# *TOWARDS 2045*

A LONG RANGE TRANSPORTATION PLAN
FOR THE
MIDLAND AREA TRANSPORTATION STUDY


www.midlandmpo.com

A Metropolitan Planning Organization

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Metropolitan Planning Organization
Midland Area Transportation Study
MATS

**Midland County Services Building**
220 W. Ellsworth Street, Suite 326
Midland, Michigan 48640

Phone: (989) 832-6333
Fax: (989) 832-6608
Email: info@midlandmpo.com
Website: www.midlandmpo.com

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## The Metropolitan Planning Organization

A metropolitan planning organization (MPO) is a federally mandated and federally funded transportation policy-making organization in the United States that is made up of representatives from local government and governmental transportation authorities. MPOs were introduced by the Federal-Aid Highway Act of 1962, which required the formation of an MPO for any urbanized area (UZA) with a population greater than 50,000.

Federal funding for transportation projects and programs are channeled through this planning process. Congress created MPOs in order to ensure that existing and future expenditures of governmental funds for transportation projects and programs are based on a continuing, cooperative, and comprehensive ("3-C") planning process.

Statewide and metropolitan transportation planning processes are governed by federal law (23 U.S.C. §§ 134–135, & 49 USC 1603, 1605, and 1607). Transparency through public access to participation in the planning process and electronic publication of plans now is required by federal law. As of 2015, there are 408 MPOs in the United States.

### Why MPOs are essential:

- Transportation investment means allocating scarce federal and other transportation funding resources appropriately;
- Planning needs to reflect the region's shared vision for its future;
- Adequate transportation planning requires a comprehensive examination of the region's future and investment alternatives; and
- An MPO is needed to facilitate collaboration of governments, interested parties, and residents in the planning process.

In other words, the federal government wished to see federal transportation funds spent in a manner that has a basis in metropolitan region-wide plans developed through intergovernmental collaboration, rational analysis, and consensus-based decision making.[1]

[1]https://en.wikipedia.org/wiki/Metropolitan_planning_organization

Statewide, nearly two-thirds of the state's population is represented by an MPO, and 85% of the nation's population are so situated. MATS is Michigan's newest MPO, as well as the smallest by population.

## The Midland Area Transportation Study

The Midland Area Transportation Study (MATS) was designated an MPO in January of 2013. The MATS metropolitan planning region is defined as the entire geographic County of Midland, the geographic area of the City of Auburn and Williams Township within Bay County, and the 2010 Midland Federal Adjusted Urban Boundary (Freeland area). Exhibit 1 shows the relationship between the city and other minor civil division boundaries, the designated Urbanized Area boundary, and the resulting overall MATS planning area.

The MATS organizational structure is presented below. MATS is governed by a Policy Committee that includes elected or appointed officials from the MATS area and representatives from the Michigan Department of Transportation (MDOT). The Policy Committee generally meets once a month, and takes policy actions to approve documents, make revisions to documents, and adopt resolutions related to current transportation issues. A Technical Committee is comprised of various transportation, planning, and engineering professionals who review the activities of MATS and make recommendations to the Policy Committee. The Technical Committee also generally meets once a month. There are also two standing Subcommittees, the Non-Motorized and Administrative Subcommittee.

Through interaction with these committees, MATS serves as a single purpose agency which focuses on transportation planning issues and fulfilling federal requirements related to transportation.

The graphic to the right shows the relationship between MATS (the MPO), the Federal government, local governments, and the regional transportation system. The MPO is both the bridge between, and the conduit for, funding and projects, local priorities and federal requirements. It does this by facilitating inter-governmental cooperation, public outreach, and maintaining a regional focus to policy-making in the transportation arena.

A primary function of MATS is to provide comprehensive transportation planning to assist in maintaining the various modal options. Undertaking this responsibility allows for a more efficient and effective multi-modal transportation network utilized by all within the MATS area today.

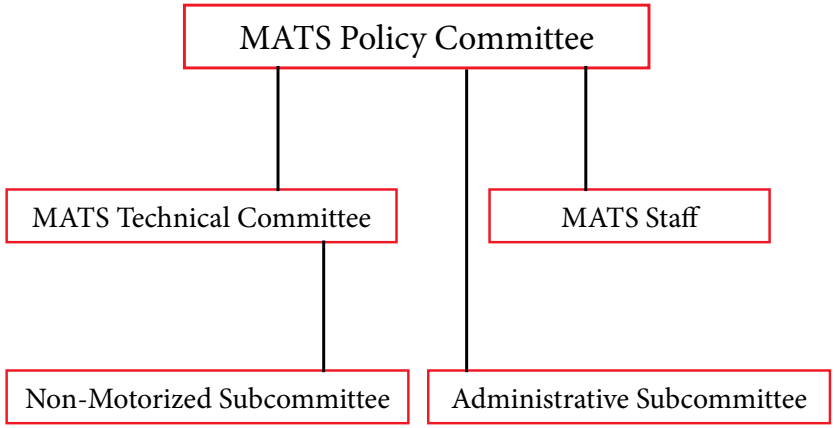
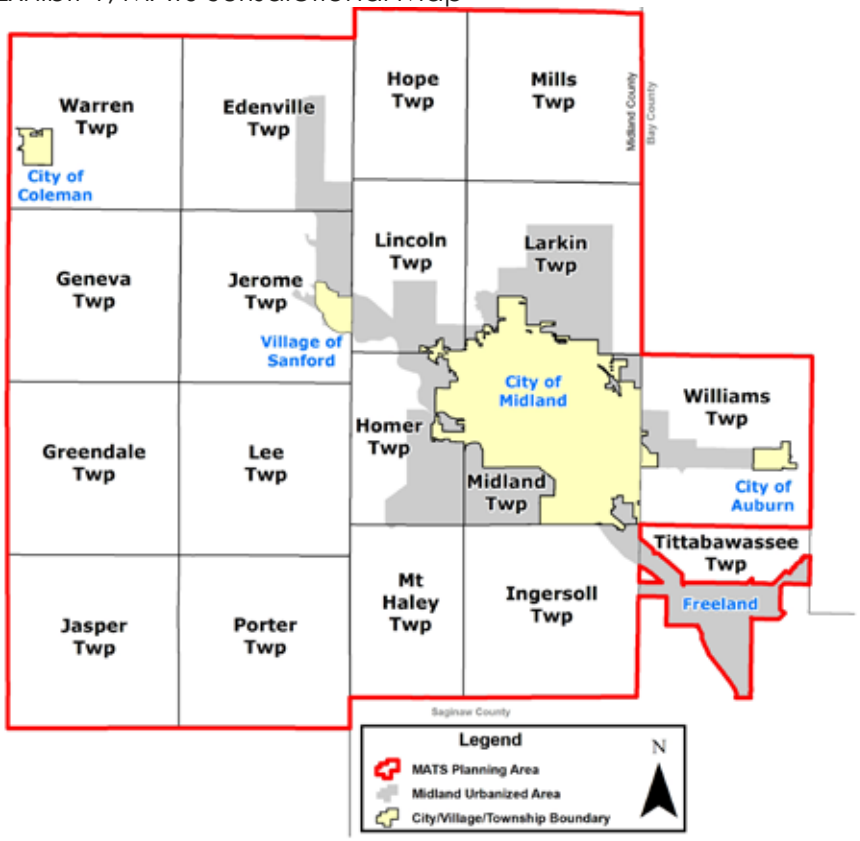
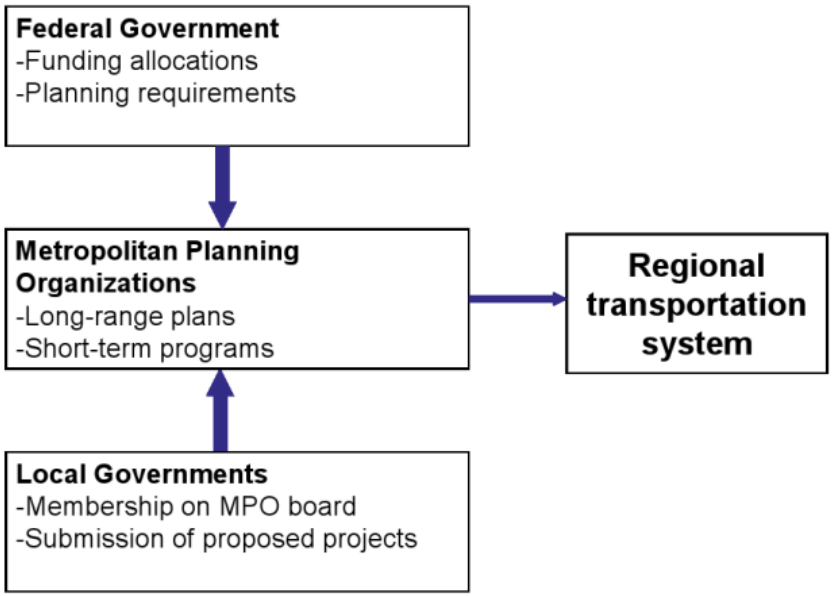



Exhibit 1, MATS Jurisdictional Map




Source: "Metropolitan Planning Organizations" Kalamazoo Area Transportation Study

# MATS Committee agency membership:

**Bay County Road Commission**

**Bay Metro Transit Authority**

**City of Auburn**

**City of Midland**

**County Connection of Midland**

**Edenville Township**

**Homer Township**

**Ingersoll Township**

**Jerome Township**

**Larkin Township**

**Lincoln Township**

**MDOT Bay Region**

**MDOT Statewide Planning**

**Midland Charter Township**

**Midland County Road Commission**

**Midland Dial-A-Ride**

**Non-motorized Representative**

**Mount Haley Township**

**Saginaw County Road Commission**

**Tittabawassee Township**

**Village of Sanford**

**Williams Charter Township**

**Bay City MPO**

**EMCOG**

**FHWA**

**Jack Barstow Airport**

**MBS Airport**

**MDOT Mt. Pleasant TSC**

**Midland County**

**Saginaw MPO**

# MATS Staff:

**Maja Bolanowska** - Director

**Bryan Gillett** - Transportation Planner

# *Towards 2045* Vision

*Striving for a safe and efficient transportation system which promotes the region's attractiveness to live, work, and visit.*

# MPO Planning

The five core functions of an MPO are: to establish a fair and impartial setting for decision-making; evaluate transportation alternatives that are appropriate for the region; maintain a fiscally-constrained Regional Transportation Plan that covers at least a 20-year time horizon; develop the fiscally-constrained Transportation Improvement Program that serves the goals of the urbanized area; and involve the general public and significantly affected groups.

Lastly, MPO plans will soon be required to include performance targets and measures that address a performance driven, outcome-based approach to planning. This will be incorporated into MATS planning efforts going forward, including in the next update of MATS Long Range Transportation Plan.

# Federal Planning Factors

Transportation planning must be a continuous, cooperative, and comprehensive process (the 3C's) designed to involve all users of the system, such as businesses, community groups, environmental organizations, the traveling public, freight operators, and the general public, through a proactive public participation process. This planning process has certain federal requirements that the state and MPOs must adhere to. The federal government further recommends the consideration of eleven federal planning factors to all MPOs in development of future projects and plans.

MATS has correspondingly incorporated these factors in the development of our 2045 Long Range Transportation Plan. The first eight factors (1 through 8 below) were established by the Federal Highway Administration (FHWA) and enacted in 2005 through the Safe Accountable Flexible Efficient Transportation Equity Act: A legacy for Users (SAFE TEA-LU). These eight factors were later reinforced through the passing of MAP-21, however three new planning factors were imposed with the FAST Act (9 through 11 below). The planning factors are:

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 all motorized and non-motorized users.**

3. **Increase the ability of the transportation system to support homeland security and to safeguard the personal security of all motorized and non-motorized users.**

4. **Increase accessibility and mobility of people and freight.**

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

6. **Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight.**

7. **Promote efficient system management and operation.**

8. **Emphasize the preservation of the existing transportation system.**

9. **Improve resiliency and reliability of the system.**

10. **Reduce or mitigate storm-water impacts on surface transportation.**

11. **Enhance travel and tourism.**

**These factors guided MATS during our visioning process for creating goals and objectives for the 2045 LRTP.**

## What is the Long Range Plan?

The development process of the Long Range Plan includes:

- Developing goals and objectives regarding the regions' transportation system
- Collecting an inventory of existing transportation modes
- Evaluating base and future year demographic data (2013 to 2045)
- Forecasting future travel demand through modeling
- Analyzing transportation issues and deficiencies
- Recommending actions to enhance the quality of the region's transportation system
- Plan monitoring and evaluation

The LRTP is developed over approximately three years with the support of MATS' various Committees and stakeholders. Staff from the Michigan Department of Transportation play a large role in generating the travel demand model for our region used in analysis for the LRP. It is the intention of MATS to create a Long Range Plan which is both practical to implement and appropriate to our region.

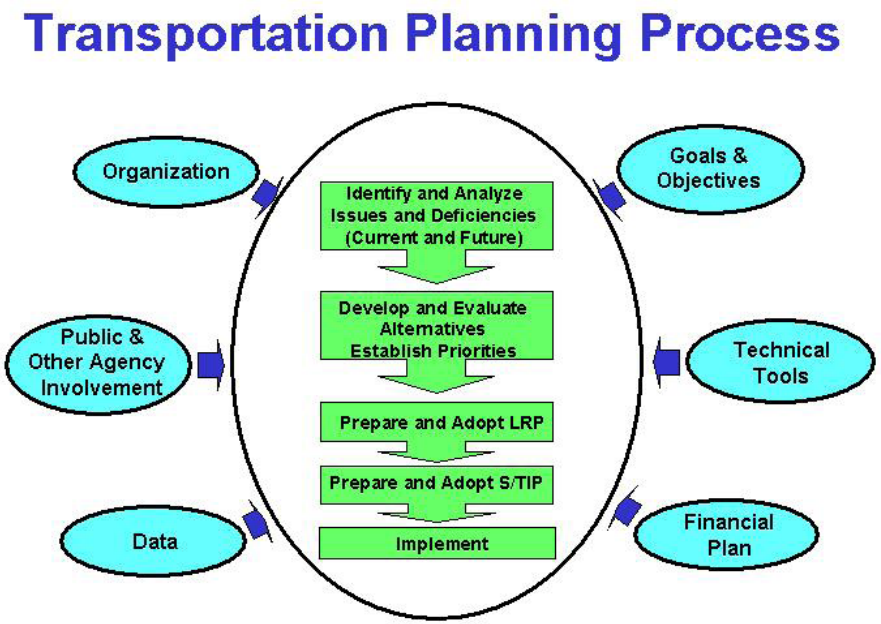
This Long Range Transportation Plan helps pinpoint and address the future transportation related needs of our region by identifying issues and deficiencies within the system, and recommending strategies to mitigate those issues. The plan is projected over a 25-year horizon and is updated every 5 years thereafter in accordance with changing needs and new transportation related legislation.

The 2045 Long Range Transportation Plan serves as a decision-making guide for the Midland MPO, stakeholders, funding agencies, and other transportation partners. The plan prioritizes funding allocations; directs the transportation improvement program; and focuses on the relationship between the transportation network and regional land uses. Guidance for developing the LRTP is derived from the FAST Act which strives to create a continuous, performance-based process. Several concerns the FAST Act addresses include safety, infrastructure condition, congestion reduction, system reliability, economic vitality, environmental sustainability, reduced project delivery delays, transit safety, and transit asset management.

Finally, a note on nomenclature and syntax. Throughout this document, certain terms and acronyms will be used interchangeably. Long Range Transportation Plan, Long Range Plan, Metropolitan Transportation Plan, LRP and MTP all refer to the same thing, this document.

### MPO Long Range Planning Process

The FAST Act establishes a cooperative, continuous, and comprehensive framework for making transportation investment decisions in metropolitan areas. The 2045 Long Range Plan is the first to be developed for the MATS area since our designation in 2013. This creates a unique opportunity for our area to explore transportation planning from a fresh perspective. Previous to MATS' designation, it may have



been more challenging for various agencies to cooperate with one another concerning long-term regional transportation activities. MATS and the Long Range Transportation Plan help facilitate this type of regional planning in a variety of ways.

The Long Range Planning Process establishes goals and objectives through collective visioning. This creates a framework for developing action strategies that may deal with transportation issues in a more sustainable manner. MATS' goals and objectives consider various aspects of transportation planning including:

- Preserving the existing infrastructure
- Developing a multi-modal transportation network
- Enhancing accessibility, efficiency, and mobility
- Promoting connectivity/integration between varying modes
- Improving overall safety and security of the system
- Mitigating environmental impacts
- Supporting economic vitality

For the Long Range Plan to be beneficial to our community, it is important to set goals and objectives which are achievable. Similarly, it is our intent to establish ones that are easily understood and tied to our overall vision which is to promote the region's attractiveness to live, work, and visit.

## Long Range Transportation Plan Development, Structure, and Process

As has been previously mentioned, a Long Range Transportation Plan has a typical structure and development process. Presenting that structure and process helps explain the results and actions required to implement those results.

To begin with, while planning has an end result in mind, it is also a circular process, in that good planning evaluates its end products and alters or modifies the process or content accordingly. The steps, and circular nature common to most long range planning, regardless of subject matter, can be seen in this graphic, which is used frequently to illustrate the process.

In general, planning starts off with a "vision" or the big picture changes that everyone mostly agrees upon. This is a sort of dream, or best of all possible outcomes stage, and although reality will enter into the picture soon enough, knowing what people really want is very important to the process.

When specifically speaking about transportation planning, the elements involved are very similar, though the specific terms and data are different. The Long Range Transportation plan must address the 11 Federally mandated planning factors, but it must also reflect the needs and priorities of the residents and stakeholders in the MATS area. This can be seen as part of the larger planning and implementation process for MATS, in the graphic here, provided by the Federal Highway Administration.

This document will, by and large, follow that structure. After the development of visioning and the setting of goals and objectives that correlate with the Federal planning factors, we will explore the history of the area, the existing and projected data in a variety of forms, and the prioritized solutions that link back to the vision and goals of the plan.

To that end, MATS staff began with an education process, which paralleled the inaugural organizational development process for the new MPO.

Although clearly the development of the LRP is a large part of the extensive Federal requirements for the formation and operation of an MPO, initially the day to day processes had to take precedence.

However, as those processes took place, the beginning steps such as collection and verification of socio-economic data, could take place with regional collaboration. This segued into a process of establishing the primary vision for the plan, and development of the goals and objectives. Thus, by early 2015 when technical staff arrived, the process of plan development could proceed in earnest.

Timing for the creation of the LRP was also driven at the outset by the Federal deadline set in March 2017. This was later extended to September 2017.


# Visioning, Goals, and Objectives

MATS determined that its mission was to strive for a safe and efficient transportation system which promotes the region's attractiveness to live, work, and visit. This is reflected throughout the Long Range Plan.

In order to fulfill that mission, the goals on the following page emerged from the planning process. These broad, primary themes are oriented towards promoting an integrated multi-modal transportation system that addresses the needs of all users.

Objectives were then developed for each goal to achieve measurable progress of the plan over time. This process allows for the analysis of future development scenarios which focus on enhancing the transportation network by improving integration, connectivity, and efficiency.

This structure of the LRTP, including scenario planning, creates a mechanism for evaluating projects in a systematic manner while remaining consistent with local and regional development goals.

MATS' goals and objectives are arranged into seven areas which correspond to the recommended federal planning factors. The goals and objectives are achieved both directly and indirectly through MATS' various activities; primary objectives have been listed in **bold** to simplify and better relate to the work efforts presented subsequently.

# *Towards 2045* Goals and Objectives

## 1. Accessibility and Mobility

- **Support transportation infrastructure improvements for all modes**
- Promote system continuity across the region
- Increase access to the transportation system for people with special needs, undeserved or disadvantaged
- Increase access to specialized services like health care facilities

## 2. Safety and Security

- Strive towards zero transportation related deaths and injuries
- Incorporate systemic approaches into safety planning
- Reduce conflicts between modes to minimize accidents
- Enhance the safety of non-motorized users
- Increase security through better emergency response practices and handling of hazardous materials

## 3. Integration and Connectivity

- **Promote an integrated system with efficient connections between modes**
- Implement the Complete Streets Program; promoting transit and non-motorized travel options
- Encourage the integration of land use and transportation during the planning process
- Develop transportation projects in coordination with local plans

## 4. Operations and System Management Efficiency

- Encourage land development patterns that promote transportation efficiency
- Relieve traffic congestion and minimize travel times
- Enhance capacity and operations of existing facilities

## 5. Preservation of Transportation System

- **Encourage efficient preservation of the existing transportation system**
- Encourage multi-agency and public-private partnerships in transportation improvements and maintenance
- Support new technologies optimizing the use of the existing system

## 6. Environmental Protection and Enhancement

- Reduce air, water, light and noise pollutant emissions
- Encourage public and non-motorized transportation as well as ride-sharing
- Preserve natural and cultural qualities of the region including habitats, open space and agricultural lands

## 7. Economic Vitality

- **Promote cost effective transportation improvements that maximize long-term benefit**
- Improve access to employment and retail centers; enhance movement of freight
- Promote investments in the transportation system (including private sector)

# Chapter 3 - Regional Background

The Midland Area Transportation Study Area is located within the Great Lakes Bay Region (GLBR) of Michigan, encompassing the City of Midland, and is closest in proximity to the cities of Bay City and Saginaw. The MATS planning area comprises approximately 571 square miles and has a 2015 estimated population of 97,805. The largest population center within the MATS area is the City of Midland with a 2015 estimated population of 42,200.

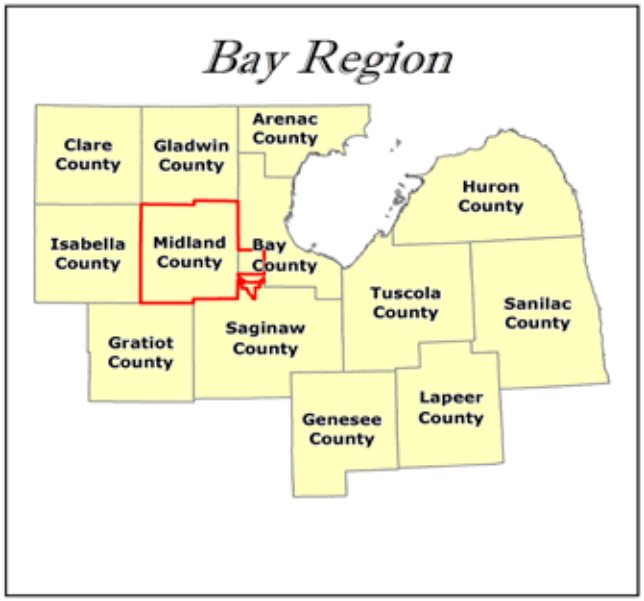
## History

Midland received its name from its geographical location in the center of Michigan's Lower Peninsula. The earliest records of Midland County describe that it was inhabited by the Potawatomi, Chippewa and Ottawa Indians. The area was later settled by French Immigrants who arrived in the early 1830s. The French came across the convergence of the Chippewa and Tittabawassee Rivers later named "The Forks". In 1831, the Midland County boundaries were established by separating boundary lines from the previously incorporated Saginaw County. Many settlers began moving to Midland County in search of the area's plentiful resources including timber and fertile soil. The official organization of the county occurred less than 20 years later in 1851 with the establishment of the City of Midland coming in 1887. The farming and lumber industries sustained the local economy for almost half a century largely due to utilizing waterways for transporting products. Eventually the farming and lumber industries began to shift away in the late 1800s and the area began transitioning to the manufacturing industry.

There were large amounts of brine deposits in Midland resulting in Herbert Henry Dow starting The Dow Chemical Company in 1897. In 1943, Dow Corning was established as a joint venture with Corning Glass to focus specifically on silicone and adhesive products for use in World War II. Both companies greatly expanded over the past century and now specialize in products such as plastics designed for the automotive industry, chemicals for water purification and pharmaceuticals, fuels and oil-based raw materials, and many other basic chemicals and plastics. Dow Chemical and Dow Corning remain Midland County's largest employers and continue to invest in the local and regional communities. Recently, the companies have combined into one entity through Dow's purchase of Corning's share of the joint venture.

Exhibit 2 - MATS Overview in Michigan


Exhibit 3 - MATS Regional Location



# Geography

MATS is located in a predominantly rural and generally flat area of lower Michigan. The area's low and level terrain, known as Lake-border plains, was formed as a result of glacier activities that occurred approximately 15,000 years ago. This glacial process contributed to the deposit of distinct soils which are native throughout eastern mid-Michigan. Another feature unique to the region is the Saginaw Bay watershed, Michigan's largest. This watershed encompasses over 8,500 square miles of land and drains approximately 15% of Michigan's land area into Lake Huron. Additional characteristics regarding the region include various woodlands, rivers, wetlands and other natural features.

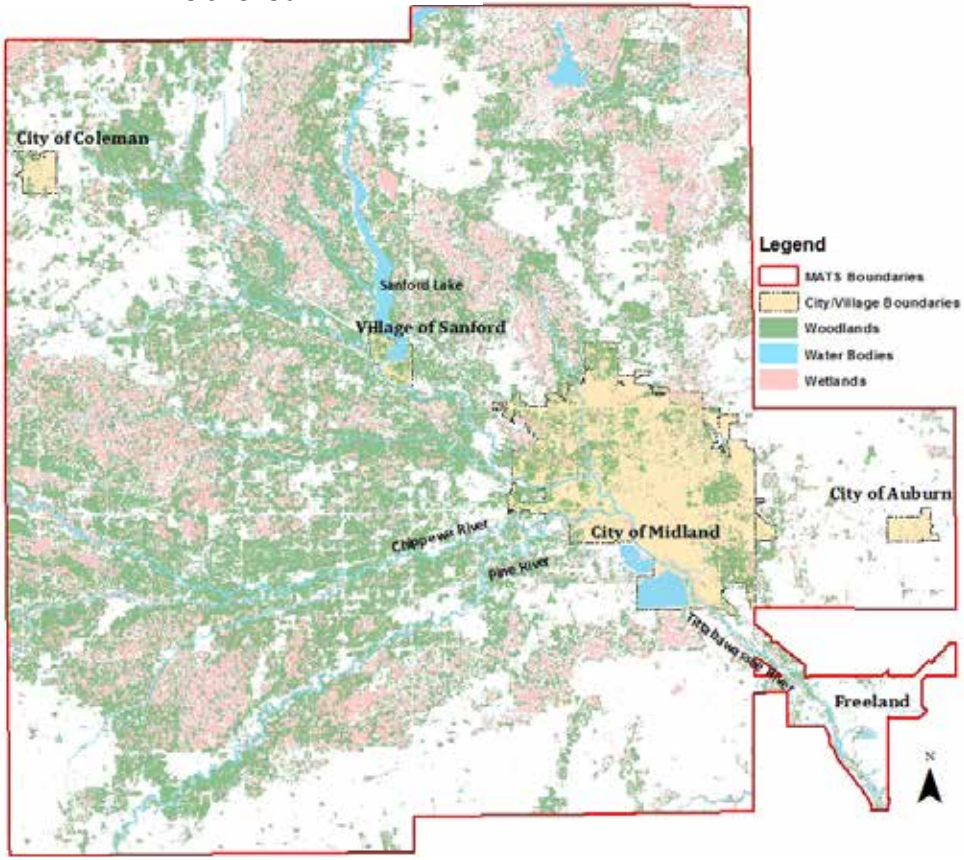
Within MATS' boundaries there are three major waterways, the Pine, Chippewa and Tittabawassee Rivers. The latter two rivers converge near the City of Midland's downtown at what is known as the Tridge; a large floodplain is associated with the area surrounding this confluence. All three rivers stretch inland across Michigan with coverage in all or parts of 22 counties. Other waterways throughout the MATS area include the Salt River, Black Creek, and Bullock Creek. Among the bodies of water in the area, Sanford Lake is the largest with a surface area of approximately 2.3 square miles. A man-made reservoir, it was created by a damming of the Tittabawassee River.

Soils deposited in the MATS area are a combination of loamy and sandy soils which are suitable for most development. However, these soils are generally impervious which stimulates frequent flooding in zones of close proximity to bodies of water. As a result, the City of Midland experiences frequent flooding and standing water in a number of areas due to poorly drained soils and low land slope. To mitigate this, the City of Midland implements best management practices to reduce the amount of impervious surfaces and preserve native vegetation which may assist in the soils ability to manage storm water.

Regarding vegetation, the MATS area was originally covered with white pine and hemlock forests. However much of the landscape was timbered and utilized for agricultural activities. Subsequently, second growth forests emerged as a blend of pine and hardwoods which created a thriving ecosystem for Michigan's native wildlife. Relevant amenities within MATS' area include portions of the Au Sable State Forest and the Chippewa Nature Center which consists of 1,200 acres of preserved land for the general public to experience a varied array of ecosystems. In more urbanized areas, grasses, landscaping plants, waterfront vegetation, and some wooded areas can be found. A significant wooded feature within the City of Midland is the City Forest. City Forest is approximately one square mile and provides a source of natural cover for local wildlife, as well as recreational opportunities for the general public.

Exhibit 4 depicts the overall geographical landscape of the MATS area. General natural features have been included such as the area's prominent woodlands, bodies of water, and wetlands.

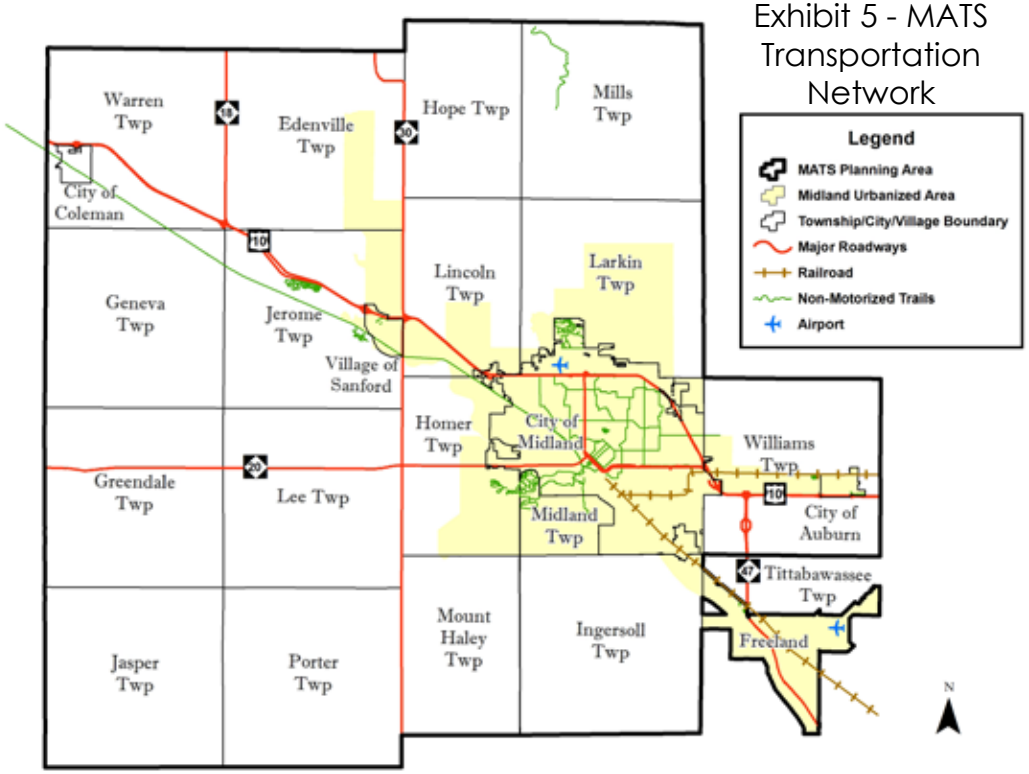
Exhibit 4 - MATS Geographical Features




Source: Created by MATS utilizing GIS Information

# Transportation Infrastructure

Exhibit 5 - MATS Transportation Network




The earliest history of the MATS transportation system includes a railway that began construction in 1867 by the Pere Marquette Railroad Company. This segment linked Saginaw to Midland while another segment was later built to link Midland to Averill in 1868. With the completion of the railroad in 1870, the City of Coleman was founded which allowed further funding for westward expansion of the railroad to Coleman. Years later the last two segments were removed with the connection between Midland and Saginaw remaining. This segment splits into two rail lines currently known as the Grand Trunk Railroad and the Chesapeake and Ohio Railroad. In the early 2000s, the two removed segments were revitalized into the Pere Marquette Rail Trail, which is described in more detail later in this section.

Local streets were first placed in the City of Midland hugging the banks of the Tittabawassee River. Over time, reoccurring floods forced the downtown to be relocated among the major road corridors developed with the emergence of the automobile. The main east-west trunkline in the MATS area is US-10, first constructed in the late 1920's. It acts as the major roadway corridor for travel through parts of Bay County and all of Midland County. US-10 provides linkage for other principal arterial roadways throughout Midland County such as M-18, M-20, M-30, and M-47. These corridors provide MATS with connection to US-10 which is a part of the National Highway System (NHS) for automotive travel.

Air services in the study area are provided by MBS International Airport and Jack Barstow Municipal Airport.

- MBS International Airport, located in Freeland, provides commercial transportation primarily for Bay, Midland, and Saginaw Counties. The MBS Airport was heavily funded in the 1940s by the federal government during WWII. Since then, funding has provided expansion of the airport with a larger terminal constructed replacing the previous terminal in 2008. Today, the airport supports commercial flights nationwide including flights to Chicago, Detroit, Milwaukee and others.

- Jack Barstow Municipal Airport, previously known as Midland Municipal Airport, is a general aviation airport located northwest of downtown Midland. It was previously located just east of downtown until it was moved in 1950 to its current location to support expansion. In 2005, a terminal was built to accommodate increased use of the local airport. Future work is planned to implement an educational outreach facility which engages youth on the importance of aviation.


Non-motorized pathways within the MATS area include the Pere Marquette Rail-Trail, a multi-use trail stretching from downtown Midland northwest to Clare County and beyond. The Trail was re-purposed in the early 1990s from what use to be the Pere Marquette Railroad. In 2001, the trail was extended an additional 8.25 miles completing the 30-mile stretch between Midland and Clare. Today, the trail is barrier-free and opened to all non-motorized transportation modes. Not only is it an important amenity to the MATS area, but it also promotes the development of other similar non-motorized pathways.

The other non-motorized pathways that have been developed over time in the MATS area include the City of Midland's various pedestrian/bicyclist friendly trails. These trails link multiple destinations within the downtown and across the City providing safe travel routes for non-motorized transportation. Currently, there is an on-going effort to fund additional trails and pathways to provide even greater non-motorized connectivity throughout the City of Midland.

From a regional perspective, the Great Lakes Bay Region contains a portion of the proposed Iron Belle Trail. The recently planned trail is a 791-mile bicycle route which connects various existing multi-use trails across the entire state of Michigan. The Iron Belle extends from Belle Isle Park near downtown Detroit to Ironwood in the western part of Michigan's Upper Peninsula. This extensive trail does not run through the MATS area, however it is proposed to run through Bay City just to the east. Having the Iron Belle in close proximity allows potential connections to the MATS non-motorized network in the future.

Three public transportation options are available to residents of the MATS area including County Connection of Midland, Dial-A-Ride Transportation (DART), and Bay Metro Transportation Authority (BMTA).

- County Connection of Midland was founded in 1996 and is both federally and locally sponsored. County Connection provides demand response, curb-to-curb service within Midland County and transfer services with the surround counties of Clare, Isabella, Gladwin, Bay, and Saginaw.

- Dial-A-Ride Transit (DART) is a public transportation service which operates similarly to County Connection. DART provides curb-to-curb transportation within the City of Midland's boundaries. This program has catered to the transportation needs of Midland residents since it was first established in 1974.

- Bay Metro Transportation Authority (BMTA) was also started in 1974 to provide public transportation to Bay City's urbanized area. In FY 1992, the agency changed to an Act 196 transportation authority, which facilitated expanded transit services to all of Bay County and links to surrounding counties.

# Land Use/Land Cover

The clear priority for MATS is to develop the region's transportation system. However, land use and transportation are inextricably linked, since changes in one inevitably affect the other.

An important component of the LRTP is recognizing changing land uses and how they relate to development of the transportation system over the next 25 years. With assistance from the Midland County GIS department, an existing land use map was created for the entire MATS region (Bay City MPO provided data for Williams Township/Auburn and Saginaw County GIS provided data for the Freeland area). Land use data for all of Midland County had not been updated since 1978, therefore a new comprehensive map had to be made. This was accomplished by utilizing each jurisdiction's master plans to compile all available land use data. Some townships had out-dated information, so new data was created by categorizing parcels in GIS based on an aerial map of the existing terrain. During this process it became clear that local master plans had differing ways of categorizing land uses versus land cover(i.e. an area with trees was categorized as both wooded and forest). To mitigate this, similar categories were combined or generalized such as "residential" now containing all areas with housing. The following land use map and table was generated as a result of this process.

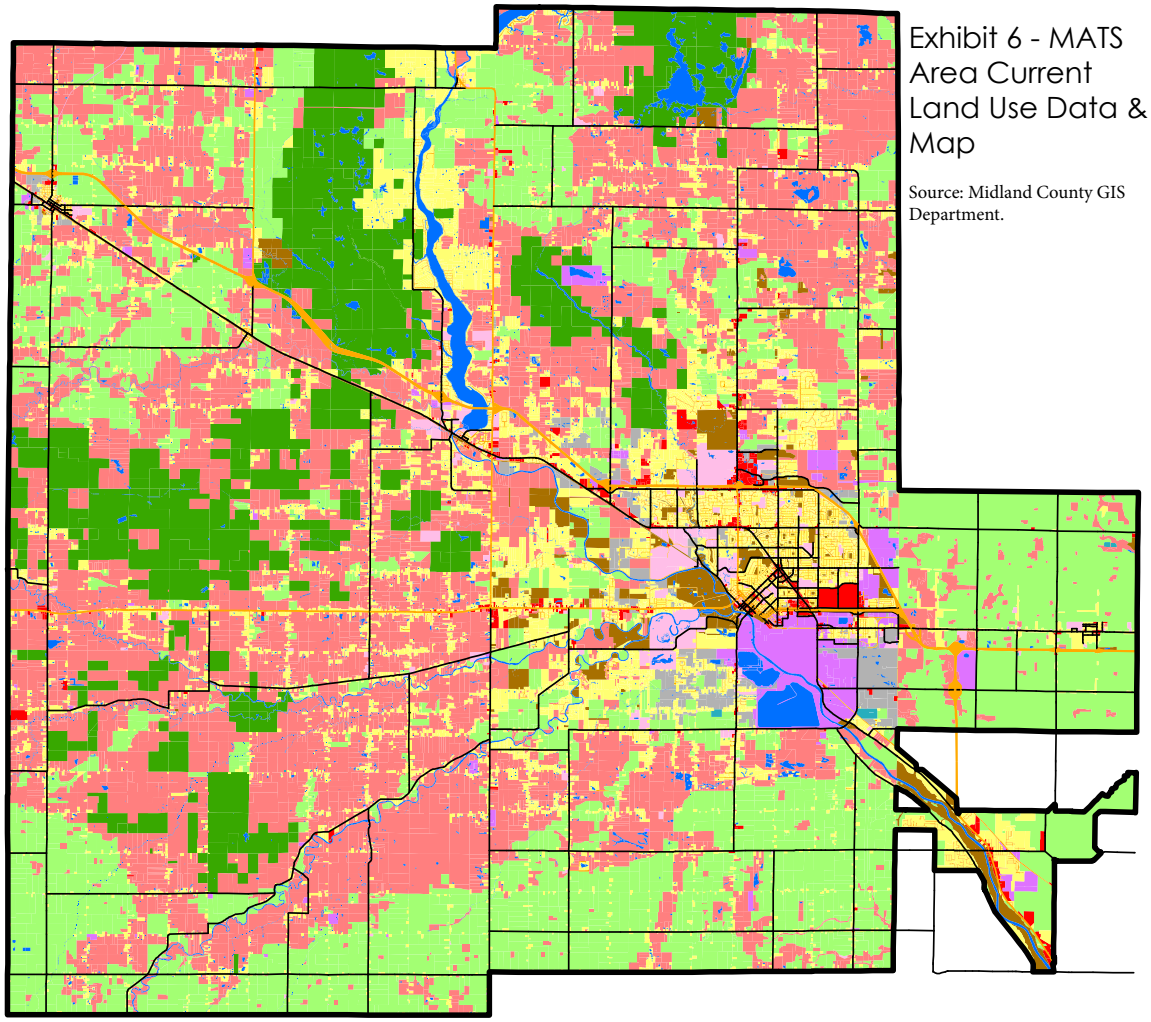


Exhibit 6 - MATS Area Current Land Use Data & Map

Source: Midland County GIS Department.

| | Category | Acreage | Percentage |
|---|---|---|---|
| | Agricultural | 103,963 | 28.11% |
| | Commercial | 3,244 | 0.88% |
| | Industrial | 6,059 | 1.64% |
| | Parks and Recreation | 7,131 | 1.93% |
| | Public | 5,245 | 1.42% |
| | ROW | 5,637 | 1.52% |
| | Residential | 50,514 | 13.66% |
| | State Land | 41,495 | 11.22% |
| | Utilities, Waste Disposal | 134 | 0.04% |
| | Vacant/No Activity | 4,742 | 1.28% |
| | Water | 9,771 | 2.64% |
| | Wooded | 131,909 | 35.67% |
| | **Total** | **369,844** | **100.00%** |

Exhibit 6 describes the total acreage and percentage of each land use found in the MATS area. In summary, wooded land (especially when combined with State land which is frequently wooded), agricultural, and residential are the three most prevalent land uses within the region. Other findings of interest include the relatively large extent of State-owned land and also the significant percentage of parks and recreational acreage throughout MATS urbanized area.

# Demographics

The twenty-one minor civil divisions that span the MATS area contain a diverse and growing, yet aging, population base. The changes in this population, its age distribution, racial and income makeup, and employment characteristics will all profoundly influence the demand for, and use of, our transportation infrastructure.

Both as a basic planning-level tool, and as preparation for the Travel Demand modeling effort, an understanding of the demographics of the MATS area is essential. Further, monitoring changes in socio-economic data will be key to evaluating the effectiveness of the plan, and any changes to it, in the coming years.

## Base Year Population, Household, and Employment Data

Once work on the Travel Demand Model and Long Range Plan commenced in 2014, 2013 was chosen as a base data year. The 2013 population, household, and employment data was then reviewed with local units of government from December 2014 to March 2015 for accuracy. This process thereby accounted for any recent developments that could influence local data trends and revised the location/number of employees for businesses within each jurisdiction. This data was then reviewed and approved by MATS Technical and Policy Committees in April 2015. These figures were then used as base year inputs to generate future year socio-economic data.

Exhibit 7 presents population, occupied households, and employments estimates for the year 2013 for all jurisdictions within MATS boundaries, with the exception of the Freeland Area since it is being accounted for in the Saginaw County portion of the Travel Demand Model.

Exhibit 7 - Base Year Population, Household, and Employment Data

| Jurisdiction | 2013 Estimated Population | 2013 Estimated Occupied Households | 2013 Estimated Total Employees |
|---|---|---|---|
| Warren TWP | 2107 | 841 | 854 |
| Coleman | 1278 | 538 | 383 |
| Edenville TWP | 2600 | 1044 | 162 |
| Hope TWP | 1396 | 576 | 144 |
| Mills TWP | 1952 | 717 | 163 |
| Larkin TWP | 5587 | 1954 | 1016 |
| Midland TWP | 2281 | 864 | 504 |
| Homer TWP | 4053 | 1558 | 644 |
| Lincoln TWP | 2547 | 1061 | 918 |
| Jerome TWP | 3897 | 1586 | 412 |
| Geneva TWP | 1038 | 449 | 79 |
| Greendale TWP | 1767 | 692 | 206 |
| Lee TWP | 4303 | 1574 | 282 |
| Jasper TWP | 1190 | 454 | 77 |
| Porter TWP | 1271 | 498 | 117 |
| Mt. Haley TWP | 1654 | 634 | 77 |
| Ingersoll TWP | 2703 | 1013 | 279 |
| Midland | 42061 | 17667 | 36699 |
| Auburn | 2087 | 915 | 875 |
| Williams TWP | 5037 | 1983 | 3686 |
| Sanford | 852 | 377 | 447 |
| **Regional Totals** | **91661** | **36995** | **48024** |

Source: 2010 Census and 2010-2013 American Community Survey Data

# Future Years Population, Household, and Employment Data Projection

Utilizing 2013 as a base year, socio-economic data, growth rates and projections for the years 2025, 2035, and 2045 were generated. This is called the future year data. In order to identify population/household growth rates and future year estimates, MATS was assisted by MDOT's Statewide and Urban Travel Analysis Section (SUTA) in coordination with the U of M – Institute for Research on Labor, Employment, and the Economy. This included utilizing Regional Economic Models, Inc. (REMI) forecast data as well as examining historical trends from the U.S. Census Bureau. Employment growth rates and future estimates are based on data from the Regional Economic Information System (REIS) published by the U.S. Department of Commerce, Bureau of Economic Analysis.

MATS staff then reviewed future data again with local units of government for accuracy and the inclusion of any known future developments within each jurisdiction. Once all data was reviewed and approved by local governments, MATS staff prepared a regional analysis of future population, household, and employment data. This was reviewed by MDOT-SUTA before it was approved in October 2015 by the MATS Technical and Policy Committees. Future year data was then utilized in the Regional Travel Demand Model to calculate trip productions and attractions for the MATS area.

Exhibit 8 displays regional totals for each category of data as well as the growth rates that occur for the interim decades.

Exhibit 8 - Future Years Population, Household, and Employment Data

| | 2013 Population | Growth Rate | 2025 Population | Growth Rate | 2035 Population | Growth Rate | 2045 Population |
|---|---|---|---|---|---|---|---|
| ***MATS Area (excludes Freeland)**** | 91661 | 4.10% | 95424 | 2.20% | 97500 | 1.40% | 98887 |

| | 2013 Occupied Households | Growth Rate | 2025 Occupied Households | Growth Rate | 2035 Occupied Households | Growth Rate | 2045 Occupied Households |
|---|---|---|---|---|---|---|---|
| ***MATS Area (excludes Freeland)**** | 36995 | 6.00% | 39225 | 2.90% | 40378 | 2.70% | 41488 |

| | 2013 Employment | Growth Rate | 2025 Employment | Growth Rate | 2035 Employment | Growth Rate | 2045 Employment |
|---|---|---|---|---|---|---|---|
| ***MATS Area (excludes Freeland)**** | 48024 | 5.90% | 50873 | 2.40% | 52111 | 2.10% | 53196 |

Source: REMI Forecast Data, REIS Employment Data - From MDOT-SUTA

* - Included in Saginaw MPO projections

# Chapter 4 - Existing Transportation System within MATS

The MATS area has a diverse transportation system that includes three curb-to-curb public transit systems, various non-motorized pathways, both a commercial and general aviation airport, freight routes, and an extensive highway network. This chapter provides a detailed review of each mode of transportation that exists within the MATS area including traffic crash data and statewide freight commodities. It also addresses emergency and security services regarding the regional transportation network.

## Roadway Network

The National Functional Classification of roadways was developed by the Federal Highway Administration for all public roads. The higher classifications emphasize mobility while lower ones are for the purpose of property access. This taxonomy facilitates the grouping of roadways into categories based on the character of service they are intended to provide. Functional classifications of public roads plays a critical role in transportation planning, allocation of funding, and management of the network.

Within the MATS area, there are approximately 600 miles of public roads that are maintained through federal transportation funding as designated by the National Functional Classification System (NFC). Roughly 150 miles are a part of the MDOT trunkline system and are classified under the NFC as Interstate, Other Freeway, and Arterials. These routes include US-10, US-10 BR, M-18, M-20, M-30, and M-47. The remaining 426 miles of federal-aid eligible roads are categorized as Minor Arterials, Major Collectors, and Minor Collectors. These roads are generally owned by local road agencies such as the county road commission, cities, or villages. Roadways that are not funded with federal transportation money are considered "local"; there are about 900 miles of local roads within the MATS area. Local roads are also administered by local road agencies. Note that other local governments, such as townships, do not receive federal-aid funding for road projects. Instead the road commission has jurisdiction over these road and they collaborate with local governments on projects.

### National Functional Classifications

The following categories are listed in order of highest mobility function to the lowest mobility function:

#### Interstate:

Designed to maximize mobility for long distance travel. Interstates link major urban areas across the United States and are generally four-lane limited access roadways which support high speed travel.

#### Other Freeways:

Function similarly to interstate roads, however they do not cross state boundaries. These roads have directional travel lanes with access limited to on and off ramp locations.

#### Other Principal Arterials:

Are highways in rural and urban areas which provide access between an arterial and a major land use. They typically support a high degree of mobility to major centers of metropolitan areas.

#### Minor Arterials:

Support high-capacity travel generally within urban areas. The primary function of an arterial road is to deliver traffic from collector roads to principal arterials, freeways, or interstates.

#### Collectors (Major & Minor):

Mainly are low-to-moderate capacity roads which serve to move traffic from local streets to arterial roads. Generate access to residential, commercial, and industrial areas.

#### Local Roads:

Are the lowest level of mobility regarding the NFC. These roads provide access property to and typically connect to collector roadways.

## Major Interstate and Principal Arterial Routes

### US-10:

Extends from I-75 near Bay City to Ludington in eastern Michigan. This is an east-west limited access route that runs from the City of Auburn northwest past the City of Coleman within the MATS area. This is the main corridor of travel in MATS jurisdiction.

### US-10 Business Route:

Connects US-10 to downtown City of Midland and serves as a catalyst for users to reach lower mobility routes within the MATS area. The segment of US-10 BR that extends from US-10 to Eastman Avenue within the City is an at grade route with one-way pairs in each direction east-west. This segment then converts into Eastman Avenue running north-south as one roadway with two lanes in each direction until it reaches US-10 to the north.

