FY2050

Metropolitan Transportation Plan

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This report was produced by the West Michigan Metropolitan Transportation Planning Program (WestPlan) with the cooperation of the governments in Muskegon and Northern Ottawa Counties, the Michigan Department of Transportation, the Federal Highway Administration, and the Federal Transit Administration.

WEST MI SHORELINE
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MISSION STATEMENT

The West Michigan Shoreline Regional Development Commission is a federal and state designated regional planning and development agency serving 120 local governments in Lake, Mason, Muskegon, Newaygo, and Oceana counties. The Commission's mission is to "promote and foster regional development in West Michigan through cooperation amongst local governments and regional partners." The general regional goal of the West Michigan Shoreline Regional Development Commission is to provide assistance to member local governments in addressing regional and public policy issues, especially as they pertain to planning and development.

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CHAPTER 1:
INTRODUCTION

On November 15, 2021, President Biden signed into law the Infrastructure Investment and Jobs Act (IIJA) also known as the Bipartisan Infrastructure Law (BIL). The BIL authorizes $1.2 trillion in infrastructure funds. This legislation builds on the previous FAST Act and MAP-21 legislation.

On December 4, 2015, President Obama signed into law Public Law 114-94, the Fixing America's Surface Transportation Act (FAST Act). The FAST Act funded surface transportation programs—including, but not limited to, Federal-aid highways—at over $305 billion for fiscal years (FY) 2016 through 2020. It provided long-term funding certainty for surface transportation was the first long-term surface transportation authorization enacted in a decade that.

The Moving Ahead for Progress in the 21st Century Act (MAP-21), enacted in 2012, included provisions to make the Federal surface transportation more streamlined, performance-based, and multimodal, and to address challenges facing the U.S. transportation system, including improving safety, maintaining infrastructure condition, reducing traffic congestion, improving efficiency of the system and freight movement, protecting the environment, and reducing delays in project delivery. The FAST Act builds on the changes made by MAP-21.

MAP-21 was the first long-term highway authorization enacted since 2005. By transforming the policy and programmatic framework for investments to guide the system's growth and development, MAP-21 created a streamlined and performance-based surface transportation program and builds on many of the highway, transit, bike, and pedestrian programs and policies established in 1991.

Clean Air Act

The Clean Air Act of 1970 (CAA) and its Amendments require that the federal government review all transportation plans to assure improved air quality. These conformity requirements, first introduced in the 1977 CAA Amendments, prohibited federal approvals of actions that did not concur with state government's State Implementation Plan (SIP) for air quality improvements. These requirements were expanded in the 1990 Amendments to require that transportation plans conform to the SIP's expressed purpose of eliminating or reducing the severity and number of violations of the National Ambient Air Quality Standards and achieving expeditious attainment of such standards.

A portion of Muskegon County and the State of Michigan are operating under the State Implementation Plan (SIP). This plan identifies how air quality will be protected and improved in the State. The process for reviewing and approving Long Range Transportation Plans and projects is outlined in the SIP and is being followed in developing transportation plans statewide.

Under the CAA, the U.S. Environmental Protection Agency has classified a portion of Muskegon County as nonattainment and Ottawa County as an attainment maintenance area for the ground-level ozone pollutant. Muskegon is classified as its own area while Ottawa and Kent counties are classified as a two-county combined area.

The WestPlan 2050 MTP provides a multi-jurisdictional, multi-year look at the Muskegon/Northern Ottawa area's future transportation system. Transportation needs and resources were evaluated for the period 2023 to 2050, and appropriate plans were made for meeting long-term needs, in the best manner possible with constrained finances. The plan also includes the use of local, state, and federal transportation goals and objectives to guide transportation plans and projects. This plan covers transportation for all the WestPlan area and is heavily flavored

with input from local elected officials, municipal and road agency staff, and the citizens of the Muskegon/Northern Ottawa area.

Description of the Metropolitan Planning Organization (MPO)

WestPlan consists of a Policy Committee and a Technical Committee. The Technical Committee reports directly to the Policy Committee. The Policy Committee is responsible for all final decisions regarding transportation. All meetings, except for special meetings, are held during normal business hours. The following local communities, transportation agencies, and transit providers are members of WestPlan:

- Federal Highway Administration (FHWA)
- City of Ferrysburg
- City of Grand Haven
- Harbor Transit
- Michigan Department of Transportation (MDOT)
- City of Muskegon
- Muskegon Area Transit System (MATS)
- Muskegon County Road Commission
- City of Muskegon Heights
- City of North Muskegon
- City of Norton Shores
- Ottawa County Road Commission
- City of Roosevelt Park
- City of Whitehall
- Village of Spring Lake
- City of Montague
- Village of Fruitport
- Muskegon County urban township representative
- Ottawa County urban township representative
- Muskegon County rural township representative
- Ottawa County rural township representative
- Muskegon County
- Ottawa County

The Technical Committee meets at least every other month and is made up mostly of staff members of various member agencies. Members are typically engineers, city managers, or the Department of Public Works (DPW) staff. The Technical Committee acts as an advisory committee to work on primarily technical issues and make recommendations to the Policy Committee.

The Policy Committee also meets at least every other month. It is comprised mostly of local elected officials who have been appointed to the committee by their jurisdiction. The Policy Committee is responsible for all final decisions regarding transportation within the MPO.

Figure 1 : WestPlan MPO Planning Boundaries

Summary of the Planning Process

The development and management of a community's transportation system requires various levels and degrees of planning. At one level, an individual community may develop implementation plans for a single construction season or capital improvement plans to meet needs for the next five to six years. At another level, MPOs (MPO's) develop both Short- and Long-Range Plans that cross municipal boundaries and provide a transportation vision for an entire metropolitan area.

Ten Federal Planning Factors and Performance Based Planning

The continual development of this document is a cooperative effort of the local communities, transportation stakeholders, the public, and the MPO (MPO). The process, explained below, includes the development of numerous elements. The MTP is driven, in part, by ten Federal planning factors which have been identified by FHWA and are outlined below.

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 the 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 on surface transportation.

10. Enhance travel and tourism.

All the proposed projects in both the Long-Range Plan and the FY2023-2026 transportation Improvement Program (TIP) advance at least one of these goals and typically touch on multiple goals. These decisions were informed by the ten federal planning factors and other considerations.

Another initial step of the planning process is the collection and analysis of data. For this effort, demographic information on the Muskegon and northern Ottawa County area was collected at a detailed "traffic analysis zone" ("TAZ") level. This included socio-economic data items such as population, housing units, vehicles available, retail and non-retail employment, and other data. Additional information includes traffic count levels, land use patterns, zoning ordinances, comprehensive development plans, environmental factors, and recent local developments.

In addition to the collection of current data, projections must be made for future years of the plan. Using

population and employment projections, environmental and other development constraints, land-use patterns, local knowledge, and many other factors, socio-economic estimates were made for the year 2050. These projections estimate how the Muskegon/Northern Ottawa area may develop in the coming years.

As the socio-economic data was being compiled and projections were being made, a computer model of the WestPlan transportation network was also being further refined. The computer model, used for long-range planning and for air quality modeling, includes a complex network of simulated roadways in the WestPlan area. Each roadway in the model carries a simulated level of traffic based on the surrounding land uses, population, traffic counts, roadway types, and other socio-economic factors.

Current socio-economic data and traffic information was used as input and the model was calibrated to simulate traffic patterns and data. Once the calibration process was complete, the socio-economic data estimates for 2050 were included in the model to determine if the current transportation system could accommodate the area's anticipated demographics. The model's purpose is to identify roadways that are currently deficient or will be in the future.

In addition, other transportation concerns are addressed in the plan through the identification of a "local concerns" list and the development of goals and objectives. The local communities compiled the local concerns to address transportation needs such as safety, operational, or economic concerns that may not be shown by the capacity deficiency model. The concerns and desires of the WestPlan area are also included in the goals and objectives that will guide transportation efforts into the future.

As the goals and objectives were developed, financial resources were analyzed. As the plan must be financially constrained, an estimate of transportation revenues to the area must be calculated before plans for the transportation system and implementing projects can be selected. Recent funding sources and levels were used by MDOT to project future revenues and the total amount of transportation funds expected through 2050.

Brief Description of Public and Stakeholder Involvement

Public and stakeholder involvement throughout the MTP planning process was ensured through several mechanisms:

- Press and information releases
- Facebook notifications
- Direct mailings of the WMSRDC newsletter
- Internet web page
- Annual report
- Meetings of the WestPlan Technical and Policy committees
- Special meetings
- Workshops
- Public meetings

The BIL also requires that WestPlan consult with federal, state, and local entities that are responsible for:

- Economic growth and development
- Environmental protection
- Airport operations
- Freight movement
- Land use management
- Natural resources

- Conservation
- Historic preservation

Lists of these transportation stakeholder agencies and consultation agencies are in the appendices. The goal of this process is to eliminate or minimize conflicts with other agencies' plans that impact transportation. WestPlan staff began the consultation process by reviewing its current stakeholder list to expand and ensure that the correct types of organizations noted above were receiving information regarding the MTP. With the assistance of the Federal Highway Administration, Michigan Department of Transportation, and other MPOs, additional entities are constantly being identified therefore expanding the transportation stakeholder list. In October of 2023, after receiving a new contact list from MDOT and FHWA, MPO staff added local contacts and created a new consultation database, separate from the public involvement contact list.

Agencies on the consultation list were contacted after a draft project list was adopted by the Technical and Policy Committees.

Progress Since Last Plan

WestPlan is committed to the region-wide promotion and implementation of a safe, convenient, and seamless passenger and freight multimodal transportation system that includes highway, rail, bus, bicycle, and pedestrian mobility networks. Attaining this vision will require modernizing the region's existing transportation infrastructure and identifying additional funding sources.

Preservation of existing roadways and facilities has been the emphasis of the MPO, with significant commitments from federal, state, and local sources committed to funding transit, highway, and non-motorized projects in the MPO area.

The WestPlan MPO partnered with MDOT and the City of Grand Haven on a study for alternatives for US-31 through the City of Grand Haven.

The WestPlan MPO administered a study which examined the management structure of Harbor Transit and MATS.

The WestPlan MPO also planned and implemented the expansion of several non-motorized trail facilities in the area. Both Ottawa and Muskegon counties have shown a commitment to fund these types of projects.

In the 2023-2026 TIP, the WestPlan MPO has committed $155,182,952 towards transit, highway, and non-motorized projects throughout the MPO.

CHAPTER 2:
REGIONAL OVERVIEW

Introduction

The earliest recorded history of the Muskegon area reflects that it was inhabited by the Ottawa and Potawatomi tribes. The name "Muskegon" is derived from the Ottawa Indian term "Masquigon" meaning "marshy river" or "swamp." The "Masquigon" river is identified on French maps as early as the 17th century, suggesting that French explorers had reached Western Michigan by that time.

The first known Frenchmen in the area were Father Jacques Marquette, who traveled through the area in 1675 on his way to St. Ignace and a party of French soldiers under LaSalle's lieutenant, Henry de Tonty, who passed through in 1679.

The earliest known resident of the county was a fur trader and trapper named Edward Fitzgerald, who settled in the area in 1748. Settlement of the area began in 1837 with the organization of Muskegon County from portions of Ottawa and Oceana counties. At the time of its incorporation in 1859, Muskegon County had six townships -- Muskegon, Norton, Ravenna, White River, Dalton, and Oceana.

The lumbering era put Muskegon County on the map, in economic terms. Ravenna was settled in 1844 when E.B. Bostwick built a sawmill. The city and township were named after Ravenna, Ohio, the hometown of the surveyor who platted the land. Norton Shores was settled by Colonel S. Norton in 1846. Casnovia was founded in 1850 by a tavern keeper named Lot Fulkerson. Montague was first settled in 1855 by Nat Sargent. Whitehall was platted in 1859 by Charles Mears and Giles B. Slocum. The town was originally named after Mears. In 1864 the Muskegon Log Booming Company was formed to sort logs and raft them to the mills. In 1868, Fruitport, originally Crawville, was founded by Edward Craw. It was renamed a year later when the Pere Marquette Railroad built a station in the town that was a fertile fruit growing area and a port. The City of Muskegon was incorporated in 1869. In 1872 North Muskegon was recorded as Reedsville, named for the first settler, Archibald Reed. It was renamed in 1881 when it was incorporated as a village. North Muskegon was later incorporated as a city in 1891.

The year 1890 marked the end of the lumber boom in Muskegon County. Successful area industrialists formed the Muskegon Improvement Company to stimulate the economy as it lagged by the end of the lumber era. The Muskegon Improvement Company purchased 1,000 acres and sold the lots in a lottery, using the proceeds to create new businesses. The project was successful enough that a train station was built in the area, presently known as Muskegon Heights, in 1902 to efficiently serve the Chicago & West Michigan Railroad.

Union Depot was opened in 1885 to serve the Chicago & West Michigan; Muskegon, Grand Rapids, & Indiana; and the Toledo, Saginaw & Muskegon railroads. It was designed by A.W. Rush & Son of Grand Rapids in the Richardsonian Romanesque style. The station was closed in 1971 until it was donated to the county in 1992, restored, and reopened as the visitor's center and museum (Historical Markers). Lakewood Club was formed as a resort association in 1912 by the Mayo brothers. It was popular enough by 1914 that a seasonal post office was set up, which became permanent in the 1940s.

The oil boom in Muskegon County was a distinct period during the city's industrial era. The oil was found by accident in 1869 when Gideon Truesdell was looking for salt. They had been drilling in various Muskegon County locations for salt between 1869 and 1886, but the salt was contaminated with petroleum. In 1922, Stanley Daniloff found oil seepage in the swampland near his home, within five years he had amassed enough funds to have the site drilled and a "gusher" was in Muskegon Township in 1927. The price of crude oil fell with the depression in 1929 and the oil era ended.

During the second world war period, Muskegon became an "Arsenal of Democracy." In the post war housing boom, Roosevelt Park was formed as a residential suburb in 1949 and named after Franklin Delano Roosevelt. The 1950s and 60s brought rough economic times to Muskegon County. Many workers were laid off and several local companies closed. In the 1960s and 70s, consolidation and mergers with national corporations left few locally owned businesses in the county.

Northern Ottawa County

As in Muskegon County, the Potawatomi and Ottawa Indians lived in the Grand Haven area prior to the first white settlers. The Grand River served as a trade route for the Native American tribes. The first permanent white settler to the area was Rev. William Montague Ferry, a Presbyterian minister who moved to the area in 1834. Ferry founded the first area church as well as the town of Ferrysburg.

A plat for the City of Grand Haven was recorded in 1835. The settlement of the surrounding areas of Spring Lake and Ferrysburg followed soon after. Over the following six decades Grand Haven saw success as part of the lumbering industry due to its location as a port.

The railroad arrived in 1858 which assisted in the development of the area's manufacturing and resort industries which took advantage of the port. In the past few decades northern Ottawa County has become a vibrant port, boating, fishing, and resort community.

Transportation History of the Region

The WestPlan MPO is located along the routes of U.S. 31 and Interstate 96, which are two major state transportation arteries linking the area to major regional population and economic centers such as Chicago, Detroit, Grand Rapids, Lansing, Indianapolis, and Milwaukee. U.S. 31 runs north and south along the Lake Michigan shoreline from South Bend, Indiana to Mackinaw City, Michigan. However, the classification of U.S. 31 as an expressway terminates at Ludington, Michigan, where it becomes a state highway generally served by only two lanes. The course of Interstate 96 is an east-west direction from Muskegon to Detroit by way of Grand Rapids and Lansing. The Muskegon metropolitan area is provided with public transit opportunities through the Muskegon Area Transit System (MATS).

Northern Ottawa County's transit needs are covered by Harbor Transit Multimodal Transportation System (Harbor Transit), which provides public transportation to the area through a demand-response system, as well as limited fixed routes during the summer months.

Commercial air service is available at the Muskegon County Airport with daily service to Chicago's O'Hare Airport. Muskegon and Grand Haven presently serve as the major deep-water ports in the area. In June 2004, Muskegon began receiving car ferry service to Milwaukee, Wisconsin by way of the Lake Express. This diesel-powered catamaran-style ferry travels at speeds of up to 40 miles per hour. Service is provided numerous times a day from late April through October.

One of the primary inter-city bicycle routes in the region is the Hart-Montague Trail State Park. The trail spans 22.5 miles from Hart in Oceana County to Whitehall in Muskegon County. Recent efforts resulted in the construction of the Fred Meijer Berry Junction Trail, which is a 10-mile stretch of trail between Whitehall and North Muskegon. This connects the Hart-Montague Trail to the City of Muskegon's Lakeshore Trail. This trail covers about 12 miles throughout Muskegon. Another path, the Musketawa Trail, extends 26 miles eastward from Muskegon to Marne in Ottawa County. From Marne, the trail becomes the Fred Meijer Pioneer Trail which extends into Kent County. Additionally, efforts are underway in northern Ottawa County to complete a trail system which would connect local trails with regional trails. U.S Bicycle Route 35 also runs through both Ottawa and

Muskegon Counties, partially on the trails and partially on local roads.

Metropolitan transportation planning in this area dates to 1973, when the West Michigan Shoreline Regional Development Commission (WMSRDC) organized the Muskegon Area Transportation Planning Program as the MPO Policy Committee. In 2003, when the U.S. Census Bureau expanded the Muskegon Urbanized Area to include northern Ottawa County, the WMSRDC realigned the Metropolitan Planning Area (MPA) of the MPO and organized the West Michigan Metropolitan Transportation Planning Program (WestPlan). The WMDRDC has administered, and staffed, the MPO since 1973. WestPlan undertakes a comprehensive transportation planning program to maintain the eligibility of local governments in the area to receive federal and state transportation funds for street and road improvements, as well as subsidies for mass transit.

Metropolitan transportation planning in the Muskegon area is a long-standing process dating back to the 1970s. In 1974, a Long-Range Transportation Plan was developed for the Muskegon Urban area. This plan was updated in 1986 and then re-certified as a Policy Document by the Muskegon Area Transportation Planning Program (MATPP) in 1990. In 1991, the plan was reviewed considering the Clean Air Act Amendments (CAAA) of 1990 and was approved by the Environmental Protection Agency (EPA) as a conforming plan for air quality. In recent years, the effects of the CAAA of 1990 and the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991 have caused changes in the scope and scale of transportation plans. In 2002, the US Census Bureau expanded the urbanized boundary for the Muskegon MPO. This action expanded the urbanized area to include Northern Ottawa County. Four townships, two cities, and one village were added to the MPO. The change was based on population density, and it was determined that the area between the Muskegon urbanized area and the Grand Haven urbanized area, also known as the “tri-cities area”, was now one contiguous urban area. This expanded MPO is now known as the West Michigan Metropolitan Transportation Planning program or WestPlan.

After the 2010 Census, the boundaries of the Adjusted Census Urban Boundary (ACUB) were changed yet again. With this expansion the urbanized boundary was extended south into Port Sheldon Township in Ottawa County. As this plan was written, further changes to the ACUB were underway after the 2020 Census. A work session with members of the MPO was conducted in July of 2023. Proposed revised boundaries were drawn and approved by the MPO committees in October of 2023. These were minor revisions and did not affect membership of the MPO.

Geography of the Region

The WestPlan MPO area is located on the central western side of Michigan’s Lower Peninsula, along the shoreline of Lake Michigan. The geography is characterized by coastal plains and immense lakeshore sand dunes, inland rolling hills, and high ridges. The area, heavily dependent on tourism revenues, is home to several popular state and county parks and other tourist activities. The area is known for its abundant natural features including productive fruit orchards, expansive forests, miles of Lake Michigan waterfront, inland lakes, and many rivers including the Grand and the Muskegon.

CHAPTER 3:

REGIONAL GOALS AND OBJECTIVES

This update to the Metropolitan Transportation Plan (MTP) for 2050 will serve as a policy statement and a guide for decision-making for the Muskegon and northern Ottawa County MPO, funding agencies, stakeholders, and transportation partners. The plan includes an inventory of the needs and deficiencies of the MPO's transportation network. It establishes priorities for allocation of federal funds and directs transportation improvement programming. The 2050 MTP focuses on state and federal initiatives and guidance, and positions the MPO to be responsive to anticipated trends and federal legislation governing transportation funding and investments.

Themes, Goals, and Objectives

The 2050 MTP will serve many purposes including setting the stage for the MPO's TIP. Additionally, it will be used to evaluate infrastructure investments and consistency with local, county, and regional land use and development goals. The following goals were developed to encompass the array of users, conditions, needs, and potential solutions exclusive to the overall transportation system within the MPO. Objectives were then developed for each goal to evaluate the value of individual projects and measure the success of the plan. In this manner, the 2050 MTP goals and objectives are organized into ten primary themes that are consistent with federal planning factors and statewide guidance:

1. Economic Vitality

Goal: Ensure that transportation investments support the economic vitality of Muskegon and northern Ottawa County, and enable local, regional, statewide, and global competitiveness, productivity, and efficiency.

Objectives:

- Improve access to targeted investment areas and planned development
- Improve access to the interstate
- Improve access to major attractions
- Improve intermodal goods movement

2. Multimodal Transportation Safety

Goal: Increase the safety of the transportation system for all users

Objectives:

- Reduce the number of motorized and non-motorized crashes
- Reduce the hazard potential for roadway-rail crossings
- Improve the safety of school zones and enhance connectivity to surrounding neighborhoods

3. Multimodal Transportation Security

Goal: Increase the security of the transportation system for all users

Objectives:

- Improve traffic control devices, signage, and access management
- Improve emergency response time and access
- Address transportation concerns associated with critical facilities

4. Multimodal Choices and Connections

Goal: Increase the accessibility and mobility options for people and freight

Objectives:

- Improve access and facilities for cyclists and pedestrians
- Improve access to public transportation and carpool opportunities

5. System Sustainability and Livability

Goal: Ensure that transportation investments protect and enhance the environment, promote energy conservation, improve quality of life, and promote consistency with state and local planned growth and economic development

Objectives:

- Improve access to employment and recreational opportunities
- Reduce impacts to environmental, natural, and cultural resources
- Support locally derived land use planning initiatives
- Incorporate Smart Transportation principles into project designs
- Plan for electric and other alternative fuel vehicles

6. Enhance the Integration and Connectivity of the Transportation System

Goal: Increase the integration and connectivity of the transportation system across modes for people and freight

Objectives:

- Improve passenger and freight services for air, rail, and waterborne transportation

7. System Efficiency and Management

Goal: Ensure efficient system management and operations

Objectives:

- Improve traffic signal system operations
- Improve Level of Service (LOS) on congested corridors and intersections

8. System Preservation

Goal: Ensure system management that emphasizes preservation of the existing transportation system

Objectives:

- Improve and maintain pavement quality
- Reduce the number of structurally deficient bridges

9. System Resiliency and Reliability

Goal: Ensure system management that analyzes potential resiliency issues in the transportation system

Objectives:

- Reduce or mitigate stormwater impacts on surface transportation
- Reduce or mitigate shoreline erosion's impact on the transportation system
- Reduce or mitigate accelerated pavement deterioration, flooded roadways, and bridge damage due to severe weather events.

10. Enhance Travel and Tourism

Goal: Ensure transportation system management that makes it easier to travel to tourist destinations and events

Objectives:

- Increase transportation options to include tourist destinations.
- Ensure direct travel connections between modes of transportation.

Background Preparation

To achieve these goals and objectives the development of the 2050 MTP included a comprehensive evaluation of local transportation and land use studies, municipal comprehensive plans, and county comprehensive plans, as well as coordination with key municipal, economic development officials, and other key stakeholders. This information provided a context for the plan's development and provided participants with a better understanding of relevant statistics, issues, and trends. Results of this activity include:

- Review of Previous MTP and Discussion with Partners: A review of the previous Metropolitan plan at the start of the update process allowed staff and key stakeholders the opportunity to identify strengths and shortcomings—in process, content, or implementation—of the previous plan and adjust accordingly. While planning partners will have identified their own issues, there should also be the opportunity for additional stakeholders, such as MDOT, advocacy organizations, and the public, to provide additional input on how the plan and process might be improved. In addition to a critique, this discussion provides an opportunity to share lessons learned from others as well as new and evolving approaches to Metropolitan planning.
- Review of Other Related Plans: In developing the next plan, it is important to look at the direction of other plans—both short- and long-term—that could directly or indirectly impact a region's transportation system. This is a chance to consider the results of corridor studies and other transportation plans and studies at the local, state, and national levels. With a recent emphasis on ensuring consistency and linkages with other ongoing planning activities, it is also important to consider county land use plans, Metropolitan plans, economic development plans, utility expansion plans, etc. Each of these external resources can provide valuable input into the development of the next MTP, thereby increasing the value and relevance of the document.

CHAPTER 4:
CONSULTATION

The Consultation Process is a separate process from the public participation process and is intended to better assess the needs of the consulted agencies. There are specific requirements that outline what types of agencies or stakeholders must be consulted during the transportation planning process, and the type of information that must be shared with these interested parties. It is suggested that contacts with state, local, Indian Tribes, and private agencies responsible for the following areas be contacted:

- Economic growth and development
- Environmental protection
- Airport managers
- Freight movement
- Land use management
- Natural resources
- Conservation
- Historical preservation
- Human service transportation providers

The objective of this process is to eliminate or minimize conflicts with other agencies' plans, programs, or policies as they relate to the MTP. By consulting with agencies such as Tribal organizations or land use management agencies during the development of the MTP, these groups can compare the MTP project list and map with other natural or historic resource inventories. WestPlan will also be able to compare the draft MTP to any documents received and adjust as necessary to achieve greater compatibility. The consultation process that WestPlan undertook is based on recommendations from the Federal Highway Administration and the Michigan Department of Transportation.

Consultation Agency List

In previous iterations of the MTP (previously known as the Long-Range Transportation Plan), the organizations from the Interested Citizens/Agencies list that WestPlan maintains for transportation public participation was used as the consultation list. For this cycle, the process was overhauled and a separate, more specific, list was created for the consultation process. The consultation list can be found in the Appendix.

For agencies targeted for consultation, a process of notification and information was undertaken. The following materials were sent to the consulted agencies on February 9, 2024: 1) an email explaining the consultation process, the Metropolitan Transportation Planning process, and the role of the WestPlan; 2) an invitation to a meeting on February 22, 2024 at the WestPlan office; 3) directions on how to provide input on the planning process and the project list, as well as how to contact WestPlan staff; 4) a copy of the 2050 MTP Project List; and 5) the rough draft of environmental assessment chapter.

The Consulted Agencies were contacted prior to the general public participation comment period to provide additional time for their review and to give WestPlan the opportunity to make changes to the MTP before the official public comment period begins. The consulted agencies were asked to have all

comments to WestPlan by February 22, 2024.

Consultation Meeting

WestPlan hosted a consultation open house-style meeting on February 22, 2024 at the WestPlan office to provide a formal opportunity for WestPlan to directly speak with consulted agencies and to gain their input on the proposed MTP prior to its public release. At the open house, the MTP project list and project map and Environmental Justice maps with projects overlay, were presented, reviewed, and discussed considering other ongoing land use, environmental, or community plans, to explore how the transportation projects or programs might interact. Consulted agencies were encouraged to submit any further comments to WestPlan for consideration during the remaining MTP planning process.

Documentation of Consultation

The intent of the consultation requirement is to exchange information with the consulted agencies and compare knowledge, plans, maps, and inventories developed with the MTP to ensure compatibility. To document this exchange, comments from consulted agencies, notes from the consultation meeting, and information distributed as part of the consultation process may be found at the end of this chapter. No individuals attended the consultation open house and WestPlan received no emails from interested citizens and/or agencies.

CHAPTER 5:

PUBLIC INVOLVEMENT

WestPlan is committed to ensuring that citizen input will figure prominently throughout the planning processes and contribute to transportation problem identification through public comment periods, public meetings, open houses, and review of the draft document.

WestPlan, as the MPO, is also federally required to explicitly set forth public participation policies. The standards for this process are found in Title 23 CFR 450.316 which requires that the public have reasonable opportunity to comment on transportation plans and programs. These policies are laid out in the Public Participation Plan in Transportation Decision Making.

The Public Participation Plan document describes all the public participation goals and requirements for WestPlan, including specific details regarding the development of the MTP. These guidelines were followed by WestPlan throughout the development of the 2050 MTP. The update of the 2050 MTP was a lengthy process—nearly two years in the making—that involved a variety of public outreach tools, including announcements on social media, direct emails, public meetings, and an open house.

Public Participation Mailing List

WestPlan maintains an extensive public participation emailing list that is used to provide information and notice to the public regarding transportation planning activities. The Interested Citizen/Agency list includes many representatives such as non-profits, faith-based organizations, concerned citizens, educational organizations, elected officials, environmental organizations, government entities and organizations, media, organizations serving the disabled, organizations serving senior citizens, transportation related organizations, and tribal organizations. This list is updated regularly and can be found in the appendix of this document.

Public Participation Outreach

To provide the public with fast, easy access to all things related to the MTP update, staff continued to maintain the wmsrdc.org website and the WMSRDC Facebook page throughout the planning process. This included posting announcements for all public participation opportunities, the Public Participation Plan, air quality conformity analysis documents, other relevant background information, past planning documents, and MPO Technical and Policy committee meeting materials. The WMSRDC website, www.wnsrdc.org, website also hosts streamlined menus, simple navigation, interactive project related mapping, and other information. More specifically it includes the mapping of all MTP projects, links to transportation related documents, contact information, etc.

