March 2019

2045 Regional Transportation Plan for Southeast Michigan

SEMCOG | SOUTHEAST MICHIGAN COUNCIL OF GOVERNMENTS

SEMCOG . . . *Developing Regional Solutions*

Mission

SEMCOG, the Southeast Michigan Council of Governments, is the only organization in Southeast Michigan that brings together all governments to develop regional solutions for both now and in the future. SEMCOG:

- Promotes informed decision making to improve Southeast Michigan and its local governments by providing insightful data analysis and direct assistance to member governments;
- Promotes the efficient use of tax dollars for infrastructure investment and governmental effectiveness;
- Develops regional solutions that go beyond the boundaries of individual local governments; and
- Advocates on behalf of Southeast Michigan in Lansing and Washington

2045 Regional Transportation Plan for Southeast Michigan

Abstract

The *2045 Regional Transportation Plan for Southeast Michigan* serves as the region's guiding policy document for transportation investment. It describes how more than $35 billion in revenues will be invested in 174 projects to support the region's transportation system through 2045. It addresses the future of mobility and responds to many of the regional, state, and national trends such as an aging demographic, future technology, and funding shortfalls. Regional policies and actions outline strategies to improve the efficiency of the transportation network, strengthen economic prosperity, increase access and safety for all users, achieve a level of fiscal sustainability, create vibrant communities, and protect the natural environment. Implementation of this plan will help improve Southeast Michigan's quality of life. The plan includes regional transportation projects and investment priorities anticipated during the life of the plan. The *2045 Regional Transportation Plan for Southeast Michigan* can be found online at www.semcog.org.

Preparation of this document may be financed in part through grants from and in cooperation with the Michigan Department of Transportation with the assistance of the U.S. Department of Transportation's Federal Highway Administration and Federal Transit Administration; the Michigan Department of Natural Resources with the assistance of the U.S. Environmental Protection Agency; the Michigan Department of Technology, Management and Budget; and local membership contributions.

SEMCOG

Southeast Michigan Council of Governments
Information Center
1001 Woodward Avenue, Suite 1400
Detroit, MI 48226-1904
313-961-4266 • fax 313-961-4869
www.semcog.org • infocenter@semcog.org

Acknowledgments

SEMCOG appreciates everyone who contributed their time in helping develop the *2045 Regional Transportation Plan for Southeast Michigan.* Input into this plan came from multiple stakeholder engagement meetings, interactive online public input surveys, Pulse of the Region surveys, a statistically significant perception survey, public comment, and various consultation agencies. Thank you to SEMCOG's Transportation Coordinating Council, Executive Committee, pass through agencies, Federal-aid Committees, the Michigan Department of Transportation, and Federal Highway Administration who guided creation of this plan. Their collaboration and feedback were critical to developing the guiding principles and overarching regional policies for the plan.

Table of Contents

Table of Data Displays

Figures

Tables

Executive Summary

Southeast Michigan's transportation system – with more than 25,000 miles of roads – supports more than 100 million miles of travel each day and provides the foundation upon which our communities and economy depend.

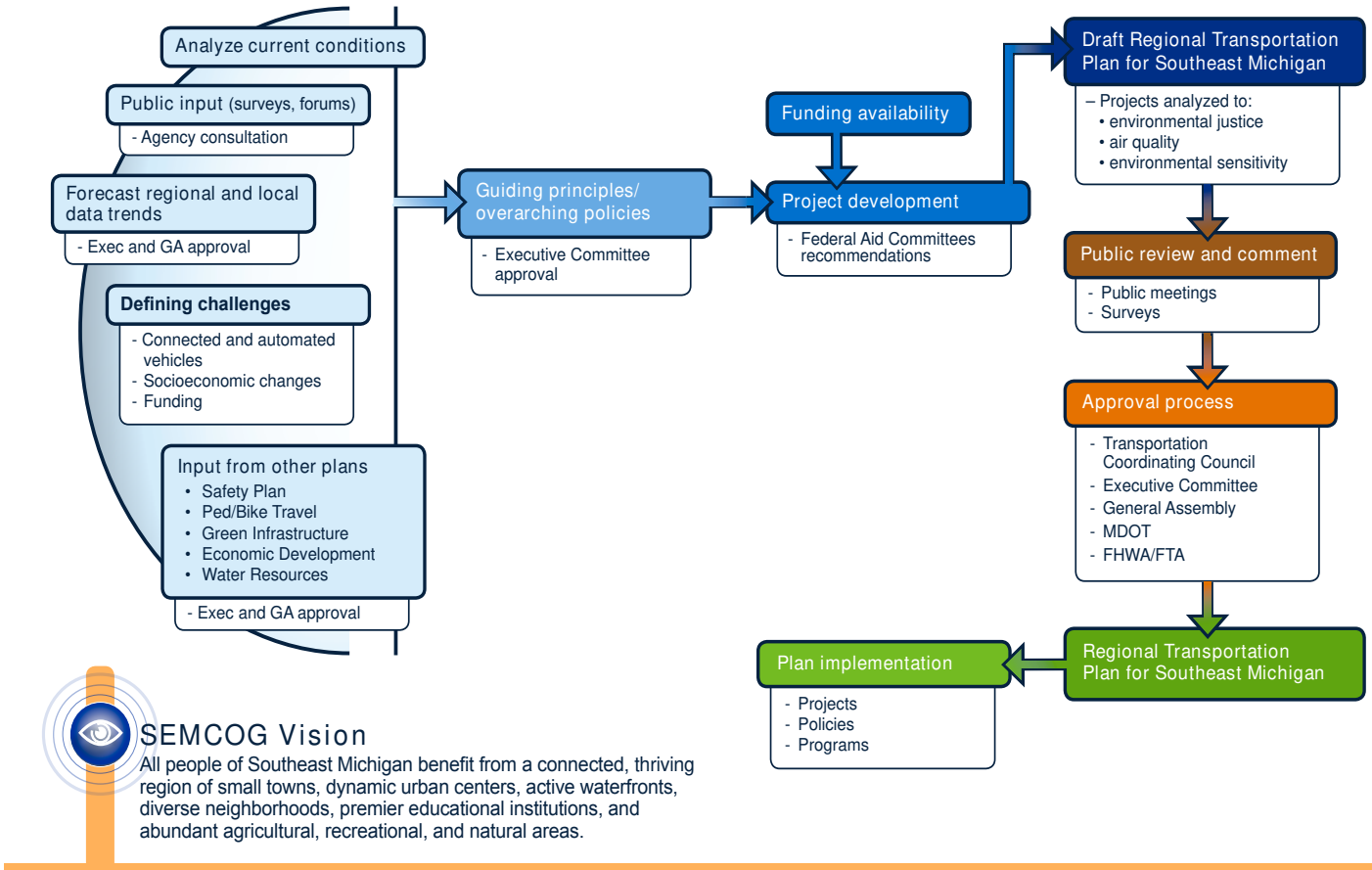
This complex system of highways, transit, rail, ports, trails, and airports knit the region together, connecting people to jobs, businesses, services, and amenities. The multimodal transportation network also distributes freight to stores and industry, expanding the region's economic reach to markets throughout the country and the world. Creating a transportation system with robust travel options gives residents with different needs access to jobs, education, health care, recreation and social opportunities, and other core services. A coordinated and efficient transportation system is a necessary element to a healthy and thriving Southeast Michigan region.

SEMCOG actively supports coordinated, local planning with technical, data, and intergovernmental resources. The *2045 Regional Transportation Plan for Southeast Michigan* (RTP) works to make the transportation system safer and more efficient, revitalize communities, encourage economic development, and improve the quality of the region's environmental resources through the policies and actions outlined in the plan.

This process was used in developing the 2045 RTP:

- Analyze current conditions of the transportation system.
- Obtain public input and agency consultation through surveys, forums, and meetings.
- Forecast regional and local data trends.
- Address defining challenges – advanced technology, socioeconomic changes, and funding.
- Incorporate input from other plans. See the complete list of plans that provided input to the 2045 RTP in Chapter 1.
- Create guiding principles and overarching policies.
- Determine funding availability and project development through Federal-Aid Committee (FAC) recommendations.
- Analyze projects for environmental justice, air quality conformity, and environmental sensitivity.
- Obtain final public input.
- Complete the approval process and begin plan implementation.

Figure 1
Process to Develop 2045 Regional Transportation Plan



SEMCOG Vision

All people of Southeast Michigan benefit from a connected, thriving region of small towns, dynamic urban centers, active waterfronts, diverse neighborhoods, premier educational institutions, and abundant agricultural, recreational, and natural areas.

Public Input Process Summary

SEMCOG relies on a wide range of demographic, economic, and transportation data to forecast the future transportation needs of residents and businesses. Alongside data analysis, it is essential that everyone who relies on the transportation system has a chance to provide input about what is important to them. In developing this plan, SEMCOG hosted public meetings in each of Southeast Michigan's seven counties and the City of Detroit, promoted participation via an interactive web-based survey, conducted a random sample survey, as well as other input opportunities to ensure representation throughout the entire region.

Public outreach meeting, Westland

Guiding Principles

The guiding principles for the 2045 RTP cover the breadth of transportation's impact in the region, developed from data analysis, public outreach, and SEMCOG's vision. These six guiding principles, detailed in Chapter 2, express the underlying regional values that set the framework for developing planning activities, policies, transportation projects, and performance management included in this plan:

- Provide planning solutions that support our unique and diverse region
- Drive a dynamic, talent-rich economy
- Steward environmental and cultural resources
- Connect people safely to jobs and essential services
- Promote coordinated and effective public services
- Educate and engage local leaders and residents

Defining Challenges

The region is challenged by complex factors that require careful analysis and decisive action. Three specific challenges that can drastically impact the future of the region are described in detail in Chapter 2:

- Advanced Technology
- Socioeconomic Changes, including population aging and labor shortages
- Transportation Funding

Overarching Regional Transportation Policies for Southeast Michigan

The overarching transportation policies set the framework for the policies and actions included in each topic area of this plan as outlined in Chapter 3. These policies work in conjunction with the guiding principles to guide the overall direction for the plan. Throughout the plan, issue area sections include actions identified by these overall policies.

The following policies provide overall guidance and support implementation activities to improve Southeast Michigan's transportation system:

Preserve Infrastructure through fiscally-responsible, data-driven asset management practices.

Increase Safety for all travelers, regardless of mode.

Increase Access to jobs and core services, regardless of race, gender, ethnicity, national origin, age, physical ability, or income.

Utilize Technology to cost-effectively improve the transportation system.

Integrate Environmental Protection into the transportation system, enhancing community health and increasing the overall resiliency of infrastructure.

Support the Regional Economy through the reliable movement of goods, efficient trade connections, expanded labor mobility, and support for tourism and local placemaking.

Educate and Collaborate with local governments, transportation agencies, utility providers, and residents to improve understanding and operation of the transportation system.

Increase Funding and Expand Local Options to provide resources that are sufficient to meet regional transportation needs.

Anticipate the Socio-economic Challenges of an Aging Region including sustaining mobility for all ages and mitigating labor shortages.

Measure Transportation System Performance to facilitate strategic investment through developing, collecting, analyzing, and disseminating data.

2045 RTP Projects

The transportation system in Southeast Michigan is an intricate network of freeways, arterials, local roads, bridges, railroads, transit systems, border crossings, trails, and intercity connections. To meet the current and future needs of Southeast Michigan, this system must both sustain existing infrastructure in a state of good repair as well as recondition the system to expand access, increase safety, improve local quality of life, reduce the impacts of large weather events, and implement innovations in transportation technology.

The RTP contains 174 projects totaling $35.7 billion that work to improve the transportation system. Transit projects total $9.2 billion. Figure 2 shows the transit projects by project type for capital and operations. Road projects total $26 billion. Figure 3 shows road projects by primary work type including pavement preservation, major projects over $100 million, road operations, safety, bridge, capacity change, and nonmotorized and enhancements.

Figure 4 maps all projects included in the 2045 RTP that have a specific location. The remainder of the projects are either investments in transit vehicles and operations or spending on routine maintenance road projects, which are not individually identified categorized in General Program Accounts (GPAs). This map represents $5.4 billion (15%) of the $35.7 billion in investments planned through 2045.

The technical analysis conducted, description of the financial plan, and funding sources for projects are included in Chapter 4. The complete project list is included in Chapter 5.

Figure 2
Transit Projects by Type ($9.2 billion), Southeast Michigan

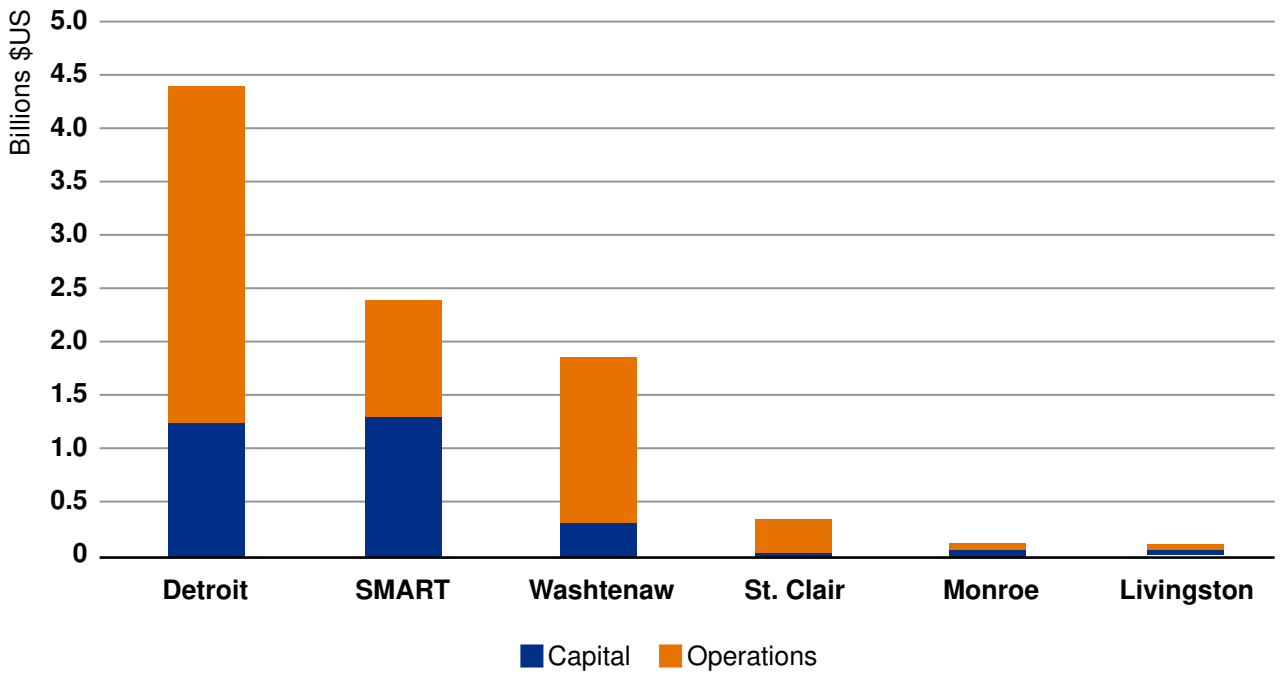
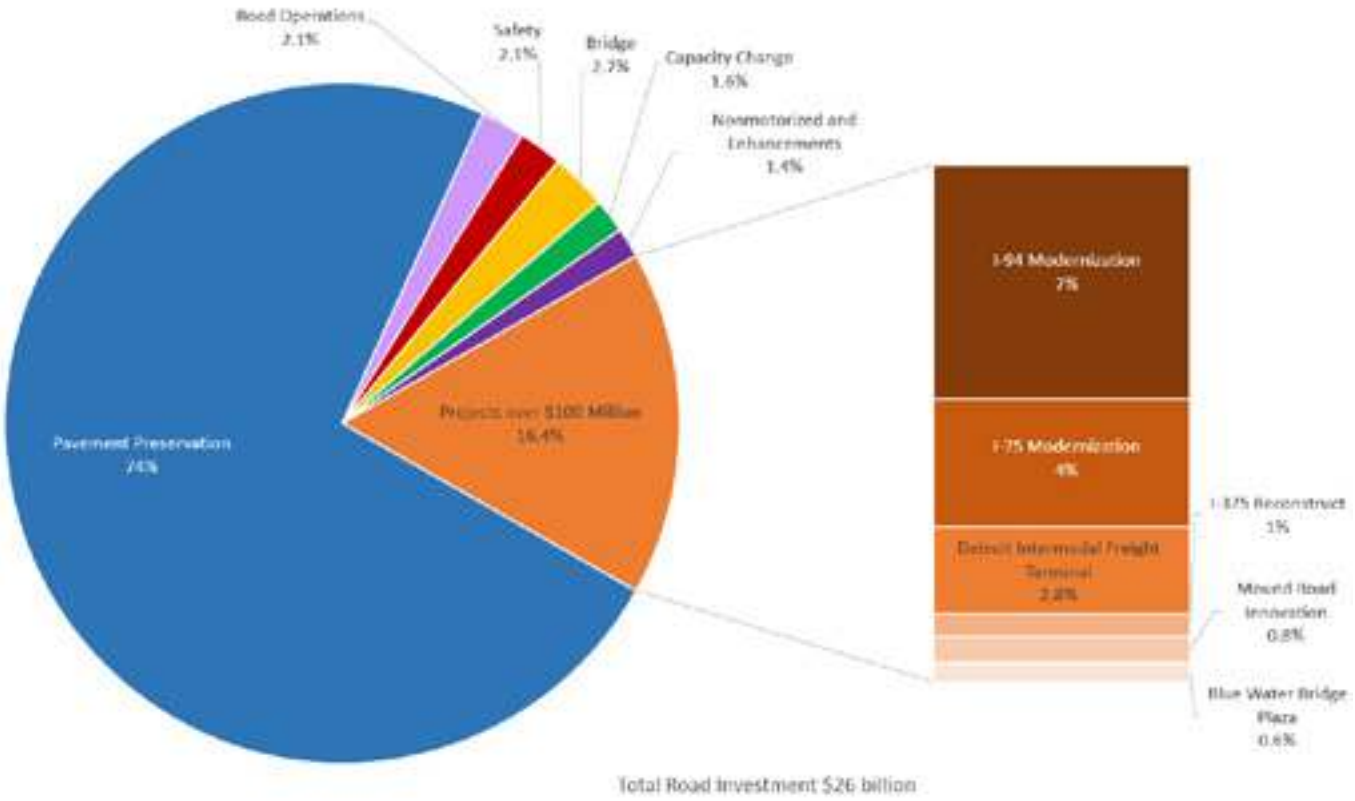
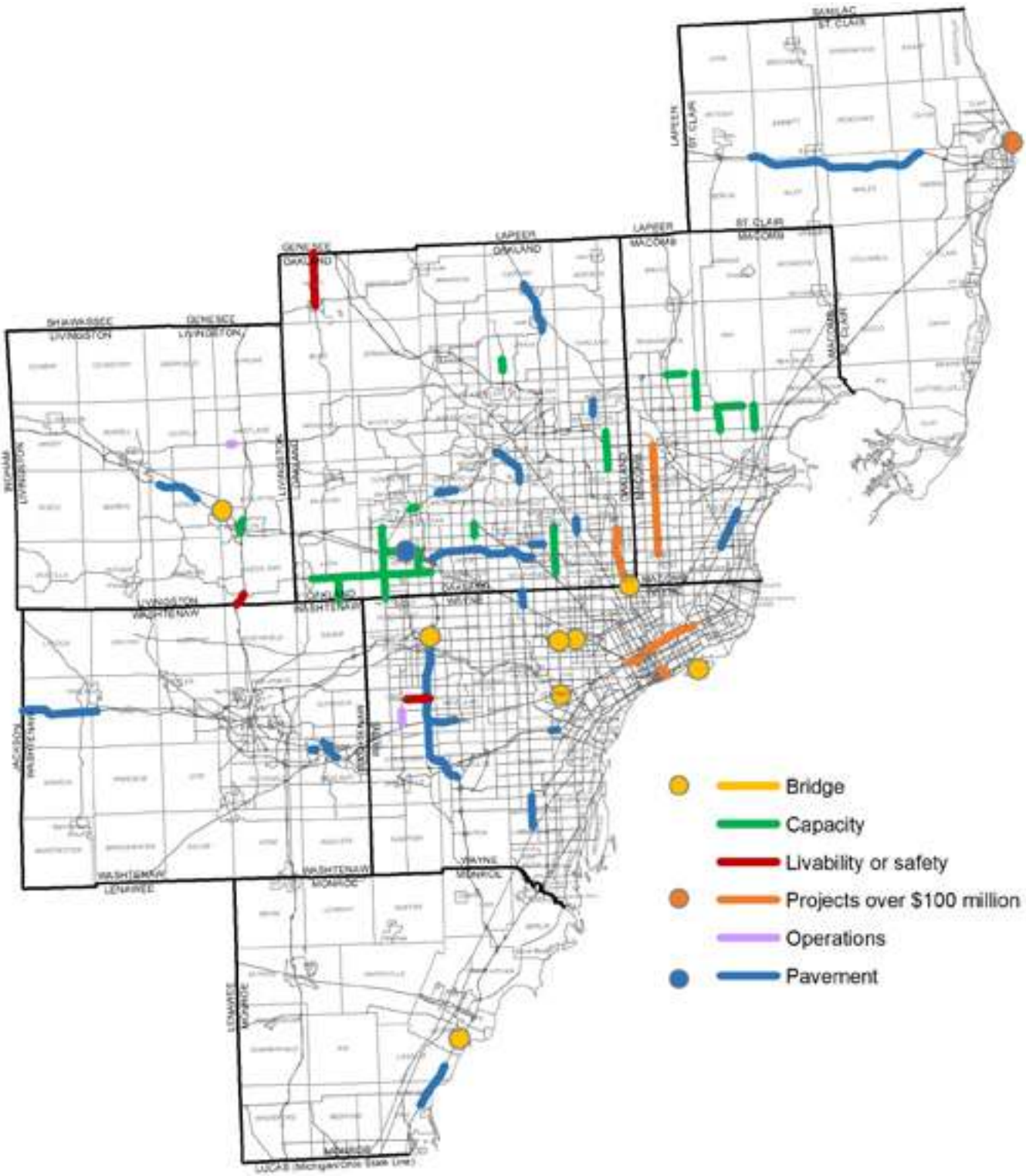


Figure 3
Road Projects by Type ($26 billion), Southeast Michigan



While the plan continues to emphasize pavement preservation, it is important to note that other projects include improvements for road operations, safety, bridge, capacity change, and nonmotorized and enhancements.

Figure 4
2045 RTP Projects, Southeast Michigan



Meeting Federal Requirements

The regional transportation plan addresses federal transportation requirements. It extends over the minimum 20-year planning horizon and addresses key planning factors outlined in federal transportation planning regulations. These are described in detail in Chapter 4.

The most recent federal surface transportation legislation – Fixing America's Surface Transportation Act (FAST) established a transportation performance management program with national performance goals for highways and public transportation to be implemented by states and Metropolitan Planning Organizations (MPO) across the country. The new expectations included in the FAST Act focus on establishing a performance-based planning process that:

- Identifies performance areas based on national transportation goals,
- Tracks a uniform set of performance measures,
- Sets performance targets, connects transportation investments to target attainment, and
- Evaluates the effectiveness of investments towards improving performance.