### M-18:

Located in the northwestern part of the MATS area, M-18 is a north-south route which begins at US-10 and connects to M-72 in Crawford County approximately 80 miles north. The roadway has many at grade crossings and links various rural communities in the central region of the Lower Peninsula.

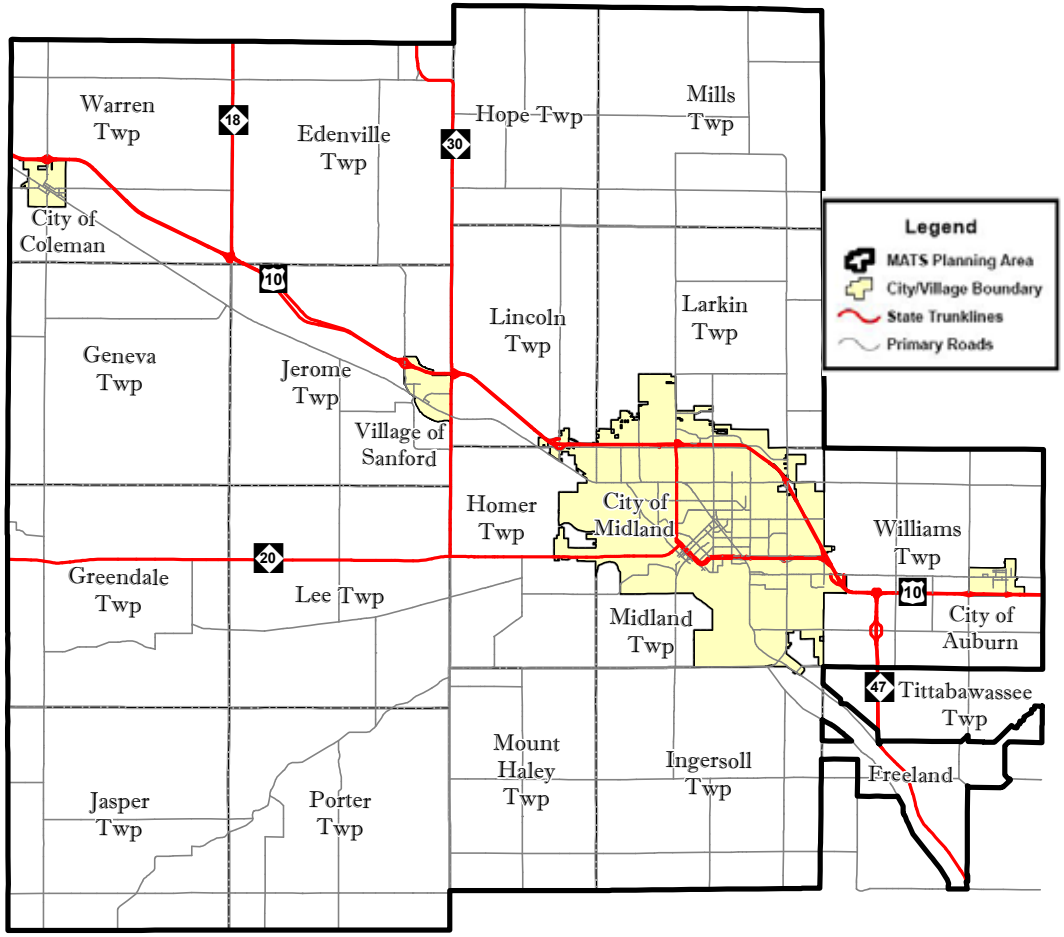
### M-20:

Functions as an east-west corridor between the City of Midland and the City of Mount Pleasant to the west; this section has two lanes in both directions with many at grade intersections. In its entirety, the road extends to Big Rapids which is roughly 70 miles west from Midland. The segment from Mount Pleasant to Big Rapids has only one lane of traffic in each direction.

### M-30:

Begins at M-20 and runs north-south to West Branch, Michigan about 52 miles to the north. This roadway functions very similarly to M-18 in that it has one lane in each direction with many at grade intersections. The route provides access to the Village of Sanford and also links various rural communities throughout its entirety.

Exhibit 9 - MATS Area Major Roadways



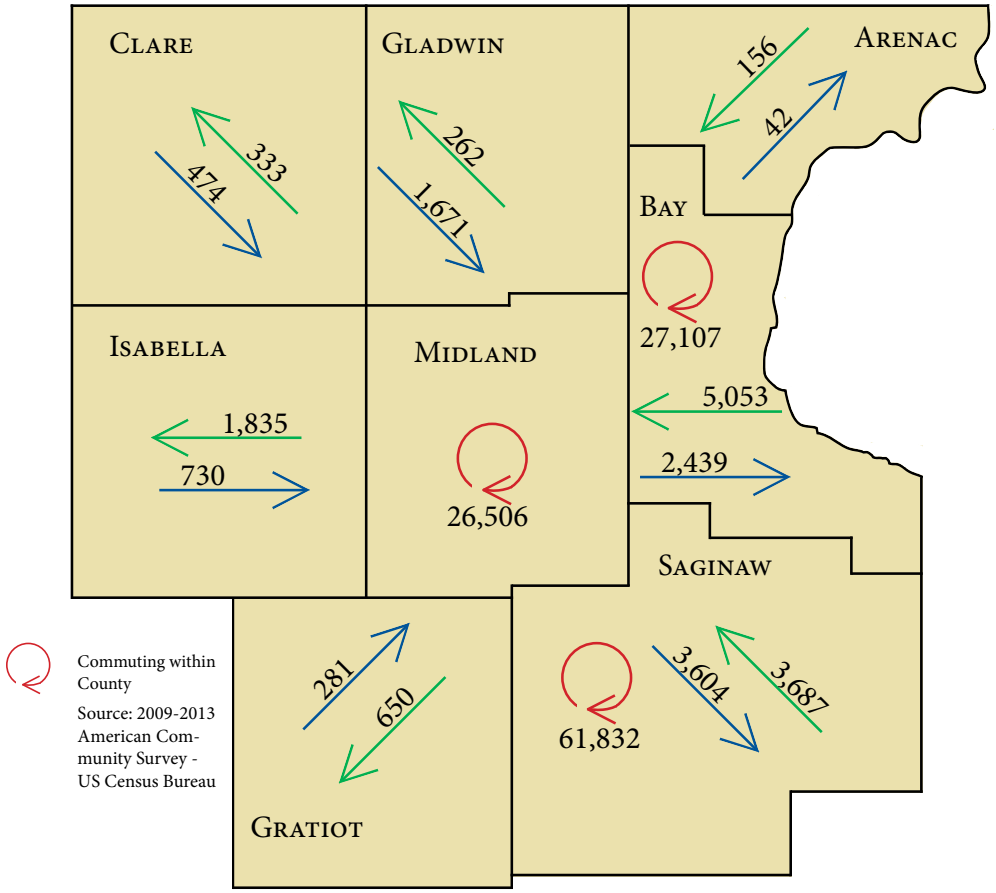

### M-47:

Is located in the southeastern part of the MATS area near Freeland. This roadway runs north-south from US-10 west of the City of Auburn to M-46 near Saginaw. The route has two lanes in each direction and is a primary link between the Midland and Saginaw. This is one of the primary access routes for MBS Airport.

## Travel Patterns

Commuting plays a significant role in employment for the MATS area. 2010 County-to-County commute data illustrates substantial work flows into and out of counties in the MATS area to neighboring counties (gathering totals for the entire area is difficult due to MATS' area including portions of Bay and Saginaw Counties). Exhibit 10 shows these travel patterns. In most cases, there are more people commuting ***to*** Midland County for work then commuting ***from*** Midland County for work. However, there are some counties where this is opposite; Isabella County has more people commuting from Midland County for work due to Central Michigan university being located there. The arrows point to Midland describe commuting to Midland County and the arrows pointing away show commuting from Midland County. The red circle displays commuting within that particular county for work (only counties within the MATS area are shown).

Exhibit 10 - Regional Travel Patterns




## Midland County Commuting Data

The tables below describe typical commuting characteristics within Midland County. The majority of workers travel less than 19 minutes, while overall mean travel time to work for all workers is about 20 minutes. The vast majority of workers 16 and older use a car, truck, or van while driving alone to get to their job. Consequently, very few people use other modes of transportation to get to work within Midland County.

Exhibit 11 - Commuting Characteristics

### Travel Time to Work (total workers 16 years old and over)

| | |
|---|---|
| Less than 10 minutes | 16.0% |
| 10 to 14 minutes | 21.7% |
| 15 to 19 minutes | 20.1% |
| 20 to 24 minutes | 13.5% |
| 25 to 29 minutes | 6.1% |
| 30 to 34 minutes | 10.2% |
| 35 to 44 minutes | 4.8% |
| 45 to 59 minutes | 5.0% |
| 60 or more minutes | 2.6% |

Mean travel time to work (minutes): 20.1

### Means of Transportation to Work
(total workers 16 years old and over)

| | |
|---|---|
| **Car, truck, or van** | 93.2% |
| Drove alone | 86.0% |
| Carpooled | 7.3% |
| In 2-person carpool | 6.1% |
| In 3-person carpool | 0.7% |
| In 4-or-more person carpool | 0.4% |
| | |
| **Public transportation (excluding taxicab)** | 0.7% |
| **Walked** | 1.4% |
| **Bicycle** | 0.6% |
| **Taxicab, motorcycle, or other means** | 0.8% |
| **Worked at home** | 3.3% |

Avg. Workers per car, truck, or van: 1.04

# Public Transit

The providers of transit services within Midland County include the County Connection of Midland, Midland Dial-A-Ride Transportation, and Bay Metro Transportation Authority. DART and CCM operate exclusively in the City of Midland and Midland County, respectively.

The two Midland based providers are demand-response services, whereas BMTA is primarily a fixed route provider. BMTA does offer ADA-compliant para-transit and a senior dial a ride service, for those who are not able to access the fixed route service. BMTA operates primarily in Bay County but runds one fixed route through the City of Auburn into the City of Midland. Exhibit 12 provides details regarding each transit agency's services.

## Midland Dial-A-Ride Transportation (DART)

| | |
|---|---|
| **Service Type** | Demand Response curb-to-curb. Calls booked on a first-call, first-serve basis. |
| **Service Area** | City of Midland Only |
| **Ridership** | Approximately 105,000 rides per year with over 70% of rides provided to seniors or persons with disabilities. |
| **Hours of Operation** | Monday through Friday from 6:30 AM - 10:30 PM<br>Saturday from 9:00 AM - 8:00 PM Sunday 8:30 AM - 2:30 PM |
| **Fleet** | 14 buses which are all lift equipped to accommodate passenger's needs. |
| **Fares** | Regular one-way fare: $2.00<br>Children 5-11 : $1.00<br>First Child under 5: Free<br>Second Child under 5: $1.00<br>Seniors and persons with disabilities : $0.75<br>Ticket book (10 one-way rides): $18.00<br>Reduced fare Ticket book (10 one-way rides): $6.75 |

Source: Agency's Websites

Exhibits 12 - Transit Systems Operational Details

## Other Public/Private Transportation Providers

In addition to CCM, DART, and BMTA, there are also a number of smaller transportation operators in the MATS area. They provide services to defined groups of people and have only a few vehicles each. These providers include retirement homes, senior citizen centers, public schools, churches, and local cab companies. Examples of these operating within the study area include MBS Taxi, Midland Public Schools, The Disability Network, and Midland Senior Services.

## County Connection of Midland (CCM)

| | |
|---|---|
| **Service Type** | Demand Response curb-to-curb. Reservation required 24 hours in advance |
| **Service Area** | All of Midland County except the City of Midland |
| **Ridership** | Approximately 83,000 riders per year with about 42% of those rides provided to seniors or persons with disabilities |
| **Hours of Operation** | Monday through Friday from 5:30 AM - 11:00 PM<br>Saturday from 5:30 AM - 9:30 AM and 2:30 PM - 6:30 PM |
| **Fleet** | 22 buses which are all lift equipped to accommodate passenger's needs. |
| **Fares** | Regular one-way fare: $3.00<br>Children 11 and under: $1.50<br>Seniors and persons with disabilities: $2.50<br>Off peak (6-9 PM): $1.50<br>All no-show charges: $3.00 |

## Bay Metro Transportation Authority (BMTA)

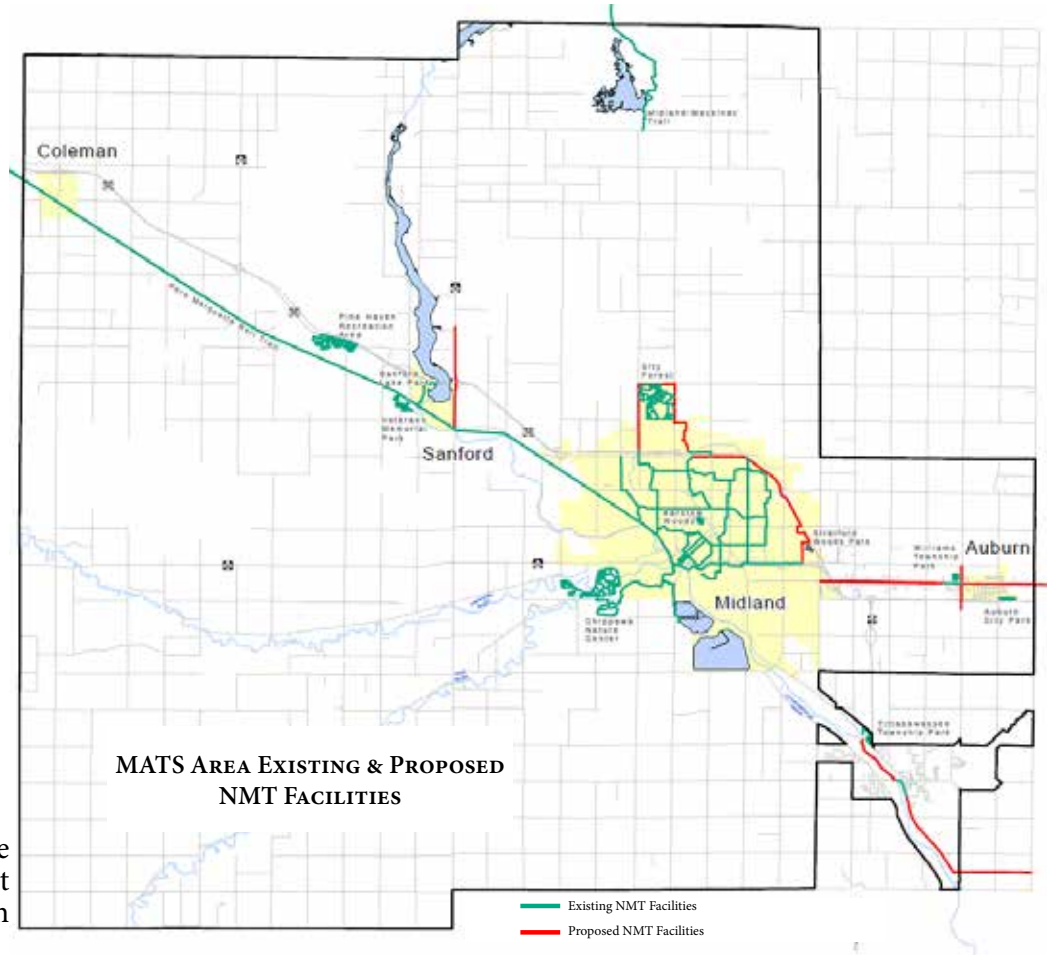
| | |
|---|---|
| **Service Type** | Demand Response curb-to-curb and fixed-route |
| **Service Area** | 11 fixed routes which service most of Bay County including Bay City, Essexville, Kawkawlin, Linwood, Pinconning, Auburn, University Center (Delta College and Saginaw Valley State University), and Standish. Route 4 encompasses Auburn and Midland Towne Plaza within MATS area |
| **Ridership** | Approximately 568,000 rides per year. |
| **Hours of Operation** | Monday through Friday from 6:30 AM - 6:30 PM<br>Saturday from 9:00 AM - 6:00 PM |
| **Fleet** | 65 vehicles |
| **Fares (Demand Response)** | Regular one-way fare: $3.00<br>Seniors and those with disabilities: $1.50<br>Full fare ticket book (10 one-way rides): $15.00 |
| **Fares (Fixed-Route)** | Regular one-way fare: $1.00<br>Student: $0.75<br>Seniors and those with disabilities: $0.50<br>Children 5 and under: Free |

# Non-Motorized Facilities (NMT)

The MATS area has numerous diverse non-motorized facilities, such as shared use paths, traditional sidewalks, trails, routes along paved road shoulders and bike lanes. A focal point of the existing network is the Pere Marquette Rail-Trail, stretching across the entire region. The study area's network serves a wide-array of users including those who utilize the pathways for recreation, commuting to work or school, or long-distance travel.

In 2015, MATS adopted a Non-Motorized Plan for the area which provides a structured way of enhancing non-motorized transportation within its boundaries (the City of Midland has also adopted a similar plan). The plan promotes the development of a non-motorized system that is comprehensive, connected, usable, and safe. Included as a part of the NMT plan is a Complete Streets Policy & Program. This program is a measure to support a balanced transportation system and a guide in encompassing the needs of all users in the planning, design, and implementation of transportation projects. The NMT plan identifies existing NMT facilities and pinpoints future network opportunities which are listed below.

Exhibit 13 - 2015 MATS NMT Plan




## NMT Facilities Proposed by the 2015 NMT Plan

### City of Midland Northern Loop Multi-use Pathway:

Proposed to connect the Pere Marquette Rail-Trail on the northwest side of the City of Midland to the Patrick Road Multi-use Pathway on the east side of the City, providing access to key recreational and transportation destinations.

### Stratford Woods Connector:

First phase of City of Midland Northern Loop Multi-use Pathway. Potentially would connect the Patrick Road Multi-use Pathway to Stratford Woods.

### Annual Improvements throughout City of Midland:

The City approved a 3-year NMT Plan that calls for bicycle/pedestrian annual improvements. Projects typically include new bike paths/routes, sidewalk improvements, and traffic signal intersection improvements.

### Pedestrian Walkways/Sidewalks in Williams Township:

These proposed sidewalks would offer a safe and direct route to both the Williams Township Park and the Auburn City Park; access from most of the subdivisions in the township would be greatly enhanced.

### NMT Path along Midland Road:

As Midland Road is being reconstructed from Four Mile Road west to the Midland County Line, the BCRC intends to place eight foot paved shoulders on both sides of the road to facilitate non-motorized traffic.

### Meridian Road (M-30) Rail-Trail Connector:

Potential non-motorized path connecting the Pere Marquette Rail-Trail to Meridian High School and Meridian Middle School in Sanford, Michigan.

# Air Services

There are two airports located within the MATS area. Jack Barstow Municipal Airport and MBS International Airport each provide different levels of service to the MPO region and surrounding areas.

## Jack Barstow Municipal Airport

Located in the City of Midland, Jack Barstow Municipal Airport primarily supports small aircraft for recreation and business use. The airfield encompasses over 500 acres and serves the needs of approximately 500 pilots. There are two runways that accommodate various wind conditions in flight and various sizes of small aircraft. The airport handles roughly 20,000 operations per year (take-offs and landings) and includes about 40 on-site hangars.

A 2,100 square foot terminal building is centrally located within the airfield at the end of Barstow Drive. The terminal includes a pilot's lounge, a conference room, and an aviation weather service to assist with flight planning. In 2015, Jack Barstow Airport was named Airport of the Year by the Michigan Department of Transportation - Office of Aeronautics. It was recognized for its efforts in promoting general aviation with the development of an observation and education gateway project.

Jack Barstow Airport is funded by the Federal Aviation Administration (FAA) and State of Michigan who provide the majority of funding for capital improvements. Generally, the City of Midland is responsible for a 2.5% share regarding the total cost of projects. Additional funds help finance airport operations such as hangar rentals, land lease rentals, and aircraft fuel sales.

## MBS International Airport

MBS International Airport is a commercial airport located in Freeland, central to the three jurisdictions which own it - the City of Midland, Bay County, and Saginaw County. It is governed by a nine member commission made up of three representatives from each community.

MBS mainly provides transportation to those living throughout the Great Lakes Bay Region. The airport supports 27 home-based aircraft which includes 13 single-engine, five multi-engine, and nine jet-engine aircraft. Approximately 50,000 flight operations are handled annually (take-offs and landings) with two runways of 8,002 ft and 6,400 ft length respectively. MBS Airport's recently constructed new terminal building is about 75,000 square feet. The two-story facility contains amenities such as various concession options, an efficient baggage claim, and convenient parking.

In 2016 MBS approved a master plan targeting $100 million in airport projects over a 20-year span. Projects include new pavement construction and rehabilitation, rental car and maintenance facilities upgrades, as well as improvements to general/private aviation development.

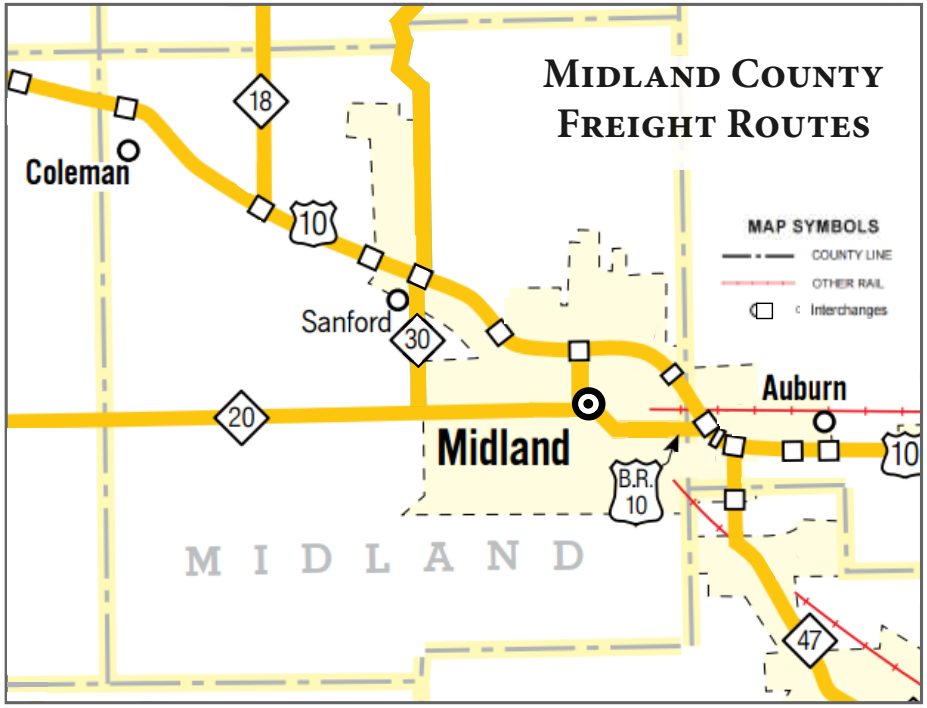

# Freight Transportation

## Freight Transportation within MATS Area

The movement of freight is one part of an efficient and prosperous local economy and is important in terms of transportation planning activities. In the MATS Area, freight routes have been designated to provide access to local manufacturing facilities and distribute goods both statewide and nationally.

The image below depicts MATS area truck and rail freight routes; in addition, limited air cargo services are available at MBS airport. The yellow lines represent MDOT Trunkline, which are the routes primarily used for the movement of goods by truck, and the red lines portray two railways existing within MATS' boundaries. These rail roads are owned and operated by the Huron and Eastern Railway Company. The railroad previously extended past the City of Coleman to the northwest, however this segment has since been converted into a rail-trail. The existing rail roads link to the Dow Chemical Company located in the southeastern part of the City of Midland. Dow is responsible for the majority of freight exported/imported in the area.

Exhibit 14 - MATS Area Freight Network

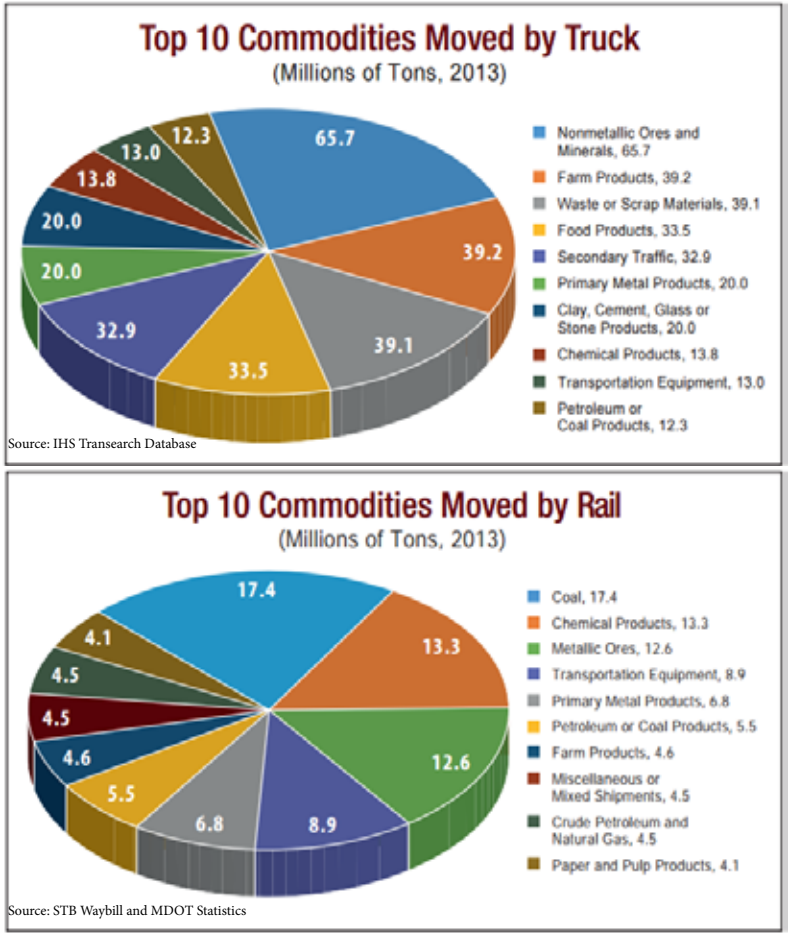



Source: Michigan Department of Transportation

## Michigan Freight Transportation

Freight is defined as any good, product, or raw material carried by a commercial means of transportation - including truck, rail, water, or air. According to the statewide Freight Primer Report produced by MDOT, the majority of freight in Michigan is transported by truck and rail. In 2013, 338.1 million tons of freight were moved by truck, accounting for 67 percent of the tonnage moved in the state. In the same year, 100.4 million tons of freight were moved by rail, accounting for 20 percent of the tonnage moved in the state. The following charts display the top 10 commodities moved by truck and rail throughout Michigan in 2013.

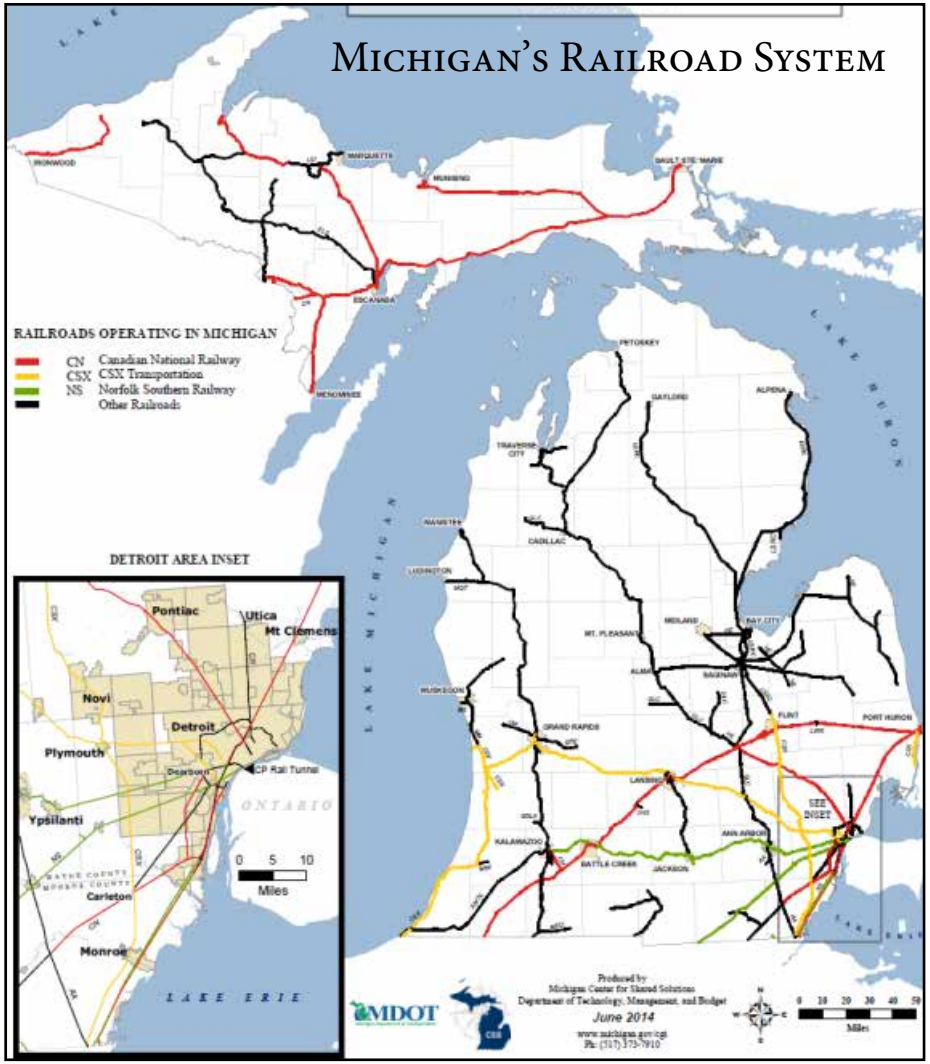
Exhibit 15 - Commodities by Truck and Rail




Source: Michigan Freight Primer Report (2013)

The freight railroad industry is now almost entirely privately owned and operated. Primary railroads throughout Michigan are the Canadian National Railway, CSX Transportation, and Norfolk Southern Railway. The State of Michigan owns a minority of this track, at 665 miles, but is in the process of turning over commercially viable rail operations to the private sector as market conditions permit. This process allows for abandoned railroads to be saved and re-used in the future. The map below depicts the various railways throughout Michigan.

Exhibit 16 - Michigan's Railroad System




Source: Michigan Freight Primer Report (2013)

Exhibit 17 - Michigan's Trunkline System


In Michigan, a heavier overall truck load is allowed compared to most other states. The maximum permissible vehicle weight is 164,000 pounds which is more than double the federal standard vehicle weight of 80,000 pounds. Many attribute the diminishing infrastructure throughout Michigan to this increased weight limit. However, research has found that pavement damage is directly related to axle load and not total weight. To mitigate this issue, Michigan requires additional axles as vehicle weight increases.

Exhibit 17 shows Michigan's trunkline routes which carry the majority of truck movement throughout the State. All maps/data provided in this section can be found in MDOT's Freight Primer Report for 2015.

A key component of the planning process is the evaluation of the current situation in all areas that the plan addresses. This includes both surface conditions and system operations. According to a presentation given at the Proceedings Of The 3rd International Conference On Bituminous Mixtures And Pavements, held at Thessaloniki, Greece, November 2002, by Norrison:

*Deterioration of pavement occurs gradually and is usually unnoticed during the first few years following construction. However, at some stage of its life, pavement structural deficiencies and surface deterioration become evident. Visual assessment of a pavement's condition identifies defects and their severity at the surface level. These defects determine the pavement's functional performance that in turn relates to the level of service. The surface condition is also the result of the pavement's sub-surface structural deterioration. The relationship between pavement performance and level of service is hard to establish because the various defects are difficult to quantify.*

Utilizing state-wide Asset Management practices, MATS staff are directly involved in monitoring road conditions within the MPOs boundaries, as an on-going process. This process is conducted through the pavement evaluation program, known as PASER (Pavement Surface Evaluation and Rating), that is utilized to assess the condition of Michigan's federal-aid eligible roads.

PASER is a visual assessment tool to assess the surface distress that pavement develops over time; distress is rated on a scale from 1 to 10. MATS staff, in partnership with MDOT and local implementing agencies, is responsible for reporting the condition of 50% of the federal-aid network annually. However since MATS was designated, 100% of the federal-aid network has been rated every year as well as portions of the local road network. MATS gathers more data than required because it is valuable in supporting management practices which may reduce the life-cycle cost of roadways by potentially mitigating more intrusive/costly improvements.

Once road evaluation data is collected, ratings are arranged into subgroups of Good (8-10), Fair (5-7) and Poor (1-4) as determined by the Michigan Transportation Asset Management Council (TAMC). Categorizing the data in this way assists in deciding which level of improvement the road segment may require; reconstruction for poor pavement, preventive maintenance for fair pavement and routine maintenance for good pavement.

Exhibit 18 displays the results of the 2015 PASER assessment of federal-aid roads within Midland County; the corresponding map is shown as Exhibit 19. Note that Williams Township/City of Auburn PASER data is collected by BCATS and Freeland PASER data is collected by SMATS. Overall, the plurality of MATS area federal-aid roads (46.14%) are categorized "fair" based on the data collected, providing substantial guidance regarding future maintenance and reconstruction project programming.

Exhibit 18 - Midland County PASER Data

| Rating | Mileage/Percent | TAMC |
|---|---|---|
| 10 | 1.77 miles/0.36% | Good |
| 9 | 7.17 miles/1.47% | |
| 8 | 106.17 miles/21.69% | |
| 7 | 53.81 miles/11% | Fair |
| 6 | 64.08 miles/13.09% | |
| 5 | 107.89 miles/22.05% | |
| 4 | 100.08 miles/20.45% | Poor |
| 3 | 41.7 miles/8.52% | |
| 2 | 6.52 miles/1.33% | |
| 1 | 0.19 miles/0.04% | |

| Mileage/Percent | TAMC | PASER |
|---|---|---|
| 115.11 miles | Good | New |
| 23.52% | | Very Good |
| | | Good |
| 225.78 miles | Fair | Adequate |
| 46.14% | | Fair |
| | | Average |
| | Poor | Subpar |
| 148.49 miles | | Poor |
| 30.34% | | Very Poor |
| | | Failed |

Source: Collected by Midland Area Transportation Study

Exhibit 19 - Midland County road ratings (1 - 10 Scale)

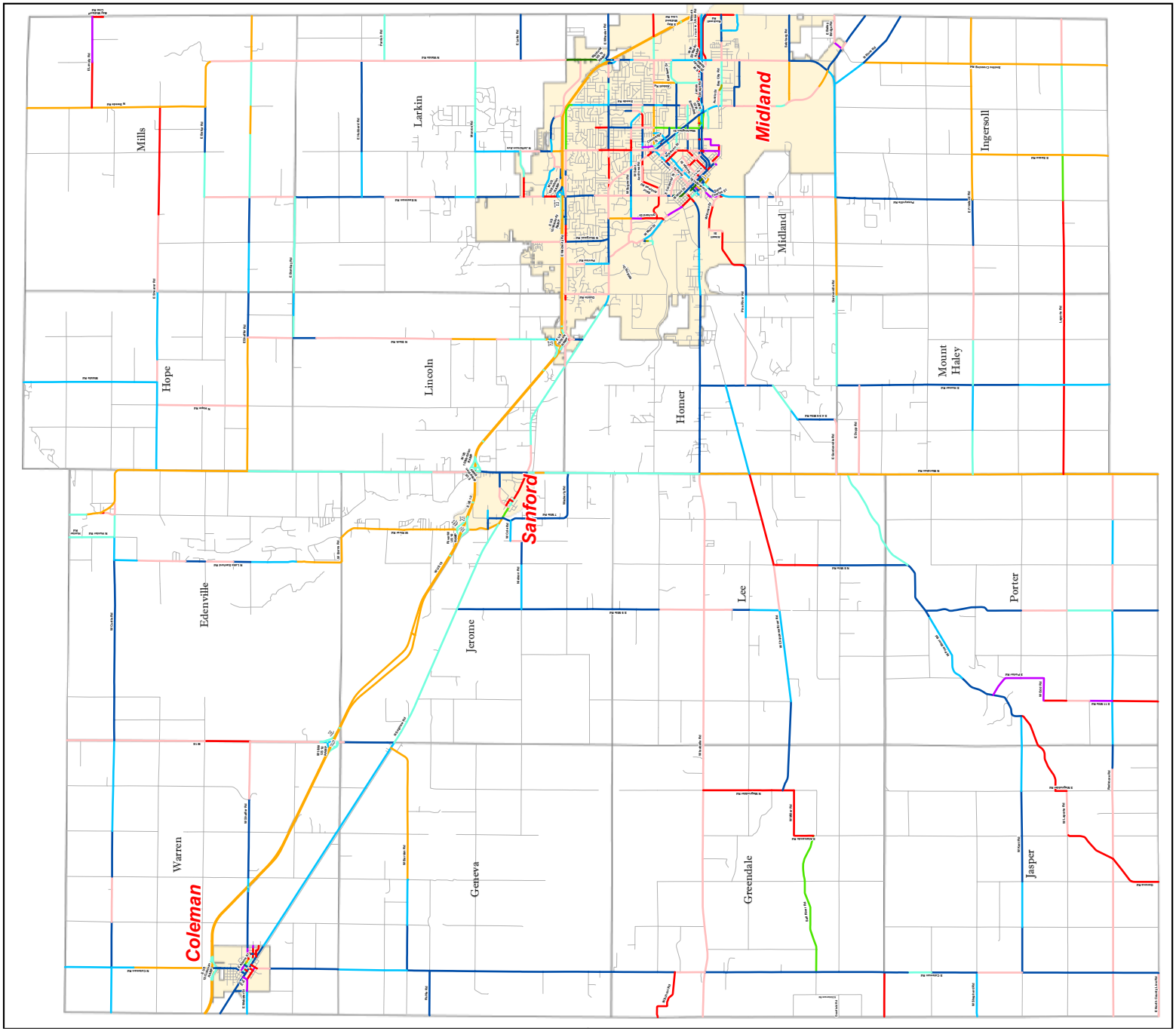
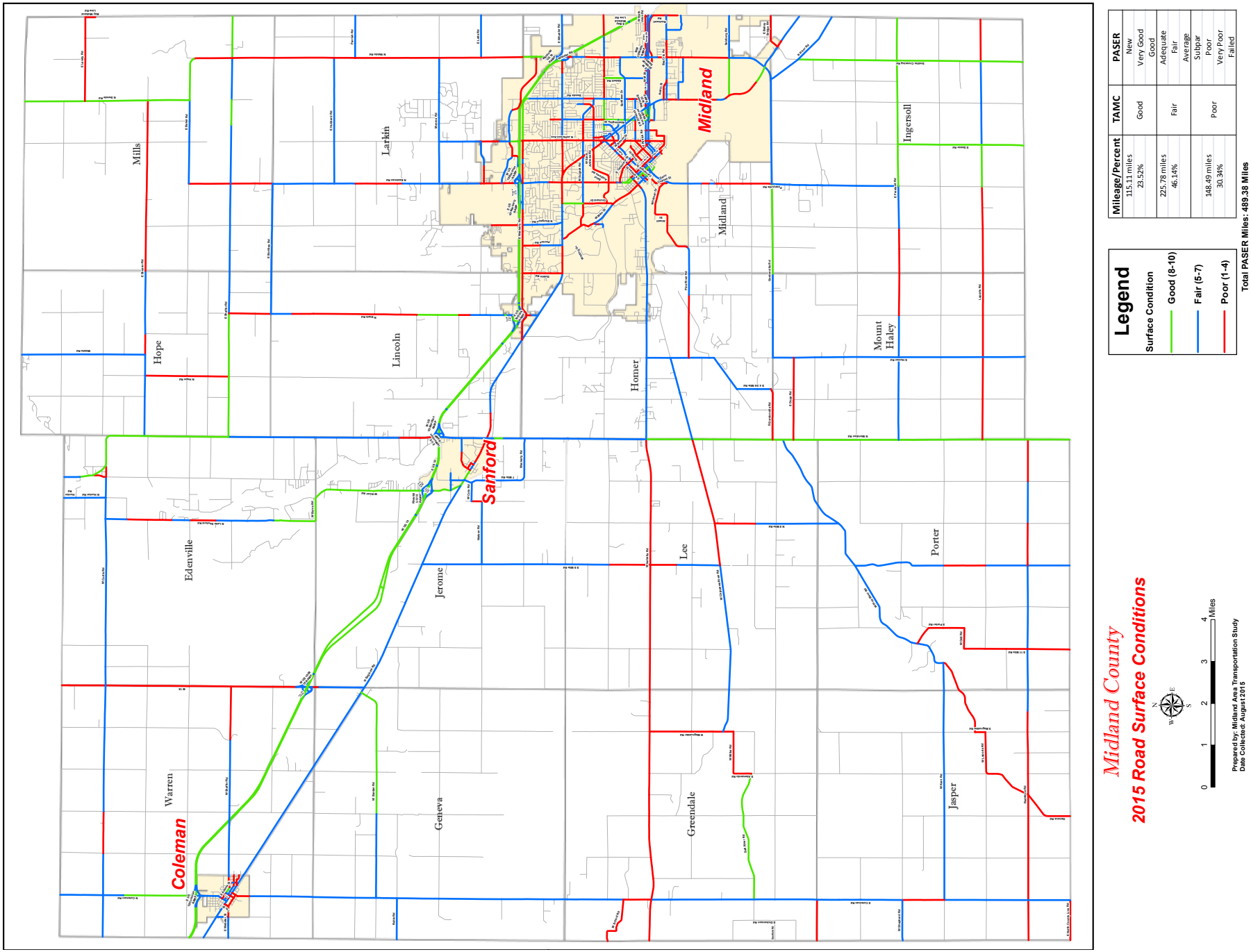


Exhibit 20 - Midland County road rating (Good, Fair, Poor Scale)



## Midland County - 2015 Road Surface Conditions

As can be seen from the previous two maps, the vast majority of the Federal Aid road network in Midland County is rated either poor or fair using the TAMC criteria. Using PASER terminology, this would be classified as adequate to very poor. The total miles of road encompassing these categories is 76.48%, leaving 23.52% as new to good.

Therefore, as part of our Infrastructure Evaluation, we can generally conclude that physical condition is a far greater problem than the proverbial "traffic jam" for our Federal Aid network. Unfortunately, current funding levels are probably grossly inadequate to remedy the problem. In fact, MDOT analysis of other urban regions indicates that transportation investment increases of 250% and more would be necessary to improve the situation, showing broad areas of pavement condition rated Good. Road construction projects completed prior to and since MPO designation reflect that priority of investment, and comparison of year-to-year PASER ratings show arrested decline of infrastructure condition.

*"Virtually everyone – residents, visitors, pedestrians, passengers, commercial and private car drivers and anyone with a window-view of a block front – experiences the streets and observes their condition. People know that it is city government's responsibility to maintain them. For many, then, the performance of local government itself is evaluated by the condition of the streets."*

*How Smooth are New York City's Streets? Fund for the City of New York, September 1998*

## System Operations

Exhibit 21 ("Existing" Scenario Capacity Deficiencies) depicts the Travel Demand Model 2013 results for current daily and peak period capacity deficiencies. This map shows 4 segments over the total network that are deficient. One, only during peak travel hours, and three that show daily deficiencies. This indicates that currently there is a generally good level of service (low travel delays) over the greatest extent of the road network for the MATS area. Note that "existing" in this context is the year 2013 since the modeling was done over the 2015-2016 time frame, using the most recent data available.

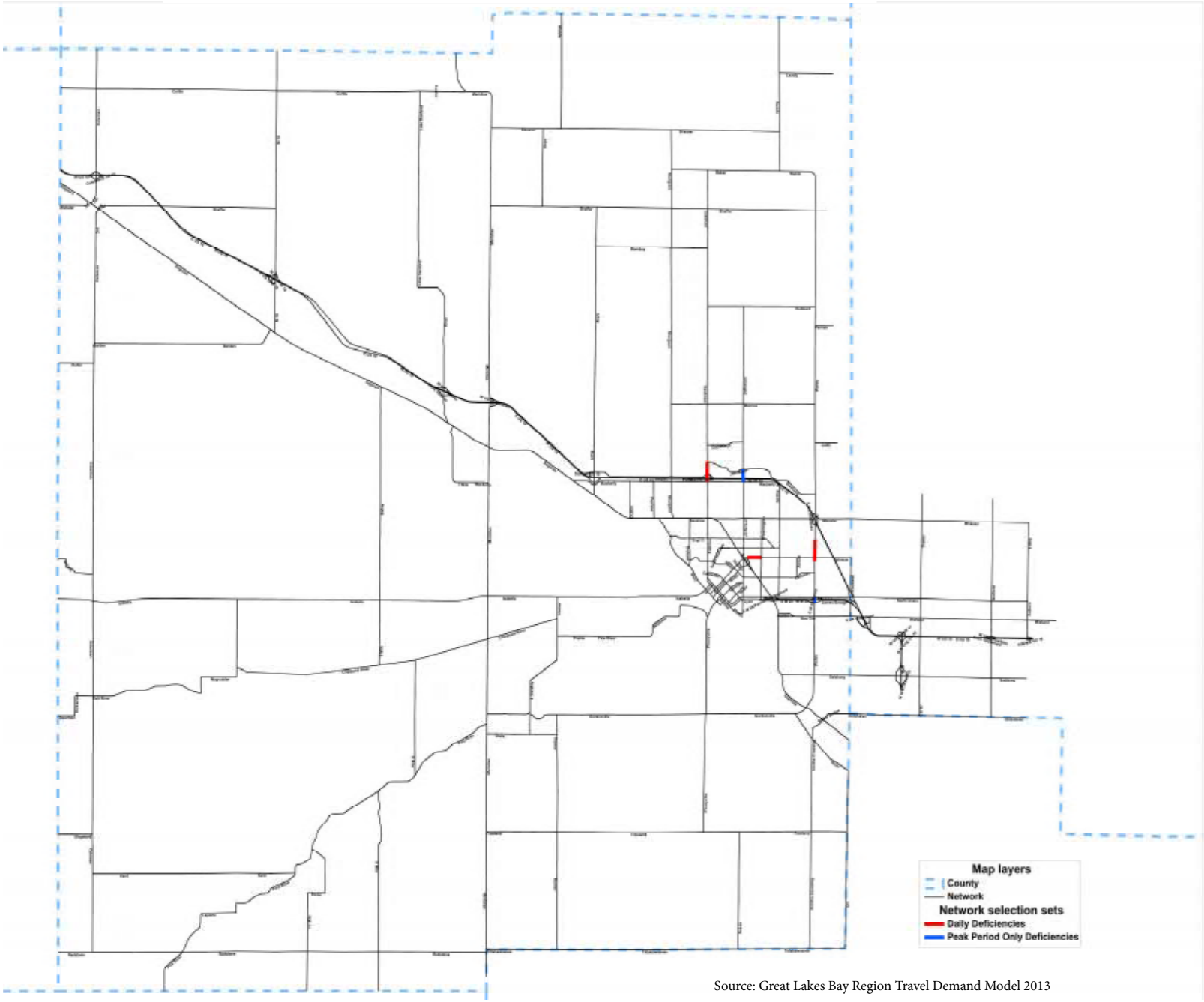
## Projects Utilizing Federal Funding Completed Since MPO Designation

The 2045 Long Range Transportation Plan will be the first long range plan developed by MATS. Therefore, projects listed within this section include all federally funded projects completed since MATS was designated in January of 2013, and prior to the adoption of this plan. A total of 76 projects were completed with approximately $78 million invested in the MATS area since designation. Allocations for transportation projects involve federal, state, and local sources for funding transit, highway, and non-motorized projects.

Projects listed for fiscal years 2013-2016 were programmed and prioritized as a part of the 4-year Transportation Improvement Program (TIP) planning process, utilizing both local agency level evaluation as well as the MATS committee structure. The TIP is an integral part of transportation planning, which identifies and prioritizes Federal-Aid projects and programs in local urbanized areas. The TIP will ultimately serve as an implementation tool of the final long-range transportation plan. It ensures that scheduled transportation improvements are consistent with current and projected financial resources. Note that the vast majority of the total dollar value is represented by MDOT projects.

Exhibit 22 lists the obligated amounts for each project completed within the MATS area categorized by the implementing agency and fiscal year the project was programmed.

