To	Project Type	Project Jurisdiction	Cost Estimate (2019)	Far Mid Term (2030-2035) Costs	STBG Funds	Local Funds
Minnesota Projects									
R116	N 1st Ave	2nd St N	US 10 E	Preservation	Moorhead	$6,400,000	$10,900,000	$5,050,000	$5,850,000
R130	S 12th Ave	Appletree Ln	40th St S	Preservation	Moorhead	$2,600,000	$4,400,000	$2,040,000	$2,360,000
North Dakota Projects									
5	76th Ave S	45th St	I-29	New Street	Fargo	$7,500,000	$12,700,000	$10,160,000	$2,540,000
9	Sheyenne St	52nd Ave S	64th Ave S	Roadway Widening	Horace	$7,275,000	$12,400,000	$9,920,000	$2,480,000
18	76th Ave S	I-29	25th St	New Street	Fargo	$14,425,000	$24,500,000	$19,600,000	$4,900,000
32	I-29	at 76th Ave		Interchange	Fargo/ NDDOT	$18,000,000	$30,600,000	$24,480,000	$6,120,000
52	Veterans Blvd	64th Ave S	76th Ave S	New Street	Fargo / Horace	$7,500,000	$12,700,000	$10,160,000	$2,540,000
R24	University Dr	University Dr .01 mi N of I94	14th Ave	Preservation	Fargo	$5,200,000	$8,800,000	$7,040,000	$1,760,000
R49	10th St N	1st Ave N	8th Ave N	Preservation	Fargo	$2,400,000	$4,100,000	$3,280,000	$820,000
Total							$110,200,000	$91,730,000	$23,520,000
Minnesota							$4,400,000	$7,090,000	$2,360,000
North Dakota							$105,800,000	$84,640,000	$21,160,000

TABLE 12.6: LONG TERM (2036-2045) ROADWAY PROJECTS BY JURISDICTION

Project ID	Corridor	From	To	Project Type	Project Jurisdiction	Cost Estimate (2019)	Long Term (2036-2045) Costs	STBG Funds	Local Funds
Minnesota Projects									
R118	Main Ave	S 11th St	S 3rd Ave	Reconstruction	Moorhead	$3,300,000	$11,550,000	$9,240,000	$2,310,000
North Dakota Projects									
7	9th St	Main Ave	12th Ave N	Grade Separation	West Fargo	$20,000,000	$46,480,000	$30,537,360	$15,942,640
25	76th Ave S / 80th Ave S	Red River (Forest River Road)	US 75	Preserve Right of Way for Future Bridge	Fargo / Clay County	$2,000,000	$4,650,000	$3,055,050	$1,594,950
52	Veterans Blvd	64th Ave S	76th Ave S	New Street	Fargo / Horace	$7,500,000	$17,430,000	$11,451,510	$5,978,490
62	76th Ave	25th St	Red River	Roadway Widening	Fargo	$9,900,000	$23,010,000	$15,117,570	$7,892,430
65	Northwest Regional Route	I-29	I-94	Expressway Route	Cass County-urban only	$6,000,000	$13,940,000	$9,158,580	$4,781,420
66	13th Ave	at I-94		Grade Separation	West Fargo	$12,180,000	$28,310,000	$18,599,670	$9,710,330
70	SW Beltway Route	I-94	100th Ave S	Expressway Route	Cass County	$3,000,000	$6,970,000	$4,579,290	$2,390,710
75	100th Ave S	38th St	Horace	Other	Cass County	$3,015,000	$7,010,000	$4,605,570	$2,404,430
81	12th Ave N / 15th Ave N	Elm Street (Fargo)	11th St N (Moorhead)	Raise Elevation of Bridge	Fargo / Moorhead	$10,300,000	$23,940,000	$15,728,580	$8,211,420
83	Approx 14th St	Potential 13th Ave	32nd Ave	New Street	West Fargo	$14,690,000	$34,140,000	$22,429,980	$11,710,020
R19	42nd St S	19th Ave	13th Ave	Preservation	Fargo	$6,600,000	$15,340,000	$10,078,380	$5,261,620
R53	University Dr N	10th St N	7th Ave N	Preservation	Fargo	$2,800,000	$6,510,000	$4,277,070	$2,232,930
R62	13th Avenue	Prairie Pkwy	15th St W	Preservation	West Fargo	$6,880,000	$15,990,000	$10,505,430	$5,484,570
Total							$255,270,000	$169,364,040	$85,905,960
Minnesota							$11,550,000	$9,240,000	$2,310,000
North Dakota							$243,720,000	$160,124,040	$83,595,960

Comparison of Initial Roadway Project Costs to Allocated STBG Roadway Funding

This section provides an analysis and summary of the project costs and funding levels (documented in TABLE 12.1 and TABLE 12.2). TABLE 12.7 provides a summary of the costs from the roadway projects that came out of the workshop, the STBG roadway funding levels, and the balance for each state by period. As noted previously, the STBG funding levels shown are a result of the desired modal split of 89% roadway, 6% transit, 5% bicycle and pedestrian.

TABLE 12.7: STBG ROADWAY BUDGET, COSTS AND FUNDS BALANCE BY PERIOD

	Minnesota	ND
Short Term (2023-2025) STBG Budget	$3,121,068	$35,957,010
Short Term STBG Costs	$3,118,020	$35,957,000
Short Term STBG Carry Over	$3,048	$10
Near Mid Term (2026-2029) STBG Budget	$4,384,310	$50,510,485
Short Term STBG Carry Over	$3,048	$10
Near Mid Term STBG Costs	$4,380,000	$38,720,000
Near Mid Term STBG Carry Over	$7,359	$11,790,495
Far Mid Term (2030-2035) STBG Budget	$7,086,029	$81,636,283
Near Mid Term STBG Carry Over	$7,359	$11,790,495
Far Mid Term STBG Costs	$7,090,000	$84,640,000
Far Mid Term STBG Carry Over to Next Period	$3,388	$8,786,779
Long Term (2036-2045) STBG Budget	$13,311,797	$13,311,797
Far Mid Term STBG Carry Over	$3,388	$8,786,779
Long Term STBG Costs	$9,240,000	$160,124,040
Long Term STBG Balance	$4,075,185	$2,024,458

Future Bicycle and Pedestrian System Priorities

The future bicycle and pedestrian projects are anticipated to come from two different funding sources:

- STBG dedicated bicycle and pedestrian funding set aside by Metro COG, as outlined in TABLE 12.1 and TABLE 12.2.

- Transportation Alternatives funding, which is anticipated to be competitive (not directly allocated to Metro COG).

The bike and pedestrian element of this plan focused on the highest-regional priority bicycle and pedestrian projects that emerged from the 2016 *Fargo-Moorhead Metropolitan Bicycle and Pedestrian Plan*, and applied the prioritization process outlined in Chapter 10 to identify the potential sequence of project implementation. These priority projects help support the Congestion Management Process laid out in Chapter 8.

The focus of the Metro Grow plan has been planning for a connected multimodal system, and a critical element common among the highest priority bicycle and pedestrian projects is that they complete system connections. The current *Fargo-Moorhead Metro Bikeways Gap Analysis* project is working to identify the most feasible implementation plan for many of the projects identified in this study.

Thus, the role of Metro Grow has been to identify anticipated bicycle and pedestrian system funding and project priorities. The bicycle and pedestrian system priority projects are shown in FIGURE 12.5 (urban view) and FIGURE 12.6 (regional view). Based on the prioritization process, TABLE 12.8 provides the priority bicycle and pedestrian projects by priority tier, including planning-level cost estimates for the base year and potential implementation periods.