The FAST Act also broadened the scope of metropolitan transportation planning to consider:

- Enhancing intercity bus services,
- Enhancing travel and tourism, and
- Improving the resiliency of the transportation system with respect to stormwater.

To implement the requirements of the FAST Act, SEMCOG works in partnership with MDOT, the Federal Highway Administration (FHWA), the Federal Transit Administration (FTA), and other Michigan MPOs, through the Michigan Transportation Planning Association (MTPA), to update regional transportation planning and programming processes as well as set up a common approach to performance measure tracking, target setting, linking investments to target attainment, and progress evaluation.

Implementing and Sustaining the Plan

Developing the *2045 Regional Transportation Plan for Southeast Michigan* provides the opportunity to assess where the region currently stands as well as identify solutions for creating a more sustainable and healthy region. The previous plan – *2040 Regional Transportation Plan for Southeast Michigan: Creating Success with Our Transportation System* – considered the existing conditions of the time. The 2045 RTP builds on the foundation of the 2040 RTP and provides detail on the evolving challenges and developments in the region.

Southeast Michigan's transportation system has a variety of assets that connects residents to their communities, the region, and beyond. In implementing the policies and actions incorporated in the *2045 Regional Transportation Plan for Southeast Michigan*, it is important to continue to work with regional partners and the Federal-Aid Committees (FAC) to implement the projects described in this plan. It is an ongoing effort that is carried out through SEMCOG's annual work program and by building partnerships with local agencies, planning partners, and other stakeholders to bring the vision to fruition.

The complete list of policies and actions can be found in Chapter 6.

Chapter 1: Introduction

SEMCOG Vision

This vision for Southeast Michigan provides the foundation for development of regional plans approved by SEMCOG's elected leadership:

All the people of Southeast Michigan benefit from a connected, thriving region of small towns, dynamic urban centers, active waterfronts, diverse neighborhoods, premiere educational institutions, and abundant agricultural, recreational, and natural areas.

To meet this vision for Southeast Michigan, we must have:

- Unique places that offer various housing choices for a large and diverse population.
- An educated and trained workforce that supports a multi-sector economy and provides opportunities for all.
- Healthy, clean lakes, streams, air and a connected system of trails, parks and natural areas that support recreational and cultural amenities.
- Safe, efficient, and coordinated infrastructure systems that embrace advances in technology and focus on access for all.
- Effective local government and engaged citizenry.

SEMCOG's Role in Transportation Planning

A vibrant, multimodal transportation system is an important factor in Southeast Michigan's vision that all people benefit from a connected region. To achieve this vision, SEMCOG develops a 25-year Regional Transportation Plan (RTP) that takes a comprehensive and coordinated view of Southeast Michigan's transportation system through a combination of data analysis and public and stakeholder input.

SEMCOG is responsible for developing the transportation plan for the seven-county Southeast Michigan region, comprised of Livingston, Macomb, Monroe, Oakland, St. Clair, Washtenaw, and Wayne Counties. In addition to developing the long-range RTP, SEMCOG maintains a short-range Transportation Improvement Program (TIP). The TIP lists the federally funded transportation projects ready to be implemented in the first four years of the RTP. It is updated every three years.

SEMCOG also leads detailed planning activities which are incorporated into the RTP and implemented to make the transportation system safer, expand travel options, improve efficiency, preserve roadway and bridge conditions, contribute to community quality of life, and encourage economic development. In order to align strategies that support economic growth and improve the quality of the region's air and water, SEMCOG incorporates regional planning processes for economic development and the environment into transportation planning.

Connecting to Other Plans

The following plans support the policies and help implement the actions included in the 2045 RTP:

Plans from SEMCOG

Access to Core Services
Access to Core Services in Southeast Michigan, adopted in January 2016, measures and benchmarks accessibility for core services that residents need to access on a regular basis – fixed-route transit, jobs, health care facilities, supermarkets, parks, schools, and libraries. This analysis measured accessibility across four modes of travel – automobile, transit, walking, and biking.

Bicycle and Pedestrian Travel
The *Bicycle and Pedestrian Travel Plan for Southeast Michigan,* adopted in November 2014, provides a framework for promoting safe bike and pedestrian travel throughout the region through regional strategies and actions. The nonmotorized network in Southeast Michigan is comprised of both on-road facilities such as bike lanes and wide shoulders, and off-road facilities such as sidewalks, shared-use paths, and trails. The region's bikeways and pathways network is more than 3,000 miles.

Congestion Management Process
SEMCOG's Congestion Management Process (CMP) follows the eight-step process outlined by the U.S. Department of Transportation. CMP is a set of multi-modal alternative strategies used systematically to manage congestion, improve the movement of people and goods, and inform decision-makers on regional transportation planning.

Economic Development
Partnering for Prosperity focuses on 11 broad-based strategies and associated action steps related to advancing community assets, business climate, and talent and innovation. The strategies reflect Southeast Michigan's current and future needs. They identify opportunities for building on strengths and addressing challenges. The goal is to grow investment, businesses, jobs, and create economic opportunity for residents.

Stabilizing and Sustaining is an economic and demographic outlook for Southeast Michigan, adopted March 2017. This forecast discusses the economic and demographic outlook though 2045. It provides the base data used in the 2045 RTP.

Green Infrastructure
The *Green Infrastructure Vision for Southeast Michigan*, adopted in May 2014, connects all components of the region's green infrastructure together and benchmarks current conditions, visions for the future, and provides policy recommendations. The vision highlights opportunities for roadway design to make critical contributions to improving regional water quality by reducing stormwater runoff from transportation infrastructure.

Intelligent Transportation System
SEMCOG, in coordination with MDOT, maintains both the Southeast Michigan Regional ITS Architecture, as a framework for implementing ITS projects across multiple jurisdictions and agencies, and a regional ITS Deployment Plan, which provide an order/sequence for implementing the projects in the architecture. The architecture ensures that institutional agreements and technical integration for the implementation of ITS projects are in place. Its primary goal is to facilitate the efficient deployment and use of ITS equipment, networks, and management structures to create a safer and more efficient transportation system across jurisdictions. All ITS projects using federal funding must conform to the Regional ITS Architecture.

Public Participation
SEMCOG is committed to providing opportunities for the public to be involved in developing and implementing its planning work. The *Public Participation Plan*, adopted in December 2015, outlines those activities, strategies, and tools. The goals of the Public Participation Plan are:

- Educate the public about the regional planning process and how they can participate in it.
- Define the tools SEMCOG uses to effectively engage the public in regional planning efforts.
- Define the tools SEMCOG uses to educate stakeholders in implementing plans.
- Define measures of effectiveness for SEMCOG's public engagement.

SEMCOG used the *Public Participation Plan* to involve stakeholders and the public during 2045 RTP development.

Safety
The *Southeast Michigan Traffic Safety Plan*, adopted in December 2015, builds on SEMCOG's long-standing goal of improving safety through a data-driven approach to roadway crash analysis. Using the four Es of safety – engineering, education, enforcement, and emergency medical services – this plan identifies key issue areas that contribute to crashes in the region, as well as specific strategies and regional safety policies to address them.

In addition, SEMCOG provides several traffic safety data resources, such as interactive maps, that show traffic volumes, crashes, and high-priority safety locations throughout the region. These can be found on SEMCOG's website.

Transit
Improving Transit in Southeast Michigan: A Framework for Action sets the course for a comprehensive transit system in Southeast Michigan. Combining extensive public input with research and technical analysis, the study finds that an improved transit system would benefit the entire transportation system by providing a balance of viable options. The study calls for a four-tiered transit system: a 12-corridor, rapid-transit network; enhanced fixed-route bus service; improved and expanded community transit; and establishment of regional transit links. Increased funding is necessary to implement the proposed system. This regional transit plan, which is not financially constrained, served as an illustrative element in the RTP.

Water Resources
The *Water Resources Plan for Southeast Michigan*, adopted in March 2018, focuses on integrated water resources management, including advancing the blue economy, natural resource protection and enhancement, and water infrastructure systems. This integrated water resources management approach provides the important connection between water resources and transportation, and the need for infrastructure coordination and to manage stormwater runoff from roads.

Plans from Partner Agencies

Michigan Department of Transportation
The State of Michigan is developing the *Michigan Mobility 2045 Plan*, a 25-year plan for transforming Michigan's transportation system. The plan is the first of its kind to incorporate an overall vision of the state's transportation system with the State Rail Plan and State Freight Plan. These three documents combined into one provide a streamlined vision of the transportation future in Michigan across all modes. SEMCOG and MDOT work together in developing the 2045 regional and state plans.

St. Clair County Transportation Study (SCCOTS)
SCCOTS focuses on transportation planning in St. Clair County and provides participating local units of government and transportation agencies access to federal and state transportation funds. SCCOTS continually monitors the current condition of the county's transportation system – roads, bicycle and pedestrian paths, bridges, and public transit.

SCCOTS is currently developing its 2045 Long-Range Transportation Plan, which provides a vision for transportation planning over the next 25 years for St. Clair County. This effort moves forward in partnership with SEMCOG's plan development.

Regional Transit Authority
The *Regional Master Transit Plan*, adopted August 2016 by the Regional Transit Authority of Southeast Michigan (RTA) for Macomb, Oakland, Washtenaw, and Wayne Counties, offers solutions to various mobility issues in the region. The plan is supported by past and present data, future projections, input from communities across the region, and a thorough understanding of the existing transit system and the region's needs. The RTA's *Regional Transit Master Plan* is an illustrative component to the 2045 RTP.

Washtenaw Area Transportation Study (WATS)
WATS is a multi-jurisdictional agency responsible for transportation planning in Washtenaw County. WATS carries out the continuing, cooperative, and comprehensive transportation planning process, which guides the expenditure of state and federal transportation funds in Washtenaw County. WATS continually monitors the current condition of the county's transportation system – roads, bicycle and pedestrian paths, bridges, and public transit.

WATS is currently developing its 2045 Long-Range Transportation Plan, which provides a vision for transportation planning over the next 25 years for Washtenaw County. This effort moves forward in partnership with SEMCOG's plan development.

Transportation and the Economy

Southeast Michigan's economy is diverse and complex, with transportation one of the most important economic drivers. The regional economy depends on the transportation system. Residents depend on highways, transit, rail stations, trails, and airports to connect them to jobs, services, and other desired destinations. This multimodal transportation network distributes freight to stores and industry, expanding the regional economic reach to markets throughout the country and the world.

Southeast Michigan's Economy

The region's economy has proved to be resilient and adaptive, bouncing back, stabilizing, and now growing slowly since the Great Recession. Shifting demographic trends will have a significant impact on the regional economy. Since 2012, the region's population and employment have grown at a modest pace. While employment is beginning to grow, the growth is slow due in part to the declining labor force – aging population as well as a lack of young people to replace those retiring. Professional and technical services, information financial activities, management of companies, and health care industries will increase. Government jobs will remain constant. Retail trade and manufacturing jobs will decrease.

Looking Forward

Southeast Michigan's economy has experienced a major transition in recent decades, adapting from a manufacturing-dominated climate to a more knowledge-based, digital world. In order to have a healthy region and remain competitive, the region needs to retain existing companies while promoting Southeast Michigan as a desirable and smart place for new companies to invest.

An important component is to invest in an education system that equips people with diverse skill-sets and educational backgrounds to ensure the region's workforce is adaptable and meets the needs of current and future employers.

To take advantage of the region's economic potential, it is imperative to continue coordination across county, state, and international boundaries, and maintain a broad perspective with private and public industry interests.

Southeast Michigan Transportation Assets

Multiple entities in Southeast Michigan are responsible for the transportation system. This includes local governments, county road agencies, public transit providers, state and federal agencies, St. Clair County Transportation Study (SCCOTS), Washtenaw Area Transportation Study (WATS), and SEMCOG.

This comprehensive network is coordinated through SEMCOG and the eight Federal-Aid Committees (FACs). Each of the seven counties and the City of Detroit has a FAC. FACs coordinate and prioritize transportation investments within the context of the regional planning process in Southeast Michigan.

Southeast Michigan has an abundance of transportation assets that are imperative to the health of the environment, quality of life for over 4.7 million residents, and sustainability of businesses throughout the region:

- More than 25,000 miles of public roads
- More than 3,000 miles of bikeways, pathways, and routes
- 8 fixed-route transit providers
- More than 2,900 bridges
- 4,000 miles of all-season truck routes
- 800 miles of main line rail
- 5 commercial marine ports
- 7 rail/truck terminals
- 5 passenger ferries
- 4,000 miles of rivers and streams
- 35 airports
- 8 international border crossings that account for more than 40% of U.S. trade with Canada

Achievements Since the 2040 RTP

Since adoption of the 2040 Regional Transportation Plan, over $5 billion has been invested in the transportation system in Southeast Michigan. Significant transportation projects have been programmed or completed, resulting in major improvements to some of the more heavily traveled roads in the region. Several important policy and education initiatives were also achieved. Here are some highlights:

Major Transportation Projects and Initiatives

Significant investment has improved these transportation assets in Southeast Michigan:

- Major portions of I-96
- Major portions of I-275
- Portions of I-94 in Washtenaw County
- Portions of M-59 in Macomb County
- Woodward Avenue in Detroit
- QLine in Detroit
- I-75 in Oakland and Monroe Counties
- I-75 over the Rouge River in Wayne County
- US-23 Active Transportation Project
- Diverging Diamond interchange across I-75 in Oakland County
- Expanded bus service along major Detroit and suburban routes
- More than 3,000 miles of bikeways and pathways
- Gordie Howe International Bridge

Education, Data, and Initiatives

- More than 50 SEMCOG University workshops on various transportation priorities.
- Annual collection of road and bridge condition data to inform asset management practices.
- Walk.Bike.Drive. Safe public safety education campaign encourages safe transportation choices through use of educational resources, safety tips, and explanations of state laws, infrastructure, and signage.
- Southeast Michigan Commuter Connect brings Southeast Michigan's ridesharing program into the digital technology and mobility age.
- Federal Performance Measures set targets for safety, pavement and bridge, system performance and freight, congestion mitigation and air quality, and public transportation.
- Collecting data and prioritizing local utility and infrastructure assets through the *Michigan Infrastructure Asset Management Pilot Report.*
- Southeast Michigan's ParkFinder application, an online map with an inventory of all the region's parks and trails, allows users to search by location, size, and recreational amenities.

- Southeast Michigan Trail Explorer provides 360-degree imagery for nearly 1,000 miles of regional hiking, biking, and water trails.
- With MDOT, the 2015 Household Travel Survey was conducted, collecting data from residents about their weekday travel. Information was gathered from nearly 12,400 households and 28,800 people across Southeast Michigan.
- Commercial Vehicle Survey to better understand movement of goods and freight in the region.
- Traffic counts were collected at more than 50,000 locations as well as a pilot bike count program.
- Promoting initiatives like PlanetM, Mcity, and American Center for Mobility (ACM) to test and evaluate various new auto-communication technologies.
- Launching bikeshare programs in 10 local communities.

Structure of the Plan

The *2045 Regional Transportation Plan for Southeast Michigan* reflects an integrated planning process that supports strategic decision-making by:

- Identifying deficiencies and trends shaping the region.
- Working with the public and stakeholders to develop collective priorities and goals.
- Recommending projects that help achieve the vision.
- Taking action by implementing the policies and actions.

The chapters that follow describe the breadth and complexity of the region's transportation system.

Chapter 2: Guiding Decisions introduces the inputs and tools that set the foundation for the plan. The guiding principles work to implement SEMCOG's vision. Using the outputs from SEMCOG's Regional Development Forecast, we can gauge what the region will look like in 2045. This information also sets the stage for identifying the region's defining challenges – those high-level factors that have the potential to significantly change how and why people travel in the future. What we learn from data analysis and public input provides a reference for developing planning activities, setting policies, selecting projects, and tracking performance.

Chapter 3: Existing Conditions and Needs describes in detail the current components of the transportation system – trends, challenges and opportunities, and policies and actions.

Chapter 4: Project Selection and Analysis highlights recommended projects and technical analysis conducted – including fiscal constraint, air quality conformity, environmental sensitivity, environmental justice, access to core services, and congestion management. Also included in this chapter are the adopted federal performance measure targets for safety, pavement and bridge, systems performance and freight, congestion mitigation/air quality, and public transportation.

Chapter 5: Projects in the 2045 RTP lists all 174 projects in the RTP totaling $35.7 billion.

Chapter 6: 2045 RTP Policies and Actions consolidates the actions proposed organized by the plan's 10 overarching policies.

Chapter 2: Guiding Decisions

The RTP was developed with numerous inputs including SEMCOG's vision, transportation and socioeconomic trends and challenges, public input, and federal requirements. This chapter highlights:

- Guiding principles that implement SEMCOG's vision
- Socioeconomic trends through the Regional Development Forecast
- Defining challenges and opportunities in advanced technology, aging population and labor shortages, and transportation funding
- Access, the ability of all Southeast Michigan's residents to reach core services
- Input from public, elected officials, and partner agencies
- Federal regulations, such as performance management

Guiding Principles

The guiding principles for the 2045 RTP express the regional values for developing planning activities, policies, transportation projects, and performance management included in the plan. These principles were approved by SEMCOG's Executive Committee as part of the RTP development process.

These are the guiding principles for the 2045 RTP:

- Provide planning solutions that support our unique and diverse region
- Drive a dynamic, talent-rich economy
- Steward environmental and cultural resources
- Connect people safely to jobs and essential services
- Promote coordinated and effective public services
- Educate and engage local leaders and residents

Provide planning solutions that support our unique and diverse region
Collect, organize, analyze, and distribute sound data that provides local governments and transportation agencies with a reliable foundation to develop regional and local plans and policies. Provide technical assistance that maximizes the value of local assets for communities across Southeast Michigan.

Drive a dynamic, talent-rich economy
Make strategic transportation investments that sustain the life of existing transportation assets, improve the reliability and reach of freight transportation, and provide the necessary conditions to develop and attract a workforce that matches the needs of a rapidly changing regional economy. Technological advancements will produce new mobility options and significant implications for the automobile industry in Southeast Michigan, community design, and how people travel.

Steward environmental and cultural resources
Protect water and air quality by reducing the overall transportation-related impact and strategic use of transportation investments to increase water filtration while reducing the load on underground storm infrastructure. Provide safe access to recreational and cultural resources that contribute to healthy lifestyles and civic engagement.

Connect people safely to jobs and essential services
Improve safe access to jobs, school, food, health care, and recreation through filling gaps in biking, pedestrian, and transit networks. Consider changes in land use, zoning, and housing options that increase overall access. Prepare for the health and mobility needs of an aging population.

Promote coordinated and effective public services
Sustain the life and condition of transportation infrastructure through data-driven asset management. Coordinate investments across road, water, electrical, communication, and sewer infrastructure. Advocate for adequate funding to restore public infrastructure to a state of good repair.

Educate and engage local leaders and residents
Equip local leaders with the tools to make sound decisions by promoting best practices and providing data and technical assistance. Provide public access to regional data resources and encourage engagement in local and regional planning activities.

Socioeconomic Trends – Forecasting Jobs, Population, and Income

Southeast Michigan's economy has emerged from its most catastrophic economic recession in our lifetime. Since 2010, the recovery has been strong and inspiring.

- The region is regaining all of the jobs it lost from 2000 to 2010.
- The unemployment rate rebounded to less than four percent today from more than 13 percent in 2010.
- Population began growing again in 2012.
- Real personal income per capita is now on par with the U.S.

Underlying this rebound in the regional economy is a U.S. economy that is continuing its recovery and an auto industry that has recently experienced several years of record sales.

Southeast Michigan's economy will be determined by where the U.S. economy is headed, by where the auto industry is headed, and by the investments the region makes, particularly in human capital, to diversify the economy into areas that show promise for future growth and prosperity and for which the region has supporting assets.

2045 Regional Development Forecast and the RTP

SEMCOG's *2045 Regional Development Forecast* (RDF) of population, households, and jobs provides an understanding of the region's future economic and demographic outlook and the coming challenges facing the region. It provides the base data for SEMCOG's long-range planning activities and is useful in local government and private-sector planning efforts. This 30-year outlook of future demographic and socioeconomic changes in communities across the region is the foundation for transportation, water, sewer, and other infrastructure planning vital to the region's future success.

Population

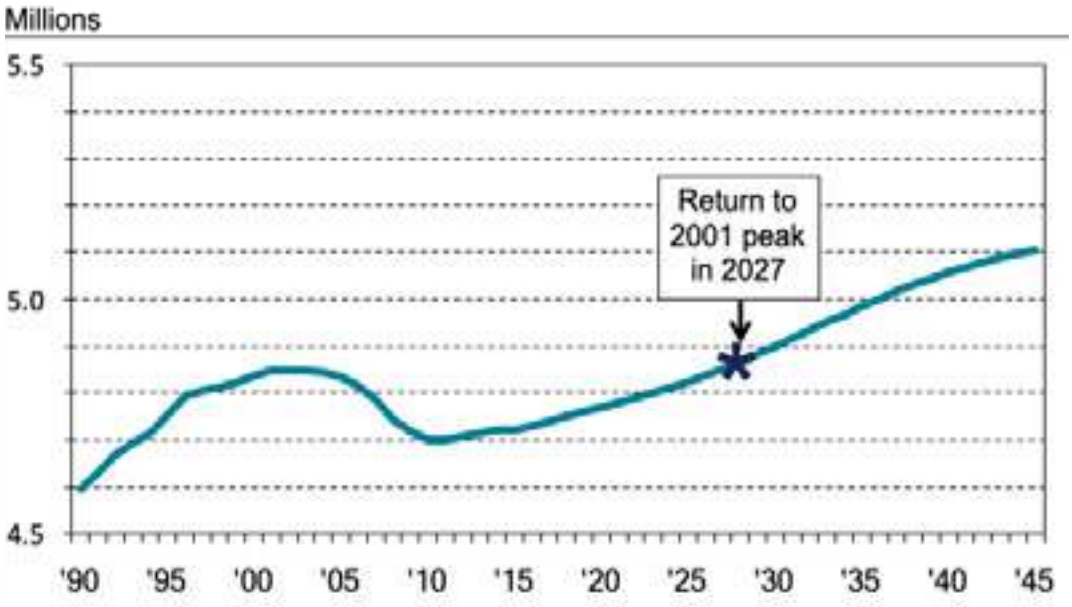
Forecasting future regional population is the foundation of regional planning. It will set the speed limits on the region's economic growth and affect the demand for infrastructure, including transportation.

- The region's population grew between 1990 and 2003 at an average rate of 0.42 percent per year.
- Between 2003 and 2011, population declined 0.39 percent per year.
- Population started growing again in 2012 and is expected to continue through 2045.
- By 2027, the region's population exceeds its 2003 peak of 4.849 million; by 2045, it reaches almost 5.105 million.

Moving forward, population growth in the United States will be only about half of what it was between 1990 and 2000. Population growth in Southeast Michigan post-2015 will be weaker, growing about 0.26 percent per year over the next 30 years.