# Exhibit 21 - 2013 "Existing" Scenario Capacity Deficiencies




Source: Great Lakes Bay Region Travel Demand Model 2013

## Exhibit 22 - Completed Road Projects 2013 - 2016

| Agency | Project | Limits | Description | Total Project Cost | Fiscal Year |
|---|---|---|---|---|---|
| City of Midland | E. Ashman Street | Cambridge Street to Swede Avenue | Crush and shape | $646,000 | 2013 |
| | Washington Street | Patrick Road to E. Ashman Street | Crush and shape | $924,000 | 2013 |
| Midland County Road Commission | Saginaw Road | Geneva Road to Eight Mile Road | Asphalt Overlay | $950,000 | 2013 |
| MDOT | M-20 | Bridge over Tittabawassee River | Pier, abutment and steel repairs | $182,418 | 2013 |
| | US-10 | M-18 to Midland/Isabella Co. Line | rubblize/HMA overlay | $20,824,854 | 2013 |
| | US-10 | US-10 Bridge under West River Road | Bridge Deck Replacement | $1,845,000 | 2013 |
| | US-10 | Four US-10 Bridges over Bluff and Mud Creeks | Deep Overlays (Rehab) | $3,300,000 | 2013 |
| | US-10 | US-10 Bridge under M-18 | Bridge Deck Replacement | $1,770,000 | 2013 |
| | US-10 | US-10 under Shaffer Road | Epoxy Overlay | $255,000 | 2013 |
| MDOT | M-47 Bridge Replacement | Over US-10 NB and SB | Bridge Replacement | $3,188,870 | 2014 |
| | N M-47/W US-10 Ramp | N M-47/W US-10 Ramp | Reconstruct | $2,481,849 | 2014 |
| | US -10 | Over Hoppler Creek | Bridge Restore and Rehabilitate | $80,819 | 2014 |
| | US -10 | Over H & E Railroad and over Patrick Road | Bridge - epoxy overlay | $155,790 | 2014 |
| | WB M-20 | At Patrick Road Crossover | Roundabout Construction | $1,315,919 | 2014 |
| | M-20 | At Patrick Road Crossover | Safety upgrade to 2 signals | $38,264 | 2014 |
| | US -10 BR (Eastman Ave) | Jerome Street to Saginaw Road | Reconstruct Pavement | $1,306,357 | 2014 |
| | US - 10 BR (Eastman Ave) | Jerome Street to Saginaw Road | Preliminary Engineering | $310,000 | 2014 |

| | | | | | |
|---|---|---|---|---|---|
| Midland County Road Commission | Stark Road | over Sturgeon Creek | Bridge Replacement | $758,334 | 2014 |
| Midland County Road Commission | Rural Resurfacing Program GPA | Three following Project Costs Combined | Resurface - Asphalt Overlay | $998,725 | 2014 |
| | Smith Crossing | Freeland Road to County Line | | | |
| | Swede Road | Baker to County Line | | | |
| | Coleman Road | US-10 to North County Line | | | |
| | Urban Resurfacing Program GPA | Six following Project Costs Combined | Resurface - Asphalt Overlay | $912,211 | 2014 |
| | West River Road | Saginaw Road to Burns Road | | | |
| | Burns Road | W. River Road to Lake Sanford Road | | | |
| | Lake Sanford Road | Burns Road to north 1 mile | | | |
| | Saginaw Road | 8 Mile Road to 7 Mile Road | | | |
| | Stark Road | Price Road to Beamish Road | | | |
| | Gordonville Road | Badour Road to Poseyville Road | | | |
| City of Midland | Airport Road | over Sturgeon Creek | Bridge Rehabilitation | $589,558 | 2014 |
| | James Savage Road | Washington Street to Saginaw Road | Reconstruction | $220,932 | 2014 |
| MDOT | US-10 | 9 Bridges in Midland County | Preliminary Engineering | $132,805 | 2015 |
| | US-10 | 9 Bridges in Midland County | Preliminary Engineering | $347,102 | 2015 |
| | M-20 | 9 Mile Road to M-30 | Preliminary Engineering | $119,601 | 2015 |
| | M-30 | At WB US-10 Ramps | Roundabout Construction, Intersection Safety Improvements | $1,781,022 | 2015 |
| | M-18 | US-10 to Midland/Gladwin County Line | Cold Mill, two course HMA overlay, joint repairs, etc | $6,788,506 | 2015 |
| | US-10 | under 9 Mile Road | Bridge Replacement - Right of Way Phase | $30,000 | 2015 |
| | US-10 | under 9 Mile Road | Bridge Replacement | $3,661,214 | 2015 |
| | M-20 | over Tittabawassee River & CSX Railroad | Bridge Replacement - SUB Phase | $2,328,019 | 2015 |

| | | | | | |
|---|---|---|---|---|---|
| MDOT | M-20 | over Tittabawassee River & CSX Railroad | Bridge Replacement - Preliminary Engineering | $44,085 | 2015 |
| Midland County Road Commission | Rural Funded Resurfacing GPA | Includes Four Projects - Combined Funds | Resurface - Asphalt Overlay | $617,686 | 2015 |
| | Saginaw Road | Geneva Road to Coleman City Limits | | | |
| | Saginaw Road | NE County Line Road to Coleman City Limits | | | |
| | Coleman Road | High Drain to County Line | | | |
| | Stark Road | Siebert Road to 1/2 mile South of Bombay | | | |
| | Coleman Road | over Big Salt River | Bridge Replacement | $1,533,589 | 2015 |
| City of Midland | Sugnet Road Extension | Northwood Drive to Dublin Road | New Route/Structure (Capacity Increase) | $800,555 | 2015 |
| | Poseyville Road | over Tittabawassee River | Bridge Maintenance | $1,642,578 | 2015 |
| BCRC | Garfield Road | Midland Road 1/4 mile North of N. Union Road | Reconstruct, storm sewer, widen 2 to 3 lanes, curb & gutter | $790,431 | 2015 |
| | Garfield Road - Utilized STUL Funding | Midland Road to 1/4 mile North of N. Union Road | Reconstruct, storm sewer, widen 2 to 3 lanes, curb & gutter | $666,272 | 2015 |
| | Garfield Road - Preliminary Engineering | near Hotchkiss Road | Increase curve radii, remove fix objects, add rumble strips | $40,700 | 2015 |
| | Garfield Road - Construction | near Hotchkiss Road | Increase curve radii, remove fix objects, add rumble strips | $540,111 | 2015 |
| MDOT | M-20 - Construction | 9 Mile Road to M-30 | Resurfacing | $955,250 | 2016 |
| | M-20 - Preliminary Engineering | Magruder Road to 9 Mile Road | Resurfacing | $105,600 | 2016 |
| | US-10 - Construction | US-10 : 9 Bridges in Midland County | Epoxy Overlay | $5,219,068 | 2016 |
| | US-10 BR | Saginaw Street to Wackerly Street | Resurfacing | $91,400 | 2016 |
| | US-10 BR | Saginaw Street to Wackerly Street | Resurfacing | $747,682 | 2016 |
| | US-10 EB | Midland/Bay CO. Line To W CL of Bay City | Resurfacing | $50,000 | 2016 |
| | US-10 EB | Midland/Bay CO. Line To W CL of Bay City | Resurfacing | $2,332,338 | 2016 |

| | | | | | |
|---|---|---|---|---|---|
| MCRC | Rehab & Reconstruct GPA-STL | Includes Four Projects | | | |
| | West Pine River | Redstone Road to CO. Line | Resurfacing | | 2016 |
| | 11 Mile Road | Redstone Road to N CO. Line Rd | Resurfacing | $1,142,484.00 | 2016 |
| | Shearer Road | Swede Road to Jefferson Road | Resurfacing | | 2016 |
| | Shearer Road | Jefferson Road to one mile west | Resurfacing | | 2016 |
| | Gordonville Road | .34 mi W of Badour to .11 mi E of Badour | Traffic Operations and Safety | $1,338,068 | 2016 |
| | Gordonville Road | 4 3/4 Mile Road to Homer Rd | Traffic Operations and Safety | $51,556 | 2016 |
| | Eastman Ave | 500' N of Bombay to 500' S of Schneider | Traffic Operations and Safety | $69,974 | 2016 |

## Transit Projects

| Agency | Project | Limits | Description | Total Project Cost | Fiscal Year |
|---|---|---|---|---|---|
| Dial-A-Ride Transportation | Replace (1) Bus | City-wide | Replace (1) Bus | $66,072 | 2013 |
| County Connection of Midland | Bus Rehabilitation | County-wide | New Bus Engine | $7,269 | 2014 |
| | Bus Replacement | County-wide | 2 Propane Buses | $166,360 | 2014 |
| | Bus Replacement | County-wide | 2 Ford Gas Buses | $325,531 | 2014 |
| Dial-A-Ride Transportation | Bus Replacement | City-wide | Two 28-foot Buses with lifts | $132,766 | 2014 |
| | Bus Replacement | City-wide | One 28-foot bus with lift | $65,976 | 2014 |
| | Bus Replacement | City-wide | 6 Buses | $375,162 | 2014 |
| | Bus Replacement | City-wide | 1 Bus | $71,754 | 2014 |
| | Communication Equipment | City-wide | Radios for Buses | $51,775 | 2014 |
| | Communication Equipment | City-wide | Base Station Radio | $17,114 | 2014 |
| | Transit Operations Equipment | City-wide | New Bus Stop and Replacement of 2 Bus Stops | $11,097 | 2014 |
| County Connection of Midland | Transit Facility Improvements | County-wide | Transit Facility Improvements | $25,000 | 2015 |
| Dial-A-Ride Transportation | Replace (1) Bus | City-wide | Replace (1) Bus (lift & security camera included) | $65,468 | 2015 |
| | Replace (2) Buses | City-wide | Replace (2) Buses (lift & security camera included) | $124,800 | 2015 |
| | Bus Shelters | City-wide | Transit Facility | $18,302 | 2015 |
| Dial-A-Ride Transportation | Transit Facility Improvements | City-wide | Transit Facility Improvements | $115,350 | 2016 |
| | Mobile Data Terminals | City-wide | Transit Communications Equipment | $21,200 | 2016 |

## Analysis of Projects Completed 2013 - 2016

The following tables and chart summarize the previously listed projects to more closely examine the breakdown of total transportation investments by agency and type.

Exhibit 23 below depicts the number of projects completed by type. Bear in mind though, the totals may be somewhat misleading since MDOT had a large $21 million project during this time frame. Projects completed include MDOT trunkline improvements, resurfacing and reconstructing roads, transit projects, bridge repairs, and other projects.

The Exhibits to the right display the breakdown of transportation investments by agency. The largest portion of total investments is primarily MDOT, but as the second graph shows, funding for Transit projects also comprises a significant segment of the total funding utilized in the MATS area.

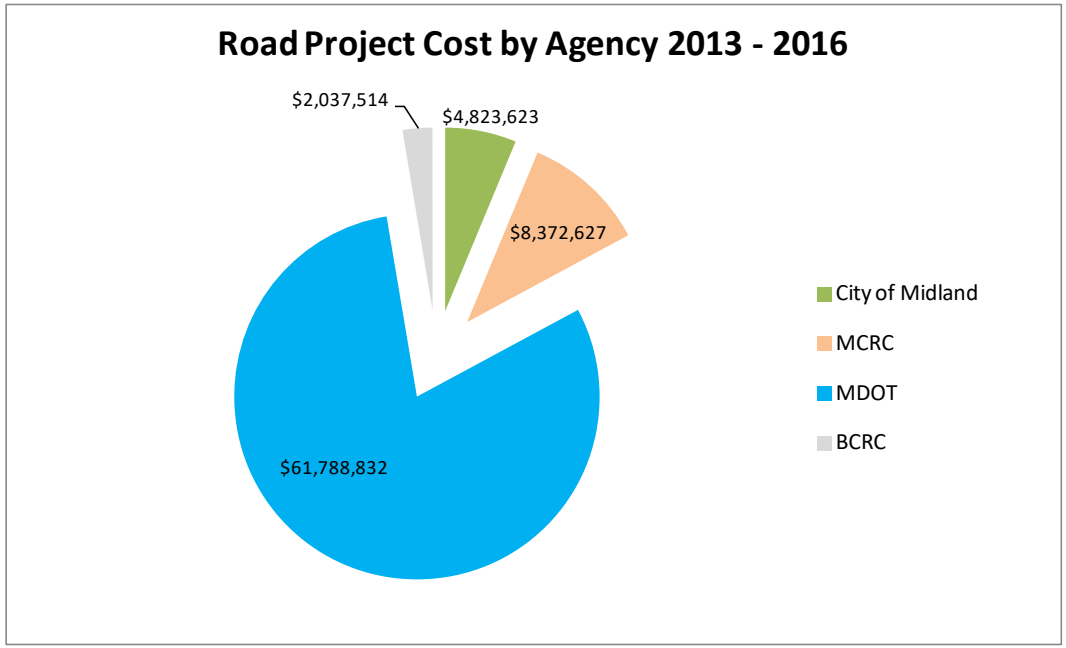
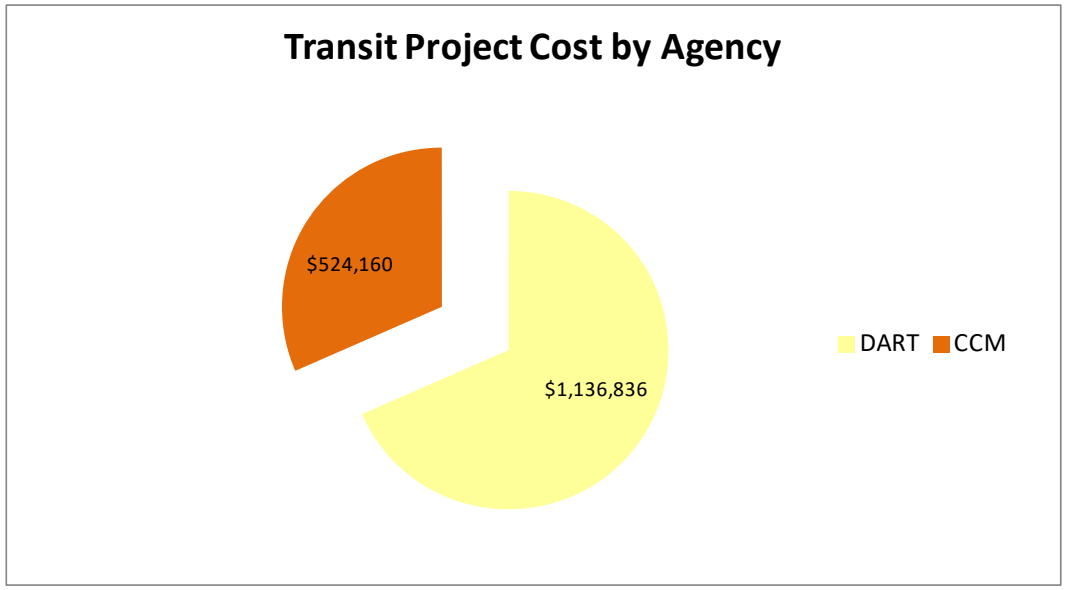



Exhibit 23 - Projects Completed by Type and Agency

| Project Type | Number | Total Cost |
|---|---|---|
| MDOT Trunkline | 30 | $61,788,832 |
| Roads | 26 | $10,709,705 |
| Bridges | 4 | $4,524,059 |
| Transit | 16 | $1,660,996 |
| Total | 76 | $78,683,592 |

Source: Collected by Midland Area Transportation Study



# System Management

One of the primary roles of MATS is to facilitate coordination between the entities responsible for transportation improvements and operations in the area. This is conducted through various programs/strategies to enhance system management in order to achieve the Goals and Objectives of the Long Range Plan. Here are several of those ongoing programs MATS participate in or facilitates.

## Asset Management

As alluded to in the previous section, MATS is directly involved in the process of Asset Management with regard to monitoring road conditions within the MPO boundaries. Asset Management is a process that provides key data for monitoring, planning and strategically improving the road network. Each local agency within MATS' area has access to PASER data and RoadSoft computer software that assists in evaluating information that has been collected. This provides a means for local agencies to track road segments' distress and implement a strategic method of investing funds to mitigate those identified issues.

## Capital Preventative Maintenance (CPM)

CPM is a key implementation component of asset management practices. This strategy includes roadway improvements such as resurfacing, re-paving, re-striping, signal upgrades, re-decking, and other preventative activities which will extend the life of the existing transportation infrastructure. These projects are much smaller in scope and therefore are not identified specifically in the Long Range Plan. However, MATS promotes CPM in its Transportation Improvement Program (TIP). These projects are typically identified as a General Program Account (GPA) on the TIP. A GPA is a grouping of similar CPM projects occurring each fiscal year. For example, a Midland County Road Commission GPA that has several resurfacing projects would be called Local Highway Rehabilitation and Reconstruction GPA. This GPA process makes it easier for local implementing agencies to complete CPM projects by streamlining project development and review.

## Traffic Counts

The collection of traffic count data is another example of ongoing system operations to enhance the transportation network in the MATS area. Both the City of Midland and Midland County Road Commission collect traffic count data on federal-aid and local roads to be utilized for various purposes. Fox example, in 2015 traffic count data was used to assist with the review and potential reclassification under the NFC, of MATS area roadways. Providing traffic count data for roadways which are supporting higher traffic volumes potentially allows for that roadway to be reclassified to a higher level. This process determines whether the roadway is eligible for federal funds, either as part of the National Highway System (NHS) or through the Surface Transportation Program (STP).

## Complete Streets

This program is a measure to support a balanced transportation system and a guide to incorporating the needs of all users (i.e. transit and non-motorized) in the planning, design, and implementation of projects. Examples of non-motorized facilities considered while planning road projects include sidewalks, bike lanes, non-motorized paths, ADA accessible crosswalks and ramps, signalized intersections, among many other enhancements. MATS requires that all projects proposed for inclusion in the TIP must be reviewed in consideration of the extent that the project will accommodate Complete Streets measures, or that the project should be exempt. Local agencies, primarily Midland's Non-Motorized Transportation Committee, and MDOT are actively involved in this process and the implementation of these types of projects.

## Transit Coordination

As mentioned previously, MATS is currently involved in or commenting on two studies being conducted to take a closer look at regional transit services and how they can be enhanced. Although these studies are on-going and will potentially lead to improvements regarding transit coordination and services, currently there are some noticeable issues with the area's public transportation.

# Highway Safety

Planning for roadway safety is an important component examined during MATS' project selection process, TIP, and LRTP development. This includes considering both traffic crash history and potential safety improvements. RoadSoft, developed by The Center for Technology & Training (CTT) at Michigan Technology University, provides a geographic summary of collision data. The segments and intersections in the MATS area with the highest crash frequency are as follows:

Exhibit 24 - Top 10 Highest Crash Segments and Intersections within MATS Area

| Intersection Location | Total # of Crashes |
|---|---|
| Eastman Avenue & N Saginaw Road | 71 |
| Eastman Avenue & US-10 Ramp | 54 |
| Isabella Road (M-20) & Meridian Road | 50 |
| Wackerly Road & Eastman Avenue | 46 |
| Jefferson Avenue/Ashman Avenue/Ashman Circle | 29 |
| Orchard Drive & N Saginaw Road | 28 |
| Buttles Street & Ashman Street | 27 |
| Airport Road & Eastman Avenue | 26 |
| Ashman Street & E Indian Street | 24 |
| Isabella Road (M-20) & Coleman Road | 24 |

| Segment Name | Limits | Total # of Crashes |
|---|---|---|
| N Saginaw Road | E Haley St to E Patrick Rd | 40 |
| N Saginaw Road | Campau St to Eastman Ave | 33 |
| N Saginaw Road | Christie Ct to Orchard Dr | 27 |
| N Saginaw Road | Eastlawn Dr to Washington St | 19 |
| Eastman Avenue | Letts Rd to Joe Mann Blvd | 17 |
| N Saginaw Road | Jefferson Ave & Ashman Circle | 17 |
| E Wackerly Road | US-10 Ramp to Eastman Ave | 17 |
| N Saginaw Road | Dublin Rd to Hedgewood Dr | 16 |
| N Saginaw Road | Dartmouth Dr to Eastlawn Dr | 16 |
| N Saginaw Road | Drake St to Christie Ct | 15 |

Source: Roadsoft - Michigan Technology University

Having access to this type of data is crucial in selecting projects which may contain various safety improvements such as intersection optimization, construction of left-turn lanes, curb and gutter enhancements, and others. This allows federal-funding to be utilized in an efficient manner to address on-going roadway safety issues in the MATS area. At the state level, it is the mission of the Michigan's Strategic Highway Safety Plan to "improve traffic safety in Michigan by fostering effective communication, coordination, and collaboration among public and private entities." The vision of moving towards zero deaths includes goals to reduce traffic fatalities and injuries drastically during 2016. A primary element of this plan establishes programs which provide funding opportunities for road agencies to apply for funds for safety improvement projects.

Another way the state assists local road agencies in highway safety planning is by maintaining extensive traffic crash data for all of Michigan. The Michigan Office of Highway Safety Planning provides a web-based data query tool that shows crash data for various geographic areas including cities, counties, MPOs, and other regions. This data tool can be found at: http://www.michigantrafficcrashfacts.org. Exhibit 25 shows two examples of crash data which can be found using the data query tool.

Exhibit 25 - Midland County Total Crashes per Type & Total Annual Crashes Per County

| Midland County (2014) Total # of Crashes per Type | |
|---|---|
| Single Motor Vehicle | 1,318 |
| Head-on | 15 |
| Head-on/Left Turn | 33 |
| Angle | 366 |
| Rear-end | 383 |
| Rear-end left turn | 16 |
| Rear-end right turn | 17 |
| Sideswipe same direction | 164 |
| Sideswipe opposite direction | 34 |
| Other/Unknown | 126 |

| Total Annual Crashes per County | | | |
|---|---|---|---|
| | Bay | Midland | Saginaw |
| 2005 | 3,317 | 2,531 | 6,731 |
| 2006 | 3,134 | 2,476 | 5,996 |
| 2007 | 3,073 | 2,725 | 6,309 |
| 2008 | 3,115 | 2,665 | 6,206 |
| 2009 | 3,127 | 2,700 | 5,868 |
| 2010 | 2,963 | 2,668 | 5,874 |
| 2011 | 2,900 | 2,661 | 5,566 |
| 2012 | 2,654 | 2,608 | 5,086 |
| 2013 | 2,879 | 2,655 | 5,650 |
| 2014 | 2,855 | 2,472 | 5,288 |

Source: Michigan Office of Highway Safety Planning - Michigan Traffic Crash Facts

# Emergency and Security Planning

Two of the eight federally adopted planning factors emphasize the importance of incorporating emergency and security planning in maintaining and developing the future transportation system. As a result, MATS has adopted goals and objectives for its own network which are relevant to this endeavor.

## Emergency Management

As defined by the Federal Highway Administration, emergency management is "the continuous process by which all individuals, agencies, and levels of government manage hazards in an effort to avoid or reduce the impact of disasters result from the hazards". There are four phases of emergency management:

- **Mitigation:** Action taken to prevent hazards from developing into disasters, or to reduce the effects or mitigate the consequences of disasters when they occur.
- **Preparedness:** In this phase, emergency managers develop plans of action for implementation when a disaster strikes.
- **Response:** Governments taking direct action to save lives, protect property, care for victims, and mitigate the amount of damage.
- **Recovery:** These efforts are primarily concerned with actions that involve rebuilding destroyed property, re-employment, and the repair of other essential infrastructure.

Within the MATS area, the Midland County Office of Emergency Management acts as the emergency management coordinator in order to prepare the community for disasters. Midland County follows guidance provided by the Federal Emergency Management Agency (FEMA) and the Michigan State Police Emergency Management and Homeland Security Division. This allows Midland County and MATS to be informed of regulatory and program changes, homeland security initiatives, advances in technology, as well as lessons learned from disasters in other parts of the United States.

## Security Planning

As recommended by the FHWA, transportation planning groups should include non-traditional members such as law enforcement, fire, emergency medical services, and emergency management agency representatives. Involving these agencies can provide recommendations to improve how a project is designed and constructed. Also, specific questions can be asked as a project is planned, which can help mitigate potential threats or hazards and seek a final design that incorporates security measures.

The Federal Highway Administration has prepared a chart which outlines steps for security planning and how they can be integrated into the transportation planning process. Below is a summary of key concepts taken from the chart - the column on the left provides a set of steps that should be utilized to help integrate security planning in the traditional planning steps listed on the right. Each planning step notes in bold the relevant security step.

Exhibit 26 - Transportation Security Planning

| Security Steps | Project Steps |
|---|---|
| *A. Security Advisory Team*<br>*B. Threat Assessment and Hazard Analysis* | *1. System Analysis -*<br>*Determine need for a new project (A)* |
| *C. Threat and Hazard Mitigation Strategies* | *2. Project Identification -*<br>*Location, purpose, access, funding source (B, C, D, F)* |
| *D. Incorporate Security Requirements* | *3. Project Planning -*<br>*Review and approval of project (C, F, G)* |
| *E. Develop Contract Language with Security in Mind* | *4. Project Programming -*<br>*Added to MPO TIP, then STIP (C, F)* |
| *F. Conduct Security Reviews*<br>*G. Develop Scope of Work*<br>*H. Conduct Planning and Rehearsals* | *5. Preliminary Design -*<br>*Initial risk assessment (D, E, F, G, H)*<br>*6. Environmental Review - (D, F)*<br>*7. Final Design - (D, F, G)*<br>*8. Acquisition and Contracting -*<br>*Acquiring ROW and construction firm (F)*<br>*9. Project Construction - (A)*<br>*10. Project Acceptance - (F, H)* |

Source: Federal Highway Administration

# Other Factors Affecting Regional Transportation

## Aging Population

As the average age of the country's population continues to increase, the transportation needs of older residents becomes significantly more important. Within the MATS area, this trend becomes very evident when analyzing the US Census Bureaus statistics on total population per age group. When comparing data from 2000 to 2014 regarding Midland County, there has been an increase to all age groups 45 and above while age groups 44 and below (except 20-24 year olds) have decreased. The overall median age during this same time period has also increased by approximately 4 years.

Examining this data makes it clear that alternatives to personal vehicles for those unable to drive must be provided. Transit services serve as a possible choice to accommodate older residents living independently for needs such as medical appointments and groceries. It is also important to mention that those with disabilities benefit similarly from these services. In order to enhance multi-modal options, primarily door-to-door services, these concerns must be addressed through various transit planning efforts. MATS must continue to participate with groups that focus on the needs of older residents who have limited mobility and are no longer able to transport themselves.

Exhibit 27 - Midland County's Aging Population

| 2000 Census | | |
|---|---|---|
| Total population | 82,874 | 100.0% |
| Under 5 years | 5,348 | 6.5% |
| 5 to 9 years | 6,446 | 7.8% |
| 10 to 14 years | 6,657 | 8.0% |
| 15 to 19 years | 6,287 | 7.6% |
| 20 to 24 years | 4,704 | 5.7% |
| 25 to 34 years | 10,332 | 12.5% |
| 35 to 44 years | 13,874 | 16.7% |
| 45 to 54 years | 11,801 | 14.2% |
| 55 to 59 years | 4,165 | 5.0% |
| 60 to 64 years | 3,285 | 4.0% |
| 65 to 74 years | 5,330 | 6.4% |
| 75 to 84 years | 3,468 | 4.2% |
| 85 years and over | 1,177 | 1.4% |
| | | |
| Median age (years) | 36.3 | |

| 2014 American Community Survey | | |
|---|---|---|
| Total population | 83,620 | 100.0% |
| Under 5 years | 4,481 | 5.4% |
| 5 to 9 years | 5,436 | 6.5% |
| 10 to 14 years | 5,472 | 6.5% |
| 15 to 19 years | 5,965 | 7.1% |
| 20 to 24 years | 5,435 | 6.5% |
| 25 to 34 years | 9,418 | 11.3% |
| 35 to 44 years | 10,234 | 12.2% |
| 45 to 54 years | 13,000 | 15.5% |
| 55 to 59 years | 6,362 | 7.6% |
| 60 to 64 years | 4,884 | 5.8% |
| 65 to 74 years | 6,807 | 8.1% |
| 75 to 84 years | 4,365 | 5.2% |
| 85 years and over | 1,761 | 2.1% |
| | | |
| Median age (years) | 40.7 | |

Source: U.S. Census Bureau

## Enhancing Livability

Like many places across the United States, there is a clear effort within the MATS area to maintain and strengthen the community's overall quality of life. Agencies within MATS' boundaries take this a step further through the various activities and programs held that establish an incredibly unique and livable community. Whether it is participating in the ongoing revitalization process of the City of Midland's downtown or attending a Great Lakes Loons minor league baseball game, there is a wide variety of events the public is encouraged to engage in that support this efforts success. Since there are an abundance of activities which build upon this movement, a list has been provided to mention some of significance:

- City of Midland's downtown Streetscape redevelopment
- Nearby Universities - CMU, SVSU, Davenport and Northwood
- City of Auburn's Farmers Market improvements
- City of Midland Safe Community designation to address fire and fall safety for seniors, drug abuse, and mental health
- Midland Community Bike Tours to promote cycling safety
- Midland County Courthouse renovations to improve access, increase security
- Art Wave collaboration to promote art and entertainment for the GLRB
- Midland STEM elementary school opening in 2017 (third in the country)

Recognizing that transportation plays a vital role both directly or indirectly regarding these activities, it is crucial for MATS to assist the continuous initiative of enhancing livability. Not only should MATS support these agencies and programs, but the MPO must ensure that transportation investments it facilitates improve quality of life as well. This understanding guided the establishment of MATS 2045 LRTP vision; MATS strives for a safe and efficient transportation system which promotes the region's attractiveness to live, work, and visit.

## Restructuring of the Dow Chemical Company

In December 2015, the Dow Chemical Company (Midland County's largest employer) announced its planned merger with the DuPont Company headquartered in Wilmington, Delaware. The announcement also included Dow Chemical's acquisition of the Dow Corning Corp. (Midland County's third largest employer). If approved, the combined company (to be named DowDuPont) is expected to separate into three independent companies including an agricultural company, a material science company, and a specialty products company. It has been proposed that at least one of these companies will be headquartered in Midland.

As this restructuring process has proceeded, further announcements have been made. On June 1, 2016, the Dow Chemical Company acquired full ownership of Dow Corning. On July 20, 2016, both Dow and DuPont stockholders officially approved the proposed merger. While the details of this transition have become more official, many residents in the Great Lakes Bay Region (GLBR) have raised concerns regarding the effect the merger will have on employment as well as the local community. Dow announced in June 2016 that potentially 700 jobs in the region, or roughly 1.2% of its global workforce but 8% of Michigan employees, would be cut. However, Dow is working in partnership with several local organizations to minimize the impact of job losses.

Once finalized, the effect this restructuring process will have on the GLBR and MATS area is uncertain. Collection and monitoring of area data, including socio-economic data, will occur as MATS continues to plan transportation improvements.

## MBS Airport Master Plan

With an FAA Classification as a Primary Service Non-Hub Airport, MBS' future plans interconnect with those of the greater MATS area. Access to the airfield, as well as the land uses around it, will greatly influence the usability of the airport as well as the traffic levels on surface streets in the vicinity.

Business growth has been occurring in the vicinity of the airport, particularly near US-10 toward Midland. The growth is attributed to multiple new businesses in the vicinity of US-10, as well as increased enrollment in the nearby Delta College and Saginaw Valley State University. With this growth, the roadway system will require upgrades to meet demand.

To better understand these impacts, MATS staff reviewed the nearly complete Airport Master Plan. The primary focus of the plan is of course the on-site infrastructure related to aviation, but roads play a key role in access to those facilities. As noted in the Bay City Area Transportation Study LRTP,

> "In 2012, MBS International Airport completed construction on their new terminal. The cost to build the terminal was approximately $55 million. This new terminal should meet the aerial needs for the region for the next 40-50 years and will improve the efficiency for air transportation for both the passengers and carriers. With this new terminal, improvement may also be on the way for Garfield Road from US-10 to MBS, the main access road to the new terminal from the north. Currently, the road is a two-lane, rural route and is operating under capacity. There are several safety issues along the route including large drainage ditches and during the winter months, wind driven snow and the mix of jurisdictional snow removal timing becomes an issue. This corridor will likely be studied in the future for possibly airport related development as the new terminal comes on line."

This correlates with an interchange study conducted in 2004 for US-10 corridors in Bay County. According to MDOT, the Garfield Road interchange of US-10 "has the geometrically sub-standard two-way eastbound US-10 on ramp which involves Fisher Road. As with the Mackinaw Road interchange, this would need to be rectified with an interchange project of any type". . The Study further determined that the modern roundabouts would be the most cost effective with estimated construction costs at $8.6 million.

## Transit Coordination and Personal Mobility Studies

Although public transit options are available in the area, two studies are currently being conducted to take a broader look at personal mobility and how it can be enhanced.

### Midland County Public Transportation Study

As has been mentioned, there are two primary point-to-point public transit providers within Midland County and various private providers such as Senior Services; each of these services operates independently from one another. According to public surveys, public transportation needs are not being met fully or adequately by existing public transportation options.

Due to this perception, a study that focuses primarily on determining and evaluating potential strategies to address those needs and services is being conducted for Midland County.

The purpose of this study is to evaluate and build on the County's current transportation services and create improvement strategies and a plan to implement them. An important aspect includes promoting connectivity collaboration among local and regional agencies (especially for non-emergency medical transportation) while being mindful of fiscal constraints and barriers. This approach will assist in deriving a feasible implementation plan of strategies identified. The *Midland County Public Transportation Study* is in the final stages of development at this point.

Understanding that enhancing public transportation plays a critical role in developing the overall transportation system, MATS will continue to work with transit providers as well as other agencies to narrow deficiency gaps that can be addressed through better planning and coordination.

### Coordinated Mobility Plan, Michigan Prosperity Region 5

Another document that may further address transit and other mobility needs is the regional Coordinated Mobility Plan. As a part of the Governor's statewide Prosperity Initiative, similar plans are being developed for each Prosperity Region across Michigan. MATS is within Prosperity Region 5 which includes Arenac, Bay, Clare, Gladwin, Gratiot, Isabella, Midland and Saginaw Counties. The aim of the Coordinated Mobility Plan was to identify regional mobility needs in Region 5 as well as the actions and strategies to remedy those needs. This results in:

1. An assessment of available services that identifies current transportation providers, both public and private.

2. An assessment of transportation needs for individuals with disabilities and seniors.

3. Strategies, activities, and/or projects to address the identified gaps between current services and needs, and opportunities to achieve efficiencies in service delivery.

4. Priorities for implementation based on resources from multiple program sources, time and feasibility for implementing specific strategies and /or activities identified.

## Momentum Midland projects and related groups

Momentum Midland is an organization that, like the Downtown Development Authority, Chamber of Commerce, and Midland Tomorrow, seeks to improve the community in various development-related ways. One Momentum Midland project that has particular impact, due to its being related to the US-10 Business Route through downtown, is the West Entranceway project. This project has as its goals:

1.Create an updated and attractive entranceway into Downtown Midland from the West.

2.Encourage reinvestment on the east side of the affected block.

3.Attract future investment on additional sites between the high-speed one-ways, Indian and Buttles, in Downtown.

Another project that relates to transportation and livability for the MATS area is a Bike Share System, partially funded through the Midland Community Foundation. This $170,000 project provides community members of all ages, income and ethnicity with access to a sustainable and affordable method of transportation, further promoting community health and wellness.

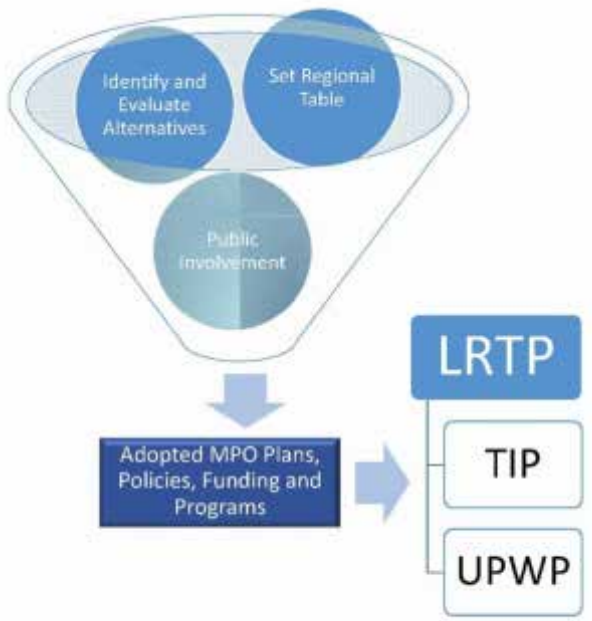
## Other significant proposed road projects

In August of 2015 the Michigan Department of Transportation (MDOT) began a corridor study of the US-10 Business Route from Washington Street to US-10 at Eastman Avenue. The primary objective of their work was to identify potential corridor improvements to US-10 BR that would alleviate traffic congestion, enhance safety, increase connectivity, eliminate barriers for non-motorized transportation, be context sensitive and support economic development.

One aspect of the larger overall study may be implemented as early as 2018. This would place portions of Indian and Buttles streets on a "road diet", essentially reducing the auto-related footprint so as to improve things like walk-ability and inter-connectedness to the downtown area. This is related to the West Entranceway project mentioned above, implemented by Momentum Midland.

## Existence of a Metropolitan Planning Organization

There are recognized benefits which accompany the designation of an MPO, chief among them access to, and eligibility for, funding for infrastructure and other transportation assets, data collection, transportation planning and research. The presence of MPO staff provides resources for coordinating or performing transportation planning activities and studies. Having an MPO promotes the involvement of local elected officials, stakeholders, and the general public in regional planning, that in turn results in policies and actions promoting integrated, modally mixed strategies for greater system efficiency, citizen mobility, and access.



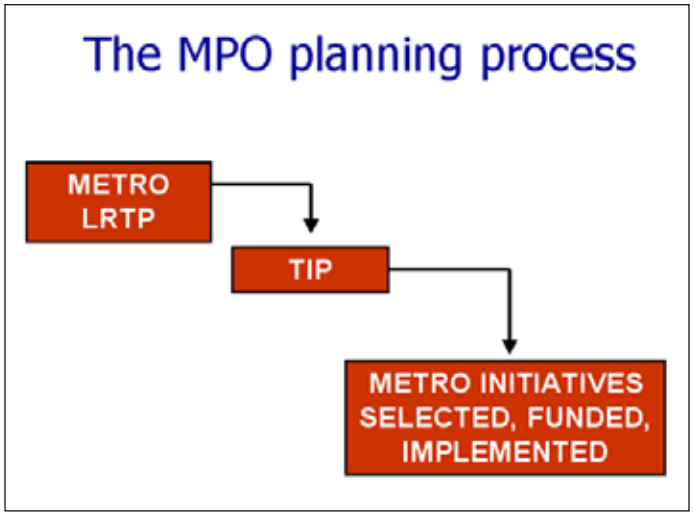

*MPO process informs planning and programming*

This is evident for the Midland area by the ability to leverage local funds with Federal funding for transportation projects. In essence, this local contribution is a match for the federal funds, so for every two dollars of local funds provided more than eight dollars of federal funds are typically available – a 300% return on investment. This leverage is further enhanced due to eligibility for federal funds for design, rights of way and construction projects. A project is required to be programmed in the Metropolitan Transportation Plan and the Transportation Improvement Plan to be eligible for federal funding.

Lastly, all modes of transportation, including streets and highways, public transit, airports, rail, trucking, and non-motorized transportation, are represented at the table with an MPO.

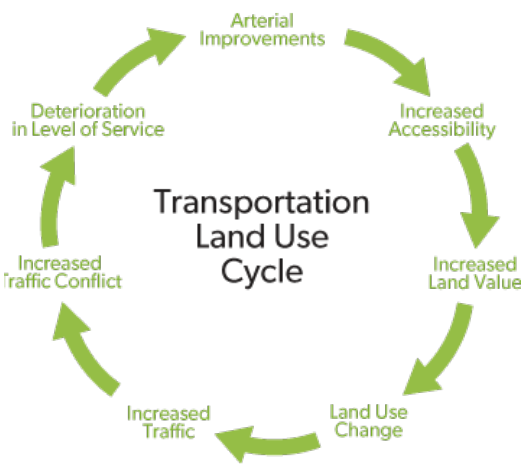
MATS produces an annual document called the Unified Planning Work Program. This is an important document that contains useful information about the MPO's work in the region, including a description of the planning work and resulting products, who will perform the work, time frames for completing the work, the cost of the work, and the source(s) of funds. It helps ensure transparency and accountability with regard to both Transportation planning and the implementation of those plans in the form of transportation projects and ongoing operating assistance for transit.

Together, these aspects of the MPO influence the region's growth patterns by planning for multi-modal transportation choices, including travel by highways, transit, rail, bicycling, and walking; and moving freight by highway, rail, or air. This helps to improve transportation safety for all, and to ensure that the transportation system is adequately maintained.



## Transportation-Land Use Cycle

How we use our land for development impacts our transportation facilities, modes of travel, services and vice versa. This land use-transportation relationship or cycle is illustrated by describing what commonly occurs when a road is built or improved. Land along the road becomes more accessible and thus increased accessibility makes the land more valuable and attractive to developers. As land along the road is developed, traffic volumes and the number of driveways increase. Furthermore, a recent report by the Surface Transportation Policy Project (STPP) found that increasing road capacity leads to increased vehicular traffic loads. The report found that every ten percent (10%) increase in the highway network results in a five point three percent (5.3%) increase in the amount of driving, over and above any increase caused by population growth or other factors.




All this results in more congestion and a deterioration of the road's capacity to efficiently move people and goods. The reduced efficiency of the road eventually necessitates roadway capacity improvements that may encourage additional development and the start of a new cycle. As the graphic below illustrates, this cycle is both dependent upon, and a result of, economic and population growth. It is this cycle that Travel Demand modeling is fundamentally premised upon, i.e. that growth creates more traffic, which creates reductions in the level of service.

Land uses are constantly changing, as both economic and population patterns change. This requires that transportation investments be planned to change with them if new or expanded facilities are required. More often than not, however, existing facilities may be adequate if maintained and rehabilitated in a timely way. The Travel Demand Model will both illuminate, and help us plan for these changes and the choice between new facilities or reinvestment in existing facilities. This can be the result if the significant up-front effort to quantify and geographically locate both population and economic activity is performed.

### Important Note on the Model

It is important to keep in mind that Travel Demand models work best at the regional level of detail. Although detailed volumes for individual segments are an output of the model, these are merely a starting point when additional analysis for a specific project is required. Further, due to factors such as demographic trends and influences, pavement condition, and the fact that some projects simply cannot be modeled at the small scale required to show results, it is a necessarily limited view of one possible path towards future transportation investments in the MATS area.

Although overall growth must be planned for, limited growth like that occurring in the MATS region does not invalidate the use of the Model. It is still an important piece of the Long Range Planning process. By proceeding through the modeling we both better understand the impact of constructing connectivity and/or roadway capacity expansion projects over the Long Range Plan time-frame, and can further identify the effect of those projects on traffic patterns and subsequent connectivity and capacity impacts identified in the model results.

Also, we can see if not constructing capacity expansion projects will affect operations of the transportation system, either positively or negatively. Modeling allows us to see optimal traffic patterns from a regional perspective and propose alternative projects or policies that address any congestion or other issues that may be revealed. Transportation models help to build high-quality multimodal transportation systems, reducing environmental impacts, minimizing traffic congestion and avoiding detrimental, undesirable travel and land use patterns.

A great deal of other information, various other factors, and not least of all public input will come to bear on the eventual list of projects, and the level of expenditures projected in the 2017 - 2045 time frame.

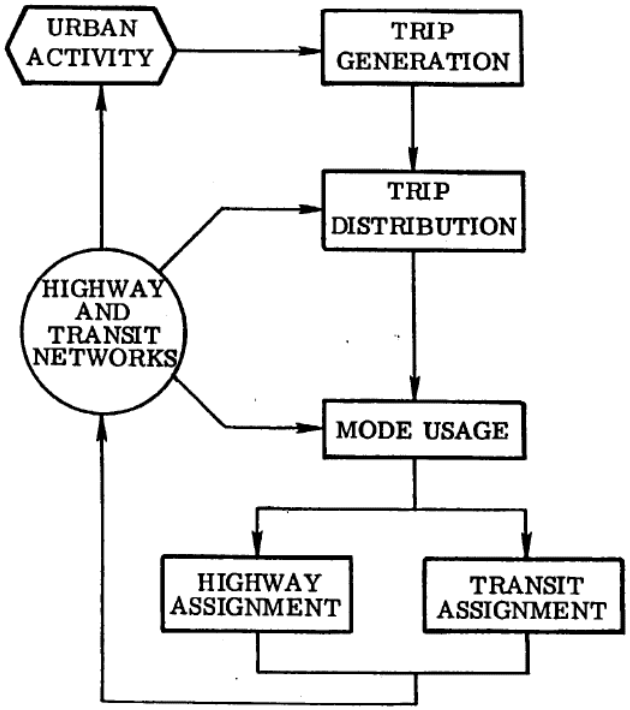
## Methodology of the Travel Demand Model

Travel Demand Forecasting relies on a 4 step approach, broken down as a workflow into approximately 7 operations. Essentially, the four steps of the transportation modeling are:

1)Trip generation determines the frequency of origins or destinations of trips in each zone by trip purpose, as a function of land uses and household demographics, and other socio-economic factors derived from Census data and assigned to what are called Traffic Analysis Zones or TAZ.

2)Trip distribution matches origins with destinations, using a gravity model function, equivalent to an entropy maximizing model.

3)Mode choice computes the proportion of trips between each origin and destination that use a particular transportation mode.




4)Route assignment allocates trips between an origin and destination by a particular mode to a route. Often (for highway route assignment) Wardrop's principle of user equilibrium is applied (equivalent to a Nash equilibrium), wherein each driver (or group) chooses the shortest (travel time) path, subject to every other driver doing the same. The difficulty is that travel times are a function of demand, while demand is a function of travel time, the so-called bi-level problem.

*(Michael G. McNally, 2000. The Four Step Model. In: Handbook of Transport Modeling, ed. David A. Hensher and Kenneth J. Button, 35-52)*

### Model Outputs

As a practical matter, several model outputs are used to assist decision-makers in planning for future transportation improvements. The "existing" scenario, the starting point for the model, is the current road network (simplified) with travel volumes based on the current socio-economic data. The model calibration/validation verifies, for the existing scenario, that the assigned volumes simulate actual traffic counts on the street system.

The "no-build" scenario is presented at the end point of the plan's time frame, called the future year, and at ten year increments between the current and future year. Projected changes to socio-economic data are applied to the model to generate future year traffic assignment and volumes. Forecasted travel is produced by substituting this forecasted socio-economic and transportation system data for the base year data. This supposes that over the model time frame no capacity is added to the network outside of projects that are currently committed to being built.

The model then shows where capacity deficiencies occur, with future year traffic loaded onto the roadway network. Roads are deficient when assigned traffic volumes exceed the link's vehicle capacity for a given time of day. The capacity deficiencies are expressed as a volume to capacity ratio compared to a predetermined benchmark of 0.8. It is important to bear in

mind however that the distinction of v/c ratios being above or below 0.8 is somewhat artificial, and may be more or less appropriate depending on the size of the urbanized area. It must be seen in the context of the whole regional network and associated travel times, as well as the perspective that in urbanized areas delays will happen simply due to the reality of signalized intersections.

Finally, a "build" scenario is presented. This has often meant in the past that deficient segments were built, or other changes were made to the network to directly alleviate the deficiencies identified by the model. These results are then compared to the existing and no-build scenarios. Occasionally, a variety of approaches to alleviating the identified deficiencies are tried, with these results evaluated as well.

## MATS Portion of the Great Lakes Bay Regional Model

Modeling for the MATS region, performed using TransCAD software, was done by MDOT as part of a larger regional model called the Great Lakes Bay Region Model. This includes Midland, Bay, and Saginaw counties, and involved a large amount of coordination and cooperation between MATS, the Bay City Area Transportation Study (BCATS), and the Saginaw Metropolitan Area Transportation Study (SMATS). The modeling process utilized by MDOT is fully documented in the Appendix. Note, however, that the Freeland area is included as part of the SMATS MPO area with results shown in the SMATS LRP. Thus, reproducing those results here would be a duplication of effort.

In Exhibit 28, we can see Existing Scenario Capacity Deficiencies. Only four segments are identified as deficient. Of those four, three have daily deficiencies, shown in red, and one is deficient only during peak hours, shown in blue. By daily deficiencies, we do not mean that the segment is deficient in capacity 24 hours of the day, merely that a significant portion of the peak and off-peak hours exhibit deficiency.

Overall this is a very good result, wherein the model essentially validates our existing experience in higher traffic areas such as near the Midland Mall including the US-10BR and US-10 interchange. We have very few segments showing a deficiency in capacity, and moreover that capacity deficiency is not especially pronounced, being only slightly above the 0.8 threshold.

In Exhibit 29, the 2045 No-Build Scenario Capacity Deficiences are presented, again shown as red for daily deficiencies and blue for peak period only deficiencies. This Future Year scenario is the end product of 2013 traffic volumes plus 32 intervening years of growth. The result is that we still have very few segments that are shown as deficient. This outcome is a consequence of several factors, among them stable, but limited, growth patterns and latent capacity in the existing network.

The segment on Jefferson, just north of US-10, previously shown as deficient only during peak hours, has now grown to a daily deficiency. In addition, only one additional segment is now shown as deficient during peak periods, Joe Mann Blvd between Jefferson and Eastman.

The 2045 Build Scenario is presented in Exhibit 30. This depicts the potential capacity expansion projects that were added to the network, and their effect on travel patterns and operations. This list is the culmination of a process that emphasized projects that were both desired, and feasible to complete in the model time-frame.

The modeling result is that exactly the same segments are shown as deficient as in the No-Build scenario. Although counter-intuitive, this makes sense when viewed in the light of several important reasons. First, the list of modeled Capacity Expansion projects (Exhibit 31) largely focused on connectivity improvements. Second, several improvements were proposed that are not directly model-able, such as turning lanes, signalization improvements, and other intersection upgrades that more effectively tune the inevitable compromise between land use access and through traffic that all roads must address. Last, to directly address the capacity deficiencies for the segments shown for example by adding lanes, is mostly not feasible. This is due to several factors such as lack of available right of way and interference with surrounding land uses.

## Individual Evaluation of Modeled Capacity Expansion Projects

1. A Commerce Drive/Letts extension provides connectivity north of the Mall area. This will allow residents to travel east and west of Eastman and Jefferson if they are not traveling to the mall area. The model shows reduction on the parallel road Monroe and some reduction on Eastman and Jefferson.

2. The Mier Road Extension adds connectivity to the area. It reduced traffic to the south on Meridian and Stark roads and created a path from Meridian to Eastman. It also increased traffic on Hope Road and Saginaw east of Hope Road. However, since Hope road was not in the Base year model this increase is hard to measure and might not be reflected in actual traffic.

