MM2045
Statewide Transit Strategy

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1. Statewide Transit Strategy Introduction

Public transit is an essential transportation service that benefits communities across Michigan. The benefits include connectivity to employment, education, health care, social activities, and other amenities around the state. They also include broad societal elements like a stronger economy, better health, improved air quality through lower overall vehicle emissions, and reduced vehicle congestion.

Transit's ability to connect people to employment, educational, and health care opportunities is its primary benefit. Access to reliable transportation can be the difference between employment and unemployment. Robust public transit provides travelers with mobility options and alternatives to driving and serves as a lifeline for those without access to an automobile or are unable to drive, especially in more rural areas where access to essential services may be especially challenging.

At the national and state levels, public transit plays a significant role in supporting the continued growth and vitality of the economy. In

Figure 1. Public Transit Provides Connectivity and Access to Opportunities Across Michigan

Michigan, public transit is a part of daily life that reliably connects people to employment opportunities. According to the American Public Transit Association (APTA), investment in transit systems yields significant returns to the communities served. At the national level, every $1 invested in public transportation generates $4 in economic returns, and every $1 billion invested in public transportation supports and creates more than 50,000 jobs. Additionally, every $10 million in capital investment in public transportation yields $30 million in increased business sales.[1]

Access to reliable transportation options is the cornerstone to creating and sustaining healthy communities. Robust transit systems promote more active forms of transportation such as walking and biking. Transportation barriers are often cited as the reason many are unable to access the medical care they need. Past research has found that approximately

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[1] American Public Transit Association. Public Transportation Benefits. https://www.apta.com/news-publications/public-transportation-benefits/. 2020.

3.6 million people in the U.S. do not obtain medical care due to transportation barriers.[2] Michigan's urban and rural transit providers help millions access the health care services needed to improve the overall well-being of the state.

Strong public transit can also reduce congestion on crowded roadways, improve overall vehicle fuel efficiency, and improve overall air quality. An enhanced and expanded public transit system in Michigan will be critical to meeting Michigan's goal to reduce vehicle miles traveled, reach carbon neutrality by 2050, and mitigate the impacts of climate change.

1.1   STATEWIDE TRANSIT STRATEGY PURPOSE

The Statewide Transit Strategy provides a pathway for Michigan's transit providers to adapt to current challenges, take advantage of evolving opportunities and plan for a more connected and collaborative future. The plan will guide long-term development and improvement of transit services, support transit operators of all sizes across the state, and establish a common direction to advance transit as an essential service. This plan identifies critical challenges for transit in the coming years and opportunities to improve safety, reliability, cost-effectiveness, and convenience of using transit throughout the state. This plan also represents early implementation of Michigan's State Long-Range Transportation Plan (SLRTP), Michigan Mobility 2045 (MM2045).

The Statewide Transit Strategy is intended for a wide and diverse audience that includes rural and urban transit operators, intercity bus operators, Metropolitan Planning Organizations (MPOs), regional planning agencies, the State Transportation Commission, Michigan Department of Transportation (MDOT) and other state departments, state legislators, transit advocates, and others. This plan is intended as a guide for MDOT's Office of Passenger Transportation (OPT) and the groups identified to plan and adapt for the future and provide recommendations that will make public transit even more safe, reliable, and convenient in Michigan.

1.1.1   Office of Passenger Transportation Introduction and Mission

The OPT's mission is to provide citizens with the best passenger transportation services through quality customer assistance.

In 2019, more than 81 million rides were provided across all public transit systems in Michigan. OPT is responsible for administering and providing oversight of federal and state transit funding grants and provides technical assistance to the state's 21 urban public transit systems, 57 rural public transit systems, and four ferryboat services. Some level of

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[2] Health Research and Educational Trust. (2017, November). Social determinants of health series: Transportation and the role of hospitals. http://www.hpoe.org/Reports-HPOE/2017/sdoh-transportation-role-of-hospitals.pdf Chicago, IL: Health Research & Educational Trust.

transit services are provided in each county of the state. OPT assists transit providers in Michigan in providing transit but does not directly operate any transit services.

OPT administers MDOT's passenger transportation programs, including local public transit, ferryboat, intercity bus, and passenger-for-hire motorcoach safety regulation, to provide a safe and balanced statewide network of passenger transportation services to enhance the social and economic well-being of the state. OPT, in cooperation with local and regional transit agencies, authorities, and companies, is responsible for the development and management of passenger transportation funding programs. This includes operating, capital, and technical assistance for purposes of providing coordinated local public transit, marine passenger, and intercity bus transportation services statewide. OPT also works closely with private charter bus operators to ensure compliance with Michigan Public Act 432 of 1982, the Motor Bus Transportation Act, which regulates the safety of private passenger-for-hire vehicles that seat more than eight passengers.

OPT and its local public transportation partners will utilize this Statewide Transit Strategy to develop service improvement initiatives, collaborate more effectively, and attract further support for enhanced and equitable transit services throughout Michigan.

1.1.2 MM2045 Integration with the Statewide Transit Strategy

MM2045 is Michigan's integrated SLRTP, which defines vision and long-term direction for the future of the state's transportation network across all modes of transportation. MM2045 provides that direction for Michigan with an aspirational multimodal vision and comprehensive goals, objectives, strategies, and investment priorities to achieve that vision. SLRTPs are the first step in the planning and program development process,

ultimately shaping transportation investment decisions and projects. The MM2045 Vision informs projects and initiatives developed by MDOT and other transportation agencies and stakeholders throughout Michigan.

MM2045 is a first-in-the-nation plan that combines multiple modes into a truly comprehensive long-range transportation plan. MM2045 is innovative and unique in its approach to long-range transportation planning. MM2045 integrates all modes: motorists, active transportation (walking, biking), multimodal freight (trucking, marine, air cargo, and pipeline), aviation, freight and passenger rail, and transit. This approach creates an SLRTP that will advance mobility, connectivity, economy, and livability in the state.

The MM2045 Vision states:

> In 2045, Michigan's mobility network is safe, efficient, future-driven, and adaptable. This interconnected multimodal system is people-focused, equitable, reliable, convenient for all users, and enriches Michigan's economic and societal vitality. Through collaboration and innovation, Michigan will deliver a well-maintained and sustainably funded network where strategic investments are made in mobility options that improve quality of life, support public health, and promote resiliency.

The Statewide Transit Strategy constitutes an early implementation step toward the MM2045 Vision. While MM2045 looks ahead 25 years into the future, the Statewide Transit Strategy focuses on a five- to 10-year time horizon. As transit technologies advance and mobility trends shift, actively planning beyond the mid-term becomes highly challenging and speculative.

1.2 PLAN ORGANIZATION

Section 2 of the plan provides a definition of goals closely aligned with those of MM2045 that will serve to measure success and drive implementation. In Section 3, the plan investigates a select number of other state departments of transportation (DOT) transit strategic planning efforts to assess lessons learned from other areas of the nation with similar transit challenges. Section 4 synthesizes insights gained from MM2045 engagement efforts. Section 5 summarizes transit needs across the state. Section 6 describes critical needs identified within OPT. The plan concludes with strategic recommendations for transit enhancement throughout the state and steps toward implementation.

2.   Goals of the Statewide Transit Strategy

The goals for the Statewide Transit Strategy follow the overall MM2045 Goals but have been further refined to direct the development of Michigan's transit systems. These transit-focused goals include:

- **MM2045 Goal - Quality of Life**: Enhance quality of life for all communities and users of the transportation network.

  - The Transit Strategy will identify needed projects or policies that will improve connectivity to employment, education, health care, groceries, and social activities that will improve quality of life.

- **MM2045 Goal - Mobility**: Enhance mobility choices for all users of the transportation network through efficient and effective operations and reliable multimodal opportunities.

  - The Transit Strategy will make public transit systems in the state more connected and convenient providing expanded mobility choices.

- **MM2045 Goal - Safety and Security**: Enhance the safety and ensure the security of the transportation network for all users and workers.

  - The Transit Strategy will work to make transit safe, reliable, and secure for passengers and transit employees.

- **MM2045 Goal - Network Condition**: Through investment strategies and innovation, preserve and improve the condition of Michigan's transportation network so that all modes are reliable, resilient, and adaptable.

  - The Transit Strategy will focus on the improved state of good repair of all assets that transit systems rely on to provide a safe and effective mobility service.

- **MM2045 Goal - Economy and Stewardship**: Improve the movement of people and goods to attract and sustain diverse economic opportunities while investing resources responsibly.

  - The Transit Strategy will define needs of transit providers to maintain and improve access for riders to employment opportunities that help bolster the state's economy. The plan will also identify stable sources of funding to meet future needs and growing expenses to be effective stewards of public funds. Environmental stewardship is also an important goal for the plan to lower carbon emissions and limit the impacts of global climate change.

- ***MM2045 Goal – Partnership***: Strengthen, expand, and promote collaboration with all users through effective public and private partnerships.

  - The Transit Strategy will examine opportunities to improve collaboration within state government and between transit providers to promote and improve mobility services.

3. Transit Strategy Peer Analysis

As part of the Statewide Transit Strategy, OPT conducted a peer analysis of five state strategic plans to gather best practices and insights that would inform the structure of Michigan's plan and recommendations. A summary of results follows in this section.

3.1 STATE STRATEGIC TRANSIT PLANS

The peer analysis selected five states varying in population, geography, and transit-dependency that had each recently developed transit-specific plans including:

- The California Statewide Transit Strategic Plan

- The Greater Minnesota Transit Investment Plan

- The Ohio Transit Needs Study

- The Washington State Public Transportation Plan

- The North Carolina Public Transportation Strategic Plan

To level-set, the review compiled important information about each state's transit network, paying close attention to ridership, population, number of transit providers, and funding. This provided an understanding of what the investment in transit looked like in each state and how they differed. Across all states, one constant was an overwhelming need to plan for an aging population. Table 1 provides a high-level profile of each peer state transit existing conditions.

Table 1. State Peer Summary

State/Plan	Agency	Statewide Ridership (2019)	Aging Population Forecast	Number of Transit Providers	Annual Federal Transit Funds
California (2015)	Caltrans	1.3 billion passenger trips per year	24% of the population by 2060	150	$1.9 billion
Minnesota (2015)	MnDOT	103.3 million passenger trips per year	20% of the population by 2060	42	$30.5 million
Ohio (2013)	ODOT	93.1 million passenger trips per year	33% of the population by 2030	61	$173.2 million
Washington (2015)	WSDOT	269 million passenger trips per year	21% of the population by 2060	32	$41.5 million
North Carolina (2017)	NCDOT	70.4 million passenger trips per year	20% of the population by 2050	98	$50 million

The peer state analysis focused on five main topics of relevance to MM2045:

- Construction and Composition of Department

- How Transit is Included in Other Statewide Modal Planning Activities

- Key Transit Initiatives

- Funding Sources

- New Trends in Mobility

From Minnesota, with 12.1 million passenger trips per year across 42 transit providers, to California, with more than 1.4 billion passenger trips per year across 150 transit providers, the five peer states reviewed demonstrate a wide array of transit investment. Each state has a different approach to documenting the long-range vision for transit. Some chose a stand-alone transit strategic plan while others chose to include transit as one of many modes defined in the SLRTP.