Figure 5 shows a slow growth of eight percent in 30 years. Nationwide, the increase is 21 percent increase nationwide for the same time period.

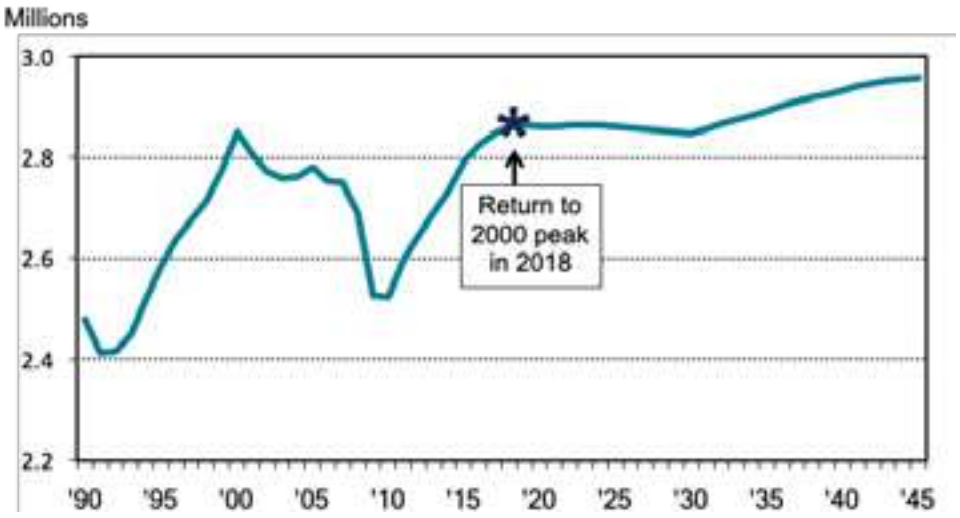
Figure 5
Total Population, 1990-2045, Southeast Michigan



Employment
Here are some employment trends:

- Employment has rebounded to the 2000 peak (Figure 6).
- Total employment will grow from 2.774 million to 2.960 million, or less than seven percent, constrained by labor force shortages.
- Employment will remain virtually flat through 2030, adding less than 2,000 jobs between 2019 and 2023, followed by a loss of about 15,000 jobs between 2023 and 2030. This corresponds with the decline in the prime-working-age population.
- After 2030, employment in the region increases slowly – about one-quarter of a percentage point per year – as the prime-working-age population begins to grow again.
- Southeast Michigan's total employment in 2045 is approximately 2.96 million.

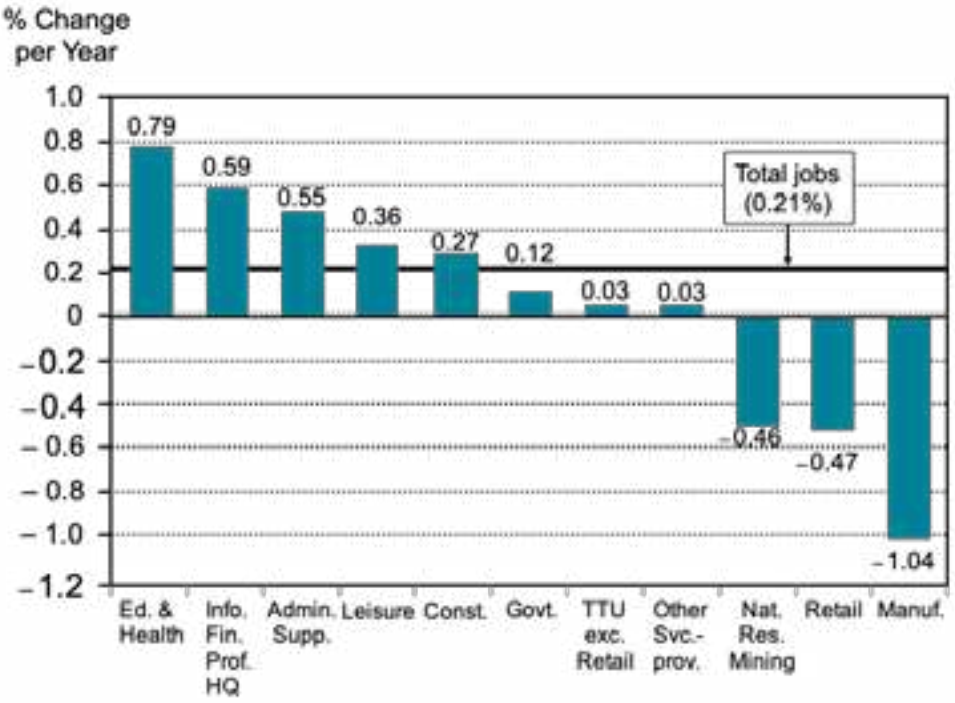
Figure 6
Total Employment, 1990 to 2045, Southeast Michigan



The future path of employment in the region is the net result of the outlooks for the industries that make up the local economy. Over the entire 2015-2045 period, total employment is forecast to grow by an average of 0.21 percent per year. There is, however, a wide variation in the performance of the major industries (Figure 7).

- Strongest growth is in private education and health services, dominated by the health-care segment and expected to expand at a rate of 0.79 percent per year.
- Major knowledge-economy service industries (information, finance and insurance, professional services, and company management) have comparatively rapid employment growth of 0.59 percent per year.
- Manufacturing is at the other end of the spectrum. Employment is forecast to decline by 1.04 percent per year on average. This does not mean that output of local manufacturing will decline. SEMCOG forecasts an increase in manufacturing output averaging 2.1 percent per year from 2015 to 2045. Because productivity growth in manufacturing is relatively high, employment declines despite the output expansion.
- Employment declines in retail trade over the next 30 years. Brick-and-mortar jobs will continue to be negatively affected by the growth in Internet shopping, along with labor-saving technology at local stores.

Figure 7
Change in Employment by Industry, 2015-2045



Income

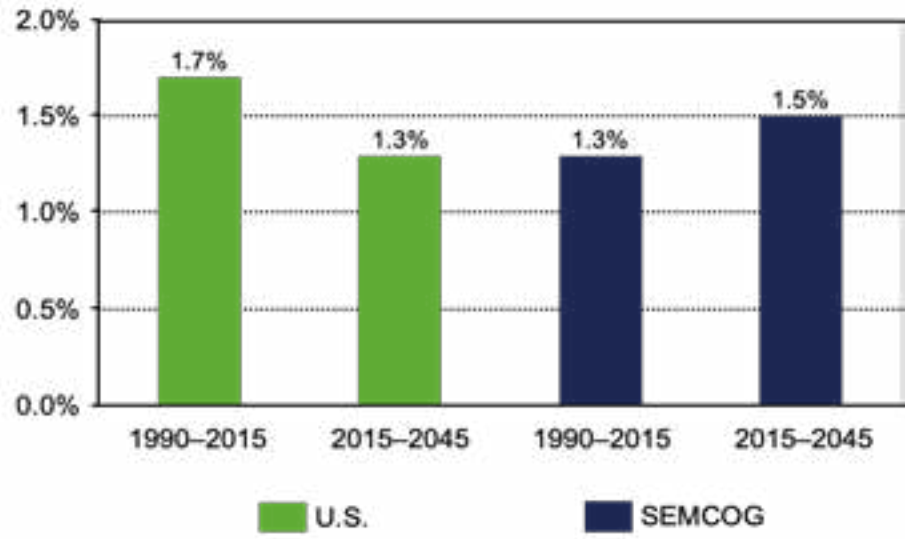
Income is another important dimension of Southeast Michigan's economic profile. Historically, personal income per capita in Southeast Michigan has been substantially higher than in the United States (Figure 8).

- In 2000, personal income per capita in Southeast Michigan was 13.7 percent higher than in the United States.
- The Detroit Three auto-centered economy then collapsed; by 2009, personal income per capita was 5.6 percent below the national average.
- During the recovery from the Great Recession, the local economy outperformed the national economy. Personal income per capita in Southeast Michigan rose to be essentially on par with the nation.
- Moving forward, growth in income per capita will be slightly stronger than the nation.
- By 2045, personal income per capita in Southeast Michigan will exceed that of the United States by 3.7 percent.
- Despite these gains, personal income per capita in Southeast Michigan relative to the U.S. does not return to its 2000 peak over the forecast horizon, or to any value reached in the 1990s.

Income level affects the region's ability to pay for infrastructure and services. Compounding the challenge is the fiscal capacity of local governments in Southeast Michigan. Michigan's decade-long recession resulted in dramatic erosion in residential and nonresidential real estate values, for which the aftershocks are still being felt today. Southeast Michigan's taxable value and state equalized value (SEV) dropped sharply during the recession.

Despite the positive gains in recent years, Southeast Michigan still has a long road to recovery in taxable value. When adjusted for inflation, taxable value is approximately 30 percent below peak. Such losses make SEMCOG and local governments rethink how they deliver infrastructure and public services to residents and businesses.

Figure 8
Personal income growth, 1990-2015, 2015-2045



Alternative Forecast Scenarios
All forecasts are conditional on the assumptions that guide the results. In SEMCOG's *2045 Regional Development Forecast,* the focus was on the forecast results representing the most likely outcome. This is the baseline forecast. Because there are different outcomes possible, five alternative scenarios were developed.

Figures 9 and 10 show the significance of the auto industry and need to continue to diversity the economy and demonstrate the importance of immigration to population and job growth through these alternative scenarios:

- Regional auto industry takes another big hit (Pink)
- Substantial reduction in international migration (Blue)
- Increase professional and technical services employment (Green)
- Increase professional and technical services employment + labor supply of engineers and computer programmers (Red)
- Increase finance and insurance industry employment up to the share of employment in the Pittsburgh Metropolitan Area (Yellow)

Figure 9
Baseline and Alternative Population Forecasts, Southeast Michigan

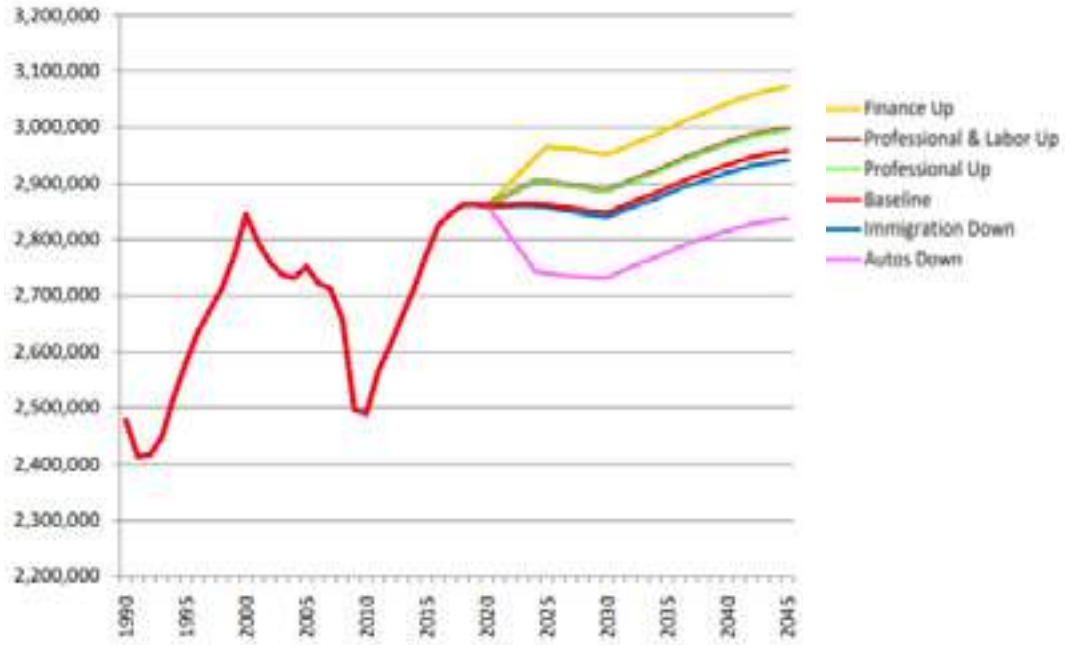
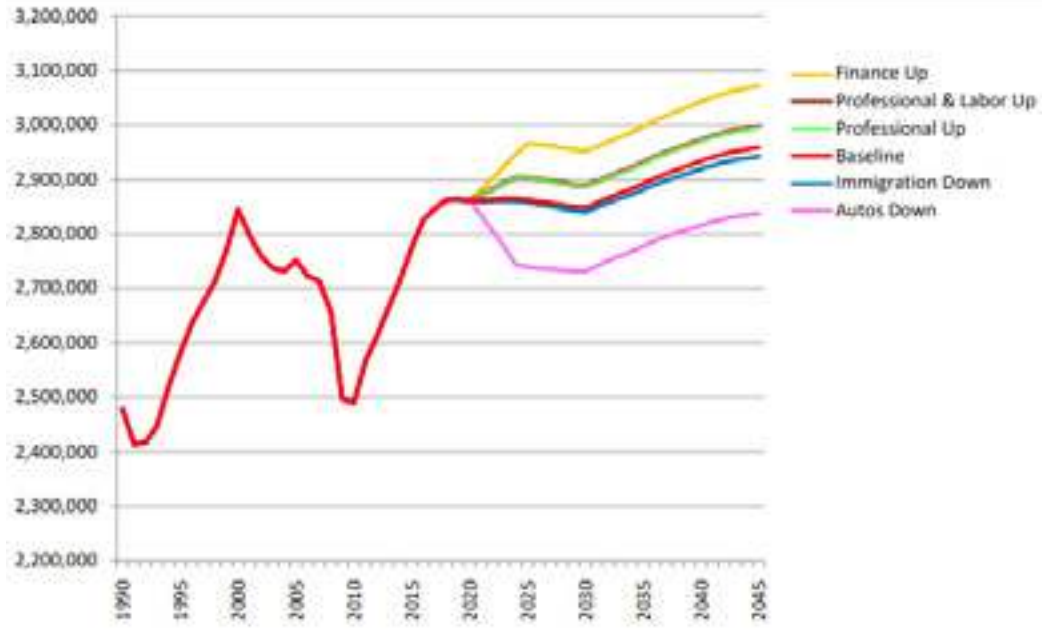


Figure 10
Baseline and Alternative Employment Forecasts, Southeast Michigan



Defining Regional Challenges and Opportunities

Over the last decade and since adoption of the 2040 RTP, Southeast Michigan has experienced significant demographic, economic, technological, environmental, and fiscal changes. The most likely future and alternative range of futures as presented in the alternative scenarios point to even more impactful trends.

The region is challenged by complex factors that require careful analysis and decisive action. Three specific challenges have the opportunity to drastically impact the future of the region:

- Advanced Technology
- Socioeconomic Changes, including population aging and labor shortages
- Transportation Funding

While some may see these challenges as threats to the region's long-term prosperity, we need to focus on the opportunities that exist and capitalize on strategic investments and decisions in order to achieve SEMCOG's vision for the region. For Southeast Michigan to succeed, we must acknowledge these challenges, build on the region's many resources, and plan for anticipated changes to come.

Advanced Technology

Advanced technology, including connected and automated vehicles (CAVs), provides many opportunities and challenges. In the long run, autonomous vehicles will provide mobility to more people, save time spent on driving, and reduce crashes. But in the transition stage, we need to plan carefully for how they will interact with human drivers and the wider driving environment. For transportation planning, we need to prepare to accommodate new technologies, and understand the potential impact on travel patterns, land use, and urban design within a multimodal system.

Over the last 20 years, advanced technology has been slowly introduced into transportation. These include dynamic message signs along the freeways, GPS navigation in vehicles and on mobile devices, and blind-spot/lane departure warning systems. Now, we are starting to see new types of transportation modes, including bikeshare, e-scooters, ridehailing services such as Uber/Lyft, as well as driverless taxi services. All of these services and technologies have an impact on the transportation system, as well as in communities.

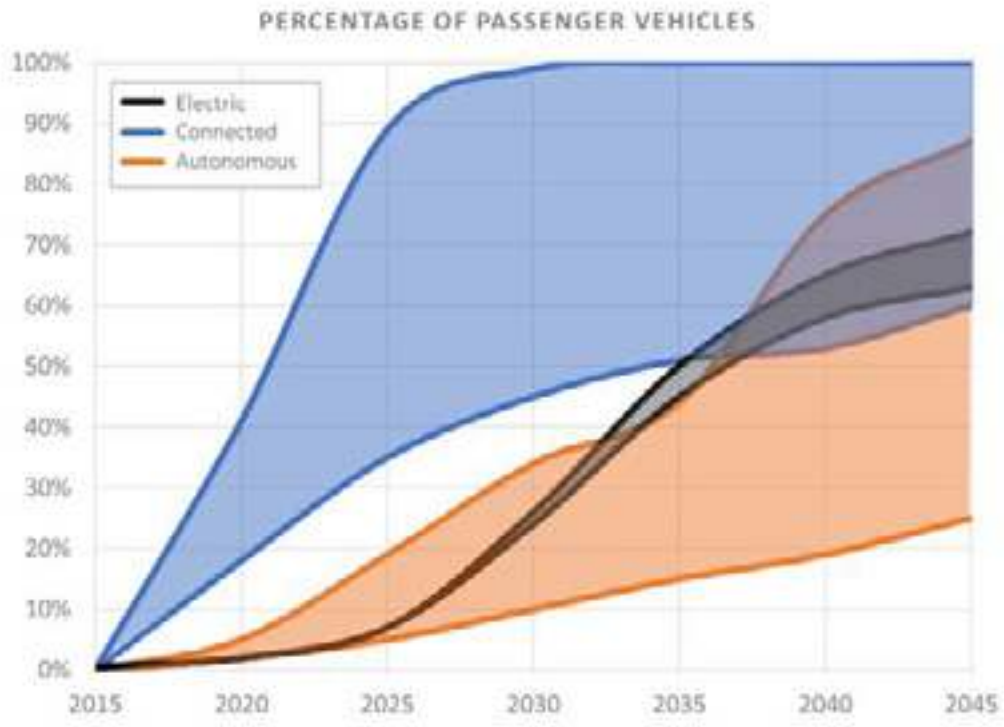
Over the next 30 years, new technologies will radically change travel and land use patterns throughout the world. These include new transportation modes, as well as fleets of electric vehicles, connected vehicles, and autonomous vehicles. The future isn't certain, but it is expected that by 2045, between 20 to 85 percent of our fleet will have some level of autonomous vehicles (Figure 11). Those vehicles will mostly be connected electric vehicles. Many factors impact these percentages, including the price of technology and regulations.

What is a Connected Vehicle?
A vehicle or a device that communicates with other vehicles and/or other devices alongside the roadway. Examples include in-vehicle navigation and sending/receiving road condition information.

What is an Autonomous Vehicle?
A vehicle that has features that allows the vehicle to guide itself without human interaction. Examples include cruise control, self-parking, and lane centering.

Does a vehicle have to be connected to be autonomous?
No, these two concepts are independent. Most new vehicles either currently come or will come with both of these features and will continue to do so.

Figure 11
Percentage of Passenger Vehicles by Electric, Connected, and Autonomous Vehicle Deployment, 2015-2045



Potential Benefits of Advanced Technology

Connected vehicles could:

- Provide users with travel and roadway information
- Provide facility owners with information on pavement and weather conditions
- Reduce total crashes
- Produce better traffic management strategies

Autonomous vehicles could:

- Reduce crashes significantly
- Provide additional mobility options for the elderly, the disabled, the blind, and those under 16
- Reduce energy consumption through more efficient use of the vehicle
- Improve time management, both commercially and personally

Shared vehicles could:

- Reduce vehicle ownership, overall use, and cost
- Improve accessibility to core services
- Reduce the amount of parking facilities needed, both commercial and residential

Figure 12

Potential Benefits of Advanced Technology

Technology and the impact on the economy
With an economy that is tied to automotive design and production, transportation technology will inevitably change how vehicles are made, what skills are in demand, and where companies will locate. Southeast Michigan's largest companies are investing in vehicle technologies that will require little to no assistance from a human driver. Now, with a focus on vehicle engineering and design and CAV research, design, and production, new skill sets based on computer programming, data management, and artificial intelligence will be required.

Technology and the impact on land use
Advanced technology will change mobility and impact land use and regional and community planning. Advanced technology can reduce the amount of space required for transportation, including vehicle circulation and storage. If vehicles can travel faster and closer to each other, there is potential to use the road more efficiently. Existing roadways could accommodate higher volume, lanes could be narrower, and medians eliminated, reducing the amount of land required for vehicle movement. Meanwhile, parking close to destinations will not be necessary. The amount of parking may be reduced and clustered on lower-value land. The impact will be significant. It is estimated that there are three nonresidential parking spots for every vehicle on the road in the U.S. today.

Reducing space required for transportation has great potential to free up land for other higher-value uses particularly in urban areas. Reducing roads and parking should bring activities closer to each other, mixing land uses, improving accessibility to destinations, and creating a better overall environment. This could increase property values. The result should be positive for development and redevelopment of urban communities.

While CAVs may increase density, mixed use, and accessibility in urban centers, it may also contribute to continued suburban and peripheral development. One benefit of CAVs is the potential to reduce time spent driving. As driving is reduced or even eliminated, people may be willing to travel even longer in vehicles from home, work, and other destinations, which may lead to more development away from urban centers.

The traditional attractions of suburbs and rural areas – larger homes and a lot of green space – have not changed, and will continue to attract households with children. The difference will be the amenities in those areas. When new young generations move from urban centers to suburbs to raise children, they may continue to demand good access to mass transit and walkable neighborhoods in proximity to jobs, shopping, entertainment, and other services. CAVs may not replace transit. Instead, they could help resolve the last-mile problems by providing better access to transit. Reducing off-street parking and eliminating on-street parking should make suburban areas friendlier to pedestrians and bikes.

SEMCOG research acknowledges the need to increase accessibility to core services via all modes of transportation. The region could get a boost from its diverse and attractive urban, suburban, and rural submarkets and affordability. As millennials enter into a new phase of lifecycles with children, they may begin looking into the "new suburbs" with augmented amenities, which CAVs could provide.

Challenges to planning and communities

The pace of CAV development is difficult to predict. But many changes related to CAVs may occur well within the timeframe of this plan. There are enormous opportunities and significant challenges to regional and community planning, and to communities. There are always concerns about potential impact of innovations. We are dealing with transformation on multiple fronts. We must be prepared to take advantage of the opportunities and deal with the challenges.

Space and curbside management

Allocating space for various uses is key to vibrant communities. With CAVs, curbside space for pick-up and drop-off will become more valuable than parking spaces. Communities will need to evaluate how to redevelop obsolete parking spaces into other uses. The goal is to create a more efficient and enjoyable environment for users to walk, bike, travel, stay, and interact.

Urban design solutions can help. Alleys and off-street loading areas separate truck deliveries from curbside traffic lanes. Some cities have already set aside space for car-sharing or scooter-sharing. It is inevitable that curbs will be of increasing importance in the future as CAVs become more common. It could be the most valuable space that a community owns and uses. It needs to be well designed for multiple modes of transportation, including cars and trucks, buses, bikes, and pedestrians. Curbs may become the center for connecting multiple modes effectively. Communities need to have new ways to design future curbside sidewalks and create new ways to charge for curb usage and experiment with technology that adjusts prices based on demand. CAVs and related service will bring a sea of changes in how buildings and space are designed in order to meet the needs of the future market.