FIGURE 12.5: BICYCLE AND PEDESTRIAN SYSTEM PRIORITY PROJECTS, URBAN VIEW

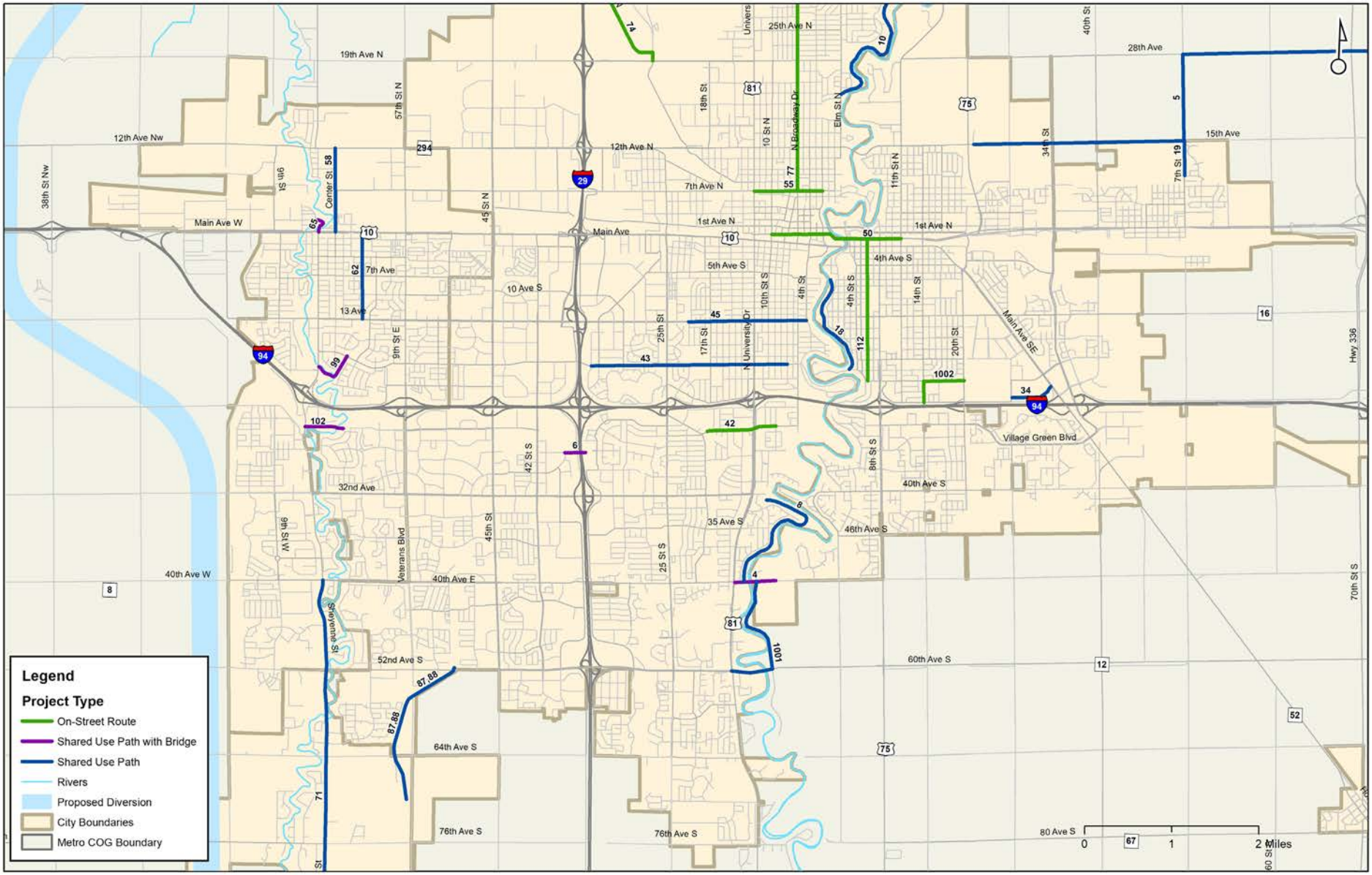


FIGURE 12.6: BICYCLE AND PEDESTRIAN SYSTEM PRIORITY PROJECTS, REGIONAL VIEW

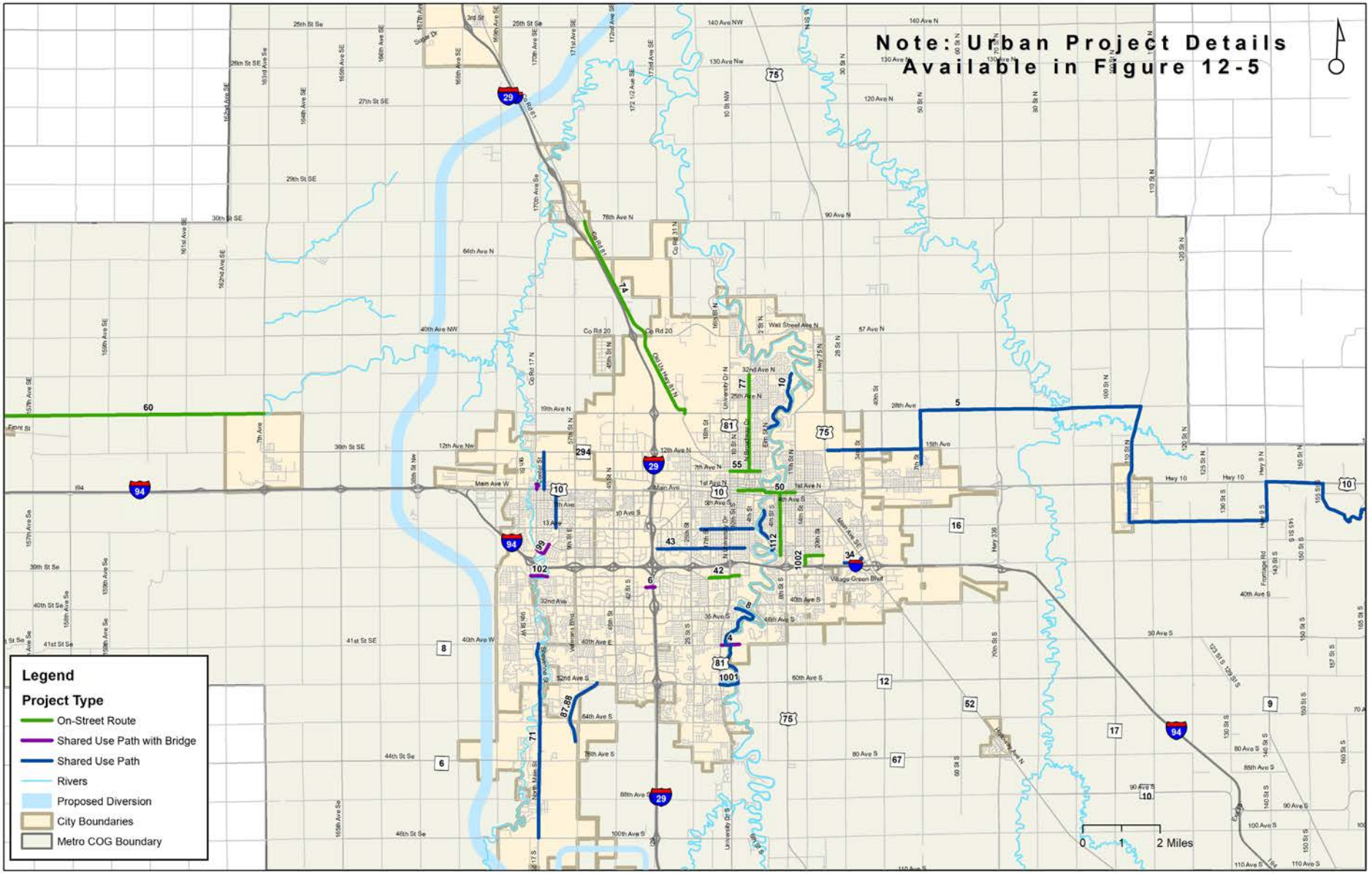


TABLE 12.8 BICYCLE AND PEDESTRIAN PRIORITY PROJECTS BY PRIORITY TIER

Project ID	Location	Project Jurisdiction	State	Cost Estimate (2019 $)	Short Term (2023-2025) Cost (YOE $)	Near-Mid Term (2026-2029) Cost (YOE$)	Far-Mid Term (2030-2035) Cost (YOE $)	Long Term (2036-2045) Cost (YOE $)
Highest Priority Tier								
42	24th Ave S - Milwaukee Trail to 9th St	Fargo	ND	$40,000	$50,000	$60,000	$70,000	$90,000
43	17th Ave S - 35th St to 5th St	Fargo	ND	$730,000	$890,000	$1,020,000	$1,240,000	$1,700,000
45	13th Ave S - 21st St to 4th St	Fargo	ND	$440,000	$540,000	$610,000	$750,000	$1,020,000
50	NP Ave - 10th St to Red River | Center Ave - Red River to 11th St	Fargo/ Moorhead	ND/ MN	$80,000	$100,000	$110,000	$140,000	$190,000
55	7th Ave N - Univeristy Dr to 2nd St	Fargo	ND	$40,000	$50,000	$60,000	$70,000	$90,000
62	Path over Drain 45 - Main Ave to 13th Ave	West Fargo	ND	$860,000	$1,050,000	$1,200,000	$1,460,000	$2,000,000
77	Broadway - 35th Ave N to 8th Ave N	Fargo	ND	$130,000	$160,000	$180,000	$220,000	$300,000
112	6th St - 24th Ave S to Center Ave (through Concordia campus)	Moorhead	MN	$80,000	$100,000	$110,000	$140,000	$190,000
1002	14th St and 24th Ave in south Moorhead	Moorhead	MN	$40,000	$50,000	$60,000	$70,000	$90,000

TABLE 12.8 (CONTINUED) BICYCLE AND PEDESTRIAN PRIORITY PROJECTS BY PRIORITY TIER

Project ID	Location	Project Jurisdiction	State	Cost Estimate (2019 $)	Short Term (2023-2025) Cost (YOE $)	Near-Mid Term (2026-2029) Cost (YOE$)	Far-Mid Term (2030-2035) Cost (YOE $)	Long Term (2036-2045) Cost (YOE $)
Second Priority Tier								
6	28th Ave S at I-29 Overpass / Underpass	Fargo	ND	$1,040,000	$1,270,000	$1,450,000	$1,770,000	$2,420,000
8	River Path - Lemke Park to 40th Ave S	Fargo	ND	$570,000	$690,000	$800,000	$970,000	$1,320,000
18	River Path - 6th Ave S to Gooseberry Park	Moorhead	MN	$390,000	$470,000	$540,000	$660,000	$910,000
34	27th Ave S - 26th St to SE Main Ave	Moorhead	MN	$163,000	$200,000	$230,000	$280,000	$380,000
58	Center St - 12th Ave NE to Main Ave	West Fargo	ND	$310,000	$380,000	$430,000	$530,000	$720,000
65	Sheyenne St to Armour Park	West Fargo	ND	$440,000	$540,000	$610,000	$750,000	$1,020,000
71	CR 17 - 40th Ave S to 100th Ave S	West Fargo/ Horace	ND	$1,640,000	$2,000,000	$2,290,000	$2,780,000	$3,810,000
74	CR 81 - 19th Ave N to Harwood	Fargo/ Cass County	ND	$1,730,000	$2,100,000	$2,410,000	$2,940,000	$4,020,000
99	17th Ave E to Sheyenne St (Charleswood Area) Path and Bridge	West Fargo	ND	$380,000	$460,000	$530,000	$650,000	$880,000
102	23rd Ave E to Sheyenne St Path and Bridge	West Fargo	ND	$550,000	$670,000	$770,000	$930,000	$1,280,000

TABLE 12.8 (CONTINUED) BICYCLE AND PEDESTRIAN PRIORITY PROJECTS BY PRIORITY TIER

Project ID	Location	Project Jurisdiction	State	Cost Estimate (2019 $)	Short Term (2023-2025) Cost (YOE $)	Near-Mid Term (2026-2029) Cost (YOE$)	Far-Mid Term (2030-2035) Cost (YOE $)	Long Term (2036-2045) Cost (YOE $)
Third Priority Tier								
4	Red River at 40th Ave S Path and Bridge	Fargo/ Moorhead	ND/ MN	$3,000,000	$3,650,000	$4,190,000	$5,090,000	$6,970,000
5	Future Heartland Trail - Moorhead to Hawley	Clay County	MN	$8,690,000	$10,570,000	$12,130,000	$14,760,000	$20,190,000
10	River Path - 32nd Ave N to 16th Ave N	Fargo	ND	$670,000	$820,000	$940,000	$1,140,000	$1,560,000
19	7th St NE - 8th Ave NE to 15th Ave NE	Dilworth	MN	$130,000	$160,000	$180,000	$220,000	$300,000
60	CR 10 - ND Hwy 18 to CR 11	Cass County	MN	$2,250,000	$2,740,000	$3,140,000	$3,820,000	$5,230,000
87,88	Path along Drain - 52nd Ave S to 70th Ave S	Fargo/ Horace	ND	$450,000	$550,000	$630,000	$760,000	$1,050,000
110	ND Hwy 46 - 163rd Ave SE to CR 81	NDDOT	ND	$3,590,000	$4,370,000	$5,010,000	$6,100,000	$8,340,000
1001	52nd Ave S/ 60th Ave S to Bluestem along Red River	Fargo/ Moorhead	ND/ MN	$1,910,000	$2,320,000	$2,670,000	$3,240,000	$4,440,000

Future Transit System Priorities

Continued operations and capital support for the transit system are anticipated to come from two different funding sources:

- FTA funding sources outlined in Chapter 9 for both operations and capital expenditures of the MATBUS system.
- STBG dedicated transit funding set aside by Metro COG, as outlined in TABLE 12.1 and TABLE 12.2. These funds will go towards capital costs, including continued bus replacement.

These two sources of funds will be applied towards maintaining the current system, providing:

- Support towards MATBUS's transit asset management performance measures for rolling stock, equipment, facilities, and infrastructure.
- Support for the Congestion Management Plan, outlined in Chapter 8.

In addition to meeting the needs of the current system, there are additional transit priorities that will be investigated in the upcoming regional Transit Development Plan. The Transit Development Plan is the implementation plan used by MATBUS for programming system priorities.

These transit strategies are shown in TABLE 12.9.

TABLE 12.9: POTENTIAL TRANSIT STRATEGIES

Potential Transit Strategy	Objective
Bus Replacement with FTA and STBG funds	Meet asset management performance targets
Replacement of Ground Transportation Center	Meet asset management performance targets
Upgrades to existing Bus Garage	Meet asset management performance targets, Improved Efficiency
Develop a transit hub at West Acres Mall	Improved System Efficiency and Connections
Develop a transit hub at Wal-Mart in Dilworth	Improved System Efficiency and Connections

Vision Plan

There are other transportation projects that are important for the region, but do not fit within the fiscally-constrained elements of the plan. These projects fit within the "Vision" elements of the plan, and remain priorities for the region between today and 2045.