3.1.1   Transit within DOTs

Office or divisions with responsibilities for public transit within the five state DOTs assessed shared many duties and functions with OPT. All had fiduciary responsibility for managing state and federal funds for transit operators in their respective state. They all provided technical assistance and helped facilitate grant support for subrecipients for federal funding opportunities. In general, state DOTs act as facilitators, supporting individual transit agencies who in turn provide transit services directly to their customers.

In reviewing peer SLRTPs, the incorporation of public transit into the comprehensive transportation system has been common to all. The state DOTs assessed all place significant importance on the role public transit plays in supporting mobility, economy, and quality of life in their states.

3.1.2   Key Transit Initiatives

Several themes emerged when reviewing the peer state transit initiatives. Many of these themes related to connectivity and regionalization over services to lower barriers and eliminate service gaps, technology adoption and integration with transit services, increased agency coordination and communication, enhanced customer access to transit information, and improved safety. Table 2 highlights identified initiatives.

Table 2. Peer State Transit Initiatives Summary

Caltrans	MnDOT	ODOT	WSDOT	NCDOT
- Double transit boardings by 2030 by encouraging transit-supportive congestion pricing in the most gridlocked areas. - Develop a statewide "Transit First" policy giving preference to transit and active transportation modes. - Create transit-supportive land use policy that promote in-fill and density.	- Implement regional transit coordinating councils to improve regional planning, communication, and service deployment. - Support local agency planning to close first-mile/last-mile gaps. - Promote customer communication with culturally specific marketing materials. - Increase ridership through investment in technologies and public/private partnerships. - Transit Technology Plan completed.	- Creation of a performance management system to communicate accomplishments and benefits of transit. - Develop regional transit services to provide improved service between municipalities or counties. - Technology investments for automatic vehicle location, automatic passenger counters, and others.	- Pilot programs to integrate transit and land use planning through transit-supportive policy developments. -Improved agency coordination. - Interdisciplinary innovation center to help make transit more efficient. - Transit Zero Plan to lower bicycle and pedestrian fatalities and injuries on transit.	- Provide enhanced mobility for seniors, veterans and persons with disabilities. - Support local transit-friendly land use policies. - Incorporation of technologies into transit services. - Improve regional/multicounty commuter services.

3.1.2.1 Transit Technology Initiatives

Transit technology has been a central initiative in Minnesota. In 2021, MnDOT completed its Greater Minnesota Public Transit Technology Plan to assist MnDOT and transit agencies in the state to better utilize technology to improve operations, customer experience, and mobility access. The plan recognized the opportunities for further integration and improvements, but also detailed challenges faced by the wide variety among transit operators across the state. For public transit agencies, the plan provides guidance, resources, and tools to assess agency capacity and needs, determine an appropriate growth plan, make informed decisions, and implement sustainable and secure technology to improve operations and the customer experience. For MnDOT, the plan recommends actions to support public transit agency technology development, increasing agency capacity to use technology effectively, and keeping data secure.[3]

The Greater Minnesota Public Transit Technology Plan also provides a Technology System Resource Guide that categorizes the various types of technology in use by transit agencies, and includes the following:

Scheduling/Dispatch Software and Related Systems

There are a variety of tools for scheduling. Those focused on demand response services address how to efficiently schedule passenger trips, identifying for each day who will be

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[3] Minnesota Department of Transportation. Greater Minnesota Public Transit Technology Plan. P. 3. June 22,2021. http://www.dot.state.mn.us/transit/reports/2021-06-22%20Greater%20MN%20Transit%20Technology%20Plan.pdf.

transported by each vehicle. Scheduling systems for fixed-route transit include scheduling vehicles to cover all trips and pairing driver schedules with vehicle schedules. Most scheduling software links driver availability, vehicle capacity, driver training and credentials, and recordkeeping functions.

Customer-Facing Trip Planning

Trip-planning tools enable customers to determine the available transit services and their schedules. Trip-planning tools are widely available for fixed-route services (bus or rail) based on General Transit Feed Specifications (GTFS) and GTFS real-time data. Trip-planning applications are often available on both mobile apps and web-based applications. Trip-planning tools are now available for demand response and route deviation services through GTFS-flex.

Communication with Riders and the Public

Transit agencies are adding websites, social media, and system-specific transit applications to the more traditional paper schedules and maps, telephone information, line, and posting notices on vehicles. These tools help transit agencies communicate information efficiently and accessibly to the public.

Asset Management and Maintenance

Transit asset management refers to tracking and maintaining a transit agency's capital assets. Transit assets include vehicles, bus shelters, and transit facilities, as well as an agency's technology systems and infrastructure. Asset management tools and procedures allow agencies to track the assets, the scheduled actions needed to maintain them over time (vehicle oil changes, shelter cleanings, etc.), and the unforeseen events that may affect their future service (collisions, vandalism, etc.).

In-vehicle Technology

A variety of technology tools are vehicle-based, from automated voice announcements (also known as annunciators) to cameras and automatic vehicle location devices. With most in-vehicle technology, the ability to integrate systems is an important consideration. On-board technologies cover many features such as safety and security, communications, fare collection, scheduling, and core operations.

Fare Payment

Fare collection can be a resource-intensive process and the pandemic has resulted in increased interest in contactless fare systems. Many fare payment methods place passengers in proximity to drivers, or in direct contact with drivers in smaller systems that may handle cash transactions. Contactless fare systems are generally used by larger transit agencies with enough revenue to warrant the costs of the technology. These systems can speed boarding of passengers, lower vehicle dwell times, and improve operational efficiency.

Service Planning

These tools are primarily for agencies charged with regional transportation planning in urban areas and/or for the larger fixed-route systems. They include tools for planning fixed-route services, conducting equity analyses, and mapping.

Grant Management and Compliance

Many state DOTs rely on management systems to track federal and state compliance information, including assets, fiscal activities, grant management, and compliance.

3.1.3 Funding Sources

Across all peer states, transit funding was of critical importance to the provision of sustainable mobility services. Each state had a unique system of providing funding for local transit systems. The level of state involvement in providing funding for transit varied. Revenue sources to support transit in each of the peer reviews primarily came from local or state sales tax revenue or property tax revenue.

3.1.4 Peer State Mobility Trends and Projects

The states reviewed have differing mobility challenges and therefore have various priorities for transit.

An important outcome for mobility in California is to reduce congestion and manage air quality, accomplished through introduction of new transit technologies and partnerships with technology startup companies to bring innovation into the transit space. State government is also fostering partnerships to offer new mobility project funding. In 2021, the California Air Resource Board announced $18 million in funding to 21 local agencies, municipalities, or nonprofits to launch zero-emission mobility projects like microtransit, bike/scooter sharing, or electric vehicle sharing. Electrification of bus transit fleets has been another focus for transit operators in California, driven by a regulation passed in 2018 that established a statewide goal for public transit agencies to gradually transition to 100 percent zero-emission bus fleets by 2040.[4] As of late 2020, California was leading the U.S. in adoption and deployment of battery-electric or hydrogen fuel cell buses (Figure 2).

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[4] California Air Resources Board. California Transition to All-electric Public Bus Fleet by 2040. December 14, 2018. https://ww2.arb.ca.gov/news/california-transitioning-all-electric-public-bus-fleet-2040.

Figure 2. Battery and Fuel Cell Electric Transit Buses Deployed or On Order in the United States (Last Updated November 2020)
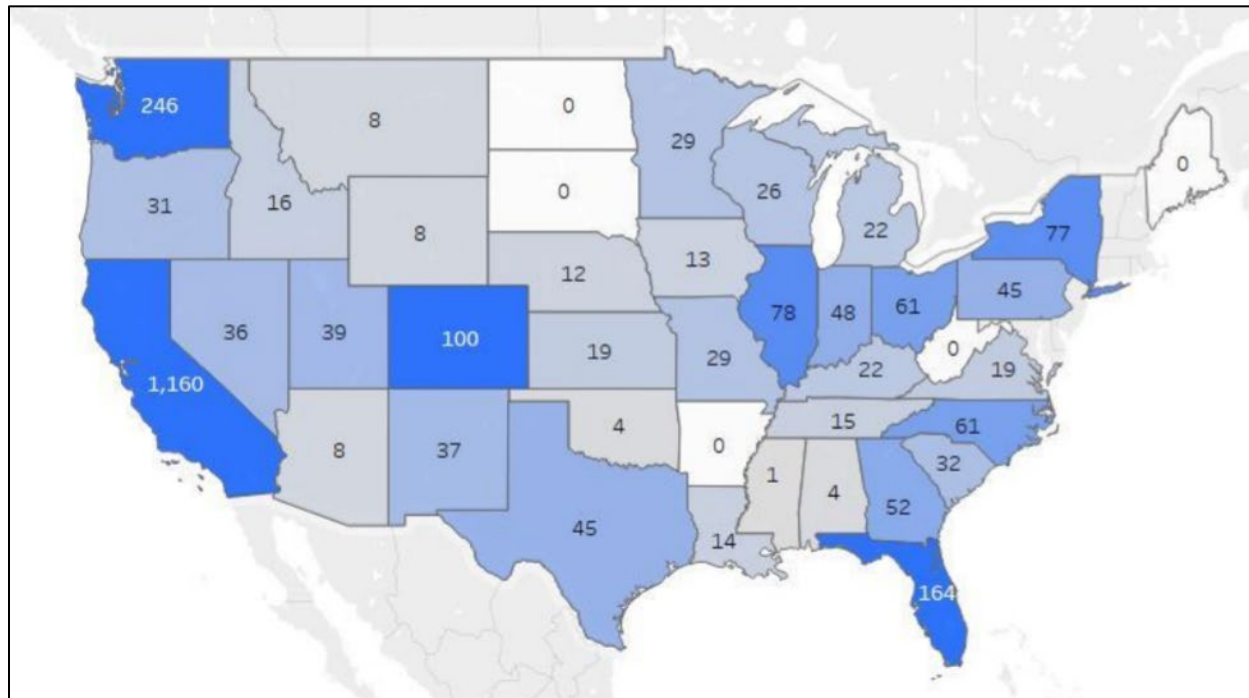
Source: **Calstart**

North Carolina is embracing new trends in mobility to address the need for improved transit statewide. To address the projected increase in long-distance commuting and recurring traffic congestion, NCDOT is promoting traffic demand management programs focused on travel demand instead of supply. These programs include vanpooling, the "Share the Ride NC" ride matching website, and other initiatives aimed at cutting down on the number of single-occupancy vehicle commuters. To improve customer experience and system service efficiency, NCDOT is promoting new technology for transit agencies statewide. This technology includes integrated fare payment systems and service integration with microtransit. A microtransit pilot program called GoTriangle is being tested in Research Triangle Park.

As Ohio looks to the future of transit, the state has focused on improvement and deployment of technology-based enhancements for transit operators of all sizes. The Ohio Statewide Transit Plan focused on a subset of six technologies that are anticipated to be among the most appropriate and offer the greatest benefit to Ohio transit agencies:

- Automatic Vehicle Location/Global Positioning Systems (AVL/GPS)

- Automated Passenger Counters (APCs)

- Scheduling Software

- Electronic Fare Collection

- Real-Time Information

- Web Trip Planners/Google Transit

While not outlined specifically in the Washington State Public Transportation Plan, WSDOT supports new trends in mobility through various grant programs, including the Regional Mobility Grant, Green Transportation Capital Grant, and First Mile/Last Mile Connections Grant. Local transit agencies such as King County Metro take advantage of these grants as well as other funding to drive forward new trends in mobility. King County has developed an Innovative Mobility Action Agenda that includes six strategies:

- Mobility,

- Mobility-as-a-Service,

- Electric and Automated,

- Data Management,

- Infrastructure, and

- Culture of Innovation.