Time

Technology may help communities manage time more effectively for city users. For example, delivery trucks currently arrive at homes and business locations when streets and sidewalks are most crowded. It makes roads more congested and also adds to the costs of e-businesses, shippers, and transportation companies. Street and highway infrastructure, strained beyond intended capacity at peak periods, often has excess capacity off-peak. Cities can encourage use of this capacity in off-peak hours. This should be more feasible, particularly when more delivery vehicles become autonomous.

Infrastructure and costs

CAVs rely more and more on vehicle-to-vehicle communications rather than vehicle-to-roadside infrastructure communications. Nevertheless, the cost of infrastructure needed to support CAVs may remain significantly high. Roadways, curbs, parking, charging stations, and traffic controllers are just a few examples that may need to be adjusted to meet the new demand of CAVs. Who and how to pay for the cost of infrastructure investment and upgrades? CAVs need support from communities. And CAV companies need to work with communities to create win-win solutions.

Data

Enormous amounts of data will be collected as CAVs are developed and implemented. Availability, transparency, and sharing of data will be very powerful. Urban data needs to be a public asset. Data infrastructure needs to be open and beneficial to the public, ranging from using the transportation system to planning for a better future. Data enhances innovation, but also needs to protect the public.

Shared economy
CAVs will certainly affect the regional economy and its continued transition from manufacture-based to knowledge-based. New jobs will be created as old jobs disappear. Competition for talent will become more intense. Talent development and training will be increasingly important.

CAVs are better suited to ridesharing and will contribute to the new business model of mobility as a service. Fewer cars may be needed. Shared mobility has the potential to provide seamless choices for urban, suburban, and rural residents. Companies need to work with communities to solve the issues together. Communities need to move faster to support innovations. Companies need to respect the process for achieving desired outcomes for all.

Equity
CAVs have the potential to benefit those who cannot afford vehicle ownership or cannot drive themselves, including people with disabilities, elderly, and children. However, all people may not be able to take advantage of CAVs if they don't have a credit card, smart phone, or Internet access. Such obstacles need to be removed for everyone to benefit from new innovations.

Other transportation technologies

Driverless taxis
While other regions have seen driverless taxis, they are expected in Southeast Michigan within the next few years. This advancement is unlikely to change trips in the short-term. Longer-term, communities should consider data-sharing agreements with companies. Additionally, communities should discuss having a shared agreement with shared-data oversight and management. Care should be taken to ensure equity of these services throughout a community and region.

One-person vehicles/pods/e-scooters/bicycles
We've already seen the influx of e-scooters in parts of Southeast Michigan. In the next few years, we may see more variations of the one-person vehicle. These may include electric bicycles and larger wheeled e-scooters, as well as the one-person vehicle or "pod." These pods would likely occur in an urban setting and could operate in smaller spaces than traditional roadways. Much like e-scooters, communities will need to consider any new regulations for operation. These could provide an additional mode for short-distance trips especially during inclement weather, reducing reliance on larger, shared-vehicle trips.

E-scooters, Downtown Detroit

Flying delivery drones
Many companies are planning delivery service by drone as soon as 2021, with some testing already occurring. Air delivery would reduce the number of trips using ground transportation. Congestion would be reduced. The Federal Aviation Administration (FAA) already has a drone registration. Local communities may want to consider additional policies regulating this technology.

Artificial Intelligence (AI)
In addition to being tied closely to self-driving vehicles, AI has the possibility of improving other aspects of the transportation system. The road freight system can use accurate prediction techniques to forecast materials needed and plan for delivery and logistics. Nonmotorized safety can be improved by predicting the path and location of pedestrians/cyclists. Real-time vehicle tracking and connected smart signals can control traffic flow. Communities can respond to this by better equipping roadside devices to provide connectivity.

Virtual Reality (VR)
Virtual reality will have an indirect impact on the transportation system. Much like the phenomena of more employees working from home, VR could allow employees to work remotely while still being able to collaborate efficiently. Online “in-person” meetings may occur more and there is some discussion about virtual vacation getaways. One positive aspect is that VR is assisting in evaluating various transportation scenarios as well as test “what-if” scenarios of various transportation futures, including the impact of self-driving vehicles. In the long run, VR could reduce some trips.

Addressing uncertainties

As CAV technology intensifies, many questions arise.

- Will it increase or decrease traffic volume?
- What impact will it have on the built environment?
- What impacts will it have on the regional economy?
- What needs to be done to ensure all benefit?

Policies and actions are needed to ensure positive results for Southeast Michigan. We continue to seek sensible solutions to this array of emerging facts. However, the complex components and the interactions among them may bring different results in the short- versus long-term. SEMCOG and communities need to learn more to prepare for a positive future.

SEMCOG preparations for future technologies

SEMCOG has been involved in various initiatives related to transportation technology advancements. In 2017, an online survey was conducted seeking perceptions regarding semi- and fully-autonomous vehicles. Here is a summary of what we heard:

- Respondents thought that CAV technology has a positive impact on road-safety issues.
- Survey responses indicated that both semi- and fully-autonomous vehicles would: Reduce the number of crashes – 70 percent (semi-autonomous vehicles); 63 percent (fully-autonomous vehicles) and reduce distracted driving – 47 percent (semi-autonomous vehicles); 56 percent (fully-autonomous vehicles)
- 58 percent said that the primary motivation for purchasing a vehicle with semi-autonomous technology was safety. Lane departure/lane keep assists was the most desired feature (66 percent). Respondents (54 percent) were willing to wait for prices to lower, however, before purchasing a vehicle with these features.
- 43 percent described their comfort level riding in fully autonomous vehicles as “apprehensive, but would give it a try.” Most respondents (43 percent) believe fully-autonomous self-driving cars will be available to the public in 6-10 years.

SEMCOG also held a summit – Re-imagining Transportation: Transforming Southeast Michigan – to examine the impacts of this transformation on Southeast Michigan. These were a few of the topics discussed:

- How will this new technology affect the economy and jobs in the region?
- How will it impact the curriculum offered by educational institutions?
- How might the coming changes impact regional demographics?
- How will local governments and road agencies adapt to these new changes?

SEMCOG's Re-imagining Transportation Transforming Southeast Michigan Summit

SEMCOG local government members and partners heard from experts from the Michigan Department of Transportation, Center for Automotive Research, and Ford Motor Company. A panel discussion on Transportation Technology in Southeast Michigan featured thought leaders from the University of Michigan, City of Detroit, Macomb Community College, The Taubman Company, and Lyft. A keypad session sought input from attendees on these topics:

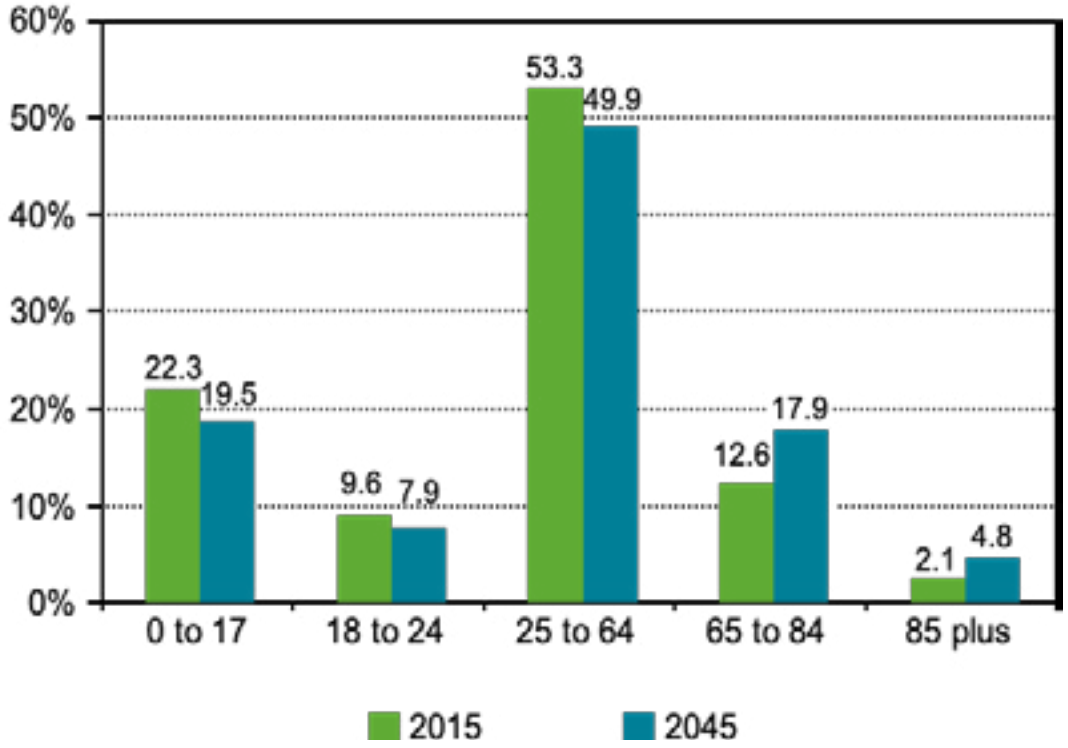
- Attitudes towards autonomous vehicles
- Impact on where we will live in the future
- Vision for household transportation needs
- Impact on current mass transit
- Impact on municipal services

The future is uncertain. New technologies will continue to emerge. In order to be nimble and prepared, SEMCOG will continue to be involved in education, planning, and policy developments surrounding transportation technology advancements.

Socioeconomic Changes

In the next 25 years, a similar number of people will call Southeast Michigan home, but the demographic composition of the region will change dramatically. These changes will impact where people choose to live, what services are in demand, how businesses develop and recruit talent, and what skills are developed. Investment in transportation systems and other infrastructure need to consider these changes – the aging population, elderly mobility, the labor shortage, and shifting workforce.

Figure 13
Population Distribution by Age Group, 2015 and 2045, Southeast Michigan

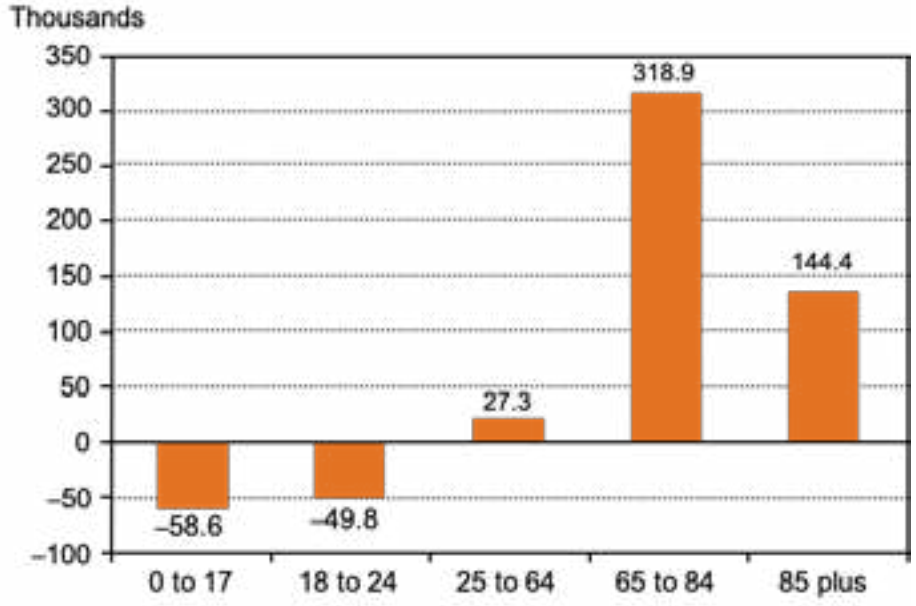


The dramatic aging of the population over the next 30 years is major trend for both Southeast Michigan and the United States. Consider these numbers between 2015 and 2045 in Southeast Michigan:

- Ages 24 and younger declines by 108,400, or 19 percent
- Ages 25-64 increases by 27,300, or 4 percent
- Ages 65 and older grows by 463,300, or 67 percent
- Those 85 and older increase 144,000, or 145 percent

Figure 14

Population Change by Age Group, 2015-2045, Southeast Michigan



How do these significant age changes impact Southeast Michigan?

- Service structures will need to change
- Housing options will need to evolve
- Recreation programs will need to adapt

A large increase of retirees offers challenges, but creates opportunities too, as individuals with talents, skills, and life experiences stay engaged in community life. What is the impact of a rapid increase of individuals aged 85 and older? As a region, we need to be ready to provide services to the 145 percent increase in this group.

People over age 65 have different travel patterns than those who are the traditional working age. Over time, this will change daily traffic patterns from multiple perspectives.

- Those over 65 may not be as dependent on traveling during rush hours.
- People providing services to these individuals may not be working traditional work hours.
- If this age group is working later into life, is it full-time or part-time? Part-time workers may be able to avoid peak congestion hours.
- How does this change strategies for congestion management?

For people over age 85, both as drivers and as pedestrians, significant safety issues develop and assisted transportation becomes a necessity. Autonomous vehicles, ride sharing, goods and service delivery, and transit may allow these individuals to live independently for a longer period of time. Some questions to consider:

- What mix of home-based services and shared, assisted residential options should communities plan for future needs?
- What transportation investments will enable continued choice, access, and engagement?

Labor shortage and shifting workforce

The size and preparedness of the working-age population is the fundamental factor in determining the longer-term prospects for the region. With the overall population holding stable and an increasing number of people entering conventional retirement age, population trends are a constraining factor on size and growth of the labor force, and an influence on the extent and distribution of consumer purchases.

The prime-working-age-population group – those aged 25-64 – is expected to shrink, from 53.3 percent of the region's population, to 49.9 percent between 2015 and 2045 (Figure 13). For a statistic where a one-percentage-point change is notable, this represents a dramatic transformation in the age distribution of the region's population. The components contributing to sluggish population growth among the working-age population – the aging of a large share of the population into the typical retirement years and the relatively low rate of in-migration of young adults – will put an increasing strain on the supply of available labor in Southeast Michigan.

A significant challenge to consider is the prospect for substantial labor shortages – particularly of workers with skills that mesh with the evolving knowledge- and information-based economy – spurred by the dramatic aging of the population as the baby-boomer generation enters the retirement years. Accelerating growth in the over-65 population and relatively low in-migration rates for young adults will put a cap on the region's ability to expand, compounded by any legislation that significantly limits immigration into the United States. It is particularly critical for the region to step up its investment in its human capital.

The strain on the supply of labor in Southeast Michigan will be particularly acute during the next 12 years. Between now and 2030, the population aged 25 to 64 in the SEMCOG region is forecast to decline by 65,000, making it increasingly difficult for employers to find workers.

Transportation Funding

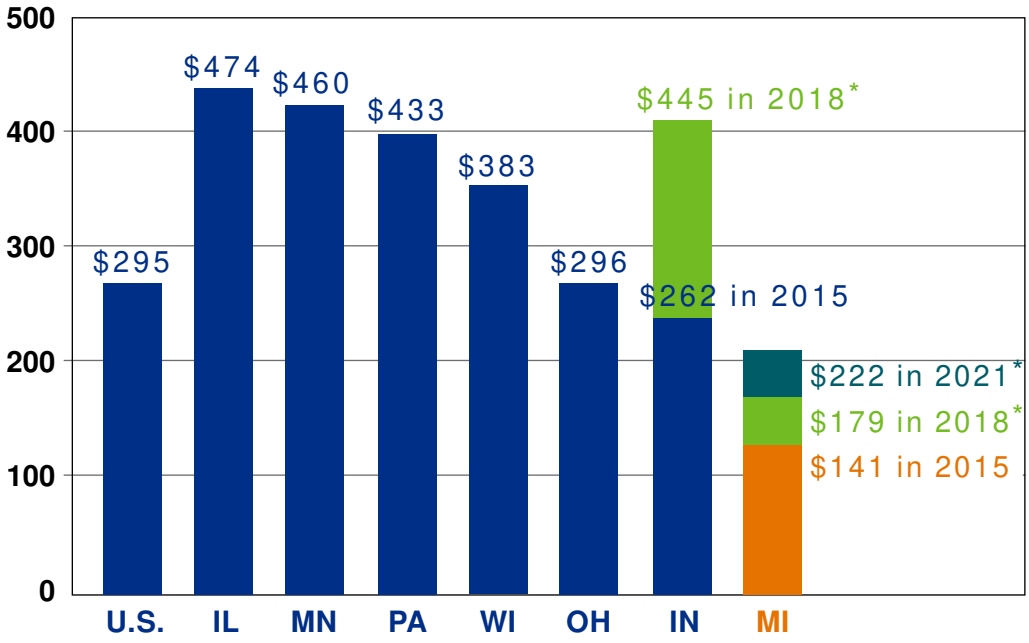
For years, Michigan has not invested enough to preserve and rebuild roads, enhance public transit, manage stormwater runoff, and provide for a multimodal system.

Road Funding

Michigan has ranked last in the nation in investing in its road system on a per capita basis. Even with revenue enhancements passed into law in 2015, Michigan will still spend less than the national average for roads. When comparing Michigan with its neighboring states, which have similar populations and land areas to cover, Michigan will spend only half of what its neighbors spend on road construction. Figure 15 compares Michigan to the other Great Lakes States.

Figure 15

Great Lakes States Road Construction Per Capita, 2015



* Reflects major revenue increases after 2015

This lack of investment is coupled with the reliance on state and federal gas taxes. Reliance on gas taxes is not a long-term, sustainable, funding source due to the continued increases in fuel-efficient, electric, and hybrid vehicles.

Compared to other states, Michigan has very average fuel taxes, above-average vehicle registration fees, and below-average federal assistance to support its roadways. Figure 16 illustrates that Michigan collects nearly the same amount of funding from traditional sources compared to the U.S. average.

Figure 16
Michigan Funding Sources Compared to U.S. Average

The missing piece to Michigan's funding compared to other states is that other areas have diversified and supplemented road construction budgets through a wide variety of other local methods. Figure 17 shows that the average state collects 450 percent more from other funding sources compared to Michigan. These other funds include general fund, sales tax, bonds, local fees, tolls, etc. Nationally, property taxes, general fund appropriations, and even local sales or income taxes, plus other taxes account for 30 percent of all revenue used to keep roads operational. Tolls can play an important role in funding roads in states with significant through traffic. Illinois and Pennsylvania are both top-10 states in revenues from toll roads, each generating over $800 million per year from their toll systems.

Figure 17
Michigan Funding Dollar Amount Compared to U.S. Average

By not supplementing traditional road-user fees, Michigan has fallen far behind the rest of the nation. Michigan has also created constitutional and statutory barriers to raising local revenue and empowering local governments to become greater financial partners in solving its road issues.

SEMCOG projections indicate that road funding within the seven-county region needs to increase from $400 million per year to $1.6 billion per year for 25 years to improve roads to 80 percent good or fair condition. It will take an additional $600 million per year over that time period to get roads to 90 percent good or fair. These figures represent only the needs for the seven-county SEMCOG region and only for federal-aid-eligible roads. It does not include the costs of addressing secondary roads or residential streets in the region.

In 2015, Michigan took a big step forward in improving funding for roads, but it is only a first step. Michigan has neglected its roads for decades and this neglect is evident across the region. When looking at funding, Michigan remains reliant on gasoline taxes at both the state and federal level, making Michigan vulnerable to further declines in revenue generation as vehicles become more fuel efficient or switch to electric motors. The 2015 funding package indexed the fuel tax rate to inflation and charges higher registration fees for alternative-fuel vehicles to make up for the loss of future fuel taxes. The federal gas tax has no accommodation for inflation, improving fuel economy, or the use of alternative-energy vehicles.

Long-term, Michigan needs to update its transportation revenue sources incorporating technological advances that allow user fees to be based on the quantity of travel rather than the amount of fuel consumed. Michigan must also provide tools for local governments to raise funds for local transportation priorities. It has taken Michigan decades of underfunding roads and deferring maintenance to reach the current conditions. It will take many years of patient rebuilding to restore Michigan roads to a state of good repair.

Transit Funding

Similar to road funding, Southeast Michigan has lagged behind our peer regions in funding our transit system. Implementing any new service, major or not, requires additional capital and operating funds. All areas of the region, large and small, urban and rural, are in need of additional transit funds. To accomplish this, a significant increase in local transit funding will be necessary to make the necessary improvements a reality.

No transit system can be successful without adequately addressing all of the basic elements. Without a dedicated and continuous source of funding that covers the cost of providing the service Southeast Michigan will not meet its needs. This includes capital, operating, and long-term maintenance expenses. Revenue from transit fares alone cannot provide sufficient funding to operate a quality transit system. Additional revenue is always required.

Capital funds can be subsidized by federal transit funding and, while we need more local revenues to leverage federal money, the bigger need is for operations. Federal dollars cannot be used for most operating costs, placing the burden almost entirely on state and local sources, including farebox revenues.

Currently, the region covers about 30 percent of operating costs from local sources, much lower than our peer regions. Figure 18 shows we provide $67 per capita, with most other regions spending two to four times that amount.

Figure 18
Transit Funding Comparisons Per Capita, 2016

This is why areas that have more robust transit systems have established dedicated sources of funding. The particular type of tax is dependent on state enabling legislation, in Southeast Michigan the available options are property and vehicle registration taxes. Most regions in other states use some form of local sales tax to fund transit.

In the four counties (Wayne, Oakland, Macomb, and Washtenaw), the Regional Transit Authority for Southeast Michigan (RTA) has enhanced its 2016 plan resulting in the draft *Connect Southeast Michigan* plan. The plan calls for $170 million per year in operations funding (in 2019 dollars), and a total investment of $696 million over 20 years in transit supporting infrastructure, and addresses concerns to provide a more robust, regional solution to transit and mobility for Southeast Michigan.

In the remaining counties of Livingston, Monroe and St. Clair, the needs are more difficult to assess and address. These areas need more flexibility in their transit options through such services as para-transit and demand response services. The lack of population and employment densities needed to support regularly scheduled services are lacking outside of the smaller urban areas of Port Huron and the City of Monroe. SEMCOG, through the Governor's Aging and Mobility Initiative, identified gaps in services and other needs for these counties. These needs can be addressed through a similar approach being taken by the RTA with its Hometown Services and Flexible Mobility.

The first step toward resolving the transit needs is to finalize and adopt the RTA's Connect Southeast Michigan Plan. Its implementation will likely require the passage of additional enabling legislation by the state. Once that is done, regional leaders must reach an agreement on the preferred funding package to implement the plan. That proposal needs to be placed on the ballot for a popular vote, requiring a simple majority in the RTA region for approval.

In the longer term, the region must arrive at a more consistent and sustainable source of revenue. Whether it is a sales tax or some other mechanism, the region needs to transition to a stable long-term local funding source that tends to gain greater voter support than property taxes.

Access and Equity

Accessibility is a key component of measuring how well our transportation system is functioning and serving the people using it. It is also about providing appropriate transportation options that meet the vital needs of all residents. The ability of all Southeast Michigan's residents to reach jobs, school, recreation, and necessary services has a profound impact on economic opportunity and quality of life.