3. The bridges and new road connections on S. Alamando Road, Magruder Road, 9 Mile Road and Burns Road all add connectivity to their respective areas and give more direct paths to arterials for residents. They do reduce traffic on some of the existing primary roads due to the creation of more direct paths. They do not affect any of the model deficiencies as they are in more rural areas where no capacity deficiencies were identified. Overall they have a positive effect on the area.

4. The Sugnet road extension will add convenience to the Northwood University and local businesses. It also will reduce traffic a little on the segment of Main Street and Saginaw Road immediately north of the extension.

5. The Ashman and Rodd project increased the V/C as the change will lower the capacity of the roads. However, the new V/C is within a Level of Service C which is generally not perceived as congested by motorists.

6. Garfield Road and Midland Road Center turn lanes reduced the Volume over Capacity ratio (V/C) for both corridors as capacity is added and the volumes remained very similar.

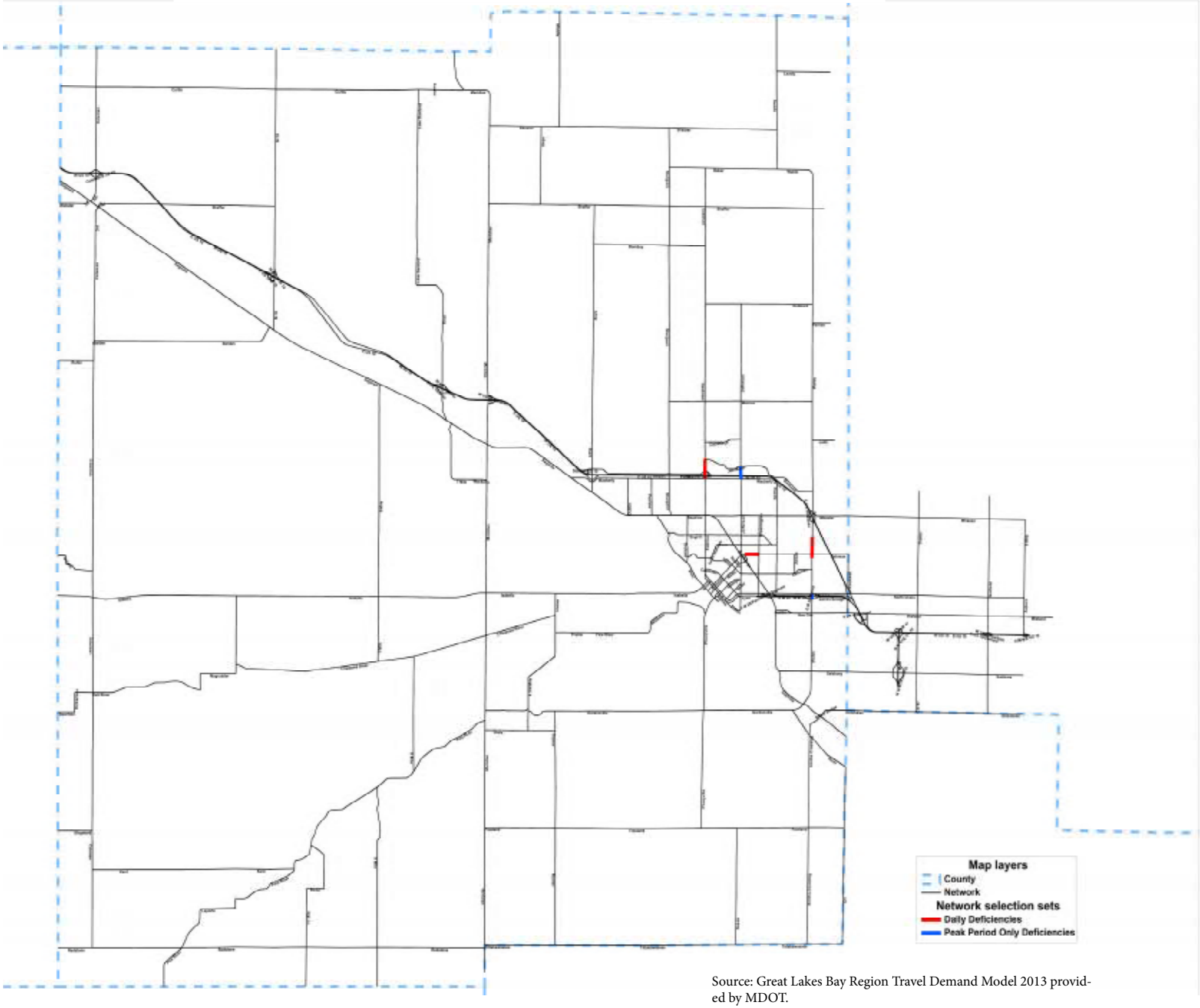
7. The Gordonville Road project was not modeled because of limitations in the model structure in that area would have prevented reliable results.

8. Eastman Road US-10 BR, Airport Rd. to Wackerly Rd. project improvements are turning flares, which will definitely make a difference in the area, but again cannot be modeled using the GLBR travel demand model. It was suggested that the Midland City planners utilize a simulation type of model to evaluate the proposed project.

In reviewing the Existing, Build, and No-Build scenarios, we can see that there is currently very little congestion and few segments with capacity deficiency, in the MATS area overall. Furthermore, adding 30-plus years of growth to the model data produces only slightly more deficiency on existing segments, and adds only one more deficient segment to the list. It is recognized that there are segments that have higher projected traffic volumes, and there are further infrastructure improvements proposed that address these issues. Finally, supplemental detailed analysis was done on segments that exceeded the volume to capacity ratio of 0.8. The results of this can be seen in the appendix.

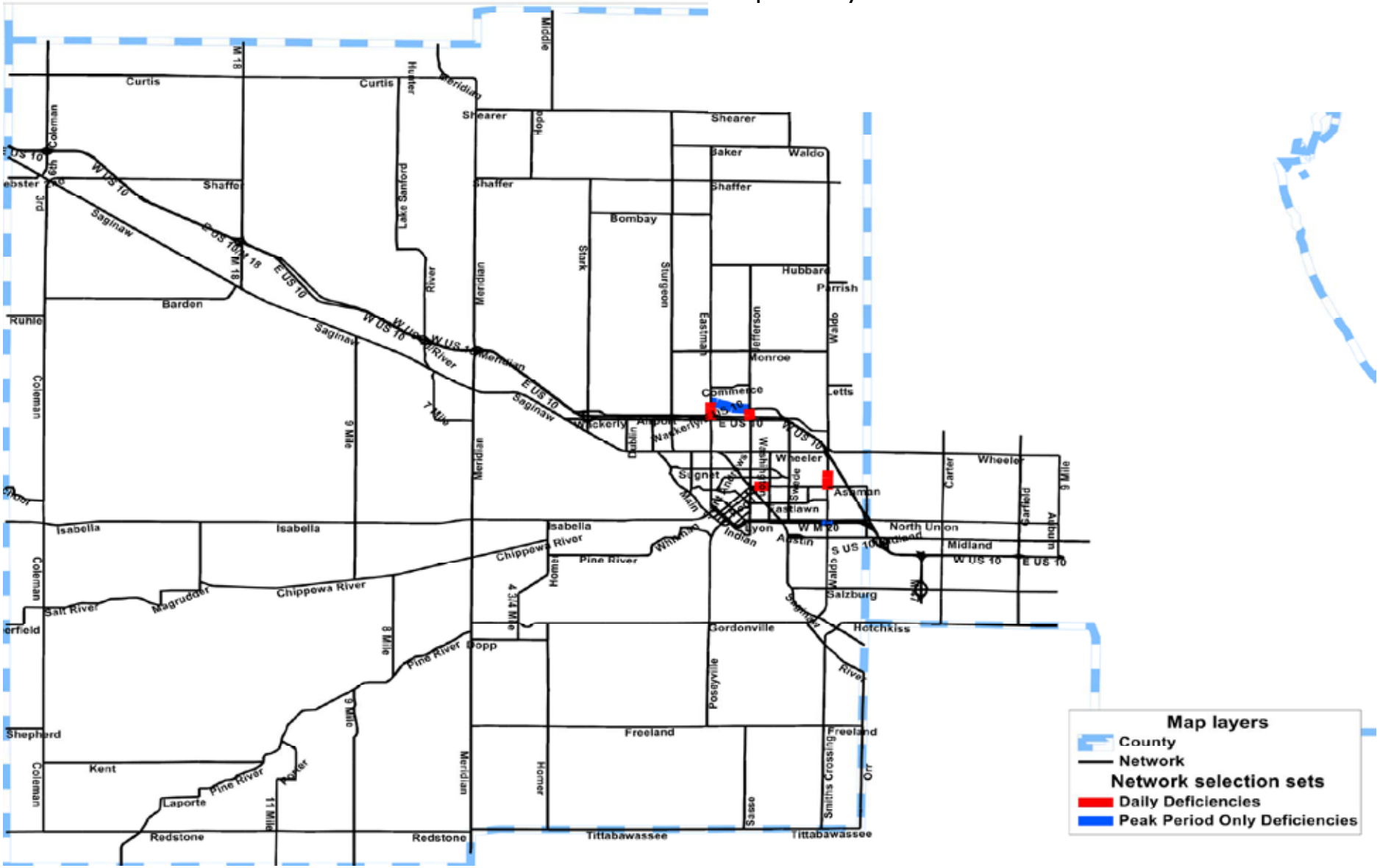
In light of this fact, these potential Capacity Expansion projects were chosen to be evaluated based on a variety of other reasons, as noted in each project's description. They are not intended to directly address the specific locations of capacity deficiency shown on the "No Build" exhibit. Rather, they utilize the overall network analysis capability of the model to evaluate broader-scale impacts of the chosen projects, in conjunction with the identified areas of capacity deficiency.

# Exhibit 28 - 2013 "Existing" Scenario Capacity Deficiencies



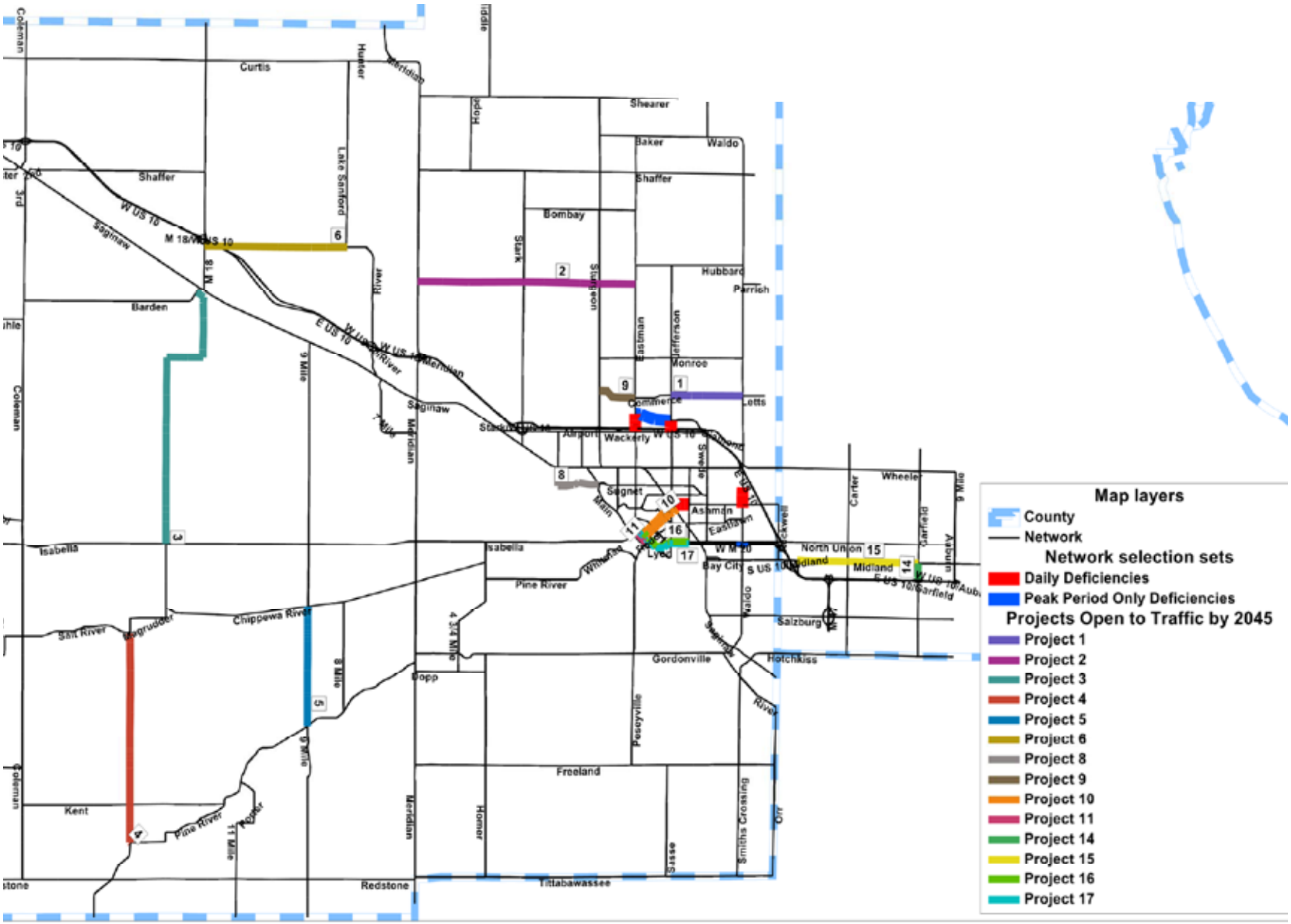

Source: Great Lakes Bay Region Travel Demand Model 2013 provided by MDOT.

# Exhibit 29 - 2045 "No Build" Scenario Capacity Deficiencies




Source: Great Lakes Bay Region Travel Demand Model
2045 No Build Model Results provided by MDOT.

# Exhibit 30 - 2045 "Build" Scenario Capacity Deficiencies & Potential Capacity Expansion Projects




Source: Great Lakes Bay Region Travel Demand Model 2045 Build Model Results provided by MDOT.

## Exhibit 31 - Modeled Potential Capacity Expansion Project List

| Project | Road and Project Limits | Project Description | Completion Year | Present Day Estimate |
|---|---|---|---|---|
| 1 | Letts Road Extension: 1 mile East of Jefferson Avenue to Waldo Avenue | Construct two lanes | 2035 | $2,600,000 |
| 2 | Mier Road Extension: 0.8 miles East of M-30 to N. Dublin Road | Construct two lanes | 2025 | $560,000 |
| 3 | Magruder Road: McNally Road to M-20 | Construct two lanes | 2035 | $2,750,000 |
| 4 | S. Alamando Road: Salt River Road to W. Pine River Road | Construct two lanes and build bridge over Little Salt Creek | 2025 | $3,655,000 |
| 5 | 9 Mile Road: W. Chippewa River Road to W. Pine River Road | Construct two lanes and build bridges over Chippewa River and Little Salt Creek | 2045 | $5,025,000 |
| 6 | Burns Road: M-18 to N. Lake Sanford Road | Construct two lanes and build bridge over Bluff Creek | 2045 | $3,850,000 |
| 7 | *Gordonville Road: Dickenson Road to 10 ½ Mile Road | Construct two lanes | 2035 | $4,775,000 |
| 8 | Sugnet Road Extension: Main Street to Dublin Avenue | Phase 1: Dublin Avenue to Northwood Drive (construct two lanes; completed 2016) Phase 2: Northwood Drive to Main Street (construct two lanes) | 2025 | $1,000,000 (Phase 2) |
| 9 | Commerce Drive Extension: Eastman Avenue to Sturgeon Road | Construct two lanes | 2045 | $2,100,000 |
| 10 | Ashman Street: Ashman Circle to Indian Street | Ashman Circle to Indian St (Reconfigure 3 lanes SB to 1 lane each direction w/center lane; roundabout modifications) | 2035 | $4,850,000 |
| | Rodd Street: Cambridge Street to Indian Street | Cambridge St to Indian St (Reconfigure 3 lanes NB to 1 lane each direction w/center lane) | | |
| 11 | Ashman Street: Indian Street to Ann Street | Indian Street to Ann Street (Reconfigure to 1 lane in each direction) | 2025 | $600,000 |
| | Rodd Street: Indian Street to Wyman Street | Indian Street to Wyman Street (Reconfigure to 1 lane in each direction) | | |
| 14 | Garfield Road: US-10 to Midland Road | Expand from 2 to 3 lanes; add center left turn lane | 2019 | $735,000 |
| 15 | Midland Road: Garfield Road to US-10 Overpass | Expand from 2 to 3 lanes; add center left turn lane | 2035 | $5,900,000 |
| | US-10BR Improvements: Multiple Projects | | | |
| 16,17 | a) Washington Street to Jerome Road | Road Diet on Indian Street and Buttles Street | 2025 | $4,610,000 |
| 18 | b) W. Hines Street to E. Wackerly Street | **Saginaw Road/Eastman Road Intersection Improvements | 2025 | $2,410,000 |
| 12,13 | c) E. Wackerly Street to Airport Road | **Eastman Avenue/Airport Road Intersection Improvements | 2025 | $1,300,000 |
| | | Add thru lane SB Eastman Avenue to Airport Street | | |
| | | Add right turn lane SB Eastman Avenue to Airport Street | | |
| | | Add right turn lane SB Eastman Avenue to US-10 On-Ramp | | |
| | | ** Eastman Avenue/Wackerly Street Intersection Improvements | 2025 | $1,900,000 |
| | | Add right turn lane NB Eastman Avenue to Wackerly Street | | |
| | | Add right turn lane WB Wackerly Street to Eastman Avenue | | |
| | | Add left turn lane EB Wackerly Street to Eastman Avenue | | |

*Cannot be modeled because of calibrated base year traffic analysis zone structure
**Cannot be modeled because of travel demand model limitations (model does not consider turning flares)

## Evidence Base

Thus far we have examined a large amount of data, information and explanations of the process utilized. This is known as the Plan Foundation, or Evidence Base. Through the process, we have defined an overall vision for the plan, i.e. "Striving for a safe and efficient transportation system which promotes the region's attractiveness to live, work, and visit." Through this process, we have arrived at goals and objectives for the MATS area with which to fulfill that vision. These goals are, briefly put:

1. Accessibility and Mobility
2. Safety and Security
3. Integration and Connectivity
4. Operations and System Management
5. Preservation of Transportation System
6. Environmental Protection and Enhancement
7. Economic Vitality

In addition, specific objectives were identified for each goal. These objectives are specific and accomplish-able, and directly support the overall vision for the plan.

*"By asking questions such as 'what should we do in order to …?', and 'what are the consequences of …?', and applying relevant expert knowledge when answering these questions – in dialogue with other actors – planners can contribute to finding ways of solving problems, reaching agreements and achieving defined objectives."*[1]

*1 Tennoy, Hansson, Lissandrello and Naess, 2016*

To accomplish these goals, the existing physical environment, infrastructure, and socio-economic conditions were identified, and reviewed. This was analyzed in conjunction with a travel demand modeling effort to better predict travel patterns for future years. Other plans, for non-motorized and air transport, or other issues, were reviewed and incorporated as well. Finally, proposed project lists were generated and reviewed for applicability and fund-ability.

## Overall Long Range Strategy

The conclusions reached from this process clearly indicated that the existing network was not urgently in need of expansion; that operations, i.e. traffic volumes etc. were overall very good; and that demographic forecasts predicted low but steady growth.

**This resulted in an overall Long Range strategy that focuses on 4 local factors; Preservation, Maintenance, Safety, and Livability.** The implementation plan, i.e. the Prioritized Project List, was then carefully prepared. The Prioritized Projects are primarily infrastructure maintenance and non-motorized facility improvements. They are presented in Chapter 10, and are both fiscally constrained (demonstrated in Chapter 9)and carefully shaped to address and support the vision, goals, and objectives identified as part of this planning process.

In addition, the remainder of the projects that were proposed are listed in Chapter 11, to illustrate the discrepancy between the transportation infrastructure needs and projected available funding.

## Background

A key requirement of the Long Range Transportation Plan and the resultant TIP is that it be fiscally constrained. This means that the total sum of all planned projects cannot exceed the amount of financial resources reasonably expected to be available within the MATS area; this pertains to each individual source of funding. Therefore, it is important that as part of the systematic analysis both the costs and the available financial resources be carefully reviewed.

In addition to those projects which are a result of the Travel Demand model outputs, there are many possible projects that will help meet the Goals and Objectives of this plan. Of course, not all can be funded, so the review and analysis process utilized carefully targeted factors, among them the fiscal constraint requirement, to determine the final list. These projects are constrained to 25-year revenue projections.

This analysis will enable us to better understand the sources and amounts of available revenue, planned expenditures, and how this Long Range Plan meets the regulatory requirement of fiscal constraint. Note however, that revenues for operations and maintenance of the transportation system come primarily from taxes and user fees at the local and state level.

## Sources of Funding

The general sources of transportation funding come from motor fuel taxes and vehicle registration fees. The federal government and the State of Michigan both tax motor fuel. Motor fuel taxes are excise taxes, which means they are a fixed amount per gallon; the tax amount does not increase/decrease with the changing cost of gasoline. Consequently, inflation erodes the purchasing power of the motor fuel tax. The State of Michigan also collects vehicle registration fees annually when motorists purchase license plates or tabs. Vehicle registration fees make up roughly half of the transportation funding collected by the state.

Through the current Federal Surface Transportation Act, the FAST Act, 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, and Rehabilitation Program, among others. The most commonly used Federal-aid programs utilized within the MATS area are summarized herein.

### Federal Funding Sources

#### STBG - Urban (STUL)

The Surface Transportation Block Grant program (STBG) provides flexible funding that may be used by States and localities for projects to preserve and improve the conditions and performance on any Federal-aid highway subject to a local match. The Small MPO program is also funded for areas with populations between 50,000 and 200,000. Therefore, this source of funding is utilized by MATS directly since it is the designated MPO for the Midland Urbanized Area. The current allocation for STUL funding is approximately $800,000 per year.

#### STBG - Rural (STL)

The Rural Surface Transportation Program, via the STBG, works through Rural Task Forces to provide funding for projects. Rural Task Force (RTF) 7C, which includes Midland, Gladwin, Isabella, and Clare Counties, has responsibility for programming transportation projects in the non-metropolitan portion of this region. The Midland County Road Commission is the agency within Midland County that is a part of the Rural Task Force. MDOT distributes funds to each rural task force based on a statewide formula. The distributed funds represent allocation "target" amounts that each task force can use to program projects for the fiscal year.

#### STBG - Transportation Alternatives Set-Aside Program

TA Funds are distributed among states via the STBG. These funds, on a

competitive basis, are eligible for activities that enhance bike and pedestrian facilities, landscaping and streetscaping, historic preservation projects, and some safety improvements, as well as Safe Routes to Schools projects.

### State Trunkline

Funds that the Michigan Department of Transportation spends on highway repairs are not allocated at a specific amount per region. Instead, priorities are set on a statewide basis depending on the conditions of the overall trunkline system. These funds are used for projects including rehabilitation, reconstruction, bridge repair, capacity improvements, or new roads.

### Transit Section 5303

Section 5303 funds are available to carry out the metropolitan transportation planning and programming requirements of the joint FTA/FHWA planning regulations. MATS receives these funds to be utilized for transit planning in the urbanized area, a portion is passed through to the Midland Dial-A-Ride transit agency for that purpose.

### Transit Section 5307

The Federal Transit Administration provides operational and capital assistance to Midland Dial-A-Ride Transportation within the MATS urbanized area. This funding level is currently approximately $715,000 per year.

### Transit Section 5311

This funding source is provided to assist transportation services in non-urbanized areas. The goal is to allocate funds to rural areas with less than 50,000 in population. This allocation is received by the County Connection of Midland and is approximately $470,000 per year.

### Transit Section 5339

This category of federal-aid provides capital funding to replace, rehabilitate, and purchase buses and related equipment and to construct bus related facilities. Both the County Connection of Midland and Dial-A-Ride apply for this type of funding on an annual basis. In 2015, approximately $186,000 in 5339 funding was obligated within the MATS area.

## State Funding Sources

### ACT 51 and Other Funds

The collection of gasoline and diesel fuel taxes in Michigan is regulated under State Act 51 of 1951. The State's current fuel tax is $0.19 per gallon, but is will increase due to recent State legislation. These funds, along with a percentage of vehicle registration fees, are deposited into the Michigan Transportation Fund (MTF). The funds are then distributed to MDOT, county road commissions, cities and villages, and the Comprehensive Transportation Fund (CTF). The CTF helps to fund public transportation systems.

MTF funds are the primary source for making the general 20% local match to 80% federal funds for transportation. They are also utilized for a wide range of transportation projects including maintenance projects. Maintenance projects can be activities such as salt and sand application, snow plowing, lawn moving, and tree trimming related to roadways.

Other State funds include Transportation Economic Development Fund (TEDF), Local Bridge Program, Winter Maintenance, Freight Economic Development Program, and others.

## Local Funding Sources

Cities and villages may provide additional funding for transportation projects at the local level. Primary funding sources include millages (property tax rate), community general funds, contribution from township or county governments, and other sources. Typically, a county road commission will supplement their budget through partnerships with local townships. The amount of funds provided by the local units of government for transportation projects usually varies based on needs. In 2015, approximately $1.6 million of local funding was provided to match federal-aid road and bridge projects and approximately $1.4 million of local funds was provided to match federal-aid transit projects in the MATS area.

# Revenue Forecast and Fiscal Constraint

The revenue forecast for MATS 2045 Long Range Transportation Plan is demonstrated in the table below. This table shows the amount of funding projected to be dedicated to each program, the details of each program can be found in the Appendix. The expenditures identified through the Prioritized Projects in Chapter 10 are not exceeding the total federal, state, and local revenues expected to be available for the 2017-2045 time period.

**Exhibit 32 - 2017 - 2045 Total Revenues for MATS Area (Federal, State, & Local Funding)**

| | | 2017-2025 | 2026-2035 | 2036-2045 | Totals |
|---|---|---|---|---|---|
| 1 | Local STP Urban Program | $13,056,099 | $16,671,361 | $17,812,678 | $47,540,138 |
| 2 | Local STP Rural Program | $6,580,909 | $7,481,866 | $9,484,391 | $23,547,166 |
| 3 | Non- Motorized Program | $1,925,048 | $2,749,312 | $4,329,941 | $9,004,301 |
| 4 | Local Safety Program | $4,412,942 | $3,032,816 | $3,844,550 | $11,290,308 |
| 5 | Local Bridge Program | $5,451,660 | $6,823,835 | $8,650,238 | $20,925,733 |
| 6 | State Preservation and Capacity Program | $106,010,282 | $127,213,924 | $181,290,828 | $414,515,034 |
| 7 | Local Capital MTF & EDD Program | $13,232,536 | $16,652,080 | $20,168,319 | $50,052,935 |
| 8 | State and Local Operations and Maintenance | $124,483,535 | $182,343,415 | $231,147,739 | $537,974,689 |
| 9 | Urban Transit - Operating Program | $20,680,549 | $27,662,099 | $34,110,040 | $82,452,688 |
| | Urban Transit - Capital Program | $1,606,278 | $2,261,487 | $2,756,740 | $6,624,505 |
| 10 | Rural Transit - Operating Program | $24,921,121 | $32,369,717 | $38,530,103 | $95,820,941 |
| | Rural Transit - Capital Program | $1,005,424 | $1,336,535 | $1,629,229 | $3,971,188 |
| Totals | | $323,366,383 | $426,598,447 | $553,754,796 | $1,303,719,626 |

# Legislative Action and Future Funding

Changes in federal and state funding priorities and legislation, the availability of dollars for transportation interests, and constraints at the local level can all influence transportation funding. Increases are possible, however, thanks to a $1.2-billion road funding package passed in late 2015. In 2017 gas taxes will increase 7.3-cents-per-gallon and diesel taxes will increase 12.3-cents-per-gallon bringing both to 26.3-cents per gallon. Fuel tax rate will be indexed to future inflation. These fuel tax increases are projected to bring in an estimated $400 million in new revenue. Another $200 million in new revenue will come from a 20% increase in vehicle registration and new fees on hybrid and electric vehicles, also beginning in 2017. Additionally, the package dedicates general fund money to the highway fund, beginning with $150 million in 2018 and ramping up to $600 million per year from 2020.

# Chapter 10 - Prioritized Projects

As the result of the planning, modeling, and evaluation process, here are the prioritized projects for the years 2017 - 2045. Each has an identified source of funding, thus ensuring a fiscally constrained plan. Though MATS compiled the list of projects with the aid of local agencies, MDOT, and other stakeholders, projects will inevitably arise that were not included in the LRP. Not all projects are listed because a) some sources of funding operate with short time-frames or are competitive sources that are not known more than a year in advance, and b) there are safety or rehabilitation projects that arise from reaction to changing circumstances and traffic patterns. However, fiscal constraint still applies, and therefore expenditures on all projects are limited to those revenues which can be obligated in a given fiscal year. Transit-related projects are not included because they are primarily operating expense and capital acquisition oriented, and consistent year-to-year. It is assumed that future transit projects will utilized available revenues to the full extent.

Presented first are the prioritized projects from the current MATS 2017 - 2020 Transportation Improvement Program (TIP) followed by the prioritized list for the time frame 2021 to 2045. Note that TIP projects are current as of May 2017 in order to finalize the data for LRP publication.

## Exhibit 33 - Prioritized Projects 2017 - 2020

| Year | Agency | Project Name | Limits | Program Type | Cost Estimate |
|---|---|---|---|---|---|
| 2017 | City of Midland | Wackerly Road | Sturgeon Road to Schade Drive | Local STP Urban Program | $370,888 |
| 2017 | City of Midland | East St. Andrews Road | Washington Street to Sugnet Road | Local STP Urban Program | $382,430 |
| 2017 | MDOT | M-20 | 9 Mile Road to Geneva Road | State Preservation and Capacity Program | $2,259,871 |
| 2017 | MDOT | US-10E | US-10 near the US-10BR interchange | State Preservation and Capacity Program | $367,948 |
| 2017 | MCRC | West Pine River Road | Magruder Road to Redstone Road | Local STP Rural Program | $623,983 |
| 2017 | MCRC | Freeland Road | Kane Road to Poseyville Road | Local STP Rural Program | $283,668 |
| 2017 | MCRC | Shearer Road | Sturgeon Road to 1 mile East | Local STP Rural Program | $291,057 |
| 2017 | MCRC | Airport Road | Perrine Road to Hicks Road | Local STP Urban Program | $450,000 |
| 2017 | MDOT | US-10 | 8 Mile Road to Isabella Co. Ln. | State Preservation and Capacity Program | $50,000 |
| 2017 | MCRC | Eastman Road Corridor | Bombay Rd. to Schneider Ct. | Local Safety Program | $699,735 |
| 2017 | MCRC | Gordonville Rd. | 4 3/4 Mile Rd. to Homer Rd. | Local Safety Program | $515,560 |
| 2017/2018 | MDOT | M-20 Bridge ROW Phase | Over Tittabawassee River & CSX Railroad | State Preservation and Capacity Program | $250,000 |
| 2017/2018 | MDOT | M-20 Bridge UTL Phase | Over Tittabawassee River & CSX Railroad | State Preservation and Capacity Program | $650,000 |
| 2017/2018 | MCRC | Eastman Road | Eastman Road/Schaffer Road Int | Local Safety Program | $564,465 |
| 2017/2018 | MCRC | Poseyville Road | Brooks Road to Gordonville Road | Local Safety Program | $880,000 |
| 2018 | City of Auburn | South Auburn Rd. | Jaycee Dr. to Midland Rd. | Local STP Urban Program | $300,000 |
| 2018 | MDOT | M-20 Bridge CON Phase | Over Tittabawassee River & CSX Railroad | State Preservation and Capacity Program | $32,298,640 |
| 2018 | MDOT | M-20 | Geneva Rd. to Isabella Co. Ln. | State Preservation and Capacity Program | $1,884,700 |

| | | | | | |
|---|---|---|---|---|---|
| 2018 | MDOT | US-10BR | Wackerly Road to Airport Road | State Preservation and Capacity Program | $465,783 |
| 2018 | MCRC | Shearer Road | Sturgeon Road to 1 mile West | Local STP Rural Program | $100,000 |
| 2018 | MCRC | Castor Road | Over Big Salt River | Local Bridge Program | $1,507,000 |
| 2018 | MCRC | Saginaw Road | Waldo Road to Saginaw Co. Line | Local STP Urban Program | $412,500 |
| 2018 | MCRC | Saginaw Road | Oak Street to Pinesboro Drive | Local STP Urban Program | $500,000 |
| 2018 | SCRC | Freeland Road/River Road | Freeland Road/River Road Int. (PE only) | Local STP Urban Program | $62,500 |
| 2018 | MCRC | W. Pine River Rd. | Magruder Rd. to Kent Rd. | Local STP Rural Program | $505,256 |
| 2019 | BCRC | Garfield Road | US-10 Off Ramp to Midland Road | Local STP Urban Program | $735,000 |
| 2019 | City of Midland | Saginaw Road | Dartmouth Drive to Patrick Road | Local STP Urban Program | $778,000 |
| 2019 | MCRC | 11 Mile Rd./Odd Rd/Porter Rd. | Redstone Road to West Pine River | Local STP Rural Program | $827,000 |
| 2020 | MCRC | Poseyville Road | Stewart Road to Midland City Limits | Local STP Urban Program | $600,000 |
| 2020 | MCRC | Eastman Road | Commerce Drive to Mier Road | Local STP Urban Program | $960,000 |
| 2020 | MCRC | 3rd Street | Railway to Coleman CL | Local STP Rural Program | $150,000 |
| 2020 | MCRC | Coleman Road | Coleman CL to Burns Road | Local STP Rural Program | $200,000 |
| 2020 | MCRC | Freeland Road | 5 Mile Road to Homer Road | Local STP Rural Program | $92,572 |
| 2020 | MCRC | Salt River Rd/Dickenson Rd/Gordonville Rd | Coleman Road to Co. Line | Local STP Rural Program | $357,500 |

Source: Collected by Midland Area Transportation Study

## Funding our Future

A simultaneous process of assembling prioritized projects lists out of all proposed projects and calculating reasonably expected revenues for each funding category over the period 2017 to 2045 was undertaken by MATS staff. Several iterations of intense and detailed effort were required to equalize the level of funding to the resulting project lists. All planning principles and financial assumptions used to identify federal and state financial resources and investment needs were developed with and reviewed by MATS Committees and federal, and state partners. The Appendix provides detailed revenue and cost projections for each funding category and project list.

## Prioritized Projects

In the list of prioritized projects that follow, two things should be noted. First, that these projects were selected by the MATS Policy committee for a variety of reasons that, taken together, aim to fulfill the goals and objectives of this LRP. This could include projects suggested by the modeling effort, but more often endeavors to deal with the urgent need to preserve and improve the aging transportation infrastructure of the area. Secondly, even though previous plans and studies may have suggested particular projects or improvements, such as in the case of the 2015 Non-Motorized Transportation Plan, other factors such as funding and project time frames may have dictated a differing set of project priorities.

# Exhibit 34 - Prioritized Projects 2021 - 2045

## Capacity Projects

State Preservation and Capacity Program/Local STP Urban Program

| Year | Agency | Project Name | Limits | Future Year Estimate (4% annual inflation) | Present Year Estimate |
|---|---|---|---|---|---|
| By 2025 | City of Midland | Sugnet Road Extension (Urban) | Main Street to Northwood Drive | $1,315,932 | $1,000,000 |
| By 2025 | MDOT/Midland | US-10 BR Modifications | Washington Street to Airport Road | $12,720,000 | $10,700,000 |

## Urban Reconstruction/Rehabilitation Projects

Local STP Urban Program

| Year | Agency | Project Name | Limits | Future Year Estimate (4% annual inflation) | Present Year Estimate |
|---|---|---|---|---|---|
| By 2025 | MCRC | Eastman Road | Blackhurst Road to Hubbard Road | $547,428 | $400,000 |
| By 2025 | MCRC | Bailey Bridge Road | Saginaw Road to Saginaw Co. Line | $615,856 | $450,000 |
| By 2025 | City of Midland | Joe Mann Blvd | Eastman Avenue to Jefferson Avenue | $1,750,674 | $1,230,000 |
| By 2025 | MCRC | Stewart Road | Patterson Road to Poseyville Road | $666,110 | $450,000 |
| By 2025 | MCRC | Waldo Road | Wackerly Road to Monroe Road | $592,098 | $400,000 |
| By 2025 | City of Midland | N. Saginaw Road | Perrine Road to Dublin Road | $2,016,685 | $1,310,000 |
| By 2035 | MCRC | Sturgeon Road | Letts Road to Monroe Road | $480,310 | $300,000 |
| By 2035 | City of Midland | Swede Avenue | Ashman Street to Patrick Road | $1,998,088 | $1,200,000 |
| By 2035 | MCRC | Waldo Road | Monroe Road to Hubbard Road | $865,838 | $500,000 |
| By 2035 | City of Midland | Waldo Road | Wheeler Road to Ashman Street | $1,818,953 | $1,010,000 |
| By 2035 | MCRC | Gordonville Road | Poseyville Road to Saginaw Road | $1,404,736 | $750,000 |
| By 2035 | City of Midland | S. Saginaw Road | Patrick Road to Ashman Street | $5,395,684 | $2,770,000 |
| By 2035 | MCRC | Homer Road | Pine River Road to Olson Road | $2,025,817 | $1,000,000 |
| By 2035 | MCRC | Hope Road | Saginaw Road to Beamish Road | $1,314,674 | $600,000 |
| By 2035 | City of Midland | Sturgeon Avenue | Letts Street to Wackerly Street | $1,367,261 | $600,000 |
| **By 2036** | MCRC | Stark Road | Airport Road to Beamish Road | $829,472 | $350,000 |

# Exhibit 34 Continued

## Rural Reconstruction/Rehabilitation Projects

Local STP Rural Program

| Year | Agency | Project Name | Limits | Future Year Estimate (4% annual inflation) | Present Year Estimate |
|---|---|---|---|---|---|
| By 2025 | MCRC | Gordonville Road | Meridian Road to 4 3/4 Mile Road | $185,031 | $125,000 |
| By 2025 | MCRC | 4 3/4 Mile Road | Gordonville Road to Pine River Road | $148,024 | $100,000 |
| By 2025 | MCRC | Shaffer Road | E. Coleman CL to M-18 | $666,110 | $450,000 |
| By 2025 | MCRC | Adams Street/2nd Street/Jefferson Street | 3rd Street to E. Coleman CL | $118,420 | $80,000 |
| By 2025 | MCRC | Coleman Road | M-20 to Huckleberry Road | $370,061 | $250,000 |
| By 2025 | MCRC | Dopp Road | Meridian Road to Homer Road | $296,049 | $200,000 |
| By 2025 | MCRC | Poseyville Road | Gordonville Road to Freeland Road | $444,073 | $300,000 |
| By 2025 | MCRC | W. Pine River Rd./Pine River Road | Kent Road to 8 Mile Road | $473,678 | $320,000 |
| By 2025 | MCRC | Chippewa River Road | Magruder Road to 11 Mile Road | $355,259 | $240,000 |
| By 2025 | MCRC | Ruhle Road/Coleman Road | Isabella Co. Line to Burns Road | $444,073 | $300,000 |

## Non-Motorized Projects

Non-Motorized Program

| Year | Project Name | Limits | Project Details | Future Year Cost Estimate (4% annual inflation) | Current Year Cost Estimate |
|---|---|---|---|---|---|
| By 2025 | Monroe Road/Jefferson Avenue | Eastman Road to Joseph Drive | 4' paved shoulders used by cyclists (PS1); bike route signage | $438,048 | $405,000 |
| By 2025 | Eastman Road | Commerce Drive to Mier Road | 4' paved shoulders used by cyclists (PS2); bike route signage | $1,169,859 | $1,000,000 |
| By 2025 | M-30 Rail Trail Connector | M-30 Rail Trail Connector | Separated multi-use path | $148,024 | $100,000 |
| By 2035 | Jefferson Ave/Hurley Rd/Eastman Rd/ Baker Rd/Sturgeon Rd/Shearer Rd | Monroe Road to Midland-Mackinac Trail | 4' paved shoulders used by cyclists (PS1); bike route signage | $1,776,293 | $1,200,000 |
| By 2035 | Eastman Multi-use Pathway | Midland Mall to Buttles | Separated multi-use path OR 5ft walkway west side | $973,019 | $300,000 |
| **By 2045** | Poseyville Road/Gordonville Road/ Saginaw Road | Ashby Road to M-47 | 4' paved shoulders used by cyclists (PS2); bike route signage | $2,960,489 | $2,000,000 |
| **By 2045** | Badour Road/Stewart Road | Gordonville Road to Poseyville Road | 4' paved shoulders used by cyclists (PS2); bike route signage | $1,369,452 | $625,000 |

## Unfunded List of Projects

The large number of projects below illustrates dramatically the level of deficient transportation infrastructure and the discrepancy between those needs and the available funding. While the previous table showed the application of the principle of fiscal constraint, the needs of the transportation system substantially outweigh the funding available to address them. Therefore, this plan also lists priorities and projects that exceed the currently available funding, in case other funding becomes available. The following tables in this chapter are projects that did not make the prioritized (funded) project list. If more funding does become available these projects are among those that should be considered. Also shown in the extensive tables is a comparison between the estimated present cost of the project and a projection of the increased cost in the future.

Finally, it should be noted that some of these projects are the result of the model process, while many are also the result of various other planning efforts. In addition, there are projects which were not included on either list. Among those is the Waldo Rd./U.S. 10 interchange with predicted regional traffic congestion relief (including the Eastman Road corridor) provided by adding the final two ramps. That interchange currently provides no re-entry for eastbound traffic and no off-ramp for westbound traffic. This project has feasibility and cost issues related to right of way and geometry however.

**Exhibit 35 - Unfunded, Needed Urban/Rural Capacity Projects**

| Year | Agency | Project Name | Limits | Future Year Estimate (4% annual inflation) | Present Year Estimate |
|---|---|---|---|---|---|
| By 2025 | MCRC | Mier Road (Rural) | 0.8 miles East of M-30 to N. Dublin Road | $828,937 | $560,000 |
| By 2025 | MCRC | S. Alamando Road (Rural) | Salt River Road to W. Pine River Road | $5,410,293 | $3,655,000 |
| By 2025 | City of Midland | Ashman Street/Rodd Street (Urban) | Indian St to Ann St/Indian St to Wyman St | $888,147 | $600,000 |
| By 2025 | City of Midland | Eastman Avenue/Airport Road (Urban) | Intersection Improvements - Phase 1 | $1,924,318 | $1,300,000 |
| By 2035 | MCRC | Letts Road Extension (Urban) | 1 mile East of Jefferson Ave to Waldo Rd | $5,696,920 | $2,600,000 |
| By 2035 | MCRC | Magruder Road (Rural) | McNally Road to M-20 | $6,025,589 | $2,750,000 |
| By 2035 | MCRC | Gordonville Road (Rural) | Dickenson Road to 10 1/2 Mile Road | $10,462,613 | $4,775,000 |
| By 2035 | City of Midland | Ashman Street/Rodd Street (Urban) | Ashman Circle to Indian St/Cambridge St to Indian | $10,626,947 | $4,850,000 |
| By 2035 | City of Midland | Eastman Avenue/Wackerly Street (Urban) | Intersection Improvements - Phase 2 | $4,163,134 | $1,900,000 |
| By 2035 | BCRC | Midland Road (Urban) | Garfield Road to US-10 Overpass | $12,927,627 | $5,900,000 |
| By 2045 | MCRC | 9 Mile Road (Rural) | W. Chippewa River Rd to W. Pine River Rd | $11,854,618 | $3,655,000 |
| By 2045 | MCRC | Burns Road (Rural) | M-18 to N. Lake Sanford Road | $12,487,080 | $3,850,000 |
| By 2045 | City of Midland | Commerce Drive Extension (Urban) | Eastman Avenue to Sturgeon Road | $6,811,135 | $2,100,000 |

## Unfunded, Needed Urban Reconstruction/Rehabilitation Projects

| Year | Agency | Project Name | Limits | Future Year Estimate (4% annual inflation) | Present Year Estimate |
|---|---|---|---|---|---|
| By 2025 | City of Midland | Diamond Drive | Joseph Drive to Waldo Avenue | $2,264,774 | $1,530,000 |
| By 2025 | City of Midland | Eastman Avenue | Joe Mann Blvd to US-10 Ramps | $932,554 | $630,000 |
| By 2025 | City of Midland | Jefferson Avenue | Wackerly Street to Ashman Street | $3,493,377 | $2,360,000 |
| By 2025 | City of Midland | Main Street | N. Saginaw Road to Orchard Drive | $2,175,959 | $1,470,000 |
| By 2025 | City of Midland | N. Saginaw Road | Ashman Street to Wheeler Road | $3,345,352 | $2,260,000 |
| By 2025 | City of Midland | Orchard Drive | Saginaw Road to Main Street | $1,687,478 | $1,140,000 |
| By 2025 | City of Midland | S. Saginaw Road | Waldo Road to Bay City Road | $6,039,397 | $4,080,000 |
| By 2025 | City of Midland | St. Andrews Road | Orchard Drive to Plymouth Street | $5,358,484 | $3,620,000 |
| By 2025 | City of Midland | Wackerly Road | Sturgeon Road to Jefferson Avenue | $3,611,796 | $2,440,000 |
| By 2025 | City of Midland | Washington Street | Adams Street to Wheeler Road | $473,678 | $320,000 |
| By 2025 | City of Auburn | Midland Road | Garfield Road to Price Street | $790,450 | $534,000 |
| By 2025 | City of Auburn | Midland Road | Price Street to City Limits (east) | $932,554 | $630,000 |
| By 2025 | BCRC | Garfield Road | US-10 to Salzburg Road | $3,256,537 | $2,200,000 |
| By 2035 | City of Midland | Ashman Street | Anne Street to N. Saginaw Road | $3,637,264 | $1,660,000 |
| By 2035 | City of Midland | Ashman Street | Swede Avenue to Waldo Avenue | $2,629,348 | $1,200,000 |
| By 2035 | City of Midland | Bay City Road | S. Saginaw Road to US-10 Ramps | $11,108,994 | $5,070,000 |
| By 2035 | City of Midland | Carpenter Street | Eastman Avenue to Jefferson Avenue | $3,374,330 | $1,540,000 |
| By 2035 | City of Midland | Dublin Avenue | Wackerly Street to Sugnet Road | $3,374,330 | $1,540,000 |
| By 2035 | City of Midland | Eastlawn Drive | Jefferson Avenue to Waldo Avenue | $5,412,074 | $2,470,000 |
| By 2035 | City of Midland | George Street | Poseyville Bridge to Collins Street | $1,796,721 | $820,000 |
| By 2035 | City of Midland | Haley Street | Buttles Avenue to Swede Avenue | $4,250,779 | $1,940,000 |
| By 2035 | City of Midland | Jefferson Avenue | Commerce Drive to Wackerly Street | $2,629,348 | $1,200,000 |
| By 2035 | City of Midland | Jefferson Avenue | Ashman Street to Austin Street | $3,768,732 | $1,720,000 |
| By 2035 | City of Midland | Joseph Drive | Jefferson Avenue to Diamond Drive | $2,191,123 | $1,000,000 |
| By 2035 | City of Midland | N. Saginaw Road | Eastman Avenue to Perrine Road | $6,617,192 | $3,020,000 |
| By 2035 | City of Midland | Nelson Street | Ashman Street to Jefferson Avenue | $832,627 | $380,000 |
| By 2035 | City of Midland | Patrick Road | S. Saginaw Road to Rockwell Road | $6,025,589 | $2,750,000 |
| By 2035 | City of Midland | Perrine Road | Wackerly Street to N. Saginaw Road | $2,519,792 | $1,150,000 |
| By 2035 | City of Midland | Rodd Street | Main Street to Cambridge Street | $3,615,353 | $1,650,000 |

| | | | | | |
|---|---|---|---|---|---|
| By 2035 | City of Midland | Stark Street | Wackerly Street to N. Saginaw Road | $657,337 | $300,000 |
| By 2035 | City of Midland | Sturgeon Avenue | Wackerly Street to N. Saginaw Road | $2,519,792 | $1,150,000 |
| By 2035 | City of Midland | Sugnet Road | Main Street to Swede Avenue | $8,326,268 | $3,800,000 |
| By 2035 | City of Midland | Swede Avenue | Wackerly Street to Ashman Street | $4,973,850 | $2,270,000 |
| By 2035 | City of Midland | Wackerly Road | Stark Road to Sturgeon Road | $5,762,654 | $2,630,000 |
| By 2035 | City of Midland | Waldo Road | Ashman Street to Salzburg Road | $7,033,505 | $3,210,000 |
| By 2035 | City of Midland | Washington Street | Wheeler Road to Ashman Street | $2,432,147 | $1,110,000 |
| By 2035 | City of Midland | Wheeler Road | N. Saginaw Road to US-10 Ramps | $7,208,795 | $3,290,000 |
| By 2035 | City of Auburn | Auburn Road | Midland Road to Railroad Tracks (north) | $444,798 | $203,000 |
| **By 2045** | City of Midland | Ashman Street | N. Saginaw Road to Swede Avenue | $3,956,945 | $1,220,000 |
| **By 2045** | City of Midland | Commerce Drive | Eastman Avenue to Elisenal Drive | $1,264,925 | $390,000 |
| **By 2045** | City of Midland | Fast Ice Drive | Bay City Road to Rockwell Road | $2,529,850 | $780,000 |
| **By 2045** | City of Midland | Main Street | Orchard Drive to Jerome Street | $3,048,794 | $940,000 |
| **By 2045** | City of Midland | N. Saginaw Road | Wheeler Road to Eastman Avenue | $1,848,737 | $570,000 |
| **By 2045** | City of Midland | S. Saginaw Road | Bay City Road to Patrick Road | $3,665,039 | $1,130,000 |
| **By 2045** | City of Midland | Wackerly Road | Jefferson Avenue to Swede Avenue | $4,021,813 | $1,240,000 |
| **By 2045** | City of Midland | Washington Street | Ashman Street to Patrick Road | $4,346,153 | $1,340,000 |

## Unfunded, Needed Rural Reconstruction/Rehabilitation Projects

| Year | Agency | Project Name | Limits | Future Year Estimate (4% annual inflation) | Present Year Estimate |
|---|---|---|---|---|---|
| By 2025 | MCRC | Eastman Road | Hurley Road to Baker Road | $592,098 | $400,000 |
| By 2025 | MCRC | Olson Road | 5 Mile Road to Homer Road | $148,024 | $100,000 |
| By 2025 | MCRC | W. Kent Road | Coleman Road to Alamando Road | $177,629 | $120,000 |
| By 2025 | MCRC | Tittabawassee Road | Sasse Road to Saginaw CO. Line | $444,073 | $300,000 |
| By 2035 | MCRC | S. Alamando Road | Pine River Road to Kent Road | $438,225 | $200,000 |
| By 2035 | MCRC | S. Alamando Road | Kent Road to Little Salt River Road | $657,337 | $300,000 |
| By 2035 | MCRC | S. Magruder Road | M-20 to 1.5 miles North | $657,337 | $300,000 |

# Unfunded, Needed Non-Motorized Projects

| Year | Project Name | Limits | Project Details | Future Year Cost Estimate (4% annual inflation) | Current Year Cost Estimate |
|---|---|---|---|---|---|
| 2017/2018 | Joseph Dr/Diamond Dr | Jefferson Ave to Waldo Rd | 2017: 4ft paved shoulder Waldo to Soccer<br>2018: Dedicated bike lane within | $10,816 | $10,000 |
| by 2020 | Commerce Dr/Elisenal Dr/Mall Dr: Cinema Dr to Eastman Rd | Cinema Dr to Eastman Rd | Dedicated bike lane within roadway | $4,679 | $4,000 |
| by 2025 | Sturgeon Rd/Monroe Rd: US-10 to Eastman Rd | US-10 to Eastman Road | 4' paved shoulders used by cyclists (PS1); bike route signage | $666,110 | $450,000 |
| by 2025 | Wackerly Street | Siebert St to Jefferson Ave | Shared road with bike signage | $1,480 | $1,000 |
| by 2025 | Sugnet Road | Northwood Dr to Main St | Dedicated bike lane within roadway | $2,960 | $2,000 |
| by 2025 | West River Rd/Burns Rd/ Sanford Lk Rd | US-10 to Curtis Rd | 4' paved shoulders used by cyclists (PS1); bike route signage | $1,776,293 | $1,200,000 |
| by 2025 | Curtis Rd/Water Rd/Star Rd | Lake Sanford Road to M-30 | Shared road with bike signage | $9,622 | $6,500 |
| by 2025 | M-30 | Stark Rd to Saginaw Rd | Separated multi-use path | $2,146,354 | $1,450,000 |
| by 2025 | Saginaw Road | Sanford Park to M-30 | Separated multi-use path | $429,271 | $290,000 |
| by 2025 | Stratford Woods Connector | Stratford Woods Connector | Stratford Woods Connector | $222,037 | $150,000 |
| by 2025 | Downtown NMT Modifications | Ashman/Rodd/ McDonald/ Buttles/Indian | Downtown NMT Modifications | $148,024 | $100,000 |
| by 2025 | Tittabawassee River Trail | Tittabawassee Twp Park to Festival Park | Separated multi-use path | $429,271 | $290,000 |
| by 2035 | Commerce/Letts | Elisenal Drive to Jefferson | Dedicated bike lane within roadway | $8,764 | $4,000 |
| by 2035 | Homer Road/Prairie Road | M-20 to Badour Road | 4' paved shoulders used by cyclists (PS2); bike route signage | $1,095,562 | $500,000 |
| by 2035 | Patterson Road | Brooks Rd to Pine River Rd | 4' paved shoulders used by cyclists (PS2); bike route signage | $2,191,123 | $1,000,000 |
| by 2035 | North Union Rd/Garfield Rd/Midland Rd | Stratford Woods Conn to 4 Mile | Separated multi-use path | $4,447,980 | $2,030,000 |
| by 2035 | Eastman Road | Mier Rd to Hurley Rd | 4' paved shoulders used by cyclists; bike route signage | $547,781 | $250,000 |
| by 2035 | Waldo Road/Monroe Road | Wackerly Rd to Jefferson Ave | 4' paved shoulders used by cyclists (PS2); bike route signage | $2,191,123 | $1,000,000 |
| **by 2045** | Northeast Section of Midland Loop MUP | Stratford Woods to Jefferson Ave | Separated multi-use path | $2,821,756 | $870,000 |
| **by 2045** | Northwest Section of Midland Loop MUP | Airport Rd/Mall Dr - Dublin Ave to Cinema Dr | Dedicated bike lane within roadway | $51,894 | $16,000 |
| **by 2045** | Dublin Avenue/Tittabwassee River Road Loop | Saginaw Rd to Saginaw Rd | 4' paved shoulders used by cyclists (PS1); bike route signage | $2,432,548 | $750,000 |
| **by 2045** | Pine River Road/Homer Road | Geneva Rd to Prairie Rd | 4' paved shoulders used by cyclists (PS1); bike route signage | $6,324,625 | $1,950,000 |
| **by 2045** | Geneva Rd/Chippewa Riv Rd Lp | M-20 to M-20 | 4' paved shoulders used by cyclists (PS2); bike route signage | $11,351,891 | $3,500,000 |
| **by 2045** | Freeland-Kochville Trail West | Freeland SportsZone to Hospital Road | Separated multi-use path | $1,881,171 | $580,000 |

## Air Quality

The Clean Air Act Amendments of 1990 (CAAA) established a mandate for better coordination between air quality and transportation planning. The CAAA requires that all transportation plans and transportation investments in non-attainment and maintenance areas be subject to an air quality conformity determination. The intent of this is to achieve and maintain clean air and meet National Ambient Air Quality Standards (NAAQS). Therefore, the LRP and the TIP must demonstrate that the implementation of these projects do not result in greater mobile source emissions than the emissions budget.