Once the draft MTP document, environmental justice, air quality conformity, and identification of deficiencies were complete, a 14-day public comment period was held from March 28 to April 17, 2024**.** Notices of the public comment period were posted on the WMSRDC website on March 28, 2024, and sent to all on the Interested Citizen/Agency List. Announcements were also made on social media. Throughout the public comment period, the draft document was made available by request for the public to view in hard-copy format at the WMSRDC office as well as on the WMSRDC website.

All public comments received throughout the course of document development, as well as during the official public comment period, including comments received at the public meetings, can be found in the appendix of this document. All public comments received were provided to the WestPlan Technical and Policy committees for consideration.

On April 10, 2024, an open house regarding the draft 2050 MTP was held at the WMSRDC office. The draft 2050 MTP Project List, Environmental Justice, Environmental Mitigation Analysis, and Air Quality Conformity results were available at this meeting.

The open house was held from 1:30 a.m. to 3:30 p.m. at the WMSRDC office. The WMSRDC office is in an ADA accessible building located along fixed-route bus service lines to increase ease of access as well as follow public meeting location standards. An announcement of the open house was sent to the Interested Citizen/Agency List, which included information on how to access the document and other related documents. Concurrent with the meeting announcement mailing, the meeting information, methods for making public comment, and related information (Air Quality Conformity Analysis, Environmental Justice Analysis, and draft project lists) were posted on the WMSRDC website.

In addition to the public meetings, opportunities for public comment are available at monthly Technical Committee, Policy Committee, and WMSRDC Board meetings. Agendas and minutes for these meetings are regularly posted on the WMSRDC website. All documents, events, and public comment opportunities were published on the WMSRDC website throughout the MTP development process and were also made public through press releases to local media.

Throughout the 2050 MTP development, all pertinent public participation information was taken to the WestPlan Technical and Policy committees for their review and consideration. This review by the committee aided staff during the process, helping to make decisions regarding the plan along the way.

All comments received were reviewed and incorporated into the MTP as appropriate. Specifically, all written public comments during the public involvement period were recorded in the appendix of this document along with staff or MPO Policy Committee responses. An evaluation of the 2050 MTP public participation efforts will be made through the Public Participation Plan process to identify areas of success and areas that can be improved upon for future plans.

CHAPTER 6:
WestPlan Transportation Inventory

The Muskegon/Northern Ottawa area has a very diverse multimodal transportation system. The network includes a mix of highway, public transit, motorized and non-motorized transportation, as well as freight, rail, port, and air transportation. With such a complex system, there is a present and continuing need to identify and plan for this regional and global asset.

Highways and Bridges

There are approximately 2,257 miles of public roads in the WestPlan MPO area, of which 860 are maintained through federal transportation funds as designated through the National Functional Classification System (NFC) and the National Highway System (NHS). Approximately 425 miles are classified as arterial, interstate, or another freeway under the NFC System. These routes include US-31, I-96, M-120, M-37, M-46, M-231, and M-104. Also included with these routes are all "Business Routes" (BR) which are generally considered "Trunkline" routes and are under the jurisdiction of the Michigan Department of Transportation (MDOT). There are approximately 435 miles of NFC classified major and minor collectors in the MPO area. Collectors are generally under the ownership of the local road agencies, road commissions, cities, or villages. The remaining 1,398 miles are considered "Local".

National Functional Classifications of roadways reflect a roadway's balance between providing land access versus mobility. Functional classification is the process by which public streets and highways are grouped into classes according to the character of service they are intended to provide. Classifications of roadways play an important role in the planning process, funding, and management of the transportation network. The Federal Highway Administration (FHWA) provides specific guidelines when assigning roadway classifications.

Arterials, both principle and minor, are the highest classified roads and are regulated by state and federal agencies. Cities, villages, and road commissions maintain all other roads down to the local level. Other local governments that are not road agencies, such as townships, do not receive federal funding for road projects. In these cases, the county road commission would have jurisdiction over the road and would work with the local government on projects. The classification system includes interstates, other freeways, arterials, collectors, and locals. To receive federal funding, a road must be classified higher than a "local" road. A general summary of the selected classifications are as follows:

FHWA Hierarchy of National Functional Classification Roadways

Arterials (Principle and Minor): These roads serve major centers of activity within the metropolitan area. Principle and minor arterials typically carry most of the traffic within the network. Minor arterials provide service for trips of moderate length, serve geographic areas that are smaller than their higher arterial counterparts, and offer connectivity to the higher arterial system. In an urban context, they interconnect and augment the higher arterial system, provide intra-community continuity, and may carry local bus routes. In rural settings, they are identified and spaced at intervals consistent with population density so that all developed areas are within a reasonable distance of a higher level arterial.

Interstate Highways: Interstates are the highest classification of arterials and were designed and constructed with mobility and long-distance travel in mind. Interstate roads are generally limited access, divided highways offering high levels of mobility while linking major urban areas of the United States. I-96 is the only corridor in this region that is on the Interstate Highway Network.

Other Freeway: These roads typically look and function like interstate roads. These roads will also have directional travel lanes separated by some type of physical barrier and their access and egress points are limited to on- and off-ramp locations or a very limited number of at-grade intersections. US-31 north of Grand Haven is an example of such a road.

Other Principal Arterial (Urban and Rural): These roadways serve major centers of metropolitan areas, provide a high degree of mobility, and can also provide mobility through rural areas. These roadways are designed to serve abutting land uses directly with driveways and at grade intersections.

Collectors (Major and minor): Collectors distribute trips from the arterial system to ultimate destinations. These roads usually provide traffic access and circulation to residential, commercial, and industrial areas.

Local Roads: These roads are classified as offering the lowest level of mobility and provide access to higher roadway systems within the network. These often delve into rural areas and can be a main source of travel in smaller towns and villages.

WestPlan MPO Roads Classified as Arterials

I-96

Interstate 96 (I-96) connects Muskegon County with Detroit, and several cities along the way. I-96 merges into US 31-BR near the US-31 interchange in the City of Norton Shores. The original connection between the existing I-96 near Coopersville and US-31 in Muskegon County was established in the early 1960's. This route replaced the previous route known as US-16 through Muskegon County. There are several access points along this five-mile stretch. Exits 4 and 5 provide access on and off of I-96 to the Fruitport area, and there is an exit further west towards the Hile Road area. There is also a connection to US-31 that allows travelers to go north or south on US-31. This is a most important junction due to the proximity to Lakes Mall and all the adjacent development around the mall, as well as the nearby Muskegon County Airport. There is an ongoing effort to provide a more efficient transition from the I-96 corridor to the US-31 corridor by means of an additional access point along I-96. In response, several studies have looked at the possibility of adding an interchange at the intersection of I-96 and Sternberg Road in Fruitport Township. MDOT has indicated that funding and federal requirements have delayed any potential projects from moving forward at that location.

US-31

US-31, in its entirety, traverses from southern Alabama to Michigan. In the MPO area, US-31 is a north/south limited access route that runs from the southern border of Grand Haven Township in Ottawa County to the northern border of Muskegon County near Montague. The route changes

characteristics in Ottawa County, where at-grade crossings are common at most major intersections. In Muskegon County, the route has limited access, with only eleven access points along the roughly 28-mile stretch inside Muskegon County. However, these serve as access points to local roads, communities, and other development within the region. Most of the interchanges have developments around them, but there are a few in the northern portion of Muskegon County that remain undeveloped. The most heavily developed areas are located around the Sternberg Road area, the Laketon and Sherman areas, the M-46 area, M-104, and the M-120 area. There is also some development in the White Lake area around the Colby Road interchange. There are two business route (BR) sections of US-31 in Muskegon County, the first of which begins in the southern portion. US-31 BR extends from the western termination of I-96 near the US-31/I-96 Interchange, extending north to M-120 in the City of Muskegon. The second US-31 BR is in the White Lake area, near the cities of Whitehall and Montague. This route begins at the Colby Road/US-31 interchange and travels through the City of Whitehall and into the City of Montague, terminating at the Fruitvale Road/US-31 interchange, north of Montague. Business Routes are intended to serve as important connections to communities and provide mobility to and from interregional corridors. MDOT is working with the City of Grand Haven to assess improvement needs and options along US-31, including the Jackson Street intersection, in the city.

M-37

M-37 is another north/south route that traverses a large area in the state, but only about five miles in Muskegon County. The Muskegon portion begins near the Village of Casnovia and heads north through Bailey before entering Newaygo County. Most of the roads in that area are two lanes with a few added turn lanes or flares for accommodating turn movements. There are a few pockets of commercial activity along this route, but most of the land use is intended for agriculture.

M-45

M-45, locally referred to as Lake Michigan Drive, begins relatively close to Lake Michigan at an intersection with Lakeshore Drive near the Grand Rapids water filtration plant. The road runs easterly through an intersection with US-31 in Agnew where the M-45 designation starts. The road runs through rural Ottawa County to Allendale where it passes by, and provides access to, the main campus of Grand Valley State University. M-45 ends at the interchange with I-196, but Lake Michigan Drive continues east to its end where it becomes Pearl Street near the Grand River in downtown Grand Rapids.

M-46

M-46 (Apple Avenue) is a major trunkline route in Muskegon County and provides east-west travel through the entire county. From the east, at the intersection of M-37, the road runs west to the City of Muskegon and terminates just east of US-31 BR. M-46 has experienced considerable growth with Muskegon Community College and Baker College of Muskegon now located in the same vicinity, along with the Orchard View School District.

M-104

The western terminus of M-104 is at US-31 in Ferrysburg just north of the drawbridge spanning the Grand River north of Grand Haven. The highway runs along Savidge Street and crosses a bridge over the channel that connects the river with Spring Lake. On the opposite shore, the trunkline continues along Savidge Street, running between the river to the south and Spring Lake to the north. M-104 crosses the

central business area of the Village of Spring Lake. East of downtown, the highway transitions to Cleveland Street which continues east to Nunica. The eastern terminus of M-104 is located at the Exit 9 interchange along I-96 just west of Nunica.

M-120

M-120 (Holton Road) begins in the City of Muskegon, near the border of the City of North Muskegon, and heads in a north-easterly direction into Oceana and Newaygo counties just past the Holton area. Most of this roadway is two lanes other than a few areas where turn lanes have been added to accommodate turn movements. There are approximately 20 miles of road that are designated as M-120 in Muskegon County. The most heavily developed areas are in the southern portion of the road in the Charter Township of Muskegon and in Dalton Township.

M-231

Between M-45 and I-96/M-104, M-231 was completed in the fall of 2015. The route begins along M-45 (Lake Michigan Drive) in Robinson Township near the intersection with 120th Avenue and runs due north and across the Grand River into Crockery Township. The route has an at-grade intersection with Lincoln St, which is the only other intersection along the corridor, except for the terminus. M-231 continues northward, crosses over Leonard Street, and then ends at M-104 (Cleveland Street). I-96 is located near this intersection, which allows access to Muskegon (northwestward) or Grand Rapids (eastward). Ramps were also added at the 112th Avenue interchange for additional access to the Nunica area.

Previously, to cross the Grand River, travelers either used US-31 through Grand Haven or 68th Avenue through Eastmanville. This new road provides a river crossing almost equidistant between the two, greatly reducing driving time between areas north and south of the river and improving mobility in Ottawa County. Previously, a drive from Nunica to Robinson was a 20-mile trip; the new highway provides a route closer to 7 miles in length. In addition, this crossing over the Grand River serves as an important connection for emergency responders and serves as an emergency route for motorists if the US-31 bascule bridge in Grand Haven or the 68th Avenue bridge in Eastmanville are inaccessible. M-231 provides a third crossing over the Grand River within the MPO region; four bridges cross the Grand River in all of Ottawa County, including M-231. The M-231 bridge over the Grand River also includes a separated, non-motorized bridge.

There has been interest expressed by multiple communities and other agencies in the area to study this corridor further. One of the options initially considered included extending M-231 further south towards US-31 north of Holland and to I-196 east of Zeeland. The current configuration of M-231 today was the Preferred Alternative in the approved Environmental Impact Statement, which was based on the funding available at that time. A formal environmental review has not been initiated for further study of this corridor, but MDOT will participate with the MPO, and others interested in studying this corridor further in evaluating local and MDOT system needs. Additional state highway improvements will depend on statewide priorities and funding levels.

Public Transit Systems

Within the WestPlan area there are two major transit providers, as well as several smaller transit providers. In Muskegon County, the Muskegon Area Transit System is the major provider, and Harbor Transit Multi Modal Transportation System is the primary transit agency in northern Ottawa County.

Muskegon Area Transit System

The Muskegon Area Transit System (MATS) is a department of the County of Muskegon. Since 1974, MATS has provided public transportation in the Muskegon community on behalf of the local communities. MATS operates a network of fixed route bus services in the Muskegon area and demand-response services throughout the County. As the public transportation provider in the community, MATS also participates in transportation planning to improve the community and coordinates various transportation efforts. MATS partners with the Federal Transit Administration (FTA) for federal operating and capital funds, and the MDOT for state operating and capital funds. MATS also receives local funding from municipalities in the service area as well as from fare revenues.

MATS has a total of 20 vehicles and employs up to 50 people. In fiscal year 2023, MATS traveled 649,181 miles, served 237,804 passengers, and operated 41,140 vehicle hours. MATS currently operates service on 7 fixed routes, serving the urbanized area consisting of the cities of Muskegon, Muskegon Heights, Roosevelt Park, Norton Shores, and Muskegon Township. MATS also provides ADA complementary paratransit services and a public micro-transit on-demand service to meet the needs of the public. The hours of operation of the MATS route and ADA services are Monday through Friday, 7:00 am to 5:00pm. The hours of operation of the MATS micro-transit program are Monday through Friday 5:00 am to 11:59 pm and Saturdays 8:00 am to 5:00 pm.

Harbor Transit Multi Modal Transportation System

Harbor Transit has been serving public transportation needs of the Tri-Cities area since 1975. It was reorganized into a public transit authority Act 196 as the Harbor Transit Multi-Modal Transportation System in January of 2012, which coincided with the expansion of the service area to include all Grand Haven Charter Township. In 2014, residents of Spring Lake Township approved a ballot proposal to add Spring Lake Township to the service area, making the total service area now 55.5 square miles. This coverage includes the cities of Grand Haven and Ferrysburg, the Village of Spring Lake, Spring Lake Township, and Grand Haven Township. Harbor Transit is a small urban transit system providing on-demand service. In 2023, Harbor Transit purchased 30 acres of land in Grand Haven Charter Township to build a new facility. The cost of the new facility is estimated to be around $20,000,000 which will include infrastructure for electric buses. The system employs 70 full and part-time employees and operates a fleet of 27 buses along with two seasonal trolleys. The fleet is powered by 20 gasoline-fueled motor vehicles along with nine L. P. powered buses. In a normal month, buses will travel 60,000 miles.

The Harbor Transit Multi-Modal Transportation System partners with the FTA for federal operating and capital funds, and the MDOT for state operating and capital funds. Locally, Harbor Transit operates as an authority and receives local mileage funding from the City of Grand Haven, City of Ferrysburg, the Village of Spring Lake, Spring Lake Township and the Township of Grand Haven for operating funds and small capital projects.

Other Transit Providers

In addition to MATS and Harbor Transit, there are several other non-profits within the MPO which provide specialized transit services. Many of these non-profits access money through the 5310-funding program. Some examples of these providers are AgeWell Services, Pioneer Resources, and Goodwill Industries.

Pioneer Resources
Pioneer Resources offers services for people with mobility impairments, developmental disabilities, senior citizens, and others facing transportation barriers. Services are provided along the lakeshore in western Michigan (Ottawa and Muskegon counties). Pioneer Resources can also assist eligible passengers or organizations with field trips and special events.

Age Well Services
The Age Well Services Senior Transportation Program is a service for Muskegon County seniors who are living on limited incomes and need transportation to get to their medical appointments. The service provides door-to-door, non-emergency medical transportation and operates Monday through Friday from 8:30am – 5:00pm.

Intercity Bus Service
Currently, no intercity bus system services the WestPlan MPO area.

Air Transportation

Muskegon and Ottawa County (City of Grand Haven) both provide different levels of Air service to the MPO area and surrounding region.

Muskegon County Airport
The Muskegon County Airport is a safe, clean, and modern commercial air facility serving West Michigan. It was established at its current site in 1929 when the Muskegon County Board of Supervisors voted to purchase 242 acres of land in Norton Township as a site for the new county airport. Since that time, the airport has been developed into a major regional air transportation facility, providing direct access to the air transportation system to a Metropolitan Statistical Area (MSA) of nearly 500,000 residents.

The airport is included in the Federal Aviation Administration's (FAA) National Plan of Integrated Airport System (NPIAS), making it eligible for both entitlement and discretionary funding as a primary commercial service airport. Approximately 95% of the aircraft operations are general aviation/corporate in nature, and the remaining 5% is commercial airline service.

The airport is open 24 hours per day, 7 days per week, providing a base for varied services, including, but not limited to, daily Southern Airways Express service to Chicago O'Hare, U.S. Coast Guard Search and Rescue, medical life flights, flight training, casino charter flights, airframe/power plant/avionics repair, and private/corporate aircraft storage. On-site firefighting, per Federal Aviation Regulation Part 139, is available, as is law enforcement support through an agreement with the Muskegon County Sheriff Department.

Grand Haven Memorial Airport

The Grand Haven Memorial Airport provides the Grand Haven area with a convenient, accessible, and safe airport for business and recreational small aircraft users. Grand Haven Memorial Airport is a U-5 General Aviation all-weather facility, licensed by the MDOT Aeronautics office. The Airport is served with a paved primary runway 3,750 feet long and a paved crosswind runway 2,100 feet long. The Airport is operated through a management agreement with Benz Aviation of Grand Haven that provides a Fixed Base Operator (FBO) for service, maintenance, and general day-to-day airport management. The airport has a 1,360 square foot administration building, maintenance, and community hangars. The airport has 68 rental hangars. Hangars are available for lease.

Port and Maritime Transportation

Port of Muskegon

The Port of Muskegon offers five commercial docking facilities providing a variety of shipping, logistics support, storage, towing, and ship repair services for corporations. Convenient options are available to deliver and receive goods from the Port of Muskegon, and move those goods to market, nationally and internationally.

Muskegon Lake is the largest natural deep-water port in West Michigan. The Port of Muskegon handles shipments of freight, aggregate, coal, and salt throughout the year. The United States Army Corps of Engineers provides funding for dredging of the Muskegon Lake Channel to provide year-round access to port facilities.

In addition to the commercial port facilities, 12 recreational marinas operate on Muskegon Lake and over 20 charter fishing operations call Muskegon Lake home. White Lake, about 7.5 nm north of the Muskegon Lake Channel, has 8 recreational marinas and 12 charter fishing operators. A scenic cruise ship, the Aquastar, offers leisure and dinner cruises on Muskegon Lake and Lake Michigan from its berth on Muskegon Lake.

Building on its tradition as a Port City, Muskegon County is also served by the Lake Express Ferry, a high-speed ship carrying passengers and vehicles across Lake Michigan from Milwaukee to Muskegon in just 2.5 hours, offering two runs every day during its May-October season.

Port of Grand Haven/Ferrysburg/Village of Spring Lake

At the mouth of the Grand River lies the cities of Grand Haven and Ferrysburg, and the Village of Spring Lake. There is limited shipping activity in this area, primarily of aggregates, but most of the activity is recreational based. There are adequate modes of transportation to accommodate shipping activities, but water depth fluctuation plays an important role, and being the mouth of Michigan's longest river, there are a lot of deposits occurring in that area. The average depth of the harbor is around 16-20 feet, which makes it difficult for deeper draft vessels to use the port. The US Army Corps of Engineers provides annual funding for dredging of the channel to allow for deeper draft vessels that deliver to the docks in Grand Haven and Ferrysburg. Fishing and boating are the primary uses of this waterway, but Grand Haven is also the home to the United States Coast Guard's "Group Grand Haven," which coordinates all Lake Michigan Coast Guard activities.

Rail and Freight Transportation

Genesee-Wyoming Inc. operates a short rail line in the Muskegon-Northern Ottawa area, which connects to several other regional lines throughout the state. The Michigan Shore Railroad (MS) is located along the shore of Lake Michigan and interchanges with the CSXT. The MS operates a line with more than 7,000 cars per year, primarily consisting of sand and chemicals.

Currently there is no rail passenger service in the MPO Area, but the region is served by Amtrak and there are ongoing discussions with local and state leaders about expanding Amtrak services that exist in Holland and Grand Rapids, into the MPO area. Amtrak's Pere Marquette route connects these two cities with Chicago.

Non-Motorized Transportation

Regional efforts are focused on a strategic approach to creating safe and easily identified routes throughout the area, as well as connecting to other regional facilities. The Region currently has numerous pedestrian and bicycle transportation facilities. These existing and proposed networks should be linked, if possible, to encourage their use by casual travelers, commuters, and for recreational purposes. An extensive bicycle and pedestrian network not only stimulate single-mode trips (walking or biking alone), but also encourages the use of public transit. Transit agencies have provided crucial links to the non-motorized system in the area by adding bicycle racks to the buses that service the Muskegon urbanized area and the Harbor Transit Multi Modal Transportation System service area.
Pedestrian facilities include sidewalks, bike lanes, greenways, and trails. Sidewalks are common in most of the cities and villages within the Region but are less common in the rural areas. Many of the communities in the Region also utilize expanded lanes on the roadway for bikers and walkers.

In 2017, MDOT, in consultation with local municipalities, governments, and regional planning agencies, updated the non-motorized plan for the Grand Region. The MDOT-Grand Region encompasses the western central portion of lower Michigan and includes 13 Counties: Mason, Oceana, Muskegon, Ottawa, Lake, Osceola, Newaygo, Mecosta, Montcalm, Kent, Ionia, Allegan, and Barry. The plan serves as a tool to help identify gaps in the non-motorized network, prioritize non-motorized investment, coordinate with other agencies, and foster cooperative planning across municipal/county boundaries. The plan is available through the MDOT website.

Lakeshore Trail System (Muskegon County)
This system of trails in the City of Muskegon was started in 1998. The trail system is approximately 13 miles in length and offers a variety of routes throughout the city. Plans include linking the Laketon Avenue section with the Musketawa Trail to the east. There are also plans to connect the Shoreline Route with another connector in North Muskegon, which will link this system up with the Muskegon State Park and the Hart-Montague Trail.

Musketawa Trail (Muskegon County)
This trail system contains approximately 26 miles of paved recreational trail, which extends from the City of Marne in Ottawa County, west to the City of Muskegon. This trail is used by bikers, horseback riders,

inline skaters, cross country skiers, wheelchair travelers, and nature lovers. Plans include linking up other trail systems in Muskegon County.

Hart-Montague Trail (Muskegon County)
This trail system runs from Hart, Michigan, south to Whitehall. It is approximately 24 miles in length. The trail ends at the Whitehall southern city limits; the Fred Meijer Berry Junction Trail continues south into Dalton Township.

Fred Meijer Berry Junction Trail (Muskegon County)
This entire trail is currently complete and connects the southern end of the Hart-Montague Trail to the Lakeshore Trail in the City of North Muskegon. The trail is approximately 12 miles from Whitehall to North Muskegon. The trail is sponsored and maintained by a very active group called the Friends of the Fred Meijer Berry Junction Trail.

Grand Haven Waterfront Trail
The Grand Haven Waterfront Trail offers access to the Grand Haven State Park and public parking areas along the waterfront.

North Bank Trail Ottawa County
The North Bank Trail (NBT) currently consists of 3.3 miles of paved trails, with an additional 14.7 miles planned once funding is secured. The multipurpose pathway is located along the former Grand Trunk Railroad that extends from Spring Lake to Coopersville. The path connects at the east end of the Village of Spring Lake Bike Path to the east end of the Musketawa Trail and serves as a regional link between the beaches of Grand Haven/Spring Lake area and the Grand Rapids metro area. Spring Lake Township is part of the "Friends of the North Bank Trail" committee that has been meeting since August of 2006 to support and strategize future NBT projects. In addition, the Spoonville Trail crosses the new M-231 bridge and will connect the Grand River Greenway Trail (once completed) to the North Bank Trail. The 28-mile Grand River Greenway would run on the south side of the Grand River and eventually connect with Allendale trails, which connect to Grand Rapids.

Lakeside Trail (Ottawa County)
The Lakeside Trail is a 15-mile trail system that encircles Spring Lake through the communities of Ferrysburg, Fruitport, and the Village of Spring Lake. There are connections from this trail to the North Bank Trail and the Grand River Greenway. The Lakeside Trail runs on the north side of Savidge from N. Fruitport Road to the east to Old Boy's Brewhouse on the west. A cross country skiing/snowshoeing trail is in the wooded area north of Lakeside Trail. It begins at North Buchanan, proceeds to Fruitport Road, and continues along the North Bank Trail, provided by Spring Lake Township, which is a continuation of the Rail-Trail that extends east 3.3 miles into Spring Lake and Crockery Townships.

Spoonville Trail (Ottawa County)
The first 1.8 miles of the Spoonville Trail were opened in 2016. This first phase goes from North Cedar Drive to Leonard Road, crossing Sgt. Henry E. Plant Memorial Bridge. When completed the trail will create a link between the North Bank Trail and the Grand River Explorers Trail. As previously stated, the Spoonville Trail crosses the new M-231 bridge and will connect the Grand River Greenway Trail (once completed) to the North Bank Trail.

Lakeshore Trail (Ottawa County)
The Lakeshore Trail in Ottawa County is a 20-mile paved path that connects the communities of Grand Haven and Holland and allows users to travel from the Grand Haven State Park to the Holland State Park on one continuous route.

In addition to these major trails there are several other local trails, pathways, and other non-motorized facilities within the MPO area that are collaborations between state and local municipalities.

CHAPTER 7:
REGIONAL ISSUES

While the modeled capacity deficiencies of the transportation system are addressed in **Chapter 8 – Travel Demand Model** there are several other transportation concerns which have been identified for inclusion in the MTP. These include system condition, system operations, and a variety of other trends and issues impacting transportation in the WestPlan MPO.

Analysis of Background Research

Through background research and discussion with various local agencies and individuals throughout the planning process, several local concerns and issues relating to transportation in the WestPlan area were identified. Trends and issues were researched through the review of various local plans, review of federal websites and publications, and local workshops with the public and local elected and appointed officials.

During the MTP process several opportunities were provided for public input on the plan. These are further outlined in greater depth in **Chapter 5 – Public Involvement**.

System Condition

Knowledge of the condition of the transportation system is important in making an informed decision on potential alternatives to address the transportation needs of the MPO. In addition to the deficiencies outlined in **Chapter 8 – Travel Demand Model**, MPO staff also track pavement conditions through its Asset Management program as well as having direct involvement in non-motorized planning for the MPO.

Asset Management

Staff are directly involved in monitoring the roadway conditions within the MPO through its Asset Management program. Asset Management is a concept in the transportation industry that is emerging as an important planning tool for public officials, planners, engineers, and others. Asset Management is based on an inventory of each local road network within the region. It provides data that allows transportation officials to monitor, plan, and strategically improve the road network. This strategic method of investment marks a break from the traditional "tactical" method of fixing roads that have the most severe problems.

In 2002 the Michigan Transportation Commission formed an Asset Management Council, with the objective of implementing a state law that enacted the Asset Management Program. The Council is appointed by the Transportation Commission and answers directly to the Commission and legislature. Its five main elements include: Policy goals and objectives, data collection, planning and programming, program delivery, and monitoring and reporting. Its goal is to inventory all 39,000 miles of federal aid eligible roads within the State of Michigan, and according to the data collected, determine future distribution of ACT 51 transportation funds. Act 51 is a state transportation funding source. In the future, the Asset Management Council may implement a similar initiative to collect similar information on the remaining local road network.

The Asset Management Council has developed a statewide process that will result in approximately 50 percent of federal aid eligible roads in the state to be rated per year using the PASER system. Each year, WMSRDC staff, along with the Michigan Department of Transportation (MDOT) and a county road commission employee, collect this data within the MPO as well as the rest of the five-county region. WMSRDC staff also assists local units of government by collecting the same data on their local road systems.

Recent changes to state legislation require that local transportation agencies with at least 100 certified road miles submit bridge asset management plans, road asset management plans, and compliance plans to MDOT. WMSRDC staff have received training in these plans and will be available to assist local road agencies.

Non-Motorized Planning

In addition to monitoring the road conditions within the MPO, WMSRDC staff is also involved in monitoring the non-motorized system. In 2013, the MPO undertook a study to develop a non-motorized plan for the MPO area. The study included an examination of existing non-motorized trails within the MPO boundaries and identified new connections to fill in the gaps between existing and proposed, but not yet constructed, trails. This plan provides a guide for the MPO, Muskegon County, northern Ottawa County, and the various municipalities and townships, to develop trail connections that will provide an interconnected system for the entire MPO area. In addition to identifying desirable trail connections, the plan identified potential funding sources and priorities. The consulting firm Progressive AE worked with representatives of the MPO to analyze existing data and develop plans identifying these new connections. Input was sought from various MPO partners in the development of the plan. The MPO identified these partners and determined the extent of their involvement.