3.2   PEER ANALYSIS SUMMARY AND CONCLUSIONS

Across the country, state and transit agency strategic plans play an important role in guiding long-range decisions about transit. These plans provide an opportunity for public and stakeholder feedback, encouraging the communities for whom these plans will have the greatest impact to get involved in the planning process. At the state level, strategic planning sets the foundation for individual transit providers to invest in their networks, seek innovations, and continue to fund ongoing operations. Each peer state DOT sought to maximize benefits by defining how best to invest in its transit systems. This was done in many ways, including investing in new technology, infrastructure, and vehicles. As the administrators of federal and state funds, state DOTs studied in the peer states reviewed coordinated and administered federal grant funds, provide training and technical assistance, and set goals to help guide transit agencies statewide in the short-, mid-, and long-terms, all of which would have been impossible to plan for without a strategic statewide plan.

Statewide plans reviewed for this analysis invested in listening to the needs of constituents and stakeholders, reviewing past successes and shortcomings, and creating a concise plan that reflected their strengths. By taking advantage of the MM2045 process and devising a multimodal approach, Michigan has aligned its statewide transportation goals for each mode, setting a plan for the future that is sure to leave a lasting impact for public transit in the state.

4.   Transit Agency and Stakeholder Outreach

Transit services in Michigan respond to the unique transportation and mobility needs of their community or service area. Because of this variety, it was important to communicate with Michigan's transit providers to understand local needs to improve transit service delivery and to uncover common issues faced by transit operators. Outreach and communication with transit operators occurred through individual and small group discussions and a digital survey to gather feedback from rural and urban areas of the state.

4.1   TRANSIT AGENCY WORKSHOPS

In late 2020, OPT held four transit agency workshops to discuss existing conditions of transit in Michigan. Two sessions were held with rural transit operators and two with urban operators. In total, more than 50 representatives from transit agencies from all parts of the state participated in these discussions, providing OPT insight into areas of common need and enhancement.

Workshop participants identified gaps in transit service as a current primary challenge faced by all operators. These service gaps could include service area coverage, limited hours of operation, limited days of service (e.g., no weekend service), lack of safe bicycle and pedestrian access to transit, and jurisdictional boundary limitations. Rural and urban providers concurred that limited-service areas were the most critical gap in providing transit services.

Another polling question asked participants to rank the most critical challenge they foresee in the future. The largest urban providers stated that responding and recovering from the COVID-19 pandemic was their greatest future challenge. Smaller urban and rural agencies all listed challenges related to increasing operating expenses or funding stability as their greatest concern. During an urban workshop, escalation of employee health care costs was discussed as one of the most impactful drivers of operating expense growth.

As MDOT and OPT do not directly operate transit services, a final poll question was asked of the workshop participants related to how OPT and MDOT could best advance transit operators' goals for improved mobility in the future. There was a split in the top answers for the urban and the rural workshops. The urban workshops noted that policies to ensure transit is incorporated in roadway projects was their number one priority, whereas the rural workshops noted connection to, and collaboration with, state agencies and programs that benefit transit riders (e.g., veterans, seniors, workforce development) as their number one priority.

The discussions summarized here represent only a small portion on the conversations held. The workshop sessions, polling results, and open conversations yielded a great deal of

information and assisted OPT in focusing in on the issues and opportunities most critical to those providing daily mobility services.

4.2   ADVOCATE AND MPO SURVEY SUMMARY

To supplement feedback from transit operators, OPT also solicited input from MPOs and public transit advocacy groups to gain a wider perspective on the needs of transit. Information from these groups was collected in early 2021 using a digital survey. Overall, there were more than 50 respondents. More than half of the survey participants identified themselves as being from transit advocacy groups.

Survey respondents were asked about the greatest challenge facing public transit agencies in their area, apart from COVID-related issues. Participants selected operational funding most frequently; first- and last-mile connections to transit arose as the second-greatest challenge.

Similar to the transit agency workshops, the survey asked participants to identify the most significant gap in mobility services. Nearly 70 percent of survey respondents selected geographic coverage of transit services as the most critical gap in service. This response aligns closely with what was stated in the agency workshop meetings. The survey also asked what improvement would have the greatest impact in the next 10 years. Almost 60 percent said system expansion and enhancements (e.g., larger service area or increased frequency) would provide the best opportunity to improve statewide transit.

The final survey question asked participants to weigh in on the most important issues for OPT to focus on in developing the Strategy. Seven issue categories were listed, including funding, rising expenses, coordination and collaboration, technology and innovation, reduction in mobility gaps, capital improvements, and integration of new mobility services (e.g., microtransit, bike and scooter sharing). Three issues stood out as the most important to these survey participants: funding for transit, reduction in mobility gaps, and improved coordination and collaboration.

4.3   MM2045 PUBLIC OUTREACH AND TRANSIT PRIORITIES

Through the more than two years of development and planning, MM2045 conducted a vigorous public engagement effort through various online and in-person means to educate, inform and solicit input on the comprehensive, multimodal planning process. The MM2045 project was developed in two phases. Public engagement efforts in Phase 1 resulted in more than 1.2 million touchpoints with the people of Michigan. Other methods included digital surveys, targeted stakeholder outreach, and telephone townhall events that collected input and answered questions from thousands of Michigan residents.

An early and important survey of Michiganders asked about attitudes and perceptions of future transportation priorities. The results of this survey showed expansion of transit

services in the state as one of the top priorities in the future, along with expanding mobility for seniors and those with disabilities, and improved biking and walking infrastructure (Figure 3).

Figure 3. Attitudes and Perceptions Survey Priority Rankings (Michigan Public)
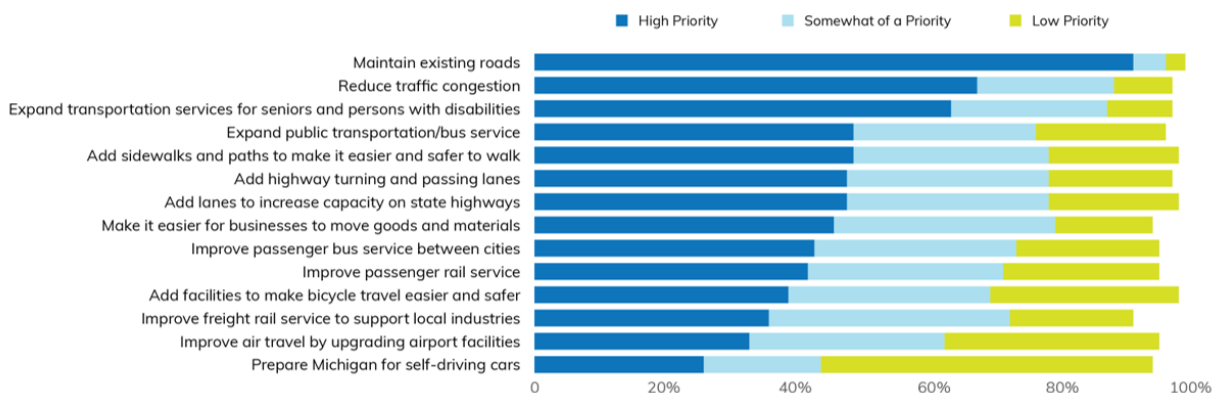
Source: Michigan Department of Transportation, 2019

4.4 COMMON THEMES DISCOVERED

The outreach conducted with transit operators, advocates of mobility services and regional MPOs defined many of the needs for transit enhancement and established a starting point to determine the priority areas for the Statewide Transit Strategy. Overall, there was close alignment between rural and urban transit operators and advocates. The following were the most common themes and issues identified for needed improvement:

- Expanding service to limit or close mobility gaps,

- Examining rapidly increasing operating expenses,

- Seeking long-term and stable sources of funding for transit,

- Increasing collaboration among transit operators, as well as with MDOT/OPT,

- Policies requiring roadway projects to consider transit needs as part of the planning process,

- Greater incorporation of technology in transit services, and

- Enhanced recruiting and retention of transit operators and mechanics.

Input collected from transit operators and other stakeholders through this outreach process was incorporated into a technical analysis of existing conditions of transit and recent historic trends to develop a holistic understanding of where the transit industry has been, where it is currently, and where it is going.

5. Statewide Transit Needs

Across Michigan, public transit and mobility needs vary widely. To best meet the specific needs of rural areas, small towns, and large urban metropolitan areas, transit systems provide a variety of transit services. Transit systems in Michigan are generally categorized as either urban or rural systems. Urban systems are divided into large urban systems and small urban systems. Intercity services provide needed connectivity between rural areas and the national transportation network. Along with these transit providers, there are four public ferryboat operators that provide critical connectivity for residents and visitors along the state's waterways.

Large urban transit providers serve urbanized areas with populations greater than 200,000 (as reported in the previous decennial census). Large urban transit systems are generally characterized by multiple fixed routes throughout a city or region, operating seven days a week and 20 or more hours on weekdays. These large systems may include a mix of transit modes and services that could include bus, bus rapid transit, paratransit, streetcar, light rail, or commuter bus. Small urban transit providers operate in urbanized areas with populations between 50,000 and 199,999 (according to the last decennial census) and share many traits of large urban systems, yet some small urban operators have limited or no fixed-route service and operate similarly to rural on-demand providers. Many small urban transit agencies run fixed-route transit on most days of the week. Rural transit agencies operate in communities or areas with less than 50,000 in population (as reported in the last census) and can be a critical lifeline for residents in lower density areas of the state. Most rural transit agencies provide door-to-door or curb-to-curb service through an on-demand or prescheduled trip service. Rural trips serve various purposes, including transporting residents over long distances for access to health care, education-related trips, employment, and social and recreational activities. To provide critical connectivity between urban and rural areas, intercity bus service is available on nine routes across the state.

The specific needs for these agencies can vary widely, but many needs apply to the majority of transit operators in the state. The following summarizes critical areas of need for transit enhancement.

5.1   CONNECTIVITY GAPS AND SYSTEM EXPANSION

While there is some form of public transit offered in every county in the state (as shown in Figure 4), service is not always comprehensive, creating gaps in the total mobility network for residents. Gaps predominate in rural areas of the state with low population density. Gaps in transit service can take many forms, including geographic coverage gaps, gaps in the time of day when service is available, day-of-the-week gaps when service is not available (e.g., weekends), and gaps cause by low-frequency routes.