On May 12, 2012 the United States Environmental Protection Agency (EPA) revoked the 1997 8-hour 0.080 ppm Ozone standard for the purposes of regional transportation conformity. Then, on May 21, 2012, the USEPA issued designations for the new 2008 8-hour 0.075 ppm Ozone standard. Based on measured air quality and mobile source emissions, MATS area is in attainment for Ozone under USEPA's 8 hour 0.075 Ozone Standard. This means that there is no requirement to conduct a regional transportation conformity analysis for the LRP or TIP for the MATS area under this designation. This is true until such time as EPA publishes a notice designating the area as non-attainment, presuming large changes in emission levels.

## Environmental Mitigation

SAFETEA-LU requires that MATS include in its long range plan "a discussion of types of potential environmental mitigation activities and potential areas to carry out these activities, including activities that may have the greatest potential to restore and maintain the environmental functions affected by the metropolitan transportation plan." (USDOT, Metropolitan Transportation Planning: Final Rule FHWA, Sec. 450.322(f)(7), effective 3/14/07). The purpose of this process is to bring attention to the range of possible impacts and to elevate the consideration of environmental resources in all phases of project planning, design, construction and maintenance.

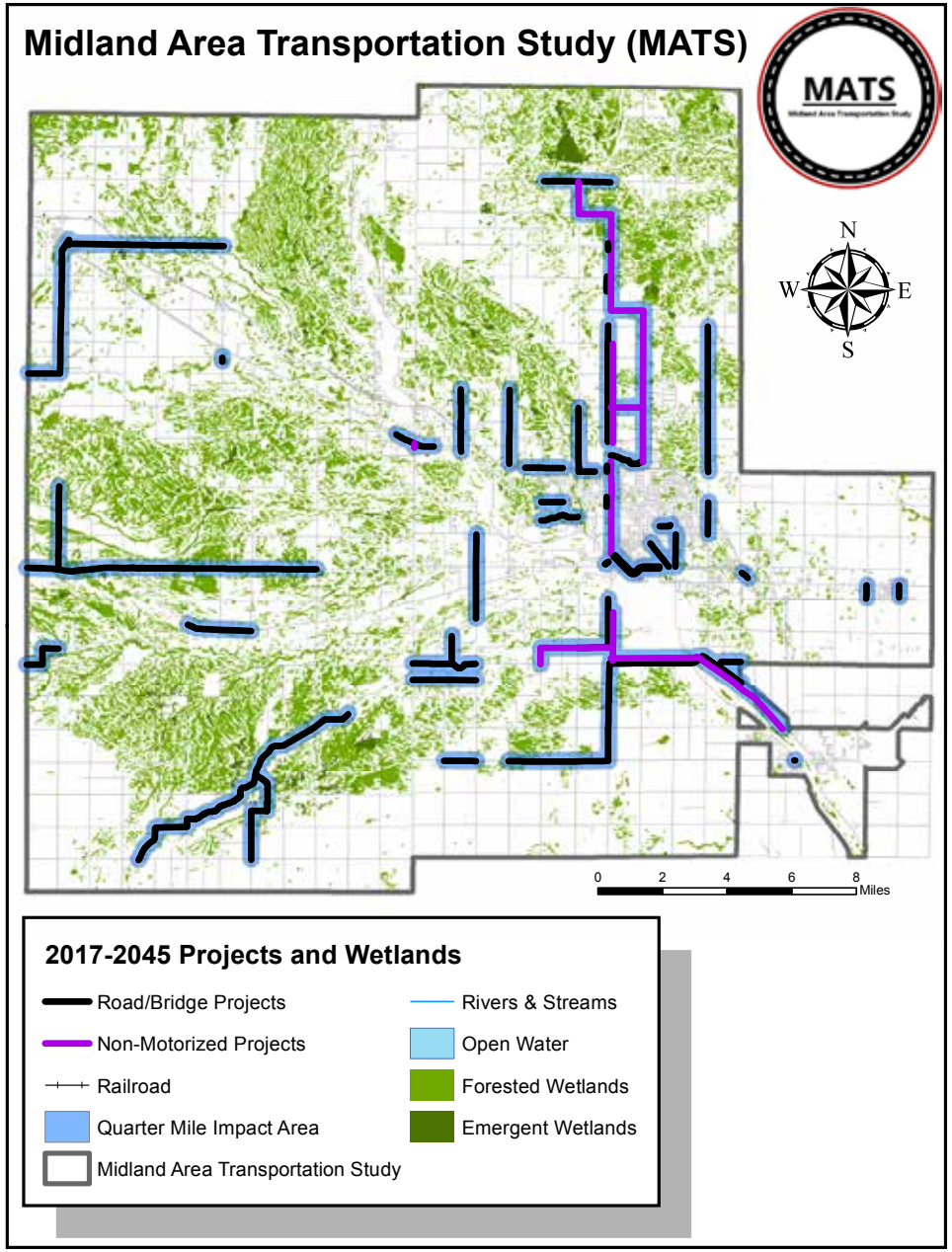
The factors reviewed include Rivers & Streams, Lakes & Ponds, Wetlands, Forests, Endangered Species, Agriculture, Parks & Trails, Historic Sites & Structures, and Cemeteries. The projects recommended in this 2045 Long Range Transportation Plan were evaluated in relation to those factors. A potential impact area within 1/4 of a mile of the proposed transportation projects is shown on each of the maps, as was also done for the environmental justice maps in the next section.

All projects are noted as potentially impacting endangered species since the habitat for many of the identified plants or animals covers the entirety of the MATS area. Thus, for this factor, information was collected from the Michigan Natural Features Inventory listing plants and animals in Bay, Midland and Saginaw Counties. The tables of the endangered species can be found in the Appendix. As for the Historical Sites and Buildings in this analysis, data was reviewed from the National Park Service website which provides an online inventory, complete up to July 2015.

As can be seen from Exhibits 36 through 39, **none of the environmental factors reviewed are disproportionately impacted** due to proposed projects being located throughout the MATS area. Of the 69 Prioritized Projects, only two are Capacity Projects, as seen on page 59. Of those two, one is a restoration improvement within the existing physical footprint of the road, hence no disturbance of resources. The remaining project is a new road, and will be subject to all applicable environmental regulations and processes.

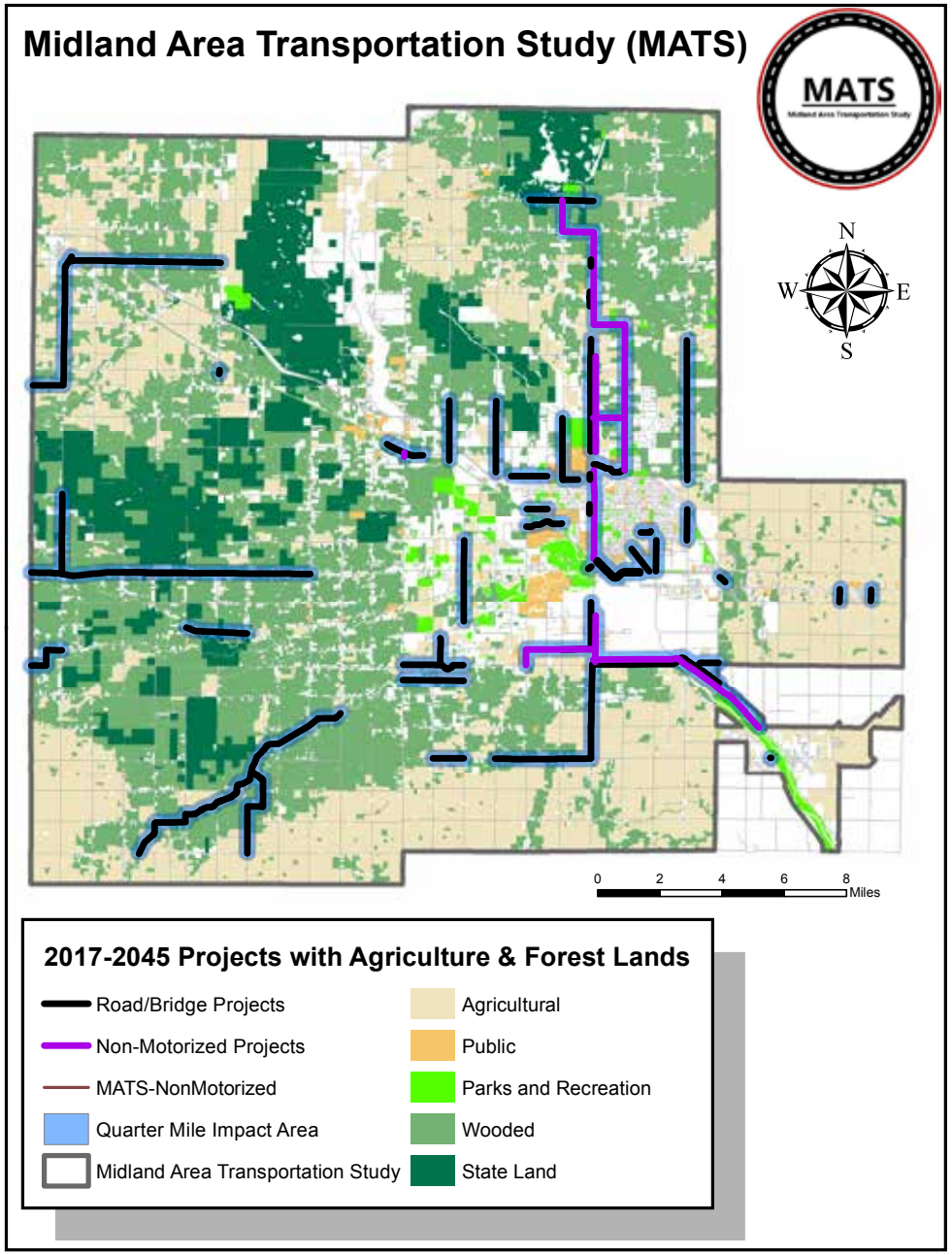
MATS and the enacting agencies will strive to minimize the impact on the environmental sensitive resources for these and future projects. This will be accomplished by following the guidelines set by the American Association of State Highway and Transportation Officials (AASHTO) Center for Environmental Excellence located at http://www.environment.transportation.org/. Agencies contacted regarding environmental mitigation are included in the list on Page 80.

Exhibit 36 - 2017 - 2045 Projects and Wetlands




Source: MATS and Michigan Geographic Data Library.

Exhibit 37 - 2017 - 2045 Projects and Forest Land




Source: MATS and Michigan Geographic Data Library.

Exhibit 38 - 2017 - 2045 Projects and Historic Sites

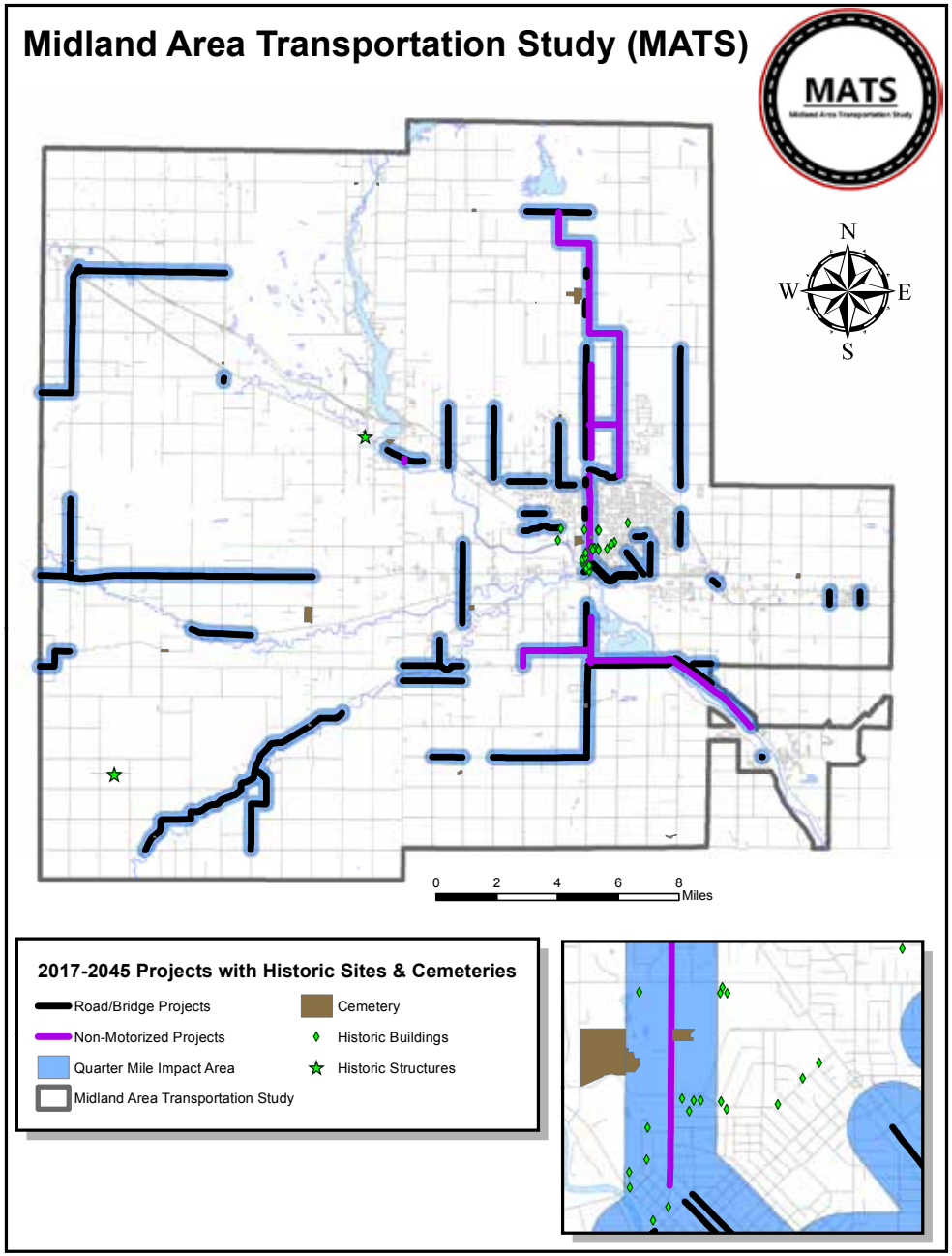
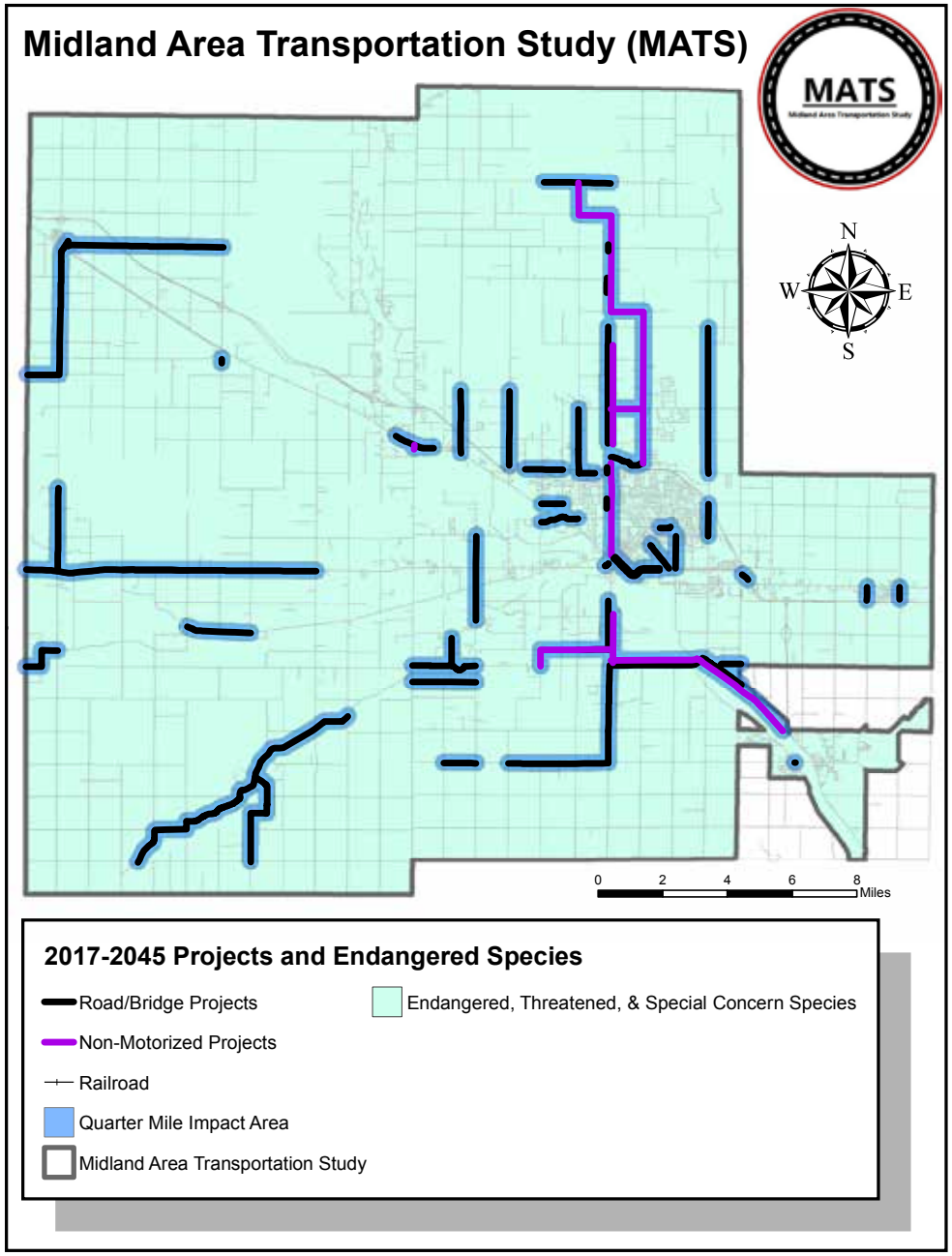



Exhibit 39- 2017 - 2045 Projects and Endangered Species




Source: MATS and Michigan Geographic Data Library.

# Environmental Justice

In 1997, the U.S. Department of Transportation (DOT) issued an order to address Environmental Justice in Minority Populations and Low-Income Populations (DOT Order 5610.2). The order generally describes the process for the incorporation of environmental justice principles into all DOT programs. policies, and activities.

It is important that environmental justice be considered in all phases of the planning process. This includes public participation plans and activities, the development of transportation plans and improvement programs prepared and adopted by MATS. There are three fundamental concepts of environmental justice:

-To avoid, minimize, or mitigate disproportionately high and adverse human health or environmental effects, including social and economic effects, on minority populations and low-income populations.

-To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process.

-To prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority populations and low-income populations.

MATS has identified Census block groups where low-income and minority populations live so that their needs can be identified and addressed, and the benefits and burdens of transportation investments can be fairly distributed. However, this cannot be achieved without the involvement of the public, community groups, and other organizations. Although there are no specific minority advocacy groups in the MATS area, extensive efforts at consultation were still undertaken. For example, flyers for public input for MATS open houses were placed on area transit vehicles, to better reach low income and disabled populations, as well as seniors.

## Definitions

As they relate to Environmental Justice, the terms "Low Income" and "minority" need to be defined.

"Low-income" is defined as a household income at or below the Department of Health and Human Services (HHS) poverty guidelines. These guidelines change every year due to inflation and vary by the number of people in the household.

According to the US DOT Order 5610.2, the following groups are defined as a "minority":

1. African American (a person having origins in any of the black racial groups of Africa).

2. American Indian and Alaskan Native (a person having origins in any of the original people of North America and who maintains cultural identification through tribal affiliation or community recognition).

3. Asian American (a person having origins in any of the original people of the Far East, Southeast Asia, or the Indian subcontinent).

4. Hispanic (a person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race).

5. Native Hawaiian and Other Pacific Islander (a person having origins in any of the original peoples of Hawaii, Guam, Samoa or other Pacific Islands).

6. Other minorities (a person having origins from the regions not included in "African American," "American Indian and Alaskan Native," "Asian American," "Hispanic," or "Native Hawaiian and Other Pacific Islander")

# Environmental Justice Analysis for the MATS Area

In accordance with Federal guidelines on Environmental Justice (EJ) that amplify Title VI of the Civil Rights Act, recent attention has been placed on the need to incorporate environmental justice principles into the process of transportation planning, as well as the implementation of projects. While procedural and analytical processes for meeting these requirements are largely unspecified, the potential for disproportionate impacts of transportation improvement projects on racial minorities and impoverished neighborhoods must be considered. MATS has conducted an analysis within the metropolitan planning area to identify the size and location of racial minority populations, and populations below poverty level in the 2010 Census.

The MATS area, as shown in Exhibit 40, is predominately white in terms of race (91.60%), with minorities representing 8.39%. Further, there are 4,793 below-poverty-level households in the MATS area representing 12.09% of all households. Exhibit 41 shows the summary of the minority populations and households below poverty level for the MATS area and the percentages of each group located within the 0.25 mile radius of the 2017-2045 LRTP projects. **As the data shows, there are not any groups that are disproportionately neglected or overexposed in terms of proposed transportation projects. Data also shows that the low income population within the MATS area is neither disproportionately burdened nor neglected with respect to future transportation improvements.**

Exhibit 40 - % of Total Racial Distribution

| | MATS MPO | | 2017-2045 EJ Impact Area (0.25 miles) | % Within Impact Area |
|---|---|---|---|---|
| ***Area*** | 598.36 sq miles | --- | 58.62 sq miles | --- |
| ***Total Population*** | 100,567 | --- | 9,473 | --- |
| ***White*** | 92,122 | 91.60% | 8,872 | 93.66% |
| ***African American*** | 1,978 | 1.97% | 122 | 1.29% |
| ***Native American*** | 386 | 0.38% | 38 | 0.40% |
| ***Asian*** | 2,119 | 2.11% | 188 | 1.98% |
| ***Hispanic*** | 2,448 | 2.43% | 98 | 1.04% |
| ***Hawaiian*** | 0 | 0.00% | 0 | 0.00% |
| ***Other Races*** | 255 | 0.25% | 1 | 0.00% |
| ***Two or More Races*** | 1,259 | 1.25% | 154 | 1.62% |
| ***Total Households*** | 39,658 | --- | 3,735 | 9.42% |
| ***Households Below Poverty Level*** | 4,793 | 12.09% | 470 | 12.57% |

Source: Census Bureau . EJ Impact area and Percent within Impact Area was calculated by MATS.

Exhibit 41 - % of Each Minority Group Impacted

| | MATS MPO | 2017-2045 EJ Impact Area (0.25 miles) | % Within Impact Area |
|---|---|---|---|
| ***Area*** | 598.36 sq miles | 58.62 Sq. Mi. | --- |
| ***Total Population*** | 100,567 | 9,473 | 9.42% |
| ***White*** | 92,122 | 8,872 | 9.63% |
| ***African American*** | 1,978 | 122 | 6.18% |
| ***Native American*** | 386 | 38 | 9.81% |
| ***Asian*** | 2,119 | 188 | 8.86% |
| ***Hispanic*** | 2,448 | 98 | 4.01% |
| ***Hawaiian*** | 0 | 0 | 0.00% |
| ***Other Races*** | 255 | 1 | 0.39% |
| ***Two or More Races*** | 1,259 | 154 | 12.20% |
| ***Households Below Poverty Level*** | 4,793 | 470 | 9.80% |

Source: U.S. Census Bureau . EJ Impact area and Percent within Impact Area was calculated by MATS.

The table to the left compares the minority populations within the Impact Area to the total population within the Impact Area. This analysis shows that similar percentages of most minority groups and low-income population are represented within impact areas of proposed transportation projects. **Accordingly, it seems clear that imminent transportation system investments are affecting all involved in a similar manner and the projects do not disproportionately burden nor fail to meet the needs of any segment of the population.**

For the purpose of environmental justice analysis, MATS has identified areas within the MPO boundary where the percentage of minority populations and percentage of households below the poverty level (based on the 2010 Census) are higher than the overall MATS average. The minority populations that are considered are African-American, Native American, Asian, Hispanic, and Hawaiian. All other minority groups are combined. The poverty evaluation was determined by the Health and Human Services guidelines from 2010. The unit of measure for this data is the Census block group for the entire analysis. The maps in this chapter show block groups with higher than average minority and low-income populations.

The data that was used in the minority maps is based on individuals, while the data for low –income is based on households. In order to show if there are minority populations or households below poverty within a certain distance of each road project, a "buffer" process was run with a radius of 0.25 miles around each project to give us the impact area. That is shown on the maps by the light blue buffer. Since some of the block groups are large in area, and the majority of the road projects are smaller in comparison, an analysis technique was applied to the raw data to better show how many people are being affected by the road projects. The data had to be prorated by using the ratio of the area of the block group to the area of the impact area. This ratio is different for each project, and once obtained it is then used to derive a number of people in the minority and low-income groups that are within a quarter mile radius of each project. Then the percentage of each group was calculated for each block group. Once the percentage of minorities and below-poverty level households was calculated within the impact area, it was compared to the average of the whole MATS area and shown graphically based on how much the actual value differed from the average. Note that the environmental justice analysis was conducted for the entire designated area of MATS, including the Freeland area in Saginaw County identified as part of the 2010 Midland Federal Adjusted Urban Boundary. The maps that follow present, for each racial group, currently proposed MATS projects for 2017-2045, the .25 mile buffer for "affected area", and the geographic distribution by Census Block Group.

Exhibit 42 - MATS projects Overview

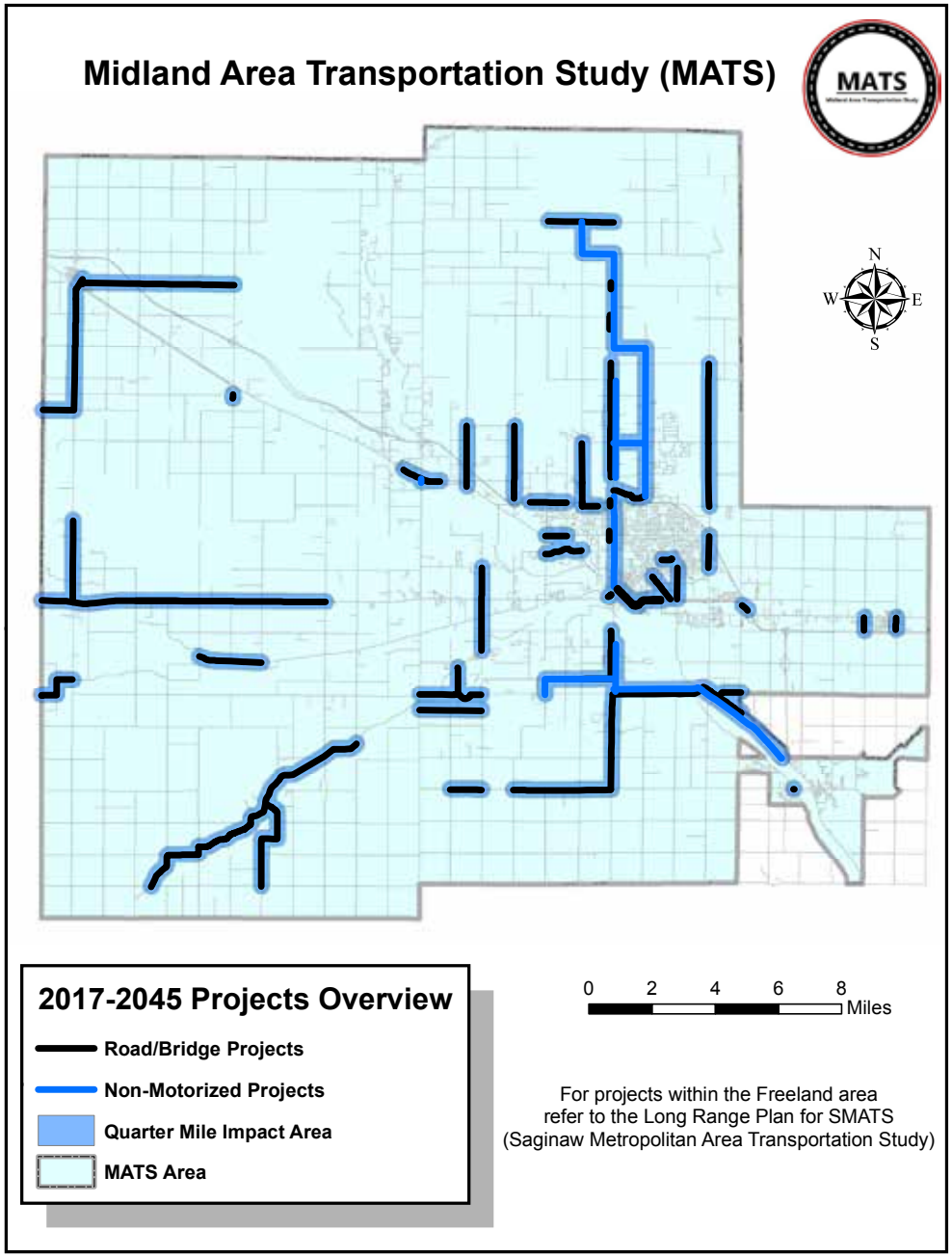
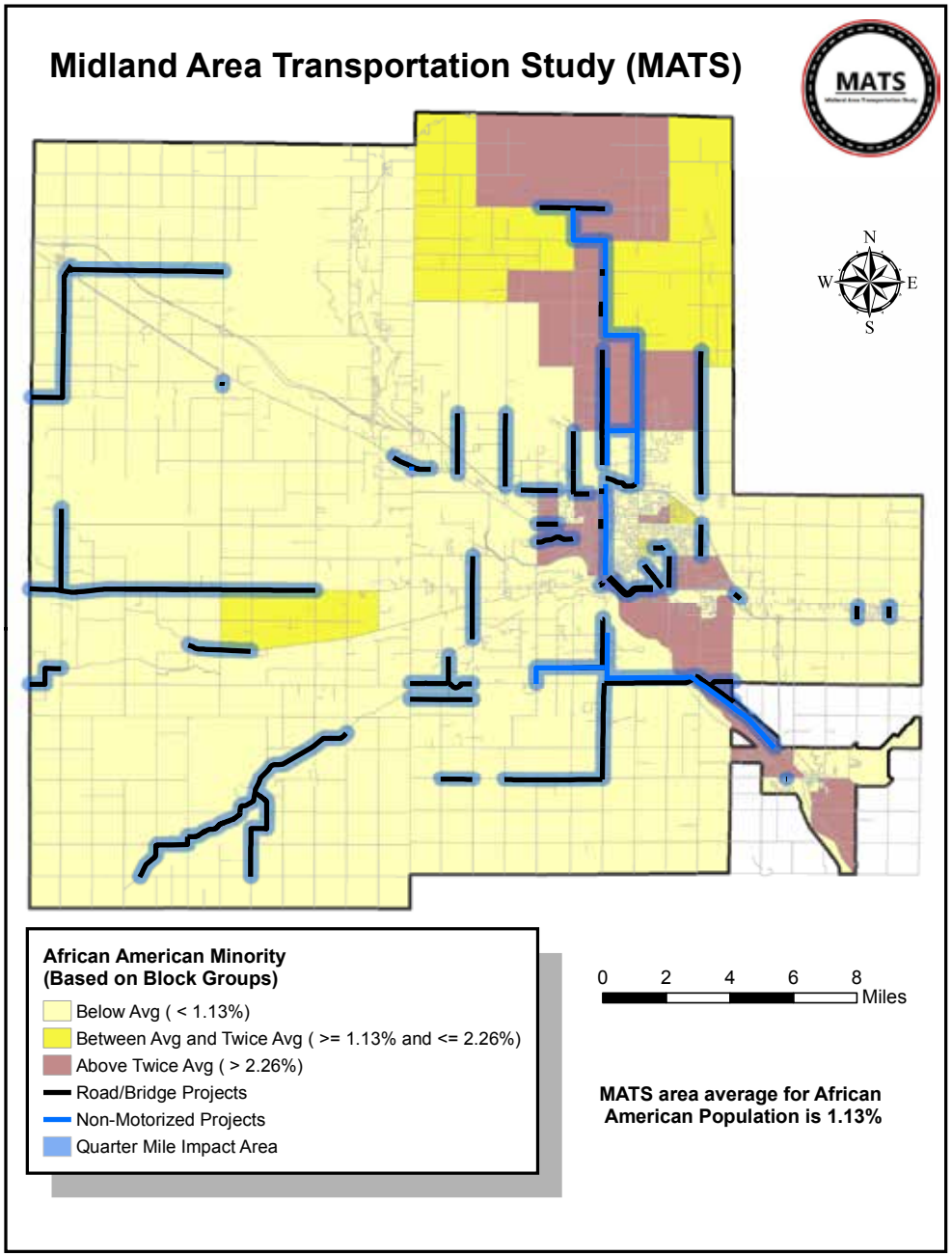
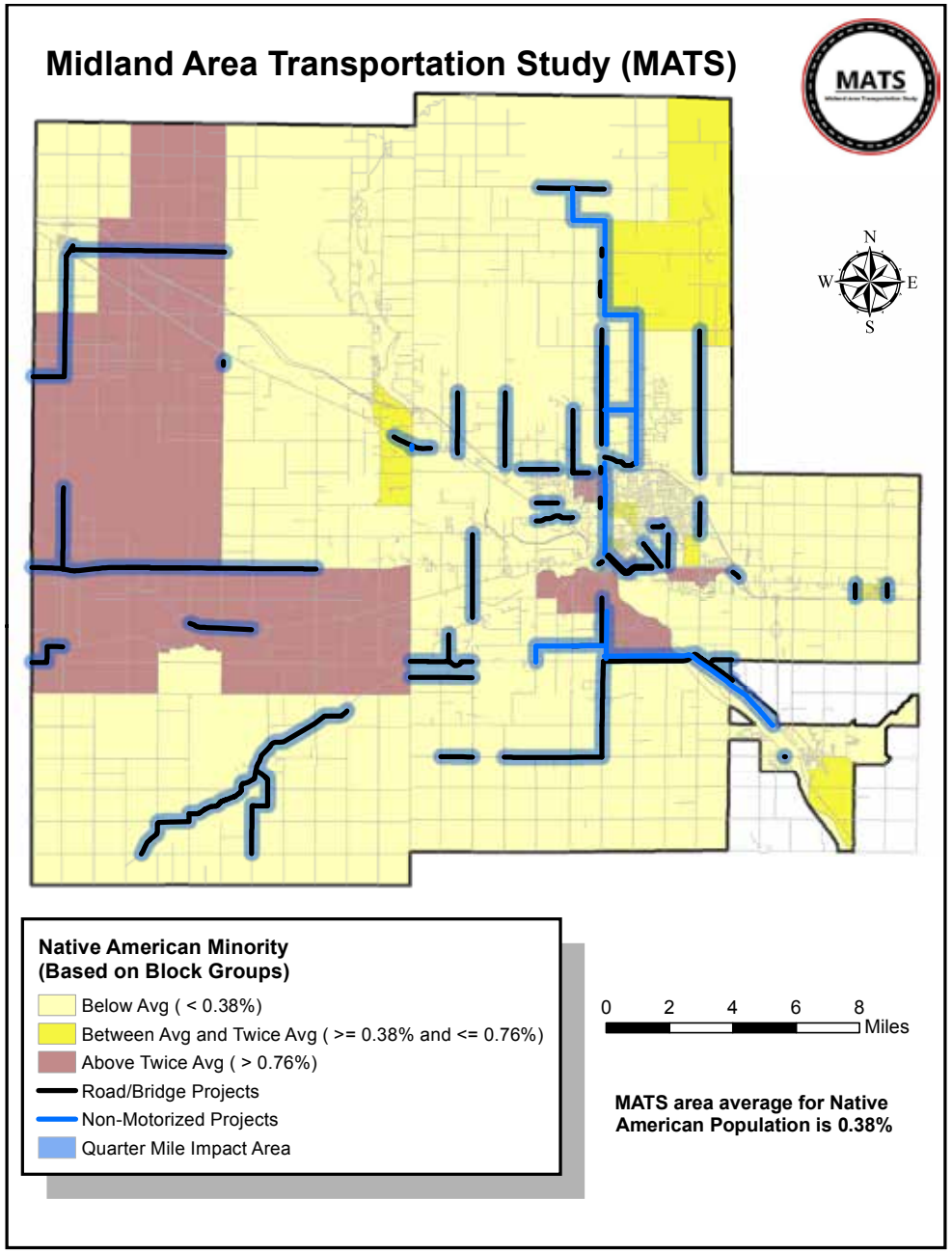


Exhibit 43 - MATS Projects and African American Population



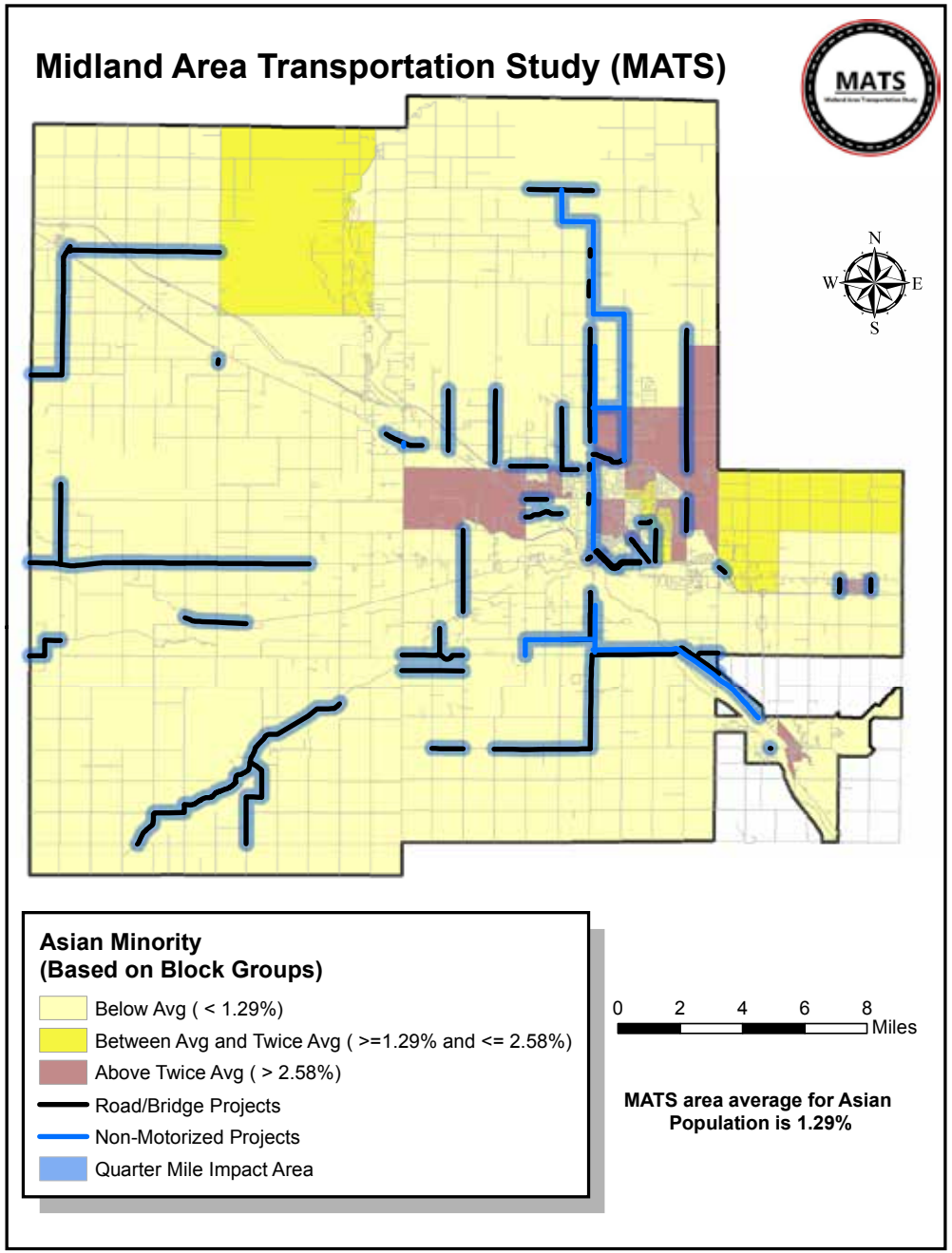

Source: data collected from U.S. Census and created by MATS.

Exhibit 44 - MATS Projects and Native American Population



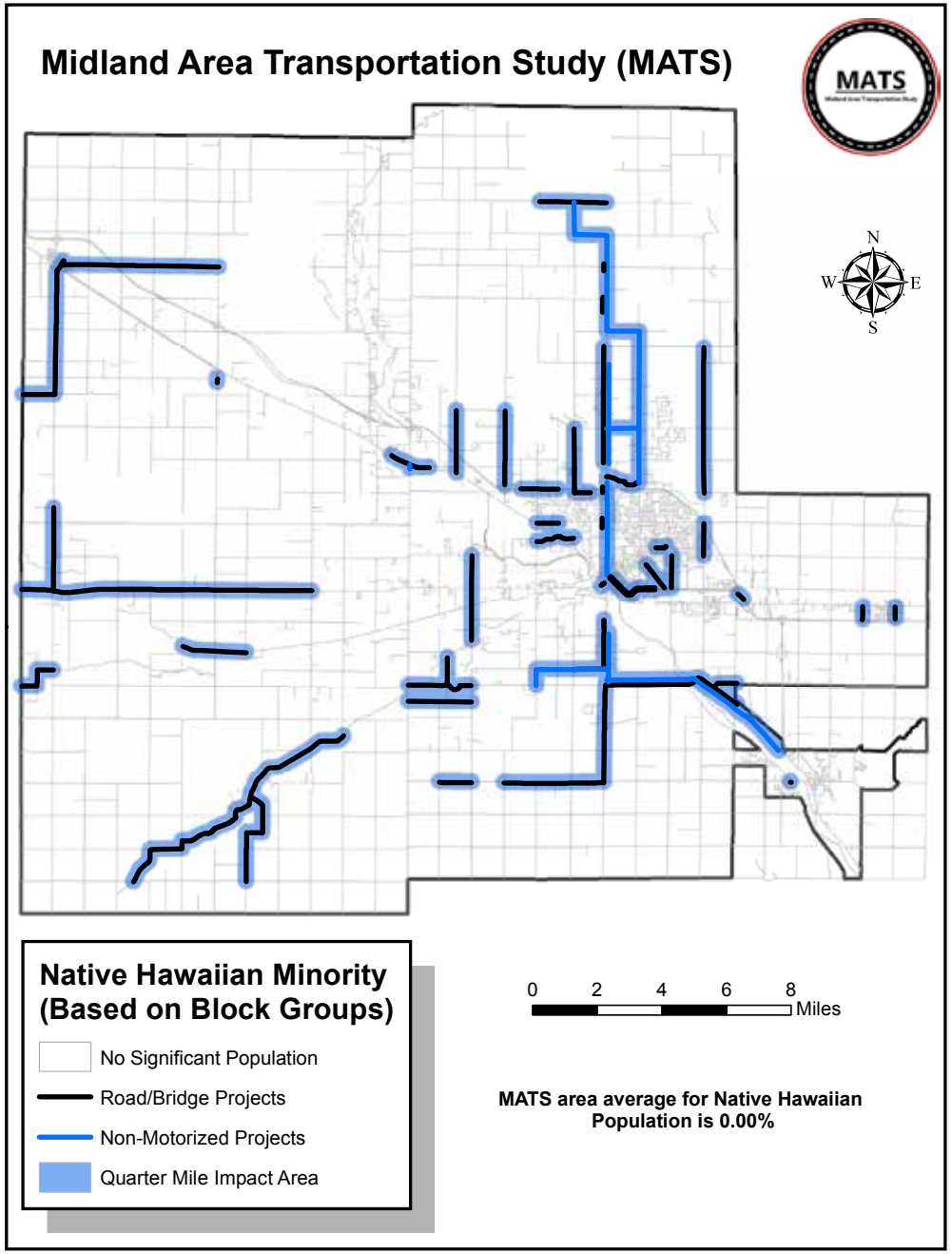

Source: data collected from U.S. Census and created by MATS.