Roadway Vision Plan

The roadway vision plan reflected a range of project types that fit into a few categories:

- Operational improvements to the Interstate system through the urban portions of the Metro COG region. An updated regional Interstate Operations Study is recommended. It is anticipated that particularly along I-94 between 34th Street in Moorhead and Sheyenne Avenue in West Fargo, and I-29 between Main Avenue and 52nd Avenue in Fargo, traffic operational and reliability issues will emerge during the planning horizon. It is anticipated that these improvements will involve Integrated Corridor Management strategies employing various technology and targeted bottleneck removals. As noted in the Financial Chapter, the funding source for these Interstate system projects would be NHPP funding, and would be required at higher levels than spent by both Minnesota and North Dakota over the past 10 years.
- Grade separation opportunities along railroads in Dilworth, Moorhead, and West Fargo. These projects tended to be relatively expensive and beyond the funding capacity of the STBG program. Grant opportunities and other funding sources should be pursued in the future to help implement these vision projects.
- New interchanges to support access to long-term growth areas in Moorhead. The levels of anticipated growth adjacent to these interchanges through 2045 are relatively limited. If growth rates accelerate during the Metro Grow plan life, these projects might become a higher priority.
- A new 76th Avenue / 80th Avenue Red River Crossing. A new river crossing would support system resiliency and connectivity goals of the Metro Grow plan, and would relieve growing traffic volumes on the 52nd Avenue South / 60th Avenue South bridge. As noted in Figures 12-3 and 12-4, the fiscally-constrained plan includes money to purchase bridge corridor right-of-way in the long term.
- Developer-funded collectors in growth areas. As outlined in the Policy Chapter, a grid street network will be encouraged in future developments. Many of these collectors were identified in the Southwest Metro Transportation Plan.

The roadway vision projects are shown in Figure 12-7(urban view) and Figure 12-8 (regional view). The roadway vision projects are described in Table 12-10.

FIGURE 12.7: ROADWAY VISION PROJECTS, URBAN VIEW

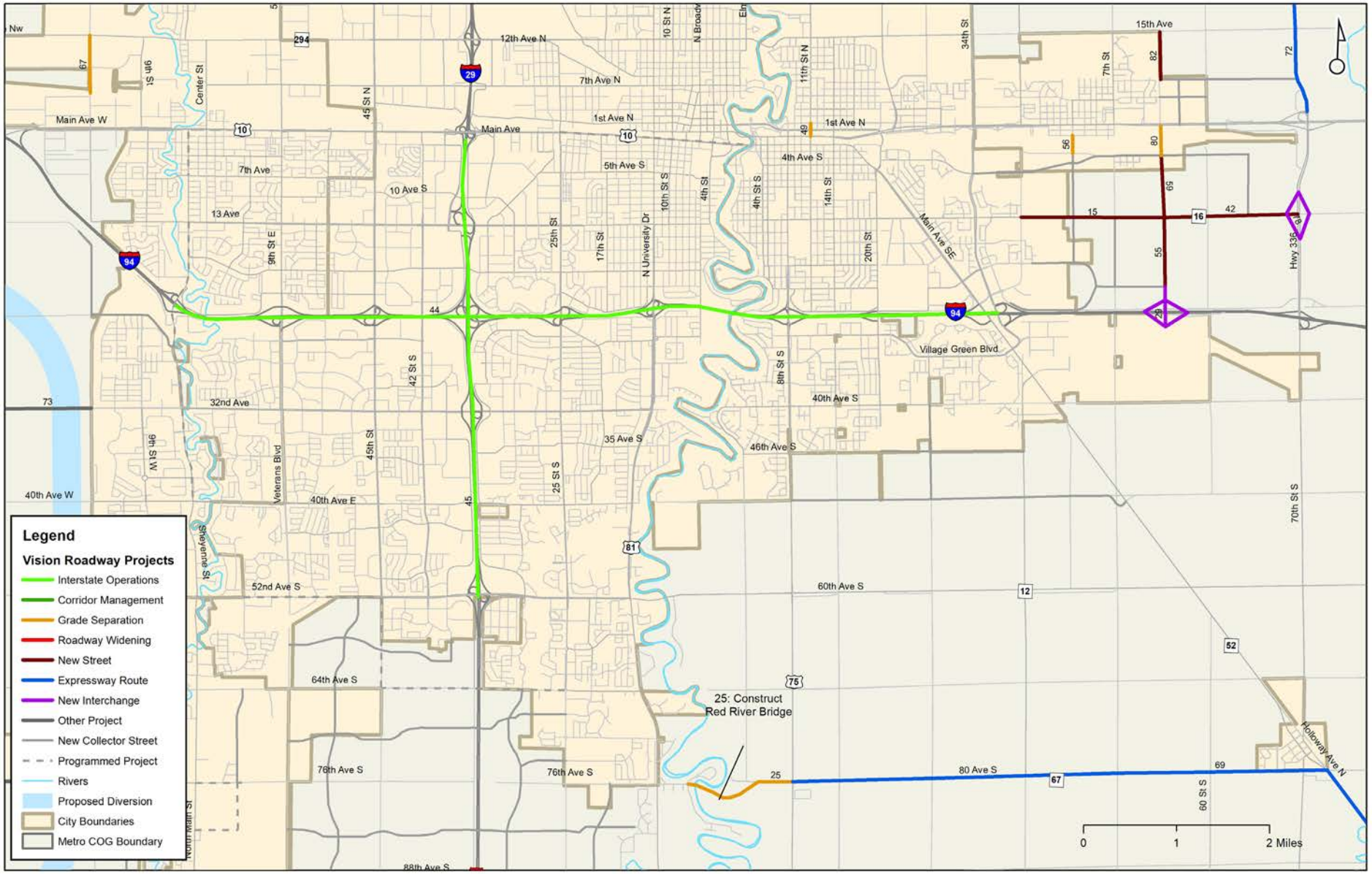


FIGURE 12.8: ROADWAY VISION PROJECTS, REGIONAL VIEW

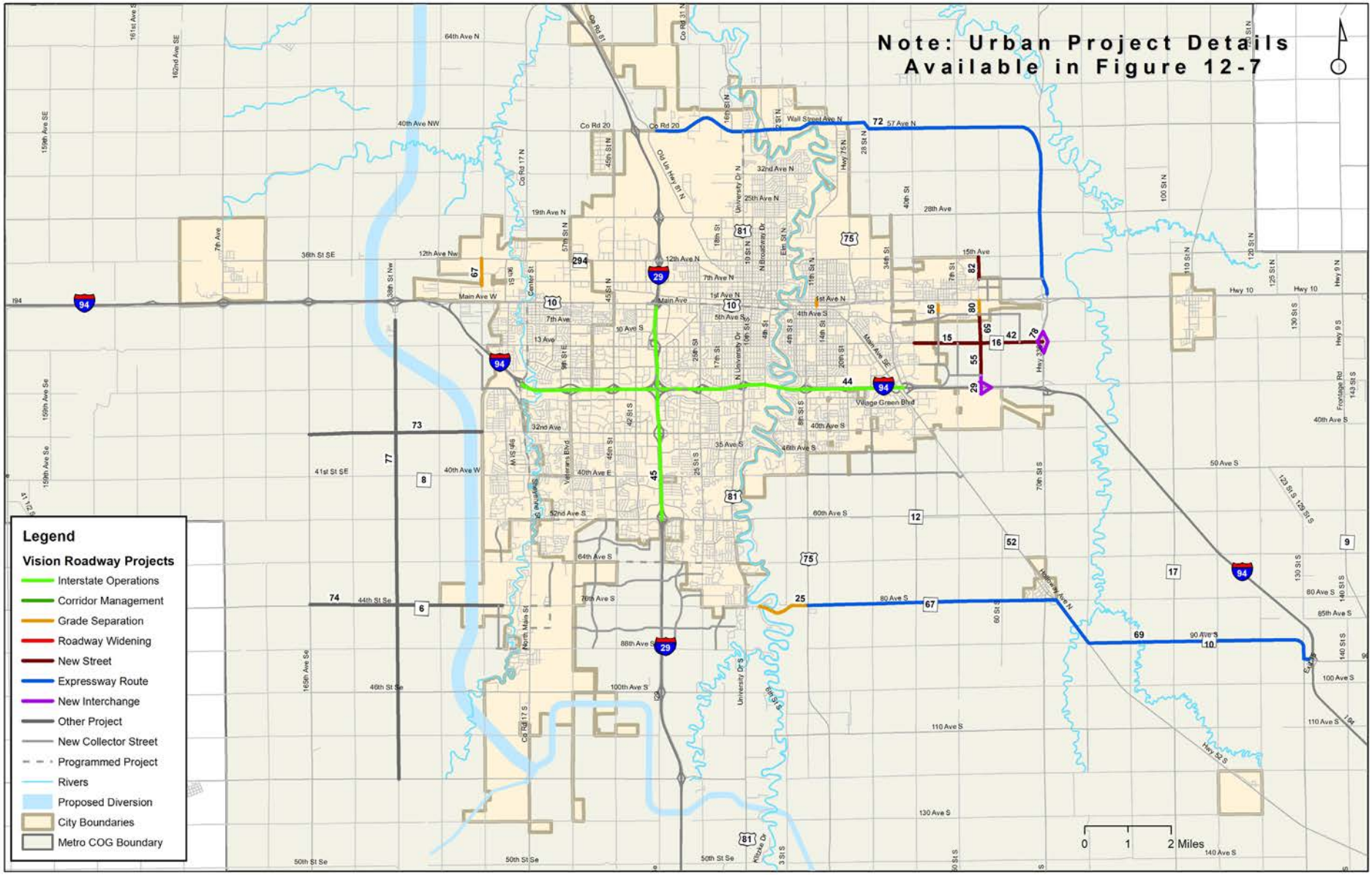


TABLE 12.10: VISION PLAN ROADWAY PROJECTS

Project ID	Corridor	From	To	Project Type	Project Description	Project Jurisdiction	Planning Level Cost Estimate (2019)
15	12th Ave S	40th St	55th St	New Street	Arterial to support fringe area growth.	Moorhead	$11,550,000
25	76th Ave S / 80th Ave S	Red River (Forest River Road)	US 75	Bridge over Red River	Project would construct Red River Bridge; fiscal constraint project acquires right-of-way. Would improve traffic operations on 52nd Ave bridge in long term.	Fargo / Clay County	$18,075,000
29	I-94	at 55th St		Interchange	Location to be determined. Potential long-term project from Moorhead Growth Area Plan Study.	MnDOT	$25,000,000
42	12th Ave	55th St	Hwy 336	New Street	Arterial to support fringe area growth.	Moorhead	$7,200,000
44	I-94	Sheyenne St	34th St (Moorhead)	Interstate Operations	New Interstate operations study to refine recommendations. Implement improvements with reconstruction projects.	NDDOT / MnDOT	$19,032,000
45	I-29	Main Ave	52nd Ave S	Interstate Operations	New Interstate operations study to refine recommendations. Implement improvements with reconstruction projects.	NDDOT	$1,500,000
49	11th St	Main Ave	1st Ave N	Grade Separation from Railroad	Grade separation of Central Moorhead rail tracks to eliminate delays and access issues due to train crossings.	Moorhead	$60,000,000
55	55th St	12th Ave	28th Ave S	New Street	Location to be determined. Part of potential long-term corridor to support growth area.	Moorhead	$5,625,000
56	Main St	2nd Ave SE	Co Rd 78	Grade Separation from Railroad	Grade separation of existing Main St from railroad tracks for reduced conflicts into growth area.	Dilworth	$15,000,000
59	55th St	4th Ave	12th Ave S	New Street	Location to be determined. Part of potential long-term corridor. Arterial to support growth area.	Moorhead	$5,025,000
67	15th St NW	4th Ave NW	12th Ave NW	Grade Separation from Railroad	BNSF Underpass & Diversion Overpass to provide improved connection to Industry area.	West Fargo	$26,890,000