Figure 4. Transit Coverage in Michigan
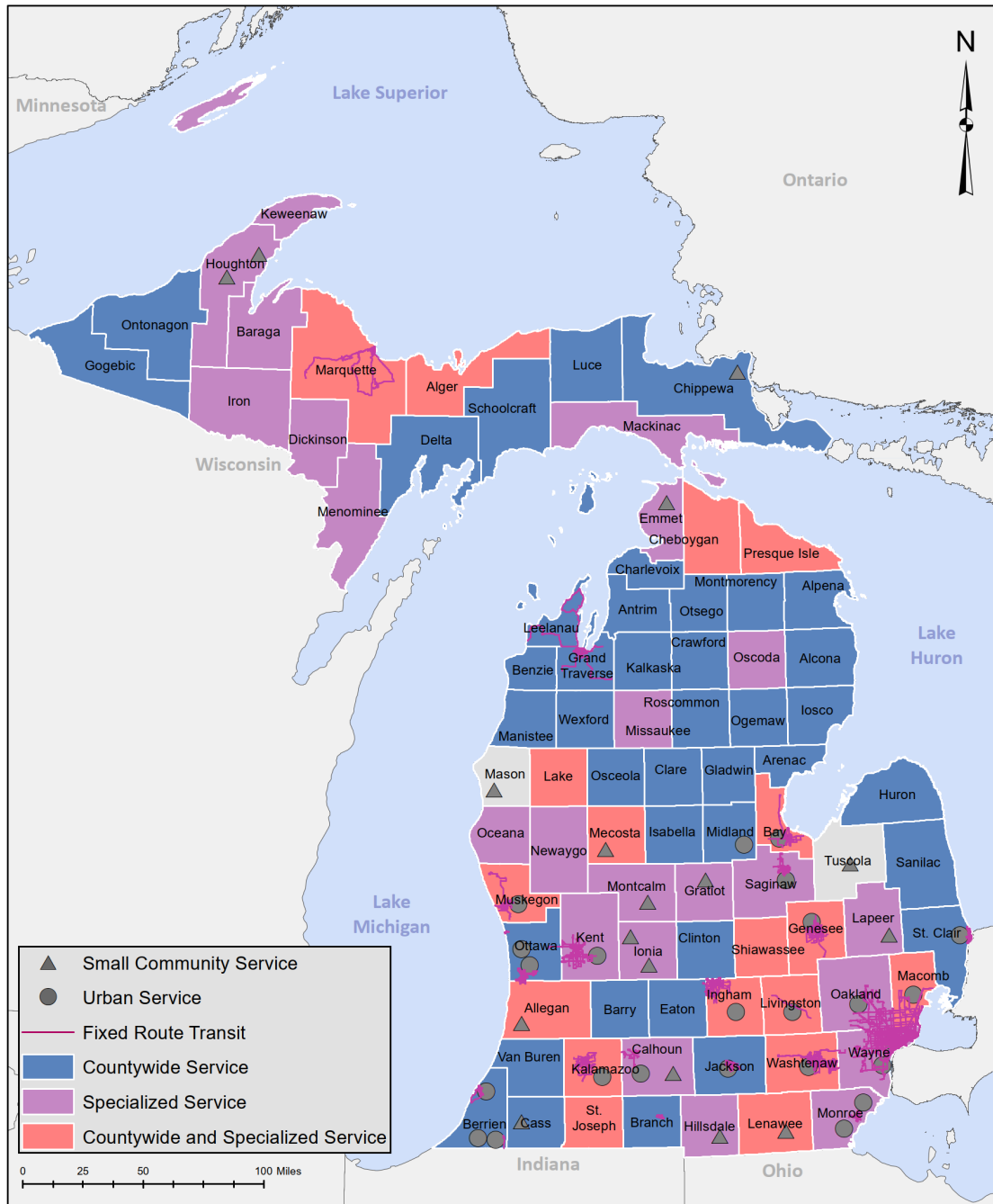
The Regional Transit Authority of Southeast Michigan (RTA) was created in 2012 to improve regional mobility in Metro Detroit and surrounding areas, secure further resources for the provision of transit services, and to enhance the quality of life for residents in the region. The RTA region covers all of Macomb, Oakland, Washtenaw, and Wayne counties, which comprises some of the most dense and active fixed-route public transit services in the state (Figure 5). There are multiple transit service providers within the RTA region, including the Ann Arbor Area Transportation Authority, City of Detroit Department of Transportation, Detroit Transportation Corporation (aka, the People Mover), Suburban Mobility Authority for Regional Transportation (SMART), and the Q-Line streetcar. In addition to the major providers, the RTA works with dozens of independent and government-sponsored community providers and nonprofits to provide services for residents throughout the region. While there is broad geographic coverage with the region, there are still gaps in the fixed-route network in areas with high concentrations of jobs and population. There is also a great deal of opportunity for further coordination to create a more seamless service experience for system users.

Figure 5. RTA Region Services
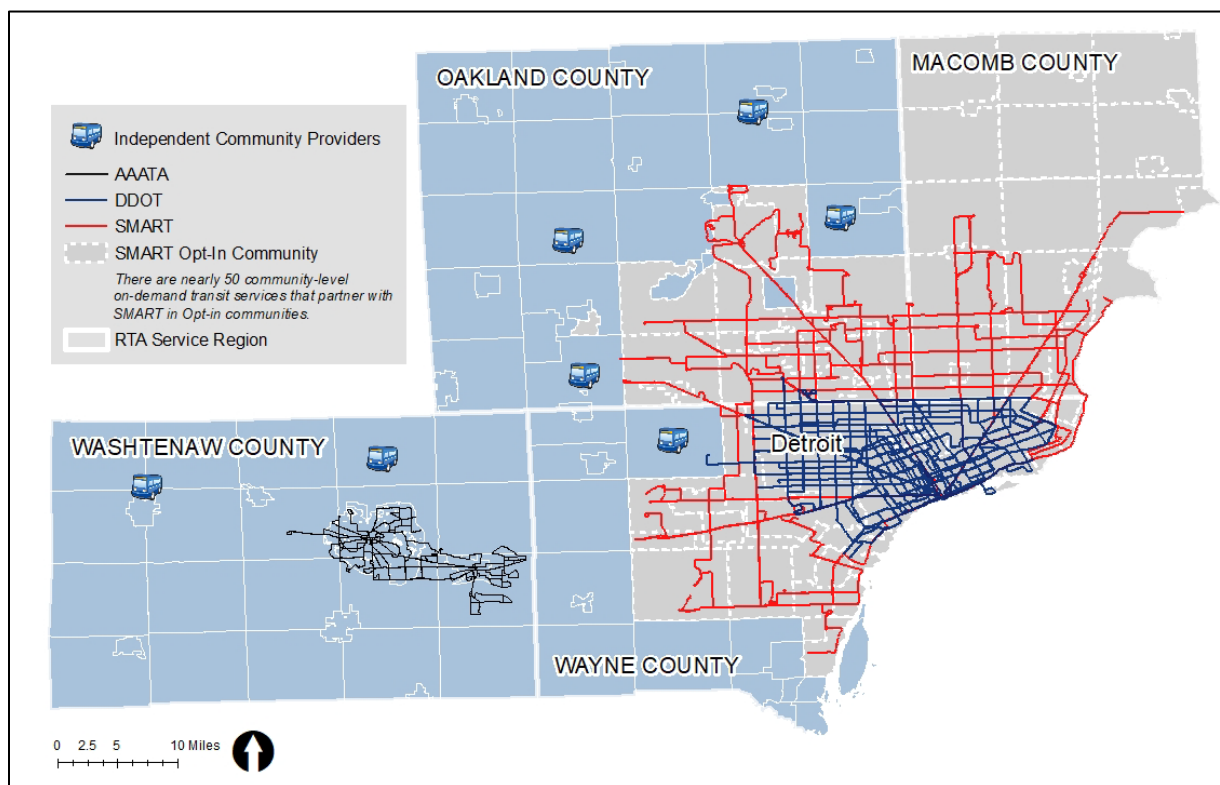
Other gaps exist in the public transit system across the state beyond those identified in the service coverage maps. These service gaps include coverage by time of day or days of the week that transit services are offered, which can have significant impacts on residents' ability in both urban and rural areas to access employment opportunities or other critical needs, such as access to health care. There are also gaps in intercity bus services that could provide improved connectivity in the state.

Many employment opportunities are in manufacturing, retail, or other service sectors that may require mobility needs outside the hours local transit services may operate. As a result, these potential employment opportunities are inaccessible for some. Further investigation could identify both spatial and temporal service coverage gaps across the state to focus and prioritize efforts to close these gaps and improve equitable access to jobs, education, health care, and other critical needs.

Jurisdictional boundaries, especially in rural areas, can create gaps in transit service. Many transit agencies are not permitted to operate outside of their service area, such as the city, county, or other municipal limits. In rural areas, this can impair access to health care as medical facilities or specialists may be located far outside local transit operational areas.

At a local level, the availability of sidewalks, Americans with Disabilities Act (ADA)-compliant curb ramps, on-street bike lanes, or off-street multi-use trails provide critical first- and last-mile connectivity to transit. Nearly all transit trips begin or end with a pedestrian component, making the availability of first- and last-mile connectivity highly important for safe and convenient transit use. The availability and condition of sidewalks is not uniform across all communities. Furthermore, due to lack of comprehensive active transportation asset data, it is difficult to know where first- and last-mile connectivity gaps exist. Sidewalk building and maintenance is managed at the local level, so coordination between communities and transit agencies is necessary to target first- and last-mile infrastructure gaps. To further minimize or eliminate these connectivity gaps, it will be critical that OPT is involved with planning coordination among municipalities, counties and/or transit providers. Enhancements to first- and last-mile connections were also recommended in MM2045 as well as the MM2045 Active Transportation Plan.

5.2   STATE OF GOOD REPAIR

Maintaining the buses, transit centers, maintenance and vehicle storage facilities, stops and stations, and all the other associated infrastructure that public transit relies on is essential to providing safe, comfortable, and reliable service, regardless of system size or location. To assist in maintaining a state of good repair for all transit infrastructure, the Federal Transit Administration (FTA) requires that all transit operators develop Transit Asset Management Plans (TAMPs) to guide the acquisition, ongoing maintenance, and eventual disposal of buses, facilities, equipment, and other various asset types through their complete life cycle. All covered providers must report their inventory of facilities as well as revenue vehicles, service vehicles, and equipment worth more than $50,000, along with the current condition of each asset. Providers determine vehicle and equipment state of good repair by comparing an asset's age against the useful life benchmark set for the asset type by the agency in reference to federal and state minimums. By prioritizing funding for replacement of assets at the end of their useful life, transit providers can achieve and maintain a state of good repair, increasing safety, reliability, and performance across the system.

In Michigan, 21 Tier I large and small urban transit providers prepared and submitted stand-alone TAMPs and MDOT's Transit Asset Management Group Plan covered the remaining 60 rural 5,311 subrecipients and 42 specialized services 5,310 subrecipients that do not receive Section 5307 funding. Nearly all TAMPs reviewed conformed to the FTA's core requirements. Tier I TAMPs varied significantly in composition, format, level of detail (particularly in how the agency planned to implement the TAMP), and frequency of updating, among other dimensions.

Due to a lack of uniformity in reporting asset inventory and condition, statewide indicators of asset value and accumulated backlog to maintain state of good repair cannot currently be quantified. As a result, the point-in-time capital needs to achieve state of good repair for Michigan's transit system remain uncertain.

Looking forward, it will be critical to understand the complete transit system's state of good repair in Michigan for all providers. This will allow OPT and others to know the state of good repair backlog and the potential gap in existing funding to bring the comprehensive transit system up to a state of good repair and maintain that level.

State of good repair is also a critical need for the four ferry boat providers in Michigan. These agencies have many significant capital needs, including condition of boats, terminals, fueling, and other related infrastructure.