To commence the project, Progressive AE met with MPO representatives to collect and review the existing base data, review the project schedule, and begin to identify issues and opportunities related to the potential trail connections and alignments. It was determined that the study area would include all the applicable communities within Muskegon County and northern Ottawa County in the MPO. The base data that was collected included:

- GIS mapping
- Township tax parcel mapping
- Michigan Resource Information System (MIRIS) base data
- Applicable city, village, and township recreational/other master plans
- MPO's TIP
- MPO's MTP
- Muskegon and Ottawa County Master Plans and Recreation Plans

The various master plans, transportation plans, and recreation plans were reviewed for any pertinent non-motorized transportation components. These components provided the foundation for future recommendations and were included in the Muskegon/Northern Ottawa Non-Motorized Plan. Utilizing the existing base information, Progressive AE carried out a complete system reconnaissance within the MPO and performed a review and verification of existing system conditions, as needed. Existing non-motorized transportation facilities and currently planned connections were confirmed for the creation of a comprehensive system. Maps illustrating the various existing non-motorized systems were created. In addition, these plans identified potential new non-motorized trail connections. Progressive AE met with MPO representatives to review the preliminary non-motorized trail connections and support plans/documents. Revisions and corrections to the preliminary plans suggested by MPO representatives were noted. Based on input from the previous tasks, the preliminary non-motorized trail connections and support plans/documents were revised and resubmitted.

The MPO then sent the plans to various municipalities within the study area, as well as pertinent advocacy groups

to solicit their input and comments regarding the existing, proposed, and suggested non-motorized trail connection design. Comments, suggestions, and concerns received back from these groups were then incorporated into the final plans. In addition, preliminary prioritization of various non-motorized trail connections was developed along with preliminary order of magnitude cost estimates. Potential funding sources were identified, as well as potential partners in the development of trial sections.

Finally, mapping of existing and proposed facilities was divided out by the community to make the document more usable for each MPO constituent related to their own particular non-motorized facilities. An overview of the WestPlan non-motorized system can be found in **Chapter 6 - Inventory of Existing Transportation System**. The entire non-motorized plan is available from WMSRDC. The WestPlan MPO will begin updating the non-motorized plan in FY2024.

In 2017, WestPlan MPO and MDOT, in consultation with local municipalities, governments, and regional planning agencies, worked with updated the non-motorized plan for the Grand Region. The MDOT-Grand Region encompasses the western central portion of Lower Michigan and includes 13 Counties: Mason, Oceana, Muskegon, Ottawa, Lake, Osceola, Newaygo, Mecosta, Montcalm, Kent, Ionia, Allegan, and Barry. The plan serves as a tool to help identify gaps in the non-motorized network, prioritize non-motorized investment, coordinate with other agencies, and foster cooperative planning across municipal/county boundaries. More information on these projects, as well as many others, can be found throughout this MTP.

System Operations

With so many road agencies and transit agencies responsible for their own portion of the transportation operations it can be difficult to get a full picture of how the system operates. However, there are several examples of where the MPO is coordinating system level programs which enhance operations.

Traffic Count Program

One example of systems operation within the MPO is the coordination of traffic counting services. WMSRDC, operating as the administrative agency for the MPO, has taken the lead on an MPO-wide traffic count system. In addition to the traffic counting itself, the MPO has become the repository and access site for traffic counts within the MPO.

Every year the MPO contracts with a consultant to collect approximately 100 traffic counts. Once completed these counts are uploaded onto a user-friendly database site which can be accessed through WMSRDC's website. A portion of the data collected are classification counts, which are used to enhance data and maximize the use of count locations.

In 2020, the MPO began cooperating with MDOT with the goal of integrating WestPlan traffic counts into the State of Michigan's traffic count database.

Air Quality Program

Another example of systems operations within the MPO is the Air Quality program, which is coordinated by WMSRDC. WMSRDC is a member of the West Michigan Clean Air Coalition (WMCAC). Formed in 1995, the WMCAC is a partnership of businesses, academic institutions, government agencies, industry, and non-profit organizations in Kent, Ottawa, Muskegon, and Kalamazoo counties working together to achieve cleaner air in the region through the education and promotion of voluntary emission reduction activities. The WMCAC coordinates with adjacent MPOs, including Grand Valley Metropolitan Council and the Macatawa Area Coordinating Council. The coalition works to educate the public and to promote voluntary emission reduction activities. Individuals and

businesses can help the coalition by making clean air choices on Clean Air Action Days. The coalition attempts to limit the health and environmental damage that excessive ground level ozone can cause by encouraging organizations and the public to alter their lawn maintenance activities, refueling habits, and travel methods. West Michigan residents can stay informed about air quality year-round by visiting the WMCAC's website at www.wmcac.org.

A *Clean Air Action* Day is called when weather forecasters have predicted that conditions will be conducive to the formation of ozone or fine particulate matter. On Clean Air Action Days, West Michigan residents are asked to take certain voluntary actions to protect their health and reduce emissions.

HPMS

The Highways Performance Monitoring System (HPMS) program is a national highway information system that monitors data on the extent, condition, performance, use, and operating characteristics of the nation's highways. HPMS data is used extensively at the federal level in the analysis of highway system condition and performance, but more importantly in the appropriation of Federal Highway dollars and in support of federal efforts to secure increased transportation funding.

Safety Planning

Safety planning is one of the key criteria which is examined during the project selection process of TIP and LRP development. In addition to road and transit projects that have safety components, MPO committees have approved several projects which are primarily safety related projects. Most notably these include various Safe Routes to School projects. Also, many of the non-motorized trail and transit projects have key safety components.

The WMSRDC is responsible for Hazard Mitigation Planning for the entire region, which includes Muskegon County. Similar planning is done for Ottawa County by the State of Michigan. Hazard Mitigation Plans are developed to identify, reduce, and eliminate long-term risks to people and property from natural or manmade hazards. Planners work directly with the Michigan State Police and the Federal Emergency Management Agency, as well as local emergency managers and stakeholders.

Some of the issues identified through local hazard mitigation plans include weather related hazards such as fog and winter storms. With proximity to Lake Michigan, the MPO area is prone to these types of hazardous weather conditions. Also identified in these plans are issues such as hazardous material incidents, which could be uncontrolled releases of hazardous materials along the transportation network. An infrastructure failure is another potential hazard identified in these plans. The failure of critical public or private infrastructure could result in temporary loss of essential functions and/or services. The Michigan Department of Transportation has identified and posted emergency routes along the major trunklines in Muskegon and Ottawa Counties, primarily on US-31 and I-96.

Trends and Issues Affecting Regional Transportation

As previously discussed, there are several trends and issues which affect transportation within the WestPlan MPO: port access and expansion, transit connections, passenger rail issues, environmental and livability issues (such as climate change), air quality, and funding.

Port Access and Expansion

As identified in **Chapter 6 - Inventory of Existing Transportation System**, both the City of Grand Haven and the

City of Muskegon have deepwater ports. Due to changes in ownership of waterfront parcels as well as the closing of the Consumers Energy Cobb plant in 2016, there is a great deal of concern within the MPO about the future of port freight movement on Muskegon Lake.

Transit

Another concern which continues to be discussed is the lack of transit connections not only connecting to areas outside the MPO, but internal connections as well. Currently, the Muskegon Area Transit System operates within Muskegon County and the Harbor Transit Multimodal Transportation System operates in northern Ottawa County. Several years ago, Harbor Transit added Spring Lake Township to their service area, so the two service areas are now adjacent. A connection between the two systems currently exists near Trinity at the Lakes in Muskegon County. There is a great interest in further expanding connections between the two systems in the future.

A study was completed in 2023 which looked at the management structure of both MATS and Harbor Transit. The study recommended that the community explore changing the structure of MATS from a county department to an authority consisting of member communities.

The existing transit systems are further detailed in **Chapter 6 - Inventory of Existing Transportation System.**

Passenger Rail Issues

A continued interest remains in some type of connection in the MPO to passenger rail service. Currently the closest service to passenger rail is Amtrak in Holland and Grand Rapids.

Environmental/Livability Issues/ Climate Change

The impacts of transportation projects on the environment and livability of the WestPlan area were identified as a concern by members of the public.

There are several potential impacts of climate change on transportation infrastructure, including accelerated pavement deterioration, flooded roadways, bridge damage/repairs, shoreline erosion, increased maintenance, and increased stormwater and drainage issues.

Environmental issues, including livability and climate change, are factors that are evaluated during the project selection process. During the goal setting process, outlined in **Chapter 3**, both the Technical and Policy Committees selected the following goal related to Sustainability and Livability as one of their ten goals:

> ***Goal***: Ensure that transportation investments protect and enhance the environment, promote energy conservation, improve quality of life, and promote consistency with state and local planned growth and economic development
> ***Objectives***:
> • Improve access to employment and recreational opportunities
> • Reduce impacts on environmental, natural, and cultural resources
> • Support locally derived land use planning initiatives
> • Incorporate Smart Transportation principles into project designs
> • Plan for electric and other alternative fuel vehicles

Air Quality

As mentioned in the earlier section on the Air Quality Program, air quality continues to be an issue in the MPO and West Michigan due to the area's proximity to Lake Michigan and the southwest winds coming across the lake.

The air quality monitor in Muskegon County (located in Laketon Township) is in violation of the 2015 National Ambient Air Quality Standard (NAAQS) for ozone. Due to this, part of Muskegon County is a designated nonattainment area for the 2015 NAAQS and the entire county is a maintenance area for the 1997 ozone NAAQS. Ottawa County meets the 2015 NAAQS but remains a maintenance area for the 1997 ozone NAAQS. This is explained in further detail in **Chapter 12 – Air Quality Conformity**.

Funding

Inadequate funding is another issue which was brought up by members of the public at multiple meetings throughout the process of creating the MTP. Specifically, a desire to see Act 51 revisited was mentioned often. An in depth look at funding is examined in **Chapter 13 – Financial Resource Analysis**. In particular, the lack of funding for local roads was seen as impacting the transportation system. Although the financial analysis of the 2050 MTP is financially constrained, there is not enough funding available to adequately maintain the transportation system.

CHAPTER 8:

Travel Demand Model

Travel demand forecasting models are a major analysis tool for the development of MTPs. These mathematical models are designed to calculate the number of trips, connect their origins with destinations, forecast the mode of travel using projected socioeconomic data, and identify the roadways or transit routes most likely to be used in completing a trip. Models are used to determine where future transportation problems are likely to occur, as indicated by modeled roadway congestion. Once identified, the model can test the ability of roadway and transit system improvements to address those problems.

The urban area travel demand modeling process for the Muskegon County and Northern Ottawa County area was a cooperative effort between WestPlan, being the MPO, and the MDOT Statewide and Urban Travel Analysis Section (SUTA). MDOT provided the lead role in the process and assumed responsibility for modeling activities with both entities reaching consensus on selective process decisions. The MPO and associated Technical Advisory and Policy Committees are responsible for carrying out transportation planning in cooperation with MDOT and the Federal Highway Administration. This is typically accomplished by full coordination of the local agencies with the MPO.

The results of the modeling effort provide an important decision-making tool for the MTP development as well as any transportation related studies that might follow. The modeling process is a systems-level effort. Although individual links of a highway network can be analyzed, the results are intended for determination of system-wide impacts. At the systems level, impacts are assessed on a broader scale than the project level.

The travel demand modeling for WestPlan has been completed using TransCAD software utilized by MDOT. The model is a computer simulation of current and future traffic conditions and is a system-level transportation planning model.

The current WestPlan model was developed for the 2050 transportation plan with a base year of 2019. The model covers the WestPlan Planning Boundary including all of Muskegon County and the northwestern portion of Ottawa County.

Phases of the Model

1. Data Collection: Socioeconomic and facility inventory data are collected.

2. Trip Generation: The model generates a synthetic population of households based on the aggregate characteristics of the population encoded in the traffic analysis zones (TAZ). The level of vehicle ownership is also applied to the household.

3. Trip Distribution: The number of trips for various purposes (work, school, etc.) are predicted for each household. The trips produced in each TAZ are distributed to all other TAZs based on attractiveness of the zone.

4. Mode Choice: Person trips are assigned to a mode of travel such as drive alone, shared ride 2 persons, shared ride 3+ persons, and transit. The dominant mode of travel (private automobile, bus, walking/biking) is modeled for the household's trip of each purpose.

5. Traffic Assignment: Trips are assigned to the roadway network and routes are chosen such that travelers minimize their travel time and costs.

6. Model Calibration/Validation: Verifying volumes (trips) simulated in traffic assignment replicate observed traffic counts.

7. System Analysis: Testing alternatives and analyzing changes to improve the transportation system.

Purpose of Urban Models	Roles in Projects and Studies
• Developed for MPO's as part of the Metropolitan Transportation Plans (MTPs) • Federal Requirement – MPOs must have an objective method to evaluate federal aid road system in the MTP. • Updated every 4-5 years • More detailed road network and zones	• Forecasts and Growth Rates • Microscopic System-wide Impacts • Traffic Diversion Patterns • Origin and Destination matrices and trip tables • Alternatives Analysis • Information for Mesoscopic and Microsimulation Models and Analysis Tools

Components of the Model

Traffic Analysis Zone (TAZ)

The TAZ is the primary geographical unit of analysis of the travel demand model, and it represents the origins and destinations of the travel activity within the model area. TAZs are determined based upon several criteria including similarity of land use, compatibility with jurisdictional boundaries, presence of physical boundaries, and compatibility with the road system. Streets and natural features, such as rivers, are generally utilized as zone boundary edges. TAZs vary in size depending on population, employment, and road network density. The WestPlan region is divided into 706 TAZs along with 30 external zones. Each TAZ includes population and employment data (aggregated from census blocks) which is fed into the travel demand model.

Road Network

The WestPlan Model network is based on the Michigan Geographic Framework and includes most roads within the study area classified as a minor collector or higher by the national functional classification system. Other roads are added to provide continuity and/or allow interchange between these facilities.

Transportation system information, or network attributes required for each link, include facility type, area type, lane width, number of through lanes, parking availability, national functional classification, and traffic counts (based on availability). The network attributes were provided by MDOT staff and reviewed by the MPO and Technical Advisory and Policy Committees. Link capacities and free flow speeds are determined based on network attributes such as national functional classification, facility type, and area type. These features of the road network are used in the traffic assignment process and in determining traffic conditions. The link capacity was determined by utilizing a look up table developed as part of the Urban Model Improvement Project undertaken by MDOT Urban Travel Analysis Staff. The table is based on the highway capacity manual utilizing network attributes and sets a capacity that would approximate a level of service “E”. This level of service is characterized by stop-and–go-travel, reduced flow rates, and severe intersection delays. A volume to capacity ratio of one or greater would

represent a level of service E or greater meaning unacceptable or deficient traffic conditions.

The two data systems, the zone system (socio-economic data), and the street system (network) are interrelated using centroids. Each zone is portrayed on the network by a point (centroid) which represents the weighted center of activity for that zone. A centroid is connected by a set of links to the adjacent street system. That is, the network is provided with a special set of links for each zone which connects the zone to the street system. Since every zone is connected to the street system by centroid connectors, it is possible for trips from each zone to reach every other zone by way of several paths through the street system.

The WestPlan 2019 calibrated and validated network includes approximately 954 miles of roadway (excluding centroid connectors) with the following classifications:

- 91 miles of Freeways (trunklines)
- 22 miles of Ramps (trunklines)
- 100 miles of Other Principal Arterials
- 233 miles of minor arterials
- 444 miles of major collectors
- 64 miles of minor collectors and local roads

Socio-Economic Data and Population Synthesis

Travel demand models are driven, in part, by the relationship of land use activities and characteristics of the transportation network. Inputs to the modeling process include the number of households, population-in households, vehicles, and employment located in each TAZ. These characteristics are generally referred to as socioeconomic data (SE-Data). The collection and verification of the SE-Data was a collaborative effort between WestPlan, MPO committee members, and MDOT.

For the base year of the model, household, population, and employment data were presented to the MPO Technical Advisory and Policy committees. The data was derived from the 2019 U.S. Census American Community Survey (ACS), 2010 Decennial Census, and employment databases from Data Axle. Data from 2020 Decennial Census was also used as a reference when developing the 2019 data. Committee members were asked to provide detailed information about new developments and where employers or the population had been reduced. TAZ's were created from the 2010 census blocks and constrained by the network, Minor Civil Division (MCD) boundaries, and physical barriers. Values for population and occupied households were aggregated from both 2010 and 2020 census blocks, along with 2019 ACS data. MDOT staff used this and MCD projections as well as local input from MPO staff and officials to develop the TAZ values for the forecast years of 2025, 2030, 2040 and 2050. The TAZ values were then reviewed by local agencies and MPO staff and approved through the MPO committee process.

Data Axle is a private market research firm providing several consumer and business databases which are continuously updated and regularly verified. MDOT purchased geocoded business employment data and merged files into a single MDOT employment database. This data includes the physical street address, employment level, and NAICS code for each record. MDOT cleaned this merged database by researching, editing, and updating records as needed such as updating addresses, NAICS codes, employment levels, or marking duplicate records. This base year employment data was reviewed by local agencies and MPO staff and approved through the MPO committee process.

WestPlan members and local officials also submitted information on planned future development which was incorporated into the 2019 base year data. This allowed known future development to be placed into the correct TAZ. Socio-economic data was then projected out to 2050 utilizing the 2019 TAZ data. Future year employment was distributed into each zone using a weighted average by current number of employees plus known development. WestPlan staff and committees reviewed the estimates and projections and adjusted given their

local knowledge and greater understanding of the unique local circumstances in each TAZ.

The WestPlan travel demand model generates a synthetic population of households based on the demographic information associated with the traffic analysis zones. For each zone, individual households are created. Each household has a total number of persons, workers, and students. Each household also has an income variable that indicates whether the household belongs to the lower, middle-, or upper-income category. The number of vehicles available to each household is modeled separately, after the population synthesis, based on these variables and other variables describing the zone in which the household is located.

Trip Generation

The trip generation process calculates the number of person-trips produced from or attracted to a zone based on the socio-economic characteristics of that zone. The relationship between person-trip making and land activity are expressed in equations for use in the modeling process. The formulas were derived from MI Travel Counts travel survey data and other research throughout the United States. Productions were generated with a cross-classification look-up process based on household demographics. Attractions were generated with a regression approach based on employment and household demographics. To develop a trip table, productions and attractions must be balanced. Walk/bike trips are calculated using a factor for each trip purpose derived from the MI Travel Counts travel survey data. The walk/bike trips are removed from the production/attraction table before trip distribution is performed. The WestPlan travel demand model also has a simple truck model that estimates commercial and heavy truck traffic based on production and attraction relationships developed from the Quick Response Freight Manual. The QRFM uses the employment data from the TAZ layer in calculating the percentage of trucks.

Trips that begin or end beyond the study area boundary are called external trips. These trips are made up of two components: external to internal (EI) or internal to external (IE) trips and through-trips (EE). EI trips are those trips which start outside the study area and end in the study area. IE trips start inside the study area and end outside the study area. EE trips are those trips that pass through the study area without stopping; this matrix is referred to as the through-trip table.

WestPlan is located adjacent to two other MPOs (MPOs): the Macatawa Area Coordinating Council (MACC), which is the designated MPO for the greater Holland-Zeeland area, and the Grand Valley Metropolitan Council (GVMC), which is the designated MPO for the greater Grand Rapids area. The southernmost boundary of the WestPlan travel demand model shares four external stations with the MACC model. Most of the eastern WestPlan model boundary shares 13 external stations with the GVMC model. The table below provides all external stations and with what MPO they are shared with, if applicable.

Figure 2: WestPlan and MACC Shared External Stations

Road Name	National Functional Class	Location
Lakeshore Dr	Major Collector (NFC #5)	Grand Haven Twp
US-31	Other Principal Arterial (NFC #3)	Grand Haven Twp
120th Ave	Major Collector (NFC #5)	Robinson Twp
96th Ave	Major Collector (NFC #5)	Robinson Twp

Figure 3: WestPlan and GVMC Shared External Stations

Road Name	National Functional Class	Location
Fillmore St	Local Road (NFC #7)*	Robinson Twp
M-45 / Lake Michigan Dr	Other Principal Arterial (NFC #3)	Robinson Twp
Bass Dr	Major Collector (NFC #5)	Robinson Twp
Leonard St	Major Collector (NFC #5)	Robinson Twp
I-96	Interstate Freeway (NFC #1)	Robinson Twp
Cleveland St	Major Collector (NFC #5)	Robinson Twp
Moorland Rd / 80th Ave	Minor Collector (NFC #6)	Ravenna Twp
Ravenna Rd / 56th Ave	Major Collector (NFC #5)	Ravenna Twp
Ellis Rd / Gooding St	Major Collector (NFC #5)	Ravenna Twp
Harrisburg Rd / Truman St	Major Collector (NFC #5)	Ravenna Twp
Trent Rd / 36th Ave	Major Collector (NFC #5)	Casnovia Twp
M-37 / M-46 / Apple Ave	Minor Arterial (NFC #4)	Casnovia Twp
Bailey Rd / 21 Mile Rd	Minor Collector (NFC #6)	Casnovia Twp

All three model area boundaries meet primarily within Ottawa County. In addition, there are several unique travel characteristics in and around Ottawa County that justify coordination of external stations between the three MPOs. This includes:

- Limited crossings over the Grand River, which runs east to west in the northern half of the county
- A bridge closure or congestion in one area may affect the trip patterns and/or volumes of another bridge or corridor in the adjacent MPO models
- Regional trip relationships between the three MPO areas, such as commuters travelling from Holland to Muskegon, or Muskegon to Grand Rapids
- Major corridors, such as M-231, 120th Ave, Fillmore Ave, M-45 (Lake Michigan Dr), I-96, etc., are near or extend into adjacent MPO models
- Land-use patterns and socioeconomic changes that impact or change regional travel

As such, it was determined that uniform volumes and growth rates at the shared external stations for all modeled years should be used. This allows larger regional changes in one model area to affect travel behavior in the adjacent MPO models. The volumes and growth rates were developed and coordinated between the three MPOs, MDOT SUTA section, and the MDOT Grand Region.

Trip Distribution

Trip distribution involves the use of mathematical formula which determines how many of the trips produced in a TAZ will be attracted to each of the other TAZs. It is the process which connects productions to attractions, connecting the ends of trips produced in one zone to the ends of trips attracted to other TAZs. The equations are based on travel time between TAZs and the relative level of activity in each zone. Trip purpose is an important

factor in the development of these relationships. The trip relationship formula developed in this process is based on principles and algorithms commonly referred to as the Gravity Model.

The gravity model is the most widely used and documented technique originally derived from Newton's Law of Gravity. Newton's Law states that the attractive force between any two bodies is directly related to the masses of the bodies and inversely related to the distance between them. Analogously, in the trip distribution model, the number of trips between two areas is directly related to the level of activity in an area (represented by its trip generation) and inversely related to the distance between the areas (represented as a function of travel time).

Research has determined that the pure gravity model equation does not adequately predict the distribution of trips between zones. The value of time for each purpose is modified by an exponentially determined "travel time factor" or "Friction Factor." Friction factors represent the average area-wide effect that various levels of travel time have on travel between zones. They were developed using an exponential function described in the Travel Estimation Techniques for Urban Planning, NCHRP 716 and calibrated to observed trip lengths by trip purpose derived from the MI Travel Counts travel survey data. A friction factor matrix is generated during the gravity model process.

The primary inputs to the gravity model are the normalized productions and attractions by trip purpose developed in the trip generation phase. The second data input is a measure of the temporal separation between TAZs. This measure is an estimate of travel time over the transportation network from TAZ to TAZ, referred to as "skims." To more closely approximate actual times between TAZs and to account for the travel time for intra-zonal trips, the skims were updated to include terminal and intra-zonal times. Terminal times account for the non-driving portion of each end of the trip and were generated from a look-up table based on area type. They represent that portion of the total travel time used for parking and walking to the actual destination. Intra-zonal travel time is the time of trips that begin and end within the same zone. Intra-zonal travel times were calculated utilizing a nearest neighbor routine.

The Gravity Model utilizes the by trip purpose Productions and Attractions, the by trip purpose friction factors, and the travel times, including terminal and intra-zonal. The output is a TAZ-to-TAZ matrix of trips for each trip purpose.

The external station trip distributions were developed primarily based on subarea analysis from the MDOT Statewide travel demand model. Socio-economic trends, such as employment and housing, and travel pattern analysis guided the development of growth rates for the shared external stations mentioned previously, in addition to analysis from the Statewide model. In some instances, the trip pattern distributions between shared external stations were adjusted in the model future years due to known land-use or roadway changes.

Mode Choice

Mode choice models are used to analyze and predict the choices that individuals or groups of individuals make in selecting the transportation modes that are used for types of trips. Typically, the goal is to predict the share or absolute number of trips made by mode. The WestPlan model uses the logit formulation to predict mode choice. In a logit mode choice model, the alternatives represent mode of transportation, and the utility is a function of the explanatory variables. These variables may include level of service, traveler characteristics, or area characteristics. The basic idea is that travel is the result of choices being made by individuals or households. Individuals choose which activities to do during the day and whether to travel to perform them, and if so, which locations to perform the activities, when to perform them, which mode(s) of transportation to use, and which routes to take. Many of these choice situations are discrete, meaning the individual must choose from a set of alternatives.

The MDOT-SUTA model framework produces and distributes all person trips including non-motorized, auto, and

transit trips. Roadway and transit networks provide important input to the mode choice model to quantify the levels of service in the region, including information like travel time for each modal option included in the model. The mode choice model separates the resulting person trip tables into the drive alone, shared ride by occupancy (2 and 3+ occupancy), transit (walk access), and non-motorized (bicycle and walk) modes.

The process uses a qualitative measure of transit network service at the zonal level to estimate transit mode shares. Transit shares are a function of trip purpose, production zone average autos per household and attraction zone area type. Transit service is represented in the model with a separate route system attached to the road network. Each route is modeled across the network passing through various zones with stops at certain nodes, so transit shares are estimated where both the production zone and attraction zone have access to transit service.

Traffic Assignment

Traffic assignment is the final step in the traditional four step TDM process. In this step, trips are assigned to a route, or path, on the roadway network between each trip origin and destination. The basic premise of trip assignment is that trip makers will choose the best path between each origin and destination. The determination of the best path is based upon selecting the route with the least impedance. Impedance, in this application, is based upon travel time – calculated as a function of link distance and speed (and later as a function of link volume and capacity). Speeds used to calculate minimum travel times are based on each link's area type, facility type, number of travel lanes, lane width, and parking. Speeds represent a relative impedance to travel and not posted speed limits. Essentially, trip makers on the roadway network will choose the route, between each trip origin and destination, which minimizes travel time.

The User Equilibrium algorithm (a commonly used algorithm) was employed in the WestPlan traffic assignment component. User equilibrium is based on the principle that while selecting the best route, trip makers will use all possible paths between an origin and destination that have equal travel time – so that altering paths will not save travel time. This algorithm attempts to optimize the travel time between all possible paths, reflecting the effects of system congestion. The product of the traffic assignment component is a series of vehicle-trip (volume) tables, by mode, for each link in the model roadway network. These assigned link volumes are then compared to observed traffic data as part of the model calibration, validation and reasonability checking phase of the overall modeling process.

The WestPlan travel demand model has 4 time periods that were developed to match the peak periods observed in traffic counts. The following periods were used: AM Peak (7:00am – 9:00am), Mid-Day (9:00am – 3:00pm), PM Peak (3:00pm – 6:00pm), and Off Peak (6:00pm – 7:00am)

A fixed time of day factor method was utilized. The factors were developed from the MI Travel Counts Michigan travel survey data and vary by trip type. Default factors from the Quick Response Freight Manual were also used for truck trips, along with actual truck traffic count data.

Model Calibration/Validation

The outputs of each of the four main steps, Trip Generation, Trip distribution, Mode Choice and Assignment, are checked for reasonableness against national standards. Modifications can be made at each step before moving on to the next.

The final model calibration/validation verifies that the assigned volumes simulate actual traffic counts on the street system. When significant differences occur, additional analysis is conducted to determine the reason. At this time additional modifications may be made to the network speeds and configurations (hence paths), trip generation (special generators), trip distribution (F factors), socio-economic data, or traffic counts.

The purpose of this model calibration phase is to verify that the base year 2019 assigned volumes from the traffic

assignment model simulate actual base year traffic counts. When this step is completed, the systems model is considered statistically acceptable. This means that future socio-economic data or future network capacity changes can be substituted for base (existing) data. The trip generation, trip distribution, mode choice and traffic assignment steps can be repeated, and future trips can be estimated for systems analysis. It is assumed that the quantifiable relationships modeled in the base year will remain reasonably stable over time.

Applications of the Calibrated/Validated Model

Generally, three distinct alternative scenarios are developed for a LRTP:

1. Simulated Base Year (2019) volumes assigned to the Base Year (2019) Roadway Network: This scenario includes the assignment of 2019 model volumes, generated using 2019 SE data, onto the roadway network representing 2019 conditions. This is referred to as the validated, existing network scenario, or base-year alternative, and is a prerequisite for the other two scenarios.