TABLE 12.10: (CONTINUED) VISION PLAN ROADWAY PROJECTS

Project ID	Corridor	From	To	Project Type	Project Description	Project Jurisdiction	Planning Level Cost Estimate (2019)
69	SE Beltway Route	Hwy 75	I-94	Expressway Route	Long term vision project for high-speed access around the metro area.	Clay County	$12,190,000
72	NE Beltway Route	I-29	US 10	Expressway Route	Long term vision project for high-speed access around the metro area.	Fargo / Moorhead / Clay County	$11,270,000
73	32nd Ave	165th Ave	current diversion	Pave Gravel Road	Identified by Cass County as future gravel to black top project.	Cass County	$6,000,000
74	76th Ave S	165th Ave	Horace	Pave Gravel Road	Identified by Cass County as future gravel to black top project.	Cass County	$6,690,000
77	38th St	I-94	124th Ave	Pave Gravel Road	Identified by Cass County as future gravel to black top project.	Cass County	$15,930,000
78	Hwy 336	at 12th Ave		Interchange	Required for 12th Ave and Hwy 336 connection.	MnDOT	$25,000,000
80	Approximate 14th St	2nd Ave SE	Adams Ave	Grade Separation from Railroad	Location to be determined. Part of potential long-term corridor. Railroad grade separation option.	Dilworth	$25,000,000
82	14th St	8th Ave N	15th Ave N	New Street	Long term extension of 14th St as Dilworth growth continues in future.	Dilworth	$3,850,000

Bicycle and Pedestrian Vision Projects

The bicycle and pedestrian vision projects are beneficial non-motorized system connections that were not identified as the highest priority projects in the 2016 *Fargo-Moorhead Metropolitan Bicycle and Pedestrian Plan* and by the bicycle and pedestrian committee. The Bicycle and Pedestrian Vision projects are shown in FIGURE 12.9 (urban view) and FIGURE 12.10 (regional view).

FIGURE 12.9: BICYCLE AND PEDESTRIAN VISION PROJECTS, URBAN VIEW

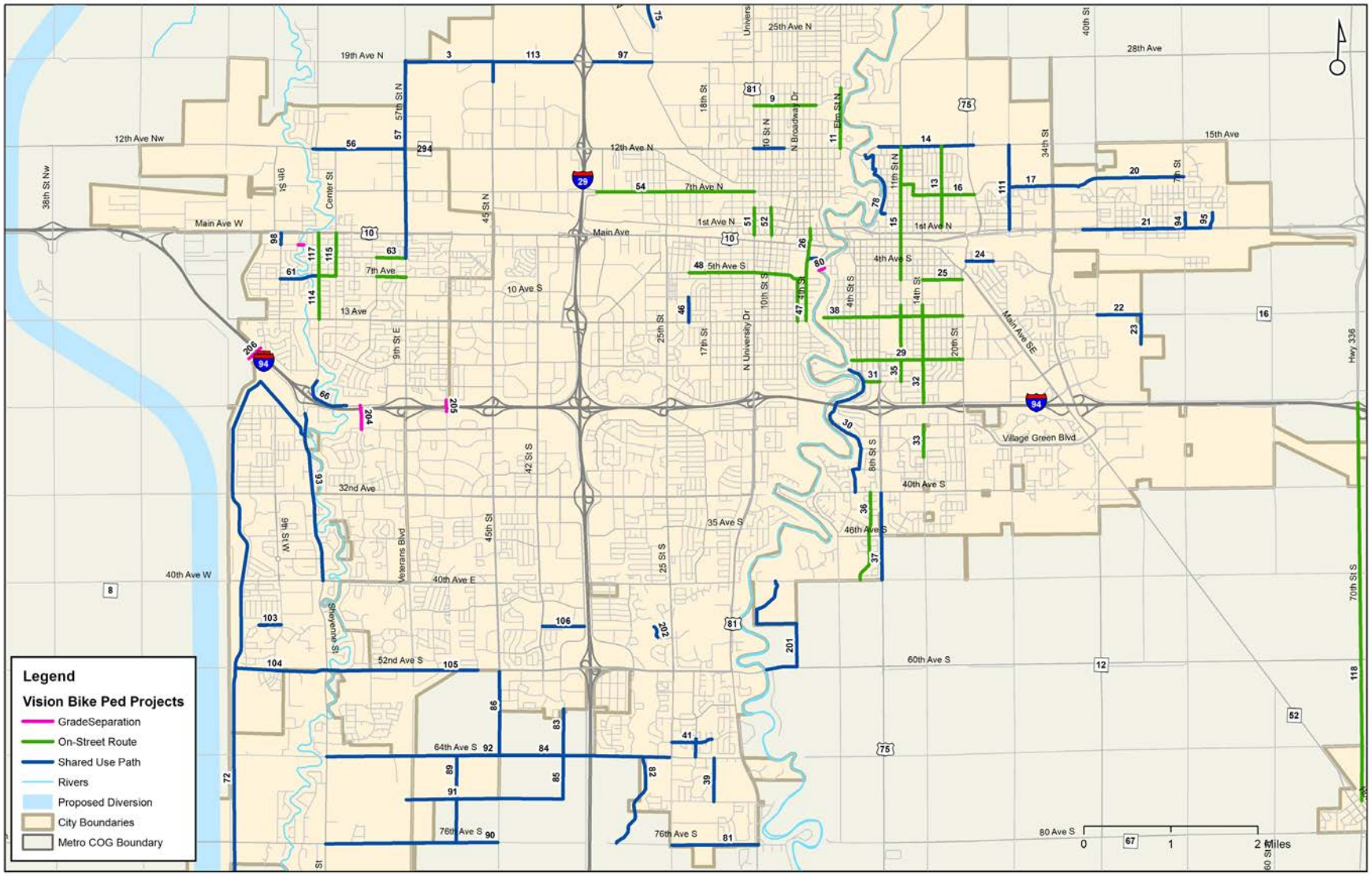
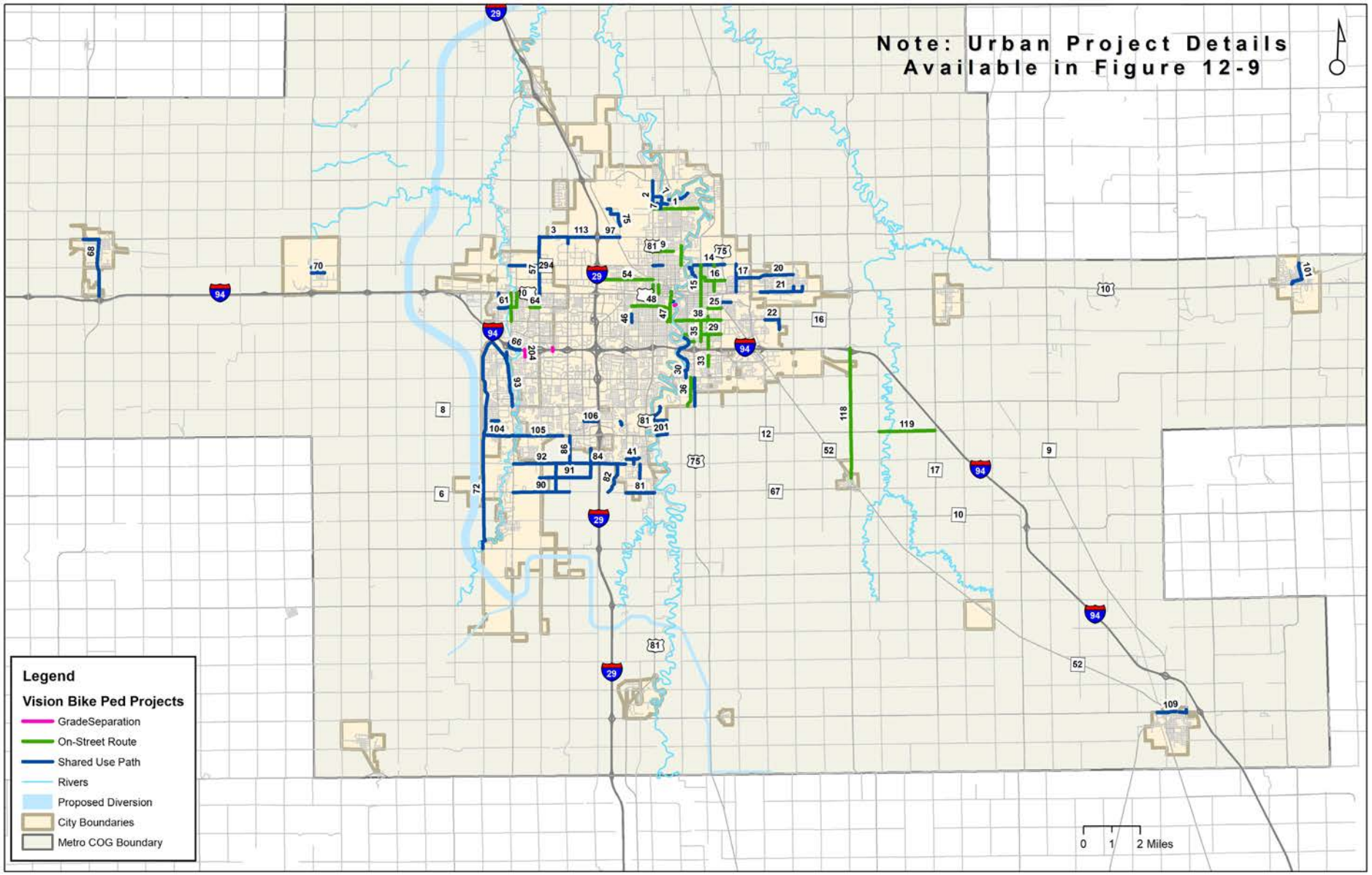


FIGURE 12.10: BICYCLE AND PEDESTRIAN VISION PROJECTS, REGIONAL VIEW



Future Planned System Performance

With the fiscally-constrained projects in place, roadway system performance will improve compared to the "do nothing" or existing-plus-committed system performance documented in Chapter 5. The same performance metrics were used, looking at:

- Trip Growth
- VMT Growth
- VHT Growth
- Average Trip Lengths
- Average Speeds

The graph below compares the results of the future fiscally-constrained planned system and the existing-plus-committed network results in Chapter 5:

- VMT increased 64% in the future planned system scenario compared to 65% in the E+C scenario. The growth area corridors added in the future planned system scenario likely contributes to slightly less traveled distance.
- VHT increased 66% in the future planned system scenario compared to 69% in the E+C scenario. This decline in the plan scenario means that the same number of trips will be made more efficiently in the MTP scenario.
- Average trip lengths are slightly lower in MTP scenario due to more direct routes being available with a more complete street grid.
- Average system speeds drop less in the planned system scenario than they do in the existing-plus-committed scenario. Average speeds drop 1% from current levels in the planned system scenario, but drop 3% from current levels in the existing-plus-committee scenario.