5.3   FUNDING STABILITY AND OPERATIONAL EXPENSE GROWTH

Adequate, sustainable, and predictable funding for public transit's operating and capital needs have been challenging for many years. As noted in Figure 6, expenses for transit agencies are rising rapidly. Almost all categories of transit providers in Michigan saw operational expenses increase between 2015 and 2019. The largest increase has been in the urbanized areas, but rural service operators have also seen operational costs grow by more than 10 percent in this five-year timeframe. Across the state, transit service expenses have risen nearly 15 percent since 2015.

Several causes are attributed to this increase in operational expenses, but a main driver of the increase is a result of the increase in health care benefit costs transit agencies pay for their employees. Transit agencies are working to control costs, but as is the case with health care, many significant areas that drive increasing operational costs are not directly under the control of the agency.

Figure 6. Michigan Transit Operating Expense 2015-2019
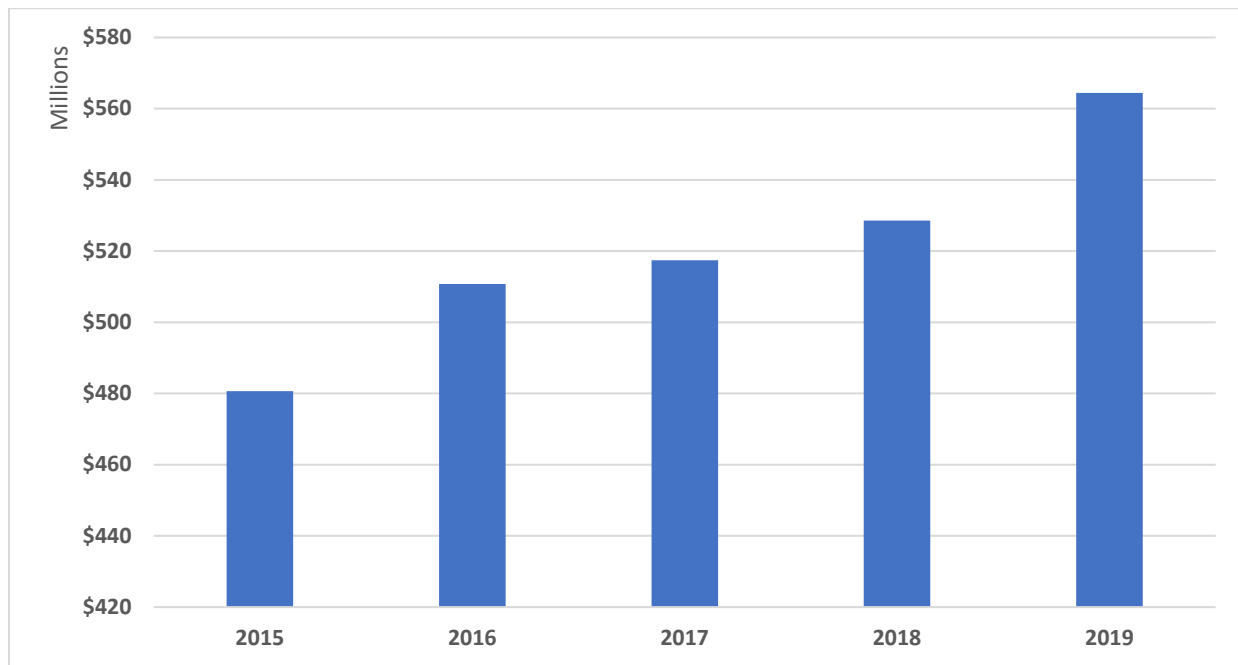
Source: OPT, 2020

Transit receives funding from the Comprehensive Transportation Fund (CTF) established in 1951 by the Michigan Legislature through Public Act 51 (known as Act 51). Revenue sources for the CTF come from a portion of the state's motor fuel tax, vehicle registration fees, and sales taxes on automobile purchases. State funding support for public transit programs has experienced continued growth over the five years prior to the pandemic, as displayed in Figure 7. In this time, financial support for public transit services in the state has seen a 17.3 percent increase from $229.5 million in 2016 to $269.2 million in Fiscal Year (FY) 2020.

Figure 7. State of Michigan Transit Funding 2016-2020
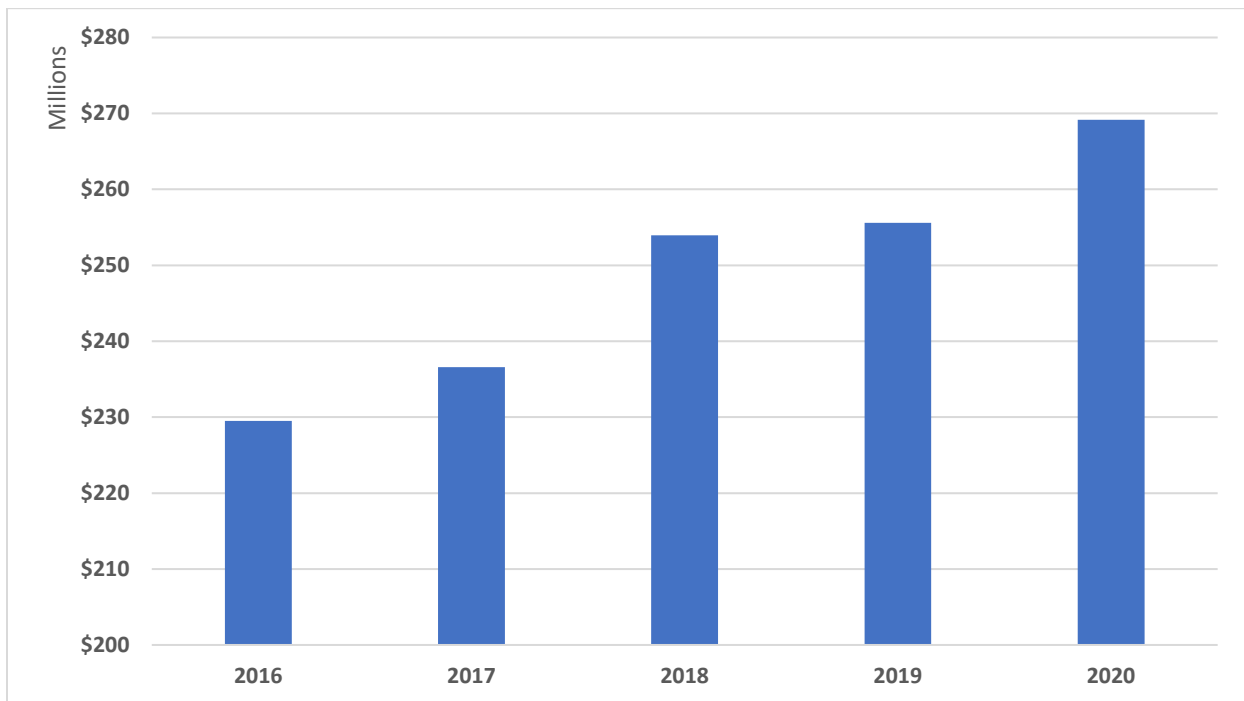
Source: OPT, 2020

Understanding the continued rise of transit operating expenses in the state will require further investigation to identify the primary causes of cost escalation. From there, Michigan can begin to develop possible solutions to more effectively control costs. This investigation should also include analysis of when rising transit operating expenses will outpace planned revenues from the CTF and all other sources. This will provide transit agencies, OPT, and legislators a more complete understanding of coming financial challenges and assist in the development of solutions.

MM2045 projects revenue needs for the complete multimodal transportation system, including public transit, over the coming 25 years. Overall, Michigan's transportation needs are estimated to total $164.6 billion for all modes in that time period. Figure 8 summarizes these needs and presents the portion of needs anticipated to be met by available revenues and those needs that would remain unmet given current and anticipated revenue levels.

For public transit, the total needs for the next 25 years are estimated to be $17.3 billion. Of this total, approximately $5.9 billion would be unmet needs under current revenue forecasts.

Figure 8. MM2045 Revenue Gap Analysis, FY 2021 to 2045 (Millions of 2020 Dollars)
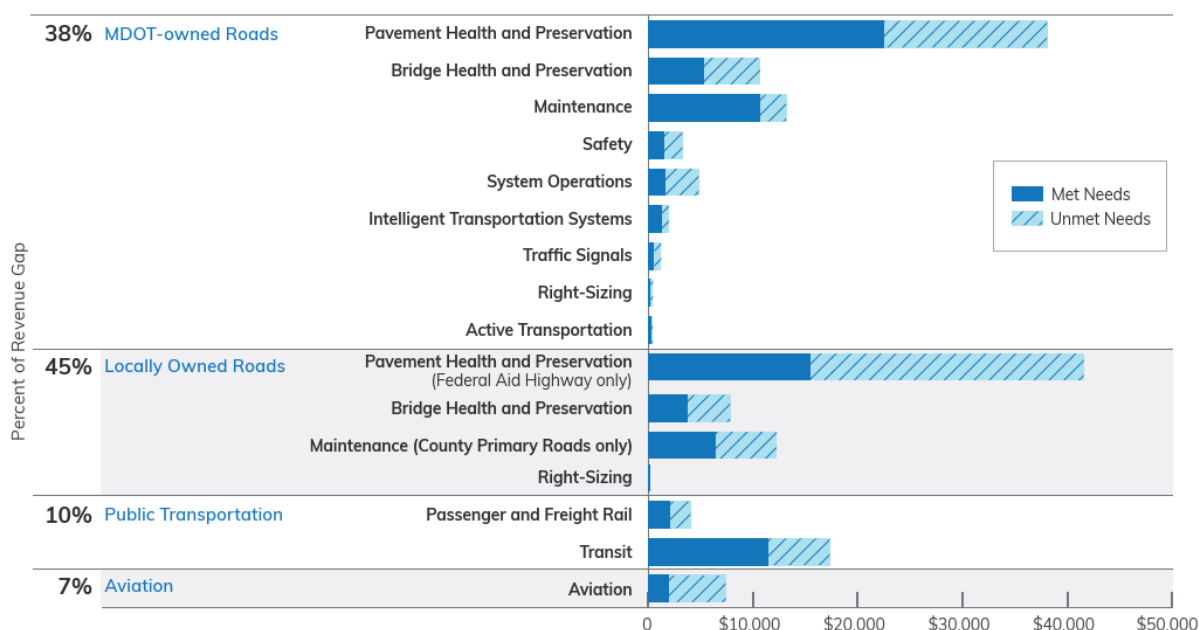
5.4   EVOLVING TECHNOLOGY

Technology advances in the last decade are dramatically impacting the public transit industry. Further planning, investigation, piloting, deployment, and integration of these transit technology advancements is an important need to operators.

Bus propulsion technology is one area that is developing quickly as transit agencies seek alternatives to fossil fuels. Battery-electric or zero-emission bus technology is continuing to develop, and many transit agencies in Michigan and elsewhere in the U.S. are moving to institute pilot programs to test how new zero-emission vehicles perform in their fleets. Los Angeles Metro, for example, has set ambitious targets to change over their entire bus fleet to zero-emission vehicles in the coming decade.