As a result of the Covid-19 pandemic, 2020 presented a unique shift in terms of travel patterns and the collection efforts of traffic counts. Since the model is a long-term forecast model, the 2019 traffic counts provide a more reliable source for representing the base-year travel characteristics of the region. Data from the 2020 Decennial Census was also used as a reference only for developing 2019 socio-economic data.

2. Simulated Forecast Year volumes assigned to a Modified Base Year Roadway Network: This scenario includes the assignment of 2050 volumes, generated using 22050 SE data, onto an amended roadway network representing 2050 conditions, and including any improvements completed since 2019 and future (near term) improvements for which funds have been committed. This alternative characterizes future capacity and congestion problems if no further improvements to the transportation system are made. This deficiency analysis on the existing plus committed (E+C) network is also called the "do nothing", or "no-build" alternative, and includes only the E+C roadway system.

3. Simulated Forecast Year (e.g. 2050) volumes on a proposed Forecast Year (e.g. 2050) Roadway Network: this scenario includes the assignment of 2050 volumes, generated using 2050 SE data, onto the roadway network as it is proposed to exist in the forecast year of 2050. This scenario is the long range transportation plan "build" alternative. It includes the E+C roadway network, plus proposed capacity improvement and expansion projects.

System Analysis

Once the base and future trips have been estimated, a number of transportation system analyses can be conducted:

- Roadway network alternatives to relieve congestion can be tested as part of the LRTP. Future traffic can be assigned to an amended, existing roadway network (i.e. “No Build” Network) to represent the future impacts to the transportation system if no improvements were made. From this, improvements and/or expansions can be planned that could help alleviate demonstrated capacity issues.
- Traffic impacts of roadway changes, such as adding or reducing capacity, can be assessed. Some roadway operational improvements can also be included in these types of analyses, such as the addition of weave-merge lanes or roundabouts.
- Individual links can be analyzed to determine which TAZs are contributing to the travel on that link (i.e. the link's service area). This can be shown as a percentage breakdown of total link volume.
- The impacts of land use changes on the roadway network can be evaluated (e.g. impact of a new major retail establishment).

- Road closure/detour evaluation studies can be conducted to determine the effects of closing a roadway and detouring traffic during construction activities. This type of study is very useful for construction management.

Congestion Analysis

With the completion of the travel demand model, areas of potential congestion in the roadway network were identified based on the volume to capacity ratios of the links. This means that the higher the V/C ratio, the higher the chances are that the roadway may experience congestion. The regional travel demand model identifies areas where traffic congestion is expected and produces a list of roadway segments that are congested or are close to capacity in the years 2019 and 2050.

The volume to capacity ratio reflects the volume for a specified time period and a capacity for that same period of time. It does not reflect areas that experience brief congestion at certain short time periods or because of roadway geometrics, or roadway condition. Congested areas are identified in the table and attached maps below.

The Travel Demand Model provided by MDOT provides a list of segments where congestion may occur through 2050. Congestion occurs when traffic volumes approach or exceed volumes that the roadway is designed to handle safely. Each link was assigned a volume to capacity ratio for each of the Scenarios listed above. The WESTPLAN Technical and Policy committees reviewed these modeling results and took them into consideration as the Long-Range Transportation Plan Improve and Expand project list was created.

Congested Segments (2019)

The Base Year scenario shows existing conditions of the area-wide transportation system as it was in 2019. There has been little traffic congestion in the majority of the WestPlan road network since the base year.

According to the model, the following corridors are identified as nearing congestion for the base year (2019), with V/C ratio greater than 0.8. Highlighted corridors have a V/C ratio greater than 1.0.

Figure 4:WestPlan 2025 MTP Congested Segments

	Road Name	Municipality	Extent
AM Peak (7:00am-9:00am)	E I-96/120th Ramp	Crockery Twp	Off Ramp
	Holton Rd (Southbound)	Dalton Twp	Bard to River Rd
	River Rd (Westbound)	Dalton Twp	Nielson Rd to Holton Rd
	Hile Rd (Westbound)	Fruitport Twp	Wilfred to I-96
	Farr Rd (Westbound)	Fruitport Twp	West of I-96 Off Ramp
	US-31	Grand Haven	M-104 to Fulton St
	US-31	Grand Haven	Fulton St to Comstock St
	M-120 Causeway (Southbound)	Muskegon	Holton to Moses J Jones Pkwy
	M-46 Apple Ave	Muskegon Twp	US-31 to Shonat Rd
	Holton / S US 31	Muskegon Twp	On Ramp - South US-31
	N US 31 / Holton	Muskegon Twp	Off Ramp - North US-31
	N US 31 / Apple Ave	Muskegon Twp	Off Ramp - North US-31
	Seaway	Norton Shores	East of Getty
	Sternberg (Westbound)	Norton Shores	I-96 to Quarterline

	Seaway / Norton Ramp	Norton Shores	SB Seaway to Norton Ramp
	US-31, Northbound and Southbound	Norton Shores	Apple to I-96
	M-104 Savidge (Eastbound)	Spring Lake	US-31 to Lake Ave
	M-104 Savidge (Westbound)	Spring Lake	Lake Ave to US-31

PM Peak (3:00pm-6:00pm)	E I-96/120th Ramp	Crockery Twp	Off Ramp – 120th/M-231
	River Rd (Eastbound)	Dalton Twp	Nielson Rd to Holton Rd
	Farr Rd (Westbound)	Fruitport Twp	West of I-96 Off Ramp
	US-31	Grand Haven	M-104 to Fulton St
	US-31	Grand Haven	Fulton St to Comstock St
	Jackson St	Grand Haven	West of US-31
	M-120 Causeway (Northbound)	Muskegon	Holton to Moses J Jones Pkwy
	Holton/ N US 31 Ramp	Muskegon Twp	On Ramp - South US-31
	N US 31 / Holton	Muskegon Twp	Off Ramp - North US-31
	N US 31 / Apple Ave	Muskegon Twp	Off Ramp - North US-31
	M-46 Apple Ave	Muskegon Twp	US-31 to Shonat Rd
	Seaway	Norton Shores	East of Getty
	US-31, Northbound and Southbound	Norton Shores	Apple to I-96

	M-104 Savidge (Westbound)	Spring Lake	West of Lake Ave
	M-104 Savidge (Eastbound)	Spring Lake	US-31 to Lake Ave

24-Hour	US-31	Grand Haven	M-104 to Fulton St
	US-31	Grand Haven	Fulton St to Comstock St
	N US 31 / Apple Ave	Muskegon Twp	Off Ramp - North US-31
	S US-31 BR / Norton Ramp	Norton Shores	SB Seaway to Norton Ramp
	US-31, NB/SB	Norton Shores	I-96 to Apple Ave
	M-104 Savidge (Eastbound)	Spring Lake	West of School St

The maps below highlight corridors which are nearing congestion from the base year 2019 as shown by the travel demand model.

Figure 5: 2019 24 Hour Flow

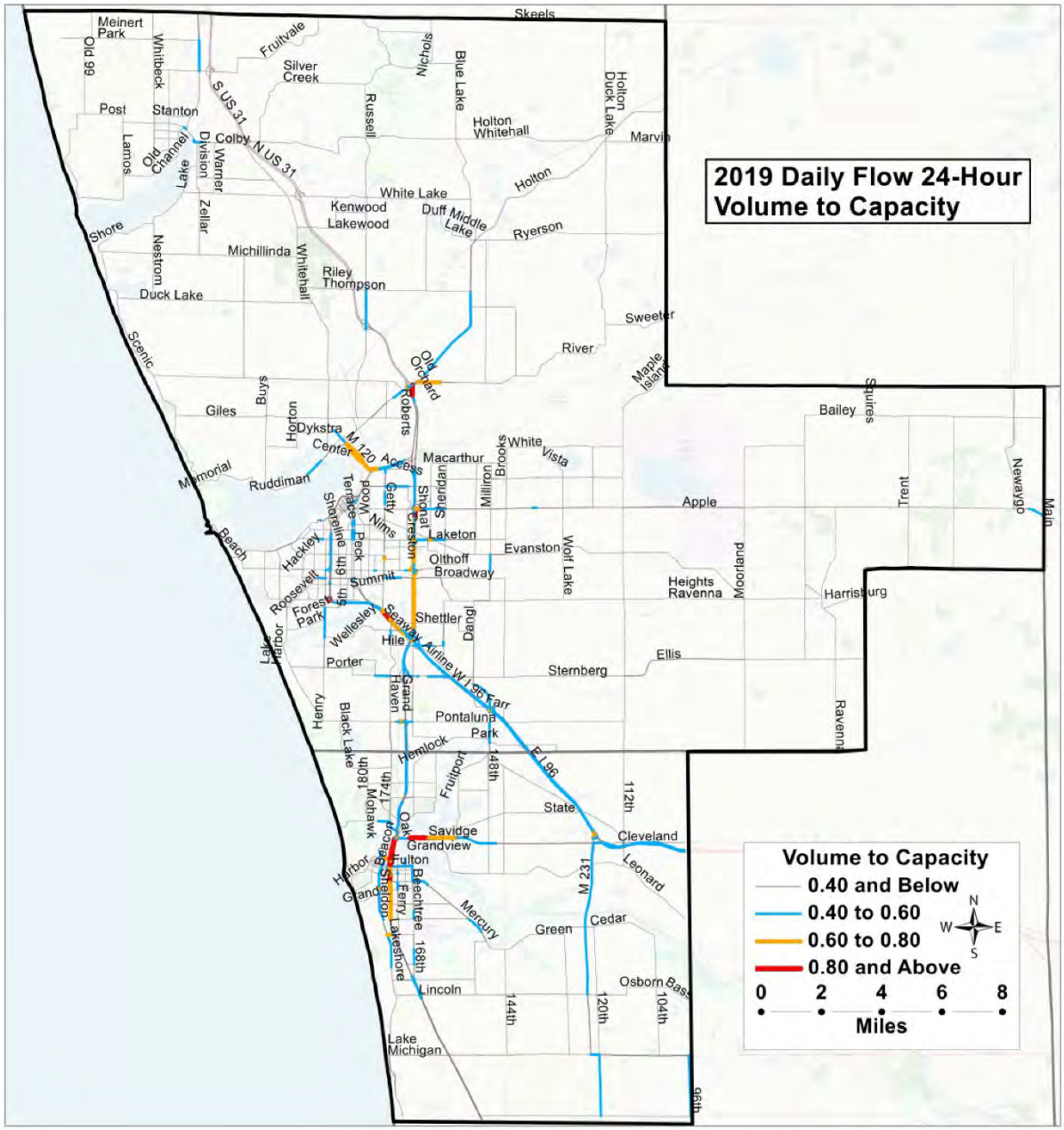


Figure 6: 2019 AM Flow

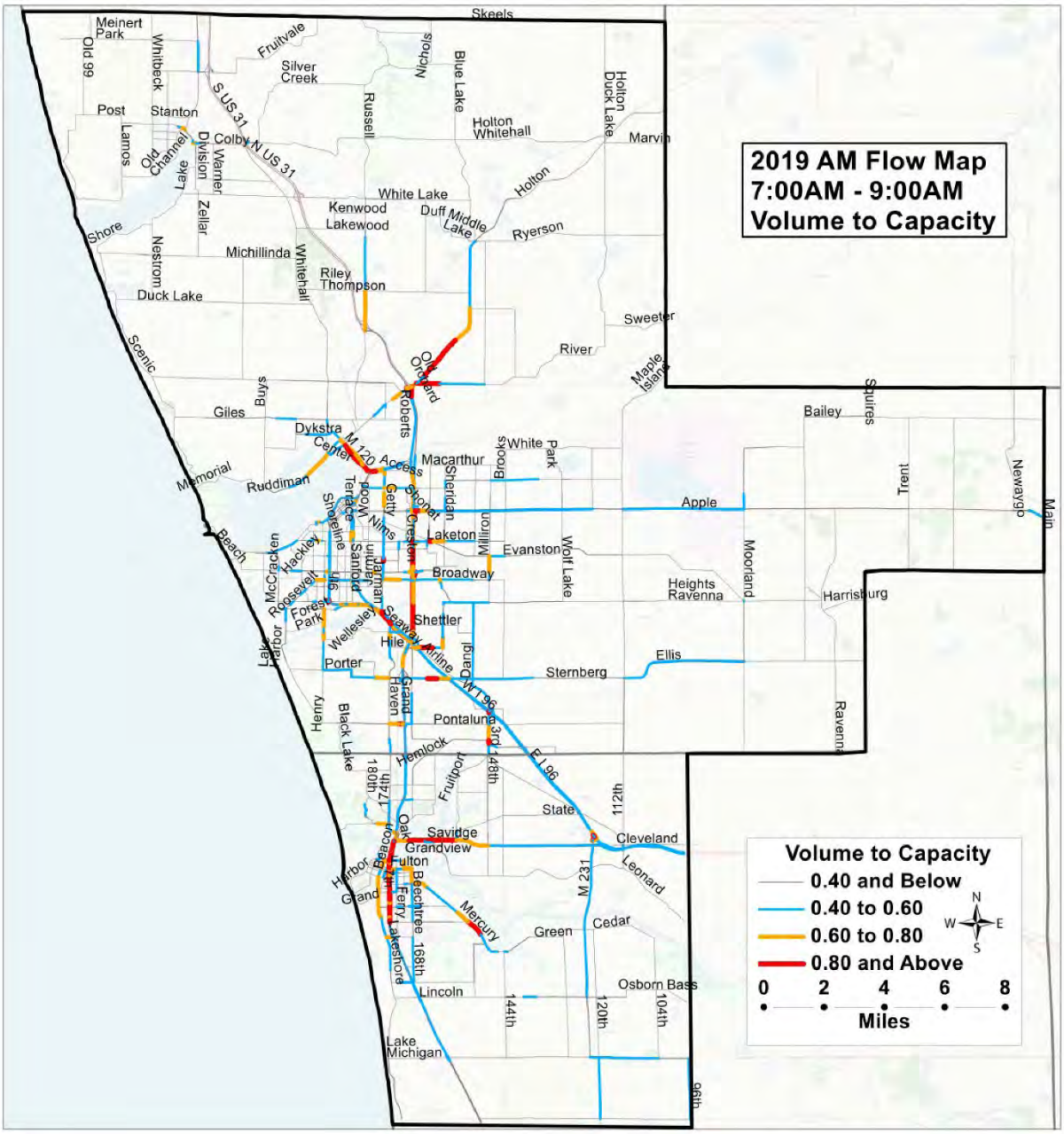
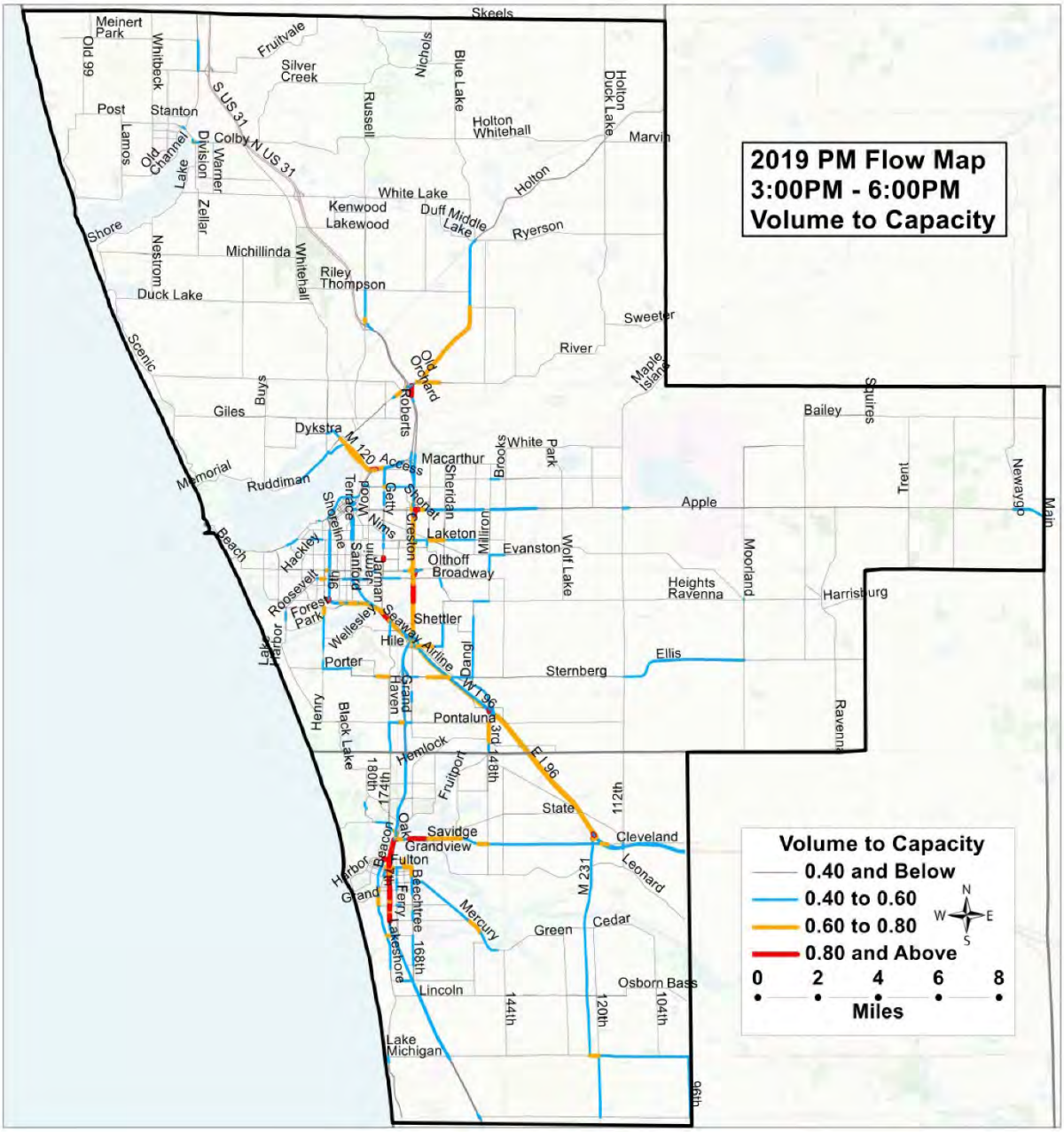


Figure 7: 2019 PM Flow



Future Congested Segments (2050)

The 2050 scenario shows forecasted conditions of the area-wide transportation system including both committed projects and proposed capacity improvements and expansion projects. In general, congestion increased slightly along the same corridors highlighted from the 2019 model results with additional corridors including M-231, M-104 through Spring Lake, parallel roads to US-31 in Grand Haven, I-96 at US-31 interchange, and US-31 from I-96 to Apple Ave including northbound exit ramps.

The following corridors are identified as nearing congestion for the future (2050), with V/C ratio greater than 0.8. Highlighted corridors have a V/C ratio greater than 1.0.

Figure 8: Future Congested Segments

	Road Name	Municipality	Extent
AM Peak (7:00am-9:00am)	E I-96/120th Ramp	Crockery Twp	Off Ramp - 120th/M-231
	M-231	Crockery Twp	I-96 to Lincoln St
	River Rd (Westbound)	Dalton Twp	Nielson Rd to Holton Rd
	Russell Rd at US-31	Dalton Twp	E Bard to W Bard
	Hile Rd (Westbound)	Fruitport Twp	Wilfred to I-96
	Farr Rd (Westbound)	Fruitport Twp	West of I-96 Off Ramp
	US-31	Grand Haven	M-104 to Jackson St
	US-31	Grand Haven	Jackson St to Comstock St
	M-120 Causeway (Southbound)	Muskegon	Holton to Moses J Jones Pkwy
	M-46 Apple Ave	Muskegon Twp	US-31 to Shonat Rd
	Holton / S US 31	Muskegon Twp	On Ramp - South US-31

	N US 31 / Holton	Muskegon Twp	Off Ramp - North US-31
	N US 31 / Apple Ave	Muskegon Twp	Off Ramp - North US-31
	N US 31 / Laketon Ave	Muskegon Twp	Off Ramp - North US-31
	Pontaluna	Norton Shores	Grand Haven Rd to US-31
	Seaway	Norton Shores	East of Getty
	Sternberg (Westbound)	Norton Shores	I-96 to Quarterline
	Sternberg (Eastbound)	Norton Shores	Robert Hunter to Grand Haven Rd.
	Seaway / Norton Ramp	Norton Shores	SB Seaway to WB Norton Ramp
	US-31, NB/SB	Norton Shores	Apple to I-96
	M-104 Savidge (Eastbound)	Spring Lake	US-31 to Lake Ave
	M-104 Savidge (Westbound)	Spring Lake	West of Lake Ave

PM Peak (3:00pm-6:00pm)	E I-96/120th Ramp	Crockery Twp	Off Ramp
	M-231	Crockery Twp	I-96 to Lincoln St
	Russel Rd at US-31	Dalton Twp	Near E Bard Rd
	River Rd (Eastbound)	Dalton Twp	Nielson Rd to Holton Rd

	Farr Rd (Westbound)	Fruitport Twp	West of I-96 Off Ramp
	US-31	Grand Haven	M-104 to Jackson St
	US-31	Grand Haven	Jackson St to Comstock St
	Jackson St	Grand Haven	West of US-31
	M-120 Causeway (Northbound)	Muskegon	Holton to Moses J Jones Pkwy
	Holton/ N US 31 Ramp	Muskegon Twp	On Ramp - South US-31
	M-46 Apple Ave	Muskegon Twp	US-31 to Shonat Rd
	N US 31 / Holton	Muskegon Twp	Off Ramp - North US-31
	N US 31 / Apple Ave	Muskegon Twp	Off Ramp - North US-31
	N US 31 / Laketon Ave	Muskegon Twp	Off Ramp - North US-31
	N US 31 / Sherman Ave	Muskegon Twp	Off Ramp - North US-31
	Pontaluna	Norton Shores	Grand Haven Rd to US-31
	Seaway	Norton Shores	East of Getty
	Seaway / Norton Ramp	Norton Shores	SB Seaway to WB Norton Ramp
	US-31, NB/SB	Norton Shores	Apple to I-96
	M-104 Savidge (Eastbound)	Spring Lake	US-31 to Lake Ave
	M-104 Savidge (Westbound)	Spring Lake	West of Lake Ave

Daily (24-Hour)	E I-96/120th Ramp	Crockery Twp	Off Ramp
	US-31	Grand Haven	M-104 to Jackson St
	US-31	Grand Haven	Jackson St to Comstock St
	N US 31/Holton Ramp	Muskegon Twp	SB Seaway to Norton Ramp
	M-46 Apple Ave	Muskegon Twp	US-31 to Shonat Rd
	N US 31 / Apple Ave	Muskegon Twp	Off Ramp - North US-31
	M-104 Savidge (Eastbound)	Spring Lake	US-31 to Lake Ave
	US-31, NB/SB	Norton Shores	I-96 to Apple Ave

The maps below highlight corridors which are nearing capacity and likely to become congested by the year 2050, as forecasted by the travel demand model.

Figure 9: 2050 24 Hour Flow

Figure 10: 2050 AM Flow

Figure 11: 2050 PM Flow

CHAPTER 9:

ENVIRONMENTAL ASSESSMENT

Federal transportation legislation contains a requirement that the MTP include a discussion of types of potential environmental mitigation activities and potential areas to carry out these activities, including those that may have the greatest potential to restore and maintain the environmental functions affected by the plan. The goal of this requirement is to balance transportation needs with environmental protection.

The WMSRDC staff has conducted a preliminary assessment of transportation projects included in the 2050 MTP to identify any projects which may have negative environmental impacts. This assessment is done at this point so that communities can be notified of the potential environmental impacts well in advance.

In addition to local and State of Michigan environmental databases, WMSRDC staff has utilized the NEPAssist site, which illustrates many critical environmental factors such as the few listed below.

Factors Used in Environmental Assessment

WMSRDC staff compiled a list of proposed transportation project in the plan and evaluated each item using the following environmental factors.

- **FEMA Floodplains** – Use of the land adjacent to a stream has a major effect on protecting water quality, avoiding flood damage, and maintaining wildlife habitat. This area adjacent to the stream channel serves as a natural reservoir for storing excess water during a flood.

- **Critical Dune Areas** – The purpose of Critical Dune areas is to preserve, protect, and enhance the quality of Michigan's dunes.

- **Historic markers** – WMSRDC staff mapped the locations of known historic markers within the MPO boundaries.

- **NWI Wetlands** – Wetlands play a vital role in water resource protection, recreation, tourism, and economy in West Michigan. Specifically, wetlands provide:

    - Flood and storm control via hydrologic absorption and storage capacity.
    - Wildlife habitat for feeding grounds, breeding, nesting, and cover for many forms of wildlife.
    - Protection of subsurface water resources, valuable watersheds, and allows for recharge of groundwater supply
    - Erosion control by serving as a sedimentation area and filtering basin, absorbing silt and organic matter.

Factors Not Evaluated

There are numerous unmentioned potential environmental factors which were considered for use in evaluating projects in the plan. However, complete and accurate data is not available for many of these factors. Listed below are a few other potential factors which could be evaluated should more complete information become available in the future.

- **Threatened and Endangered Species** – The data available is insufficient to accurately map. As part of the consultation phase, the Fish and Wildlife Service was contacted. In response, they noted that the following threatened and/or endangered species may be present in the WestPlan MPO: The Indiana Bat, the Karner Blue Butterfly, Bald Eagles, Pitcher's Thistle, the Piping Plover, and the Eastern Massassauga Rattlesnake.

- **Archeological sites** – There is no complete data that is available to the public.

Environmental Assessment Findings

The map and chart on the following pages show which projects are adjacent to the environmental features that were examined. This inventory in no way substitutes a project sponsor's responsibility to complete a more in-depth environmental assessment.

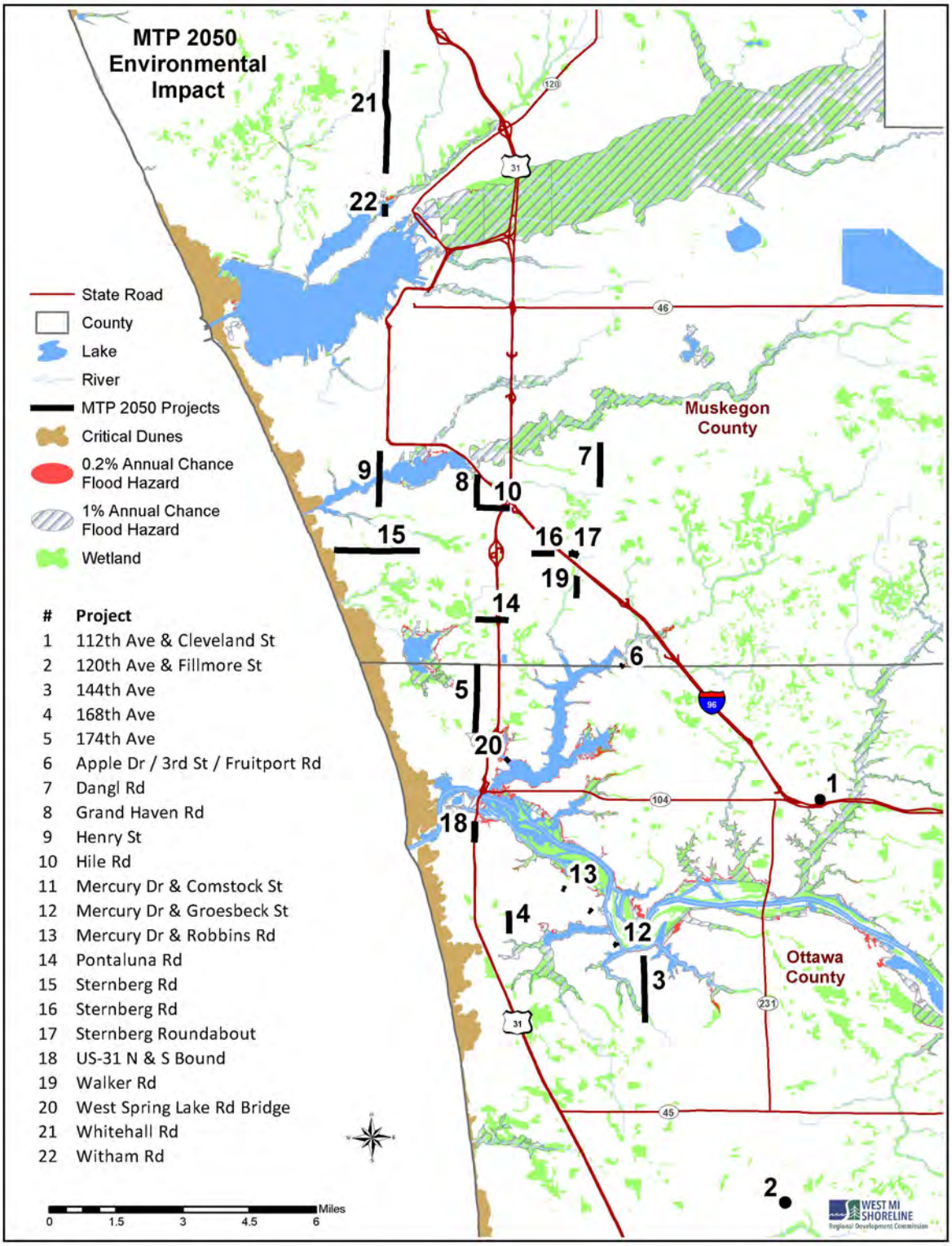
From the preliminary review, it does appear that some of the projects are adjacent to the environmental features which were examined. Project sponsors are encouraged to follow the best practices which are outlined in the following sections.