Exhibit 45 - MATS Projects and Asian Population



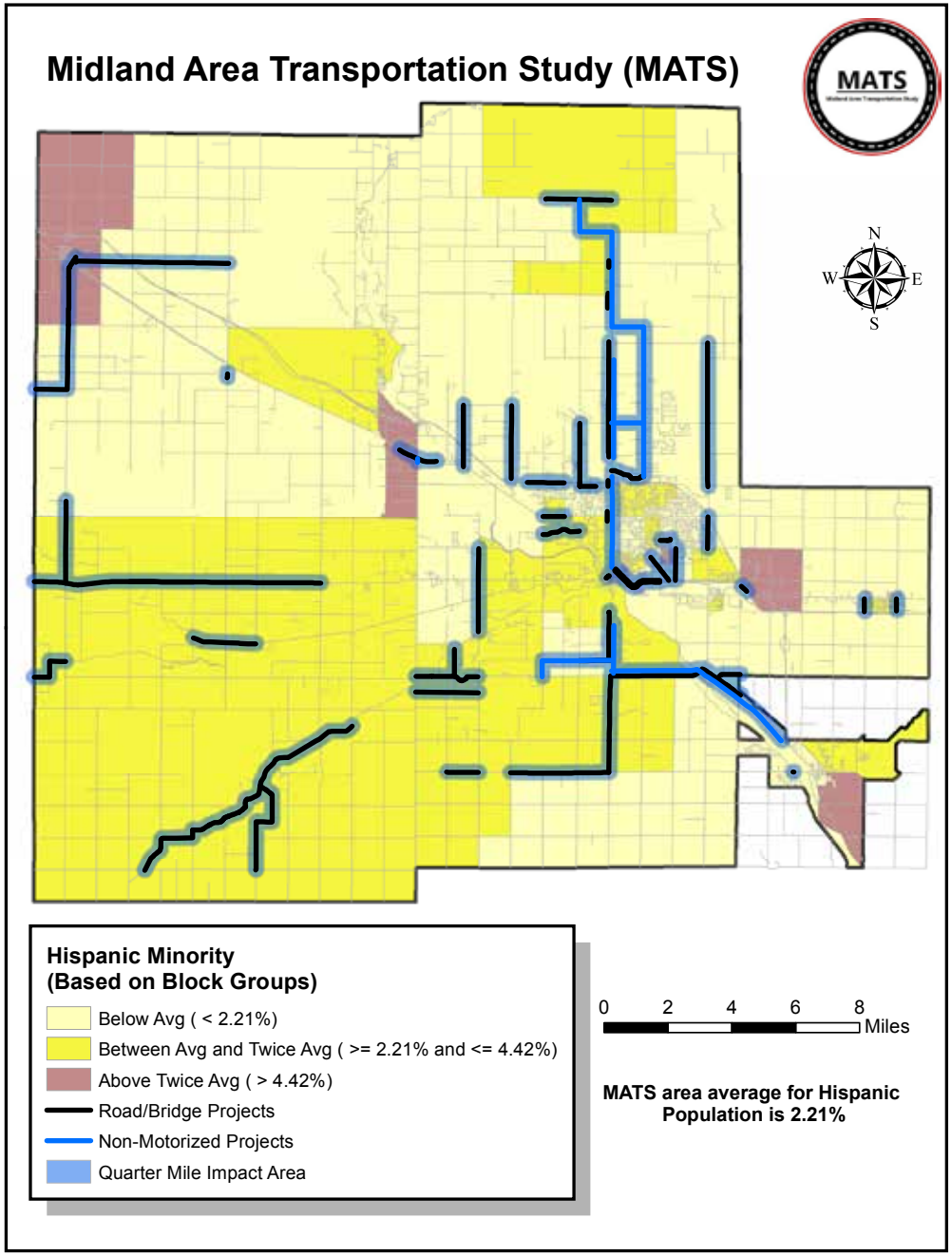

Source: data collected from U.S. Census and created by MATS.

Exhibit 46 - MATS Projects and Native Hawaiian Population



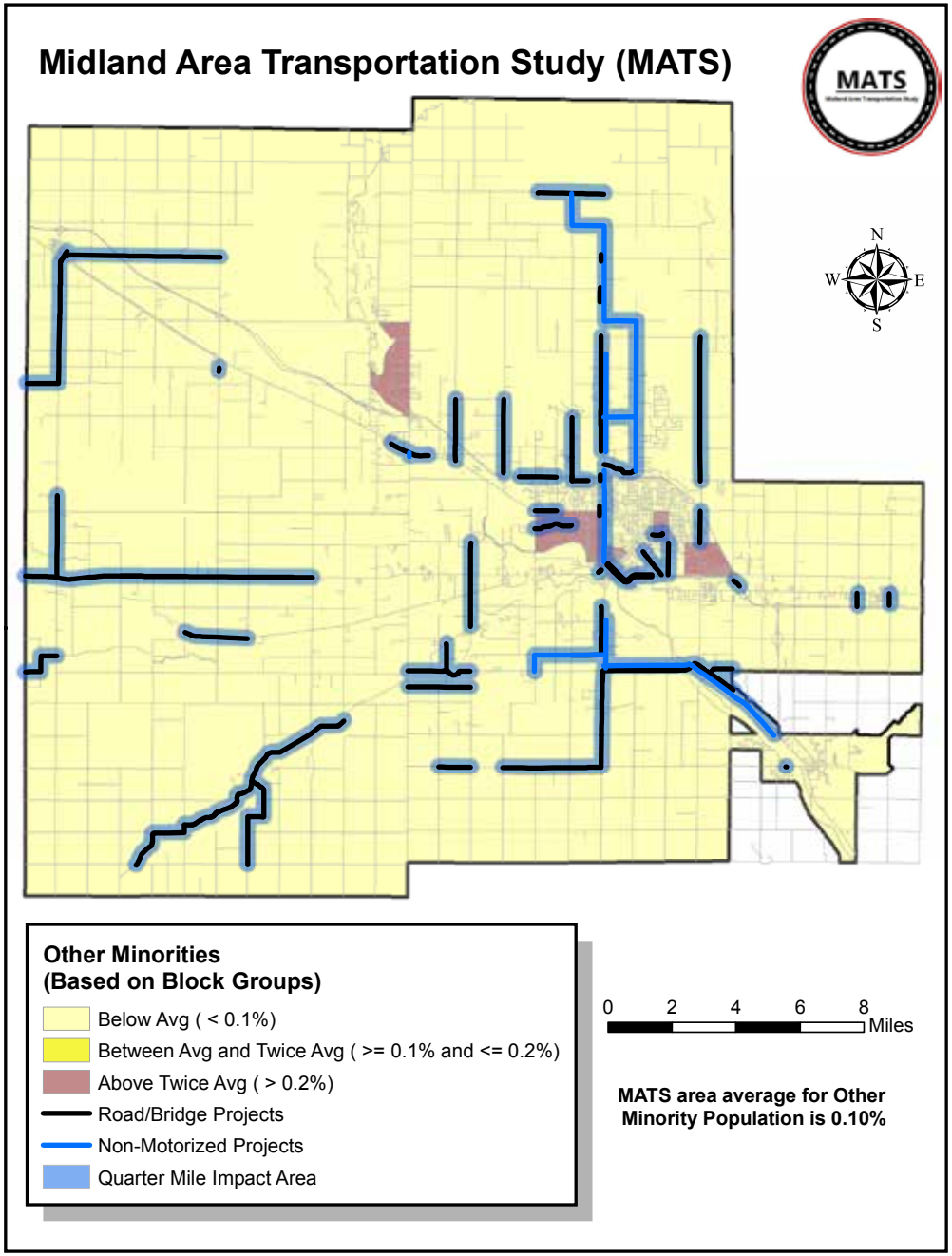

Source: data collected from U.S. Census and created by MATS.

Exhibit 47 - MATS Projects and Hispanic Population



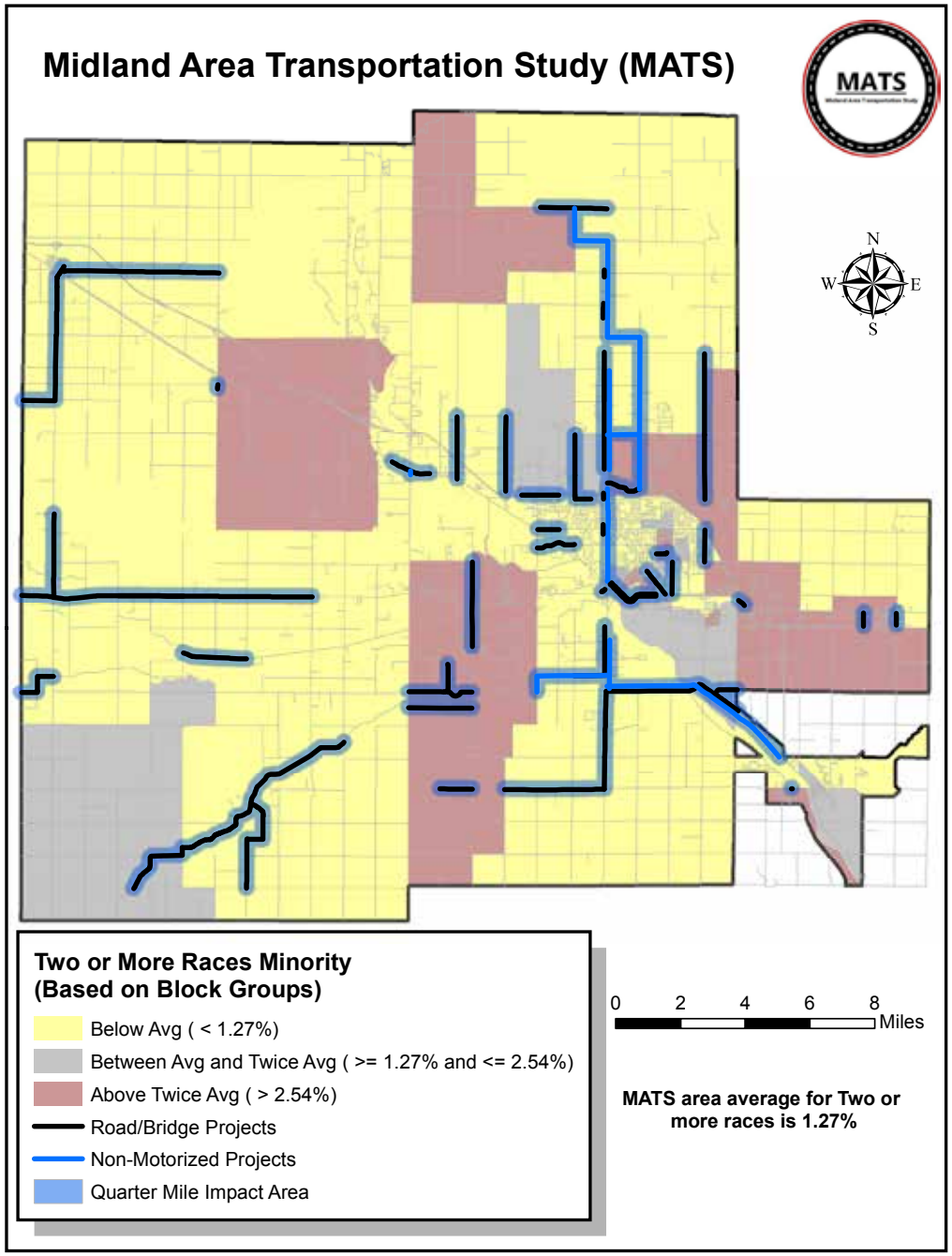

Source: data collected from U.S. Census and created by MATS.

Exhibit 48 - MATS Projects and Other Minority Population



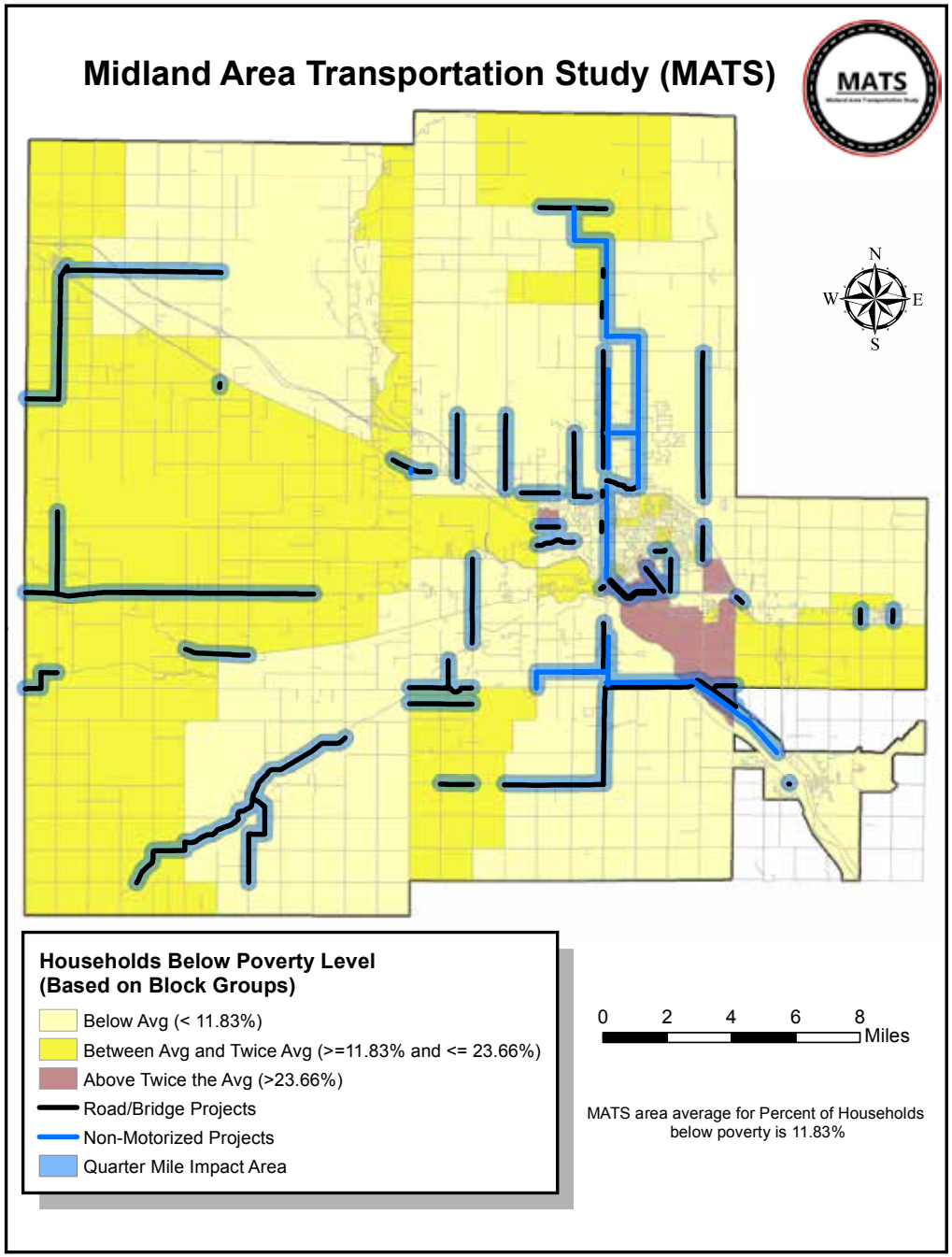

Source: data collected from U.S. Census and created by MATS.

Exhibit 49 - MATS Projects and Two or More Minority Population




Source: data collected from U.S. Census and created by MATS.

Exhibit 50 - MATS Projects and Below Poverty Households




Source: data collected from U.S. Census and created by MATS.

# Measuring Effectiveness of the Plan with Performance Measures

Any plan, to be taken seriously, must include both a process for evaluating progress towards the goals and objectives identified and a system of measuring that progress. Monitoring progress towards achieving goals and objectives is helped by developing performance measures during the planning process.

In general, performance measures must be directly relatable to goals, utilize available data that is trackable over time, and measure progress. According to the Federal Highway Administration (FHWA), "Performance measures are a qualitative or quantitative measure of outcomes, outputs, efficiency, or cost effectiveness."

## National Performance Measures

MAP-21 focuses on national goals, increasing accountability, and improving transparency. These changes improve decision-making through better informed planning and programming. Under MAP-21, U.S. DOT are to establish performance measures and state DOTs are to develop performance targets in consultation with metropolitan planning organizations (MPOs) and others. State investments must make progress toward these performance targets, and MPOs must incorporate these performance measures and targets into their Transportation Improvement Programs (TIPs) and Long Range Transportation Plans. MATS is currently working with MDOT and other MPO's to determine which targets correspondingly will be adopted. As these are finalized, and guidance becomes available, MATS will integrate the performance measures identified in the next update of the Long Range Plan.


### National Goal Areas for Performance Management

Nationally, MAP 21 sets seven goal areas for performance measures. They are:

1. **Safety**: To achieve reduction in fatalities and serious injuries on all public roads.

2. **Infrastructure Condition**: To maintain highway infrastructure assets in state of good repair.

3. **Congestion Reduction**: To achieve reduction in congestion on the National Highway System.

4. **System Reliability**: To improve the efficiency of the surface transportation system.

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

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

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

The Fixing America's Surface Transportation (FAST) Act, our current federal surface transportation legislation, emphasizes performance goals previously established in MAP-21. By focusing on national goals, increasing accountability, and improving transparency, the FAST Act improves decision-making through better-informed transportation planning.

The table below (Exhibit 51) indicates the status of the various frameworks for performance measures for national transportation planning activities.

Exhibit 51 - FHWA Performance Management Schedule

| Performance Areas | Notice of Proposed Rulemaking | Final Rule Published | Rule Effective |
|---|---|---|---|
| ***Safety Performance Measures*** | March 11, 2014 | March 15, 2016 | April 14, 2016 |
| ***Highway Safety Improvement Program*** | March 28, 2014 | March 15, 2016 | April 14, 2016 |
| ***Statewide and Metro/ Non-Metro Planning*** | June 2, 2014 | May 27, 2016 | June 27, 2016 |
| ***Pavement and Bridge Performance Measures*** | January 5, 2015 | January 18, 2017 | May 20, 2017 |
| ***Highway Asset Management Plan*** | February 20, 2015 | October 24, 2016 | October 2, 2017 |
| ***NHS, Freight, & CMAQ**** | *Projected* April 2016 | January 18, 2017 | May 20, 2017 |

As a result, MPO's, and State and Local agencies will invest resources in projects to achieve individual targets that will collectively make progress towards these national goals. The FHWA enacts performance measures and targets that guide the selection of transportation projects and programs based on the previous goals.

## State Performance Measures and Targets

The Michigan Department of Transportation established a Transportation System Condition Team in April 2010 that has continued to review and evaluate measures to assess the condition of Michigan's transportation system. MDOT maintains a performance-based planning process at the state level and helps coordinate the selection of measures by linking planning and programming to performance targets. Driven by Excellence: A Report on Transportation Performance Measurement at MDOT, includes performance measures for four primary areas of the Michigan Long Range Transportation Plan:

- Stewardship (system condition; maintain service)
- Safety and Security (safety; reduced risk)
- System Improvement (modernization; expand access)
- Efficient and Effective Operations (reducing delays)

In addition however, MDOT must now act within the Federal framework of these six areas, and develop targets and methodologies for Federally defined measures within each of the six performance areas.

## MPO Performance Measures and Targets

The process for setting MPO targets (and their accompanying evaluation methodologies) for these performance measures will extend past the completion date of this document. This is because they must be derived from, and connected to, both the MDOT targets and the Federal process. However, this performance-based planning will be relevant to the Goals and Objectives identified in Chapter 2, and once complete will be included in the next Long Range Plan update.

# Public Involvement and Public Participation

MAP-21 states that:

*MPO's shall include a proactive public involvement process that provides complete information, timely public notice, full public access to key decisions, and supports early and continuing involvement of the public in development plans and TIPs and meets the requirements and criteria as specified.*

MATS strives to ensure that public input plays a considerable role in the transportation planning process. This goal is predominantly met by providing opportunities for stakeholders and the public to contribute input during the development of programs and reports. Our Public Participation Plan sets out guidelines regarding public involvement and how they are incorporated into the Long Range Plan.

## Public Involvement Activities

Since the Long Range Plan development process began, the MATS Technical & Policy Committees were updated each month regarding the plan's development. They were closely involved in evaluating different components of the plan to create a document that would be both inclusive and relevant to the needs of the MATS area. The minutes of these meetings are available on the MATS website to be viewed by the public at any time. A brief survey was also developed to provide community members another opportunity to give feedback regarding the area's transportation system. This survey was published both electronically on the MATS website and distributed during public open houses. Survey results emphasized the importance of specific transportation development strategies, the quality of the transportation infrastructure in the area, and many other critical transportation issues. The Exhibit on the right displays one of the questions included on the public input survey. The question asks for an individual's opinion on the quality of different transportation related components within the MATS area.

Exhibit 52 - Sample Survey Results

| On a scale of 1 to 5, RATE the quality of the following within the area (1 being the lowest quality and 5 being the highest quality): | | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | Responses | Weighted Average |
| Roads and Streets | 0 | 5 | 13 | 7 | 0 | 25 | 3.08 |
| Bike Paths and Sidewalks | 1 | 5 | 12 | 5 | 3 | 26 | 3.15 |
| Public Transit Services | 6 | 3 | 10 | 3 | 1 | 23 | 2.57 |
| Traffic Signs and Signals | 1 | 1 | 11 | 12 | 1 | 26 | 3.42 |
| Parking and Bicycle Facilities | 1 | 6 | 12 | 6 | 1 | 26 | 3.00 |

Source: Collected by Midland Area Transportation Study

## Public Notices

During the development of the 2045 Long Range Transportation Plan, public notices were printed in the local newspaper to promote our open houses. The notices provided brief information of the content that would be discussed at each open house and encouraged members of the public to attend. The public was given the opportunity to provide feedback regarding the LRTP in person, via telephone or email. MATS focused on targeting specific businesses, community organizations, public agencies and other key stakeholders when giving proper notice of our events. A mailing list was created including these stakeholders, which allowed MATS to address a broader audience. Other means of advertising for public open houses included:

- MATS and other partner agencies websites
- Notice at City of Midland Planning Commission Meeting
- Article in the Midland Daily News
- Community Stakeholder Letters (Information distributed amongst agency)
- Flyer postings

## Public Open Houses

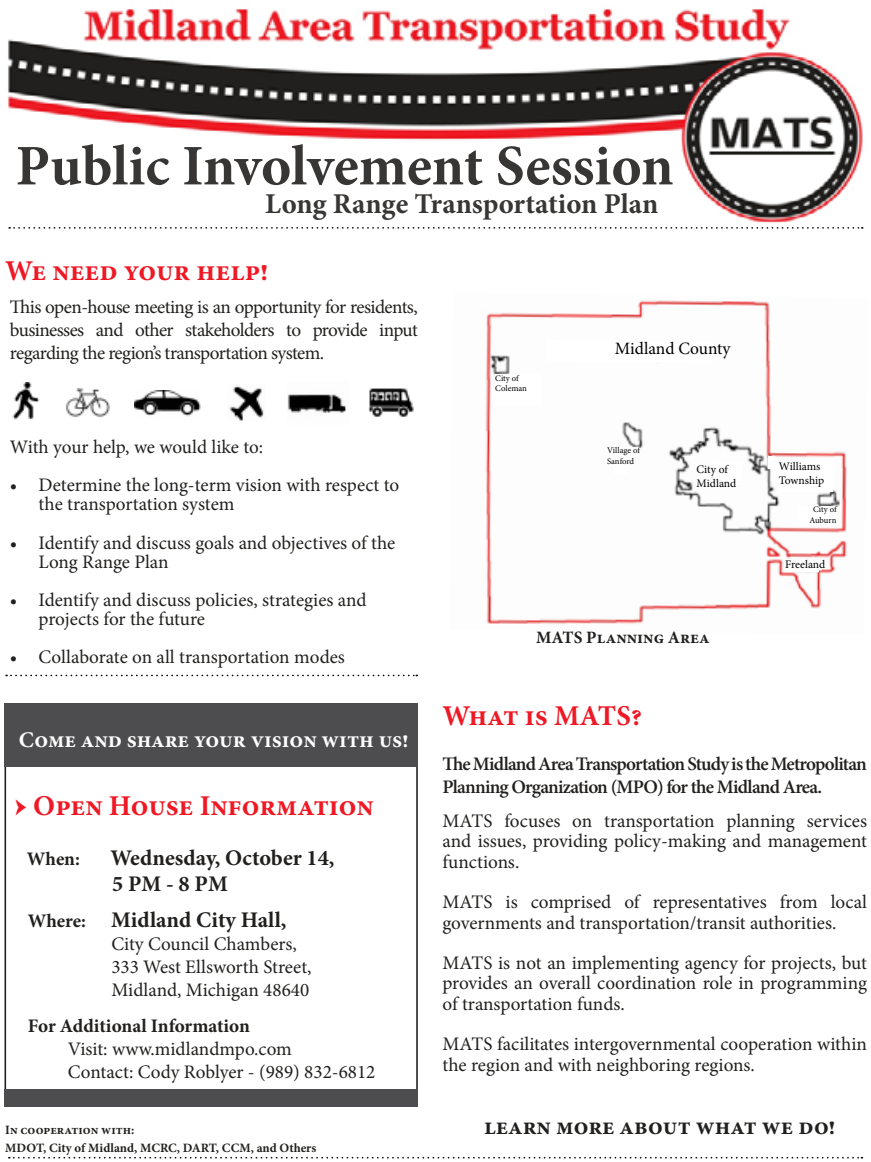
MATS held three open houses during the development of the 2045 Long Range Transportation Plan with the overall objective of educating and engaging the public. The first open house occurred on October 14th, 2015 at Midland City Hall, the second on November 16th, 2016 at the Grace A. Dow Public Library, and the third took place on August 9th once the draft LRTP was complete.

The October 14th, 2015 Open House was held from 5:00pm-8:00pm and was an opportunity for members of the public to learn about the Long Range Plan, receive more information regarding MATS, and discuss various transportation related topics. During the open house, MATS staff displayed informational posters about the LRTP and discussed multiple issues regarding each mode of transportation and the proposed goals and objectives of the LRTP; Members of the public were able to write their responses to these questions as a means of evaluation. Individuals also had the option of recommending changes to the transportation network utilizing printed out maps of the area's road network. Additionally, our public input survey was made available by paper copy for anyone to fill out at their convenience.

The second meeting, held November 16th, 2016, provided an opportunity to coment on needed and proposed transportation infrastructure projects within MATS area and learn about the progress of the LRTP. This second meeeting was well attended, and provided a forum for a great discussion and input, with some written comments received as well.

The third meeeting, held August 9th, 2017, provided an overview of the draft Long Range Transportation Plan and an opportunity for comments, questions, and critique. In addition, this draft and supplemental material was displayed at MATS' booth at the Midland County Fair, August 11-19, 2017.

A summary of comments received during the three open houses can be found in the Appendix.



## Public Hearing

The official public hearing for the MATS 2045 Long Range Transportation Plan was held September 6th, 2017. After this public hearing, the MATS Long Range Transportation Plan was officially adopted by the MATS Policy Committee on September 6th, 2017.

## Solicitation and Responses to Comments

Meaningful public participation is important so that the concerns of a diverse community of stakeholders and the general public can be represented in the transportation planning process. MATS is committed to pro-actively involving the public in identifying and addressing transportation issues. The goal is to foster genuine two-way communication between the MPO and users of the area's transportation system. To that end, MATS conducted an extended public comment period for the LRTP, from July 22 to August 28, 2017.

MATS staff has prioritized increased public involvement by utilizing our Public Participation Plan. The Public Participation Plan facilitates opportunities for community members to provide comments or suggestions regarding transportation planning. Feedback was gathered from individuals through the differing activities and meetings held during the Long Range Plan's development. This feedback was reviewed and incorporated in the plan where appropriate. Many comments focused on the need for a fixed-route transit system throughout the City of Midland (extending into Midland County and surrounding jurisdictions), increased non-motorized trails for both recreational and personal use, and improving transportation infrastructure throughout the area. Public comments received have been sorted by relevant categories and are available from MATS, along with any responses from MATS staff or committee members. A list of MATS key stakeholders and contacts is documented in the Consultation Efforts section of this chapter.

# Consultation

During the transportation planning process, there are certain agencies which are required to be included in the consultation process. This process is different from the public participation process in that the Federal Highway Administration and the Michigan Department of Transportation recommend certain agencies responsible for the following areas be contacted: Airport operators, conservation, economic growth and development, environmental protection, freight movement, historical preservation, human service transportation providers, land use management, and natural resources. Consulting with state, local, tribal, and private agencies with these responsibilities allows for a more streamline approach in developing the LRTP. This process primarily helps to minimize conflict with other agencies' programs, plans, and policies.

## List of Contacts

To better track consultation and outreach efforts, MATS staff created a list which includes all partner agencies, community organizations, interested businesses, and other key stakeholders that are a part of the consultation process. The Consultation List is as follows:

- Hope Township
- Village of Sanford
- City of Midland
- Larkin Township
- Edenville Township
- Mills Township
- Ingersoll Township
- Jasper Township
- Lee Township
- Geneva Township
- Warren Township
- Bay County Road Commission
- Saginaw County Road Commission
- Lincoln Township
- City of Auburn
- Jerome Township
- Williams Charter Township
- Greendale Township
- Mount Haley Township
- Tittabawassee Township
- Porter Township
- Homer Township
- City of Coleman
- Midland Charter Township
- Midland County Road Commission
- 211 Northeast Michigan
- Arnold Center
- Affordable Housing Alliance
- Chippewa Nature Center
- Community Mental Health
- Dial-A-Ride Transportation
- Disability Network
- Dow Gardens
- Faith Based Community
- Family and Children Services
- Grace Dow Library
- Greater Midland Community Center
- Legacy Center for Community Success
- Midland Area Chamber of Commerce
- Midland Area Community Foundation
- Midland Center City Authority
- Midland Center for the Arts
- County Connection of Midland
- Midland County Convention and Visitors Bureau
- Midland Downtown Development Authority
- Midland Non-Motorized Transportation Committee
- Midland Tomorrow
- Momentum Midland
- Open Door
- United Way of Midland County
- Bay Metro Transit Authority
- East Michigan Council of Governments
- East Michigan Council of Governments
- Federal Highway Administration
- Jack Barstow Airport
- MBS International Airport
- Michigan Department of Transportation - Bay Region
- Michigan Department of Transportation - Mt. Pleasant TSC
- Michigan Department of Transportation - Urban Travel Analysis Section
- Michigan Department of Transportation - Statewide Planning Section
- Midland County GIS
- Midland County Road Commission
- Saginaw County Road Commission
- Saginaw Metropolitan Area Transporta tion Study
- Michigan DNR
- Michigan DEQ - Great Lakes Office
- Michigan DEQ - Air Quality
- Michigan Department of Agriculture
- Saginaw Basin Land Conservancy

## Participation Efforts

Stakeholders were notified by email and mailing regarding MATS three open houses that occurred during the 2045 LRTP development. This gave stakeholders the opportunity to provide feedback concerning the Long Range Plan via phone, email, mail, or in person at the event.

Events/meetings hosted by area stakeholders were attended by MATS staff to improve consultation efforts and community outreach.

### Momentum Midland Downtown Opportunity Summit

At this event, representatives of local government, businesses, and organizations came together to learn about other Michigan downtowns and listen to a panel discussion where ideas were shared to improve Midland's downtown. Speakers at the event included:

- Samantha Harkins - Michigan Municipal League Foundation
- Rebekah Kik -City of Kalamazoo Planning Department
- Randy Maier - St. Clair County Community Foundation
- Midland City Manager Jon Lynch also sat on the discussion panel

### Midland County Public Transportation Study

MATS worked with various local stakeholders plus a selected consultant to evaluate existing transportation services in order to develop plans and recommendations for improvements to the public transportation services for Midland County residents. The study was conducted in 2016/2017. The primary goal of the study was to enhance the existing transportation system, increase accessibility and mobility of citizens within the county, improve the quality of life and economic vitality of the area, and promote efficient transportation through viable public/private options.

### City of Midland Downtown Streetscape Redevelopment

MATS staff attended a workshop/input session regarding the City of Midland's streetscape redevelopment process. Many other local stakeholders were involved throughout the entire process of determining the scope of the project. The City's primary goal for the project was to evaluate design options and provide base conceptual engineering plans for redesigning the roads, sidewalks, landscaping, lighting, and other amenities in the downtown.

### Midland Area Chamber of Commerce

In 2016, MATS joined the Midland Area Chamber of Commerce in order to build relationships with other local agencies, businesses, and organizations. MATS staff attended multiple events held by the MACC to promote work activities of the MPO and learn about stakeholders that could potentially be involved in MATS' planning efforts.

***Towards 2045*** fulfills federal mandates for creating the MATS Long Range Plan to provide a regional view of transportation needs, and guide the year-to-year investments of federal funding in the MATS planning area transportation system.

Through the designation of the Midland Urbanized Area, and the creation of a Metropolitan Planning Organization in MATS, participating governments in the region have satisfied Federal requirements and taken a significant step towards greater resources and a regional view of transportation improvements.

## LRP Process Overview

The process for the creation of this plan involved many aspects, beginning with the vision, goals, objectives. Next, the area's background and history, land use, and demographics were all analyzed relative to the transportation system. Previous reports were reviewed related to non-motorized transportation, air travel, freight and traffic safety. Data was gathered regarding the current and past condition of our streets and roads, traffic volumes and patterns. Then, travel demand modeling was performed analysing the effect of expected growth and pinpointing areas of traffic deficiencies. Based on the findings from these aspects the overall long range strategy was developed focusing on critical local factors. Finally, the implementation plan, i.e. the prioritized project list, was carefully prepared.

A thorough financial resource analysis was conducted, comparing expected revenues to project costs. This is a requirement to ensure a fiscally constrained plan. Environmental mitigation analysis and environmental justice analysis were conducted, as required.

Finally, MATS has aimed to ensure a broad and inclusive level of public input for this plan. Open houses, public notice of meetings, surveys, and advertising were all utilized in this process. The input gleaned from all of these interactions has been instrumental in the development of ***Towards 2045,*** and will be central to the activities of MATS going forward as well.

## LRP Findings and Conclusions

This process supports the synergistic approach developed early in the visioning process for the LRP, and the analysis of the data gathered subsequently. The resulting four integrated core strategies of the Plan are: Preservation, Maintenance, Safety, and Livability. These stem from the seven primary goals derived from the planning process:

1. *Accessibility and Mobility*
2. *Safety and Security*
3. *Integration and Connectivity*
4. *Operations and System Management*
5. *Preservation of Transportation System*
6. *Environmental Protection and Enhancement*
7. *Economic Vitality*

The goals and objectives of the Plan therefore truly promote an integrated multi-modal transportation system focused on addressing the needs of all users.

The Plan also identifies the investments that we will need to make in our transportation system to achieve such a future. Due to the expansiveness and the age of our transportation system, this transportation investment plan leans heavily toward projects that rebuild and preserve our existing system. It also identifies prioritized projects that help our system operate more efficiently, and new facilities that help expand our system's capacity and connectivity.

The conclusions reached from this process clearly indicated that the existing network was not urgently in need of expansion; that operations, i.e. traffic volumes etc. were overall very good; and that demographic forecasts predicted low but steady growth.

The travel demand model forecasted only occasional congestion issues, with few segments showing daily capacity deficiency and even fewer show-

ing current or projected peak period capacity deficiency. This largely validates the focus on maintenance and reconstruction and led to the development of the prioritized project list, which strives to address the goals of the plan by utilizing the four core strategies. The prioritized projects in this plan thus address the primary issue of aging infrastructure, and have an identified source of funding, thereby ensuring a fiscally constrained plan.

The environmental review showed that no environmental resources are disproportionately neglected or overexposed in relation to these projects, concluding that there would be no impact both due to the MATS region currently being in attainment for Federal air quality, and the geography of the proposed projects. Furthermore, the programmed 2017-2045 transportation projects are located throughout the MATS planning area, thus no population groups are disproportionately neglected or overexposed in relation to these projects. The needs of the minority and low-income population are being taken into consideration with respect to future transportation improvements.

In light of Federal requirements laid out in both the most recent and the previous transportation funding legislation, performance measures are introduced that, over time, will be fully integrated into the MATS planning process. This further reflects the fact that plans are more effective if their results can be measured, and therefore implementation steps and projects can be more effectively programmed.

Lastly, the plan presents a large number future transportation projects which fall outside of estimated reasonably expected transportation revenues, but which are still needed to maintain the transportation infrastructure at adequate levels. This strongly indicates that needs will continue to exceed resources in the near term at least.

Achieving the goals laid out in the pages of ***Towards 2045*** will require a concerted, coordinated effort on behalf of elected officials, local agencies, and the public. The result will be a more sustainable, equitable, and innovative region that is ready to compete and prosper on the national and global stage.

***Towards 2045 - Long Range Transportation Plan***

Midland Area Transportation Study (MATS)
220 West Ellsworth St - Midland, MI 48640
Phone: 989-832-6333 – Fax 989-832-6608
E-mail: info@midlandmpo.com
Website: www.midlandmpo.org
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# Appendix

A. Terms & Definitions

B. Resources

C. Chapter 7 Supplemental Information: Travel Demand Model

D. Chapter 9 Supplemental Information: Fiscal Constraint Demonstration Tables

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G. MATS Resolution of Long Range Plan Adoption

MIDLAND AREA TRANSPORTATION STUDY

MATS

# A. Terms & Definitions

**ANALYSIS AREA** - Any geographic area such as a TAZ or group of TAZs combined for the purpose of making an analysis.

**ANNUAL AVERAGE DAILY TRAFFIC (AADT)** - The total number of vehicles passing a given location on a roadway over the course of one year, divided by 365 (days in the year). Requires permanent traffic recorder to measure annual total.

**AVERAGE DAILY TRAFFIC (ADT)** - The average number of vehicles passing a specified point during a 24-hour period, calculated from an approximation of AADT based on a limited number of 24-hour counts, adjusted for known variation in levels of travel by month of year and day of week.

**BASE YEAR** - The year selected to which the major portion of data is related.

**BLOCKS** - The smallest Census Geographic area used as basic tabulation units in urbanized areas with populations of 10,000 or more.

**CALIBRATION** - The procedure used to adjust travel models to simulate base year travel.

**CAPACITY RESTRAINT** - The process by which the assigned volume on a link is compared with the practical capacity of that link and the speed of the link adjusted to reflect the relationship between speed, volume, and capacity. The procedure is iterative until a realistic balance is achieved.

**CAPACITY** - The maximum number of vehicles that can pass over a given section of a lane or roadway in one direction (or in both directions for a two-lane or three-lane highway) during a given time period under prevailing roadway and traffic conditions. It is the maximum rate of flow that has a reasonable expectation of occurring. The terms "capacity" and "possible capacity" are synonymous. In the absence of a time modifier, capacity is an hourly volume. The capacity would not normally be exceeded without changing one or more of the conditions that prevail. In expressing capacity, it is essential to state the prevailing roadway and traffic condition under which the capacity is applicable. Refer to the revised edition of the "Highway Capacity Manual" for more detail.

**CENSUS TRACT** - Small areas into which large cities and adjacent areas are divided for the purpose of providing comparable small area population and housing census tabulations.

**CENSUS TRANSPORTATION PLANNING PACKAGE (CTPP)** - Results of appropriate data items from the 2000 Census tabulated at the TAZ level by the Census Bureau for transportation planning applications.

**CENTROID** - An assumed point in a TAZ that represents the origin or destination of all trips to or from the TAZ. Generally, it is the center of trip ends rather than a geometrical center of the zonal area.

**CORDON LINE** - An imaginary line enclosing a study area, along which external interviews with motorists may be conducted for input to the modeling process.

**CORRIDOR** - A group of linear transportation facilities established by common characteristics, such as proximity, direction, or functional classification.

**COUNT** - A volume counted on the street, which may be used for comparison with the present traffic volume assigned to the corresponding link. The count may be directional or total two-way, peak hour - morning and/or afternoon - and/or a 24 hour value.

**DESTINATION** - The TAZ in which a trip terminates.

**DRIVING TIME** - The time to traverse the distance between TAZs, not including terminal time at each end of the trip.

**DWELLING UNIT** - A room or group of rooms occupied or intended for occupation as separate living quarters by persons or a group of persons. Includes houses, flats, apart ments, or other places thought of as homes. Occasionally a dwelling unit may be located in a warehouse, office building, trailer, on the grounds of another "house" , or in other unusual places.

**FACILITY** - A specific road, road segment, route, or route segment.

**FHWA** - Federal Highway Administration

**FISCAL YEAR (FY)** - For Federal and State of Michigan agencies, and MATS, the time period beginning October 1 and ending September 30 of the subsequent calendar year. Fiscal years are designated by the calendar year in which they end.

**FORECASTING** - The process of determining the future values of land use, socio-economic, and trip making variables within the study area.

**FTA** - Federal Transit Administration

**FUNCTIONAL CLASSIFICATION** - An identification and categorization of segments of the street and highway system according to the character of service they provide.

**GIS** - Geographic Information Systems

**GLBR** - Great Lakes Bay Region

**GROWTH FACTOR** - A ratio of future trip ends divided by present trip ends.

**LABOR FORCE** - The number of persons residing in a designated area assumed to be employable and actively seeking work.

**LEVEL OF SERVICE (LOS)** - The term used to indicate the quality of service provided by a facility under a given set of operating conditions. Refer to the revised edition of the "Highway Capacity Manual" for more detail.

**MDOT** - Michigan Department of Transportation

**METROPOLITAN PLANNING ORGANIZATION (MPO)** - The organization designated by the Governor responsible, together with the State, for comprehensive transportation planning according to 23U.S.C. 134, 23U.S.C. 104(f)(3), and 49U.S.C. 1602(a)(2) and (c)(a)1, 49U.S.C. 1603(a), and 49U.S.C. 1064(g)(1) and (1). This organization shall be the forum for cooperative decision making by principal elected officials of general local government.

**MICHIGAN TRANSPORTATION ECONOMIC DEVELOPMENT FUND(TEDF)** - Special fund of transportation monies for projects promoting economic development. There are several categories of funds available, all with specific requirements and restrictions. Administered at the MDOT, calls for projects not on a predetermined schedule.

**MODE OF TRAVEL** - Means of travel such as auto driver, vehicle passenger, mass transit passenger, or walking.

**MODEL** - A mathematical formula that expresses the actions and interactions of the elements of a system in such a manner that the system may be evaluated under any given set of conditions: i.e. land use, economic, socio-economic, and travel characteristics.

**MTPA** - Michigan Transportation Planning Association

**NETWORK** - A system of links describing a transportation system for analysis.

**ORIGIN** - The location of the beginning of a trip or the TAZ in which a trip begins.

**PEAK HOUR** - That one-hour period during which the maximum amount of travel occurs. Generally, there is a morning peak and an afternoon peak and traffic assignments may be made for each period, if desired.

**PRODUCTIONS** - That number of home based trip eds in the TAZ of residence. For all non-home based trips, productions are synonymous with origins.

**ROUTE** - That combination of street and freeway sections connecting an origin and destination. In traffic assignment, a continuous group of links connecting centroids that normally require the minimum time to traverse.

**STATE IMPLEMENTATION PLAN FOR AIR QUALITY(SIP)** - A plan developed by the State for an air quality control region which details what has to be done to assure com

**STUDY AREA** - The area delineated for the purpose of data collection by a transportation study. This area contains the central city and surroundings, which will become urbanized in 20 to 30 years and is the area for which forecasts of travel are made.

**TRAFFIC ANALYSIS ZONE (TAZ)** - The basic analysis unit into which all socio-economic, land use, and trip generation used to determine origin and destination of travel are summarized. Their development is based on land use, human activity, natural boundaries, and compatibility with the street system.

**TRAFFIC ASSIGNMENT** - The process of determining route or routes of travel and allocating the TAZ-to-TAZ trips to these routes.

**TRANSPORTATION IMPROVEMENT PROGRAM (TIP)** - A staged multi-year program of planned transportation improvement projects.

**TRAVEL DEMAND FORECAST MODEL (TDFM)** - A series of computer programs used to analyze and evaluate motor vehicle travel on a highway network. It uses various data on the location and characteristics of a population and its employment to predict travel demand, which can ultimately be used to identify highway deficiencies.

**TRAVEL TIME** - The time required to travel between two points, including the terminal time at both ends of the trip.

**TRIP** - A one-direction movement which begins at the origin at the start time, ends at the destination at the arrival time, and is conducted for a specific purpose.

**TRIP DISTRIBUTION** - The process by which the movement of trips between TAZs is estimated. The data for each distribution may be measured or be estimated by a growth factor process, or by synthetic model.

**TRIP END** - Either a trip origin or a trip destination.

**TRIP GENERATION** - A general term describing the analysis and application of the relationships which exists between the trip-makers, the urban area, and the trip making. It relates to the number of trip ends in any part of the urban area.

**TRIP PURPOSE** - The reason for making a trip. Normally, one of ten possible purposes each trip may have a purpose at each end. For example, home to work.

**TRIP TABLE** - A table showing trips between TAZs - either directionally or total two-way. The trips may be separated by mode, by purpose, by time period, by vehicle type or other classification.

**URBAN AREA** - An urban place as designated by the Bureau of the Census having a population of 50,000 or more and not within any other urbanized area.

**URBAN AREA BOUNDARY** - The boundaries of the area that encompass the entire urban place as designated by the U.S. Bureau of Census plus that adjacent area as agreed upon by local officials in cooperation with the State.

**URBANIZED AREA (UA)** - An urban place containing a city (or twin cities) of 50,000 or more (central city) plus the surrounding closely settled incorporated area which meets certain criteria of population size or density, as designated by the Bureau of the Census, and not within any other urbanized area. As defined by minimum population density, the urbanized area can include the central city, suburbs, and the closely settled fringe of development.

**USDOT** - United States Department of Transportation

**VEHICLE HOURS OF TRAVEL (VHT)** - Generally used as an area-wide measure. May be calculated by dividing the product of average trip length (in miles) and number of vehicle trips by average speed (in mph).

**VEHICLE-MILES OF TRAVEL (VMT)** - Generally used as an area-wide measure. May be calculated by summing data on a link basis or by multiplying average trip length (in miles) times the total number of vehicle trips.

**VMT** - Vehicle-Miles of Travel

**VOLUME** - The number of vehicles using a facility.

**VOLUME TO CAPACITY RATIO (V/C)** - A measure of the level of service on a facility.

**ZONE** - A portion of the study area, delineated as such for particular land use and traffic analysis purposes. There may be two types of zones used in the traffic assignment process: 1) Survey Zone - A subdivision of the study area which is used during the data collection phase of the study; and 2) Traffic Analysis Zone (TAZ) - A subdivision of the study area.