SEMCOG's report, *Access to Core Services in Southeast Michigan*, adopted in 2016, developed common measures of accessibility for comparison across the region, established benchmarks to identify gaps and challenges where accessibility is low, and set regional policies and local actions to be implemented by various stakeholders.

Access to Core Services measured and evaluated accessibility in order to understand how well the region's transportation system provides access to core services across four modes of travel – automobile, transit, walking, and bicycling. The core services measured were jobs, health care facilities (including hospitals, community health centers, and urgent care facilities), supermarkets, public parks, schools, libraries, and fixed-route transit.

The results shows that job accessibility by walk (figure 45 on page 165) for total population will increase between 2015 and 2045. This is consistent with projected more than 6 percent job growth in the region. Job accessibility will grow for most demographic groups except for zero car households, indicating additional efforts are likely needed to improve their access to work opportunities in the future. Meanwhile, most disadvantaged populations have higher job accessibilities than their counterparts (population excluding the disadvantaged) except for elderly people, who have less work commutes due to low labor participation rate.

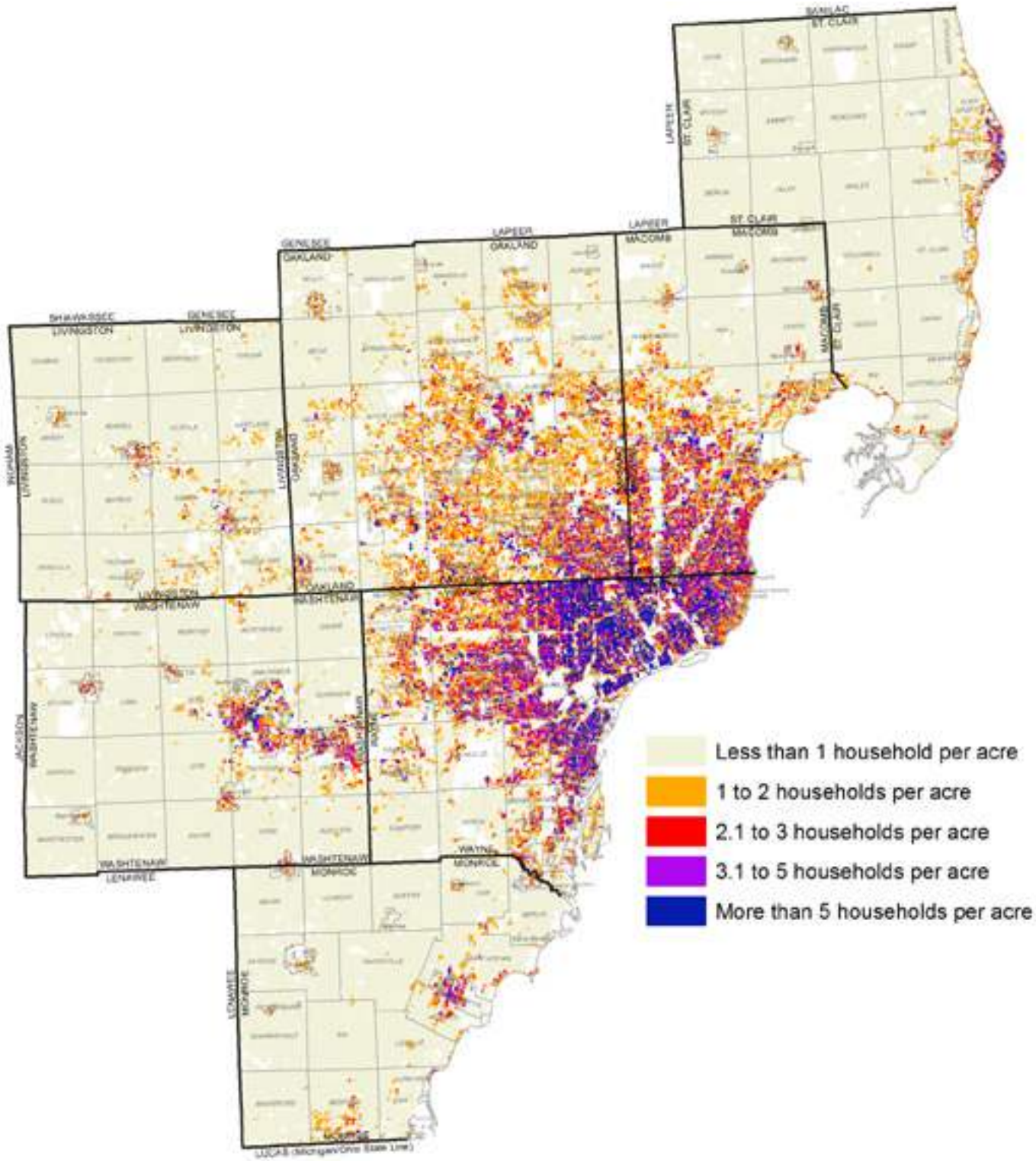
Additionally, an accessible transportation system needs to provide an equitable level of service to all people who use it as a means of reaching core services. For a significant number of people in the region, including those with low incomes, older people, people with disabilities, and others, the automobile is not always a viable mobility option. For these people, alternative modes of transportation, including fixed-route transit and specialized transportation (i.e., door-to-door paratransit or demand-response community transit) are critical. Walking and bicycling may provide access to core services for some, especially those with low incomes, but there are several limitations (including distance, physical ability, and lack of facilities) that often make these modes not practical or possible.

The system also needs to be measured in terms of how well it provides accessible and convenient options to all residents in reaching core services, and ensure that certain populations don't accrue disproportionate benefits or burdens. *Access to Core Services* identifies three focus populations that are particularly and specifically impacted by accessibility challenges associated with transportation:

- Transit-dependent households
- Households in poverty
- Senior households (+65 years of age)

Figure 19 displays the concentration of these three focus population groups by households per acre. In total, 40 percent of the region's population is identified as a focus population with the highest concentration primarily located in the more urbanized areas of the region, especially in the City of Detroit and neighboring communities.

Figure 19
Density of Focus Populations, Southeast Michigan



The report also details that accessibility challenges exist regardless of the transportation mode. While the automobile provides by far the greatest access to all measured core services, gaps still exist and many households and/or core services are located in areas of the region with limited access. For example, one in five (20 percent) households in the region is beyond a 10-minute drive to the nearest hospital. The region's focus populations have significant challenges in accessing core services by either fixed-route transit or walking, specifically:

- One in five (20 percent) transit-dependent households are beyond a 30-minute walk to fixed-route transit service; two in three (65 percent) are beyond a 10-minute walk;
- Even for households with high (within five-minute walk) or moderate (15-30-minute walk) access to fixed-route transit, bus availability, and frequency of service is often a challenge;
- Only 22 percent of the region's jobs are accessible within a 90-minute fixed-route transit commute;
- 40 percent of households in poverty are beyond a 30-minute transit trip to a supermarket; 22 percent are beyond a 30-minute walk;
- 65 percent of households with seniors are beyond a 30-minute transit trip to any health care facility; and
- 87 percent of transit-dependent households are beyond a 30-minute transit trip to a large regional park; 38 percent are beyond a 10-minute walk to either a public park or school.

Improvements to the transportation system can play a key role in providing equitable access, connecting all people in the region to jobs and other services and opportunities. While improving and expanding transportation options to safely and efficiently connect people and places is important, it is not the only factor in creating a more accessible and equitable transportation system. Efforts to better align the location and proximity of core services to meet the needs and demands residents, especially focus populations, is needed. Also needed is increased coordination and planning to decrease barriers to accessing both transportation modes and desired core services. Other important elements include access to quality education and job training; a clean, healthy environment; access to quality health care services; and affordable housing options in close proximity to jobs.

An effective and efficient transportation system provides an equitable level of transportation services to all segments of the population by connecting residents to the places they need to go and enhancing economic success of the region.

Input

While data and analysis is a key component of the plan, input from the public, elected officials, and agencies is critical to verify plan priorities and to receive guidance on development of the Plan. SEMCOG's *Public Participation Plan*, adopted in 2015, outlines the objectives and techniques used for SEMCOG outreach efforts. In developing of this plan, SEMCOG worked to engage a broad range of participants to ensure that interested parties have ample opportunities to understand and provide input to the plan.

As with all of SEMCOG's engagement efforts, the public input process for the RTP has four primary objectives:

- **Educate:** Create content to inform stakeholders and publics about all aspects of the RTP process.
- **Publicize:** Promote participation through the use of different communications tools.
- **Receive:** Collect input on regional transportation priorities.
- **Evaluate:** Measure the effectiveness of public outreach efforts.

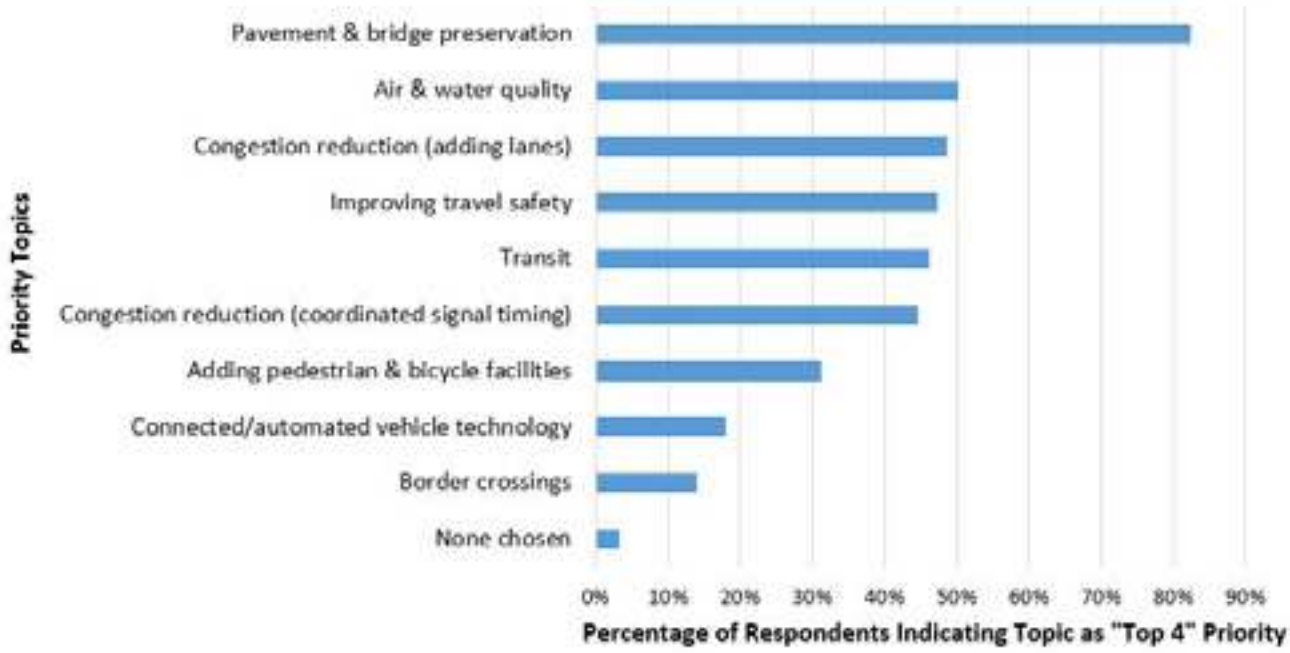
Public and Elected Official Outreach

The information captured through surveys, input meetings, public comments, and other activities from July 2013-October 2017 can be found in SEMCOG's *Public Outreach Report for the 2045 Regional Transportation Plan*. This report summarizes the results by topic area and gives an overall view of the publics level of satisfaction with the region's transportation system and their attitudes toward prioritizing transportation improvements. The results of the public outreach inform the decision-making process for investing in transportation in the future which is outlined in this plan.

Public Input Meeting, Westland

Respondents of the statistically significant regional survey were asked to indicate which four components of the region's transportation system are most important and should be a top priority for the next 5-10 years. The results of the top regional priorities for improvement are shown in Figure 20.

Figure 20
Statistical Survey Responses, Regional Priorities



Consultation Agency Outreach

The goal of the consultation agency outreach process is to provide expanded involvement opportunities to participate in the planning process for specific public and private agencies and officials responsible for planning activities related to or with interest in the transportation system. The consultation process included early involvement, direct outreach, information and data sharing, plan comparison, and evaluations that meet federal regulations.

Although there is overlap between the consultation agency and public engagement processes, the two efforts are separate. The primary difference is the target audience for consultation agencies is comprised of formal groups and organizations, while public outreach is directed towards individuals. Agencies involved in the consultation outreach are planning partners across the region in various capacities including natural resources, education, conservation, environmental justice, community and economic development, tribal interests, freight, transit, border crossings, aviation, and more.

Consultation between these various agencies and planning partners is an opportunity to discuss needs of the larger community, compare and coordinate planning approaches, and communicate about the vision for the overall transportation system that crosses multiple jurisdictions. SEMCOG interacts with many of these agencies on an ongoing basis to ensure its plans/programs are aligned. This will continue through plan implementation.

Performance Management

The most recent federal transportation legislation – Fixing America's Surface Transportation Act (FAST) – included new expectations for metropolitan transportation planning focused on establishing a performance-based planning process that:

- Identifies performance areas based on national transportation goals,
- Tracks a uniform set of performance measures,
- Sets performance targets, connects transportation investments to target attainment, and
- Evaluates the effectiveness of investments towards improving the transportation system.

SEMCOG has addressed this performance management approach to track, analyze, and direct investment into the transportation system to support regional goals. In particular, SEMCOG, in partnership with state and local road agencies, has developed regional data sources and tracking for pavement condition, traffic crashes, and highway operations. This data has been used in SEMCOG's regional transportation planning to weigh priorities and provide road agencies with data and analysis tools to be used in local investments and planning.

The focus on using data to systematically track and inform decision-making was introduced as a nationwide approach in 2012 in the previous transportation legislation – Moving Ahead for Progress in the 21st Century (MAP-21). The objective of this performance and outcome-based program is to invest in projects that collectively make progress toward achieving nationally set goals.

The FAST Act stipulates that Metropolitan Planning Organizations (MPO), such as SEMCOG, establish performance targets that address the performance measures or standards established in 23 CFR part 490, 23 CFR part 450, and 49 CFR Part 625. SEMCOG, the Michigan Department of Transportation (MDOT), and transit operators will coordinate in establishing performance targets by:

- Sharing available data related to the federally-required performance measures,
- Discussing target setting methodology,
- Establishing performance targets, and
- Reporting on performance targets and progress in attaining targets.

Federal performance measure areas include: safety performance, pavement and bridge asset management, system performance, congestion mitigation and air quality, and public transportation. More information on the specific measures can be found in Chapter 4.

Chapter 3: Existing Conditions, Needs, Policies, and Actions

Existing Conditions and Needs describes in detail the current trends, challenges and opportunities, and policies and actions for each of the vital components of the transportation system:

- Bicycle and Pedestrian
- Bridge
- Congestion
- Environment
- Freight
- Intercity Transportation
- Pavement
- Safety
- Security
- Tourism
- Transit
- Travel Demand Management

Elizabeth Park, Trenton

Bicycle and Pedestrian

By the Numbers

- More than 3,000 miles of bikeways, pathways, and routes in the region
- 100 biking and walking count locations completed (2018)
- The Iron Belle Trail will connect 36 communities through 168 miles of hiking and biking trails
- More than $69 million spent on 110 successful Transportation Alternatives Program projects from 2013-2019

Bicycle and pedestrian travel is a vital component of our region's transportation system. Almost every trip, including those made by automobile and transit, likely begins or ends with walking or biking. Communities across the region desire additional bicycle and pedestrian facilities to improve residents' quality of life. In addition to recreational benefits, the region's bicycle and pedestrian network:

- Provides residents transportation choices,
- Enhances the accessibility of the region's transit system,
- Contributes to the economic vitality of town centers and downtowns, and
- Empowers people, especially those without access or ability, to operate private automobiles.

Bicycle and Pedestrian Travel Plan for Southeast Michigan

In 2014, SEMCOG and MDOT jointly adopted the *Bicycle and Pedestrian Travel Plan for Southeast Michigan* which promotes the integration of various components of the regional nonmotorized transportation network into a cohesive system. The plan includes goals to:

- Improve safety to reduce bicycle and pedestrian crashes
- Increase connectivity to regional destinations and core services
- Provide multimodal options for people who walk and bike
- Promote an economically and environmentally sustainable system
- Provide education and encouragement
- Evaluate the region's bicycle and pedestrian system to measure impact

Trends

Much has been accomplished over the past four years since the adoption of SEMCOG's *Bicycle and Pedestrian Travel Plan* in the areas of safety, connectivity, multimodal options, education and encouragement, and evaluation.

Since 2014, new pedestrian and bicycle facilities have been built across the region that contribute to filling in gaps and helping provide safer travel environments. Projects include:

- 109 miles of shared-lane markings
- 105 miles of local bike routes
- 57 miles of shared-use paths
- 47 miles of conventional bike lanes
- 24 miles of protected bike lanes

Many of the newer projects have been implemented using the Transportation Alternative Program (TAP), which have funded 110 projects since 2013, including biking and walking facilities, streetscapes, and Safe Routes to School projects.

Common types of bicycle and pedestrian facilities in Southeast Michigan are detailed in Figure 21. Figure 22 shows the location of all existing bike facilities in the region. SEMCOG's website showcases the Southeast Michigan Bicycle Network map, where the existing regional routes and trails and existing local and state bike routes facilities can be viewed in more detail.

Figure 21

Common Types of Bicycle and Pedestrian Facilities in Southeast Michigan

BICYCLE FACILITIES

Shared Lane Markings (sharrows)
Assist bicyclists and motorists by showing them where it's safest for bicyclists to ride within a lane (directly over the markings). Sharrows are typically found on roads with low traffic speeds and volumes.

Bike Lanes
Provide bicyclists a defined space to ride in the road at their own pace and reduce crashes with pedestrians on sidewalks.

Buffered Bike Lanes
Provide visual separation between biking and driving lanes, through the use of enhanced pavement markings.

Separated/Protected Bike Lanes
Provide vertical elements, such as flexible posts, curbs, or planter boxes that provide physical separation that actively discourages vehicles from entering the biking space.

SHARED FACILITIES

Shared Use Paths
8-10 foot wide, often asphalt or limestone surface pathways, used by bicyclists and pedestrians that either parallel a road or follow their own course. Paths are the backbone of Southeast Michigan's recreational trails system, an important part of recreational tourism.

PEDESTRIAN FACILITIES

Local Neighborhood Sidewalks
Provide pedestrians with their own space free from cars (and often bikes), connecting people to desired destinations and core services.

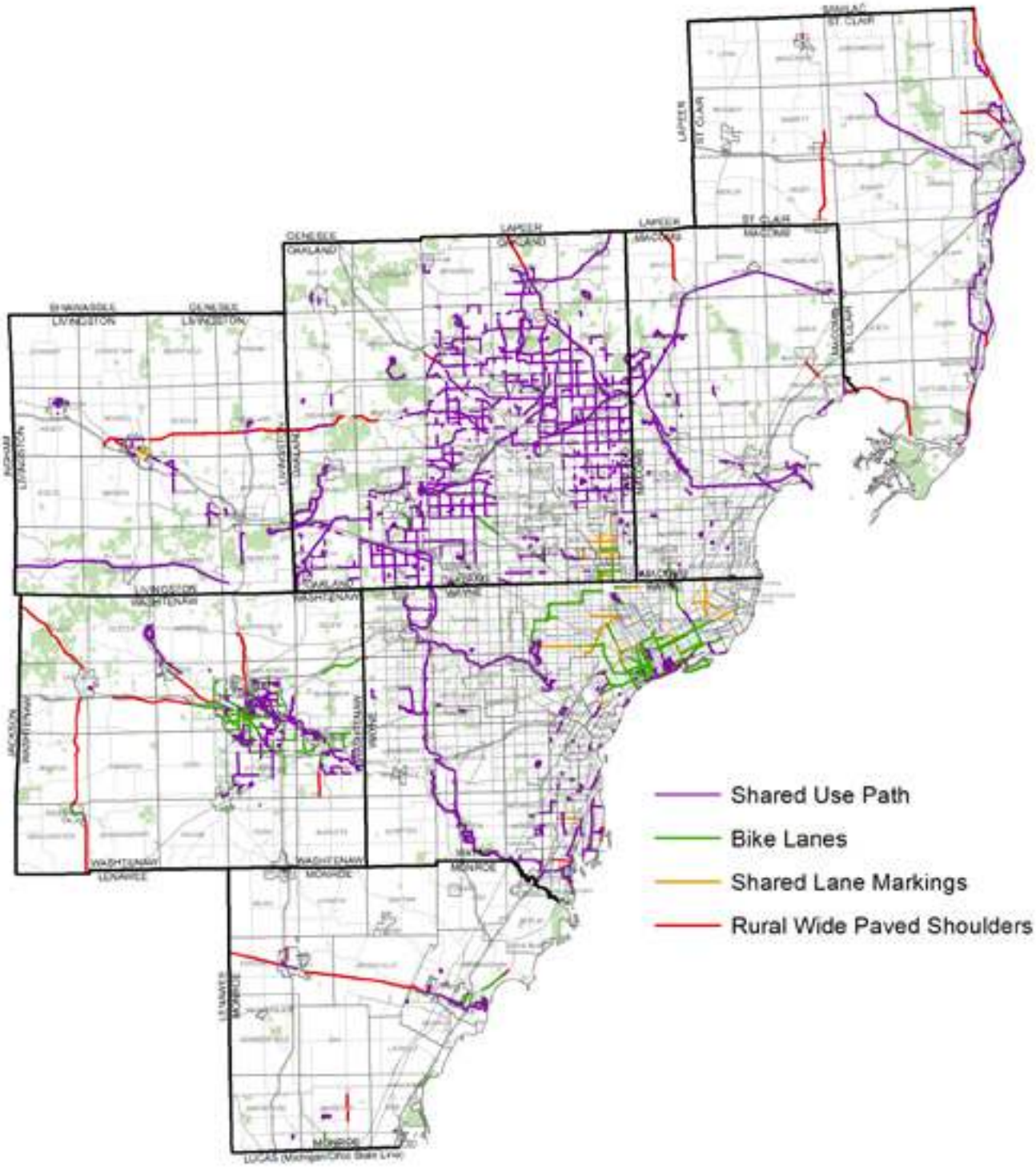
Town Center Sidewalks and Downtown Streetscapes
Provide pedestrians with active space for on street shopping, dining, and recreation.

Enhanced Crosswalks
Alert motorists of pedestrian crossings and typically include elements such as curb extensions and refuge islands.

Midblock Pedestrian Signals
Protect pedestrians in high traffic areas by providing an activated signal that stops motor vehicle traffic.

Wide Paved Shoulders
In rural environments, fill gaps between bicycle and pedestrian facilities with paved space outside the motor vehicle travel lane. Wide paved shoulders are often built where shared use paths or sidewalks are not yet feasible.

Figure 22
Existing Bike Facilities, Southeast Michigan



These trends are impacted by the increase in bicycle and pedestrian travel:

Healthy and active communities
With an increasing focus on health, walking and biking facilities provide an avenue for residents to participate in a more active lifestyle. Additionally, ensuring that these facilities connect to and provide access to recreational, natural, and active activity centers has positive impacts on both the physical and mental health of residents.