Environmental factors may need to be examined in more detail to mitigate any negative impacts. These features may also influence project costs and timing. As previously stated, this assessment does not prevent any project from moving forward, but rather is to be used to identify potential problems.

Figure 12: Environmental Assessment Table

Project name	Critical Dunes	Floodplain	Wetlands	Historic Markers
112th Ave & Cleveland St				
120th Ave & Fillmore St				
144th Ave			X	
168th Ave				
174th Ave				X
Apple Dr / 3rd St / Fruitport Rd				
Dangl Rd				
Grand Haven Rd				
Henry St			X	
Hile Rd				
Mercury Dr & Comstock St				
Mercury Dr & Groesbeck St		X		
Mercury Dr & Robbins Rd				
Pontaluna Rd			X	
Sternberg Rd			X	
Sternberg Rd				
Sternberg Roundabout			X	
US-31 N & S Bound				X
Walker Rd				
West Spring Lake Rd Bridge			X	
Whitehall Rd				
Witham Rd		X	X	

Figure 13: Environmental Assessment Map



Planning/ Design Guidelines

Regardless of the type of project or the resources that may be impacted, the following guidelines should be considered during the planning, design, construction, and maintenance of transportation projects. They represent good planning practice and will help ensure a blending of sound construction techniques with desired environmental protection goals.

- Employ context sensitive solutions (CSS) principles from the earliest point possible in project development.
- Identify the area of potential impact related to the transportation project, including the immediate project area, anticipated borrow/fill areas, haul roads, prep sites, and other contractor areas, as well as other related project development areas.
- Conduct an inventory to determine if any environmentally sensitive resources could be impacted by the project.
- Conduct a pre-construction meeting with local community officials, contractors, and subcontractors to discuss environmental protection.
- If possible, avoid impacts to environmental resources by limiting the project scope or redesigning the project.
- Where impacts cannot be avoided, mitigate them as much as possible.
- Integrate stormwater management into the design of the site. If appropriate, utilize low-impact development practices that infiltrate stormwater into the ground (e.g., swales, rain gardens, native plantings).

Construction/Maintenance guidelines

- Insert special requirements addressing sensitivity of environmental resources into plans, specifications, and estimates provided to construction contractors.
- Confine construction and staging areas to the smallest necessary and clearly mark area boundaries.
- Install construction flagging or fencing around environmental resources to prevent encroachment.
- Sequence construction activities to always minimize land disturbance, but especially during the rainy or winter season for natural resource protection and during the high-use season for resources open to the public.
- When utilizing heavy equipment, pay close attention to the potential of uncovering archeological remains.
- Before site disturbance occurs, implement erosion control best management practices to capture sediments and control runoff.
- Incorporate stormwater management into the construction phase.
- Properly handle, store, and dispose of hazardous materials (e.g., paint, solvents, epoxy) and utilize less hazardous materials when possible.
- Keep equipment in good working condition and free of leaks. Avoid equipment maintenance or fueling near sensitive areas. If mobile fueling is required, keep a spill kit on the fueling truck.
- Identify and implement salt management techniques to reduce the impacts of salt on area waterways.
- Conduct on-site monitoring during and immediately after construction to ensure environmental resources are protected as planned.

CHAPTER 10:

ENVIRONMENTAL JUSTICE

The projects in this plan must meet the principles of Executive Order 12898 relating to environmental justice (EJ). Specifically, the plan must identify and address any disproportionately high and adverse human health or environmental effects of its programs and policies on minority populations and low-income populations.

The process undertaken in analyzing the principles of Executive Order 12898 included mapping the areas of impoverished and minority population concentrations. These concentrations were overlaid with the MTP's projects and subjected to a visual analysis of potential impacts.

Analysis of potential impacts center on three potential major areas of concern:

1. Disproportionally high adverse impact to impoverished and minority areas.
2. Minimizing/blocking access of low-income areas and minority areas to the transportation system.
3. Neglect of the transportation system in low-income areas and minority areas.

Identification of Minority Groups Utilizing 2020 Census Data

Minority population groups identified in this study included individuals who self-identified as being part of a minority racial or ethnic group in the 2020 U.S. Census. These figures were taken from the 2020 Census-Profile of General Population and Housing Characteristics. For this analysis, individuals belonging to a minority group were grouped into one category: minority. These groups include individuals who self-identified as:

Race (Not Hispanic or Latino)

- Black or African American
- American Indian or Alaska Native
- Asian
- Native Hawaiian or Other Pacific Islander
- Some other Race

Hispanic or Latino (Of Any Race)

- Cuban
- Mexican
- Puerto Rican
- South or Central America
- Other Spanish culture or origin

Other factors

- Disability
- Age
- Low Income

Analysis

Analysis of potential impacts center on three potential major areas of concern:

1. Disproportionately high adverse impact to low-income areas and minority areas

2. Minimizing/blocking access of low-income areas and minority areas to the transportation system

3. Neglect of the transportation system in low-income areas and minority areas.

Of the identified improve and expand projects contained in the WestPlan 2050 MTP, only one is contained in or near the low-income areas. None of the projects are contained in or near minority areas.

Neglect of the transportation system in low-income areas
WestPlan staff reviewed the transit service areas to determine if coverage of low-income areas is being served. The two public transit providers in the MPO are Harbor Transit, which covers northern Ottawa County with a call/demand service and Muskegon Area Transit System which offers fixed route service as well as GO2, a micro-transit ride service. Maps included in this chapter show that most fixed routes and call/demand systems within the MPO cover minority and low-income communities. The expansion projects listed in the MTP address deficiencies or expansion in the system. At this point in time there are very few deficiencies in the system within the low-income areas of the WestPlan MPO.

Minimizing/blocking access of low-income areas to the transportation system
Minimizing access can be characterized as closing of streets or eliminating access to transit. None of the expansion projects identified in the plan will block access to the transportation system.

Disproportionately high adverse impact to low-income areas
Of the identified projects contained in the WestPlan 2050 MTP, there is one project located in low-income areas. After review it has been determined that there will be no negative impacts from noise, right of way acquisition, or pollution.

Neglect of the transportation system in minority areas
WestPlan staff reviewed the transit service areas to determine if coverage of minority and low-income areas are being served. The two public transit providers in the MPO are Harbor Transit, which covers northern Ottawa County with a call/demand service and Muskegon Area Transit System which primarily offers fixed route service. Most fixed routes and call/demand systems within the MPO cover minority and low-income communities. At this point in time there are very few deficiencies in the system within the minority areas of the WestPlan MPO.

Disproportionately high adverse impact to minority areas
There are no identified expansion projects located in minority areas. The projects listed in the MTP address deficiencies or expansion in the system. The areas within the WestPlan MPO with a higher percentage of minority population tend to be within urbanized areas which are essentially built out and do not have capacity deficiencies. Since none of these projects are in minority areas, there will be no negative impacts from noise, right of way acquisition, or pollution.

Minimizing/blocking access of minority areas to the transportation system

Minimizing access can be characterized as closing of streets or eliminating access to transit. None of the identified capacity projects are located within minority areas. Therefore, there will be no blocking of access to the transportation system.

Conclusions

This analysis finds that the proposed roadway and transit projects do not result in violations of Executive Order 12898. Furthermore, to supplement the analysis done here, WestPlan's continuing public participation process undertaken during the design of the WestPlan 2050 MTP made a concerted effort to reach out to traditionally disadvantaged populations to ascertain the potential effects and or impacts of the proposed projects.

Figure 14: Transit Service and Low-Income Areas

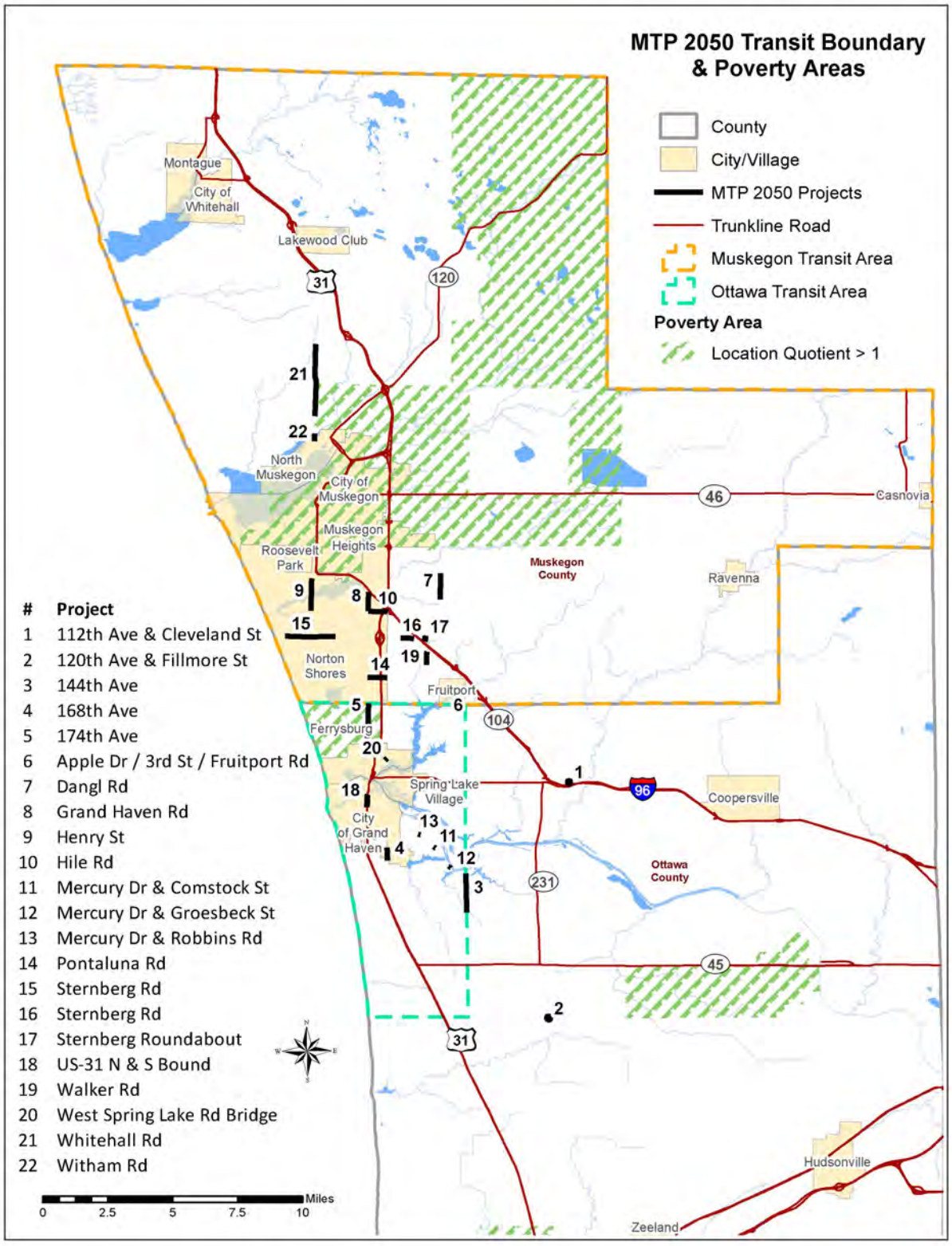


Figure 15: Transit Service and Minority Areas

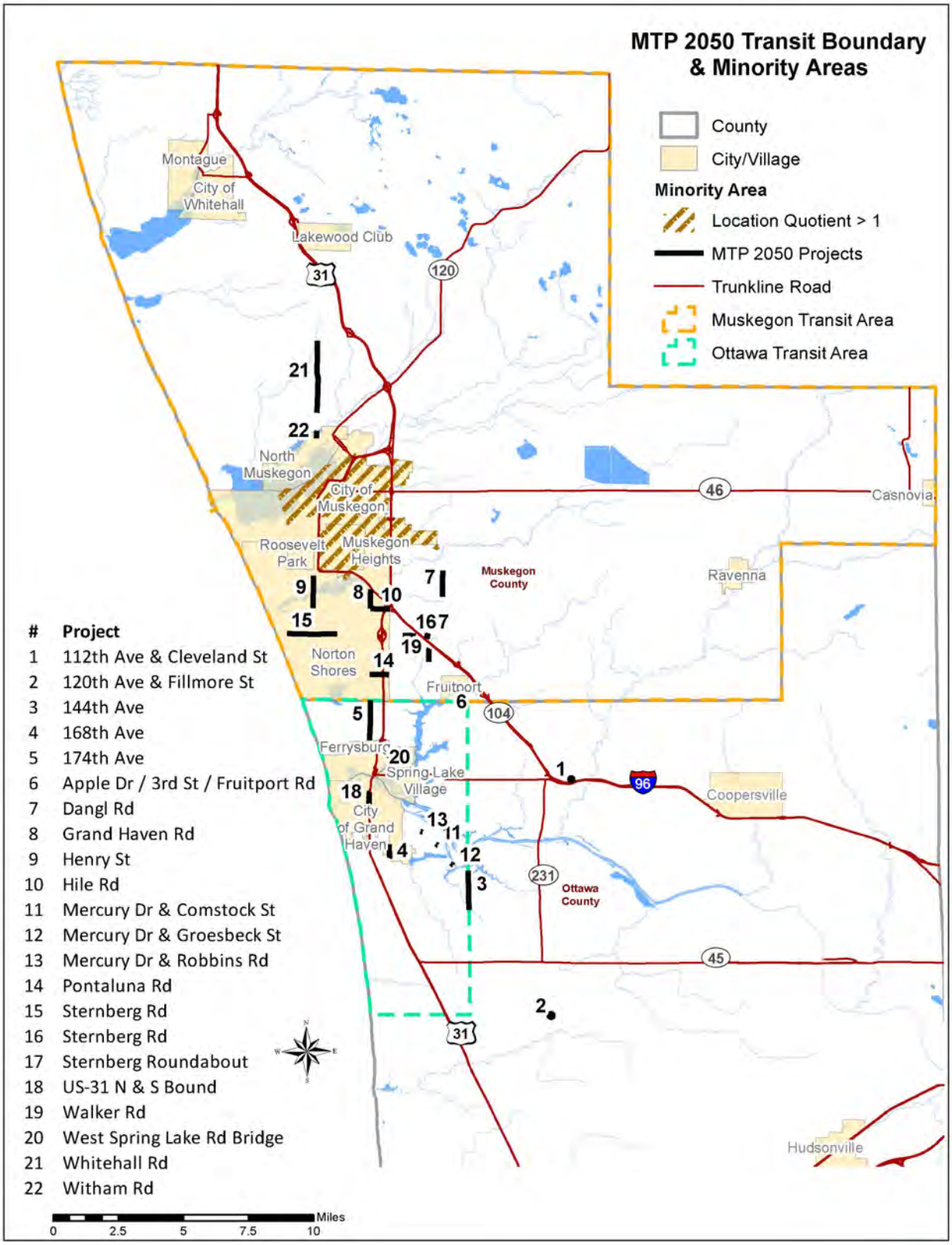


Figure 16: Projects and Low Income Areas

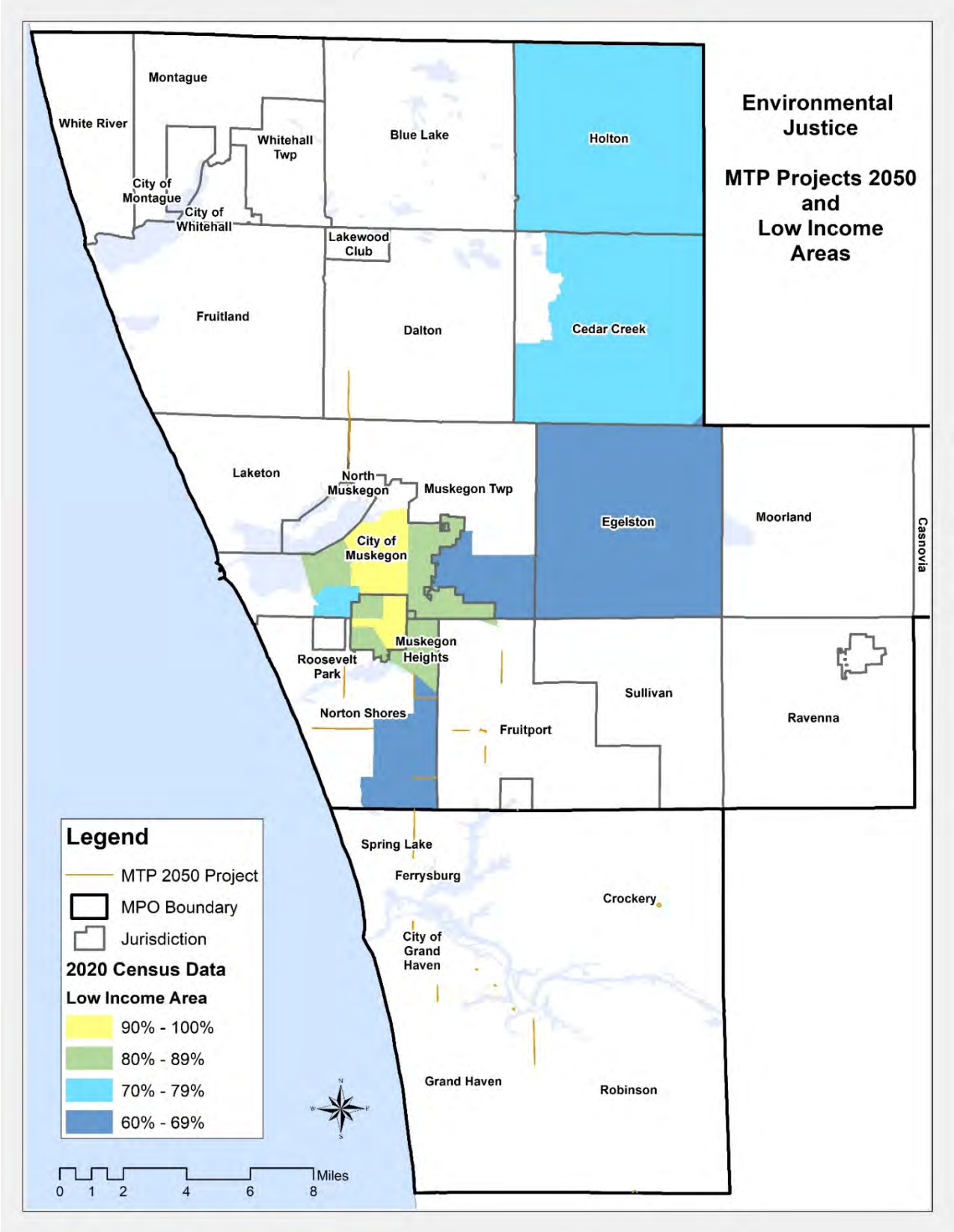
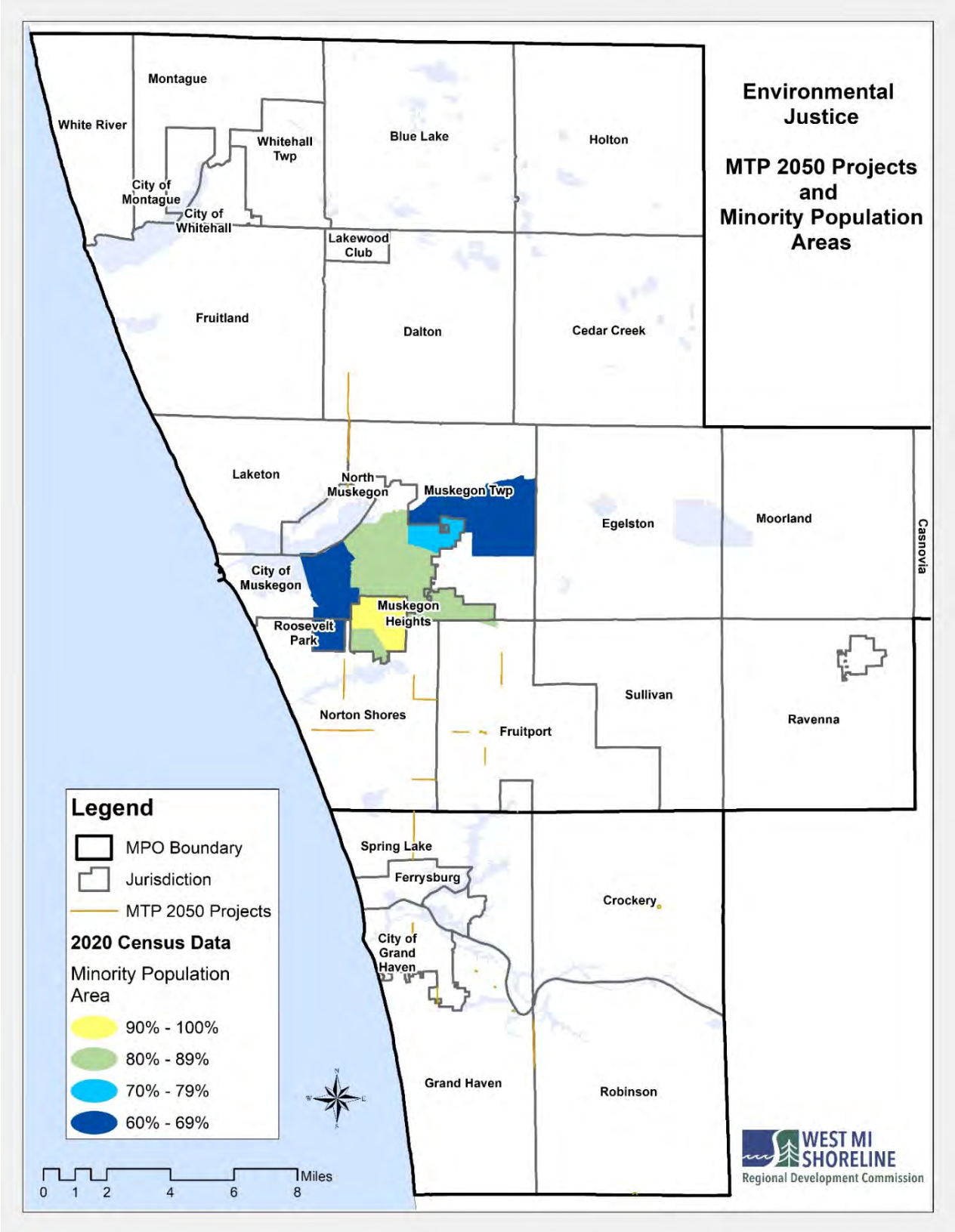


Figure 17: Projects and Minority Areas



CHAPTER 11:

RESILIENCE

Extreme weather events and climate change impacts can damage transportation infrastructure and exceed the functional capacity of a facility, leading to unplanned and intolerable service disruptions. Additionally, gradual changes in temperature and precipitation can change infrastructure deterioration rates and result in increased costs due to decreased asset lifespans, emergency repairs, increased maintenance and labor, supply chain disruptions and lost economic activity. The Fourth National Climate Assessment (2018) noted that climate change is expected to raise the cost of building and maintaining transportation infrastructure in the U.S., though cost increases will vary by region depending on the level of impacts experienced.

Resilience is addressed in this chapter to establish a baseline for supporting transportation projects and policies that are designed to withstand and recover from future disruptions. Natural and human-caused hazards constitute some of the acute "shocks" to which a system can be vulnerable. Although natural forces are the primary factor discussed in this chapter, other potentially disruptive threats include longer-term societal "stresses," such as unemployment, poor access or barriers to education, crime, or homelessness.

Establishing Resilience

The Fifth National Climate Assessment (2023) defines resilience as ***the ability to prepare for threats and hazards, adapt to changing conditions, and withstand and recover rapidly from adverse conditions and disruptions.***

To achieve characteristics of resilience, intentional action must be layered into every aspect of a given system. Planning for resilience should empower a diverse set of stakeholders to cooperatively identify vulnerabilities, evaluate plans, set strategic policies, and implement projects that will enhance long-term sustainability, reliability of services, and resistance to disruptions and unforeseen circumstances. In addition, flexible and proactive approaches must be employed to maintain resilient systems that are able to adapt, and even thrive, amidst changing conditions or challenging circumstances.

For man-made developments to be resilient, they must be strategically located and carefully designed. This not only helps mitigate the risk of future loss or damage, but it also can lessen the impacts of human development upon the environment and natural processes.

Infrastructure resilience depends on both physical attributes of engineered infrastructure systems and on the capabilities of organizations affecting the operation and management of those systems (e.g., infrastructure owners and operators, regulatory authorities, and vendors and contractors). Resilience is also influenced by organizational factors such as the existence of business continuity and emergency response plans, the level of workforce training, and the frequency of exercises to test plans. Developing resilience is essential to managing the wide range of risks that communities face, including those presented by dependencies between and among infrastructure systems.

Changing Climate

According to the U.S. Environmental Protection Agency, Michigan's climate is changing. Most of the state has warmed up two to three degrees Fahrenheit in the last century. Heavy rainstorms are becoming more frequent, and ice cover on the Great Lakes is forming later or melting sooner. The Michigan Sea Grant website urges Great Lakes residents to understand how climate change will affect their region. Although specific projections vary, scientists predict that the regional climate of the Great Lakes basin will be warmer, wetter, and less icy by the end of the century.

Furthermore, the Great Lakes Integrated Sciences and Assessments (GLISA) has identified a variety of projected climate impacts for the coming century. The following are just a sample of those which could directly or indirectly effect the WestPlan MPO transportation network:

- Increased average air temperatures 3.6 to 11.2 degrees
- More intense storms and more storm damage
- Less lake ice, leaving more water exposed to evaporate and become lake-effect rain or snow
- Fluctuating lake levels
- More frequent and severe droughts

In essence, climatic conditions are changing, and those changes may stress infrastructure systems that may have been designed to standards that are no longer sufficient or appropriate. The uncertainty of changing climate conditions makes resilient community development both a challenge and a necessity.

Natural Hazards

Natural hazards, like much of nature, are part of complex interconnected systems. While most hazard events seemingly occur independently, they are often correlated, and in some cases may greatly influence the probability, frequency, and magnitude of one another. This can be true even when specific hazard occurrences are separated by long distances or periods in time.

Extreme weather events such as flooding, severe heat, and intense storms threaten the long-term investments that Federal, State, and local governments have made in transportation infrastructure. Transportation systems are already experiencing costly climate-related impacts, leading to disrupted and damaged roads, bridges, rail systems, and other transportation infrastructure. It is expected that these impacts will intensify in magnitude, duration, and frequency across the United States.

Winter weather, precipitation-driven flooding, and extreme temperatures appear to be the primary natural hazards of concern in relation to transportation infrastructure within the WestPlan MPO. The following descriptions outline some weather-related variables that may impact transportation systems:

- ***Temperature*:** Temperature is projected to increase in almost every part of the country in the coming decades. For the transportation sector, some stressors include an increase in the number of very hot days and heat waves and changes to freeze-thaw cycles. These impacts may result in changes to the length of the construction season and higher rates of evaporation and drier soil, affecting rates of erosion and pavement degradation.

- ***Precipitation*:** Many of the most significant future impacts on the U.S. transportation system will likely be due to the intensification of precipitation events. Over the last several years, significant flood events have caused substantial damage to transportation infrastructure. Climate models project continued increases in heavy precipitation events across much of the United States. Federal agencies are studying whether or not this increase in precipitation will correlate to an increase in the types of extreme precipitation events that cause flooding interruptions and damage to roads. The cumulative effect of smaller, more frequent precipitation events can also cause increased structural vulnerability and damage to transportation infrastructure.

- ***Sea Level:*** Sea levels are changing along U.S. coastlines at varying rates. The 2014 U.S. National Climate Assessment projects sea level to rise by 1 to 4 feet this century, with some scenarios suggesting as much as 6.6 feet. Rising sea levels present the risk of permanent or periodic inundation of coastal infrastructure as well as increased coastal erosion, possible loss of coastal vegetative buffers, rising groundwater levels, and changes in salinity. Sea level rise may also reduce navigational bridge clearances and jeopardize low-lying access roads to major port facilities. Although water levels on the Great Lakes are known to be cyclical, the timing, extent, and

duration of high and low periods can only be estimated. High water levels generally exacerbate or increase the risk of flooding and erosion. Low water levels can cause significant impacts as well if shipping companies and ferry services are forced to lighten loads or shut down due to low water depths. Significant drops in water levels can also result in an increase in demand for costly dredging projects.

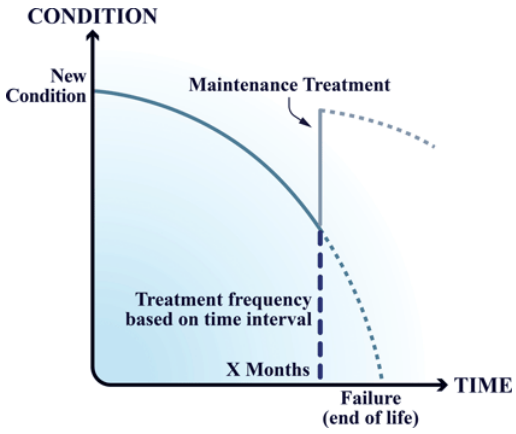
- ***Streamflow*.** Increases in the magnitude and frequency of floods can damage or destroy roads, bridges, and culverts, requiring reconstruction, resurfacing, and increased maintenance activities. Days with heavy precipitation have also increased significantly across the eastern United States, particularly in New England. However, this trend is not strongly related to changes in river flooding.