	Trip Change	VMT Change	VHT Change	Average Trip Length	Average Speeds
Existing-Plus-Committed Scenario	39% ▲	65% ▲	69% ▲	18% ▲	3% ▼
Future Planned System Scenario	39% ▲	64% ▲	66% ▲	18% ▲	1% ▼

To evaluate the performance of the fiscally-constrained future system performance, the travel demand model was applied with the expansion projects shown in Figures 12.3 and 12.4. This approach was similar to the one employed for the 2045 E+C scenario in Figure 5.3. The resulting traffic operations for peak conditions with the 2045 planned MTP network is shown in FIGURE 12.11.

As shown in the traffic operations for the MTP network, several of the performance issues identified in the E+C scenario are addressed:

Additions to the arterial grid network in the southwestern parts of the study area will provide sufficient capacity for several corridors that were congested in the E+C scenario, including:

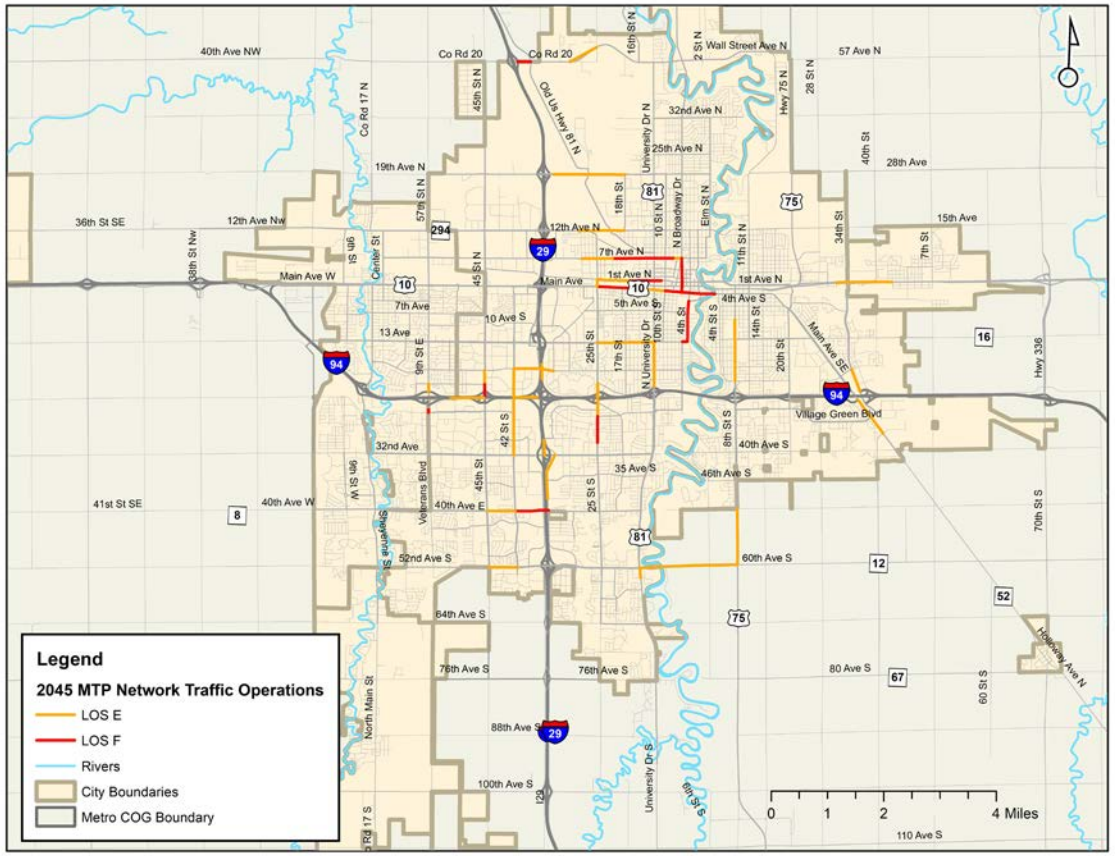
- Sheyenne Street south of 40th Avenue S.
- 52nd Avenue South between Sheyenne and I-29.
- 76th Avenue between Horace and the I-29 frontage road.
- The frontage road west of I-29 between 100th Avenue S and 52nd Avenue S.
- 25th Street south of 52nd Ave S.

The locally-funded traffic system management projects would provide moderate improvement to operations on some urban corridors such as Veterans Blvd and 32nd Avenue South.

This approach meets Metro COG's CMP approach of improving congestion while promoting a multimodal environment and livable streets.

The remaining areas of 2045 congestion are predominately in fully-developed areas without straight-forward solutions. Capacity additions in many of these corridors would impact livability and multimodal access, and will thus rely on TSM&O strategies and demand management to manage congestion. The areas of Interstate congestion will need to be addressed through future State investments, with recommendations coming from an updated *Interstate Traffic Operations Study.*

FIGURE 12.11: FUTURE 2045 FORECAST PLANNED NETWORK TRAFFIC OPERATIONS



Additional Metro Grow Recommendations

During the development of Metro Grow, a series of issues and opportunities arose that warrant more detailed evaluation and consideration than is possible within the scope of the MTP. The remainder of this section provides some recommendations for additional study and processes that should be implemented to meet the overall regional goals of this plan.

Complete an Interstate System Operations Study Update

As noted in the Congestion Management Chapter (Chapter 8), it is recommended that a new, comprehensive Interstate System Operations Study be completed. The last comprehensive study of Interstate Operations was completed in 2012, and significant regional growth, new transportation management strategies are available, and the emergence of big data and new tools have occurred over that time. Reconstruction of the regional Interstate system is anticipated during the Metro Grow planning horizon, and this study could identify a timeframe to merge the management and bottleneck relief strategies required for maintaining system operation with the required system preservation activities.

Regional Transportation Systems Management and Operations (TSM&O) Plan

The Metro Grow plan reflects the recent shift in how the region approaches mobility challenges by considering new strategies. There is a growing realization that the benefits in investing in improved system management and operations could provide cost effective benefits to the region. TSM&O is a comprehensive set of strategies, projects, and programs that optimize the performance of the current transportation system. This would build off of the significant investments local jurisdictions have made in their traffic signal equipment and communications abilities, and recommendations of the 2017 *Fargo-Moorhead Alternate Route and Traffic Incident Management Guidebook Project*.

There could be several elements included as part of a regional TSM&O plan, including a **Traffic Management Master Plan**, which would be a comprehensive review of the current regional traffic signal systems including the three major urban signal systems (Fargo, Moorhead, and West Fargo) and potentially both DOTs' traffic signals. This could potentially lead to **Traffic Signal Retiming Projects.** FHWA recommends that traffic signal timing should be reviewed every three to five years, and more often in corridors with rapid traffic growth due to development pressures.[12]

Future Corridor Studies

There are two primary corridor studies identified through the Metro Grow process, but others may arise as additional needs are identified.

- **Truck Highway 10 Dilworth Corridor Study:** Truck Highway 10 through Dilworth is anticipated to be reconstructed in approximately 2026. This corridor is a rural cross-section that current has no sidewalks or sidepaths. The study should take a comprehensive look at multimodal needs in the corridor, and review potential intersection and access treatments.
- **Veterans Boulevard Corridor Study:** Veterans Boulevard currently terminates just south of 52nd Avenue, but is an arterial corridor with direct access to I-94 and Main Avenue to the north. To the south are the Horace and southwest Fargo growth areas. There are drainage challenges in this corridor, including the need to cross and avoid Drain 27 in the alignment area. The study should identify a potential alignment and determine items like constructability, cost, access, and bicycle and pedestrian treatments in this corridor.

Implement a Regional Street Typology System

Streets are traditionally classified according to FHWA's functional classification system. This hierarchy includes Interstates, arterials, collectors, and local streets of different levels, and evaluates the function of each street as a trade-off between vehicular mobility and land access. The concept of street typology is that that in addition to these functional considerations, there are important considerations like:

[12] FHWA, *Traffic Signal Timing Manual.*

- The street context in terms of adjacent land use, development orientation, and development density.
- Non-motorized users of the street need to be considered, and the impact of vehicle speed, volumes and adjacent land uses has on those bicyclists and pedestrians.
- On-street parking presence as it relates to corridor type.

Part of the metro area had a street typology system established for it in the *Fargo/West Fargo Parking and Access Study*. Metro Grow developed a draft street typology system that extended the Parking and Access Study typologies to the remaining urban communities in the planning area, to support project prioritization. A formalized Regional Street Typology System would provide Metro COG's member jurisdictions with a methodology that would promote the livability and complete streets goals of the region.

Develop a Dynamic Traffic Assignment (DTA) Network Model of the Region

To support implementation of the Congestion Management Plan and a future Interstate Operations Study, the region could consider development of a regional DTA model. The DTA provides a more fine-grained look at both the transportation system and potential strategies that can be deployed, and a more detailed look at how and when people travel. This model would allow much more detailed evaluation of some regional system management strategies than the current travel demand model can, including corridor signalization strategies, ramp metering, bus on shoulder, and transit signal priority.

Linking TIP Project Selection to the MTP

As Metro COG becomes a TMA, it will need to implement a planning process for project selection. There is interest in identifying a process for selecting projects in the TIP that is consistent with the Metro Grow MTP project prioritization approach.

There are several TMAs that can provide examples of best practices for Metro COG to consider as it implements a TIP selection process linked to this MTP. An example TMA with a relevant TIP - MTP project selection link is the Portland Area Comprehensive Transportation System (PATS), the MPO for the Portland, Maine area.

PACTS scores potential TIP projects based on a formula that incorporates the MTP's guiding principles, and also includes a "roadway" formula that incorporates roadway-specific scoring metrics like capacity and congestion. PACTS combines the MTP and roadway formulas to score projects for selection. PACTS places their suballocated funds into one of five categories, with funding placed into these five categories according to percentages established in the MTP. The five project categories that PACTS uses for these funding percentage set asides are:

- Pavement preservation
- Intersections
- Rebuild roads
- Transit
- Bike / Pedestrian

Many of the elements PACTS uses for their TIP selection, like the MTP-based project scoring and modal funding targets, have been established in Metro Grow. A process like this could be adapted and tailored to meet the Fargo-Moorhead region's TIP project section process and integrated with the Congestion Management process once in place.

Continued Congestion Management Process Refinement

The Congestion Management chapter (Chapter 8) provides some specific recommendations. It is acknowledged that the CMP process will evolve as Metro COG transitions into a TMA, but there are some specific recommendations regarding committee, network definition, data collection, and performance measures that should begin to be implemented through the five-year life of Metro Grow.

Metro COG Role in Land Use Planning

As noted in the Policies chapter, there would be benefits to the region with the greater coordination between land use and transportation planning activities. Many elements such as urban form, land use, development patterns, access management, and mobility patterns are interconnected. Metro COG would be a good candidate for facilitating this regional coordination.

Safety, Security, and Environmental Overview

System Safety

The Metro Grow plan has made safety one of the central goal areas for the region. As outlined in Chapter 4, the plan identifies safety issue areas in an effort to support national and state performance measures. The plan also gives priority to projects with the potential to improve system safety through its project prioritization approach. This chapter also outlines potential safety improvements to consider for the intersections identified in Chapter 4.