# B. Resources

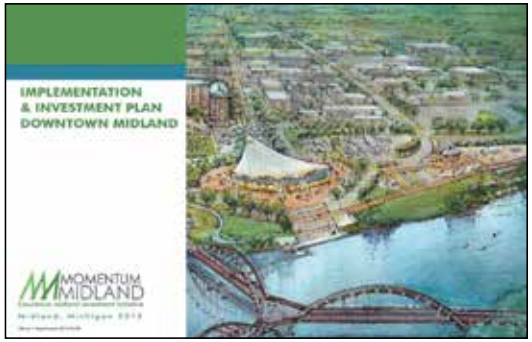
## Plans Reviewed During Development


### Statewide Plans

- 2015-2019 Five-Year Transportation Program (2015)
- 2035 State Long-Range Transportation Plan: Moving Michigan Forward (2012)
- 2040 State Long-Range Transportation Plan: Moving Michigan Forward (2016)
- Driven By Excellence: A Report on Transportation Performance Measurement at MDOT (2010)
- Fiscal Years 2014-2017 State Transportation Improvement Program (2013)
- Fiscal Years 2017-2020 State Transportation Improvement Program (2016)
- Michigan Freight Plan (2013)
- Michigan Freight Primer: An Introduction to Freight Modes in Michigan (2015)
- Michigan State Rail Plan (2011)
- Michigan Strategic Highway Safety Plan (2012)

### Local Plans

- City of Auburn Master Plan (2011)
- City of Midland Master Plan (2013)
- City of Midland Non-Motorized Transportation Improvement Plan (2013)
- City of Midland Parks and Recreation Master Plan (2015)
- MATS NMT Plan (2015)
- MATS Public Participation Plan (2014)
- MBS Airport Master Plan (2016)
- MDOT US-10 BR Corridor Study (2016-2017)
- Midland Downtown Streetscape Plan (2016-2017)
- Momentum Midland Implementation & Investment Plan (2015)
- Various Township Master Plans
- Village of Sanford Master Plan (2014)


### Other Plans

- Battle Creek Area Transportation Study LRTP
- Bay County Area Transportation Study LRTP
- Broward (Florida) Metropolitan Planning Organization LRTP
- Genesee County Metropolitan Planning Commission LRTP
- Kalamazoo Area Transportation Study LRTP
- Macatawa Area Coordination Council LRTP
- Saginaw Metropolitan Area Transportation Study LRTP
- Washtenaw Area Transportation Study LRTP
- West Michigan Shoreline Regional Development Commission LRTP

## Web Resources

US Department of Transportation (USDOT)
http://www.dot.gov

Bureau of Transportation Statistics (BTS)
http://www.bts.gov

Federal Highway Administration (FHWA)
http://www.fhwa.dot.gov

Office of Transportation Technologies
http://www.ott.doe.gov

Federal Transit Administration (FTA)
http://www.fta.dot.gov

ITS Electronic Document Library (FHWA)
http://www.its.dot.gov

Federal Aviation Administration (FAA)
http://www.faa.gov

Federal Railroad Administration (FRA)
http://www.fra.dot.gov

Transportation Equity Act for the 21st Century (TEA-21)
http://www.fhwa.dot.gov/tea21/

National Highway Traffic Safety Administration (NHTSA)
http://www.nhtsa.dot.gov

Essential Air Service
http://www.ostpxweb.dot.gov/aviation/

National Safety Council
http://www.nsc.org

Local Technical Assistance Program (LTAP)
http://www.ltap.org

National Scenic Byways Program
http://www.byways.org

FHWA Real Estate and Right-of-Way Information
http://www.fhwa.dot.gov/realestate

US Department of Agriculture – Rural Development
http://www.rurdev.usda.gov/nrdp

Safe Communities Services
http://www.nhtsa.dot.gov/safecommunities

US Department of Commerce
http://www.doc.gov

USDOT & USDA Transportation Toolbox for Rural Areas & Small Communities
http://ntl.bts.gov/ruraltransport/toolbox/

American Association of State Highway and Transportation Officials (AASHTO)
http:www.aashto.org

American Planning Association (APA)
http://www.planning.org

American Public Transit Association (APTA)
http://www.apta.org

American Public Works Association (APWA)
http://www.apwa.net

Association of American Railroads (AAR)
http://www.aar.org

American Traffic Safety Services Association (ATSSA)
http://www.atssa.com

Intelligent Transportation Society of America (ITSA)
http://www.itsa.org

American Public Transportation Association (APTA)
http://www.apta.com

The National Associations Working Group for ITS
http://www.nawgits.com

National Association of Towns & Townships
http://www.natat.org

Michigan- Department of Transportation
http://www.mdot.state.mi.us

# C. Travel Demand Model

## Background and Detailed Process

*Note: The following information is provided by the SUTA Division of MDOT.*

Because of the interaction of traffic between Midland, Bay City, and Saginaw it was decided that the travel patterns of the area could be better modeled if a regional model was built. The travel demand model used for the Midland Area Transportation Study (MATS) 2045 Metropolitan Transportation Plan (MTP) is a regional model, referred to as the Great Lakes Bay Region (GLBR) Model that includes Midland, Bay and Saginaw Counties. This effort required coordination and cooperation between MATS, Bay City Area Transportation Study (BCATS), and Saginaw Metropolitan Area Transportation Study (SMATS).

The urban area travel demand modeling process for the MATS portion of the GLBR Model was a cooperative effort between MATS, being the Metropolitan Planning Organization (MPO), and the Michigan Department of Transportation, Statewide and Urban Travel Analysis Section. MDOT provided the lead role in the process and assumed responsibility for modeling activities with both entities reaching consensus on selective process decisions. The local transportation planning agency is the MPO, comprised of representatives of local governmental units and is the umbrella organization 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 is to provide an important decision making tool for the MPO Metropolitan Transportation Plan 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 MATS has been completed through the use of TransCAD software utilized by MDOT. The model is a computer estimation of current and future traffic conditions and is a system-level transportation planning model. Capacity deficiencies are determined using a Level of Service E capacity.

The urban travel demand forecasting process used has seven phases:

1. Data Collection, in which socio-economic and facility inventory data are collected.
2. Trip Generation, which calculates the number of person trips produced in or attracted to a traffic analysis zone (TAZ).
3. Trip Distribution, which takes the person trips produced in a TAZ and distributes them to all other TAZs, based on attractiveness of the zone.
4. Mode Choice, which assigns person trips to a mode of travel such as drive alone, shared ride 2, shared ride 3+, and ride transit.
5. Assignment, which determines what routes are utilized for trips. Non-motorized and transit trips are accounted for however they are not part of the traffic assignment.
6. Model Calibration/Validation, which is performed at the end of each modeling step to make sure that the results from that step are within reasonable ranges. The final assignment validation involves verifying that the volumes (trips) estimated in the base year traffic assignment replicate observed traffic counts.
7. System Analysis, tests alternatives and analyzes changes in order to improve the transportation system.

There are two basic systems of data organization in the travel demand forecasting process. The first system of data is organized based on the street system. Roads with a national functional class (NFC) designation of "minor collector" and higher are included in the network. Some local roads are included to provide connectivity in the network or because

they were deemed regionally significant. The unit of analysis is called a "link." A link is a segment of roadway which is terminated at each end by an intersection. In a traffic assignment network, intersections are called "nodes." Therefore, a link has a node at each end.

The second data organization mechanism is the Traffic Analysis Zones (TAZ). TAZs are determined based upon several criteria, including similarity of land use, compatibility with jurisdictional boundaries, the presence of physical boundaries, and compatibility with the street system. Streets are generally utilized as zone boundary edges. All socio- economic and trip generation information for both the base year and future year are summarized by TAZ.

The two data systems, the street system (network) and the TAZ system (socio-economic data), are interrelated through the use of "centroids." Each TAZ is represented on the network by a point (centroid) which represents the weighted center of activity for that TAZ. 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 TAZ which connects the TAZ to the street system. Since every TAZ is connected to the street system by these "centroid connectors," it is possible for trips from each zone to reach every other zone by way of a number of paths through the street system.

## Network

A computerized "network" (traffic assignment network) is built to represent the existing street system. The GLBR Model network is based on the Michigan Geographic Framework version 14 and includes most streets 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 available, national functional classification, traffic counts (where available), and volumes for level of service E (frequently described as its capacity). If the information is not the same for the entire length of a link, the predominant value is used. The network attributes were provided to the MPO and MDOT staff by the respective road agencies, with the exclusion of link capacity. The link capacity was determined by utilizing a look-up table, developed for MDOT as part of the Urban Model Improvement Program, which takes into account the network attributes and sets a capacity that would approximate a level of service "E". Therefore a volume to capacity ratio of 1 or greater indicates a Level of service E and is characterized by stop-and–go-travel, reduced flow rates and severe intersection delays. This typifies unacceptable or deficient traffic conditions.

The street network is used in the traffic assignment process. The traffic assignment process takes the trip interactions between zones from trip distribution and loads them onto the network. The travel paths for each zone-to-zone interchange are based on the minimum travel time between zones. They are calculated by a computer program which examines all possible paths from each origin zone to all destination zones. The shortest path is determined by the distance of each link and the speed at which it operates. The program then calculates travel times for all of the possible paths between centroids and records the links which comprise the shortest travel time path.

Speeds used to calculate minimum travel times are based on each link's national functional classification, facility type, and area type. Speeds represent a relative impedance to travel and not posted speed limits.

## 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 Michigan 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. In order to develop a trip table, productions (P's) and attractions (A's) must be balanced also referred to as normalization. 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 moving on to trip distribution.

The GLBR 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 I (QRFM I). The QRFM I uses the employment data from the TAZs in its calculations.

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.

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

The process which connects productions to attractions is called trip distribution. The most widely used and documented technique is the "gravity model" which was 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 "F factor" also known as a "Friction Factor." "F factors" represent the average area-wide effect that various levels of travel time have on travel between zones. The "F factors" used 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. The F factor matrix is generated in TransCAD during the gravity model process.

The primary inputs to the gravity model are the normalized productions (P's) and attractions (A's) 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."

In order to more closely approximate actual times between TAZs and also 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 P's & A's, the by trip-purpose "F factors", and the travel times, including terminal and intra-zonal. The output is a TAZ to TAZ matrix of trips for each trip purpose.

## Mode Choice

The number of person trips and their trip starting and ending point have been determined in the trip generation and trip distribution steps. The mode choice step determines how each person trip will travel. The GLBR travel demand model uses a simplified mode to predict mode choice.

The process uses a qualitative measure of transit network service at the zonal level to estimate transit mode shares. The transit trips are accounted for but not assigned to a specific route. The split between single occupancy vehicles (SOV) and shared ride trips (SR2 & SR3+) is based on the average auto occupancy for the applicable trip purpose. The output to this step is a vehicle trip matrix by trip purpose. The external trips and the truck trips, which are originally developed as vehicle trips which eliminates the need of the mode choice step for these trip purposes, are added to the vehicle trip matrix.

## Assignment

The GBLR model has 4 time periods that were developed to match the peak periods observed in traffic counts.

The following period were used: AM Peak (7a - 9a) Mid Day (9a - 3p) PM Peak (3p - 6p) Night Time (6p – 7a)

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 purpose. Default factors from the Quick Response Freight Manual I (QRFM I) were used for truck trips.

The traffic assignment process takes the trips produced in a zone (trip generation) and distributed to other zones (trip distribution) and loads them onto the network via the centroid connectors. A program examines all of the possible paths from each zone to all other zones and calculates all reasonable time paths from each zone (centroid) to all other zones. Trips are assigned to paths that are the shortest path between each combination of zones. As the volumes assigned to links approach capacity, travel times on all paths are recalculated to reflect the reduction in seed due to congestion. This may create a new shortest path which trips will be assigned to in the next iteration. This process continues through several iterations until no trip can reduce its travel time by changing routes and all used alternative paths between zones have approximately the same travel time. This user equilibrium assignment method reflects the alternative routes that motorists use as the original shortest path becomes congested. The assignment step produces an assigned volume for each link by time period that can be added together to calculate a daily volume.

## Travel Demand 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 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 Validated Travel Demand Model

Forecasted travel is produced by substituting forecasted socio-economic and transportation system data for the base year data. This forecasted data is reviewed and approved by the MPO. The same mathematical formulas are used for the base and future year data. The assumption is made that the relationships expressed by the formulas in the base year will remain constant over time (to the target date).

Some of the applications of the model that were utilized in the development of the MATS 2045 Metropolitan Transportation Plan (MTP) Capacity Project list are:

- Future traffic can be assigned to the existing network to show what would happen in the future if no improvements were made to the present transportation system.
- Network alternatives to relieve congestion can be tested. This process is often referred to as "deficiency analysis." From this, improvements can be planned that would alleviate demonstrated capacity problems.
- Proposed "road diet" configurations can be tested for their effect on the transportation system.
- The impact of planned roadway improvements or network changes can be assessed.
- Links can be analyzed to determine what zones are contributing to the travel on that link and to better understand traffic patterns.
- The network can be tested to simulate conditions with or without a proposed bridge or new road segment. The assigned future volumes on adjacent links would then be compared to determine traffic flow impacts. This, in turn, would assist in assessing whether the bridge should be build, replaced and/or where it should be relocated to.

Additional applications that may be performed outside of the MTP development are:

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

- The impacts of land use changes on the network can also be evaluated (e.g., what are the impacts of a new regional mall being built).

Understanding of two issues are critical in using the modeling tools and processes:

- The modeling process is most effective for system level analysis. Although detailed volumes for individual intersection and "links" of a highway are an output of the model, additional analysis and modification of the model output may be required for project level analysis.

- The accuracy of the model is heavily dependent on the accuracy of the socio- economic data and network data provided by the local participating agencies, and the skill of the users in interpreting the reasonableness of the results.

## System Analysis for MTP

Three different alternative scenarios were developed for the MTP deficiency report:

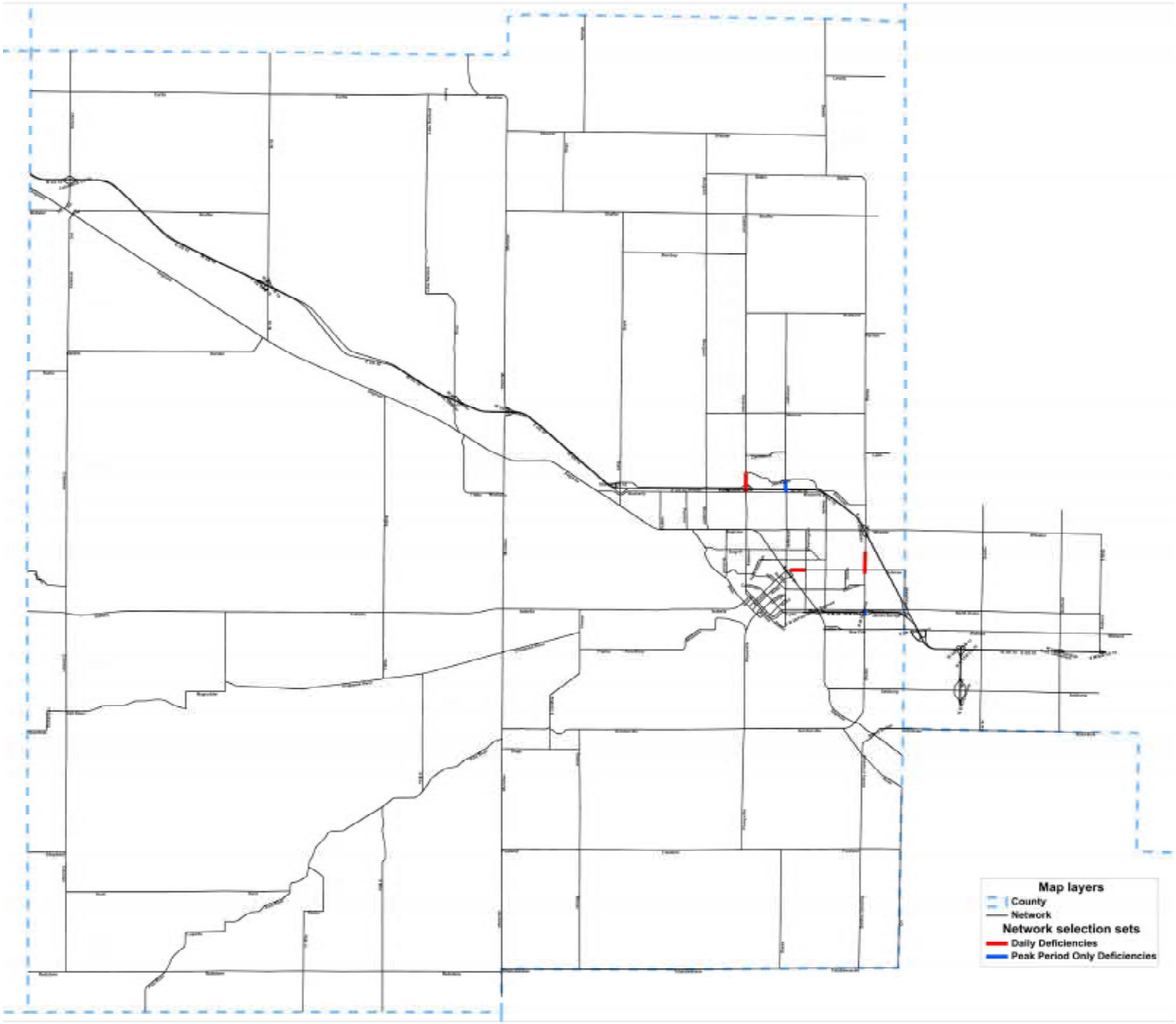
1. Existing trips on the existing system. This is the "calibrated," existing network/scenario. This is a prerequisite for the other two scenarios.

2. Future trips on the existing network. Future trips are assigned to the existing network. This alternative displays future capacity and congestion problems if no improvements to the system are made. This is called the "No Build" alternative, and usually includes the existing system, plus any projects which are in the MPO Transportation Improvement Program (TIP) and thus committed to be built in the near future.

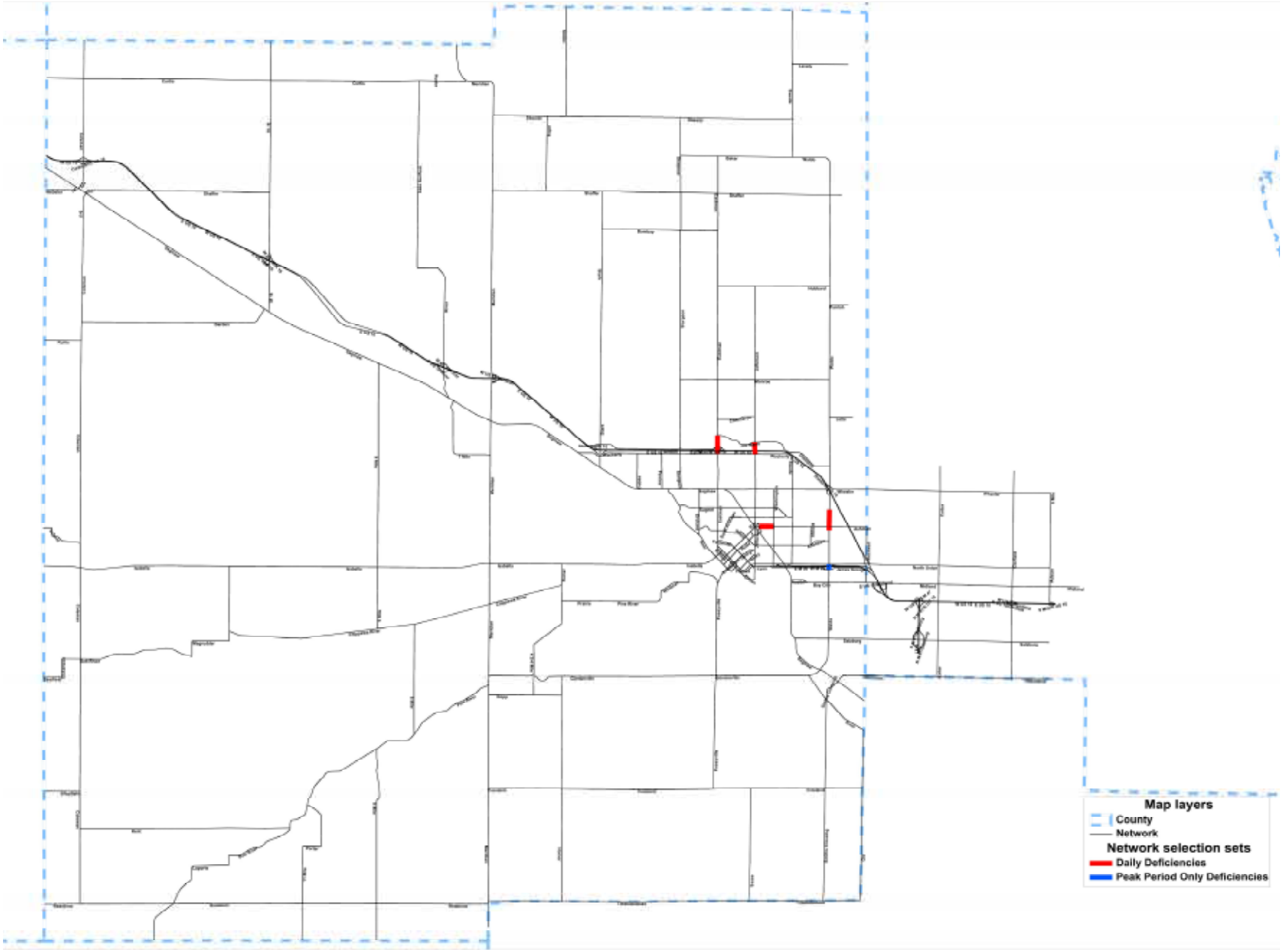
3. Future trips on the future system. This scenario is the "Build" alternative and the network includes the capacity projects listed in the MTP.

It is important to remember that the volume to capacity ratio reflects a volume for a specified time period and a capacity for that same period of time. It does not reflect deficiencies that only occur briefly at certain short time periods or because of roadway geometrics, or roadway condition.

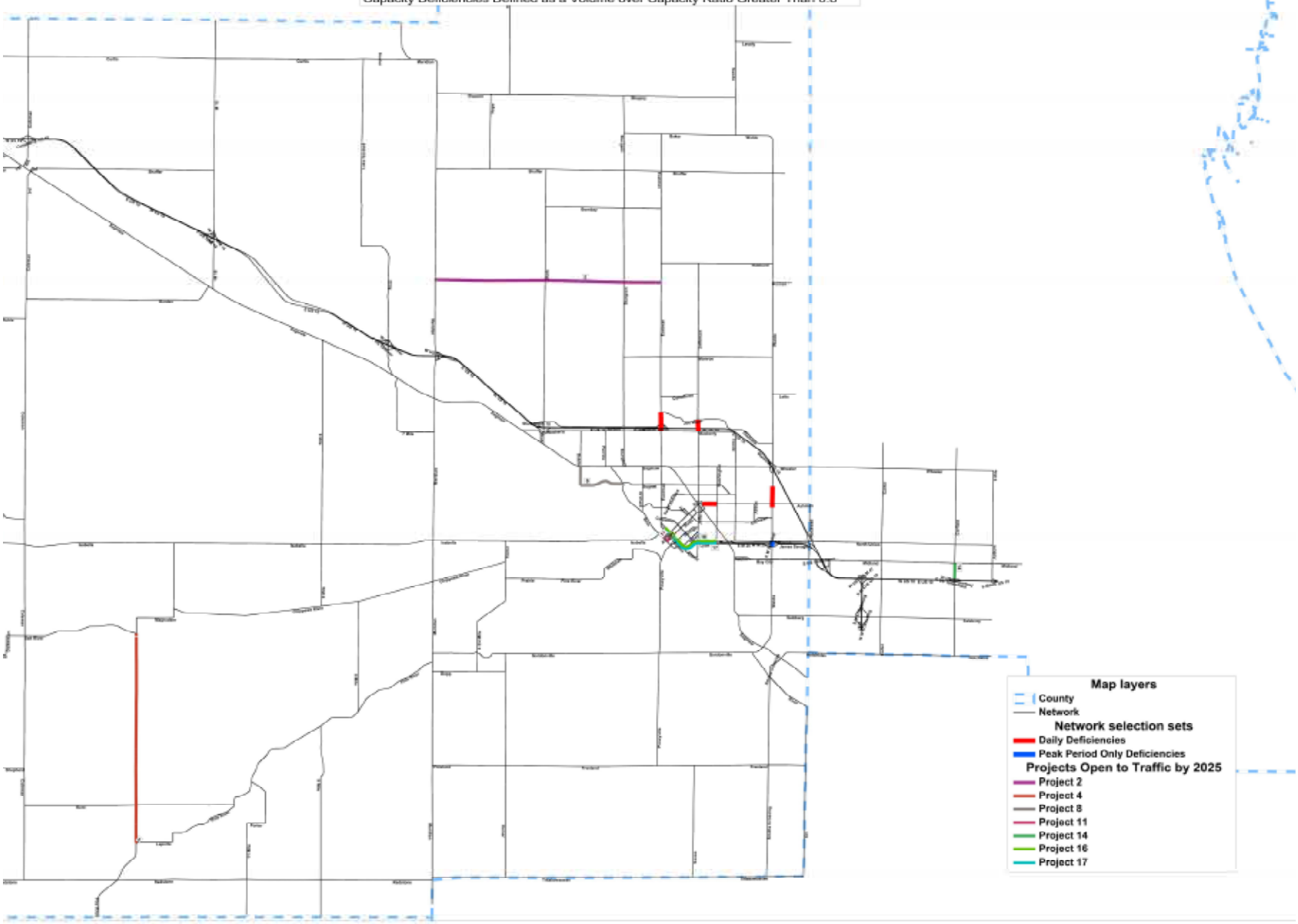
Great Lakes Bay Region Travel Demand Model
2013 Model Results for the Midland Area Transportation Study
Daily and Peak Period Capacity Deficiencies Labeled
Capacity Deficiencies Defined as a Volume over Capacity Ratio Greater Than 0.8



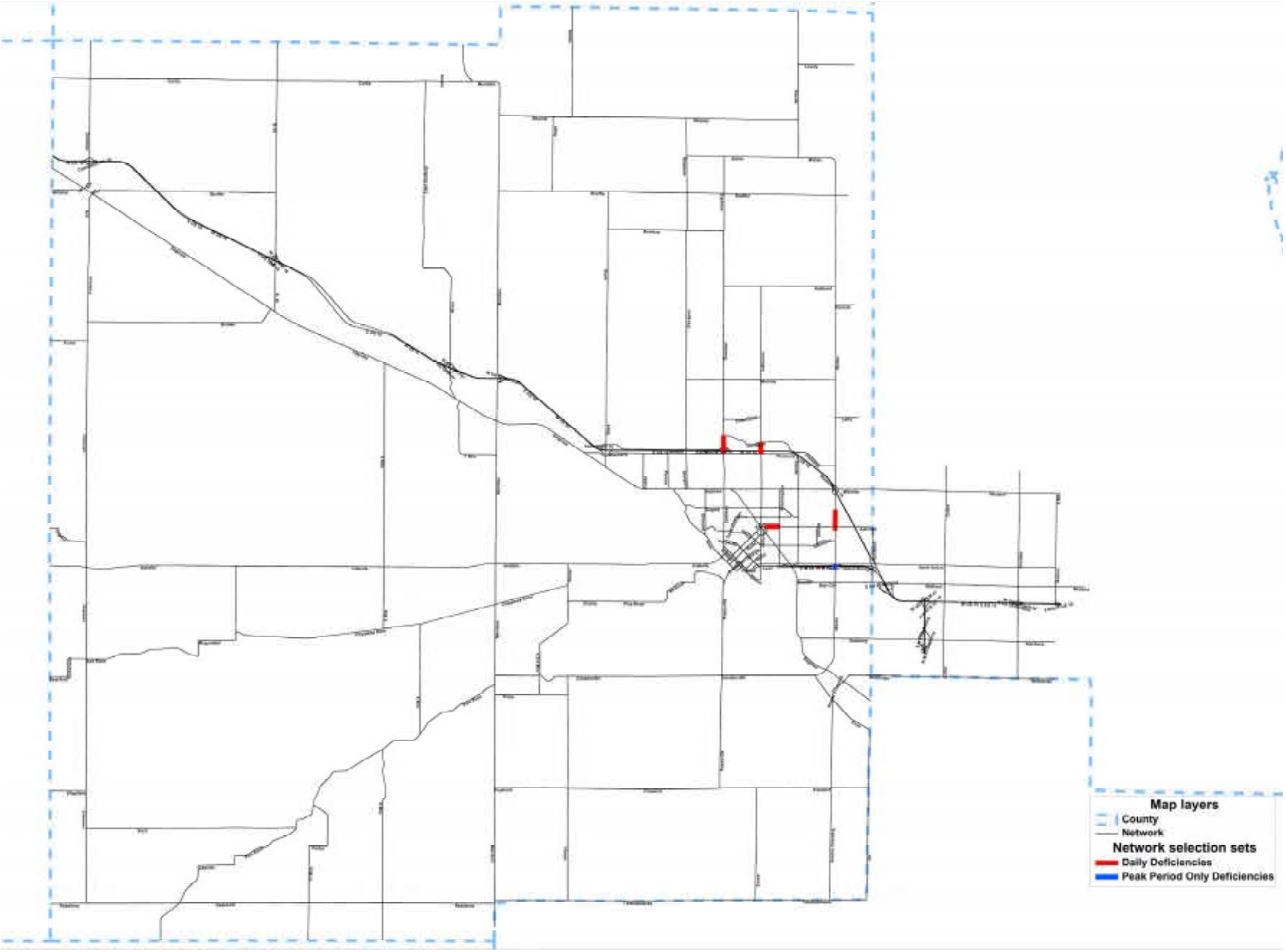
Great Lakes Bay Region Travel Demand Model
2025 No Build Model Results for the Midland Area Transportation Study
2025 Forecast Assigned on the 2013 Network
Daily and Peak Period Capacity Deficiencies Labeled
Capacity Deficiencies Defined as a Volume over Capacity Ratio Greater Than 0.8



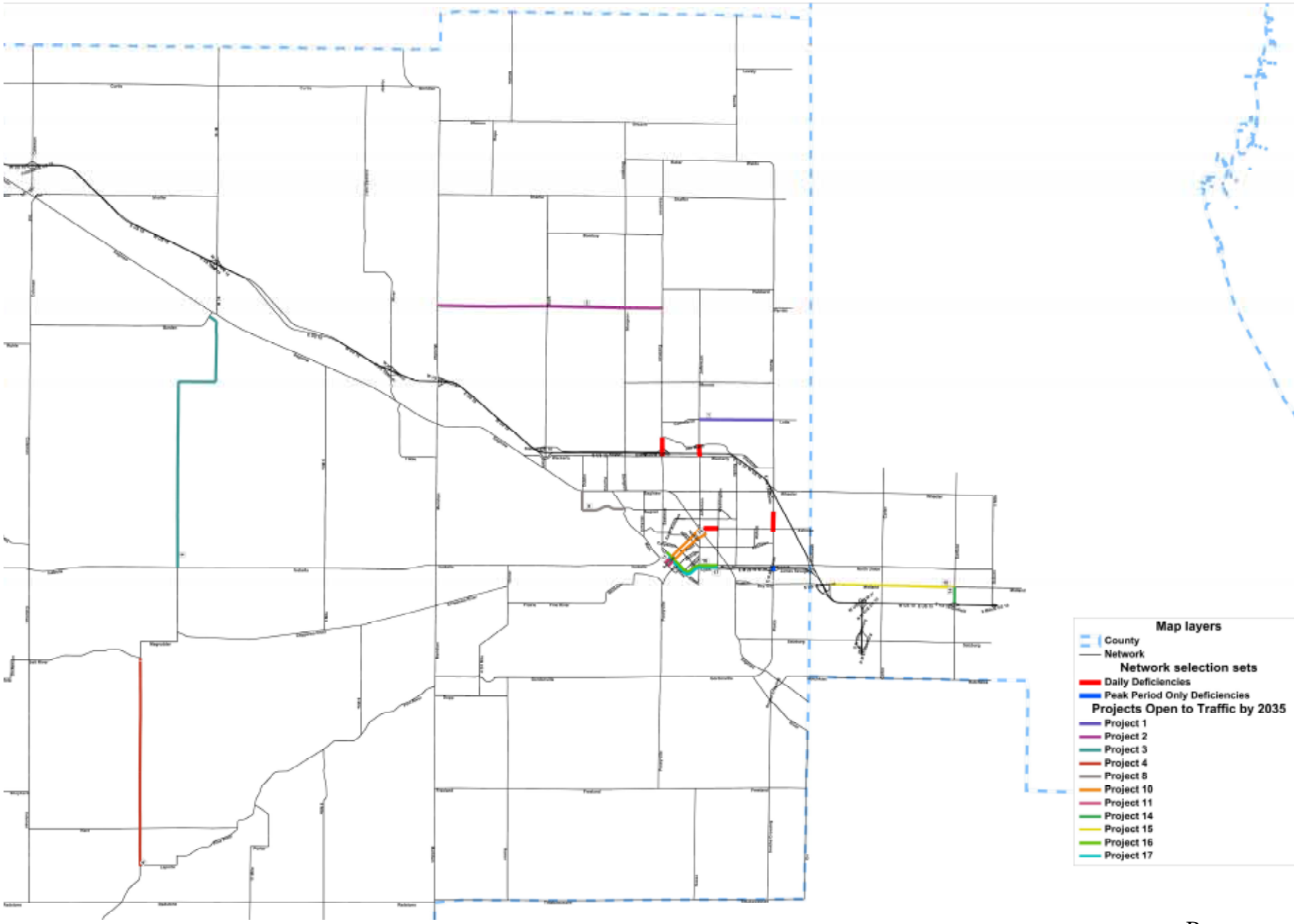
Great Lakes Bay Region (GLBR) Travel Demand Model
2025 Build Model Results for the Midland Area Transportation Study
2025 Forcast Assigned on the Metropolitan Transportation Plan (MTP) 2025 Network
All Projects Included in the 2025 Analysis are Labeled on the Map
Daily and Peak Period Capacity Deficiencies Labeled
Capacity Deficiencies Defined as a Volume over Capacity Ratio Greater Than 0.8



Great Lakes Bay Region Travel Demand Model
2035 No Build Model Results for the Midland Area Transportation Study
2035 Forecast Assigned on the 2013 Network
Daily and Peak Period Capacity Deficiencies Labeled
Capacity Deficiencies Defined as a Volume over Capacity Ratio Greater Than 0.8



Great Lakes Bay Region (GLBR) Travel Demand Model
2035 Build Model Results for the Midland Area Transportation Study
2035 Forecast Assigned on the Metropolitan Transportation Plan (MTP) 2035 Network
All Projects Included in the 2035 Analysis are Labeled on the Map
Daily and Peak Period Capacity Deficiencies Labeled
Capacity Deficiencies Defined as a Volume over Capacity Ratio Greater Than 0.8



## Regional Deficiencies

The table below is one result of the travel demand model process and shows the deficiencies during daily and peak times.

### MATS Capacity Deficiencies

| Road Name | Extent | 2013 V/C with TIP Projects | 2025 V/C without MTP Projects | 2025 V/C with MTP Projects | 2035 without MTP Projects | 2035 V/C with MTP Projects | 2045 V/C without MTP Projects | 2045 V/C with MTP Projects |
|---|---|---|---|---|---|---|---|---|
| **Daily** | | | | | | | | |
| Eastman | Wackerly to Joe Mann | 0.86 - 0.96 | 0.90 - 1.0 | 0.89 - .99 | 0.92 - 1.01 | 0.92 - 1.0 | 0.93 - 1.02 | 0.94 - 1.01 |
| Jefferson | Wackerly to Joe Mann | Not deficient | 0.81 | 0.81 | 0.86 | 0.86 | 0.91 | 0.91 |
| Ashman | Cambridge to Washington | 0.82 - 0.91 | 0.82 - 0.90 | 0.82 - 0.90 | 0.82 - 0.85 | 0.81 - 0.85 | 0.81 - 0.83 | 0.80 - 0.84 |
| Waldo | South of Ashman to North of Ashman | 0.80 - 0.93 | 0.80 - 0.93 | 0.80 - 0.93 | 0.81 - 0.94 | 0.81 - 0.93 | 0.82 - 0.94 | 0.81 - 0.93 |
| **Am Peak (7a-9a)** | | | | | | | | |
| Eastman | Wackerly to Joe Mann | 0.89 - 0.99 | 0.92 - 1.0 | 0.92 - 1.0 | 0.94 - 1.01 | 0.95 - 1.02 | 0.95 - 1.02 | 0.96 - 1.03 |
| Jefferson | Wackerly to Joe Mann | 0.92 | 0.94 | 0.94 | 0.95 | 0.95 | 0.95 | 0.95 |
| Waldo | South of Ashman to North of Ashman | 0.88 - 0.95 | 0.91 - 0.98 | 0.91 - 0.98 | 0.93 - 1.0 | 0.94 - 1.01 | .94 - 1.01 | 0.95 - 1.02 |
| Waldo | James Savage to Patrick | 0.92 | 0.94 | 0.95 | 0.95 | 0.97 | 0.96 | 0.98 |
| Ashman | Cambridge to Washington | .85 - .94 | .87 - .95 | .88 - .95 | 0.88 - 0.96 | 0.88 - 0.96 | 0.88 - 0.96 | 0.89 - 0.96 |
| **PM Peak (3p-6p)** | | | | | | | | |
| Eastman | Wackerly to Joe Mann | 0.91 - 1.01 | 0.96 - 1.03 | 0.96 - 1.03 | 0.99 - 1.05 | 0.99 - 1.05 | 1.0 - 1.06 | 1.01 - 1.06 |
| Jefferson | Wackerly to Joe Mann | 0.93 | 0.95 | 0.95 | 0.96 | 0.97 | 0.96 | 0.98 |
| Joe Mann | Eastman to Jefferson | Not deficient | Not deficient | Not deficient | Not deficient | Not deficient | .80 - 0.84 | 0.81 - 0.83 |
| Waldo | South of Ashman to North of Ashman | 0.86 - 0.95 | 0.85 - 0.95 | 0.86 - 0.95 | 0.84 - 0.94 | 0.85 - 0.95 | 0.84 - 0.94 | 0.85 - 0.95 |
| Waldo | James Savage to Patrick | 0.89 | 0.89 | 0.89 | 0.9 | 0.9 | 0.9 | 0.91 |
| Ashman | Cambridge to Washington | 0.84 - 0.94 | 0.84 - 0.92 | 0.84 - 0.92 | 0.84 - 0.91 | 0.84 - 0.90 | 0.85 - 0.91 | 0.84 - 0.90 |

Source: MDOT.

# D. Fiscal Constraint Demonstration Tables

## Local STP Urban Program

### STP - Urban Revenue Estimates

| | Federal Funding | Local Match | Total Revenues |
|---|---|---|---|
| 2017-2020 | $3,462,805 | $2,088,513 | $5,551,318 |
| 2021-2025 | $4,732,631 | $2,772,150 | $7,504,781 |
| 2026-2035 | $11,241,380 | $5,429,981 | $16,671,361 |
| 2036-2045 | $14,250,142 | $3,562,536 | $17,812,678 |
| | | | |
| Total | $33,686,958 | $13,853,180 | $47,540,138 |

### STP - Urban Expenditure Estimates

| | Federal Funding | Local Match | Total Revenues |
|---|---|---|---|
| 2017-2020 | $3,462,805 | $2,088,513 | $5,551,318 |
| 2021-2025 | $4,732,631 | $2,772,150 | $7,504,781 |
| 2026-2035 | $11,241,380 | $5,429,981 | $16,671,361 |
| 2036-2045 | $14,250,142 | $3,562,536 | $17,812,678 |
| | | | |
| Total | $33,686,958 | $13,853,180 | $47,540,138 |

Expenditures match revenues as all available funding will be utilized.

### STP - Urban Financial Constraint

| | Federal Funding | Local Match | Total Revenues |
|---|---|---|---|
| 2017-2020 | Yes | Yes | Yes |
| 2021-2025 | Yes | Yes | Yes |
| 2026-2035 | Yes | Yes | Yes |
| 2036-2045 | Yes | Yes | Yes |
| | | | |
| Total | Yes | Yes | Yes |

Current Urban (MPO) Allocations used as base revenues. 2% annual growth rate applied until 2025, 2.4% annual growth rate thereafter to derive yearly revenues for 2021-2045. For years 2017-2020, revenues derived based on Urban (MPO) projects in the MATS TIP.

# Local STP Rural Program

## STP - Rural Revenue Estimates

| | Federal Funding | EDD Funding (State) | Local Match | Total Revenues |
|---|---|---|---|---|
| 2017-2020 | $2,212,069 | $351,896 | $867,071 | $3,431,036 |
| 2021-2025 | $2,519,898 | $400,000 | $229,975 | $3,149,873 |
| 2026-2035 | $5,985,493 | $800,000 | $693,373 | $7,481,866 |
| 2036-2045 | $7,587,513 | $800,000 | $1,096,878 | $9,484,391 |
| | | | | |
| Total | $18,304,973 | $2,351,896 | $2,887,297 | $23,547,166 |

## STP - Rural Expenditure Estimates

| | Federal Funding | EDD Funding (State) | Local Match | Total Revenues |
|---|---|---|---|---|
| 2017-2020 | $2,212,069 | $351,896 | $867,071 | $3,431,036 |
| 2021-2025 | $2,519,898 | $400,000 | $229,975 | $3,149,873 |
| 2026-2035 | $5,985,493 | $800,000 | $693,373 | $7,481,866 |
| 2036-2045 | $7,587,513 | $800,000 | $1,096,878 | $9,484,391 |
| | | | | |
| Total | $18,304,973 | $2,351,896 | $2,887,297 | $23,547,166 |

Expenditures match revenues as all available funding will be utilized.

## STP - Rural Financial Constraint

| | Federal Funding | EDD Funding (State) | Local Match | Total Revenues |
|---|---|---|---|---|
| 2017-2020 | Yes | Yes | Yes | Yes |
| 2021-2025 | Yes | Yes | Yes | Yes |
| 2026-2035 | Yes | Yes | Yes | Yes |
| 2036-2045 | Yes | Yes | Yes | Yes |
| | | | | |
| Total | Yes | Yes | Yes | Yes |

Current RTF Allocations used as base revenues. 2% annual growth rate applied until 2025, 2.4% annual growth rate thereafter to derive yearly revenues for 2021-2045. For years 2017-2020, revenues derived based on RTF projects in the MATS TIP.

# Non-Motorized Program

## NMT Program Revenue Estimates

| | Transportation Alternatives Program (TAP) | Local Match | Total Revenues |
|---|---|---|---|
| 2017-2025 | $1,540,038 | $385,010 | $1,925,048 |
| 2026-2035 | $2,112,414 | $636,398 | $2,749,312 |
| **2036-2045** | $2,677,802 | $1,652,139 | $4,329,941 |
| | | | |
| Total | $6,330,254 | $2,673,547 | $9,004,301 |

Base TAP Revenue derived from MDOT 10-year estimate. 2% growth rate utlized for years 2017-2026, and 2.4% growth rate for years 2027-2045.

## NMT Program Expenditure Estimates

| | TAP Only | Local Match | Total Expenditures |
|---|---|---|---|
| 2017-2025 | $1,404,745 | $351,186 | $1,755,931 |
| 2026-2035 | $2,112,914 | $636,398 | $2,749,312 |
| **2036-2045** | $2,677,802 | $1,652,139 | $4,329,941 |
| | | | |
| Total | $6,195,461 | $2,639,723 | $8,835,184 |

Based on Prioritized Projects.

## NMT Program Financial Constraint

| | TAP Only | Local | Total |
|---|---|---|---|
| 2017-2025 | Yes | Yes | Yes |
| 2026-2035 | Yes | Yes | Yes |
| **2036-2045** | Yes | Yes | Yes |
| | | | |
| Total | Yes | Yes | Yes |

# Local Safety Program & Local Bridge Program

## Local Safety Program Revenue Estimates

| | Federal Funding | Local Match | Total |
|---|---|---|---|
| 2017-2025 | $3,769,360 | $643,582 | $4,412,942 |
| 2026-2035 | $2,729,534 | $303,282 | $3,032,816 |
| **2036-2045** | $3,460,095 | $384,455 | $3,844,550 |
| | | | |
| Total | $9,958,989 | $1,331,319 | $11,290,308 |

## Local Bridge Program Revenue Estimates

| | Federal Funding | State+Local Match | Total |
|---|---|---|---|
| 2017-2025 | $4,361,328 | $1,090,332 | $5,451,660 |
| 2026-2035 | $5,459,068 | $1,364,767 | $6,823,835 |
| **2036-2045** | $6,920,190 | $1,730,048 | $8,650,238 |
| | | | |
| Total | $16,740,586 | $4,185,147 | $20,925,733 |

## Local Safety Program Expenditure Estimates

| | Federal Funding | Local Match | Total |
|---|---|---|---|
| 2017-2025 | $3,769,360 | $643,582 | $4,412,942 |
| 2026-2035 | $2,729,534 | $303,282 | $3,032,816 |
| **2036-2045** | $3,460,095 | $384,455 | $3,844,550 |
| | | | |
| Total | $9,958,989 | $1,331,319 | $11,290,308 |

Expenditures match projected revenues since all available funding likely will be utilized.

## Local Bridge Program Expenditure Estimates

| | Federal Funding | State+Local Match | Total |
|---|---|---|---|
| 2017-2025 | $4,361,328 | $1,090,332 | $5,451,660 |
| 2026-2035 | $5,459,068 | $1,364,767 | $6,823,835 |
| **2036-2045** | $6,920,190 | $1,730,048 | $8,650,238 |
| | | | |
| Total | $16,740,586 | $4,185,147 | $20,925,733 |

Expenditures match projected revenues since all available funding likely will be utilized.

## Local Safety Program Financial Constraint

| | Federal Funding | Local Match | Total |
|---|---|---|---|
| 2017-2025 | Yes | Yes | Yes |
| 2026-2035 | Yes | Yes | Yes |
| **2036-2045** | Yes | Yes | Yes |
| | | | |
| Total | Yes | Yes | Yes |

Local Safety Program: Allocated per grant basis. $200,000 annually used as base (recommended by MCRC). 2% growth rate used for 2017-2025 with 2.4% there-after per MTPA/MDOT.
2017-2018: Revenues derived based on projects in the MATS TIP.
2019-2045: Revenues derived using base revenues and applying above-noted growth rates.

## Local Bridge Program Financial Constraint

| | Federal Funding | State+Local Match | Total |
|---|---|---|---|
| 2017-2025 | Yes | Yes | Yes |
| 2026-2035 | Yes | Yes | Yes |
| **2036-2045** | Yes | Yes | Yes |
| | | | |
| Total | Yes | Yes | Yes |

Local Bridge Program: Allocated per grant basis. $400,000 annually used as base (recommended by MCRC). 2% growth rate used for 2017-2025 with 2.4% thereafter per MTPA/MDOT.
2017-2018: Revenues derived based on projects in the MATS TIP.
2019-2045: Revenues derived using base revenues and applying above-noted growth rates.

# State Preservation & Capacity Program

## Federal/State Revenues Available for State Facilities

| | Preservation | Capacity |
|---|---|---|
| 2017-2025 | $92,853,264 | $0 |
| 2026-2035 | $127,213,924 | $0 |
| **2036-2045** | $181,290,828 | $0 |
| | | |
| Total | $401,358,016 | $0 |

Federal/State revenues available for State facilities:
Base revenues provided by MDOT. 2% growth rate used for 2017-2025 with a 2.4% rate thereafter per MTPA/MDOT.

Years 2017-2018: State preservation & capacity program revenues derived based on projects in the MATS TIP.

Years 2019-2045: State preservation & capacity program revenues derived using base revenues and applying the above noted growth rates.

## Federal/State Expenditures for State Facilities

| | Preservation | Capacity |
|---|---|---|
| 2017-2025 | $92,853,264 | $0 |
| 2026-2035 | $127,213,924 | $0 |
| **2036-2045** | $181,290,828 | $0 |
| | | |
| Total | $401,358,016 | $0 |

Expenditures match projected revenues since all revenues available will likely be utilized.

## Financial Constraint - Funding Used by MDOT

| | Preservation | Capacity |
|---|---|---|
| 2017-2025 | Yes | Yes |
| 2026-2035 | Yes | Yes |
| **2036-2045** | Yes | Yes |
| | | |
| Total | Yes | Yes |

Preservation includes Trunkline, Bridge and Safety projects.

# Local Capital MTF & EDD Program

## State/Local Revenues Used by Local Agencies for Federal-Aid Roads

| | MTF | EDD | Local | Total |
|---|---|---|---|---|
| 2017-2025 | $9,626,560 | $720,000 | $2,885,975 | $13,232,536 |
| 2026-2035 | $12,327,259 | $800,000 | $3,524,821 | $16,652,080 |
| **2036-2045** | $15,474,723 | $800,000 | $3,893,596 | $20,168,319 |
| | | | | |
| Total | $37,428,542 | $2,320,000 | $10,304,392 | $50,052,935 |

## State/Local Expenditures by Local Agencies for Federal-Aid Roads

| | MTF | EDD | Local | Total |
|---|---|---|---|---|
| 2017-2025 | $9,626,560 | $720,000 | $2,885,975 | $13,232,536 |
| 2026-2035 | $12,327,259 | $800,000 | $3,524,821 | $16,652,080 |
| **2036-2045** | $15,474,723 | $800,000 | $3,893,596 | $20,168,319 |
| | | | | |
| Total | $37,428,542 | $2,320,000 | $10,304,392 | $50,052,935 |

Expenditures match projected revenues since all revenues available will likely be utilized.

## Financial Constraint - Funding used by Local Agencies

| | MTF | EDD | Local |
|---|---|---|---|
| 2017-2025 | Yes | Yes | Yes |
| 2026-2035 | Yes | Yes | Yes |
| **2036-2045** | Yes | Yes | Yes |
| | | | |
| Total | Yes | Yes | Yes |

**State/Local Revenues Used by Local Agencies for Federal-Aid Roads** Numbers provided by Local Agencies.

MTF: Amounts used on federal-aid roads (capital projects) only. Other MTF Revenues for federal-aid roads included in Local Operations and Maintenance Category. $50,000 (recommened by City of Midland) $1,000,000 (recommended by MCRC). 3.7% growth rate applied annually until 2025; 2.3% annually thereafter (recommended by MDOT)

Economic Development (EDD) - provided by MCRC; flat rate

Local: Amounts used on federal-aid roads (capital projects) only. $200,000 (recommended by MCRC); $105,000 (recommended by City of Midland). 1% growth rate applied annually (derived by MATS staff)

# State and Local Operations and Maintenance Program

## Operations and Maintenance Revenues

| | State (Trunkline) | Local (Federal-Aid) | Total |
|---|---|---|---|
| 2017-2025 | $61,446,585 | $63,039,951 | $124,483,535 |
| 2026-2035 | $90,252,781 | $92,090,634 | $182,343,415 |
| **2036-2045** | $114,408,991 | $116,738,748 | $231,147,739 |
| | | | |
| Total | $266,108,357 | $271,866,333 | $537,974,689 |

## Operations and Maintenance Expenditures

| | State (Trunkline) | Local (Federal-Aid) | Total |
|---|---|---|---|
| 2017-2025 | $61,446,585 | $63,039,951 | $124,483,535 |
| 2026-2035 | $90,252,781 | $92,090,634 | $182,343,415 |
| **2036-2045** | $114,408,991 | $116,738,748 | $231,147,739 |
| | | | |
| Total | $266,108,357 | $271,866,333 | $537,974,689 |

Expenditures match projected revenues since all revenues available will likely be utilized.

## Financial Constraint - Operations and Maintenance

| | State (Trunkline) | Local (Federal-Aid) |
|---|---|---|
| 2017-2025 | Yes | Yes |
| 2026-2035 | Yes | Yes |
| **2036-2045** | Yes | Yes |
| | | |
| Total | Yes | Yes |

**Operations and Maintenance Revenues:** Revenue numbers provided by MDOT and local agencies. 3.7% growth rate applied annually until 2025, 2.4% annually thereafter (recommended by MDOT). Strictly state funding, federal funding cannot be used for operations and maintenance.