- ***Drought*.** Prolonged periods with hot temperatures and little rainfall can result in higher rates of evaporation and drier soil, leading to higher rates of erosion and pavement degradation. Drought also increases the probability of wildfire, which can affect visibility and lead to road and airport closures. Wildfires can significantly alter the hydrologic response of a watershed to the point that modest rainstorms produce dangerous flash floods and debris flows. Moreover, droughts can weaken vegetation and cause increased susceptibility to pests, which can also lead to issues with debris.

Infrastructure Asset Management

Title 23, Code of Federal Regulations, defines asset management as: ***a strategic and systematic process of operating, maintaining, and improving physical assets, with a focus on both engineering and economic analysis based upon quality information, to identify a structured sequence of maintenance, preservation, repair, rehabilitation, and replacement actions that will achieve and sustain a desired state of good repair over the life-cycle of the assets at minimum practicable cost.***
According to the Canadian Network of Asset Managers, asset management provides communities with the opportunity to do more with less, by providing a structured way of tracking performance, costs, and risks to meet service objectives in the most efficient and effective manner. In other words, the asset management approach can lay a foundation for resilient community planning, development, and management.

Asset management offers a viable approach to coping with changing climate patterns and extreme weather events. Asset management is an integrated approach, involving all organization departments, to effectively manage new and existing assets to deliver services to customers. The intent is to maximize benefits, reduce risks, and provide satisfactory levels of service to the community in a sustainable manner – providing an optimum balance. Good asset management practices are fundamental to achieving sustainable communities.

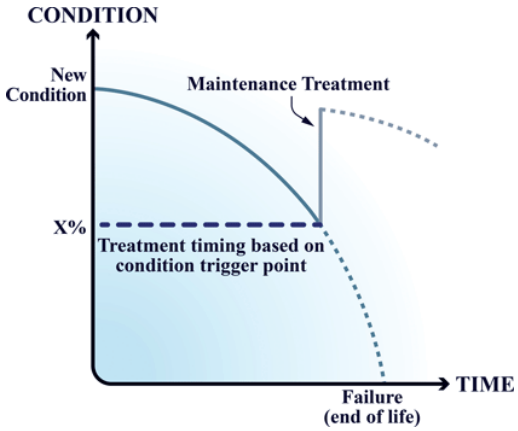


Asset management considers the entire life cycle of an asset and aids in determining which programs and projects to invest in to achieve the best long-term benefit. The ultimate goal of transportation asset management is to simultaneously minimize long-term costs while maximizing performance, including asset and system resilience to extreme weather events and climate change.

According to the Federal Highway Administration, there are three general maintenance management approaches to consider in the asset management process: condition-based, interval-based, and reactive.

Condition-based Maintenance Management. Involves regular monitoring of an asset to assess the point at which repair, or replacement, is required. The cost to undertake inspections can be high and should be balanced with

the associated risk of failure.



Reactive Maintenance Management. When the information on an asset is limited, the risk of failure is low; or if the cost to collect data (including condition) is high, then a reactive approach to repair and replacement may be appropriate. Although reacting to asset failure has the benefit of maximizing the life of the asset, from a risk perspective, this approach should consider the time required to repair the system and the impact of that down time.

Interval-based Maintenance Management. Once an asset reaches a specified age it is either repaired or replaced. The age at which an asset must be repaired or replaced varies (sometimes considerably), but this proactive approach reduces the likelihood of asset failure. Interval-based maintenance management relies on information regarding the age of the asset to be able to assess the time to repair/replace.

Adaptation

Given changing weather patterns and the increasing frequency of extreme weather events, there is little choice but for transportation systems to adapt. The Vulnerability Assessment and Adaptation Framework (Federal Highway Administration, 2017) offers this definition of adaptation: ***adjustment in natural or human systems in anticipation of, or response to, a changing environment in a way that effectively uses beneficial opportunities or reduces negative effects*.**

Adaptation solutions can be natural, structural, or policy-based and can range from site-specific to regional. Strategies may include:

- Engineer new assets to withstand anticipated environmental conditions (e.g., use construction materials better suited to higher heat days);
- Retrofit existing assets to accommodate impacts (e.g., add barriers to prevent water incursion into tunnels, harden roadway embankments);
- Increase redundancy of the system to ensure transportation services provided by infrastructure can be supplied by other means/alternatives (e.g., build alternative access routes at higher elevations to avoid flooding);
- Relocate assets to avoid damage;
- Institute intensive maintenance schedules (e.g., more frequent cleaning of drains);
- Incorporate findings into asset management plans and systems;
- Integrate findings into systems planning (e.g., site new facilities outside of expanded floodplains where their potential for climate-related damage is reduced); and
- Improve operations plans for weather emergencies.

Many possible adaptation options can be implemented even in the face of uncertainty about future climate impacts. Flexible options (i.e., those that can be modified as conditions change, or as new data becomes available) can help address this uncertainty. Agencies should consider developing climate variable thresholds that trigger specific actions when reached (e.g., a commitment to build a flood barrier if the relative sea level rise for the region exceeds a certain threshold). Keep in mind that adapting certain assets may increase or reduce the adaptability of other assets.

Nature-Based Solutions

The Federal Emergency Management Agency (FEMA) defines nature-based solutions as ***planning, design, environmental management and engineering practices that weave natural features or processes into the built environment to promote adaptation and resilience***. These solutions utilize natural features and processes to achieve objectives, such as combat climate change, reduce flood risk, improve water quality, protect coastal property, restore, and protect wetlands, stabilize shorelines, and so on.

For example, according to the U.S. Federal Highway Administration, nature-based solutions that rely on existing or enhanced landscapes help improve roadway resiliency by reducing impacts from hazards such as rising sea level, storm surge, and "nuisance" flooding (such as high tide or windblown flooding). Often these "green" strategies are both more effective and cost-efficient than traditional engineering or gray solutions on their own. While this instance is focused on coastal highway resiliency, this approach may be employed to great benefit throughout a transportation network.

Summary

According to the Fifth National Climate Assessment (2023), "transportation is fundamental to improving the quality of life in the United States and is a key enabler of economic and social activity for our communities. Transportation and mobility systems are… a catalyst for change and offer an opportunity to reduce the impacts of a changing climate. Investments in transportation systems are linked to safety, environmental, social, and economic outcomes." Considering unprecedented environmental conditions and frequency of extreme weather events, not to mention other stresses such as aging infrastructure and a spectrum of societal challenges, resilient transportation systems are arguably needed now more than ever.

To clarify, resilience is not a "plan"; rather it is a characteristic (or set of characteristics) that must be cultivated, coordinated, and maintained. Numerous frameworks are available for fostering resilience; most of which tend to share resilience-enhancing strategies, such as data gathering, threat assessment, stakeholder engagement, inter-departmental or cross-sector collaboration, communication, prioritization, and data-informed decision-making. Unfortunately, there isn't a "one-size-fits-all" solution to resilience because every transportation organization and system exhibits a unique set of strengths, assets, challenges, and vulnerabilities. Furthermore, these attributes may be impacted to varying degrees by variables such as climate change, extreme weather, political will, local resources, etc.

Adoption of a suitable framework for increasing resilience is just the first step. The real challenge for an organization or system is to leverage that framework into a culture of resilience through incremental steps that are sustained over time.

CHAPTER 12:
AIR QUALITY

Another program within the MPO is the Air Quality program, which is coordinated by West Michigan Shoreline Regional Commission (WMSRDC). WMSRDC is a member of the West Michigan Clean Air Coalition (WMCAC). Formed in 1995, the WMCAC is a partnership of businesses, academic institutions, government agencies, industries, and non-profit organizations in Kent, Ottawa, Muskegon, and Kalamazoo counties working together to achieve cleaner air in the region through the education and promotion of voluntary emission reduction activities. The WMCAC coordinates with adjacent MPOs, including GVMC and the MACC.

The coalition works to educate the public and to promote voluntary emission reduction activities. Individuals and businesses can help the coalition by making clean air choices on Clean Air Action Days. The coalition attempts to limit the health and environmental damage that excessive ground level ozone can cause, by encouraging organizations and the public to alter their lawn maintenance activities, refueling habits, and travel methods. West Michigan residents can stay informed about air quality year-round by visiting the WMCAC's website at www.wmcac.org.

A *Clean Air Action Day* is called when weather forecasters have predicted that conditions will be conducive to the formation of ozone or fine particulate matter. On Clean Air Action Days, West Michigan residents are being asked to take certain voluntary actions to protect their health and reduce emissions.

Air quality continues to be an issue in the MPO and West Michigan due to the area's proximity to Lake Michigan and southwest winds coming across the Lake. The air quality monitor in Muskegon County (located in Laketon Township) is violating the 2015 National Ambient Air Quality Standard (NAAQS) for ozone. Due to this, part of Muskegon County is designated a nonattainment area for the 2015 NAAQS and the entire county is a maintenance area for the 1997 ozone NAAQS. Ottawa County meets the 2015 NAAQS but remains a maintenance area for the 1997 ozone NAAQS.

Air Quality Conformity

The concept of transportation conformity was introduced in the Clean Air Act (CAA) of 1977, which included a provision to ensure that transportation investments conform to a State Implementation Plan (SIP) for meeting the federal air quality standards. Conformity requirements were made substantially more rigorous in the CAA Amendments of 1990. The transportation conformity regulations that detail implementation of the CAA requirements were first issued in November 1993 and have been amended several times. The regulations establish the criteria and procedures for transportation agencies to demonstrate that air pollutant emissions from LRTPs or MTPs, TIPs, and projects are consistent with ("conform to") the state's air quality goals in the SIP.

Transportation conformity is required under CAA Section 176(c) to ensure that federally supported transportation activities are consistent with ("conform to") the purpose of a state's SIP. Transportation conformity establishes the framework for improving air quality to protect public health and the environment. Conformity to the purpose of the SIP means Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) funding and approvals are given to highway and transit activities

that will not cause new air quality violations, worsen existing air quality violations, or delay timely attainment of the relevant air quality standard, or any interim milestone.

Grand Rapids Limited Orphan Maintenance Area

The conformity area covered by the ***Transportation Conformity Determination Report for the 1997 Ozone NAAQS – Grand Rapids Limited Orphan Maintenance Area*** consists of two counties: Kent and Ottawa. Within the boundary are the MPOs (MPOs) of GVMC (core city Grand Rapids), parts of the WestPlan (core city Muskegon), and MACC (core city Holland/Zeeland), as well as the rural projects contained in the STIP in Ottawa County.

Findings of the transportation conformity report are for transportation activities contained within the conformity area. This conformity determination was completed consistent with CAA requirements, existing associated regulations at 40 CFR Parts 51.390 and 93, and the *South Coast II* decision, according to EPA's *Transportation Conformity Guidance for the South Coast II Court Decision* issued on Nov. 29, 2018.

This conformity report is to ensure that the part of the WestPlan 2050 MTP in Ottawa County satisfies its obligation to the CAA. The 2045 MTP of GVMC and 2050 LRTP plan of the MACC have not changed since the previous analysis. This analysis also includes all three areas' TIPs and their latest amendments. This report evaluates transportation activities contained in:

- MACC 2050 LRTP in Ottawa County
- MACC 2023-2026 TIP in Ottawa County
- GVMC 2045 MTP
- GVMC 2023-2026 TIP
- WestPlan 2050 MTP in Ottawa County
- WestPlan 2023-2026 TIP in Ottawa County
- STIP projects in Kent and Ottawa counties
-

Transportation conformity for the 1997 ozone NAAQS does not require emission modeling. The MACC 2050 LRTP, WestPlan 2050 MTP, GVMC 2045 MTP, all three 2023-2026 TIPs, and the rural STIP in Ottawa county can be demonstrated by showing the remaining requirements in Table 1 in 40 CFR 93.109 have been met. These requirements, which are laid out in Section 2.4 of EPA's guidance, include: Latest planning assumptions (93.110), Latest Emissions Model (93.111), Consultation (93.112), Transportation Control Measures (93.113(b) and (c)), Emissions Budget and/or Interim emissions (93.118 and/or 93.119), and Fiscal constraint (93.108).

In conclusion, the conformity determination process completed for the MACC 2050 LRTP, GVMC 2045 MTP, WestPlan 2050 MTP, all three 2023-2026 TIPs, and the 2023-2026 STIP for Ottawa county demonstrates that these planning documents meet the CAA and Transportation Conformity rule requirements for the 1997 ozone NAAQS.

Muskegon Partial County Maintenance Areas

The conformity area covered by the ***Transportation Conformity Determination Report for the 1997 Ozone NAAQS – Muskegon Partial County Orphan Maintenance Area*** consists of the eastern part of Muskegon County, consisting of seven townships, Holton, Cedar Creek, Egelston, Moorland, Casnovia, Sullivan, and Ravenna all within the boundary of the MPO (MPO) of WestPlan.

The same process as for the Grand Rapids Limited Orphan Area was followed as described above and the conformity determination process completed for the WestPlan 2050 MTP, 2023-2026 TIPs, in the partial county maintenance area of Muskegon County demonstrates that the planning document meet the CAA and Transportation Conformity rule requirements for the 1997 ozone NAAQS.

Muskegon Partial County Nonattainment Area

The conformity area covered by the ***Air Quality Conformity Analysis for the Partial County 2015 Ozone NAAQS Nonattainment Area for Muskegon County*** consists of the western part of Muskegon County; it includes six cities (Muskegon, North Muskegon, Roosevelt Park, Muskegon Heights, Montague, and Whitehall) and 10 townships (White River, Montague, Blue Lake, Fruitland, Dalton, Laketon, Muskegon Township, North Shores, Fruitport, and Whitehall Township

Transportation conformity provisions of the Clean Air Act Amendments require MPOs to make a determination that the MTP, TIP, and projects conform to the State Implementation Plan (SIP), and that regional emissions will not negatively impact the region's ability to meet the National Ambient Air Quality Standards (NAAQS).

Conformity to the SIP means that the region's MTPs, and TIPs 1) will not cause any new violations of the NAAQS; 2) will not increase the frequency or severity of existing violations; and 3) will not delay attaining the NAAQS. A demonstration is conducted by comparing emissions estimates generated from implementation of MTPs, and TIPs for analysis years to the motor vehicle emissions budgets (MVEBs) contained in the SIP.

The purpose of a conformity analysis is to document the process and findings of the transportation conformity analysis for the nonattainment area and demonstrate that it can conform to the SIP.

Findings of the transportation conformity analysis are for projects within the partial county 2015 nonattainment area. Projects for the new 2050 WestPlan MTP and 2023 to 2026 TIP were evaluated for this analysis at a meeting on Oct. 26, 2023, of the Michigan Transportation Conformity Interagency Workgroup (MITC-IAWG). Projects in the WestPlan FY 2023-2026 TIP are included in the modeling but not in the project list. Projects for the analysis are contained in the partial county nonattainment area of the:

- WestPlan 2050 MTP, and
- WestPlan 2023-2026 TIP.

Conformity is demonstrated when the analysis-year emissions are equal to or less than the SIP budget. For the 2015 ozone standards, as shown in **Table 1**, the results for each of the analysis years show that

the volatile organic compounds (VOC) and nitrogen oxides (NOx) emissions are lower than the SIP budgets; thus, conformity for the ozone standard is demonstrated.

Figure 18:Results of 2015 Ozone Standard Conformity Analysis

Analysis Year	Emissions (tons/day)	
	VOC	NOx
SIP Budget	1.74	1.73
2025	1.35	1.18
2030	1.06	0.78
2040	0.84	0.52
2050	0.76	0.47

In conclusion, establishing conformity is a two-step endorsement process. The MPOs must make a formal conformity determination through a resolution supporting the findings of the conformity analysis. Thus, emissions are at or below the budgets found in the SIP. Then FHWA, jointly with the FTA, after consultation with the EPA, issues a letter of concurrence with the determination.

The Public Participation Plan, adopted by the MPO Policy Committee, establishes the procedures by which the MPOs reach affected public agencies and the public. The same procedures were followed for the conformity documents, ensuring the public had an opportunity to review and comment before the MPO Policy Committee made a determination. A formal public comment period was held from March 28, 2024 to April 17, 2024.

CHAPTER 13:

FINANCIAL RESOURCES ANALYSIS

FINANCIAL RESOURCES ANALYSIS

Federal legislation requires the 2050 MTP (MTP) to be financially constrained, making for a plan which is more useful in guiding decision making for the future. It is required that the MTP show that projects planned will be reasonably funded by the expected revenues. This means that the sum of the costs for the planned projects cannot exceed all financial resources reasonably available to the WestPlan MPO area. This analysis of the financial resources for the plan will show that WestPlan is constraining its plans to the amount of funds realistically expected. The revenues for operation and maintenance of the transportation system come primarily from taxes and user fees at the local and state level.

Cooperative Revenue Estimation Process

The revenue estimates in this chapter were derived through a cooperative process which included the FHWA, MDOT, MTPA, MPO staff and committees, as well as local road and transit agencies. Local revenues were derived through review of Act 51 reports, historical Transportation Improvement Plan (TIP) data, and in consultation with local agencies. State and Federal revenue estimates were provided by MDOT and FHWA.

Revenue Growth Rate

The following Federal & State Revenue Growth Rates Approved by MDOT Executive Team, Spring 2022.

Figure 19: Growth Rates

2022-2031	Annual Growth
2022 Federal	22.0%
2023-2026 Federal	2.0%
2027 Federal	-7.0%
2028-2031 Federal	1.9%
2022-2031 State	2.7%
2032-2050	
Federal	1.0%
State	1.3%

The growth rates were developed using the same methodology that was used for the last long-range (2020's MM2045) revenue estimates.

2022-2031

- Federal:
    - Matches MDOT Federal Revenue Specialist's estimates.
        - FY 2022: first year of IIJA (increase from FY 2021 FAST Act Actual to FY 2022 IIJA estimate)
        - FY 2027: first year after IIJA (reduce FY 2026 by General Funding, and then grow 1.9%)

        - Other FY's: Use annual rate of 2% for IIJA, and 1.9% post-IIJA, based on 2% codified in FAST Act
- State: 2.7%
    - For fuel taxes and vehicle registrations (doesn't include Income Tax Revenue or excise tax on recreational marijuana)
    - Matches Finance's State Trunkline Fund forecast.
    - Matches Michigan Transportation Fund long-range revenue forecast.

2032-2050

- Federal: 1.0%
    - 90% of 20-year historical federal revenue

- State: 1.3%
    - 90% of 20-year historical state revenue (doesn't include Income Tax Revenue or excise tax on recreational marijuana)

The Revenue Estimating Forecast will assume Income Tax Revenue transfers continuing through 2050, with annual transfers for FY2022-2050 at the FY2021 level. Excise tax on recreational marijuana continues at the FY2024 level.

Year of Expenditure (Inflation) Factor

The WestPlan MPO uses the Financial Workgroup Sub-team's recommended inflation factor of 4% for project costs. This is the factor which is used by the MDOT as well as recommended by FHWA guidance as a default factor.

Anticipated Funding Sources

FEDERAL FUNDING SOURCES

Funds through the federal gas and diesel tax are deposited in the Federal Highway Trust Fund through the current federal surface transportation bill, IIJA or BIL. Michigan receives most of its federal highway funding from the following programs: The Interstate Maintenance Program, the National Highway System Program, the Surface Transportation Program, the Highway Bridge Replacement & Rehabilitation Program, and the Congestion Mitigation & Air Quality Program. State and local governments have substantial flexibility in the use of some of their federal transportation funds, to choose the best mode or combination of modes where their dollars will be invested. The most used federal-aid programs within the WestPlan area are described below.

STP-Urban (STUL) (Muskegon/Northern Ottawa County MPO)

The Surface Transportation Program will continue to provide funds for urban projects through this category. The small MPO program is funded for areas of population between 50,000 and 200,000. Based on recent annual TIP expenditures, it has been estimated that revenues of $138,376,494 would be made available for this category over the life of the plan.

STP-Small Urban (STUL) (Whitehall Area)

The Surface Transportation Program will continue to provide funds for projects through this category through the Small Urban Committee. This funding category is available for communities that have a population between 5,000 and 50,000. Based on current annual TIP expenditures, including local match, it has been estimated that revenues averaging $16,804,833 would be made available for this category over the life of the plan.

STP-Rural (STL)

The Surface Transportation Program (STL) will continue to work through the Rural Task Forces to provide funds for rural projects through this category. Rural Task Force 14, which covers Lake, Mason, Oceana, Newaygo, and Muskegon Counties, has significant responsibilities for transportation programming in non-metropolitan areas. Only the rural areas of Muskegon County are included within the MPO boundaries. Based on current annual TIP allocations, including local match, it has been estimated that revenues of $33,845,928 would be made available for this category through 2050.

Highway Safety

The Safety category of funds is a statewide competitive category. The anticipated size of these safety projects ranges from approximately $100,000 to $200,000 each. Safety projects have not been a historically large portion of the funding within the MPO.

STP-Transportation Alternatives

Enhancement funds are distributed on a competitive basis among states and local agencies. The Surface Transportation Program Enhancement category has provided funding for several transportation enhancement activities in recent years, including bike and pedestrian facilities, landscaping and streetscaping, historic preservation projects, and highway run-off prevention. As this is a statewide competitive category of funds, a funding target is not guaranteed.

Local/Critical Bridge

The local bridge program is a statewide highly competitive program where funds are available to replace bridges within the state. This has not been significant portion MPO project funding in the past.

Congestion Mitigation Air Quality (CM)

As an attainment/maintenance area for ozone, the MPO is eligible for a portion of the Congestion Mitigation Air Quality (CM) funds which the State of Michigan receives. These funds are intended for transportation projects, which reduce traffic congestion or in other ways improve air quality in an area. The MPO expects to continue to receive a portion of the CMAQ funds allocated to the state. Based on current annual TIP allocations, it has been estimated that revenues of $32,823,985 would be made available for this category over the life of the plan.

Carbon Reduction Funding (CRSM)

The MPO is eligible for the Carbon Reduction (CRSM) funds, a new funding source included in the BIL. These funds are intended for transportation projects which support the reduction of transportation emissions. The MPO expects to continue to receive a portion of the CMAQ funds allocated to the state. Based on current annual TIP allocations, it has been estimated that revenues of $14,274,278 would be made available for this category over the life of the plan.

Trunkline

Funds that the Michigan Department of Transportation (MDOT) spends on highway repairs are not allocated at a specific level of funding every year to each geographic area. Priorities are set on a statewide basis depending on the condition of the state trunkline system. These funds can be used for such things as rehabilitation and reconstruction. Based on figures given by MDOT, the total estimated trunkline revenues, including state match, over the 26-year period are $437,700,000.

FEDERAL TRANSIT FUNDING

The public transit program funding is based on the following FTA-funded transit programs:

Transit Section 5307 Operating

The Federal Transit Administration provides operating assistance to the Muskegon Area Transit System and Harbor Transit. Based on estimates provided by MDOT, it has been estimated that revenues of $135,121,402 would be made available for this category over the life of the plan.

Transit Section 5310 Capital

The Federal Transit Administration provides funds for acquisition of capital items (5310) to private nonprofit organizations or public transit agencies to meet the special needs of the elderly and disabled. Based on current annual TIP expenditures, it has been estimated that revenues of $71,757,352 would be made available for this category over the life of the plan.

Transit Section 5311

The Formula Grants for Other Than Urbanized Areas (5311) is a rural program that is formula-based and provides funding to states for the purpose of supporting public transportation in rural areas. The goal of the program is to provide services to communities with a population less than 50,000. Based on current annual TIP expenditures, it has been estimated that revenues of $2,255,252 would be made available for this category over the life of the plan.

Transit Section 5316

The Job Access and Reverse Commute (5316) program, also known as JARC, was established to address the unique transportation challenges faced by welfare recipients and low-income persons seeking to obtain and maintain employment. Many new entry-level jobs are in suburban areas and low-income individuals have difficulty accessing these jobs from their inner city, urban, or rural neighborhoods. In addition, many entry-level jobs require working late at night or on weekends when conventional transit services are either reduced or non-existent. There are no projects in the current TIP base year on which to base estimates.

Transit Section 5317

The New Freedom formula grant program (5317) aims to provide additional tools to overcome existing barriers facing Americans with disabilities seeking integration into the work force and full participation in society. The New Freedom formula grant program seeks to reduce barriers to transportation services and expand the transportation mobility options available to people with disabilities beyond the requirements of the Americans with Disabilities Act (ADA) of 1990. There are no projects in the current TIP base year on which to base estimates.

Transit Section 5339

This category section of funding provides capital funding to replace, rehabilitate, purchase buses and related equipment, and to construct bus-related facilities. There are no projects in the current TIP base year on which to base estimates.

STATE FUNDING SOURCES

ACT 51 and other funds

Collection and distribution of gasoline and diesel fuel taxes in Michigan is regulated under State Act 51 of 1951. Michigan's fuel tax is collected and deposited into the Michigan Transportation Fund (MTF). Most states, as well as the federal government, distribute some or all of the tax for support of highways and mass transit improvements. MTF dollars are distributed to MDOT, county road commissions, cities and villages, and the Comprehensive Transportation Fund (CTF). The CTF was established to fund public transportation systems. In Michigan, a portion of the registration fees for automobiles and trucks are also deposited in the MTF.

Regarding other state funds, MDOT has previously conducted long-term revenue forecasts, using a model based on expected travel and tax structure data. Travel data includes the registered number of vehicles and forecasted vehicle miles of travel to predict revenue from gasoline taxes, diesel fuel taxes, liquid petroleum gas fuel taxes, vehicle registrations, and other related fees. These revenues contribute to the Michigan Transportation Fund (MTF). After portions of this fund are taken off the top, up to 10% is reserved for transit and deposited into CTF.

The remainder of the MTF is distributed by a specific formula established in the State of Michigan Public Act 51. MDOT receives 39.1%, county road commissions receive 39.1%, and 21.8% goes to cities and villages. None of this money goes directly to townships. Public roads in townships are under the jurisdiction of the respective county road commissions. MTF funds are the primary source for making the general 20% local match to 80% federal funds for transportation and may also be used for a wide variety of transportation projects, including mostly small, light maintenance projects. Regular maintenance needs must also be funded both within cities and villages, and on county roads. Activities such as snow plowing, salt and sand application to road surfaces, lawn mowing, and tree trimming related to roadways, are categorized as maintenance. Maintenance may also include those activities that improve the quality of a road surface, but do not completely resurface a roadway such as filling potholes, improving signage, or road painting and marking.

State-raised funds include TEDF, Winter Maintenance, Local Bridge, and other funds. To estimate State funding revenues, planners obtained Act 51 reports from each of the MPO member agencies. Averages were computed and extrapolated out to 2050. Based on current annual funding levels, it has been estimated that revenues of $1,088,425,503 and $536,090,173 would be made available for this category over the life of the plan.

State Transit Operating Assistance and State Transit Capital Assistance (Comprehensive Transportation Fund)

The Michigan Department of Transportation provides a percentage of the local match for operating assistance and for assistance for the purchase of capital equipment by the Muskegon Area Transit System and Harbor Transit. While this funding can increase with large purchases in any given year, based on recent allocations, this source provides approximately $135,121,402 to the WestPlan MPO area over the life of the plan.

Local Funding Sources

Cities and villages may provide additional local funding for transportation improvements. Typical funding sources at this level include a community's general fund, millages, general obligation bonds, contributions from county governments and other communities, tax increment financing, and special assessment districts. Local governments currently are not permitted by the State of Michigan to assess or impose a gasoline tax or a vehicle registration fee. Some communities also accumulate interest in MTF revenue after it has been distributed to them. County road commissions supplement their budgets through contributions from townships. Some enter into maintenance agreements with MDOT for work on state trunklines within the county.

Several local communities allocate general fund money to assist in transportation projects. These funds are used in a variety of ways, including local road repairs, matching grants, transit assistance, non-motorized projects, and other transportation-related improvements, including general maintenance. The amount of funds provided by the local units of government can vary widely based on needs. However, it is estimated that local units of government on transportation projects may utilize approximately $215,850,423, based on recent allocations. Also, local transit funding sources are estimated at approximately $94,900,000.

Alternative Funding Sources

Several non-traditional sources of transportation funding may exist for use on appropriate occasions. There are sources related to historical or recreational uses that may pay for transportation improvements to a significant location or facility. There are also numerous community or civic foundations that may be willing to contribute to unique transportation endeavors, particularly of a transit or public service nature.

The private sector has also become a substantial source of funds in some areas, primarily when a developer pays for the construction of drives or access roads leading to a development. Improvements of this type are often included in the overall plans and cost of development. However, it is difficult to identify and project in advance the precise location and value of such private improvements to the system, which will be actuated by various market forces. These non-traditional funding sources have not played a significant role within the WestPlan MPO, so no estimates have been projected.

REVENUE SUMMARY

A summary table of all estimated revenues through 2050 is included on the following page.