Plan Support for State Highway Safety Plans

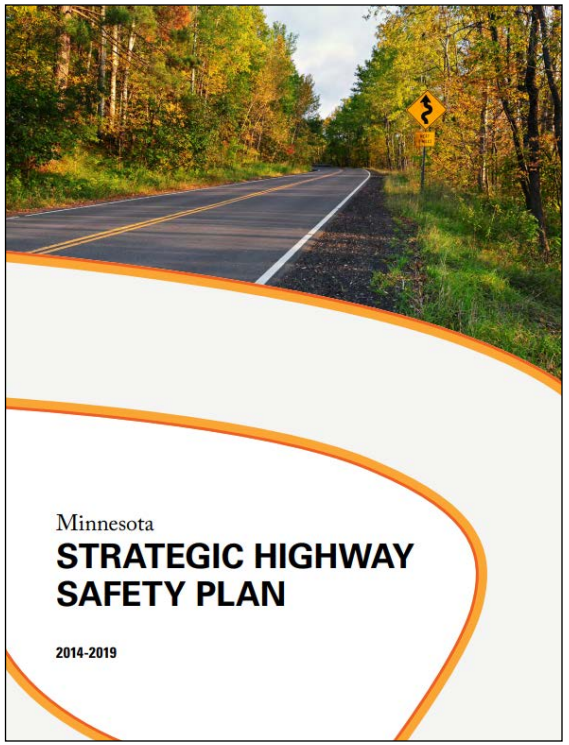
The Metro Grow MTP is set up to support the State Highway Safety Plan (SHSP) of both Minnesota and North Dakota. The key components that relate to the Metro Grow plan are included in this section.

Minnesota's Strategic Highway Safety Plan (2014-2019)

The Minnesota SHSP summarizes crash data and trends, to provide focus areas for the plan, strategies, and collaborative approach toward zero deaths. The plan includes a list of tracking indicators that provide metrics for progress towards the safety focus areas.

Those focus areas include:

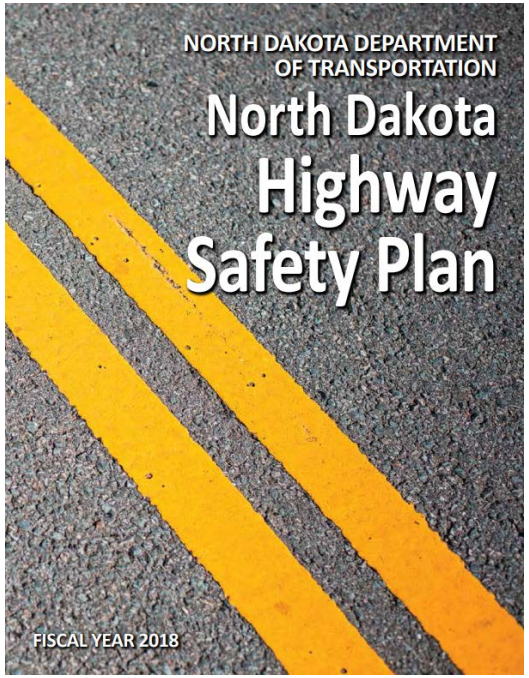
- Traffic Safety Culture and Awareness
- Intersections
- Lane departure
- Unbelted occupants
- Impaired roadway users
- Inattentive drivers
- Speed
- Older drivers
- Younger drivers
- Motorcyclists
- Pedestrians
- Bicyclists
- Commercial vehicles
- Trains
- Work zones
- Unlicensed drivers
- Vehicle Safety Enhancements



North Dakota's Highway Safety Plan (2017)

The North Dakota Highway Safety Plan is a data-driven approach that notes the challenges of the population spike that has occurred this decade due to the oil boom, and the initial crash rate increases that went with that. Crash rates have dropped over the past few years, and are approaching the national average. It was noted in that document that Cass County had one of the higher crash rates in the state, at 2.48 crashes per Million Vehicle Miles Traveled (MVMT). However, as the largest urban county in the state, a high crash rate is not surprising. Strategies laid out in the North Dakota SHSP included enforcement strategies aimed at:

- Impaired Driving
- Occupant Protection
- Distracted Driving
- Underage Drinking Enforcement



The SHSP also lays out 11 core performance measures, which are more focused versions of the Federal performance measures Metro Grow supports. Those 11 core performance measures are:

- Number of fatalities from traffic crashes
- Number of serious injuries from traffic crashes
- Fatalities per vehicle miles traveled (VMT)
- Number of unrestrained passenger vehicle occupant fatalities
- Number of fatalities involving a driver or motorcycle operator with a .08 BAC or above
- Number of speed related fatalities
- Number of motorcycle fatalities
- Number of unhelmeted motorcycle fatalities
- Number of drivers age 20 and younger involved in fatal crashes
- Number of pedestrian fatalities
- Number of bicyclist fatalities

The SHSP also lays out countermeasures and a program for moving towards each of the 11 safety performance measures.

Potential Safety Countermeasures

To support the Highway Safety Improvement Program (HSIP), this plan includes potential countermeasures to consider at the highest crash intersections identified in Chapter 4. Counter measures are defined as long-term adjustments to the roadway or its surroundings intended to change motorists' driving behavior.

HSIP funding is provided competitively across both states, and jurisdictions in the region have not traditionally received significant HSIP funding, so the Metro Grow plan provides these intersection improvements as potential future projects for consideration. Some of the high-crash intersections identified in Chapter 4 have recently been improved, and others did not have any observable areas for improvement. Those high-crash intersections where potential future safety countermeasures could be investigated include those documented in TABLE 13.1. It is recommended that more detailed safety engineering assessment be completed prior to incorporation of any of the countermeasures identified.

TABLE 13.1 HIGH CRASH INTERSECTIONS AND POTENTIAL SAFETY COUNTERMEASURES

Intersection	Potential Safety Countermeasures
13th Ave S & 25th St S	Consider installing high-visibility crosswalks, centering signal heads of approach lane (EB)
13th Ave S & 38th St SW	Consider installing signal heads over all approach lanes and lane assignment signing and markings.
13th Ave S & 42nd St S	Consider installing signal heads over approach lanes.
13th Ave S & I-29 East Ramp Terminal	Consider improved signal visibility and enhanced high-visibility cross-walk for sidepath on south side.
13th Ave S & S University Dr	Consider installing signal heads over all approach lanes and lane assignment signing and markings. Also consider prohibiting southbound right turn on red.
19th Ave N & N University Dr	Consider centering signals over each lane and prohibiting right turn on red. Potential to install higher-visibility cross-walk.
19th Ave S & 45th St S	Consider installing signal heads over all approach lanes.
1st Ave N & Broadway N	Consider installing high-visibility cross-walks and colored bike lane markings.
32nd Ave S & 25th St S	Consider installing signal heads over all approach lanes and lane assignment signing and markings.
32nd Ave S & 45th St S	Consider installing signal heads over all approach lanes and speed information signs.
Main Ave & 25th St S	Consider installing signal heads over all approach lanes and lane assignment signing and markings.
Main Ave & S University Dr	Consider improved cross-walk visibility and limiting southbound right-turns on red.

System Security and Resiliency

Transportation security emerged as a consideration for transportation agencies in the wake of the September 11, 2001 terrorist attacks. Since that time, the concept of system security has evolved to a broad consideration of providing a resilient transportation system. Metropolitan Transportation Plans can address these requirements by identifying potential threats and strategies to provide a more secure and resilient transportation system.

Security from a surface transportation perspective has been evolving over the past two decades. During the life of the Metro Grow plan, it will continue to evolve. One recent development that could influence metropolitan security planning is the **Surface Transportation Security Advisory Committee (STSAC)** established in April 2019 by the Transportation Security Administration (TSA). The STSAC will report to the TSA Administrator and will provide recommendations on surface transportation security matters, including the development, refinement, and implementation of policies, programs, initiatives, rulemakings, and security directives. The 35 member board will represent members from a range of modes and interests, including:

- Transit and Passenger Rail
- Freight Rail
- Pipeline
- Highway and Motor Carrier
- Surface Transportation Users

The primary risks that the Fargo-Moorhead region faces include risks from seasonal flooding and potential incidents that can impact the region's typically reliable transportation system.

Transportation Resiliency and Flooding

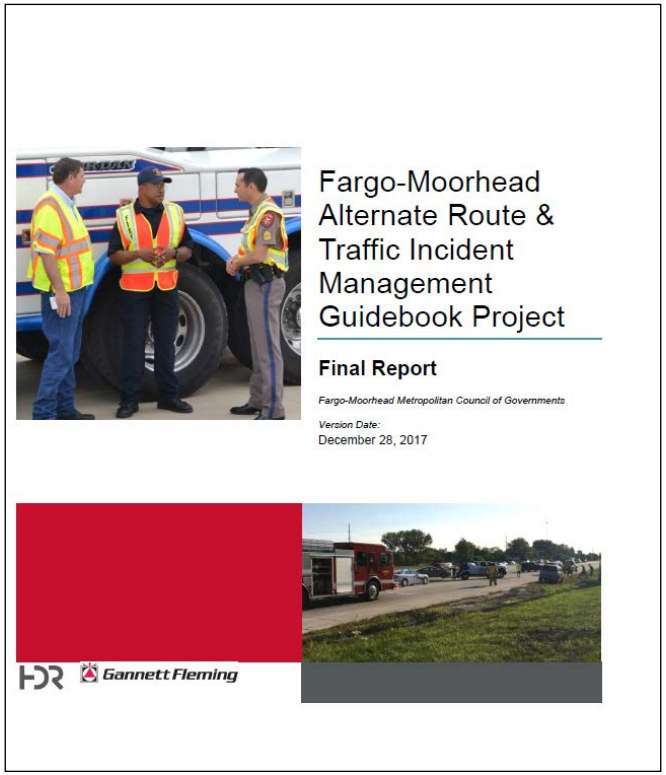
The region has already accomplished much to address the risks associated with flooding, but there is additional future work planned. A series of flood-management projects have been constructed in recent years to mitigate some of the flooding risks. The ultimate goal is to construct a $2.75B, 30 mile long Red River Diversion channel, which has received recent approvals to move forward. If all the required funding comes through, construction of the Diversion will occur over the life of this MTP.

The flood risks from a transportation system perspective are significant. Regional hydrology data indicate that a 100-year flood would dramatically impact the National Highway System and all modes of travel across the region, particularly on the North Dakota side. Without the diversion project, this level of flooding would cause several miles of closures to both I-29 and I-94 in the region, in addition to arterials and trails across the metro area.

Transportation Resiliency Strategies

Traffic Incident Management

One way to mitigate the risks to regional mobility from traffic incidents is Traffic Incident Management (TIM). Metro COG completed the Fargo-Moorhead Alternate Route & Traffic Incident Management Guidebook Project in December 2017. That study organized a TIM stakeholder group, including emergency responders, engineering and planning officials with jurisdictions from across the region, and towing companies. The alternate route portion of the study identified detours due to closure incidents.