Economic development and placemaking
Providing walking and biking opportunities is also linked to enhancing placemaking and quality of life. This has positive impacts on the economy. An MDOT study estimates that bicycling contributes $668 million per year in economic benefit to Michigan's economy. This study shows biking affects the bottom line when it comes to employment, retail revenue, tourism expenditure, improved health, and increased productivity.

State and national recreational trails and bike routes
Connecting local and regional trail and bike routes to state and national routes is a regional and state priority. State routes include the Iron Belle Trail which connects Detroit's Belle Isle State Park to the City of Ironwood in Michigan's upper peninsula and the Great Lake to Lake Trail, which connects Port Huron to South Haven. In total, these two major state and regional trails will connect more than 60 communities through nearly 300 miles of hiking and biking pathways, further defining the region as a trail destination and supporting tourism and economic development. An example of a national routes include the Underground Railroad Bicycle Route, which connects Mobile, Alabama to Marine City, Michigan. Future national routes include US Bike Routes 25 and 30 which will connect Michigan with Ohio and beyond. Additionally, the new Gordie Howe International Bridge will have a shared-use path, connecting bikeways and pathways in Michigan and Ontario, Canada.

Increase in number and use of local facilities
Over the last several years there has been an increase in both the number and diversity of facilities. Early planning efforts focused largely on shared use paths, sidewalks, and traditional traffic signals. Communities are planning and implementing on-road biking facilities (e.g., buffered and protected bike lanes) and new enhanced pedestrian crosswalks (e.g., pedestrian beacons, HAWK signals) that help complete networks and create opportunities for more users to access core services. Figure 21 illustrates the diverse types of pedestrian and bicycle facilities that are successfully being used to enhance local and regional connectivity.

Anecdotally, there is evidence that more people are walking and biking across the region, likely due to the increased number of new facilities. To better understand usage, SEMCOG established a bicycle and pedestrian count program in 2017.

To date, more than 100 bicycle and pedestrian counts have been conducted. SEMCOG is currently working with national, state, and local stakeholders to identify how many counts are necessary for a fully established regional database. These counts are useful for local level projects, providing information for decision makers such as:

- Travel mode share percentages (passenger vehicles, trucks, people walking, people biking),
- Crosswalk compliance,
- Bicyclist riding behavior,
- The number of e-scooters on sidewalks/roads,
- Bicycle and e-scooter helmet usage, and
- Access to transit and other modes of travel.

Micro-mobility

As identified in SEMCOG's *Bicycle and Pedestrian Travel Plan*, approximately 42 percent of our region's daily trips are under three miles. With advances in technology, another trend is the increased options for making these short trips more convenient and often faster. As of 2018, 14 communities in Southeast Michigan have been experimenting with or fully implemented bikeshare systems. Also in 2018, the State of Michigan passed a series of laws on electrified bike or e-bikes, regulating their speed, form and where they can ride. Recently, three private companies deployed fleets of electrified dockless e-scooters in greater downtown Detroit and Ann Arbor. All of these micro-mobility solutions help complement the transit system serving as the first and/or last miles, as well as provide additional options for people to access destinations.

Challenges

Gaps in the system

While there has been significant increases in the amount of pedestrian and bicycle facilities, gaps in the network remain. This is due to the incremental nature of the construction of these facilities that is largely based on targets of opportunity. For example, new developments may require sidewalks, but parcel development is often not contiguous, creating small segments of sidewalk that don't connect to a larger system. Regional system gaps also often remain due to difficulties in construction or cost barriers. These challenges include freeway crossings where an existing bridge doesn't allow for pedestrian/bicycle traffic , where right-of-way is limited or difficult to obtain, or environmentally sensitive areas such as wetlands, creeks and rivers.

While filling the many gaps in the regional network is important, priorities need to focus on ensuring facilities are in place that provide residents with access to core services such as jobs, schools, libraries, grocery stores, and medical facilities. Region wide, nine percent of Southeast Michigan households do not have access to an automobile. Additional analysis and prioritization needs to occur to ensure households that do not have access to an automobile have mobility options provided by pedestrian and bicycle facilities.

Maintenance and operation
Just like roads, bike lanes, sidewalks, and pathways need routine capital preventive maintenance. For asphalt surfaces, this includes seal cracking, chip seals, overlays, and seal coats. For concrete surfaces this includes slab leveling and periodic replacement. Gravel surfaces need to be grated and drainage issues need to be fixed in order to prevent aggregate from washing away. Trees need to be trimmed and grass needs to be edged to prevent overgrowth on sidewalks and paths. Within the road, crosswalk and bike lane markings need to be periodically re-striped. These are largely issues of funding.

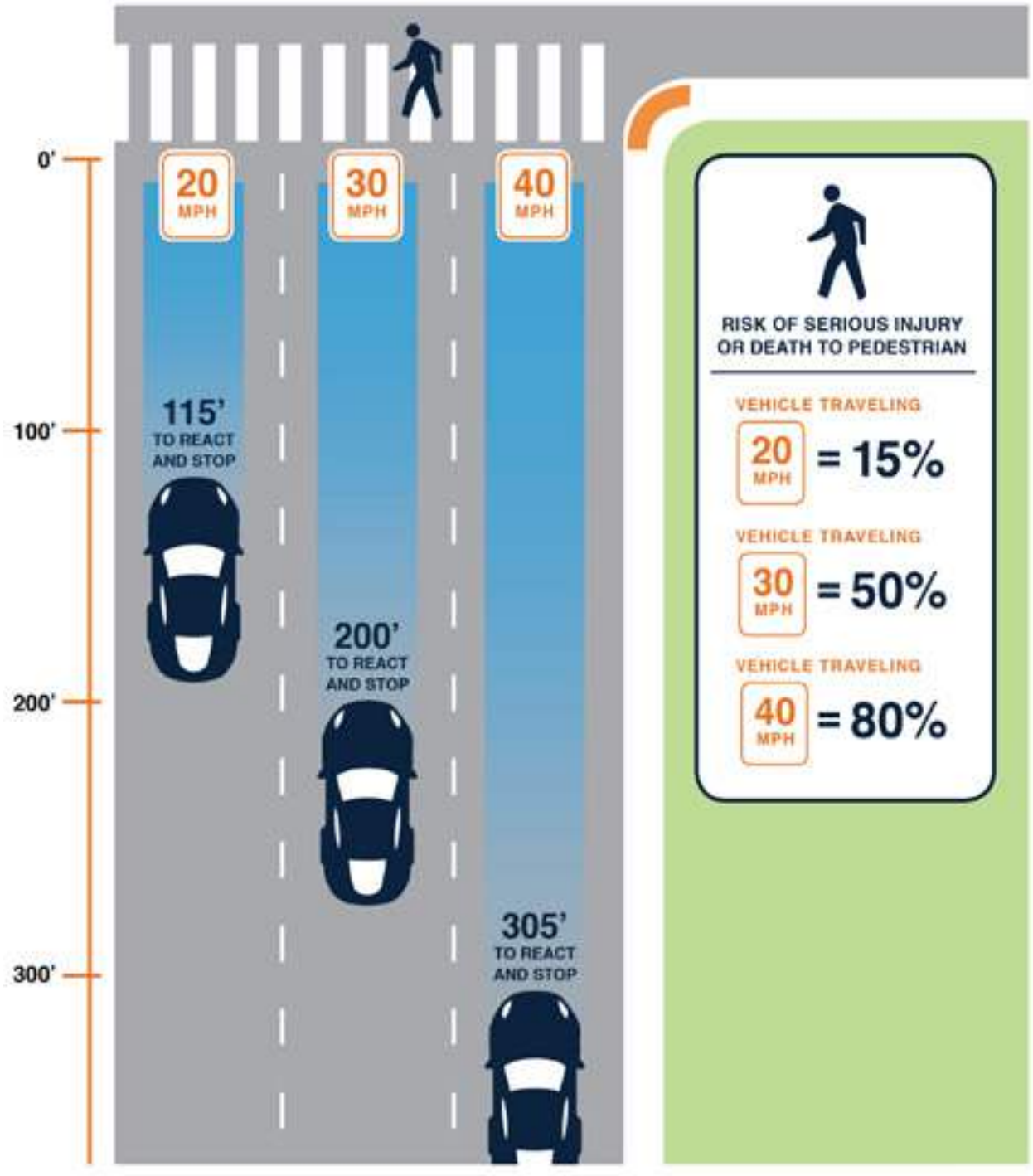
Additionally, there needs to be routine maintenance to keep bikeways, pathways, and sidewalks clear of debris and snow. Oftentimes, debris and snow from the roadway is moved directly into the bike lanes or on the sidewalks. Sometimes snow is built up so high at intersections that crosswalks are impassible. In some cases, it the responsibility of the road agency to clean these surfaces, but often times, this responsibility is relegated to the local community or the adjacent property owners. With the later, snow clearing can be haphazard, creating large temporary gaps within the system. Communities need to create procedures to clear the bikeways and pathways that are timely and coordinated, especially in areas where people are relying on these facilities to access core services.

Safety
While representing only two percent of all crashes, bicycle and pedestrian crashes account for 30 percent of all fatalities. Engineering, education, and enforcement are all strategies for addressing this issue. Engineering solutions include filling gaps such as connected and widened sidewalks, adding crosswalks, implementing pedestrian signals, and bump-outs/medians.

Enforcement activities include enforcing speed limits and the three-foot-safe-distance that motorists must give bicyclists while passing. Figure 23 illustrates the impact speeds has on the survival rates of pedestrians. Sustainable enforcement campaigns can be used that are similar other efforts such as specific targeting for seat belt enforcement.

Education is essential to protect pedestrians and bicyclists. This education is important for all users of the system: drivers, walkers and bikers. Because of this, SEMCOG launched the Walk.Bike. Drive. Safe Education Campaign. This campaign focuses that safety is everyone' responsibility and provides data driven messages including using crosswalks, look before turning, and being seen especially in dark conditions. Another educational need is to ensure that all users understand and correctly use the infrastructure to help make pedestrians and bicyclists safer such as separated bike lanes, pedestrian hybrid beacons, and roundabouts. Many drivers do not know how to interact with them. Education is also needed at the state level to ensure walking and biking laws are in place to protect users such as a uniform state law on who has the right-of-way at crosswalks.

Figure 23
Impacts of travel speed on survival rate of pedestrian



Regional Policies and Actions

Bicycle and Pedestrian

The following policies establish a framework for bicycle and pedestrian prioritization to enhance a safe and efficient transportation system for all users.

Increase Safety for all travelers, regardless of mode

- Educate lawmakers on the need for more uniform crosswalk laws
- Educate lawmakers, roadway designers, and local government officials on the impact of traffic speed on rate of serious injury crashes and fatalities
- Support community-led Americans with Disabilities Act (ADA) transition plans for sidewalks, paths, and crosswalks
- Support community-led maintenance and snow removal plans

Educate and Collaborate with local governments, transportation agencies, utility providers, and residents to improve understanding and operation of the transportation system

- Create a taskforce of local, county, and state-wide stakeholders to update the Bicycle and Pedestrian Travel Plan to ensure challenges are incorporated and include strategies for addressing.
- Work with MDOT and county road agencies to develop multi-modal tools that are context sensitive to assist communities in planning bicycle and pedestrian facilities.
- Continue working with MDOT and Michigan Fitness Foundation on the TAP-Safe Routes to School selection process
- Educate users of the health benefits of walking and biking.

Measure Transportation System Performance to facilitate strategic investment through developing, collecting, analyzing, and disseminating data

- Create a rating system for the bicycle and pedestrian network of bikeways and pathways
- Seek opportunities to map and assess the pedestrian sidewalks and trails network for Southeast Michigan.
- Collect count data for all modes of travel to accurately depict the usage and future needs of the transportation system.

Support the Regional Economy through the reliable movement of goods, efficient trade connections, expanded labor mobility, and support for tourism and local placemaking

- Analyze and prioritize the pedestrian and bicycle system to ensure households that do not have access to an automobile have mobility options including pedestrian and bicycle facilities to core services including hospitals, schools, jobs, and grocery stores.
- Seek opportunities to connect the regional system and improve the pedestrian system of sidewalks
- Support the planning, branding, and advertising of the regional recreational trails and routes such as the Iron Belle Trail, Great Lake to Lake Trail, and US Bike Route system.
- Help communicate the location of regional recreational trails and routes through tools such as Southeast Michigan Trail Explorer and the Bikeways and Pathways online maps
- Continue to support efforts that strengthen the walkability, bikeability and placemaking ability of downtowns, villages, and trail towns.

Bridges

By the Numbers

- A bridge is a structure with a span of 20 feet or greater in length
- More than 2,900 bridges in Southeast Michigan
- More than 26.6 million square feet of bridge deck in Southeast Michigan
- Bridges and culverts in the region provide more than 13,000 road stream crossings
- More than 15.7 million passenger cars, busses, and trucks traveled over the international bridges in 2017 in Southeast Michigan

Bridges are an essential part of Southeast Michigan's transportation system. More than 2,900 bridges cross over rivers, streams, railroads, and other roadways throughout the region. Bridges are longer lasting and more expensive by square foot than typical roadways. The design of a bridge determines the number of travel lanes for motor vehicles, bikes, and pedestrians; the loads and heights of freight trucks; and accessibility for disabled persons.

For communities with streams, rivers, railroads, and limited-access highways, the number and location of bridges determines the ease of cross-community travel and response times for emergency services. It is important to maximize the health of all bridges in the region as well as update the design of bridges to improve accessibility, reduce network gaps, and respond to current and forecasted travel demand. Bridge projects are selected based on several factors – the amount of traffic carried by the bridge, location of the bridge in the region's transportation network, and critical needs to ensure access for emergency services.

Trends

SEMCOG uses information from the Michigan Department of Transportation's (MDOT) Michigan Structure Inventory and Appraisal (MSIA) database to track bridge conditions. Percent of bridges in good, fair, and poor condition is shown in Figure 24. Location of each bridge and the condition is shown in Figure 25. This information is used by SEMCOG and road agencies to develop priorities for maintenance of regional bridges.

Figure 24
Bridge Condition 2006-2017, Southeast Michigan

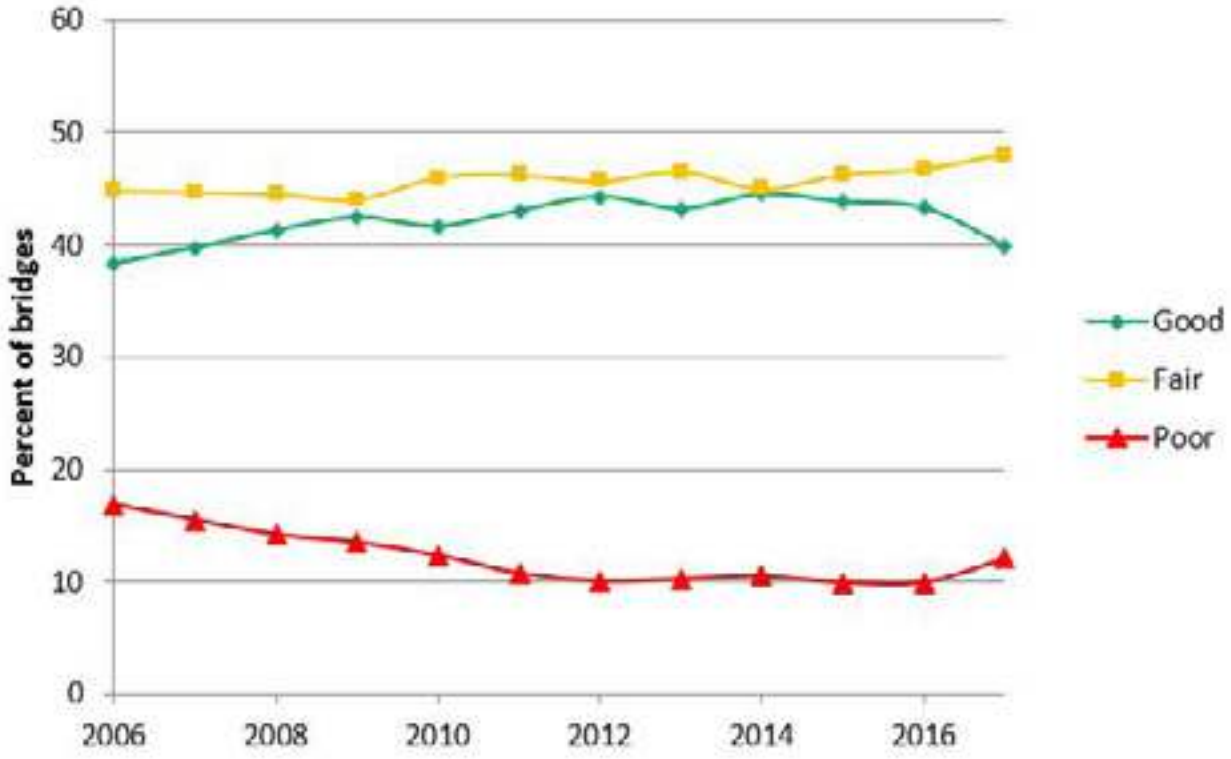
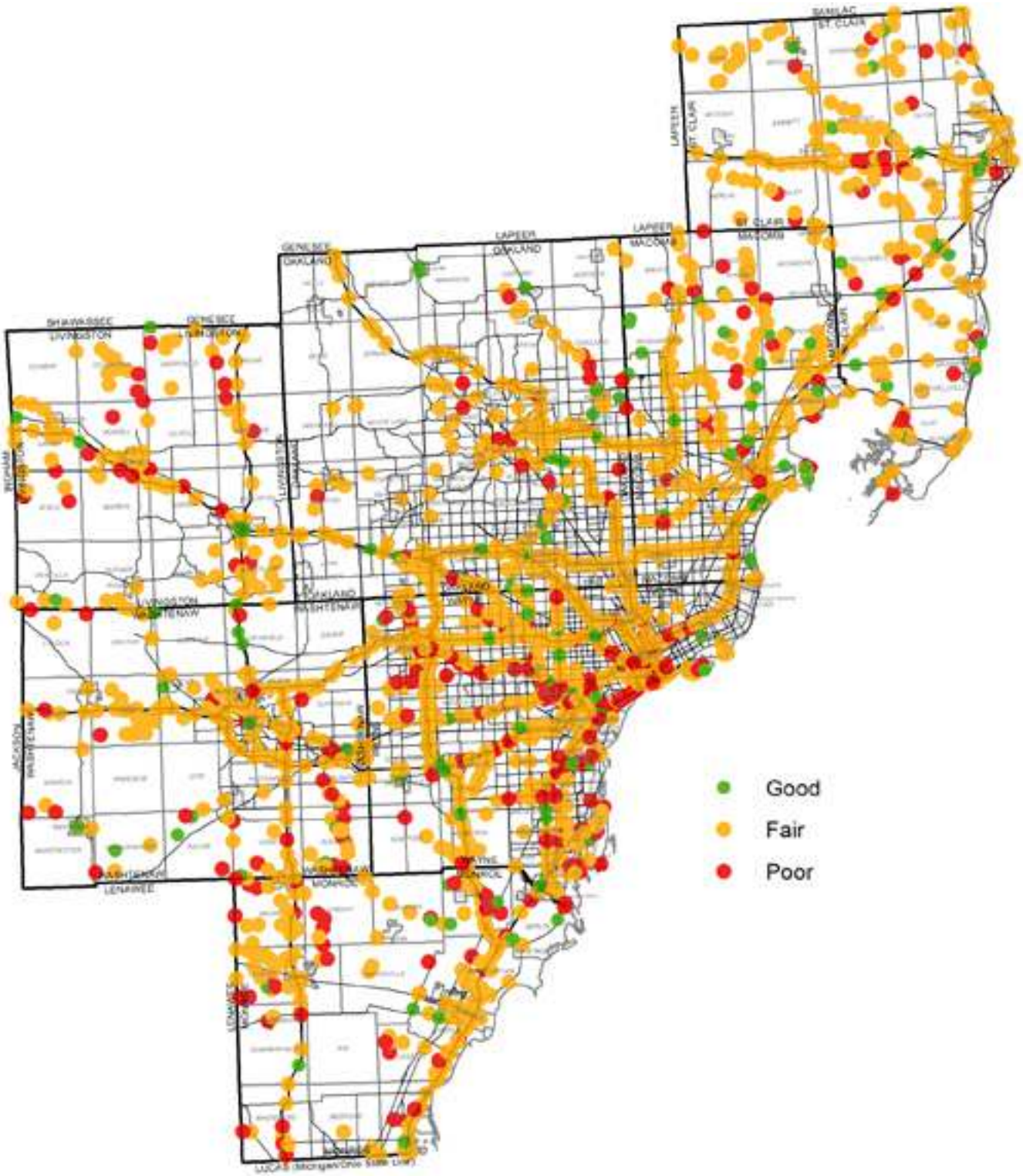


Figure 25

Regional Bridge Condition, Southeast Michigan, 2018



Challenges

Maintenance cost

Bridges are expensive to maintain and replace. Maintaining bridges in a state of good repair requires an annual investment that helps ensure that bridges are able to fulfill or exceed their expected useful life. For each square foot of bridge deck, it costs about $255 to repair. Since the replacement cost for bridges is many times more costly than maintenance and rehabilitation, each bridge replacement can represent a significant share of total funds available for maintenance of the transportation system. A balance must be kept between replacing bridges and reserving sufficient funds to maintain the other bridges. Foregoing maintenance eventually leads to an unsustainable number of bridges in need of full replacement. Pursuing a regular cycle of capital preventative maintenance is important to efficiently spend transportation dollars in a way that best preserves the structural integrity and extends the service life of the road network.

Access

Bridges are essential for creating continuous networks for pedestrian and bicycle travel. Bridges that lack features such as sidewalks, bike lanes, or wide shoulders limit travel routes and access for pedestrians, cyclists, and people with disabilities. Once a bridge is built with inadequate pedestrian, bicycle, or Americans with Disabilities Act (ADA) features, the bridge can be a barrier for decades. There are limited ways to modify a bridge to include pedestrian and bicycle features after it is built.

One approach used to address access for nonmotorized travel not accommodated by roadway bridges is dedicated pedestrian and bicycle overpasses and underpasses. These dedicated bridges can range from short connections over waterways to longer bridges over limited-access freeways and high-speed, high-volume arterial roads. Separate pedestrian and bicycle facilities from vehicular traffic allows for a safer, uninterrupted flow of travel for all modes. A list of the regional corridors within the nonmotorized network can be found in SEMCOG's *Bicycle and Pedestrian Travel Plan for Southeast Michigan.*

It is essential to have barrier-free travel for Emergency Medical Services (EMS), fire, police, and other public services. When bridges deteriorate to the point of requiring weight restrictions or permanent closure accessibility, safety and the economy are impacted.