Figure 20: Revenue Projections

REVENUE PROJECTIONS

		FY 2023 Estimate	27 Year Total
Federal Highway Funds			
Local Jurisdiction Programs			
Surface Transportation Program		$3,962,770	$138,376,494
Surface Transportation Program - Small Urban		$481,250	$16,804,833
Surface Transportation Program - Rural		$968,266	$33,845,928
Highway Safety		$0	$0
Transportation Alternatives		$0	$0
Bridge		$0	$0
Carbon Reduction		$408,781	$14,274,278
CMAQ		$940,000	$32,823,985
	Subtotal Local	**$6,761,067**	**$236,125,518**
MDOT Programs			
Trunkline and Operations/Maintenance		$11,000,000	$437,700,000
	Subtotal MDOT	$16,834,615	**$437,700,000**
	Total Federal Highway	**$23,595,682**	**$673,825,518**
Federal Transit Funds			
Section 5307		$3,869,552	$135,121,402
Section 5310 Capital		$2,054,958	$71,757,352
Section 5311		$64,585	$2,255,252
Section 5316		$0	$0
Section 5317 New Freedom		$0	$0
Section 5339		$0	$0
	Total Federal Transit	**$5,989,095**	**$209,134,006**
State-Raised Funds			
MTF (ACT 51),TEDF, Etc.		$31,169,889	$1,088,425,503
ACT 51 Operations and Maintenance		$15,352,333	$536,090,173
Transit Operating State Match		$3,869,552	$135,121,402
	Total State-Raised	**$50,391,774**	**$1,759,637,078**
Local Funds			
Local Transit Funding		$2,500,000	$94,900,000
Millages, Taxes, Levies, General Fund Contributions,etc		$6,181,437	$215,850,423
	Total Local	**$8,681,437**	**$310,750,423**
	Grand Total	**$88,657,988**	**$2,953,347,025**

COST ESTIMATES

Improve and Expand Projects

Through the planning process, several "improve and expand" projects were identified for the WestPlan 2050 MTP. These projects are discussed in more detail in Chapter 11. The total costs of these projects come to $42,920,000 represented in the FY 2023 budget. Estimated for the year of construction, this number increases to $140,324,912.

Operations and Maintenance of Local Roads

Activities, such as snow plowing, salt and sand application to road surfaces, lawn mowing, and tree trimming related to roadways, are categorized as maintenance. Maintenance may also include those activities that improve the quality of a road surface, but do not completely resurface a roadway such as filling potholes, improving signage, or road painting and marking. Cost estimates for the operation and maintenance of local roads were developed in consultation with the local units of government. Act 51 reports were obtained for each entity, and annual averages were extrapolated out through 2050. Based on recent cost averages, these costs are estimated to be around $1,062,592,413 for the MPO area over the life of the plan.

Operations and Maintenance of State Trunklines

In addition to collecting Act 51 reports from local jurisdictions, WestPlan staff requested estimates from MDOT for operations and maintenance funding through 2050. Operations and maintenance funds are used for projects such as culvert maintenance, winter maintenance (snow plowing), mowing, roadway surface maintenance (pothole patching, crack sealing, etc.) and other expenses necessary to operate and maintain the road network.

Cost estimates for the Operations and Maintenance of State Trunklines were developed by MDOT, who in turn forwarded the figures on to MPO staff. Based on these figures, it is estimated that costs would be $414,000,000 through 2050.

Operations and Maintenance of Transit /Transit Projects

Costs for transit needs, including replacement of vehicles and the construction, purchase, and renovation of an operations facility, as well as operations and maintenance must also be considered. The transit fleets will need to be replaced during the lifetime of this plan. Based on current annual TIP expenditures and figures provided by MDOT, it has been estimated that transit costs will be $170,937,756 over the life of the plan.

Other Projects

Planning regulations suggest that pedestrian walkway and bicycle facilities, highway and transit enhancement activities, and safety improvements should be included in the transportation plan. While no future projects have been identified at this time, current trends suggest that these activities will increase in importance and frequency in the future.

DEMONSTRATION OF FINANCIAL CONSTRAINT

This information is provided to present funding sources available in a summarized fashion. The information here is a summary of the preceding sections regarding federal, state, and local funding categories, as well as estimated expenses. Based on the analysis that was done with these estimates, the WestPlan MPO has determined that

there is sufficient funding for the projects identified in the plan. The estimates also indicate that there is a significant balance in available funding for I/E projects. Based on this conclusion, the WestPlan MTP is financially constrained.

Figure 21:Demonstration of Financial Constraint

Total Federal, state, and local revenues estimated to be available for roadway construction, transit capital/operating and local road operations and maintenance	**$2,953,347,025**
Expenditures for Metropolitan Transportation Plan Improve and Expand Projects	$140,324,912
Expenditures for Operations/Maintenance of State Trunkline Roads	$414,000,000
Expenditures for Operations/Maintenance of Local Roads	$1,062,592,413
Expenditures for Transit Projects/Operations/Maintenance of Transit	$170,937,756
REMAINING BALANCE	**$1,166,230,825**

CHAPTER 14:

PERFORMANCE BASED PLANNING

Federal transportation legislation established a performance-based planning framework and target setting requirements for states and MPOs (MPOs). These requirements are focused on contributing to achieving several national goals and include the following categories:

Figure 22:Performance Measures and Targets

Performance Measure	Performance Targets
Safety Performance	Number of fatalities Rate of fatalities Number of serious injuries Number of non-motorized fatalities and non-motorized serious injuries
Pavement and Bridge Condition	Percent NHS bridges in good and poor condition Percent interstate pavement in good and poor condition Percent non-interstate NHS pavement in good and poor condition Rate of serious injuries
System and Freight Reliability	Percent of person-miles traveled on the interstate that are reliable Percent of person-miles traveled on the non-interstate NHS that are reliable Truck travel-time reliability
Congestion Mitigation and Air Quality	Peak hour excessive delay per capita Percent of non-single occupancy vehicle travel Total emissions reduction
Public Transportation	Transit Asset Management (TAM) Plans (rolling stock, equipment, facilities, infrastructure) State of Good Repair measures are identified by individual transit providers as part of TAM Plan Public Transportation Agency Safety Plan (fatalities, injuries, safety events, system reliability)

Federal legislation requires that transportation long range plans include a system performance report and subsequent updates to evaluate the condition and performance of the transportation system with respect to the

adopted performance targets. The information should include progress achieved by the MPO in comparison with system performance baseline data. This document is intended to fulfill this federal requirement, and with the recent introduction of performance reporting, there is not a lot of specific data to draw baseline numbers at this point. However, the WestPlan MPO has incorporated performance-based planning into the MPO process for many years through a variety of multimodal transportation projects that have been programmed by MPO agencies.

The WestPlan MPO System Performance Report will outline the targets and discuss how the MPO is working toward meeting the targets based on planning and projects. There are also examples of projects that have been programmed to address these targets. The information provided in this document is used to evaluate and guide decisions for future transportation investments.

The WestPlan MPO works closely with federal, state, and local member agencies, the public, and other stakeholders to establish targets based on the federally required areas of focus. The WestPlan MPO has elected to adopt targets set and developed by the State of Michigan for all the focus areas outlined in the legislation.

Safety Performance Measures

In March 2016, the Federal Highway Administration (FHWA) published in the Federal Register (81 FR 13722) a final rule revising 23 CFR part 924 and 23 U.S.C. 148 Highway Safety Improvement Program (HSIP) to incorporate new statutory requirements of MAP-21 and the FAST Act. The HSIP focuses on reducing fatalities and serious injuries on all public roads through targeted investment in infrastructure programs and projects to improve safety.

On the same date, FHWA published a companion Safety Performance Management (Safety PM) final rule (81 FR 13881) to support national safety goals and carryout the HSIP. The safety PM final rule has been codified in a new regulation 23 CFR Part 490, Subpart B. The purpose of the Safety PM is to improve transparency through use of a public reporting system using common data standards and elements, and aggregating progress toward the national goal of reducing traffic fatalities and serious injuries. The five safety performance measures identified in the regulation are applicable to all public roads regardless of jurisdiction.

In 2018, the National Highway Traffic Safety Administration (NHTSA) published the final Uniform Procedures for State Highway Safety Grants Program (83 FR 3466) and updated Highway Safety Plan (HSP) requirements. The purpose of the safety grants is to focus investments on reducing fatalities, injuries, and economic loss resulting from vehicle crashes through behavioral traffic safety programs.

The FHWA and NHTSA coordinated the final rules to identify three common performance measures (1 through 3 below) for which the annual performance targets must align as much as possible when reported in the HSIP and HSP. The measures/targets are reported as five-year rolling averages.

1. Number of Fatalities
2. Rate of Fatalities per 100 million Vehicle Miles Traveled (VMT)
3. Number of Serious Injuries
4. Rate of Serious Injuries per 100 million VMT
5. Number of Non-motorized Fatalities and Serious Injuries

The 23 CFR Part 490, Subpart B communicates the process for which State DOTs and MPOs are to establish and

report on the five HSIP safety targets, and the criteria FHWA will use to assess whether State DOTs have met or made significant progress toward meeting their safety targets.

With three common safety performance measures reported in the annual HSIP and HSP, establishing targets is a coordinated effort between the Michigan Department of Transportation (MDOT), the Strategic Highway Safety Office (SHSO), and MPOs. The coordination and target requirements promote working collaboratively to achieve the targets.

The WestPlan MPO Policy Committee took action to support the state targets at their meeting on November 15, 2023. The following table shows the 2024 Calendar Year Michigan State Safety Targets which were supported by the WestPlan MPO:

Figure 23: State Safety Targets for CY 2024

SAFETY PERFORMANCE MEASURES
(STATE OF MICHIGAN 2023)

Safety Performance Measure	Baseline Condition (2017-2021)	Calendar Year 2023 State Safety Target
Fatalities	1,041.8	1,105.6
Fatality Rate*	1.071	1.136
Serious Injuries	5,742.2	5,909.2
Serious Injury Rate*	5.878	6.058
Nonmotorized Fatalities & Serious Injuries	752.0	743.4

*Michigan State Safety Targets (Rate Per 100 Million Vehicle Miles Traveled

The FY 2023-2026 TIP includes several projects which are anticipated to impart safety benefits to the transportation system which are illustrated in the following table:

Figure 24: FY2023-2026 TIP Specific Safety Projects

Year	Project	Description	Safety Benefit
2023	Muskegon County	Install traffic signal dilemma zone systems	Reduce the potential for crashes along multiple roadways with dangerous sight distances
2023,2024, 2025,2026	Grand Region- Regionwide	Special marking application on trunkline routes	Reduce the potential for crashes along multiple roadways
2023,2024, 2025,2026	Grand Region- Regionwide	Pavement marking retro-reflectivity readings on trunkline routes	Reduce the potential for crashes along multiple roadways with dangerous access points and sight distances
2023,2024, 2025,2026	Grand Region- Regionwide	Longitudinal pavement marking application on trunklines in Grand Region	Reduce the potential for crashes along multiple roadways
2023	US-31 Ottawa County	Indirect Left Turn Lanes	Reduce the potential for crashes along multiple roadways
2023	M-46 Muskegon County	Signal Modernization	Reduce the potential for crashes along multiple roadways with dangerous access points and sight distances
2024	US-31 and M-104 Ottawa County	ITS Applications	Reduce the potential for crashes along multiple roadways with dangerous access points and sight distances
2024,2026	MDOT Muskegon TSC-wide	Non-Freeway Signal upgrades	Improve sign and signal visibility
2024,2026	M-104 at Fruitport Road	Signal Modernization	Improve signal visibility
2025	M-46	Signal Modernization	Improve signal visibility

WestPlan will continue to contribute to achieving the safety targets by working with state and local partners and programming projects that will move toward meeting those targets. As a small MPO, WestPlan local agencies apply annually for consideration of funding for safety projects from a statewide pool of safety funds. Project selection at the state level is heavily weighted toward projects impacting fatality and serious injury crash locations. WestPlan supports the local agencies and assists them with the application process. Once awarded, projects are amended into the TIP. In addition, WestPlan will continue to implement the safety plan and work with state and local agencies to identify potential safety related projects and to support educational campaigns. These actions will help the MPO, and the state move toward the agreed targets.

Bridge and Pavement Condition Performance Measures

Federal performance measures require that state DOTs establish 2-year and 4-year targets for a 4-year performance period for the condition of infrastructure assets. State DOTs established their first statewide targets on May 20, 2018. As with the pavement condition reporting, state DOTs are required to submit three performance reports to the Federal Highway Administration (FHWA) within the 4-year performance period: a baseline performance report published on October 1, 2018; a mid- performance period progress report by October 1, 2020; and a full performance period progress report by October 1, 2022. The two performance measures for assessing bridge condition are: percent of National Highway System (NHS) bridges in "good condition"; and percent of NHS bridges in "poor condition".

The MPOs will establish targets by either supporting MDOT's statewide target(s) or defining a target unique to the metropolitan area each time MDOT sets a target. WestPlan supports the maintaining of NHS and local bridges within its area. However, bridge funding is administered at the state level by MDOT. MDOT evaluates bridges on interstate and state trunkline routes for necessary projects and funding. A statewide Local Bridge Advisory Board allocates funds for the Michigan Local Bridge Program based on available funds and weighted ratios. In 2016, only 89 of 363 submitted local bridge projects could be funded due to budget constraints. As of June 2017, approximately two million square feet of locally owned bridges in Michigan have deck area in poor, serious, or critical condition. This translates to the local agencies in Michigan having 17 percent of NHS bridge deck area under their jurisdiction in poor condition. This exceeds the penalty threshold of no more than 10 percent of NHS bridges, measured by deck area, being classified as structurally deficient. MDOT's NHS bridge condition by deck area is only slightly under the 10 percent threshold, at 9 percent poor condition.

MDOT is projecting "condition improvement" for the NHS bridges in the state based on projects programmed through the MDOT and local bridge programs described above. Deterioration is estimated based on comparing network wide deterioration rates to the age and condition of each major component of each structure. The targets are highly dependent on the deck area of bridges that fall to poor. Therefore, the smaller the inventory considered the higher potential for a single bridge to skew results. The statewide targets are assumed to be less variable than for an individual MPO.

Federal regulations require that states measure, monitor, and set goals for pavement performance based upon a composite index of metrics. The pavement condition metrics are international roughness index (IRI), cracking percent, and rutting or faulting as reported by each state to the Highway Performance Monitoring System (HPMS) database. IRI and cracking percent are metrics for all road types. Rutting is only applicable to asphalt pavements and faulting is only measured for jointed concrete pavements. The rule applies to the entire National Highway System (NHS), which includes interstate and non-interstate NHS. MDOT is responsible for approximately 5,931 through-lane miles of interstate in Michigan, as of 2022.

The non-interstate portion of the system includes MDOT trunkline routes (about 11,959 miles in 2022) and local government owned non-trunkline roads (about 4,239 miles in 2022). Local agencies are responsible for 19 percent of the NHS route mileage in Michigan.

MDOT has established 2-year and 4-year targets for a 4-year performance period for pavement condition on the NHS in response to the federal regulations. Based on the metrics described above and the rating of roads along a metric value range, there are four measures that will be used to assess pavement condition: percent of interstate road pavement in "good" condition; percent of interstate road pavement in "poor" condition; percent of non-interstate NHS pavement in "good" condition; and percent of non-interstate NHS pavement in "poor" condition.

The following table shows the WestPlan supported targets for pavement and bridge condition:

Figure 25:State of Michigan Pavement and Bridge Condition Targets

National Highway System Pavement Performance Measures					
Pavement Performance Measure	Baseline Condition (2017-2021)	Baseline Condition (2022-2025)	2-Year Predicted Performance Target	4-year Predicted Performance (Target)	Condition in WestPlan (2021)
% of interstate pavement in good condition	57.80%	70.40%	59.20%	56,7%	72.70%
% of interstate pavement in poor condition	4.90%	1.80%	5.00%	5.00%	0.80%
% of non-interstate pavement in good condition	49.20%	41.60%	33.10%	33.10%	47.00%
% of non-interstate pavement in poor condition	18.90%	8.90%	10.00%	10.00%	3.40%
National Highway System Bridge Performance Measures					
Pavement Performance Measure	Baseline Condition (2017-2021)	Baseline Condition (2022-2025)	2-Year Predicted Performance Target	4-year Predicted Performance (Target)	Condition in WestPlan (2021)
% of national highway system deck area in good condition	32.70%	22.10%	15.20%	12.80%	5.00%
% of national highway system deck area in poor condition	9.80%	7.00%	6.80%	5.80%	2.00%
Source: Michigan Department of Transportation					

Figure 26: FY 2023-2026 TIP Specific Pavement and Bridge Improvement Projects

Fiscal Year	Project Name	Limits	Primary Work Type	Project Description
2023	US-31BR	US-31 BR SB/NB Over The Black Creek	Bridge Replacement	Structure Replacement
2023	US-31	US-31 at unnamed tributary 0.3 miles South of Van Wagoner Street.	Reconstruction	Culvert Replacement.
2023	US-31 S	4 Structures along US-31 NB/SB over Colby Road & Walsh Road	Bridge CPM	Epoxy Overlay
2023	US-31 S	4 Structures along US-31 NB/SB over Colby Road & Walsh Road	Bridge CPM	Epoxy Overlay
2024	M-46	From Shonat Street east to Maple Island Road	Road Rehabilitation	Milling and Two Course Asphalt Resurfacing
2024	Muskegon TSC Wide	M-120	Road Capital Preventive Maintenance	2024 Asphalt Crack Treatment
2024	Muskegon TSC Wide	M-120	Road Capital Preventive Maintenance	2024 Asphalt Crack Treatment
2024	US-31BR	US-31 BR Over the White River	Bridge Replacement	Bridge Replacement
2024	US-31 BR	From the White River north to Stanton Boulevard	Road Rehabilitation	Milling and Two Course Asphalt Resurfacing
2025	M-46	from Muskegon Avenue east to Home Street	Road Rehabilitation	Concrete Pavement Inlay
2025	M-46	from Muskegon Avenue east to Home Street	Road Rehabilitation	Concrete Pavement Inlay
2025	US-31 S	4 Structures along US-31 NB/SB over Colby Road & Walsh Road	Bridge CPM	Epoxy Overlay
2025	M-46	M-46 over Crockery Creek	Bridge Replacement	Bridge Replacement
2026	I-96	from Airline Road east to Apple Drive	Road Rehabilitation	Milling and Two Course Asphalt Resurfacing
2026	US-31 BR	From the White River north to Stanton Boulevard	Road Rehabilitation	Milling and Two Course Asphalt Resurfacing
2026	US-31 BR	From the White River north to Stanton Boulevard	Road Rehabilitation	Milling and Two Course Asphalt Resurfacing

WestPlan will continue to contribute to achieving the pavement and bridge condition targets through the following actions:

Provide pavement deficiency information to local jurisdictions to utilize during the project selection process.
Implement road projects that make the most cost-effective use of resources while focusing on maintenance to maximize the life of existing roads.
Support the development of local asset management plans that are regularly monitored, updated, and coordinated with other infrastructure systems.
Implement construction projects that make cost-effective use of resources with a focus on maintenance to maximize the life of existing roads and bridges.

WestPlan will also continue to monitor the pavement conditions of state and locally owned roads within the MPO through the annual Pavement Surface Evaluation and Rating (PASER) system. The system is implemented under the guidance of the Michigan Transportation Asset Management Council (TAMC), Michigan's ACT 51 (P.A. 499 in 2002 and 199 in 2007) is the legislation that provides a means for road agencies to annually report the mileage and condition of the federally funded road and bridge systems under their jurisdiction. In addition, the MPO uses the PASER system to collect local data for road agencies throughout the MPO and regionwide.

2023 Federal Aid PASER Road Survey

What Is Asset Management?

Asset management is a concept in the transportation industry that has emerged as an important planning tool for public officials, planners, engineers, and others. Asset Management is based on an inventory of each local road network within the region. It will provide data that will allow transportation officials to monitor, plan, and strategically improve the road network. This strategic method of investment marks a break from the traditional "tactical" method of fixing roads that have the most severe problems.

The Michigan Transportation Commission has formed an Asset Management Council, with the objective to implement a state law that enacted the Asset Management Program. The Council is appointed by the Transportation Commission and answers directly to the Commission and legislature. Its five main elements include: policy goals and objectives, data collection, planning and programming, program delivery, and monitoring and reporting. Its goal is to inventory all 39,000 miles of federal aid eligible roads within the State of Michigan, and according to the data collected, determine future distribution of ACT 51 transportation funds. In the future, the Asset Management Council may implement a similar initiative to collect similar information on the remaining local road network.

Regional Commission Involvement

In a typical year, region staff, along with the Michigan Department of Transportation (MDOT) and a county road commission employee, collect this data within the region. Annually, staff attend a training session to review the previous year's collection process and to keep the training up to date for those who will be involved.

Each region within the State of Michigan receives a laptop equipped with GIS, a GPS device, and software to collect the data. The data collection effort will require the collection of three items: PASER rating (Pavement Surface Evaluation and Rating), surface type, and the number of lanes. PASER is a visual rating assessment system that rates the road surface condition for a given segment on a scale of 1-10.

Purpose
The purpose of this task is to help satisfy the requirements of P.A. 499 of 2002, which establishes an Asset Management Council and charges it to develop an Asset Management Process for the State of Michigan. Regional transportation planning agencies play a significant role in this process as outlined in the following task assignments.

Method
The Asset Management Council has developed a statewide process that will result in approximately 50 percent of federal aid eligible roads in the state to be rated per year. Activities to be undertaken as part of this task include:

1. Attendance at training seminars on the use of PASER.
2. Participation as part of a three-person team that will rate the federal-aid eligible roads in the region.
3. Providing the results of the PASER ratings to local agencies to review and revise where appropriate.
4. Public display of PASER ratings on the WMSRDC website or through other public means so it is available for public review and use in project and plan development activities.
5. Transmit PASER ratings along with other roadway data to the TAMC. (i.e., traffic counts).

Products

1. Road network loaded in Roadsoft.
2. PASER data collected on federal-aid eligible roads in region.
3. Web based or other public display of PASER road ratings on network.
4. Report to the Asset Management Council with PASER and other roadway data and transportation project completion information for the region.

Data Collection Process
In previous years, regional staff assisted in rating 100 percent of roads on the Federal aid system. Beginning in 2008, regional staff rated 50 percent of the Federal aid system miles. In recent years, regional staff has resumed rating 100% of the federal aid eligible roads per year. Typically, region staff, along with an MDOT employee and a county road commission employee, collect this data within the region.

The first step in this process is for each of the county road commissions to create a network in Roadsoft and export it to the region's Laptop Data Collector (LDC). The LDC software is housed on the region's laptop computer and connected to a GPS unit. Roadsoft GIS is an asset management software package created and distributed free of charge by the Michigan Technological University's Technology Development Group. The current version of the program was designed with a special module to collect PASER rating data. The rating group then drives the entire network that was previously selected by the road commission. For each segment of road, the rating team agrees on a road rating by using the PASER system, giving a numerical value for the condition of the road, 10 being new and 1 being failed.

Once the entire network has been rated, the data is exported back to the county road commission's Roadsoft program. After this is completed, the county's data is exported to the region, which passes the information back to the Asset Management Council.

Computer Equipment and Software
Staff collected data using a laptop computer with the Roadsoft GIS LDC software. A Garmin GPS unit was connected to the laptop to track position and locate road segments.

Staff Time
To collect PASER data, it is most efficient to have three people in the vehicle; one driver, one navigator/rater, and one who is assigned to enter information into the computer. In typical years, for each county road rating project, there is one representative from the region, one road commission employee, and one MDOT representative present.

Training
COVID-19 has changed the training requirements for asset management. An in-person training was required for all raters pre-COVID-19. New trainees are now required to participate in three webinars containing background information on asset management. Participants receive an overview of the project and are given instructions on how to use the Roadsoft software and the PASER road rating system for data collection. Once out in the field, experienced staff members show the new participants how to use the Roadsoft program and guide them through the rating process. Most participants feel comfortable after an hour of working on the computer and rating the roads. In addition, every three years, raters are required to complete a webinar training on how to rate unpaved roads.

PASER Rating System
The PASER road rating system was developed by the University of Wisconsin-Madison Transportation Information Center to be used as the State of Wisconsin's standard road rating system. PASER is a "windshield" road rating system that uses a 1 to 10 rating scale, with a value of 10 representing a new road and a value of 1 representing a failed road. Condition ratings are assigned by monitoring the type and number of visual defects along a road segment while driving the segment. The PASER system interprets these observations into a condition rating. A sample PASER rating chart has been included on the next page.

The State of Michigan Asset Management Council has requested that the information gathered in this survey be reported using the following categories:

- **Roads with PASER ratings of 8-10 require Routine Maintenance**. Routine maintenance is the day-to-day maintenance activities that are scheduled, such as street sweeping, drainage clearing, shoulder gravel grading, and sealing cracks to prevent standing water and water penetration.

- **Roads with PASER ratings of 5-7 require Capital Preventive Maintenance**. Capital preventive maintenance is a planned set of cost-effective treatments to an existing roadway system and its appurtenances that preserves, retards future deterioration, and maintains or improves the functional condition of the system without significantly increasing structural capacity. The purpose of capital preventive maintenance is to protect the pavement structure, slow the rate of pavement deterioration and/or correct pavement surface deficiencies. Surface treatments are targeted at pavement surface defects primarily caused by the environment and by pavement material deficiencies.

- **Roads with PASER ratings of 1-4 require Structural Improvements**. This category includes work identified as rehabilitation and reconstruction which address the structural integrity of a road.

Figure 27: PASER Rating System

Surface Rating		Visible Distress	General Condition / Treatment Measures
10	Excellent	• None	New construction
9	Excellent	• None	Recent overlay, like new.
8	Very Good	• No longitudinal cracks except reflection of paving joints. • Occasional transverse cracks, widely spaced (40' or greater).	Recent sealcoat or new road mix. Little or no maintenance required.
7	Good	• Very slight or no raveling, surface shows some traffic wear. • Longitudinal cracks (open 1/4") spaced due to reflection or paving joints. • Transverse cracks (open 1/4") spaced 10 feet or more apart, little or slight crack raveling. • No patching or very few patches in excellent condition.	First signs of aging. Maintain with routine crack filling.
6	Good	• Slight raveling (loss of lines) and traffic wear. • Longitudinal cracks (open 1/4" - 1/2") due to reflection and paving joints. • Transverse cracking (open 1/4" - 1/2") some spaced less than 10 feet. • Slight to moderate flushing or polishing. • Occasional patching in good condition.	Show signs of aging, sound structural condition. Could extend life with sealcoat.
5	Fair	• Moderate to severe raveling (loss of lines and coarse aggregate). • Longitudinal cracks (open 1/2") show some slight raveling and secondary cracks. First signs of longitudinal cracks near wheel path or edge. • Transverse cracking and first signs of block cracking. Slight crack raveling (open 1/2"). • Extensive to severe flushing or polishing. • Some patching or edge wedging in good condition.	Surface aging, sound structural condition. Needs sealcoat or non-structural overlay.
4	Fair	• Severe surface raveling. • Multiple longitudinal and transverse cracking with slight raveling. • Block cracking (over 25 - 50% of surface). • Patching in fair condition. • Slight rutting or distortions (1" deep or less).	Significant aging and first signs of need for strengthening. Would benefit from recycling or overlay.
3	Poor	•Closely spaced longitudinal and transverse cracks often showing raveling and crack erosion. •Block cracking over 50% of surface. •Some alligator cracking (less than 25% of surface). •Patches in fair to poor condition. •Moderate rutting or distortion (1" or 2" deep). •Occasional potholes.	Need patching and major overlay or complete recycling.
2	Very Poor	• Alligator cracking (over 25% of surface). • Severe distortions (over 2" deep). • Extensive patching in poor condition. • Potholes.	Severe deterioration. Needs reconstruction with extensive base repair.
1	Failed	• Severe distress with extensive loss of surface integrity.	Failed. Needs total reconstruction.

Muskegon County

Project overview
In 2023, region staff assessed the condition of 100% of Muskegon County's federal-aid eligible roads using the PASER road rating system, as required by the State of Michigan Asset Management Council.

Results
Approximately 629 miles of federal-aid eligible roads were rated for this project in 2023. The following summarizes the distribution of ratings by mileage and percentage of the total for all roads rated in the project. The Asset Management Council has prescribed a fix for each of the PASER rating categories:

- Roads receiving a rating of Good (8 or higher) require only Routine Maintenance
- Roads receiving a rating of Fair (5-7) require Capital Preventative Maintenance
- Roads receiving a rating of Poor (4 or less) require Structural Improvements

2023 PASER Rating Summary for Muskegon County

Condition	***Centerline Miles***	***Percentage***
Good (Rating 8+)	**12.385**	**1.97%**
Fair (Rating 5-7)	**301.191**	**47.94%**
Poor (Rating 1-4)	**314.664**	**50.09%**

Ottawa County

Project overview
Northern Ottawa County is part of the WestPlan MPO which is administered by WMSRDC. In 2023, region staff assessed the condition of 100% of the federal-aid eligible roads in the Village of Spring Lake, the City of Ferrysburg, the City of Grand Haven, Spring Lake Township, Grand Haven Township, Robinson Township, and Crockery Township, as well as local roads in the City of Grand Haven using the PASER road rating system.