Several project recommendations came from the TIM plan:

- **Recommendation #1 –** The ownership and responsibility to maintain the Alternate Route & TIM Guidebook maps and documents should rest with the Safety Committee of the Fargo-Moorhead Metropolitan Council of Governments.
- **Recommendation #2 –** Develop and monitor TIM performance measures in the Fargo-Moorhead region.
- **Recommendation #3 –** Engage the Fargo-Moorhead region's vehicle towing industry in TIM exercises, event planning, and regional safety committees
- **Recommendation #4 –** Install alternate route signage along key designated alternate routes in North Dakota, similar to signage installed in Minnesota
- **Recommendation #5 –** Identify locations for future Dynamic Message Signs (DMS) that provide for increased notice to drivers of interstate closures and alternate route availability
- **Recommendation #6 –** Develop a regional Traffic Operations Center/ Transportation Management Center or coordinate operations regionally between individual traffic and transportation management centers
- **Recommendation #7 –** Develop MOUs and partnership agreements between agencies, cities, counties, and states that allow for shared use of first responder resources and the use of local roads as an alternate route for interstate traffic
- **Recommendation #8 –** Enhance the coverage of CCTV cameras and vehicle detection capability throughout the Fargo-Moorhead region
- **Recommendation #9 –** Engage in a TIM Capability Maturity Self-Assessment exercise

Additional Metro COG Resiliency Strategies

There are several resiliency elements that support a more secure and resilient transportation system in the Metro COG region:

- Metro Grow has included a performance objective and related prioritization metric related to system resiliency, to identify strategies to make transportation infrastructure more resilient to natural and manmade events.
- Metro Grow includes a project in the fiscally-constrained project list, the raising of the 12th Avenue North (Fargo) / 15th Avenue North (Moorhead) bridge to an elevation that would keep the bridge open during a 37 foot flood event.
- System safety and resiliency projects are being implemented by both state DOTs. MnDOT is planning additional snow fences for installation along I-94 and US Highway 10 in Clay County, which will improve the reliability of the system during Winter storms. North Dakota DOT is adding median barriers along I-29 and I-94 through the study area, to reduce the risk of serious cross-over crashes, which would improve safety and increase reliability due to reduced incidents.
- Agencies such as North Dakota DOT and Cass County have plans in place to adjust infrastructure to accommodate the diversion project and make their infrastructure more resistant to flooding. It is known that I-29 will need to be raised and new bridges constructed at the diversion crossings. Cass County has plans for where its county road system will need to cross the diversion to provide connections between protected and unprotected parts of the County.
- Metro COG staff are coordinating with Clay County staff on the County's Hazard Mitigation Plan.

Environmental Context of the Transportation Plan

Environmental resources that could potentially be affected by transportation projects included in Metro Grow are discussed in this section. While Metro Grow considered potential environmental impacts with the development of project alternatives, this study is a regional-scale assessment, and projects included in the MTP will require additional project development prior to implementation. As those project details are developed, more detailed environmental review will be conducted in the future phases of study.

At later project development steps, the project sponsors should consider the potential project impacts and consider environmental mitigation. The National Environmental Policy Act (NEPA) of 1969 was established to assure that all branches of the Federal government give proper consideration to the environment prior to undertaking any major federal action that significantly affects the environment.

The NEPA process has three different levels of analysis, depending on potential project impacts:

1. **Categorical Exclusions (CE):** CEs are granted for actions that do not individually or cumulatively involve significant social, economic or environmental impacts.
2. **Environmental Assessments (EAs):** EAs might be required when the significance of the environmental impact is not clearly established. An EA can result in either a Finding of No Significant Impact (FONSI) requiring no further environmental evaluation, or identification of potentially significant impacts requiring the applicant to conduct an Environmental Impact Statement.
3. **Environmental Impact Statements (EIS):** Depending on the nature of the proposed project, applicants may be required to develop an EIS, or request an EIS based on the outcome of an EA.

The main elements of NEPA decision making include:

- Assessment of the social, economic, and environmental impacts of a proposed action or project.
- Analysis of a range of reasonable alternatives to the proposed project, based on the applicants defined purpose and need for the project.
- Consideration of appropriate impact mitigation: avoidance, minimization and compensation.
- Interagency participation: coordination and consultation.
- Public involvement including opportunities to participate and comment.
- Documentation and disclosure.[1]

As noted, Metro Grow is the first step of project development process, prior to the NEPA process being initiated. However, there are benefits to early and collaborative transportation planning and consideration of environmental impacts as the project development process continues. State and local agencies responsible for land use management, natural resources, environmental protection, conservation, and historic preservation were consulted via letter during MTP development during alternatives analysis phase of the study

Environmental Mitigation Discussion

Archaeological and Historical Resources

There is potential for historic and cultural resources to be present within the MTP Study Area. Historic and cultural resources are regulated under Section 106 of the National Historic Preservation Act, and may require coordination with the North Dakota Department of Transportation (NDDOT) and the consultation with the North Dakota State Historic Preservation Office (SHPO). The Environmental Overview Map identifies areas listed on the National Register of Historic Places or known historic districts. In addition to known listed sites, other cultural resources may be present and regulated under Section 106.

Early in project planning, the jurisdictional entity should notify NDDOT and SHPO of its intent to proceed with a particular roadway improvement project, and request that they advise the jurisdiction on the applicability of Section 106, the need to identify consulting parties, and for a Class I cultural resource literature search. When appropriate, the jurisdiction should anticipate that a Class III identification effort will be conducted, including identification of archaeological, architectural, and traditional cultural properties subject to the effects of the project. When historic properties are identified, the jurisdiction should anticipate that avoidance or mitigation of adverse effects to such properties may be required. Clarification of these procedures and the expectations of other participants in consultation can be addressed under the terms of a Programmatic Agreement among the parties that tailors the review process to the needs of the COG's MTP.

Wetlands and Waters of the U.S.

Wetlands and other waters of the US will need to be considered for each project during the progression from the planning stages to construction. Wetland delineations are recommended in the initial stages of roadway improvement projects to confirm the boundaries of wetlands and other waters of the U.S. within the project area and to coordinate with United States Corps of Engineers (USACE) to determine jurisdiction.

For this MTP, the National Wetlands Inventory (NWI) and aerial photography were reviewed within the Study Area to determine potential project impacts. The Red River (a large perennial river) occurs in the Study Area. Several smaller wetland areas also occur throughout the Study Area. Because the NWI provides an estimate of wetlands based on soil type and aerial photography, these boundaries are utilized as guidance for identifying wetland areas and field delineation would be required for each project.

Threatened and Endangered Species

Fish and wildlife species listed under the Federal Endangered Species Act (ESA) would need to be considered for each project. Consultation with U.S. Fish and Wildlife Service (USFWS) would be required to determine which ESA-listed species have the potential to occur within each project area.

[1] Environmental Review Toolkit ,NEPA Transportation Decisionmaking, FHWA

ESA-listed species occurring in Cass County in the ND-portion of the project include the gray wolf, northern long-eared bat, and whooping crane. In Clay County, MN, listed species include the northern long-eared bat, Dakota skipper, and western prairie fringed orchid. Critical habitats occurring in Clay County include Poweshiek skipperling habitat and Dakota skipper habitat, both of which are east of and outside the Study Area. Habitat for Dakota skipper and western fringed orchid would generally be limited to grass and prairie habitat. Whooping cranes could occur in relatively undisturbed wetland areas associated with grass or agricultural fields. Northern long-eared bats and gray wolves could occur in portions of the Study Area. Although habitat for some of these species could be present in the Study Area, the urban nature of most of the habitat would deter most of these species from using habits where roadway improvement projects would occur. Further review should be completed to confirm the presence of threatened and endangered species and their habitats prior to construction of the roadway improvement projects.

Section 4(f) and Section 6(f) Resources

The Department of Transportation Act (DOT Act) of 1966 included a special provision – Section 4(f) – which is intended to protect publicly owned parks, recreational areas, wildlife and waterfowl refuges, or public and private historical sites. Similarly, Section 6(f) protects state and locally sponsored projects that were funded as part of the Land and Water Conservation Fund (LWCF).

Publicly owned parks and recreation areas are present within the MTP Study Area. If the projects proposed in these alternatives receive Federal Highway Administration (FHWA) funds, the projects will be subject to Section 4(f) consultation.

Public spaces within the Study Area may have received LWCF grant money are subject to Section 6(f) regulations. It is recommended that consultation occur early with each project to determine the location of improvements to determine whether any park areas impacted will be subject to Section 6(f) regulations. In ND, the appropriate contact for LWCF impacts would be the ND Parks and Recreation. In MN, the contact would be the MN Department of Natural Resources.

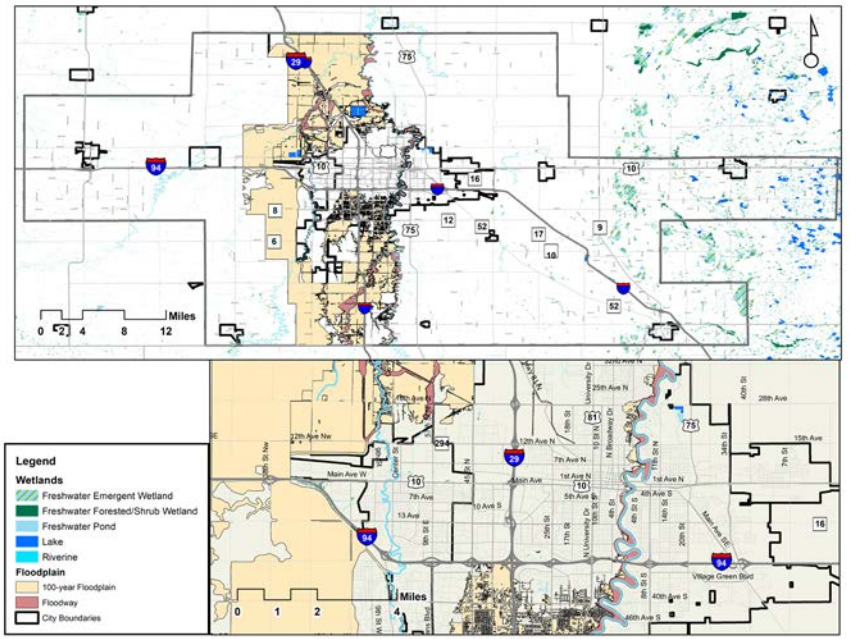
Floodplains

Within the Study Area, there are both regulated floodways and 100-year floodplains. Executive Order 11988, Floodplain Management, outlines measures to reduce the risk of floodplain and requires agencies to identify whether a project would cause an encroachment into a floodplain and directs agencies to evaluate alternatives to such an encroachment and analyze potential floodplain impacts.

The Environmental Overview Map identifies floodways, the 100-year floodplains occurring within the Study Area. The Red River bisects the Study Area and has a history of frequently flooding. If any roadway improvement would encroach into the 100-year floodplain or regulated floodway, coordination will be required to secure the appropriate local floodplain permits.

Mapping showing existing floodplains and wetlands is shown in FIGURE 13.1.

FIGURE 13.1 FLOODPLAINS AND WETLANDS



Title VI Program

Title VI of the Civil Rights Act of 1964 protects people from discrimination based on race, color, and national origin in programs and activities receiving federal financial assistance. Metro COG has a *Title VI Non-Discrimination and Limited English Proficiency Plan*, which was approved by the Policy Board in 2017. Metro COG is committed to compliance with Title VI of the Civil Rights Act of 1964, 49 CFR, part 2, the Civil Rights Restoration Act of 1987, and all related regulations and directives.

As outlined in the *Title VI Non-Discrimination and Limited English Proficiency Plan, Metro COG's* commitment to the Title VI program assures that no person or groups(s) of persons shall, on the grounds of race, color, national origin, sex, age, disability/ handicap, and income status, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any and all programs, services, or activities administered by the Agency, regardless of whether those programs and activities are federally funded or not. Metro COG also assures that every effort will be made to prevent discrimination through the impacts of its programs, policies, and activities on minority and low-income populations. In addition, Metro COG will provide meaningful access to services for persons with Limited English Proficiency.

The public outreach elements of this plan were conducted within the guidelines of Metro COG's Title VI policy.