Climate resiliency

Resilience to extreme weather events is imperative for the region's bridge infrastructure. MDOT conducted a *Climate Vulnerability Assessment Pilot Project,* which provided an initial assessment on the criticality, vulnerability, and risk for all MDOT-owned bridges, trunkline roadways, pumps, and culverts. A current resiliency analysis is underway to build upon the findings from the initial assessment and identify those assets most at risk for extreme precipitation events. SEMCOG is using this work and building on its findings in future projects. These projects help prioritize infrastructure assets for future investment considerations.

Economic development

A healthy freight network ensures that residents and businesses get the goods they need in a timely manner. It is also important for the movement of materials and goods to markets in other parts of the nation and world. Freight and truck activity raises significant infrastructure challenges. Bridges across the region with clearance or weight limitations pose threats that impede truck and freight travel. Deviations in truck sizes or oversized loads require different clearance heights which could result in routing restrictions or pose risk to the bridge infrastructure or facility carried by the bridge. Information such as open, posted, closed, detour routes, and travel times should be readily available to ensure that freight and truck travel through the network with minimal impediments.

Regional Policies and Actions
Bridges

The following policies establish an overarching framework for long-term bridge condition management in Southeast Michigan.

Measure Transportation System Performance to facilitate strategic investment through developing, collecting, analyzing, and disseminating data

- Work with state, county, and local road agencies and other bridge owners to develop, maintain and implement an asset management plan.
- Coordinate with bridge owners to set condition targets based on available resources and bridge-management best practices.
- Conduct an annual analysis of bridge condition performance target setting and program adjustments.
- Integrate climate resiliency risk analyses results for roads, bridges, culverts, and pump stations into asset management databases.

Educate and Collaborate with local governments, transportation agencies, utility providers, and residents to improve understanding and operation of the transportation system

- Monitor the outcomes of investments made through the Transportation Improvement Program (TIP) and update asset management plan strategies.
- Maintain a current public website with regional bridge condition data consistent with the Transportation Asset Management Council (TAMC).
- Expand infrastructure and asset management collaboration opportunities with other infrastructure assets such as water, sewer, utilities, roads.
- Identify opportunities to align bridge infrastructure projects with related local watershed projects.
- Educate the public regarding the cost of constructing and maintaining bridges.

Preserve Infrastructure through fiscally-responsible, data-driven asset management practices

- Share information on best practices in bridge design, construction management, and maintenance practices.
- Implement construction projects that make the most cost-effective use of resources with a focus on maintenance to maximize the life of existing bridges.

Increase Funding and Expand Local Options to provide resources that are sufficient to meet regional transportation needs.

- Work with regional and state leaders to explore alternative funding options that are sufficient and sustainable.
- Develop educational materials that demonstrate the resource gap and identify possible solutions.

Congestion

By the Numbers

- Annual total freeway delay cost = $484.3 million
- Annual total vehicle hours delay for freeway = 17.9 million hours
- 282 of 1,100 miles (26%) of freeways experience congestion at peak travel periods
- Total freeway congested hours (speed < 30 mph) = 118,923 hours annually
- On an average weekday, commuters spend about 70 minutes traveling
- About 90% of commuters drive alone to work
- Southeast Michigan residents travel farther to work than other commuters across Michigan and the U.S.

Southeast Michigan has an extensive, complex road system comprised of state trunklines, arterials, and local roads used to move people and goods locally and nationally. Managing road congestion in the region can positively impact:

- Safety and security,
- Efficient and reliable operations,
- Quality of life, and
- Economic development.

SEMCOG defines a road as being congested when the average speed falls below:

- 35 mph on freeways for at least 15 minutes during peak travel periods;
- 20 mph on arterials for at least 15 minutes during peak travel periods; and

Alleviating congestion allows users to travel with fewer delays and restrictions. It opens access for employers to a broader, regional labor pool, and facilitates just-in-time shipments to ensure goods can move into, through, and out of the region efficiently. SEMCOG collaborates with state, county, and local stakeholders to mitigate congestion issues through data collection, analysis, and other best practices

Trends

Third-party data
Many travelers, hoping to bypass heavy traffic, are using web and mobile applications to plan routes prior to making trips so that they can make adjustments in real-time. GPS applications like Google Maps™ and Waze™ aggregate real-time-travel data on the transportation system and allow users to shift trips to underused roadways. The State of Michigan also manages MiDrive which is a tool with real-time construction and maintenance information.

Increased use of infrastructure technology
Many road agencies are installing sophisticated traffic signal and camera systems. These adaptive systems allow signal timings to automatically adjust during peak periods to accommodate heavier traffic volumes, increasing throughput and alleviating congestion. Cameras can be monitored at a traffic operations center and signal plans adjusted remotely to mitigate bottlenecks. Cameras can be coupled with electronic message boards to create lane control systems like the US-23 Flex Route, which adds an additional lane of capacity for commuters during peak morning and evening traffic periods.

Connected and autonomous vehicles
Connected vehicles and infrastructure may lower congestion on Southeast Michigan roadways in the future. Commuters in connected vehicles can receive and transmit real-time travel data allowing the system to be used more efficiently. Many agencies across Southeast Michigan have begun investing in dedicated short-range communication (DSRC) and other vehicle-to-infrastructure (V2I) communication that will allow for more data to be collected, shared, and used to improve the transportation system.

Challenges

Congestion severity
As the region's economy continues to recover from the great recession, use of the transportation system will continue to increase. As more people head to work, school, and play, and as more goods circulate into, through, and out of the region, congestion – in the form of how long drivers and goods sit in traffic – will continue to increase.

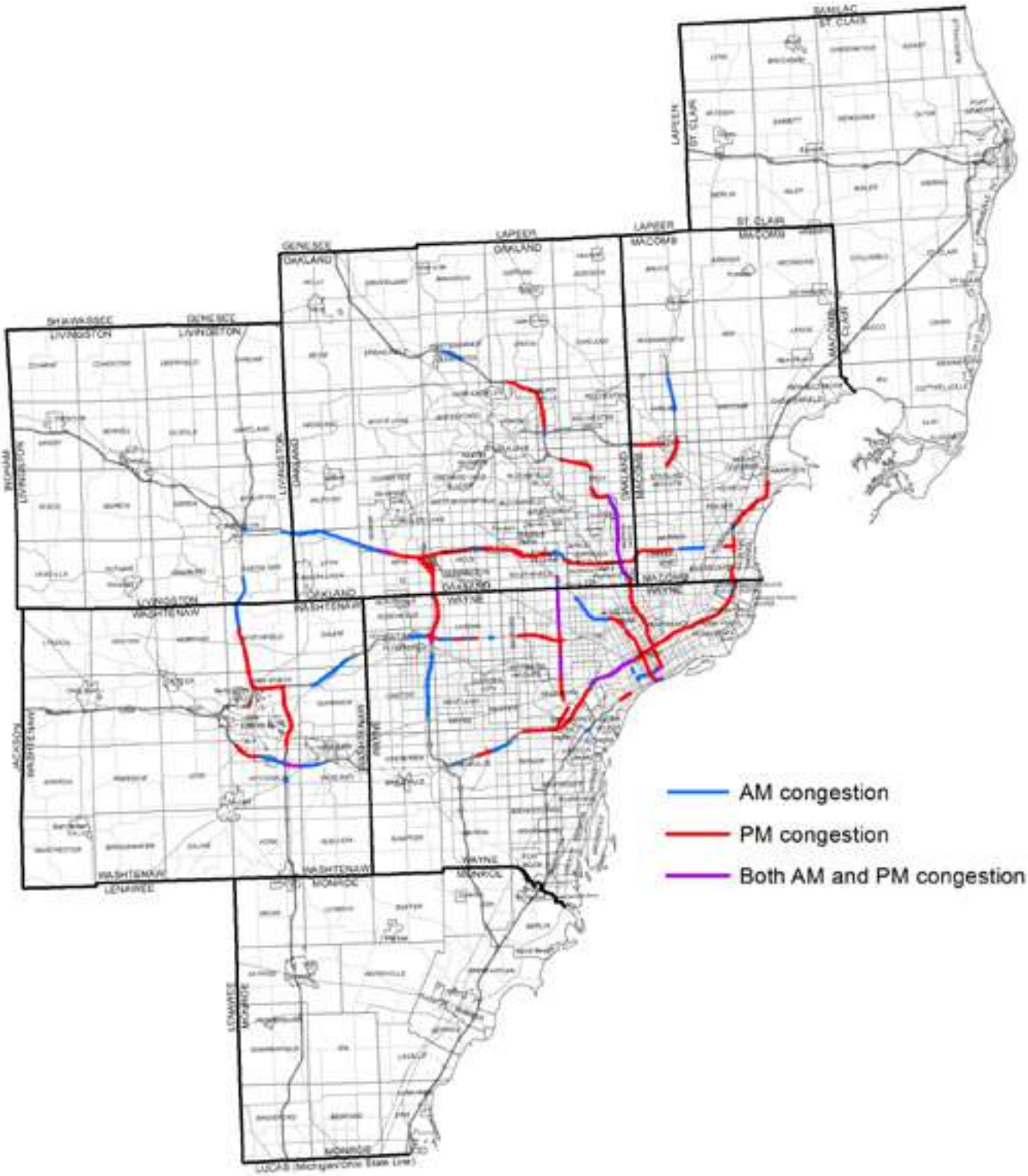
Bottlenecks
In Southeast Michigan, the number of congested locations along the freeway system has steadily increased since 2012. For both morning and evening peak-hour periods, the number of congested locations is increasing (Figure 26).

Nonreoccurring congestion
According to the most recent congestion management process report, while the amount of time a roadway segment is congested following an incident decreased dramatically in the final year of reporting, the number of incidents increased dramatically and the overall amount of time freeways were congested due to incidents increased.

Funding
The congestion management process identifies mitigation strategies and techniques that can be used to relieve congestion in Southeast Michigan. Often, there is not enough funding available to even maintain the existing system. High-cost projects, such as adding capacity that could alleviate some of the congestion, are prohibitive for many communities.

Figure 26

Congested Freeway Locations AM/PM Travel Times, Southeast Michigan



SEMCOG Congestion Management Process

SEMCOG maintains the Congestion Management Process (CMP), which is a systematic approach for managing congestion that provides accurate, updated information on transportation system performance and assesses alternative strategies for congestion management that meet state and local needs. The CMP informs decision makers on regional transportation planning, documents transportation system performance, project selection, and prioritization. The CMP is designed to develop successful, performance-based outcomes by following U.S. Department of Transportation guidelines.

With the 2017 CMP update, SEMCOG included a toolbox, adapted from other major metropolitan areas, to help decision makers select projects that improve regional mobility and accessibility. The toolbox, adapted from other major metropolitan areas, includes congestion mitigation strategies that may be implemented in Southeast Michigan given the region's existing infrastructure, land uses, and environmental resources.

Regional Concept of Transportation Operations

SEMCOG also maintains the Regional Concept of Transportation Operations (RCTO), which guides regional transportation operations through collaborative and coordinated efforts to improve movement along the entire regional transportation network, regardless of jurisdiction. The RCTO:

- Sets a shared vision for future transportation operations,
- Seeks commitment from regional agencies and jurisdictions for a common regional approach to operations and management, and
- Provides opportunity to strengthen working relationships between planners, managers, and decision makers responsible for operations.

The RCTO vision for Southeast Michigan states: Southeast Michigan will have reliable and managed transportation operations across jurisdictional, geographic and modal boundaries for both routine traffic operations and traffic incident management that saves lives, time, and money for its travelers. Four objectives were identified to improve short-term transportation operations:

- Identify priority corridors for future investment,
- Retime traffic signals regularly,
- Clear incidents quickly and safely, and
- Disseminate operations information.

Southeast Michigan is implementing these four objectives. A list of significant corridors was developed across the region and used by road agencies to target technology improvements including adaptive signals, video monitoring, and other intelligent transportation systems. The State of Michigan adopted the "Steer It, Clear It" and "Move Over" laws to improve safety following an incident.

Regional Policies and Actions
Congestion

The following policies establish an overarching framework for long-term congestion management and coordination for Southeast Michigan.

Measure Transportation System Performance to facilitate strategic investment through developing, collecting, analyzing, and disseminating data

- Monitor congestion levels, prioritize congested locations, and implement treatments.
- Use data to inform projects for inclusion in the short- and long-term planning process.
- Conduct annual analysis of congestion performance target setting and program adjustments.
- Invest in tools, including activity based models and microsimulation, to guide decisions.

Increase Safety for all travelers, regardless of mode

- Support campaigns that promote effective and safe first responder trainings.
- Develop and educate drivers on best practices to clear incidents quickly and safely.

Utilize Technology to cost-effectively improve the transportation system

- Improve technology on priority corridors to provide drivers with real time travel information.
- Improve data sharing between road agencies and first responders.
- Implement best practices for work-zone design and alternate route detouring during construction.
- Manage demand for curbspace to balance connected and automated vehicle technology, pick-up, deliveries, parking, and nonmotorized travel.
- Promote use of Commuter Connect program as a mechanism to reduce congestion.
- Coordinate across transportation agencies through the deployment of technology to implement the Regional Concept for Transportation Operations.

Environment

By the Numbers

- 400 miles of Great Lakes shoreline
- 53,377 acres of inland lakes
- 33% tree canopy
- More than 340,000 acres of wetlands
- More than 13,000 road stream crossings
- Southeast Michigan Ozone Action program established in 1994
- On average, eight Ozone Action days are called each year
- Southeast Michigan Commuter Connect participants reduced emissions by more than 200,000 lbs in 2017

Healthy, attractive environmental assets, such as clean air and water, are essential to a thriving region. Southeast Michigan's transportation system plays a significant role in the region's air quality, water, and natural resources. Local air quality is primarily affected by mobile sources – passenger cars to large trucks, trains, and ships – and point sources from local industry. The transportation network also connects the region's water and natural resources and links many land- and water-related recreational activities.

Transportation can affect the water and natural resources through a number of mechanisms, generating stormwater runoff, changing wetland and woodland dynamics, disrupting the movement of water and wildlife, and affecting local habitat conditions. At the same time, the region's aging infrastructure – both transportation and water -- is also impacted by weather events, such as severe storms, freeze-thaw cycles, and extreme heat.

Improving the quality of the region's air, water, and natural resources requires an integrated planning approach across public and private agencies. By sheer scale, the region's dense transportation network and the millions of people and vehicles that travel in the region every day, have a sustained impact on the region's physical landscape. Table 1 identifies environmental and infrastructure priorities in which transportation planning and projects can contribute or impact.

Table 1
Environmental and Infrastructure Priorities, Southeast Michigan

Air Quality	Land/Natural Resources
• Enhance Ozone Action Public Awareness • Prioritize Congestion Mitigation and Air Quality Programs • Influence Air Quality Conformity Strategies • Work Towards National Ambient Air Quality Standards	• Protect and Restore Wetlands • Increase Tree Canopy • Enhance Riparian Corridors • Manage Invasive Species
Water Resources and Infrastructure	
• Reduce Stormwater Runoff and Improve Local Water Quality • Integrate Complete Streets and Green Streets • Enhance Public Awareness • Ensure Streamflow through Culverts and Bridges • Strengthen Infrastructure Resiliency • Implement Transportation and Water Asset Management	

Water Resources Plan for Southeast Michigan
As a region in the Great Lakes, we have a special relationship with water. Southeast Michigan's lakes, rivers, and wetlands define the region's geography and are essential to its economic health, attracting visitors and enhancing quality of life for residents. With more than 4,000 miles of rivers and streams, Southeast Michigan has 450 miles of designated water trails, attracting visitors and building economic health. Transportation provides a connection to water resources throughout the region, making it an important element to achieving water resource goals.

As the designated water quality management agency, SEMCOG published the *Water Resources Plan for Southeast Michigan* in 2018. To help further protect and develop Michigan's water resources, the 2045 Regional Transportation Plan addresses policies and strategies from this plan. Coordinating efforts to align water, natural resources, and transportation priorities will ensure quality water resources for future generations.

Green Infrastructure Vision for Southeast Michigan
The region's green infrastructure network includes natural areas, such as wetlands, woodlands, and riparian corridors, in addition to constructed green infrastructure, designed to manage stormwater runoff from adjacent areas. To address Southeast Michigan's growing need for green infrastructure, the *2045 Regional Transportation Plan* draws from the policies and strategies contained in the *Green Infrastructure Vision for Southeast Michigan.*

This plan addresses how green infrastructure can be used throughout the region to provide connectivity along transportation corridors, as well as how to design and implement greener streets. Through strategic placement of green infrastructure, roadways can be redeveloped to provide natural connectivity and aesthetic beauty, as well as environmental services, such as stormwater management.

Trends

Water resources and infrastructure

Southeast Michigan has nearly 400 miles of Great Lakes shoreline and is home to almost half of the state's population. Most of the region's watersheds connect directly to Lake Huron, the St. Clair River, Lake St. Clair, the Detroit River, and Lake Erie. While water resources are highly valued throughout the region, poor water quality conditions exist in various rivers, lakes, and streams. Changing precipitation events and high amounts of impervious surfaces can result in degraded water resources, localized flooding, overtaxed infrastructure, including culverts, bridges, underground utilities, road closures, and property damage.

Stream flashiness is an indicator of instream water quality and should range between 0.3 to 0.5; this is analogous to a subwatershed that has sufficient stormwater best management practices so that it functions hydrologically like it has only 10-15 percent impervious cover. The level of impervious cover across the region for all subwatersheds ranges from less than 10 percent to more than 60 percent, with transportation corridors making up 35 percent of all impervious cover in the region. Declining water resource conditions will continue without significant collaboration and implementation of appropriate stormwater best management practices, such as constructed green infrastructure techniques across all land-use types.

The transportation network includes other infrastructure within right-of-way corridors – underground drinking water, wastewater and stormwater systems, in addition to numerous private utilities – electric, gas, cable, and phone. While there is an increasing trend in communities developing water asset management programs, there are still thousands of miles of underground infrastructure in the region with little to no information about location, condition, and remaining useful life. Knowing these details are the first steps to building a 21st Century Infrastructure System. Aligning infrastructure priorities in asset management programs will achieve the greatest value for investment while protecting environmental and public health.

Natural resources

Southeast Michigan's water resources are dependent on the quality and quantity of wetlands, woodlands, riparian corridors, and agricultural lands. Currently, Southeast Michigan has over 340,000 acres of wetlands, less than 30 percent of the historical wetland coverage in the region. The region has approximately 33 percent tree canopy, ranging from 20 percent in Monroe County, to 44 percent in Oakland County. These wetlands and woodland areas provide wildlife habitat, improve local air quality and aesthetics, and strengthen property values. Together, these natural resources help reduce stormwater runoff, flooding, and erosion; replenish groundwater; and stabilize streamflow.

These natural resources are often located along riparian corridors, or the adjacent lands along local water ways, also including the designated 100-year and 500-year floodplains. Riparian corridors slow down overland water flow, which benefits the transportation and stormwater infrastructure by reducing the amount of runoff conveyed through culverts and bridges. Extreme precipitation events often result in blocked and surcharged culverts leading to further localized flooding and road closures. Maintaining and restoring the connectivity between riparian corridors and adjacent floodplains is important to addressing runoff from significant rain events. Over many decades the quantity and quality of these natural features has declined while also realizing a significant increase in the prevalence of both aquatic and terrestrial invasive species, such as Phragmites.

Air Quality

SEMCOG is the designated lead local air-quality planning agency under the federal Clean Air Act, In this role, SEMCOG is involved in a number of activities to help attain and maintain national ambient air quality standards (NAAQS) in the region. Table 2 lists the current Southeast Michigan air quality designations.

Table 2
Air Quality Designation, Southeast Michigan

Pollutant	Designation	Year Designated	Area	Transportation Conformity Required?
Ozone	Nonattainment	2018	Entire Region	Yes
Fine Particulate (24-Hr)	Attainment/ Maintenance	2013	Entire Region	Yes
Fine Particulate (Annual)	Attainment	2015	Entire Region	No
Carbon Monoxide (CO)	Attainment / Maintenance	1999	Portions of Wayne, Oakland and Macomb	Yes[1]
Sulfur Dioxide	Nonattainment	2013 & 2016	Portion of Wayne and St. Clair Counties	No[2]

[1]Until maintenance period ends in 2019
[2]Mobile sources are not a significant contributor

In 2018, the entire Southeast Michigan region was designated nonattainment for ozone. Ozone is formed when O2 comes into contact with emission compounds like VOC, NOx, and CO. When ozone forms in the upper atmosphere, it is considered safe and protective of earth, but when it is formed in the lower atmosphere due to emissions, it can cause health issues for humans and affect local air quality. Figure 27 shows the declining trend of ground-level ozone concentrations resulting in improved air quality. The United States Environmental Protection Agency (USEPA) lowered the ground-level ozone concentration standard from 75 parts per billion (ppb) to 70 ppb in 2017. The region would be in attainment without this change in the ozone standard.