In summer 2021, Blue Water Area Transit (BWAT) became the first public transit agency in Michigan to deploy fully battery-electric buses in its fleet. BWAT was able to procure the vehicles and charging equipment with grant funding from the FTA's Low or No Emissions Program, with matching funds from MDOT/OPT (Figure 9).

Figure 9. Blue Water Area Transit Electric Bus

Source: Blue Water Area Transit, 2021

Research into connected and automated transit vehicles also continues to rapidly advance. MDOT and OPT have been on the leading edge of these efforts as participants in the Automated Bus Consortium, formed in May 2019. One key goal of the Consortium is the deployment in the years ahead of full-sized electric transit vehicles that operate autonomously with a transit operator still behind the wheel in all driving conditions.

Another area where technology would benefit passengers is advancement of a statewide Mobility as a Service (MaaS) platform. MaaS is the integration of many mobility services, generally through a smartphone app-based system that coordinates multiple travel options to complete a single trip. For example, a MaaS system could provide a mobile trip-planning application used to check out a nearby e-scooter that would take an individual to the closest bus stop in time to board the bus, then check out a docked shared bike adjacent to the bus stop after alighting to complete the last leg of the trip. All segments of this trip could be planned and paid for through a single mobile application. OPT is exploring a statewide MaaS project that would enable people anywhere in the state to connect with available transit options in their area. Additional features, such as mobile trip planning, reservations and fare payment, could be added in various regions.

Figure 10. May Mobility Autonomous Shuttle

Several automated transit vehicle pilot projects are underway or are planned in Michigan, including the Grand Rapids May Mobility autonomous shuttle project (Figure 10), Ann Arbor's Yandex self-driving ride hailing vehicle pilot, the A2GO autonomous shuttle pilot in Ann Arbor, and the upcoming Connected and Autonomous Vehicle Corridor project between Detroit and Ann Arbor.

5.5   TRANSIT WORKFORCE RECRUITMENT AND RETENTION

Shortages of qualified bus operators and mechanics to operate and maintain transit fleets pose an immediate and growing challenge for many transit agencies in Michigan and across the U.S. Competition for drivers has become more challenging with growing demand for commercial delivery drivers for package delivery companies such as Amazon, FedEx, and UPS. Opportunities with such companies have lured away current or potential transit operators from careers with transit agencies. Competitive pay has been one of the primary causes for driver shortages. The median hourly wage for a municipal bus driver in the U.S. is $19.61, according to the Bureau of Labor Statistics. Entry-level paychecks tend to be smaller, which can pose a barrier to many young workers, especially with the fee required to earn the requisite commercial driver's license. According to a 2021 survey conducted by the Michigan Public Transit Association (MPTA), urban transit systems offered an average minimum wage for full-time bus operators of $17.24 and an average maximum wage of $21.26. MPTA conducted a similar survey of rural transit agencies in 2021 and found the

average starting wage for bus operators was $14.16 with an average maximum wage of $16.62.

Driver shortages have been exacerbated by the COVID-19 pandemic. Concerns about contracting the coronavirus at some transit agencies have caused higher absenteeism, leading to reductions in service.

Operator shortages impact the reliable and effective delivery of transit services and also can have financial impacts. As labor shortages persist, current operators may be asked to work longer shifts. This can also lead to higher absenteeism rates. To help ensure reliable transit service, transit agencies may assign more stand-by drivers to be on duty in the event routes do not have operators. This additional staffing can cause overall operational expenses to rise.

Increasing pay to attract more bus operators is a challenge for almost all transit providers. These agencies face pressures to expand transit service coverage while simultaneously managing rising expenses for labor and benefits. More research, collaboration, and coordination will be needed across the state to develop strategies to promote and attract the qualified labor needed to operate and maintain transit services in the future. Along with this, new or enhanced training of existing maintenance staff is likely to be needed in the coming years as advancements in technology for transit vehicles will require new skills to service bus fleets with autonomous technology or electric propulsion systems.

Staffing challenges are also occurring within OPT as well as transit operators. It is anticipated that OPT staff turnover will increase due to retirements in the near-term. Because of the complex and specialized nature of OPT's duties and limited staff and training resources, it is challenging to cross-train staff members of each unit. This leaves individual units, and OPT overall, vulnerable to the loss of institutional knowledge in the event of an unexpected key staff departure. This challenge is exacerbated by extensive new staff training time associated with the breadth of responsibilities for each position and the amount of detail required to perform these duties efficiently and effectively.

Recognizing this vulnerability highlights the need for OPT to formalize succession plans for the most critical roles and those where turnover is anticipated. These succession plans could include hiring new staff and allowing an appropriate amount of transition time for knowledge transfer from existing staff to mitigate critical institutional knowledge gained from years of experience. Succession planning and on-boarding new staff could minimize impact on OPT and its ability to effectively serve subrecipients and transit riders.

5.6   COVID-19 PANDEMIC RECOVERY

The negative impacts on the public transit industry caused by the COVID-19 pandemic in Michigan and across the U.S. are likely to have long-lasting repercussions for transit from both budgetary and future service operation and policy perspectives. Transit agencies moved quickly to keep essential transit operators safe; they implemented policies to limit

the number of passengers on vehicles, increased passenger spacing in vehicles, suspended fare payments to limit contact points, and required passengers to board and alight from rear bus doors when available. Transit agencies also enhanced cleaning and sanitizing of transit vehicles to help limit the spread of the virus. These rapid changes to operating policy had significant financial impacts. The pandemic also caused a historic slowing of the economy and curtailed the gas tax revenues that constitute a major funding stream for many transit operators. The reduction in both fare revenue and revenue generated from user fee sources will have a long-lasting impact on transit agency financial planning for many years and will likely lead to reduced services as agencies seek to balance budgets.

According to APTA, national transit ridership dropped 73 percent from April 2019 to April 2020.[6] When the pandemic finally recedes, ridership levels, especially on commuter routes, may be slow to return to pre-pandemic levels and may never fully recover. Many Americans who were required to work from home in 2020 may choose to continue to do so once the pandemic has ended. This shift to home-based work could have long-lasting impacts on transit ridership. Those who must return to a place of work other than home may shift their mode choice to avoid crowded transit vehicles in the future. At the time of this plan, it is difficult to predict choices transit passengers will make in the months and years to come as the pandemic comes to an end. It is likely that transit agencies in Michigan will experience budgetary pressures and may need further federal and/or state support to remain sustainable and recover fully from the COVID-19 pandemic.

As transit agencies seek to manage significant budgetary shortfalls, reductions in transit service around the state could have negative mobility impacts and exacerbate transit coverage service gaps that would connect people to employment, health care, shopping, education, and other opportunities.

5.7   ENHANCED COMMUNICATION AND COLLABORATION

Improving communication and coordination between the transit agencies, transit advocates, MPOs, and OPT will be critical to improving total mobility in Michigan. Transit agency stakeholder engagement noted a desire for more formalized, peer-sized agency working groups to be established where these transit operators could share challenges and solutions to similar issues they are experiencing.

There is also an important need to enhance coordination within state government. OPT is one of many state offices that support or provide transportation and mobility. While OPT is responsible for the coordination, oversight, and funding of public transportation for the general public in Michigan, other departments have more narrowly focused mandates providing safety or budgetary assistance. Still others are involved in providing mobility services to specific segments of the state's population, such as veterans and seniors. Some

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[6] American Public Transit Association. The Impact of the COVID-19 Pandemic on Public Transit Funding Needs in the US. May 5,2020. https://www.apta.com/wp-content/uploads/APTA-COVID-19-Funding-Impact-2020-05-05.pdf.

of these include the Department of Military and Veterans Affairs, Department of Health and Human Services, Office of Future Mobility and Electrification, Office of Rail, and more.

Increasing collaboration will be important in the coming years as a means to share resources, enhance efficiencies, limit redundancies, and strive to reduce or eliminate service gaps.

6.   Statewide Transit Strategic Recommendations

Over the next 10 years, OPT will focus its efforts on advancing the state's transit goals and objectives in the following areas. The strategic recommendations listed below illustrate the key early actions identified during transit strategy development but may be added to over the coming years as more partnerships develop and implementation progresses. The recommendations that follow respond to the needs identified from transit agency stakeholders and public input and seek to address the MM2045 Goals: Quality of Life, Mobility, Safety and Security, Network Condition, Economy and Stewardship, and Partnership. Recommendations are grouped into the following themes that emerged in the planning process: Partnership and Outreach, Programs and Funding, Innovation, People and Recruitment, and Process Enhancements.

6.1   PARTNERSHIPS AND OUTREACH

6.1.1   Cross-Departmental Mobility Working Group

Financial and staff resources of OPT, along with transit operators, are anticipated to remain limited for the foreseeable future. OPT should establish a formal working group with other offices within MDOT, as well as other state departments that either administer, support, or operate passenger mobility services. This working group, in concert with local transit operators, could identify where services are overlapping or where connections between systems are not being made and seek solutions to provide more convenient and seamless mobility in these areas. This working group could also examine modifications to internal policies or procedures that would benefit interaction and support for local mobility service operators. This could include procurement of transit vehicles, technology equipment, or other assets that may provide cost savings along with improved system user experience.

Within MDOT, further coordination with OPT could assist with transit needs being included in roadway, ITS, and other modal projects earlier in the planning process so transit enhancements are considered and built along with corresponding roadway projects.

6.1.2   Transit Data Dashboard

Many people are unaware of the reach and impact public transit has throughout Michigan.

To assist with communicating the importance, impact, performance, and necessity of transit in the state, OPT should lead an effort to develop a new publicly facing transit data dashboard to be hosted on the OPT website.

Traditional dashboard metrics, such as ridership and miles traveled, do not necessarily illustrate transit's impact on mobility, equity and the economy. OPT should develop a

dashboard that clearly demonstrates the positive impact transit has around the state. Development should use a collaborative planning process that includes transit agency stakeholders. This process could identify a selection of appropriate data elements to collect and report; identification of intended audiences; definition of data reporting and aggregation responsibilities; inclusion of metrics that demonstrate access to services and employment opportunities; and other details required to advance the project. Data elements could include accessibility via transit to education, employment and health care, and transit's role in social equity.

MDOT currently collects traditional metrics data from transit providers quarterly or annually, depending upon the type of service provided. OPT may want to engage a consultant to determine how to measure and report updated metrics that better measure mobility outcomes and equity.

The dashboard should allow open access and downloadable data for all supporting background information.

This tool could serve as an excellent way to conveniently and concisely communicate the positive impacts that public transit services have throughout the state.

6.1.3   Transit Benefits Fact Book

In conjunction with the transit data dashboard, OPT should develop an annual public transit benefits fact book to be presented to state legislators each year. The composition of the Legislature changes with each election cycle. As new members join the Legislature, their knowledge of the importance and benefits of transit may vary. Having a concise source of current transit system performance information and benefits data could serve as a useful briefing tool for OPT to communicate with state legislators.

6.1.4   Peer Transit Agency Communication

Through the stakeholder engagement process used in development of this plan, OPT heard from local transit agency leaders of a desire for greater peer-to-peer transit agency communication. OPT could partner with the state's two transit associations and serve as a facilitator for interactions among transit agencies of similar size, region, and/or operating profile to support open communication and knowledge sharing. OPT could organize peer transit agency groups by size and assist in scheduling and hosting in-person or virtual meetings at regular intervals. This would allow for discussion of common challenges, sharing of solutions to issues, and development of service deployment enhancement strategies.