Results
Approximately 190 miles of federal-aid eligible roads were rated for this project in 2023. This included less than 1 mile of unpaved roads which do not receive a number rating. The following summarizes the distribution of ratings by mileage and percentage of the total for all roads rated in the project. The Asset Management Council has prescribed a fix for each of the PASER rating categories:

- Roads receiving a rating of Good (8 or higher) require only Routine Maintenance
- Roads receiving a rating of Fair (5-7) require Capital Preventative Maintenance
- Roads receiving a rating of Poor (4 or less) require Structural Improvements

2023 PASER Rating Summary for Ottawa County

Condition	***Centerline Miles***	***Percentage***
Good (Rating 8+)	**3.97**	**2.06%**
Fair (Rating 5-7)	**83.042**	**43.66%**
Poor (Rating 1-4)	**103.198**	**54.27%**

System and Freight Reliability Performance Measures

Title 23 CFR §490 – National Performance Measures, Subpart E, directs MDOT and MPOs to coordinate development of 2-year and 4-year predicted performance reliability targets within a defined 4-year performance period in support of the national goals established by Congress in MAP-21 of 2012.

In accordance with regulation and Federal Highway Administration (FHWA) guidance, targets are data-informed, analysis driven, realistic predictions of future performance constrained to projected program funding. These short-term predictions are intended to evaluate and support the most effective investment strategies for achieving long-term performance goals and expectations in State and MPO planning documents.

Level of Travel-Time Reliability (LOTTR)
Percentage of person-miles traveled on the [Interstate/Non-Interstate NHS] that are reliable

- Interstate and (2) Non-Interstate NHS
- 2-Year and 4-Year Targets
- Four (4) Time Periods
- Fifteen (15) Minute Travel Intervals
- Longer Travel Time: 80th Percentile
- Normal Travel Time: 50th Percentile
- Threshold: Reliability <1.50
- Factors Applied: Vehicle volumes (HPMS) and Vehicle Occupancy Factor (provided by FHWA)

Truck Travel-Time Reliability (TTTR)
Interstate freight reliability, truck travel time Index

- Interstate (only)
- 2-Year and 4-Year Targets
- Five (5) Time Periods
- Fifteen (15) Minute Travel Intervals
- Longer Travel Time: 95th Percentile
- Normal Travel Time: 50th Percentile
- Threshold: None
- Factors Applied: No additional factors are applied

The reliability measures are limited to directional mainline highways on the National Highway System (NHS), regardless of ownership, and the NHS represents a subset of the entire network managed by MDOT, MPOs, and local governments.

Section 490 directs State DOTs and MPOs to use three performance measures for assessing travel time reliability. The National Performance Management Research Data Set (NPMRDS) is vehicle probe-based travel time data used to calculate the national reliability measures. The NPMRDS is provided by the Federal Highway Administration (FHWA) for use by states and MPOs. The NPMRDS is processed through an analytical software tool known as Regional Integrated Transportation Information System (RITIS).

Figure 28: State of Michigan System Reliability and Freight Reliability Targets

National Highway System Travel Time Reliability					
System Reliability	Baseline Condition (2017-2021)	Baseline Condition (2022-2025)	2-Year Predicted Performance Target	4-year Predicted Performance (Target)	Condition in WestPlan (2021)
% of the reliable person-miles traveled on the interstate based on 80th percentile over 4 time periods	85.20%	97.10%	80.00%	80.00%	100.00%
% of the reliable person-miles traveled on the interstate based on 80th percentile over 4 time periods	84.00%	94.40%	75.00%	75.00%	93.90%
Truck travel time reliability (TTTR) index on the interstate based on the 95th percentile over 5 time periods	1.38%	1.31%	1.60%	1.60%	1.22%
Source: Michigan Department of Transportation					

The level of travel time reliability for both the NHS interstate and non-interstate NHS measures the percentage of person-miles traveled considered to be reliable. The roads are considered reliable when the difference between normal travel time and congested travel time is below 50 percent. Baseline data from 2017 and 2018 reveals Michigan's interstate highways and non-interstate highways have been around 85 percent reliable, meaning 85 percent of person-miles traveled meet the federally established thresholds. The freight reliability measure measures the same reliability; however, the longer travel time is calculated using the 95th percentile travel time.

WestPlan staff participated in coordination meetings during MDOT's statewide target development process and the WestPlan MPO committees elected to support the state targets for this reporting period.

The FY 2023-2026 TIP includes several projects which are anticipated to help the state meet the proposed targets for System Performance and Freight.

WestPlan will contribute to achieving these statewide targets through the following actions:

- Provide reliability deficiency information to local jurisdictions to utilize during project selection.
- Monitor congestion levels, prioritize congested locations, and implement treatments.
- Use data to inform projects for inclusion in the short- and long-term planning process.
- Conduct an annual analysis of congestion performance target setting and program adjustments.

These actions correspond with MDOT's actions to meet these targets:

- Monitor performance measures and consider system performance as a factor in the decision-making process for transportation investments.
- Evaluate project types and funding templates that can impact travel reliability, such as capacity.
- Operational changes, safety projects that have operational impacts, and pavement projects that change the condition from poor to good or fair.

Figure 29: FY 2023-2026 TIP Specific System Performance and Freight Projects

Fiscal Year	Project Name	Limits	Primary Work Type	Project Description
2023	US-31	US-31 at unnamed tributary 0.3 miles South	Reconstruction	Culvert Replacement.
2023	US-31 S	4 Structures along US-31 NB/SB over Colby	Bridge CPM	Epoxy Overlay
2023	US-31 S	4 Structures along US-31 NB/SB over Colby	Bridge CPM	Epoxy Overlay
2024	M-46	From Shonat Street east to Maple Island Road	Road Rehabilitation	Milling and Two Course Asphalt Resurfacing
2024	Muskegon TSC	M-120	Road Capital Preventive Ma	2024 Asphalt Crack Treatment
2024	Muskegon TSC	M-120	Road Capital Preventive Ma	2024 Asphalt Crack Treatment
2024	US-31BR	US-31 BR Over the White River	Bridge Replacement	Bridge Replacement
2024	US-31 BR	From the White River north to Stanton	Road Rehabilitation	Milling and Two Course Asphalt Resurfacing
2025	M-46	from Muskegon Avenue east to Home Street	Road Rehabilitation	Concrete Pavement Inlay
2025	M-46	from Muskegon Avenue east to Home Street	Road Rehabilitation	Concrete Pavement Inlay
2026	I-96	from Airline Road east to Apple Drive	Road Rehabilitation	Milling and Two Course Asphalt Resurfacing
2026	US-31 BR	From the White River north to Stanton	Road Rehabilitation	Milling and Two Course Asphalt Resurfacing
2026	US-31 BR	From the White River north to Stanton	Road Rehabilitation	Milling and Two Course Asphalt Resurfacing

Congestion Mitigation and Air Quality

This measure applies to urbanized areas containing NHS mileage and having a population over 200,000 (Phase 1 population over 1 million). The WestPlan area does not qualify for inclusion in this measure.

Public Transportation

There are two public transit providers in the WestPlan area: Muskegon Area Transportation System (MATS) and

Harbor Transit Multi-Modal Transit System (HT). Both are direct recipients of funds from the Federal Transit Administration (FTA). As such, MATS and HT are identified as tier II recipients under the current federal legislation and have developed state of good repair targets. Federal surface transportation legislation mandated that the FTA develop a rule establishing a strategic and systematic process of operating, maintaining, and improving public capital assets effectively through their entire life cycle. The Transit Asset Management (TAM) Final Rule 49 CFR part 625 became effective Oct. 1, 2016, and established four performance measures:

- Rolling Stock - Percentage of revenue vehicles exceeding useful life benchmark (ULB)
- Equipment - Percentage of non-revenue vehicles exceeding ULB
- Facilities - Percentage of facilities rated under 3.0 on the Transit Economic Requirements Model
- (TERM) scale
- Infrastructure - Percentage of track segments under performance restriction (only applies to rail fixed routes)
- Guideway systems – not applicable in the WestPlan region

Figure 30:Transit Asset Management Targets

Asset Class	Baseline Condition	Performance Measure	Approximate Baseline Condition	Target
Rolling Stock	Large Bus	Age: Percentage that have met or exceeded their useful life benchmark	0% exceeding ULB	Not more than 15%
	Small Bus	Age: Percentage that have met or exceeded their useful life benchmark	14% exceeding ULB	Not more than 10%
	Sedan/SUV	Age: Percentage that have met or exceeded their useful life benchmark	0% exceeding ULB	Not more than 10%
Equipment	Service Vehicles	Age: Percentage that have met or exceeded their useful life benchmark	25% exceeding ULB	Not more than 20%
	Maintenance Equipment	Condition: Percentage of equipment and facilities with a condition rating adequate or below on the FTA	0% below target	Not more than 20%
	Building Subsystems	Condition: Percentage of equipment and facilities with a condition rating adequate or below on the FTA economic requirements model scale	0% below target	Not more than 10%
Facilities	All fixed facilities	Condition: Percentage of equipment and facilities with a condition rating adequate or below on the FTA economic requirements model scale	25% below target	Not more than 10%

WestPlan received agency-level State of Good Repair (SGR) targets from the MATS and the HT in 2022, which were approved and supported by the MPO Technical and Policy committees. FTA recommends that MPOs adopt a single set of region-level targets for each asset class that are developed in coordination with the region's public

transportation providers. Therefore, staff engaged the public transit providers in a coordination process to cooperatively develop a single set of regional SGR targets after WestPlan received updated targets from the transit agencies, as well as targets from MDOT (applicable to MDOT Section 5311 and 5310 sub recipients). Through this coordination process, the following region-level targets were developed and adopted by the WestPlan committees and are shown in the table below.

Figure 31: Transit State of Good Repair Targets for 2023

Asset Class	Current Condition MATS	Current Condition HT	2023 Target MATS	2023 Target HT
Revenue Vehicles: small bus and van	1%	5%	0%	5%
Revenue Vehicles: large bus	20%	21%	44%	21%
Service Vehicles	0%	5%	0%	5%
Facilities	0%	5%	0%	5%

Public Transportation Agency Safety Plan

Both MATS and Harbor Transit have current agency adopted Public Transportation Safety Plans (PTASP). The PTASP is a plan that standardizes how each transit authority focuses on safety concerns and identifies weaknesses while considering risks and risk management throughout the agency. These plans are available at the transit agency and are also available through the MPO. Details of the PTASP are included below:

Certification of Compliance

- Each transit agency must annually certify via FTA's Certifications and Assurances process that its safety plan meets the requirements of the final rule.
- States must certify safety plans on behalf of small public transportation providers that operate 100 or fewer vehicles in peak revenue service within their states unless providers opt to certify their own safety plans upon notification to the state.

Documentation and Recordkeeping

- A transit agency must maintain documents that set forth its safety plan, including those related to SMS implementation.
- Those documents must be made available upon request by FTA and other agencies with safety jurisdiction, such as the National Transportation Safety Board (NTSB) and State Safety Oversight Agencies (SSOAs).
- A transit agency must maintain these documents for a minimum of three years after they are created.

Figure 32: FY2023-2026 Transit Projects

Fiscal Year	Responsible Agency	Project Description
2023	Muskegon County Board of Commissioners	FY 2022 CMAQ - Bus replacement
2023	Harbor Transit Multi-Model Transportation System	FY 2023 CMAQ - Bus Replacement
2023	Muskegon County Board of Commissioners	FY 2023 CMAQ - Bus Replacement
2023	Muskegon County Board of Commissioners	FY 2023 CMAQ - Bus Replacement
2023	Harbor Transit Multi-Model Transportation System	FY 2022 CMAQ - Bus replacement
2023	Pioneer Resources	Replacement buses, six medium duty with lifts
2023	Pioneer Resources	Regional Mobility management
2023	Muskegon County Board of Commissioners	Mobility management
2023	Goodwill Industries of West Michigan	Bus Replacement and Bus Purchase
2023	Muskegon County Board of Commissioners	FY2023- 5307 Preventative Maintenance
2023	Harbor Transit Multi-Model Transportation System	A&E for new facility
2023	Harbor Transit Multi-Model Transportation System	FY23 5307 New facility land acquisition
2023	Harbor Transit Multi-Model Transportation System	A & E for new facility - FY2023 5307
2023	Harbor Transit Multi-Model Transportation System	A & E for new facility - FY2023 5307
2023	Harbor Transit Multi-Model Transportation System	FY23 5307 Maintenace equipment
2023	Pioneer Resources	FY2023- 5310 CTF Elderly and Disabled
2023	Disability Network West Michigan	Mobility management under FY22 Section 5310.
2023	Pioneer Resources	Vehicle replacements under the FY22 Section 5310 program.
2023	Harbor Transit Multi-Model Transportation System	FY 2023 CMAQ - Outreach and marketing
2023	Muskegon County Board of Commissioners	FY 2022 CMAQ - Outreach and marketing
2023	Pioneer Resources	New freedom
2023	Pioneer Resources	JARC
2023	Muskegon County Board of Commissioners	Operating assistance for delivery of transit and paratransit services
2024	Muskegon County Board of Commissioners	Add FY2024 Carbon Reduction - Bus replacement
2024	Harbor Transit Multi-Model Transportation System	FY24 CMAQ 5307 Flex Construct new transit facility
2024	Harbor Transit Multi-Model Transportation System	FY 2025 -SECTION 5307 TRANSIT CAPITAL - <30 ft replacement bus
2024	Harbor Transit Multi-Model Transportation System	FY 2024 5307 <30 FOOT REPLACEMENT BUS
2024	Harbor Transit Multi-Model Transportation System	FY 2024 5339 - Capital - <30 ft replacement bus
2024	Harbor Transit Multi-Model Transportation System	Transit Capital 5339
2024	Muskegon County Board of Commissioners	FY2024-5339- Capital Cost of Contracting & Misc. Support Equipment
2024	Muskegon County Board of Commissioners	FY2024-5339- Capital Cost of Contracting & Misc. Support Equipment
2024	Muskegon County Board of Commissioners	FY2024- 5310 Mobility Management Activities and Marketing
2024	Goodwill Industries of West Michigan	FY2023- 5310 CTF Elderly and Disabled- One replacement van
2024	Harbor Transit Multi-Model Transportation System	Bus purchase
2024	Harbor Transit Multi-Model Transportation System	Security/ Surveillance System-
2024	Muskegon County Board of Commissioners	5339
2024	Harbor Transit Multi-Model Transportation System	FY24 Carbon Reduction Program (CRP) - Bus Replacement
2024	Muskegon County Board of Commissioners	FY 2024 CMAQ - Transit outreach and marketing
2024	Pioneer Resources	FY2024 5311- JARC Operating
2024	Pioneer Resources	FY2024 5310 New Freedom Operating
2024	Harbor Transit Multi-Model Transportation System	FY 2024 5307 Operating CTF Urbanized Formula
2024	Pioneer Resources	JARC
2024	Pioneer Resources	5310- Mobility Management
2025	Harbor Transit Multi-Model Transportation System	FY25 CMAQ 5307 Construct new transit facility
2025	Harbor Transit Multi-Model Transportation System	FY 2025 5307 <30 ft expansion bus
2025	Harbor Transit Multi-Model Transportation System	FY 2025 5339 <30 ft replacement bus
2025	Muskegon County Board of Commissioners	Mobility Management Activities and Marketing
2025	Muskegon County Board of Commissioners	Preventative Maintenance
2025	Muskegon County Board of Commissioners	FY 2025 - CMAQ and 5307 Transit outreach and marketing
2025	Pioneer Resources	FY2025 5310 New Freedom Operating
2025	Pioneer Resources	FY2025-5311 JARC Operating
2025	Harbor Transit Multi-Model Transportation System	FY 2025 5307 CTF Urbanized Forumula
2025	Pioneer Resources	FY2024 5310 New Freedom marketing
2025	Pioneer Resources	JARC
2025	Muskegon County Board of Commissioners	Operating Assistance for Transit and Paratransit Services
2025	Pioneer Resources	5310- Mobility Management
2025	Pioneer Resources	JARC 5311 New Freedom Operating
2026	Muskegon County Board of Commissioners	FY 26 5307 CMAQ Outreach and Marketing
2026	Harbor Transit Multi-Model Transportation System	FY 2026 5307 Operating CTF Urbanized Formula
2026	Harbor Transit Multi-Model Transportation System	FY 2026 5339 <30 ft replacement bus
2026	Muskegon County Board of Commissioners	Mobility Management
2026	Muskegon County Board of Commissioners	Preventative Maintenance
2026	Pioneer Resources	FY2026 5310 New Freedom Operating
2026	Pioneer Resources	FY2026 5311 - JARC Operating
2026	Harbor Transit Multi-Model Transportation System	FY 2026 CTF Urbanized Formula
2026	Pioneer Resources	JARC
2026	Muskegon County Board of Commissioners	Operating Assistance for Transit and Paratransit Services
2026	Pioneer Resources	5310 Transit Operating
2026	Pioneer Resources	JARC- 5311 New Freedom Operating

Project Selection in the FY 2023-2026 TIP

For the development of the FY 2023-2026 TIP, WestPlan collected detailed data for each individual project that was submitted for consideration. To gather this data, road agencies were required to submit a "project/program nomination form" for each project submitted. The form, developed by WestPlan, specifically asks for safety information (number of crashes) about each project, as well as condition data, traffic volumes, crash data, congestion issues, PASER ratings, and priority within the agency if multiple projects were submitted. In addition, the form captures information regarding other modes of transportation, i.e. non-motorized and transit. Projects selected are closely reviewed to ensure that they align with the performance measures to work toward meeting established targets.

The project selection form was utilized in compiling a listing of projects to be considered for inclusion in the FY 2023-2026 TIP and evaluated by the WestPlan TIP Subcommittee. Projects were selected within the financial constraints of the various funding programs and with consideration to supporting the goals of the 2045 WestPlan MTP.

Transit agencies also submitted forms and worked with MPO staff to determine potential projects that will address the public transportation performance measures and targets, including the Transit Asset Management (TAM) Plan that is currently in use.

All of these forms were utilized to prepare a list of projects for consideration by the WestPlan TIP Subcommittee. The MPO Technical Subcommittee worked together to select projects within the financial constraints for the various funding programs represented in the TIP, as well as consider each project's support for the performance targets adopted by WestPlan.

WestPlan is committed to meeting the statewide performance measure targets for all the national goals. Project planning and allocation of federal funding to meet these measures and goals is an important part of the MPO process. As resources continue to be available, they will be allocated toward multimodal transportation projects that address these measures and targets.

Figure 33: WestPlan Project Selection Form

WESTPLAN PROJECT SUBMISSION FORM FY 2023-2026 TIP			
PROJECT		**PROJECT LIMITS**	
ROAD NAME		FROM	TO
FISCAL YEAR	COUNTY	ROAD AGENCY	PROJECT RANK #
MAJOR WORK TYPE		NFC CLASS	CURRENT PASER RATING
EXISTING PAVEMENT TYPE	PROPOSED PAVEMENT TYPE	DATE OF LAST WORK COMPLETED	AGE OF PAVEMENT
PROJECT ON TRANSIT ROUTE?	ADJACENT SIDEWALKS/NON MOTORIZED FACILITIES?	ON STREET PARKING?	UTILITY WORK PLANNED?
PROJECT LENGTH	POSTED SPEED	ADT	% COMMERCIAL
ROW EXISTING FEET	ADDITIONAL IF NEEDED (Feet)	# OF EXISTING LANES	PROPOSED # LANES IF NECESSARY
BUDGET		**ADDITIONAL BUDGET INFO**	
STP (FEDERAL)			
LOCAL MATCH			
OTHER PARTICIPATING			
NON-LAP PARTICIPATING			
1. CE			
2. PE			
3. OTHER			
NON PARTICIPATING			
TOTAL JOB COST	**$0**		

Does this project address any of the federally mandated performance measures such as Safety, Transit, Pavement/Bridge Condition, Congestion, System Reliability, or Environmental Sustainability? If so, how?
OTHER INFO

WestPlan FY2023 Obligated Project List

The following table shows a listing of projects obligated in FY2023. These projects support the commitment and investment by the WestPlan MPO to work with member agencies toward addressing and meeting the adopted performance measure targets.

Figure 34: FY2023 Obligated Projects List

Fiscal Year	Job Type	Job#	County	Responsible Agency	Project Description	Fed Estimated Amount	Fed Obligated Amount	Difference(Oblg. - Est.)	State Estimated Amount	State Obligated Amount
2023	Local	215759	Muskegon	Montague	Reconstruct	$200,000	$168,513	($31,487)	$0	$0
2023	Local	217939	Muskegon	Montague	Resurface	$143,581	$143,581	$0	$0	$0
2023	Local	205415	Muskegon	Muskegon	Reconstruction	$1,410,000	$1,410,000	$0	$0	$0
2023	Local	213948	Muskegon	Muskegon	Bridge Removal	$49,161		($49,161)	$0	$0
2023	Local	213948	Muskegon	Muskegon	Bridge Removal	$375,075		($375,075)	$0	$0
2023	Local	205418	Muskegon	Muskegon County	Resurface, Crush and Shape	$571,200	$571,200	$0	$0	$0
2023	Local	205907	Muskegon	Muskegon County	Crush and shape and asphalt resurfacing	$868,000	$768,068	($99,932)	$0	$0
2023	Local	205907	Muskegon	Muskegon County	Crush and shape and asphalt resurfacing	$0		$0	$269,225	$238,574
2023	Local	215559	Muskegon	Muskegon County	Reconstruct	$379,800	$379,800	$0	$0	$0
2023	Local	215559	Muskegon	Muskegon County	Reconstruct	$144,583	$144,583	$0	$0	$0
2023	Local	217942	Muskegon	Muskegon County	Signal Replacement	$206,898	$206,898	$0	$0	$0
2023	Local	205427	Muskegon	Muskegon Heights	Reconstruction	$437,312	$437,312	$0	$0	$0
2023	Local	209812	Muskegon	North Muskegon	Miscellaneous Bridge Capital Preventative Maintenance	$0		$0	$229,627	$374,389
2023	Local	213627	Muskegon	North Muskegon	Resurface	$88,593		($88,593)	$0	$0
2023	Local	214126	Muskegon	North Muskegon	Curb and gutter, sidewalk ramps, remove bump out	$321,840	$337,840	$16,000	$0	$0
2023	Local	211753	Ottawa	Ottawa County	Construct Grand River Greenway Phase IV shared use non-motorized pathway	$3,378,238	$2,337,757	($1,040,481)	$0	$0
2023	Local	212256	Ottawa	Ottawa County	Bridge Rehabilitation	$382,400	$744,005	$361,605	$0	$0
2023	Local	212256	Ottawa	Ottawa County	Bridge Rehabilitation	$0		$0	$23,900	$46,500
2023	Local	205401	Muskegon	Roosevelt Park	Reconstruct	$88,593	$88,593	$0	$0	$0
2023	Local	205401	Muskegon	Roosevelt Park	Reconstruct	$567,395	$552,957	($14,439)	$0	$0
2023	Local	205209	Muskegon	West Michigan Shoreline Regional Development Commission	FY 23 (Date Authorized to 09/30/2023) Clean Air Action Outreach and Marketing	$100,000	$100,000	$0	$0	$0
2023	Local	213628	Muskegon	West Michigan Shoreline Regional Development Commission	Non-Motorized/Pedestrian Traffic Counting Devices	$30,000	$30,000	$0	$0	$0
2023	Local	219022	Muskegon	West Michigan Shoreline Regional Development Commission	Public Involvement software	$2,480	$2,480	($0)	$0	$0
2023	Local	205428	Muskegon	Whitehall	Road rehabilitation	$250,000	$250,000	$0	$0	$0
2023	Local	205428	Muskegon	Whitehall	Road rehabilitation	$111,527	$111,527	$0	$0	$0

2023	Multi-Modal	218541	Muskegon	Disability Network West Michigan	Mobility management under FY 2022 Section 5310	$25,012	$25,012	$0	$6,253	$6,253
2023	Multi-Modal	207079	Muskegon	Goodwill Industries of West Michigan	Bus Replacement and Bus Purchase	$97,998		($97,998)	$24,500	
2023	Multi-Modal	218384	Muskegon	Goodwill Industries of West Michigan	FY 2023 - 5310 CTF Elderly and Disabled- One replacement van	$48,407		($48,407)	$12,102	
2023	Multi-Modal	205205	Ottawa	Harbor Transit Multi-Model Transportation System	FY 2023 CMAQ - Outreach and marketing	$24,900	$24,900	$0	$6,225	$6,225
2023	Multi-Modal	205207	Ottawa	Harbor Transit Multi-Model Transportation System	FY 2023 CMAQ - Bus Replacement	$130,000	$130,000	$0	$32,500	$32,500
2023	Multi-Modal	205217	Ottawa	Harbor Transit Multi-Model Transportation System	FY 2022 CMAQ - Bus replacement	$130,000	$130,000	$0	$32,500	$32,500
2023	Multi-Modal	218325	Ottawa	Harbor Transit Multi-Model Transportation System	A&E for new facility	$171,347	$171,347	$0	$42,837	$42,837
2023	Multi-Modal	218326	Ottawa	Harbor Transit Multi-Model Transportation System	FY 2023 5307 New facility land acquisition	$1,282,276	$1,282,276	$0	$320,569	$320,569
2023	Multi-Modal	218327	Ottawa	Harbor Transit Multi-Model Transportation System	A & E for new facility - FY 2023 5307	$465,478	$465,478	$0	$116,370	$116,370
2023	Multi-Modal	218327	Ottawa	Harbor Transit Multi-Model Transportation System	A & E for new facility - FY 2023 5307	$0	$0	$0	$0	$0
2023	Multi-Modal	218328	Ottawa	Harbor Transit Multi-Model Transportation System	FY 2023 5307 Maintenace equipment	$40,000		($40,000)	$10,000	
2023	Multi-Modal	205212	Muskegon	Muskegon County Board of Commissioners	FY 2023 CMAQ - Bus Replacement	$285,000	$285,000	$0	$71,250	$71,250
2023	Multi-Modal	205213	Muskegon	Muskegon County Board of Commissioners	FY 2023 CMAQ - Bus Replacement	$440,240	$440,240	$0	$110,060	$110,060
2023	Multi-Modal	207044	Muskegon	Muskegon County Board of Commissioners	Operating assistance for delivery of transit and paratransit services	$1,510,451	$1,510,451	$0	$906,271	
2023	Multi-Modal	207061	Muskegon	Muskegon County Board of Commissioners	Mobility management	$140,000	$140,000	$0	$35,000	$35,000
2023	Multi-Modal	217824	Muskegon	Muskegon County Board of Commissioners	FY 2023 - 5307 Preventative Maintenance	$400,000	$400,000	$0	$100,000	$100,000
2023	Multi-Modal	206934	Muskegon	Pioneer Resources	Replacement buses, six medium duty with lifts	$480,000		($480,000)	$120,000	
2023	Multi-Modal	206949	Muskegon	Pioneer Resources	New freedom	$79,530	$79,530	$0	$0	$0
2023	Multi-Modal	206963	Muskegon	Pioneer Resources	JARC	$46,585	$46,585	$0	$46,585	$46,585
2023	Multi-Modal	206979	Muskegon	Pioneer Resources	Regional Mobility management	$4,000	$4,000	$0	$1,000	$1,000
2023	Multi-Modal	218385	Muskegon	Pioneer Resources	FY 2023 - 5310 CTF Elderly and Disabled	$449,784	$449,784	$0	$112,446	$112,446
2023	Multi-Modal	219019	Muskegon	Pioneer Resources	Vehicle replacements under the FY 2022 Section 5310 program	$599,434		($599,434)	$149,859	
2023	Trunkline	127478	Ottawa	MDOT	Indirect Left Turn Lanes	$1,014,941	$1,021,553	$6,612	$225,061	$226,626
2023	Trunkline	201293	Muskegon	MDOT	Structure Replacement	$8,198,915	$9,482,979	$1,284,064	$1,818,085	$2,102,823
2023	Trunkline	209373	Muskegon	MDOT	Modernizing signalized intersection to current standards	$50,000	$50,000	$0	$0	$0
2023	Trunkline	215033	Muskegon	MDOT	Epoxy Overlay	$193,544	$193,544	$0	$42,918	$42,918

2023	Trunkline	215033	Muskegon	MDOT	Epoxy Overlay	$220,995	$220,995	$0	$49,005	$49,005
2023	Trunkline	204951	Kent	MDOT	Install traffic signal dilemma zone systems	$118,640	$98,244	($20,396)	$13,182	$11,202
2023	Trunkline	207358	Kent	MDOT	Longitudinal pavement marking application on trunklines in Grand Region	$756	$603	($153)	$84	$67
2023	Trunkline	207358	Kent	MDOT	Longitudinal pavement marking application on trunklines in Grand Region	$215,460	$302,348	$86,888	$23,940	$33,594
2023	Trunkline	207359	Kent	MDOT	Special pavement marking application on trunklines in Grand Region	$756	$756	$0	$84	$84
2023	Trunkline	207375	Kent	MDOT	Pavement marking retroreflectivity readings on trunklines in Grand Region	$1,210	$1,128	($82)	$134	$125