Environmental Justice Populations

As part of the Title VI program, Metro COG tracks data that indicate the spatial distribution of Environmental Justice populations in the metropolitan area. Environmental Justice (EJ) is the approach to identifying and addressing potential disproportionately high and adverse effects of transportation programs, policies, and activities on minority populations and low-income populations. The goal is to achieve an equitable distribution of benefits and burdens.

In 1994, President Clinton issued Executive Order 12898, directing federal agencies, to the greatest extent practicable, to identify and address disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations. In 1997, the Department of Transportation (U.S. DOT) issued an Order to address EJ in minority populations and low-income populations to summarize and expand upon the requirements of Executive Order 12898 on EJ. This section describes how EJ populations were identified for Metro Grow.

Environmental Justice Assessment

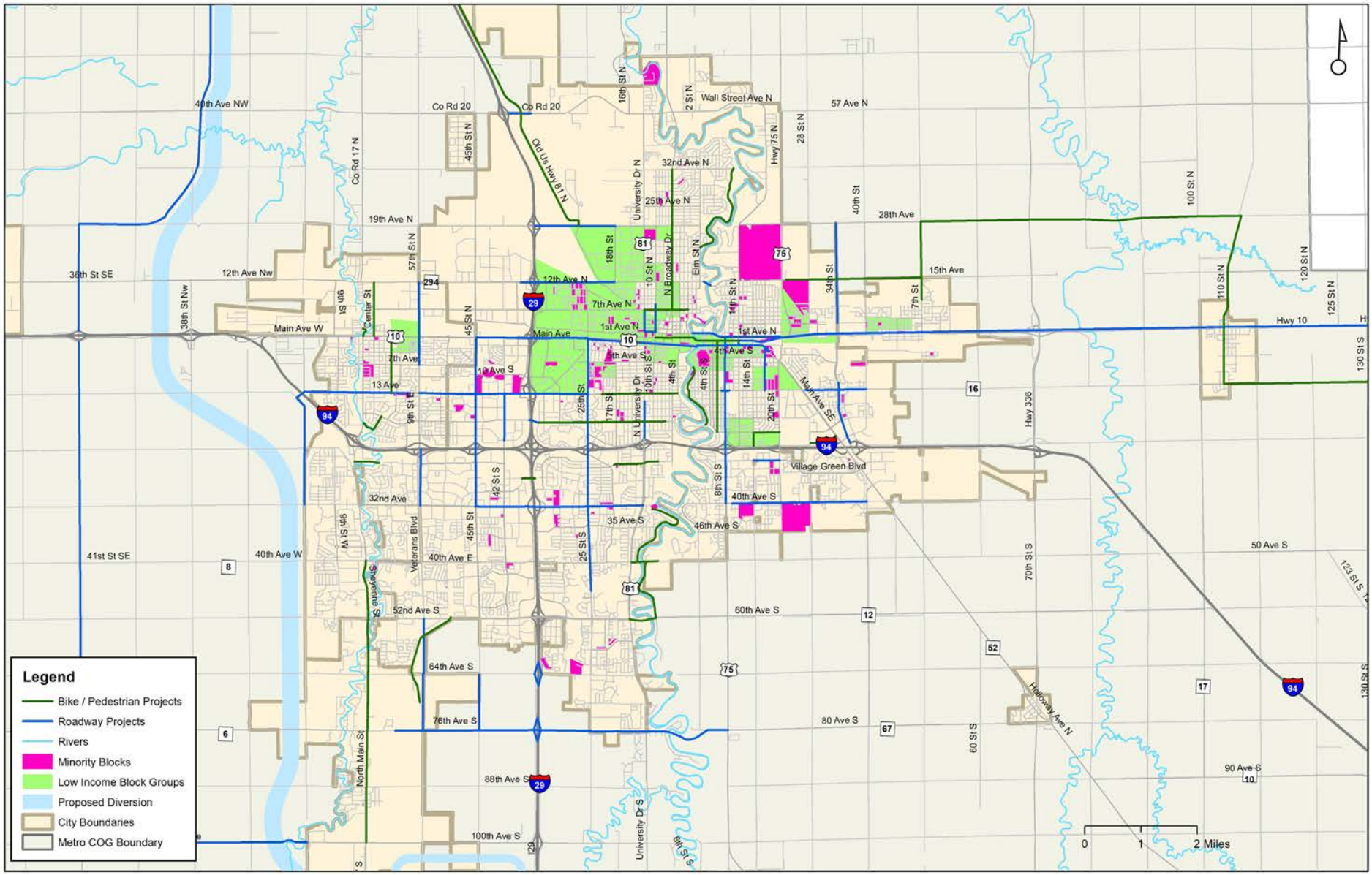
The roadway and bicycle and pedestrian projects were evaluated in relationship to Metro COG's identified environmental justice populations. The Metro COG Environmental Justice populations for low-income and minority populations are shown in FIGURE 13.2. The projects included Metro Grow area at a planning level and the full potential benefits and impacts of the included transportation projects are not fully known. This section documents the relationship between EJ populations and the future transportation investments identified in the Metro Grow plan, and where public open houses were held in relation to EJ populations.

From a project perspective, there are two different ways to consider the potential effects of transportation investment decisions on environmental justice (EJ) populations:

- **Benefits:** Transportation projects provide enhanced access and mobility to system users. This analysis looked at whether the plan-identified projects were directly accessible to EJ populations.

- **Impacts:** Some transportation projects can cause environmental and social impacts to adjacent populations. This analysis identified the project types that had the most potential to have impacts, and see if these project types are disproportionately placed adjacent to EJ populations.

FIGURE 13.2: EJ POPULATIONS IN RELATION TO METRO GROW PROJECTS



Project Proximity Benefits

To evaluate the relative benefits of the projects in the Metro Grow plan in relation to EJ populations, the number projects that were within ¼ mile of an EJ defined population were identified. The number and percentage of bicycle and pedestrian and roadway projects for each mode were:

- **Roadway Projects:** 33 of the 54 fiscally-constrained roadway projects were within ¼ mile of EJ populations. Thus, 61% of roadway projects were determined to be readily accessible to EJ populations.
- **Bicycle and Pedestrian Projects:** 17 of the 28 highest priority bicycle and pedestrian projects were within ¼ mile of EJ populations. Thus, 61% of bicycle and pedestrian projects were determined to be readily accessible to EJ populations.

Using this methodology, approximately 55% of regional households were within or adjacent to EJ populations. Thus, the evaluation of project benefits determined that the overall allocation of multimodal projects between EJ and non-EJ areas was balanced, with a slightly higher proportion of projects within EJ access.

Project Impacts

To evaluate the potential impacts of the projects in the Metro Grow plan in relation to EJ populations, the most impactful project types were identified. It was determined that the roadway project types with the most potential to have impacts were roadway widenings and new roadway infrastructure like grade separations, interchanges, and expressway routes. Of the 54 roadway projects within the entire metro area:

- 34 projects were low-impact reconstruction, rehabilitation or corridor management projects.
- 20 projects were potentially higher-impact roadway widenings, new streets, new interchanges, or new railroad grade separations.

Of the 33 roadway projects within ¼ mile of an EJ population:

- 30 projects were low-impact reconstruction, rehabilitation or corridor management projects.
- Three (3) projects were potentially higher-impact roadway widening, new interchange, or a new railroad grade separation.

Thus, only 9% of the projects in EJ areas have the potential to cause impacts, while region wide 37% of projects have the potential to cause impacts.

Public Open House Access

All rounds of the public open houses had an event held in close proximity to EJ populations and all had MATBUS transit access. For the first round of public meetings, the same meeting content and format was held on two consecutive days, and one of those meetings was held at the Library in downtown Moorhead and one was held in West Fargo at the Rustad Recreation Center. The West Fargo event was the only exception where an open house was not held near an EJ population, but it was located along a MATBUS transit line.

Environmental Justice Summary

The allocation of projects is relatively balanced in regards to EJ populations, and there are fewer roadway projects with the most potential for impacts located adjacent to EJ populations. All rounds of public meetings were held near EJ populations and were accessible to public transit. For these reasons, the Metro Grow plan was consistent with EJ principles of:

- Avoiding, minimizing or mitigating disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority and low income populations.
- Ensuring the full and fair participation by all potentially affected communities in the transportation decision-making process
- Preventing the denial of, reduction of or significant delay in the receipt of benefits by minority and low-income populations.

Consistency with Federal Planning Goals

Federal regulations for metropolitan transportation planning state that MPOs like Metro COG should "develop long-range transportation plans and TIPs through a performance-driven, outcome-based approach to planning for metropolitan areas." As noted in Chapter 1, there are 10 Federal metropolitan transportation planning factors. These planning factors need to be considered and reflected in the metropolitan transportation planning process . TABLE 14-1 shows the 10 planning factors and how the Metro Grow plan has incorporated them into the regional planning process.

TABLE 14.1 METRO GROW ELEMENTS THAT SUPPORT FEDERAL TRANSPORTATION PLANNING FACTORS

Transportation Planning Factors	Related Metro Grow Elements
1. Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency	• Established an economic development goal and associated prioritization metrics. • Focused on Freight Reliability performance measures on the Interstate System. • Identified grade separation projects that will allow improved access to industrial areas.
2. Increase the safety of the transportation system for motorized and non-motorized users	• Established a safety goal and associated performance measures. • Identified highest crash locations to support performance measures. • Identified potential safety counter measures at high crash locations.
3. Increase the security of the transportation system for motorized and non-motorized users	• Established a security and resiliency goal and associated prioritization metric. • Identified resiliency risks. • Identified opportunities for better integration of Traffic Incident Management into system operation.
4. Increase accessibility and mobility of people and freight	• All facets of the plan focused on mobility and accessibility. • Plan established new metrics for network accessibility that connected land use and multimodal network.

TABLE 14.1 METRO GROW ELEMENTS THAT SUPPORT FEDERAL TRANSPORTATION PLANNING FACTORS

Transportation Planning Factors	Related Metro Grow Elements
5. 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	• Established an Environmental Sustainability goal and associated metrics. • Provided a section on environmental mitigation. • Assessed Metro Grow projects and process for Environmental Justice benefits and potential impacts.
6. Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight	• Discussed multimodal connections and implementation of Complete Streets. • Established mode-specific goals and connectivity prioritization metrics. • Identified future projects with multimodal elements.
7. Promote efficient system management and operation	• Established Travel Efficiency and Reliability goal area and associated prioritization metrics. • Identified a Congestion Management Process that emphasized transportation system management strategies. • Included Corridor Management projects in the final project list.
8. Emphasize the preservation of the existing transportation system	• Established a Transportation Infrastructure goal and associated pavement and bridge performance measures. • Measured current pavement and bridge conditions on the NHS. • Analyzed and identified local pavement needs and funding capabilities, demonstrating sufficient local funding levels to preserve the existing system.
9. Improve the resiliency and reliability of the transportation system and reduce or mitigate stormwater impacts of surface transportation	• Established separate objectives and prioritization metrics related to both resiliency and reliability. • Assessed system reliability for all vehicles and freight on the NHS. • Included sections on transportation resiliency, including traffic incident management and incorporating the Red River Diversion project into Metro Grow.
10. Enhance travel and tourism	• Placed an emphasis on placemaking and complete streets in project prioritization, shown to enhance economic development and places people want to visit.

METRO GROW

2045 F-M TRANSPORTATION PLAN