Table 3. Partnership and Outreach Recommendations Summary

Recommendation	MM2045 Goal(s) Addressed
Cross-departmental working group	Partnerships
Transit data dashboard	Economy and Stewardship
Transit benefits fact book	Economy and Stewardship
Peer transit agency coordination	Partnerships

6.2 PROGRAMS AND FUNDING

6.2.1 Transit Service Needs Aggregation

The majority of transit planning and service deployment decisions are managed at the local level, making the combined statewide transit system's needs difficult to define. OPT should lead an effort with rural, urban, intercity bus, and ferry boat operators to define the full scope of needed services at the local level. This would be a critical first step in the process of eliminating the numerous service gaps that have been identified as mobility challenges and improving connectivity for the state's transit riders. As the complete transit system needs are collected, costed, and combined, a clearer understanding of the revenues needed for an improved statewide network could be clearly articulated.

6.2.2 Transit Expense Growth Assessment

As discussed earlier, operational expenses for transit operators of all sizes have experienced increases. Between 2015 and 2019, operators reported an approximate 15 percent increase in operational expenses.

There are multiple factors that contribute to escalating transit operation expenses, several of which may be out of the direct control of transit agencies. Increased expenses may be caused by operator wages, fringe benefits such as health insurance for employees, overtime pay, fuel prices, fleet and facilities maintenance, and several others. The rapid increase in health care costs for employees is likely one of the primary causes of the overall upward trend, but more refined research would be needed to define all causes of increased operational expense around the state.

OPT should lead a study in partnership with transit operators to examine the growth trend of transit operational expenses to conclusively identify the primary drivers of this trend and develop solutions and strategies to slow or reverse further growth of operational costs. This analysis should also examine the growth of current revenue generation sources to identify an anticipated point in the future where expense growth would possibly outpace revenue generation.

6.2.3 Transit Revenue Generation Opportunities Review

Operational expenses for transit agencies are rising. Existing revenues may not be adequate to support the system's needs sustainably into the future. Most of the funding for transit is

generated from the CTF. Local funding, often in the form of property taxes, also contributes to operations. A total of 54 of 78 public transit agencies are locally supported by property tax millages.[7] According to the National Transit Database, in 2018 more than $138 million was generated for transit services through property taxes across Michigan. Millage rates are set at the local level and maximum rates are established by each locality. Millage rates for multiple public entities joining together in a joint endeavor to offer transit services under the Municipal Partnership Act (2011) may only set millage rates up to five mills.

Currently, local option sales taxes to support public transit services are not permitted under state law. As expenses are likely to continue to increase, alternative sources of revenue generation should be explored. This could include discussions that would require modification of current state statutes to allow for new source of revenue generation for transit that could include sales taxes or transit development districts. Other future revenue sources could include highway tolling, high occupancy toll lanes and other road-user charging methods. Adjustments to state statues regarding taxation are likely to be challenging and would need a partnership of transit operators, transit advocacy associations, and champions at local levels.

Table 4. Programs and Funding Recommendations Summary

Recommendation	MM2045 Goal(s) Addressed
Transit service needs aggregation	Mobility Partnership
Expense growth assessment	Economy and Stewardship Network Condition Partnership
Revenue generation opportunities review	Economy and Stewardship Network Condition Mobility

6.3   INNOVATION

6.3.1   Rural Transit Technology Assessment

Transit technologies are rapidly evolving and impact nearly all elements of transit service delivery, from vehicle propulsion to fare collection, scheduling, trip planning, route and network planning software, accounting, and asset management. Even large transit operators with ample staff may have difficulty staying current on these various products, services, software, and other technical innovations, or incorporating these technologies into their operations. This challenge is amplified for smaller transit operators with significantly smaller staffs and budgets. Finding the most appropriate technology and vendor can pose several risks for transit agencies.

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[7] Michigan Department of Transportation. Michigan Public Transportation Facts FY 2020.
https://www.michigan.gov/mdot/0,4616,7-151-9625_21607-34128--,00.html#:~:text=for%20Fiscal%20Year%20(FY)%202019&text=Total%20state%20transit%20funding%20in, funds%2C%20and%20property%20tax%20millages.

To support the further incorporation of modern technologies into transit operations across the state, OPT initiated a Rural Transit Technology Assessment Plan. This assessment will develop a baseline for transit technology readiness across all rural agencies in the state, analyze the most critical technology type needs, and develop a series of recommendations for OPT that could help to create a more standardized and systemic approach to adopting, deploying, and supporting transit technology. This would have the benefit of reducing risks for transit operators, allowing them to pilot new technologies and to potentially lower costs of these technologies. When completed, OPT should work to advance the technology recommendations of this assessment.

Along with the Rural Transit Technology Assessment, a coordination effort with urban transit providers should be conducted to align technology platforms to increase collaboration and create efficiencies. Lessons learned from the Rural Technology Assessment could be applied to urban operators to improve technology integration in urban areas.

6.3.2   Support Automated Bus Pilot Projects

MDOT and OPT have been active in the leadership of the Automated Bus Consortium (ABC) since its inception and have assisted with the development of the nation's first automated bus technical specification. MDOT is working with two partner transit agencies to deploy autonomous buses in demonstration pilot projects. The pilot projects will use 40-foot autonomous buses to be deployed in real-world service environments. Results from these pilot projects will be shared with ABC members and the FTA to advance this developing technology. Plans are in place for initiation of these pilot projects in 2023.

Along with the autonomous bus pilots stemming from the ABC, other projects are developing. In 2019, CALSTART announced the launch of an automated vehicle technology project to support the development of a zero-emission autonomous transit vehicle. CALSTART has partnered with public and private agencies across the U.S., including Michigan, for projects that can assist in the advancement of automated bus technologies. Another automated bus pilot project is ongoing at the Michigan State University campus in partnership with Adastec. The project is using full-sized transit vehicles with level 4 automation to provide transit service on a 7-mile route.

In the coming years, OPT should continue its close involvement with the Consortium and other automated bus initiatives to assist in the advancement of autonomous technology integration for transit use.

6.3.3   Develop Statewide Mobility as a Service Platform

MDOT is exploring a statewide MaaS project that would enable people anywhere in the state to connect with available transit and shared mobility options in their area. Additional features, such as mobile trip planning, reservations and fare payment, could be added in various regions. In the near-term, OPT should implement this important project to increase mobility options, close mobility gaps, and make transit easier and more convenient to use

by providing a single location for trip planning and fare payment. OPT is well positioned to organize and support the development of a statewide MaaS service platform that could integrate many of the state's transportation providers.

6.3.4   Transit Electrification Plan

Transit agencies around Michigan and the nation are beginning the process of integrating battery-electric buses (BEB) into their fleets. In recent years, battery technology has continued to advance, providing greater range and reliability for transit vehicles, making this new form of vehicle propulsion more attractive and less risky for transit agencies. The upcoming shift away from buses powered by fossil fuels will provide multiple benefits to cities and counties in Michigan. These benefits will include improved air quality and decreased operating costs. It is about 2.5 times cheaper to power vehicles with electricity rather than diesel, and electricity prices are generally much more stable than gasoline or diesel prices. The U.S. National Renewable Energy Laboratory has found that the fuel economy of BEBs is five times higher than that of diesel buses operated on equivalent routes. In addition, maintenance costs for electric motors are much lower because they have far fewer moving parts than conventional motors and are far more efficient.[8] The impacts of climate change are already being felt in Michigan and around the nation. A strategically planned shift toward a zero-emission bus fleet would assist in lowering carbon output in the state and mitigate against the growing impacts of ongoing climate change.

To prepare for this anticipated transition to BEB or other non-fossil fuel-based future, OPT should lead the creation of a statewide transit electrification plan. This plan should assess the overall readiness of the many transit agencies in the state, assess the manufacturers of BEBs to recommend the most appropriate vehicles for Michigan, detail electrical infrastructure needs at maintenance facilities, develop capital cost estimates, and identify funding opportunities to support agencies in deployment of BEBs in their operations. This plan should serve as a road map for all agencies across the state to follow as the transition to electrified fleets progresses.

Table 5. Innovation Recommendations Summary

Recommendation	MM2045 Goal(s) Addressed
Rural and urban transit technology assessment	Mobility Quality of Life Partnerships Economy and Stewardship
Support automated bus pilot projects	Mobility Quality of Life Safety and Security
Develop statewide MaaS platform	Mobility Quality of Life Partnerships
Transit electrification plan	Quality of Life Network Condition

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[8] Nunno, Richard. Battery Electric Buses; Benefits Outweigh Costs. October 26, 2018. Environmental and Energy Study Institute. https://www.eesi.org/papers/view/fact-sheet-electric-buses-benefits-outweigh-costs.

	Safety and Security Partnerships

6.4 PEOPLE AND RECRUITMENT

6.4.1 Succession Planning for OPT Positions

One of the greatest strengths of OPT is its dedicated staff, who are committed to supporting subrecipient transit agencies and mobility providers to deliver the highest quality of service. To prepare for the expected staff turnover and potential for loss of institutional knowledge, OPT should formalize succession plans for the most critical roles and those where turnover is anticipated. Succession planning and on-boarding new staff would minimize impact on OPT and its ability to effectively serve subrecipients and transit riders.

6.4.2 OPT Internship Program

Recruitment of professionals into the public transit industry and governmental service can be challenging. In many cases, graduating students may be unaware of the organizations that support or provide public transit services on which they depend. To help with the recruitment of new staff, OPT should develop an annual internship program for undergraduate or graduate students at universities in Michigan. This program would provide hands-on experience working with teams supporting the complex needs that support transit operations across the state. This program would provide students with an introduction of civil service as well and experience in the public transit industry, which could eventually lead to a future career. An internship program would also benefit OPT with a reoccurring influx of staff with new perspectives and various skillsets, providing extended staff capacity for new projects.

6.4.3 Transit Operators and Mechanic Recruitment

Many agencies face challenges in attracting transit operators and mechanics due to competition with parcel delivery companies, who can offer higher wages. This competition is a major concern as agencies may find themselves short-staffed. To assist transit operators with this challenge, OPT should develop a statewide transit operator and support staff recruitment program that could raise the profile of career and employment opportunities with local public transit agencies. This program should include identification of barriers to recruitment of potential candidates, engagement with transit agencies to discover the most common challenges to operator and mechanic recruitment and retention, coordinated recruitment activities at trade school or other career fairs, recruitment/hiring advertising campaigns, collaboration with workforce agencies and state transit associations, and an examination of existing wages of transit operator and maintenance staff. This effort could also examine critical workforce development programs that could be beneficial to retraining current mechanics as transit vehicle technology continues to rapidly evolve with the introduction of battery-electric bus, hydrogen fuel cell, autonomous technologies, and

others. OPT should also conduct a peer review to assess successful recruitment and retainment programs from other transit operators or state DOTs to develop new strategies to attract needed operators and mechanics.