State O & M: See page 22 of the 2017-2020 TIP Report as to how base year was derived. Local O & M: MTF funding is primarily used for local O & M. Base Year derived by gathering information from MCRC and City of Midland;taken from TIP (other agencies are too difficult to determine).

# Urban Transit - Operating Program

## DART Revenues - Operating

| | Federal (5307) | State | Local | Total |
|---|---|---|---|---|
| 2017-2025 | $6,997,062 | $5,932,544 | $7,750,943 | $20,680,599 |
| 2026-2035 | $10,475,663 | $6,788,471 | $10,397,965 | $27,662,099 |
| 2036-2045 | $14,433,105 | $7,001,873 | $12,675,062 | $34,110,040 |
| | | | | |
| Total | $31,905,830 | $19,722,888 | $30,823,970 | $82,452,688 |

Federal and State Revenues provide by MDOT Passenger Transportation Divison, 3.08% annual growth rate. Local revenues based on historical revenues, 2% annual inflation rate utilized.

5307 Operating revenues equal to overall 5307 funding minus 5307 Capital expenditures.

## DART Expenditures - Operating

| | Federal (5307) | State | Local | Total |
|---|---|---|---|---|
| 2017-2025 | $6,997,062 | $5,932,544 | $7,750,943 | $20,680,549 |
| 2026-2035 | $10,475,663 | $6,788,471 | $10,397,965 | $27,662,099 |
| 2036-2045 | $14,433,105 | $7,001,873 | $12,675,062 | $34,110,040 |
| | | | | |
| Total | $31,905,830 | $19,722,888 | $30,823,970 | $82,452,688 |

Expenditures expected to match revenues, all revenues utilized.

## DART Financial Constraint - Operating

| | Federal (5307) | State | Local | Total |
|---|---|---|---|---|
| 2017-2025 | Yes | Yes | Yes | Yes |
| 2026-2035 | Yes | Yes | Yes | Yes |
| 2036-2045 | Yes | Yes | Yes | Yes |
| | | | | |
| Total | Yes | Yes | Yes | Yes |

## DART Revenues - Capital

| | Federal (5339 Urban)* | State Urban 5339 Match | Federal 5307 | State 5307 Match | Local Match | Total |
|---|---|---|---|---|---|---|
| 2017-2025 | $669,110 | $167,277 | $615,913 | $153,978 | $0 | $1,606,278 |
| 2026-2035 | $992,491 | $248,123 | $816,698 | $204,175 | $0 | $2,261,487 |
| **2036-2045** | $1,344,223 | $336,057 | $861,168 | $215,292 | $0 | $2,756,740 |
| | | | | | | |
| **Total** | **$3,005,824** | **$751,457** | **$2,293,779** | **$573,445** | **$0** | **$6,624,505** |

Federal and State Revenues provide by MDOT Passenger Transportation Divison, 3.08% annual growth rate. Local revenues derived to achieve fiscal constraint.

## DART Expenditures - Capital Projects

| Project Name | Cost Estimate | |
|---|---|---|
| Replace Bus 10 (2017) | $83,000 | **Expenditures** |
| Replace Bus 12 (2018) | $83,000 | 2017-2025 |
| Replace Bus 11 (2019) | $83,000 | $1,606,278 |
| Replace Bus 13 (2020) | $83,000 | |
| Replace Bus 14 (2021) | $99,600 | |
| Replace Six Buses - 15, 16, 17, 18, 19, & 20 (2022) | $597,600 | |
| Replace Three Buses - 21, 22 & 23 (2023) | $298,800 | |
| Transit Improvements (2024) | $178,678 | |
| Replace Bus (2025) | $99,600 | |
| Replace about 15 buses between 2026-2035 | $1,821,178 | 2026-2035 |
| Transit Improvements between 2026-2035 | $440,309 | $2,261,487 |
| Replace about 15 buses between **2036-2045** | $2,220,005 | **2036-2045** |
| Transit Improvements between **2036-2045** | $536,735 | $2,756,740 |

## Capital Program - Financial Constraint

| | Federal/State | State | Local | Total |
|---|---|---|---|---|
| 2017-2025 | Yes | Yes | Yes | Yes |
| 2026-2035 | Yes | Yes | Yes | Yes |
| **2036-2045** | Yes | Yes | Yes | Yes |
| | | | | |
| **Total** | **Yes** | **Yes** | **Yes** | **Yes** |

# Rural Transit - Operating Program

## CCoM Revenues - Operating

| | Federal (5311) | State | Local | Total |
|---|---|---|---|---|
| 2017-2025 | $4,886,846 | $8,898,806 | $11,135,469 | $24,921,121 |
| 2026-2035 | $7,248,681 | $10,182,695 | $14,938,341 | $32,369,717 |
| **2036-2045** | $9,817,549 | $10,502,799 | $18,209,755 | $38,530,103 |
| | | | | |
| **Total** | **$21,953,076** | **$29,584,300** | **$44,283,565** | **$95,820,941** |

Federal and State Revenues provide by MDOT Passenger Transportation Divison, 3.08% annual growth rate. Local revenues based on historical revenues, 2% annual inflation rate utilized.

## CCoM Expenditures - Operating

| | Federal (5311) | State | Local | Total |
|---|---|---|---|---|
| 2017-2025 | $4,886,846 | $8,898,806 | $11,135,469 | $24,921,121 |
| 2026-2035 | $7,248,681 | $10,182,695 | $14,938,341 | $32,369,717 |
| **2036-2045** | $9,817,549 | $10,502,799 | $18,209,755 | $38,530,103 |
| | | | | |
| **Total** | **$21,953,076** | **$29,584,300** | **$44,283,565** | **$95,820,941** |

Expenditures expected to match revenues, all revenues utilized.

## CCoM Financial Constraint - Operating

| | Federal (5311) | State | Local | Total |
|---|---|---|---|---|
| 2017-2025 | Yes | Yes | Yes | Yes |
| 2026-2035 | Yes | Yes | Yes | Yes |
| **2036-2045** | Yes | Yes | Yes | Yes |
| | | | | |
| **Total** | **Yes** | **Yes** | **Yes** | **Yes** |

# Rural Transit - Capital Program

## CCoM Revenues - Capital

| | Federal (5339 Rural) | State Capital Match (5339 Rural) | Local Match as needed | Total |
|---|---|---|---|---|
| 2017-2025 | $380,660 | $95,166 | $529,598 | $1,005,424 |
| 2026-2035 | $564,636 | $141,159 | $630,740 | $1,336,535 |
| **2036-2045** | $764,738 | $191,184 | $673,307 | $1,629,229 |
| | | | | |
| **Total** | **$1,710,034** | **$427,509** | **$1,833,645** | **$3,971,188** |

Federal and State Revenues provide by MDOT Passenger Transportation Divison, 3.08% annual growth rate. Local revenues derived to achieve fiscal constraint.

## CCoM Expenditures - Capital Projects

| Project Name | Cost Estimate | Expenditures |
|---|---|---|
| Replacement Buses - 1 annually; 2017-2025 | $905,424 | 2017-2025 |
| Bus Storage Facility Improvements (by 2021) | $100,000 | $1,005,424 |
| Replacement Buses - 1 annually; 2026-2035 | $1,214,636 | 2026-2035 |
| Transit Facility Improvements (2026-2035) | $121,899 | $1,336,535 |
| Replacement Buses - 1 annually; **2036-2045** | $1,480,634 | **2036-2045** |
| Transit Facility Improvements (**2036-2045**) | $148,595 | $1,629,229 |

CCoM has a need to replace more than one bus a year (average of 3 a year desired), however in order to show fiscal constraint only one bus a year could be programmed.

## Capital Program - Financial Constraint

| | Federal/State | State | Local | Total |
|---|---|---|---|---|
| 2017-2025 | Yes | Yes | Yes | Yes |
| 2026-2035 | Yes | Yes | Yes | Yes |
| **2036-2045** | Yes | Yes | Yes | Yes |
| | | | | |
| **Total** | **Yes** | **Yes** | **Yes** | **Yes** |

# E. Endangered Species Listing

State Status:
E= Endangered T=Threatened SC=Special Concern

Federal Status:
LE=Listed Endangered
LT=Listed Threatened
LELT=partly Listed Endangered & partly Listed Threatened
PDL=Proposed De-List
E(S/A)=Endangered based on Similarities/Appearance
PS=Partial Status (only in part of range)
C=species being Considered for federal status

## Midland County Endangered Species

**Midland County Species Review List**

| Scientific Name | Common Name | Federal Status | State Status | Global Rank | State Rank |
|---|---|---|---|---|---|
| Accipiter gentilis | Northern goshawk | PS | SC | G5 | S3 |
| Alasmidonta marginata | Elktoe | | SC | G4 | S3? |
| Alasmidonta viridis | Slippershell | | T | G4G5 | S2S3 |
| Aristida longespica | Three-awned grass | | SC | G5 | S2 |
| Buteo lineatus | Red-shouldered hawk | | T | G5 | S4 |
| Carex haydenii | Hayden's sedge | | X | G5 | SX |
| Carex seorsa | Sedge | | T | G5 | S2 |
| Chlidonias niger | Black tern | | SC | G4G5 | S2 |
| Cypripedium arietinum | Ram's head lady's-slipper | | SC | G3 | S3 |
| Diarrhena obovata | Beak grass | | SC | G4G5 | S2 |
| Eleocharis engelmannii | Engelmann's spike rush | | SC | G4G5 | S2S3 |
| Epioblasma triquetra | Snuffbox | LE | E | G3 | S1S2 |
| Eurybia furcata | Forked aster | | T | G3 | S1 |
| Falco peregrinus | Peregrine falcon | PS:LE | E | G4 | S3 |
| Glyptemys insculpta | Wood turtle | | SC | G3 | S2 |
| Haliaeetus leucocephalus | Bald eagle | | SC | G5 | S4 |
| Ligumia recta | Black sandshell | | E | G4G5 | S1? |
| Lithospermum latifolium | Broad-leaved puccoon | | SC | G4 | S2 |
| Lycopus virginicus | Virginia water-horehound | | T | G5 | S2 |
| Pleurobema sintoxia | Round pigtoe | | SC | G4G5 | S3 |
| Ptychobranchus fasciolaris | Kidney shell | | SC | G4G5 | S2 |
| Sterna hirundo | Common tern | | T | G5 | S2 |
| Stylurus amnicola | Riverine snaketail | | SC | G4 | S2S3 |
| Tradescantia virginiana | Virginia spiderwort | | SC | G5 | S2 |
| Venustaconcha ellipsiformis | Ellipse | | SC | G4 | S3 |
| Villosa iris | Rainbow | | SC | G5Q | S3 |

Source: Michigan Natural Features Inventory.

## Bay County Endangered Species

**Bay County Species Review List**

| Scientific Name | Common Name | Federal Status | State Status | Global Rank | State Rank |
|---|---|---|---|---|---|
| Accipiter gentilis | Northern goshawk | PS | SC | G5 | S3 |
| Alasmidonta marginata | Elktoe | | SC | G4 | S3 |
| Alasmidonta viridis | Slippershell | | T | G4G5 | S2S3 |
| Ammodramus henslowii | Henslow's sparrow | | E | G4 | S3 |
| Arnoglossum plantagineum | Prairie indian-plantain | | SC | G4G5 | S3 |
| Asclepias hirtella | Tall green milkweed | | T | G5 | S2 |
| Astragalus neglectus | Cooper's milk vetch | | SC | G4 | S3 |
| Beckmannia syzigachne | Slough grass | | T | G5 | S2 |
| Botaurus lentiginosus | American bittern | | SC | G5 | S3 |
| Callophrys irus | Frosted elfin | | T | G3 | S2S3 |
| Carex lupuliformis | False hop sedge | | T | G4 | S2 |
| Charadrius melodus | Piping plover | LE | E | G3 | S2 |
| Chlidonias niger | Black tern | | SC | G4G5 | S2 |
| Cincinnatia cincinnatiensis | Campeloma spire snail | | SC | G5 | S3 |
| Circus cyaneus | Northern harrier | | SC | G5 | S4 |
| Cistothorus palustris | Marsh wren | | SC | G5 | S3 |
| Cyclonaias tuberculata | Purple wartyback | | T | G5 | S2 |
| Emydoidea blandingii | Blanding's turtle | | SC | G4 | S2S3 |
| Epioblasma torulosa rangiana | Northern riffleshell | LE | E | G2T2 | S1 |
| Erynnis persius persius | Persius dusky wing | | T | G5T1T3 | S3 |
| Falco peregrinus | Peregrine falcon | PS:LE | E | G4 | S3 |
| Galearis spectabilis | Showy orchis | | T | G5 | S2 |
| Gallinula galeata | Common gallinule | PS | T | G5 | S3 |
| Haliaeetus leucocephalus | Bald eagle | | SC | G5 | S4 |
| Hydroprogne caspia | Caspian tern | | T | G5 | S2 |
| Ixobrychus exilis | Least bittern | | T | G5 | S3 |
| Ligumia nasuta | Eastern pondmussel | | E | G4 | S2 |
| Ligumia recta | Black sandshell | | E | G4G5 | S1? |
| Lycopus virginicus | Virginia water-horehound | | T | G5 | S2 |
| Nycticorax nycticorax | Black-crowned night-heron | | SC | G5 | S3 |
| Pisidium amnicum | Greater European pea clam | | SC | G5 | SNA |
| Platanthera ciliaris | Orange- or yellow-fringed orchid | | E | G5 | S1S2 |
| Platanthera leucophaea | Prairie white-fringed orchid | LT | E | G2G3 | S1 |
| Rallus elegans | King rail | | E | G4 | S2 |
| Sander canadensis | Sauger | | T | G5 | S1 |
| Silene virginica | Fire pink | | E | G5 | S1 |
| Sterna forsteri | Forster's tern | | T | G5 | S2 |
| Sterna hirundo | Common tern | | T | G5 | S2 |
| Trichophorum clintonii | Clinton's bulrush | | SC | G4 | S3 |
| Xanthocephalus xanthocephalus | Yellow-headed blackbird | | SC | G5 | S2 |

Source: Michigan Natural Features Inventory.

## Saginaw County Endangered Species

**Saginaw County Species Review List**

| Scientific Name | Common Name | Federal Status | State Status | Global Rank | State Rank |
|---|---|---|---|---|---|
| Alasmidonta marginata | Elktoe | | SC | G4 | S3? |
| Alasmidonta viridis | Slippershell | | T | G4G5 | S2S3 |
| Ammodramus henslowii | Henslow's sparrow | | E | G4 | S3 |
| Ammodramus savannarum | Grasshopper sparrow | PS | SC | G5 | S4 |
| Botaurus lentiginosus | American bittern | | SC | G5 | S3 |
| Chlidonias niger | Black tern | | SC | G4G5 | S2 |
| Circus cyaneus | Northern harrier | | SC | G5 | S4 |
| Cistothorus palustris | Marsh wren | | SC | G5 | S3 |
| Clemmys guttata | Spotted turtle | | T | G5 | S2 |
| Emydoidea blandingii | Blanding's turtle | | SC | G4 | S2S3 |
| Epioblasma triquetra | Snuffbox | LE | E | G3 | S1S2 |
| Falco peregrinus | Peregrine falcon | PS:LE | E | G4 | S3 |
| Galearis spectabilis | Showy orchis | | T | G5 | S2 |
| Gallinula galeata | Common gallinule | PS | T | G5 | S3 |
| Glyptemys insculpta | Wood turtle | | SC | G3 | S2 |
| Haliaeetus leucocephalus | Bald eagle | | SC | G5 | S4 |
| Hetaerina titia | Smokey rubyspot | | SC | G5 | S4 |
| Isotria verticillata | Whorled pogonia | | T | G5 | S2 |
| Jeffersonia diphylla | Twinleaf | | SC | G5 | S3 |
| Ligumia nasuta | Eastern pondmussel | | E | G4 | S2 |
| Ligumia recta | Black sandshell | | E | G4G5 | S1? |
| Notropis texanus | Weed shiner | | X | G5 | S1 |
| Obliquaria reflexa | Threehorn wartyback | | E | G5 | S1 |
| Obovaria olivaria | Hickorynut | | E | G4 | S1 |
| Pantherophis gloydi | Eastern fox snake | | T | G3 | S2 |
| Pantherophis spiloides | Gray ratsnake | | SC | G4G5 | S2S3 |
| Percina copelandi | Channel darter | | E | G4 | S1 |
| Percina shumardi | River darter | | E | G5 | S1 |
| Platanthera leucophaea | Prairie white-fringed orchid | LT | E | G2G3 | S1 |
| Pleurobema sintoxia | Round pigtoe | | SC | G4G5 | S3 |
| Potamilus ohiensis | Pink papershell | | T | G5 | SNR |
| Protonotaria citrea | Prothonotary warbler | | SC | G5 | S3 |
| Ptychobranchus fasciolaris | Kidney shell | | SC | G4G5 | S2 |
| Pycnanthemum pilosum | Hairy mountain mint | | T | G5T5 | S2 |
| Rallus elegans | King rail | | E | G4 | S2 |
| Sistrurus catenatus | Eastern massasauga | LT | SC | G3 | S3 |
| Toxolasma parvum | Lilliput | | E | G5 | S1 |
| Truncilla truncata | Deertoe | | SC | G5 | S2S3 |
| Utterbackia imbecillis | Paper pondshell | | SC | G5 | S2S3 |
| Venustaconcha ellipsiformis | Ellipse | | SC | G4 | S3 |
| Villosa iris | Rainbow | | SC | G5Q | S3 |
| Xanthocephalus xanthocephalus | Yellow-headed blackbird | | SC | G5 | S2 |

Source: Michigan Natural Features Inventory.

## Explanation of Federal Status, State Status, Global Rank, and State Rank

### FEDERAL LEGAL STATUS

Legal status information provided for information only. For official definitions and lists of protected species, consult the relevant federal agency.

Definitions derived from U.S. Endangered Species Act of 1973, Sec. 3.
LE = Listed Endangered
LT = Listed Threatened
PE = Proposed endangered
PT = Proposed Threatened
C = Candidate
PDL = Proposed for delisting
E (S/A) or T (S/A) = Listed endangered or threatened because of similarity of appeaance
XE = Essential experimental population
XN = Nonessential experimental population
No Rank = Usually indicates that the taxon does not have any federal status. However, because of potential lag time between publication in the Federal Register and entry in the central databases and state databases, some taxa may have a status which does not yet appear.
(Rank, Rank) = Combination values in parenthesis = The taxon itself is not named in the Federal Register as having U.S. ESA status; however, all of its infraspecific taxa (worldwide) do have official status. The statuses shown in parentheses indicate the statuses that apply to infraspecific taxa or populations within this taxon.
(PS) = partial status= Status in only a portion of the species' range. Typically indicated in a "full" species record where an infraspecific taxon or population has U.S. ESA status, but the entire species does not.
(PS: Rank) = partial status= Status in only a portion of the species' range. The value of that status appears because the entity with status does not have an individual entry in Natureserve.

### STATE STATUS

E= Endangered T=Threatened SC=Special Concern

### GLOBAL RANK

G1 = Critically imperiled globally because of extreme rarity (5 or fewer occurrences or less than 1000 individuals) or because of extreme vulnerability to extinction due to some natural or man-made factor.
G2 = Imperiled globally because of rarity (6 to 20 occurrences or less than 3000 individuals) or because of vulnerability to extinction due to some natural or man-made factor.
G3 = Either very rare and local throughout its range (21-100 occurrences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction from other factors.
G4 = Apparently secure globally (may be rare in parts of range).
G5 = Demonstrably secure globally.
GH = Of historical occurrence throughout its range, may be rediscovered (e.g., ivory-billed woodpecker).
GX = Believed to be extinct throughout range.
GXC = Extirpated from the wild but still known from captivity or cultivation.
G#? = Tentative rank (e.g., G2?).
G#G# = Range of rank; insufficient data to assign specific global rank (e.g., G2G3).
G#T# = Rank of a taxonomic subgroup such as a subspecies or variety; the G portion of the rank refers to the entire species and the T portion refers to the specific subgroup; numbers have same definition as above (e.g., G3T1).
G#Q = Rank of questionable species - ranked as species but questionable whether it is species or subspecies; numbers have same definition as above (e.g., G2Q).
G#T#Q = Same as above, but validity as subspecies or variety is questioned.

### STATE RANK

The priority assigned by the Michigan Natural Features Inventory for data collection and protection based upon the element's status within the state. Criteria not based only on number of occurrences; other critical factors also apply. Note that ranks are frequently combined.

S1 = critically imperiled in the state because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres) or because of some factor(s) making it especially vulnerable to extirpation in the state.
S2 = imperiled in state because of rarity (6 to 20 occurrences or few remaining individuals or acres) or because of some factor(s) making it very vulnerable to extirpation from the state.
S3 = rare or uncommon in state (on the order of 21 to 100 occurrences).
S4 = apparently secure in state, with many occurrences.
S5 = demonstrably secure in state and essentially ineradicable under present conditions.

# F. Public Comments

## Comments Received during October 15, 2015 Open House

### Non-Motorized Comments

- "Put bike lanes on as many roads as possible! In the city and county."
- "Need more emphasis on non-motorized transportation. Look at separate bike lanes – separated from car lanes by a wide curb and colored." (Drew a diagram of separated bike lanes)
- "PR campaign for the benefit of pedestrian and cyclists. What we need is to remind auto drivers that other users are authorized to be on the roads. IE: remind the drivers that cyclists are Fathers, Mothers, sisters, brothers, etc."
- "We need a pedestrian bridge on Eastman by the mall. It would greatly reduce congestion. People would get exercise and it would be beneficial for the environment. It would also be safer."
- "Reduce/use 3rd lane at each (Ashman/Rodd) for non-motorized connectivity to downtown from circle (center city)."
- "Create non-motorized lanes/paths at lane reduction (from three auto-lanes to two) on Indian and Buttles."
- "I think there is too much emphasis on NMT in Midland. This is a winter state. Pushing NMT is rather silly."
- "Please complete bikeable circuit around Midland; Bicycle links to Bay City and Saginaw; Better delineation where possible on major roads (wider, better sidewalks?) to facilitate bicycle commuting; major reworking of roads could include bike lanes."
- "I would like to see non-motorized paths in the Bullock Creek area. There are many students that would walk or bike to school, but the road shoulders are too narrow to allow this."
- "The Eastman Corridor in particular is a major barrier to non-motorized transportation especially as for young people. It is simply too dangerous."

### Transit Comments

- "Transit- more transit is needed. Let's get regular services between Midland and Bay City. Bring back the inter-urban rail system."
- "The inter-urban rail system is very efficient & good at getting people around the state."
- "Midland needs a fixed route bus system – DART is inefficient as is. You can have both DART and CCM, but you also need a fixed route. Something that loops the city & makes scheduled stops. When DART began, it was a fixed route. Many people would probably love the chance to take the bus if a fixed route bus existed. It would reduce traffic. Taxi businesses are cropping up because of the need for people to leave & arrive on schedule – especially for work."
- "Do I use Midland's transit system? No – I would if it had a fixed route system, but yes Bay City's is excellent."
- "I would like to see a more efficient transit system in Midland. I would get some buses set up for a fixed route."
- "I think funding transit services is vital. Midland has way too much traffic for a town of its size. The future lies in reducing the carbon footprint."

- "I think there is waste with maintaining 2 public transportation systems. Transportation is named as a major barrier for most social service agencies."
- "Provide fixed-routes, Sunday services, and need bus station (Indian Trails/Greyhound)."
- "We need (desperately so) a fixed route, reliable transit system in Midland County. DART and CCM simply don't work!!"
- "DART: Same day services (Medication needs, doctor appointments that do not warrant an ambulance) and Sunday services."
- "I utilize the DART system for my primary mode of transportation. I like DART due to the fact that I don't drive. The hours are fair as well as the cost."
- "I use DART six days a week. I love that it has convenient hours. Thanks you DART."
- "Consider public transportation from/to Freeland."
- "Implementing a public transportations system between counties (i.e. including Freeland)."
- "The current public Transportation system with DART and CCM is inefficient, costs too much, and riders don't like it. There has to be a better way to provide rides to those who would like to use the bus."
- "More coordination between DART and CCM. Establish a fixed bus route that may go to other counties."
- "Have something like 5 dollar cab rides."

## Freight Comments

- "Freight – Add more rail & passenger rail."
- Reduce/eliminate Indian and Buttles as truck routes."
- "Emphasis & need to be placed more on agricultural products (raw and finished between the source and the processing plants (i.e. grain, produce, etc.) have no direct routes short of local road systems. Specific routes with proper roads (all season, no load limits) are needed in local and rural areas.(Williams Township – Bay County)"

## Aviation Comments

- "Develop high speed interchange at US-10/Mackinac Rd. Build limited access 4-lane road (Mackinac) from US-10 to MBS. Extend Freeland Rd to I-75 (4 lanes limited access and high-speed interchange at I-75). Provide incentives to attract businesses to MBS."

## Auto-Oriented Comments

- "Convert Ashman/Rodd to two-ways for greater connectivity to downtown and circle (center city)."
- "Indian and Buttles – road diet. They are a barrier to downtown from northern neighborhoods. Reduce lanes to (2) with pedestrian crosswalks"
- "Ashman and Rodd St: 1-way pair, 3 lanes each way. Vehicular traffic could easily be handled with 2 lanes. Suggest using 3rd lane for separated multi-use or bike lane. Possibly some streetscaping. Could be a key connector for bike/peds from residential to downtown."
- "US-10: M-20 by-pass around south part of Midland."
- "Fix the roads."
- "Improve traffic flow around the Midland Mall."

- "The city does not have an urban development plan that aggressively transforms the transportation system from auto-centric to one that embraces complete streets designs. The city is reactive and preserves the status quo – auto rules!"

## LRTP Visioning Comments

- "LRTP – 1) Integration & Connectivity is most important. 2) Economic Vitality. 3) Accessibility & Mobility. 4) Environmental Protection & Enhancement. 5) Safety & Security. 6) Operations & System Management. 7) Preservation of Transportation System."
- "Long term vision – sustainability: moving away from 1 person, 1 car"
- "It is most important to encourage new transportation & infrastructure"
- "Multi-modal is good, don't forget about transit!"

## Comments from Maps:

A series of maps was available for the public to mark where they experience issues within MATS transportation network.

- "West-bound ramp added at 9 Mile and US-10 in Auburn."
- "Garfield Road – Williams Township."
- "Midland Road – over US-10 to airport (at least Salzburg) widen to 3 lanes!"
- "Multi-Use path from end of Patrick Path to new housing development (East of US-10) and then to Auburn."
- "Extreme congestion & confusion in the area of Washington, Lyon, Patrick, and James Savage. No left turn from Washington to highway/James Savage."
- "East-bound on-ramp to US-10 from Waldo Road and Westbound exit-ramp to Waldo Road from US-10."
- "Full interchange at Waldo & US-10."
- "Bike lanes/sidewalk from Wheeler to Diamond Drive on Waldo."
- "Non-motorized path on the south side of Buttles."
- "Roadway diet/complete street along Ashman/Rodd."
- "Provide non-motorized path along Tittabawassee River Road. Access to very scenic area. Loop route connecting to Rail Trail on both ends."
- "An interchange at or near Jefferson & US-10. Reduce Mall congestion by providing access from each side. Provide a direct route to Wackerly east of Jefferson."
- "Develop an Access Management Plan and ordinance for Eastman Ave/Joe Mann Blvd area."
- "Evaluate congestion along Eastman."
- "Non-motorized lane/paths from El Rancho to Wackerly along Jefferson."

## Comments Received during November 16, 2016 Open House

**How would you prioritize the following categories of projects? (Rank 1-4, 1 being the first priority)**

- Non-motorized projects (i.e. bike/pedestrian facilities including sidewalks, etc.)
  *Average Ranking is 1.75 (tied for first priority)*
- Roadway Reconstruction/Maintenance Projects (preservation of existing roads)
  *Average Ranking is 1.75 (tied for first priority)*
- Public Transportation Projects (i.e. buses, transit facility improvements and carpool services)
  *Average Ranking is 2.5 (Third priority)*
- Roadway Capacity Projects (adding or expanding roads)
  *Average Ranking is 4 (Fourth priority)*

Note: Only four responses received; data obtained not extensive

**What are your thoughts on the current transportation network including roadway, non-motorized, and public transportation infrastructure?**

Transportation is good. Mall area is congested during Christmas season. Need better NMT access to mall area from south and west. I have also heard comments that people north of mall would like to be able to bike to town or mall. Add Commerce Road (Eastman to Jefferson) to get it on list before too much development.

Need bike lanes or separated paths on many more county roads.

More public transportation between Freeland, Auburn and Midland so disabled or old persons in those areas have access to Midland Hospital/Doctors.

**Are there specific roadway, non-motorized, or transit improvements which you think should be/should not be made?**

Commerce from Jefferson to Eastman should have a bike lane. Shared bike lanes on Sturgeon across US-10. Move up timing for bike lanes on Airport Road.

Pine River Road, Waldo Road, Chippewa River Road, and some roads to Bay City

Another street - S. Midland Road and N. US-10 that connects Price Street to the west to Garfield Road in Auburn

**In your opinion, which Long Range Plan goals and objectives are most important?**

Streets for all modes - complete streets. Access for those with special needs. Pay special attention to areas of Midland with senior housing. Safety!

Ease of access to events and enough parking, plus safety for pedestrians

**What regional/local issues do you think are affecting transportation?**

No responses received

**Do you have any additional comments?**

I'd like to see the priority raised for NMT projects #17, 27, and 26 (in that order)

**Other Comments (provided on index cards):**

I am concerned about the long term viability of our current Dial-A-Ride & County Connection system, especially in a "smaller government" environment. Based on total cost & number of rides, the average cost of a ride is $20. The Midland Daily News says that County Connection chargers $3 per ride which covers 10% of the cost. That comes to $30 per ride. At $40 to $60 per round trip, is there a way to provide these services in a more efficient way? Could Dial-A-Ride & County

Connection be merged? Note we also have ride services from Senior Services and a modest taxi service in town.
Need a rapid transit from Bay, Midland, to Saginaw (Fixed Routes).
Living out in the Township area, I find that there is no accommodation for multiple means of transportation (i.e bikes, cars, trucks & buses). Roads are narrow with deep ditches and no shoulder lee way for emergencies, passing slow vehicles, etc. I believe there may be a need for lighting in some areas and possibly more caution signs and signals. Attitude of many drivers is a problem when confronting slower vehicles.
Two highest capacity priorities: 1. Provide a connection for M-20/US-10 traffic that does not have to pass through Midland. 2. Provide an US-10 interchange on the east side of the Midland Mall area that is closer than Waldo. P.S. I am very much in favor of NMT #25 (Dublin & River Road Loop).

**Letter provided by attendee:**

To Whom It May Concern,

My name is *(redacted)*. I've lived here in Midland for just over three years. I have cerebral palsy and I'm unable to drive. Five years ago I had a hip replacement to improve my walking. The new hip got infected while I was in the hospital, it had to be removed. Strong antibiotics had to flush the area without a hip in place every hour for weeks. While in the hospital I caught Mersa and almost died. I now have an orthopedic surgeon who specializes in infection. I was hospitalized for over three months, followed by IV antibiotics for over six months.

I'm telling you all of this because that part of the story is what brought me to Midland. I live in Bay County at the time. Bay Metro Transit has Dial A Ride service; it needs to be booked 7 days in advance of the ride you want. You also ride around for hours before you arrive where you need to be, picking up or dropping off other passengers. Due to the long bus rides, I was missing doses of medicine that I needed to get well. It's rare when you were sick as I was to get well, the infection could come back at any time. I've also been told that odds are good that it will reoccur.

Because of all this my doctor advised me to move to an area where I could get to a hospital for care quicker when I needed to. This type of infection spreads quickly and isn't dangerous to others, but if it took me a week to get care I could be dead. I went home and started researching cities in Michigan with good public transit systems in place. Midland was at the top of the list.

The hours Dial A Ride runs here are the best I've found anywhere.

The fact that you can book a ride the day before you need it still amazes me and I've been doing it for 3 years. This happens in no other place I've ever lived. I've taken 7 different public transit systems in Michigan and some in other states as well.In Midland you can arrange same day service also if it can be fit in the schedule for the day or evening. This is unheard of, people here are very blessed. The people employed by Dial A Ride care about their customers, and it shows.

I know that your agency is looking at ways to improve the service for the residents of Midland. I thought you should know how fantastic the service already is as well. In my opinion if Midland went to a standard route service, Dial A Ride Service would suffer. I've experienced it in other cities. Would there be enough money in the budget to have both services be run well? It's something to consider as well.

It took me over two and a half years to finally move to Midland, the transit system is the main reason I came here. I volunteer at an elementary school here two days a week. I am a special education teacher. I can attend church here as well, or just meet friends for dinner. I have a full life here because of Dial A Ride, I'm grateful to all who work there.

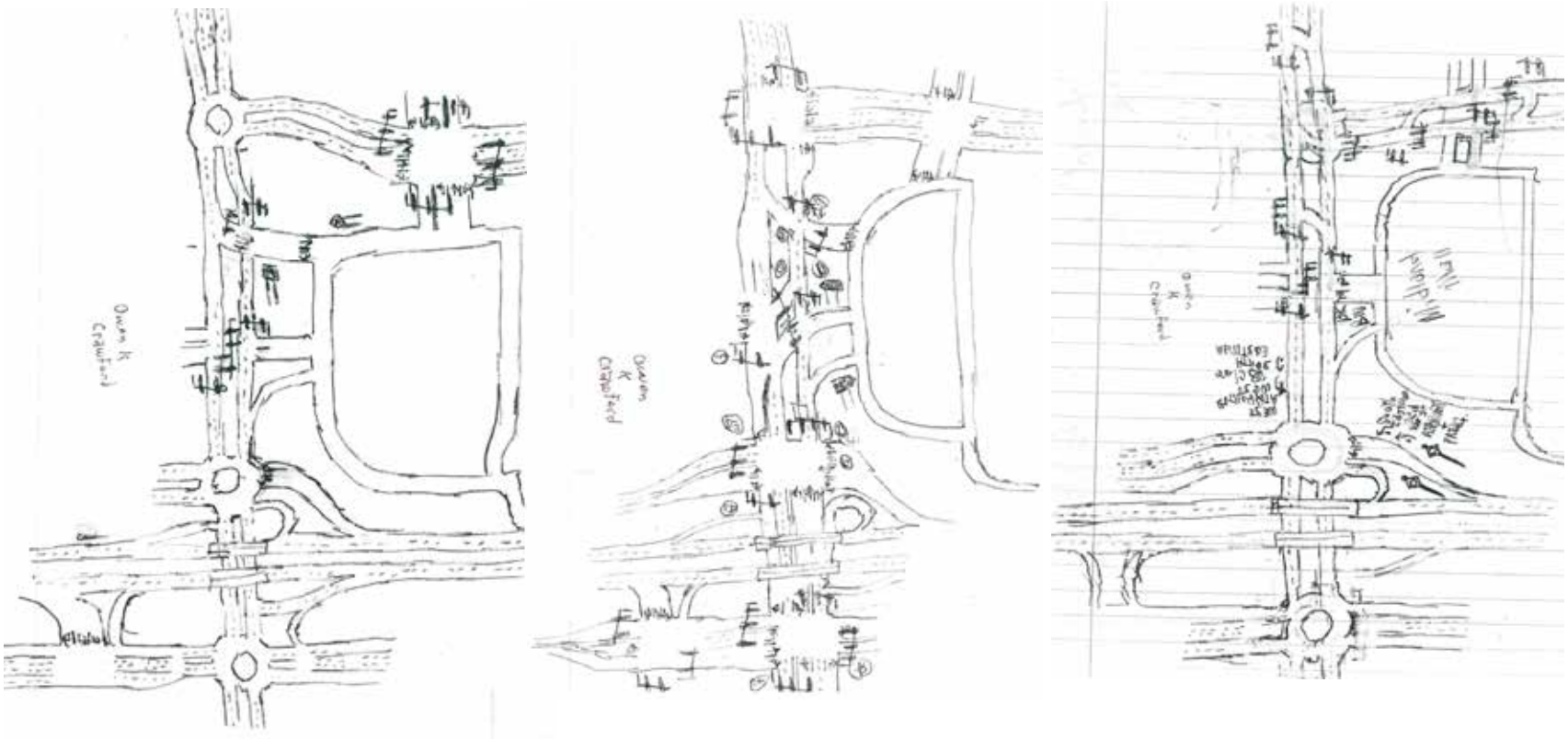
Thank you,
*(redacted)*

## Comments Received during the August 9th, 2017 Open House

- " I am so glad we are part of an MPO and that the Technical Committee has a cyclist on the committee. "

- "Suggestions/alternatives -

  Take Eastman north to Shearer, (already) commercialized & use Shearer as the E-W connector
  Do not use Mier as connector
  Trails - Make multi-use for equestrian & cyclist & not paved. Recognize the economic importance of the equestrian community.
  Educate all trail users"



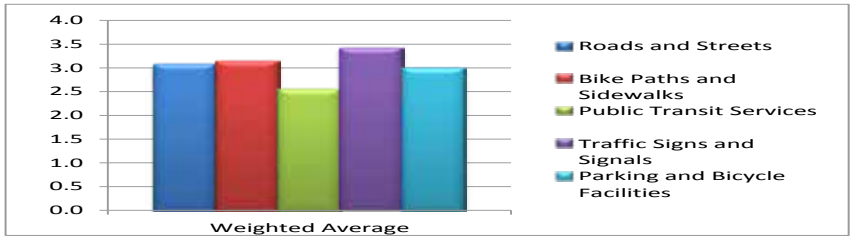
In addition, the graphics above were supplied by Mr. Owen K. Crawford, as attributed, depicting suggestions for the street network around the Midland Mall/US-10/Eastman area.

# MATS Long Range Plan Community Input Survey Results

This spreadsheet summarizes public input received from a survey available both electronically and at the MATS October 14, 2015 Public Open House. Approximately 26 members of the public took the survey anonymously. The data collected displays a wide array of opinions and concerns regarding the MATS transportation system. The compiled data is shown as follows:

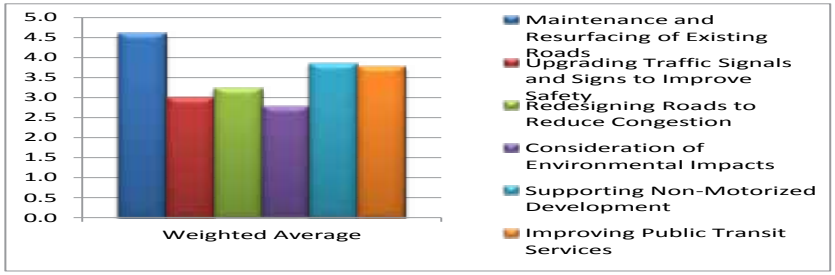
**On a scale of 1 to 5, RATE the quality of the following within the area (1 being the lowest quality and 5 being the highest quality):**

| | 1 | 2 | 3 | 4 | 5 | Responses | Weighted Average |
|---|---|---|---|---|---|---|---|
| **Roads and Streets** | 0 | 5 | 13 | 7 | 0 | 25 | 3.08 |
| **Bike Paths and Sidewalks** | 1 | 5 | 12 | 5 | 3 | 26 | 3.15 |
| **Public Transit Services** | 6 | 3 | 10 | 3 | 1 | 23 | 2.57 |
| **Traffic Signs and Signals** | 1 | 1 | 11 | 12 | 1 | 26 | 3.42 |
| **Parking and Bicycle Facilities** | 1 | 6 | 12 | 6 | 1 | 26 | 3.00 |



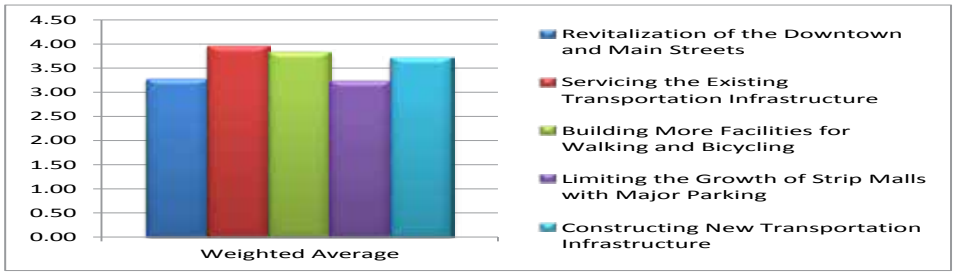

**Please RANK the following from 1 - 6 in order of importance to you. (1 being most important, 2 being second most important, etc.):**

| | 1 | 2 | 3 | 4 | 5 | 6 | Responses | Weighted Average |
|---|---|---|---|---|---|---|---|---|
| **Maintenance and Resurfacing of Existing Roads** | 10 | 4 | 4 | 5 | 2 | 0 | 25 | 4.60 |
| **Upgrading Traffic Signals and Signs to Improve Safety** | 1 | 2 | 6 | 6 | 7 | 3 | 25 | 3.00 |
| **Redesigning Roads to Reduce Congestion** | 1 | 6 | 3 | 3 | 7 | 3 | 23 | 3.22 |
| **Consideration of Environmental Impacts** | 2 | 3 | 3 | 4 | 5 | 8 | 25 | 2.76 |
| **Supporting Non-Motorized Development** | 5 | 6 | 5 | 2 | 3 | 4 | 25 | 3.84 |
| **Improving Public Transit Services** | 6 | 4 | 4 | 5 | 1 | 5 | 25 | 3.76 |




**Please RATE what you think about the following transportation development strategies to address transportation issues (1 showing low support and 5 showing strong support):**

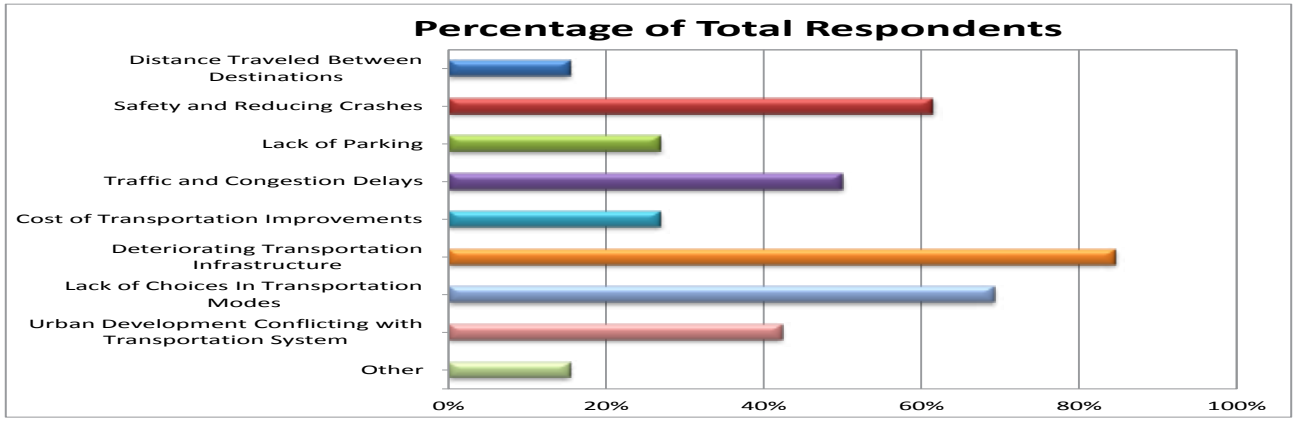
| | 1 | 2 | 3 | 4 | 5 | Responses | Weighted Average |
|---|---|---|---|---|---|---|---|
| **Revitalization of the Downtown and Main Streets** | 5 | 2 | 5 | 7 | 6 | 25 | 3.28 |
| **Servicing the Existing Transportation Infrastructure** | 0 | 2 | 5 | 10 | 8 | 25 | 3.96 |
| **Building More Facilities for Walking and Bicycling** | 1 | 3 | 3 | 10 | 8 | 25 | 3.84 |
| **Limiting the Growth of Strip Malls with Major Parking** | 3 | 4 | 8 | 4 | 6 | 25 | 3.24 |
| **Constructing New Transportation Infrastructure** | 0 | 2 | 9 | 7 | 6 | 24 | 3.71 |



# MATS Long Range Plan Community Input Survey Results

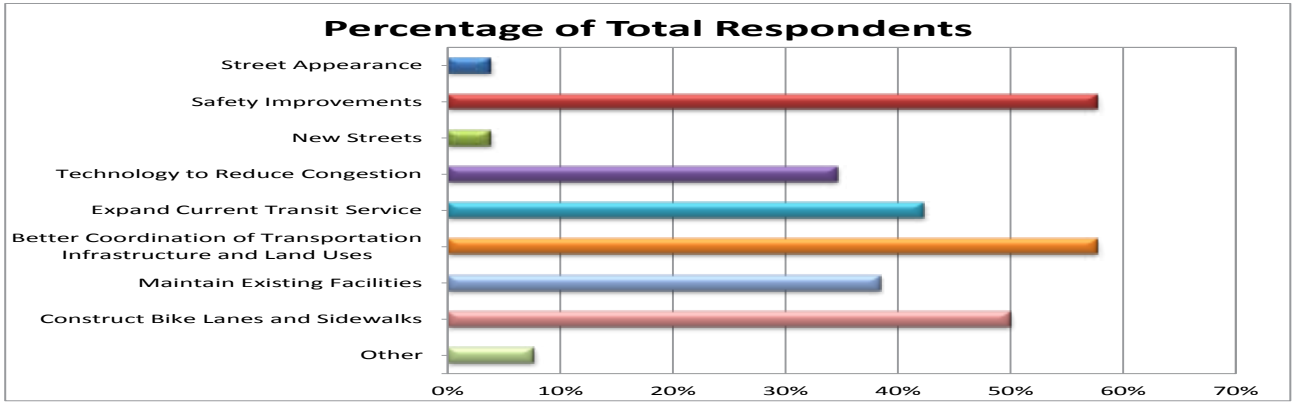
**In your opinion, which transportation issues require the most attention in future development? (Please select 4 choices)**

| | Responses | Percentage of Total Respondents |
|---|---|---|
| Distance Traveled Between Destinations | 4 | 15.38% |
| Safety and Reducing Crashes | 16 | 61.54% |
| Lack of Parking | 7 | 26.92% |
| Traffic and Congestion Delays | 13 | 50.00% |
| Cost of Transportation Improvements | 7 | 26.92% |
| Deteriorating Transportation Infrastructure | 22 | 84.62% |
| Lack of Choices In Transportation Modes | 18 | 69.23% |
| Urban Development Conflicting with Transportation System | 11 | 42.31% |
| Other | 4 | 15.38% |
| Total Respondents | 26 | |




**If you had the authority to fund transportation improvements, which of the following would you fund? (Please select 3 choices):**

| | Responses | Percentage of Total Respondents |
|---|---|---|
| Street Appearance | 1 | 3.85% |
| Safety Improvements | 15 | 57.69% |
| New Streets | 1 | 3.85% |
| Technology to Reduce Congestion | 9 | 34.62% |
| Expand Current Transit Service | 11 | 42.31% |
| Better Coordination of Transportation Infrastructure and Land Uses | 15 | 57.69% |
| Maintain Existing Facilities | 10 | 38.46% |
| Construct Bike Lanes and Sidewalks | 13 | 50.00% |
| Other | 2 | 7.69% |
| Total Respondents | 26 | |



Metropolitan Planning Organization
Midland Area Transportation Study
MATS

## CERTIFIED RESOLUTION
## APPROVAL AND ADOPTION OF *Towards 2045:* A LONG RANGE TRANSPORTATION PLAN

WHEREAS, The Midland Area Transportation Study (MATS) is the designated Metropolitan Planning Organization (MPO) for the Midland, Michigan urban area; and

WHEREAS, the development of a long range transportation plan is a requirement of both the Federal Highway Administration and the Federal Transit Administration; and

WHEREAS, the MATS 2045 Long Range Transportation Plan has been developed pursuant to USC 23 Section 134, as amended by the Fixing America's Surface Transportation Act (FAST Act), with a planning horizon of at least 20 years; and

1. the MATS 2045 Long Range Transportation Plan identifies transportation facilities that should function as an integrated metropolitan transportation system, and recognizes the necessity of preserving and maintaining the existing transportation system while including projects that will enhance the efficiency of the existing system to relieve vehicular congestion and improve the mobility of people and goods; and

2. the MATS 2045 Long Range Transportation Plan includes a financial analysis that demonstrates how the projects that have been identified will have adequate funding, and indicates the resources that are reasonably expected to be made available to carry out the LRTP; and

3. the MATS 2045 Long Range Transportation Plan was developed through a process that included input from private citizens, private providers of transportation, affected public agencies, and other interested parties; and



4. the MATS 2045 Long Range Transportation Plan has been available for public review and comment during the legally required time period of 30 days as well as at key points throughout the development of the Plan, and input received has been documented and incorporated as appropriate;

**NOW THEREFORE BE IT RESOLVED,** that the Policy Committee of the Midland Area Transportation Study hereby approves and adopts *Towards 2045*: A Long Range Plan for the Midland Area Transportation Study, finds it to be compliant with 23 U.S.C. 134; and 49 U.S.C. 5303, as amended, and approves its submission to the Michigan Department of Transportation, the Federal Highway Administration and the Federal Transit Administration.;

_____ _____
C. Bradley Kaye, Chairman September 6, 2017
MATS Policy Committee

I, Maja Bolanowska, Director of MATS, do hereby certify that the foregoing is a true and correct copy of a resolution adopted by a majority vote of all the members present at a regular meeting of MATS Policy Committee held on Tuesday, September 6, 2017.

_____ _____
Director, Midland Area Transportation Study (MATS) September 6, 2017