Table 6. People and Recruitment Recommendations Summary

Recommendation	MM2045 Goal(s) Addressed
Succession planning for key OPT positions	Network Condition Economy and Stewardship Safety and Security
OPT internship program	Network Condition Economy and Stewardship Quality of Life
Transit operator and mechanic recruitment	Partnerships Network Condition Economy and Stewardship Safety and Security

6.5   PROCESS ENHANCEMENT

6.5.1   State of Good Repair Data Collection

Maintaining and improving the state of good repair for all transit assets across Michigan is a fundamental need to supporting the safe and reliable operations of public transit services. The TAMP approach now required for both rural and urban agencies will help with this effort, but improvements to this approach are needed. As discussed earlier, rural transit agencies have joined a group TAMP and report all assets (buses, facilities, support vehicles, and equipment) through a common inventory and asset condition process. Urban transit operators each created their own unique TAMPs that collected asset data and condition assessments utilizing varying methodologies, making it impossible to collect and aggregate both the rural and urban transit system condition and assess total statewide transit system state of good repair needs.

OPT should collaborate with urban transit providers to establish a common framework for asset condition data collection and reporting as they each update their TAMPs. This could take the form of an appendix for urban operators' future TAMP updates that report asset inventory, condition, and useful life benchmarks in alignment with reporting from the Tier II Group TAMP. This will help OPT to collect, assess, and project anticipated capital needs and state of good repair backlog at a statewide level. This collaboration, analysis, and reporting of complete statewide state of good repair backlog would also assist with informing state legislators of future expenditures needed to maintain the transit system in Michigan.

6.5.2   Implement New Public-Transit Management System

The Public-Transit Management System has been the primary conduit where transit operators interface with OPT for funding and many other critical functions with OPT. The

original Public-Transit Management System was deployed more than two decades ago and has outlived its useful life. OPT is in the process of developing a new and updated Public-Transit Management System that will provide greater functionality and efficiency for all users of the system. OPT should continue efforts to develop, implement, and train users of this new system to provide better collaboration supporting transit in Michigan.

Table 7. Process Enhancement Recommendations Summary

Recommendation	MM2045 Goal(s) Addressed
State of good repair data collection	Network Condition Safety and Security Economy and Stewardship Partnership
Implement new Public-Transit Management System	Network Condition Partnerships Economy and Stewardship

7.   Appendix 1 – Michigan Transit Operators

Urban Transit Operators

Agency	Service(s) Provided	County
Ann Arbor Area Transportation Authority	Fixed Route, demand response	Washtenaw
Battle Creek Transit	Fixed route, demand response	Calhoun
Bay Metropolitan Transportation Authority	Fixed route	Arenac, Bay
Benton Harbor / Twin Cities Area Transportation Authority	Fixed route, demand response	Berrien
Blue Water Transportation Commission	Fixed route, demand response	St. Clair
Detroit Department of Transportation	Fixed route, demand response	Wayne
Suburban Mobility Authority for Regional Transportation	Fixed route, demand response	Macomb, Monroe, Oakland, Wayne
Detroit Transportation Corp. (The People Mover)	Fixed route	Wayne
Flint Mass Transit Authority	Fixed route, demand response	Genesee
Interurban Partnership (The Rapid)	Fixed route, demand response	Kent
Harbor Transit	Demand Response	Ottawa
Jackson Transportation Authority	Fixed route, demand response	Jackson
Kalamazoo Central County Transportation Authority	Fixed route, demand response	Kalamazoo
Capital Area Transportation Authority	Fixed route, demand response	Ingham
Livingston Essential Transportation Services	Demand response	Livingston
Macatawa Area Express Transportation Authority (Holland)	Fixed route, demand response	Ottawa
City of Midland Dial-A-Ride	Demand response	Midland
Muskegon Area Transit System	Fixed route, demand response	Muskegon
Niles Dial-A-Ride	Demand response	Berrien
Saginaw Transit Authority Regional Services	Fixed route, demand response	Saginaw

Rural Transit Operators

Agency	Service(s) Provided	County
Adrian Dial-A-Ride	Demand response	Lenawee
Allegan County Transportation	Demand response	Allegan
Alma Dial-A-Ride	Demand response	Gratiot
Alger Transit Authority	Demand response	Alger
Antrim County Transportation	Demand response	Antrim
Arenac County Transit	Demand response	Arenac, Bay
Barry County Transit	Demand response	Barry
Bay Area Transportation Authority	Fixed route, demand response	Grand Traverse, Leelanau
Belding Dial-A-Ride	Demand response	Ionia
Benzie Transportation Authority	Demand response	Benzie
Berrien County Public Transportation	Fixed route, demand response	Berrien
Big Rapids Dial-A-Ride	Demand response	Mecosta

Agency	Service(s) Provided	County
Branch Area Transit Authority	Demand response	Branch
Cadillac/Wexford Transit Authority	Demand response	Wexford
Caro Transit Authority	Demand response	Tuscola
Cass County Transportation Authority	Fixed route, demand response	Cass
Charlevoix County Public Transit	Demand response	Charlevoix
Clare County Transit Corporation	Demand response	Clare
Clinton Area Transit System	Demand response	Clinton
Crawford County Transportation Authority	Demand response	Crawford
Delta Area Transit Authority	Demand response	Delta
Dowagiac Dial-A-Ride	Demand response	Cass
Eastern U.P. Transportation Authority	Demand response	Chippewa, Luce
Eaton County Transportation Authority	Demand response	Eaton
Gladwin City/County Transit	Fixed route, demand response	Gladwin
Gogebic County Public Transit	Demand response	Gogebic
Greater Lapeer Transportation Authority	Demand response	Lapeer
Greenville Transit	Demand response	Montcalm
City of Hancock	Demand response	Houghton
Hillsdale Dial-A-Ride	Demand response	Hillsdale
Houghton Motor Transit Line	Fixed route, demand response	Houghton
Huron Transit Corporation	Demand response	Huron
Interurban Transit Authority	Demand response	Allegan
Ionia Dial-A-Ride, City of Iosco Transit Corporation	Demand response	Ionia
Iosco Transit Corporation	Demand response	Iosco
Isabella County Transportation Commission	Demand response	Isabella
Kalkaska Public Transit Authority	Demand response	Kalkaska
Lake Erie Transit	Fixed route, demand response	Monroe
Lenawee Transportation Corporation	Demand response	Lenawee
Ludington Mass Transportation Authority	Demand response	Mason
Manistee County Transportation	Demand response	Manistee
Marquette County Transit Authority	Fixed route, demand response	Marquette
City of Marshall Dial-A-Ride	Demand response	Calhoun
Mecosta Osceola Transit Authority	Demand response	Mecosta, Osceola
Midland County Connection	Demand response	Midland
Niles Dial-A-Ride	Demand response	Berrien
Ogemaw County Public Transit	Demand response	Ogemaw
Ontonagon County Public Transit	Demand response	Ontonagon
Otsego County Bus System	Demand response	Otsego
Roscommon County Transportation Authority	Demand response	Roscommon
Sanilac Transportation Corporation	Demand response	Sanilac
City of Sault Ste. Marie	Demand response	Chippewa
Schoolcraft County Public Transportation	Demand response	Schoolcraft
Shiawassee Area Transportation Agency	Demand response	Shiawassee
Straits Regional Ride	Fixed route, demand response	Cheboygan
St. Joseph County Transportation Authority	Demand response	St. Joseph

Agency	Service(s) Provided	County
Thunder Bay Transportation Authority	Demand response	Alcona, Alpena, Presque Isle
Van Buren Public Transit	Demand response	Van Buren
Yates Township Transportation System	Demand response	Lake

Ferry Boat Operators

Agency	County
Beaver Island Transportation Authority	Charlevoix
Charlevoix Transportation Authority – Ironton Ferry	Charlevoix
Eastern U.P. Transportation Authority	Chippewa, Luce
Mackinac Island Transportation Authority	Mackinac

Intercity Carriers/Routes

Greyhound
Indian Trails
Michigan Flyer
Baron's Bus
Miller Transportation

5310 Special Service Providers

Agency	Service(s) Provided	County
Agewell Services of West Michigan	Demand response	Muskegon, Ottawa, Oceana
Baraga-Houghton-Keweenaw Community Action Agency	Demand response	Baraga, Houghton, Keweenaw
Baragaland Senior Citizens, Inc.	Demand response	Baraga
Brighton Senior Center (Brighton Community Education)	Demand response	Livingston
Cheboygan County Council on Aging	Demand response	Cheboygan
Chippewa-Luce-Mackinac Comm. Action	Demand response	Chippewa, Luce, Mackinac
Community Action Agency of South Central Michigan	Demand response	Branch, Barry, Calhoun, St. Joseph
Community Inclusive Recreation	Demand response	Calhoun
Emmet County Medical Care Facility (Bay Bluffs)	Demand response	Emmet
Friendship Center of Emmet County	Demand response	Emmet
Georgetown Seniors	Demand response	Ottawa
Goodwill Industries - Muskegon	Demand response	Muskegon
Goodwill Industries of Northern Michigan	Demand response	Houghton
Gratiot County Commission on Aging	Demand response	Gratiot
Hartland Senior Center	Demand response	Livingston
Healthsource Saginaw, Inc.	Demand response	Saginaw
Hope Network, Inc.	Demand response	Kent
Ionia County Commission on Aging	Demand response	Ionia
Jewish Community Services	Demand response	Oakland
Jewish Family Services of Washtenaw County	Demand response	Washtenaw
Kent County Community Action	Demand response	Kent
Key Opportunities	Demand response	Hillsdale
Lapeer Team Work, Inc.	Demand response	Lapeer
Lenawee Community Action Agency	Demand response	Lenawee

Agency	Service(s) Provided	County
Lenawee County Department on Aging	Demand response	Lenawee
Mackinac County Transportation	Demand response	Mackinac
Manchester Area Senior Center	Demand response	Washtenaw
Marian Burch Center	Demand response	Calhoun
Mecosta County Commission on Aging	Demand response	Mecosta
Menominee/Delta/Schoolcraft Community Action and Human Resource Agency	Demand response	Menominee, Delta, Schoolcraft
Michigan Transportation Connection	Demand response (Non-emergency Medical Transportation)	Statewide
Milan Seniors for Healthy Living	Demand response	Washtenaw
Missaukee County Commission on Aging	Demand response	Missaukee
Montcalm County Commission on Aging	Demand response	Montcalm
Disability Network West Michigan	Demand response	Newaygo, Oceana
Newaygo County Commission on Aging	Demand response	Newaygo
Northfields Human Services	Demand response	Washtenaw
Oceana County Council on Aging	Demand response	Oceana
Oscoda County Area Transit Specialists	Demand response	Oscoda
Peoples Express	Demand response	Washtenaw
Pioneer Resources	Demand response	Muskegon
Presque Isle County Council on Aging	Demand response	Presque Isle
Saginaw County Commission on Aging	Demand response	Saginaw
Senior Neighbors	Demand response	Kent
SMART - 35 subrecipients	Demand response	Macomb, Oakland, Wayne, Monroe
St. Mary's Guardian Angel	Demand response	Saginaw
TRICO Opportunities, Inc.	Demand response	Dickinson
United Methodist Community House	Demand response	Kent
Upper Peninsula Community Services, Inc.	Demand response	Delta
Vocational Independence Program Transportation	Demand response	Genesee
Wellspring Lutheran Services	Demand response	Multiple
Western-Washtenaw Area Value Express	Demand response	Washtenaw

Michigan Department of Transportation

Michigan*2045*
>>>Mobility
A transportation plan for a connected future #MM45

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