Figure 27
Declining Trend in Ground Level Ozone, Southeast Michigan

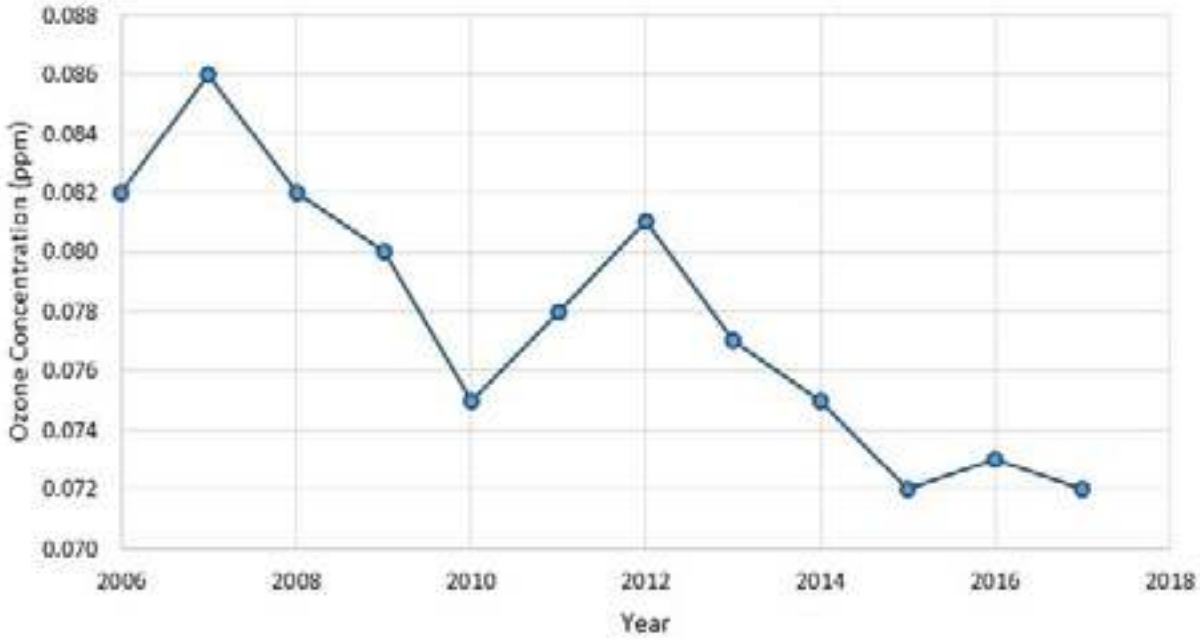
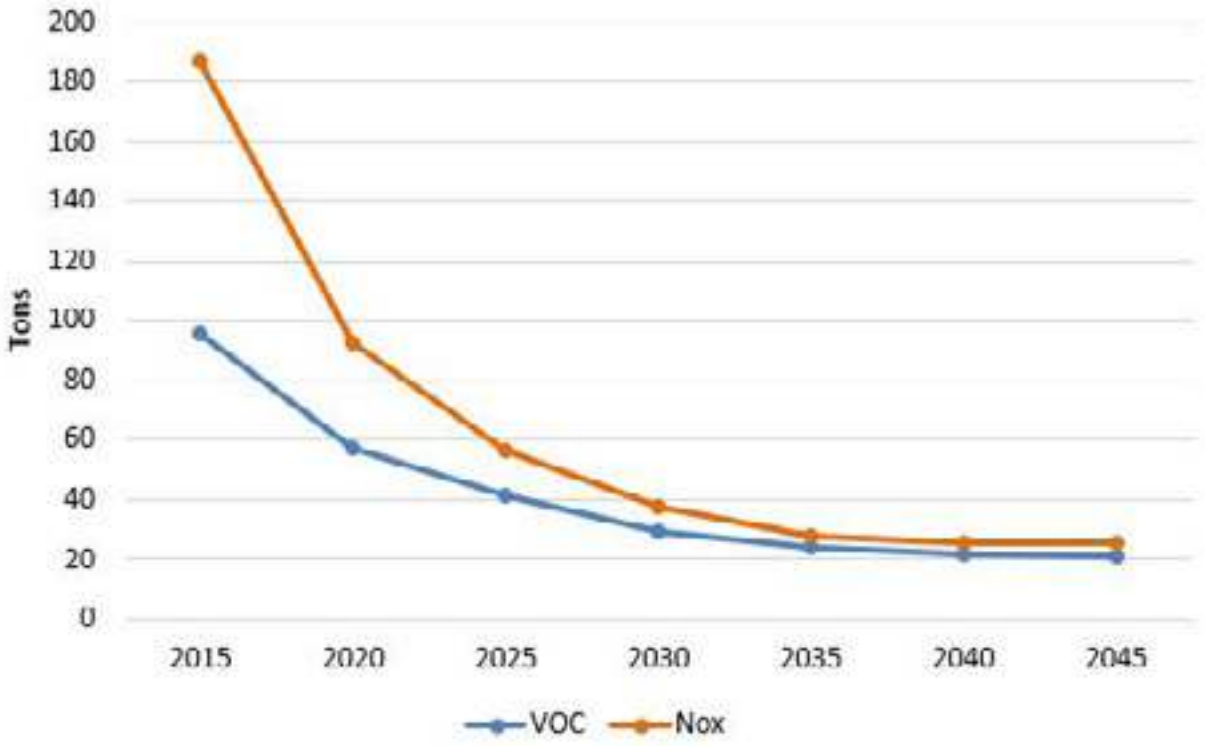


Figure 28
Declining On-Road Mobile Emissions, Southeast Michigan



SEMCOG is actively working to reduce transportation-related air emissions, in order to attain and maintain better air quality in the region. SEMCOG's Congestion Mitigation and Air Quality Improvement (CMAQ) program funds transportation projects that contribute to attainment or maintenance of the NAAQS. Approximately 500 tons of both VOC and NOx emissions are reduced through this funding program.

Other activities aimed at reducing mobile emissions include promoting pedestrian and bicycle travel, ridesharing, telecommuting, and use of public transit.

Challenges

Water Resources and Infrastructure

Transportation corridors often carry significant amounts of runoff from surrounding areas and communities to local streams and rivers. Often times, developments along major transportation corridors carry stormwater into existing MDOT, county, and local stormwater systems, ultimately shifting the burden of stormwater management to road agencies. This challenge is exacerbated by the aging stormwater infrastructure within road right-of-way and changing precipitation events. Transportation and water infrastructure is not adequate to manage extreme weather events.

Additionally, transportation projects are often completed independently of underground infrastructure projects along the same corridors. Coordinating and aligning multiple infrastructure improvement needs will lead to cost-effective investments across all sectors. Agencies are able to seek out available funding resources in order to sequence implementation of the multiple project elements.

Natural Resources

Wetlands, woodlands, and riparian corridors all provide significant environmental benefits to transportation infrastructure, including stormwater management and flooding mitigation. The multi-decade decline of the quality and quantity of these natural features further impacts water resource and other environmental challenges, including achieving adequate stormwater management, protecting and mitigating wetlands, minimizing loss of threatened and endangered species, ensuring habitat connectivity for fish and aquatic life, and managing invasive species.

As transportation agencies plan, design, and construct projects, they must consider multiple aspects of water and natural re- sources, as well as environmental protection.

Air Quality

Currently, Southeast Michigan is designated marginal nonattainment for ozone, meaning that the region is only slightly out of attainment. The USEPA has set a deadline to achieve attainment in 2021 or the region will be bumped up to moderate nonattainment. The MDEQ State Implementation Plan (SIP) for Ozone is also due in 2021 and will outline strategies to achieve attainment. A potential moderate nonattainment designation will include mandatory vehicle inspection and maintenance programs.

The 2021 designation determination is based on an average of ozone data for 2018-2020 seasons. With 2018 an exceptionally hot ozone season, lower temperatures are needed for the 2019 and 2020 seasons in order to achieve attainment. Current regional emission inventory data suggests that mobile emissions account for approximately 30 percent of VOC emissions and more than 50 percent of NOx emissions. It is important to support strategies for the Ozone SIP that are cost effective and have a direct environmental benefit.

Regional Policies and Actions
Environment

The following policies provide framework to better connect transportation and environmental needs:

Preserve Infrastructure through fiscally-responsible, data-driven asset management practices

- Develop a regional asset management system that directs infrastructure investments in a collaborative manner, reduces costs and provides more efficient service.
- Support local and regional opportunities to expand asset management programs, including collection of data and mapping in those areas lacking information.
- Inventory and conduct a condition and vulnerability assessment of culverts; categorize and prioritize for improvements.

Integrate Environmental Protection into the transportation system, enhancing community health and increasing the overall resiliency of infrastructure

- Integrate environmental elements into the early transportation planning process.
- Utilize the environmental sensitivity analysis to inform transportation agencies of potential impacts.
- Support and facilitate collaboration between road agencies and local jurisdictions regarding stormwater management opportunities.
- Complete a climate resiliency analysis for regional transportation assets.
- Continue air quality conformity analysis for all transportation projects.
- Ensure that new projects will not cause new air quality violations, worsen existing violations, or delay timely attainment of NAAQS.
- Reduce stormwater water runoff entering combined sewer systems using green infrastructure or other stormwater management techniques.

Educate and Collaborate with local governments, transportation agencies, utility providers, and residents to improve understanding and operation of the transportation system

- Seek opportunities to strengthen public-private partnerships to address unique air quality and water resource challenges.
- Work across jurisdictional boundaries and agencies to develop and implement capital improvement programs.
- Support partnerships such as the GLWA's One Water Partnership and the Partners for Clean Water.
- Enhance public education and awareness through Ozone Action, Commuter Connect and One Water programs.
- Support activities of the Water Asset Management Council and Michigan Infrastructure Council.

Increase Funding and Expand Local Options to provide resources that are sufficient to meet regional transportation needs

- Work with local agencies and the legislature to support dedicated funding sources for water resources and infrastructure, natural resources and air quality programs.

Freight Travel

By the Numbers

- 180 million tons moved in, out, and within Southeast Michigan annually
- $335 billion in value moved in, out, and within Southeast Michigan per year
- 47% of US/Canada border trade crosses through Southeast Michigan ports of entry
- $597 million in goods each day cross through Southeast Michigan border with Canada

Southeast Michigan's transportation system was developed alongside the growth of the Michigan automobile manufacturing industry. The freight transportation system enables Southeast Michigan industry to resource raw materials, ship products to connections throughout the world, and distribute goods within the region. Freight infrastructure in Southeast Michigan is equipped to handle a wide variety of freight from port facilities that receive shiploads of steel, to freeways carrying just-in-time goods by truck across North America, to railroads that deliver raw materials to industry and distribute finished automobiles, to airports that handle high-value, time-sensitive cargo.

As Southeast Michigan's economy changes and new technologies change how goods are shipped and delivered, the freight transportation system must also adapt to serve this new economic make-up, retain efficient access to national and world markets, reduce impacts on the environment, and minimize the cost of goods.

Trends

Regional freight movement

Freight shipments starting from, ending in, or shipped within Southeast Michigan total more than 180 million tons each year, with a value of more than $335 billion (Figure 29). Each component of the freight system, trucks, water, air, rail, plays a crucial role in delivering goods on-time with minimal cost per unit. Trucking is the most flexible mode, which matches the needs of industry related to automobile manufacturing. Trucks account for the majority of goods moved (69 percent by weight; 66 percent by value). Advances in connected and automated technology are being implemented in trucking leading to new strategies that include truck platooning and even full automation. Marine vessels on the Great Lakes carry vast amounts of coal, steel, gravel, and other commodities, reducing shipment costs for these goods. Airport cargo operations ship low weight, high-value items that supply goods with a short shelf life (e.g., flowers and fish) and keep factories running when a critical shipment is delayed. Railroads carry both large amounts of commodities and higher value automobile parts and consumer goods. Southeast Michigan is also the main gateway for goods traded with Canada, the largest U.S. trading partner. Maintaining the condition and reliable operation of each component of the freight system is fundamental to the regional economy and the supply of everyday necessities for Southeast Michigan residents.

Figure 29

Freight Movement by Weight (Tons) and Value (Dollars): Truck, Rail, Air, Water

Components of the freight system

Truck routes

There are more than 4,000 centerline miles of all-season truck routes in Southeast Michigan (Figure 30). These highways are designed to carry the weight of the variety of truck configurations permitted in Michigan. Every year, truck weights are lowered during the transition from winter to spring, when pavement is most vulnerable to damage. All-season routes maintain a higher weight limit during this time than other roads. All-season roads generally have higher traffic volumes of both freight and passenger vehicles and are in better physical condition than non-truck routes. However, trucks also rely on local roads to make 'last mile' connections to factories, warehouses, and commercial areas. Maintaining the integrity, safety, and efficient operation of these local connections is an equally important part of the freight system.

Michigan has a truck-weight standard based on maximum axle loadings that differs from most other states. Since pavement damage is most directly related to axle loadings (i.e., the amount of weight each axle is carrying) rather than gross vehicle weight (the total weight of the truck and load), Michigan bases allowable truck weights on axle loads rather than gross vehicle weights. Michigan limits the weight allowed on individual axles, depending on the space between them, to a maximum of 11 axles. This permits truck configurations that exceed the national limit of 80,000 pounds total or 17,000 pounds per axle. In Michigan, trucks can total up to 164,000 pounds, but with only 13,000 pounds per axle. These standards are strictly enforced, with oversize and overweight loads requiring a special permit to travel in Michigan. This standard reduces the number of trucks needed to carry the same amount of material, reduces weight per axle stress on highways, and pairs close to the load limits in Canada.

Rail

Southeast Michigan's freight rail system is a complex mix of private and public owners with railroads operating on international, national, regional, and local scales (Figure 31). Rail accounts for over 32 million tons of freight worth over $94 billion moved in and out of the Southeast Michigan each year, carrying both heavy, low-value-per-pound commodities such as coal and high-value products such as auto parts and finished vehicles. Intercity rail passenger service offered by AMTRAK as well as planned commuter rail service uses the same track as freight rail companies and must coordinate and negotiate available times and fees to operate. Rail lines with passenger service have received significant investment in Michigan in the last decade including double tracking and positive train control that increase the safety, speed, and efficiency on passenger rail lines.

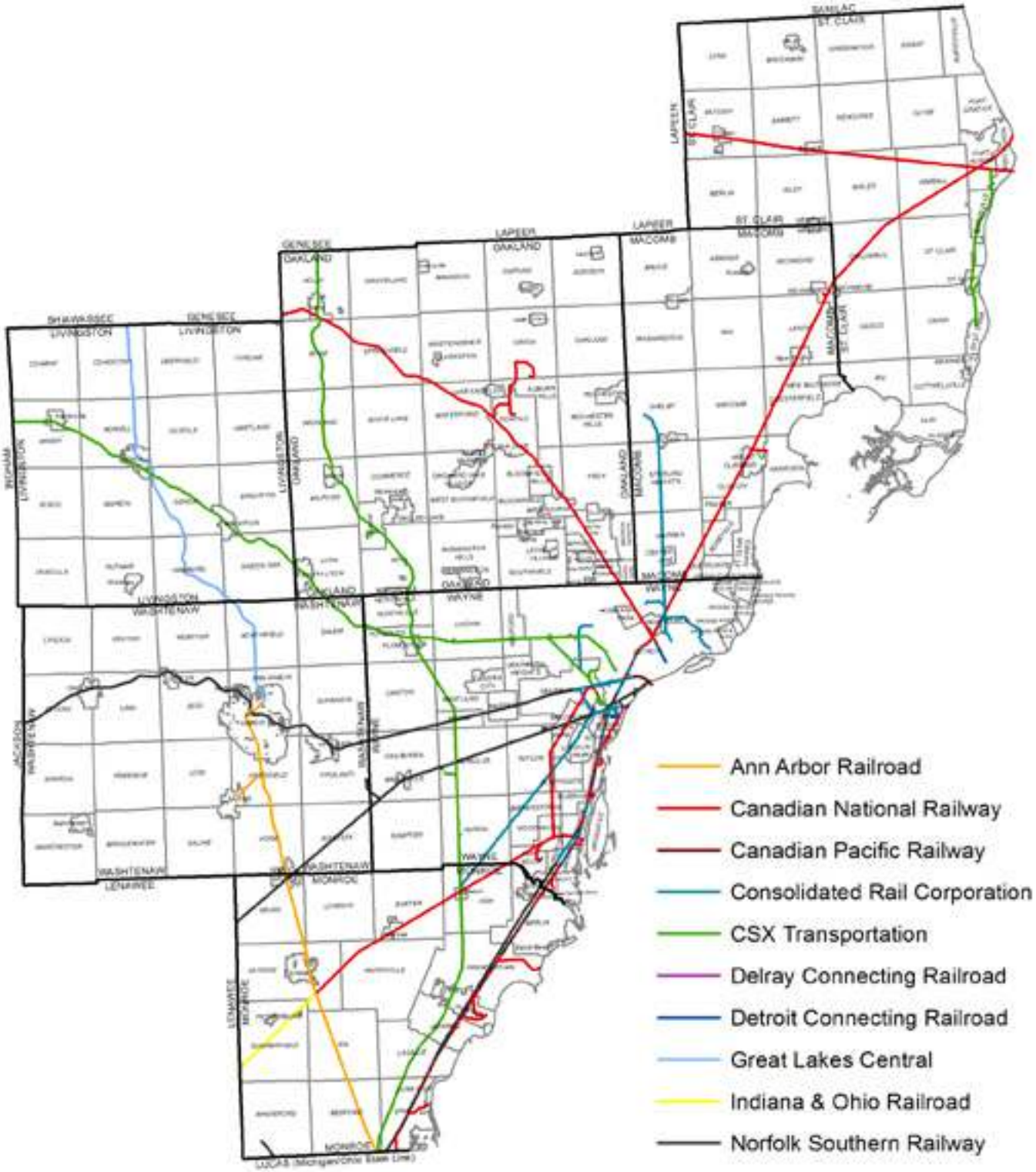
In Southeast Michigan, four Class I railroads (Canadian National, Canadian Pacific, Norfolk Southern, and CSX Transportation) operate rail and supply businesses with national and international service to Canada and Mexico. These railroads carry a wide range of goods, from coal to chemicals to finished vehicles and parts to containerized consumer goods.

Two Class II Regional railroads connect Southeast Michigan with northern Michigan (Great Lakes Central Railroad) and portions of Indiana and Ohio (Indiana & Ohio Railway). These Class II regional railroads primarily carry commodities and interchange with both Class I railroads and Class III short-line railroads.

Seven railroads supply local rail connections to the regional and national railroad network. Two are classified as Class III Shortline Railroads (Ann Arbor Railroad and Detroit Connecting Railroad), which handle a wide range of commodities including automobile parts, finished automobiles, metal products, and bulk materials (flour, sugar, grain, sand, and plastics). Three are Switching and

Figure 30
All Season Truck Routes, Southeast Michigan

Figure 31
Rail by Primary Operator, Southeast Michigan



Terminal Railroads whose primary purpose is to perform local switching services or operate a terminal facility. These railroads are the Adrian & Blissfield Railroad Company (southwest Monroe County), Conrail Shared Assets Operations (Trenton, Detroit, Sterling Heights, Utica), and the Delray Connecting Railroad (southwest Detroit).

International crossings

Southeast Michigan has two areas – Detroit/Windsor and Port Huron/Sarnia – where the Great Lakes are sufficiently narrow to build and operate transportation connections between the U.S. and Canada. There are three highway connections (the Ambassador Bridge and Detroit-Windsor Tunnel in Detroit and the Blue Water Bridge in Port Huron, two rail connections (the Detroit River Tunnel in Detroit and the St. Clair International Rail Tunnel in Port Huron), and three ferries (the Blue Water Ferry in Marine City, the Detroit Truck Ferry in Detroit, and the Walpole-Algonac Ferry Line in Algonac). The Detroit Truck Ferry provides relief service for trucks carrying oversize, overweight, or hazardous material loads not permitted on the Ambassador Bridge. The Walpole-Algonac Ferry has no freight service.

Since Canada and the U.S. have the world's largest two-way trading relationship, these international crossings are some of the most critical transportation links to U.S. economy. The Detroit/Windsor collection of crossings carried $133 billion in goods in 2017, which is 29 percent of all trade crossing the U.S./Canada border. Around $100 billion in goods crosses the Ambassador Bridge alone each year. The Port Huron/Sarnia crossings add another $84 billion in goods. Together, these Southeast Michigan gateway areas are responsible for processing 47 percent of trade crossing the U.S./Canada border.

Concern over these crossings to be able to handle the trade volume in the event that one of the crossings is disabled led to the study and development of a new crossing. The result is the construction of a new bridge just south of downtown Detroit and downtown Windsor named the Gordie Howe International Bridge (GHIB). The GHIB is now under construction, with a planned opening in 2024. It will be a six-lane bridge with direct connections to freeways on both sides, advanced communications capabilities, modern customs facilities, and access for people wishing to cross by bike or on foot.

The GHIB is governed by the Windsor Detroit Bridge Authority (WDBA), a not-for-profit Crown corporation whose board is made up of representatives from Canada and Michigan. The WDBA is charged to design, build, finance, operate, and maintain the GHIB through a public-private partnership (P3). Under the P3 model used by the WDBA, the selected private partner, Bridging North America, will participate in the long-term benefits and risks of the project. Bridging North America will finance most of the upfront costs of designing, building, and operating the GHIB. The WDBA will collect tolls from people using the bridge, which will be used to first reimburse Bridging North America for their investment in the project and second the Government of Canada, who is funding the design and construction of the customs plazas and highway connections on both sides of the border. With this arraignment, Michigan pays nothing for the upfront costs, will benefit from a brand-new connection to Canada, and will receive a share of the toll revenue after all other participants recoup their investment. While the GHIB embodies many of the policies for the SEMCOG 2045 RTP and is the central investment in continuing a close economic and social connection with Canada into the future. The GHIB does not appear in the SEMCOG 2045 RTP project list because the project is presently underway with no ongoing financial obligations expected from the US and Michigan governments.

Intermodal facilities
Almost all businesses and residences connect to the freight system by road and almost one-third is shipped to and from Southeast Michigan by vessel, aircraft, or rail. For most of these shipments, the freight must be transferred between transportation modes at dedicated intermodal facilities.

Commercial marine ports
Southeast Michigan's seven commercial marine ports are all served by vessels traveling on the Great Lakes as part of the St. Lawrence Seaway connecting all the lakes stretching 2,300 miles from Lake Superior to the St. Lawrence River and the Atlantic Ocean. Almost all cargo traveling on the Great Lakes starts and ends at U.S. or Canadian ports on the Great Lakes. These ports transfer, process, and store primarily bulk commodities such as sand, salt, stone for use on roads and building construction, and coal for use by on-site power utilities.

In 2016, Southeast Michigan ports handled 22.8 million tons, which is more than 10 percent of the weight of all goods moved in the region. The Port of Detroit is the largest marine port in Michigan, handling one-fifth of all waterborne cargo moved in the state. The Port of Detroit is overseen by the Detroit/Wayne County Port Authority and consists of multiple marine terminals in Detroit, River Rouge, and Ecorse. The Port of Detroit handles the widest variety of commodities including steel, iron ore, coal, stone, aluminum, and oversize project cargoes, such as windmill towers.

The Port of Monroe is located in the City of Monroe on Lake Erie and the mouth of the River Raisin. It is the region's second largest port and has on-site Class I rail access and is adjacent to I-75. There are five ports located on the St. Clair River in St. Clair County. The St. Clair Power Plant in East China Township receives more than five million tons of coal per year by water. The Ports of Marine City and Marysville handle between 400,000 and one million tons of bulk sand, stone, and salt every year. The ports of Algonac and Port Huron have also received shipments of bulk commodities in the past five years.

Air cargo services
Air travel is both the fastest mode and the mode most sensitive to weight. Therefore, cargo traveling by air tends to be high-value goods (e.g., pharmaceuticals and computer components), goods with high-time sensitivity (flowers, produce, and seafood) or both (automotive parts and parcels). Air cargo is typically transported one of three ways: by an express package delivery service (e.g., FedEx, UPS, and DHL) with dedicated air logistics; by "belly-space" in scheduled flights of commercial passenger airlines (e.g., Delta); and by all-cargo carriers who offer scheduled and unscheduled dedicated cargo flights to select high-volume airports.

In Southeast Michigan, air cargo constitutes over $18 billion in value shipped each year (5.5 percent of all annual freight value). This figure is a combined total of the express package delivery and "belly-space" operating at Detroit Metropolitan Airport, the all-cargo service operating at Willow Run Airport, and private charter flights operating at the Oakland County International Airport in Waterford Township.

Rail/truck intermodal terminals
Railroads increasingly rely on intermodal containers to package freight shipments so that the freight can be transferred between truck, rail, and vessel without needing to unpack, sort, and repack the goods with each change of transportation mode. Containers are used to ship automobile parts, consumer goods, and even bulk agricultural commodities. These containers can either be destined for another part of North America or a coastal port to be loaded on an ocean-going vessel. Rail/Truck Intermodal Terminals are facilities where local industry truck containers to be loaded onto rail or pick up containers from railroads to be delivered for local use or sale.

Southeast Michigan has six intermodal yards in which truck/rail exchanges take place. Each Class I railroad in Southeast Michigan operates at least one intermodal yard: Canadian National (Ferndale), Canadian Pacific (northwest Detroit), CSX Transportation and Norfolk Southern (southwest Detroit). In addition, Norfolk Southern operates its Triple Crown service using specialized truck trailers that can also serve as rail cars in yards in Melvindale and Ypsilanti Charter Township near Willow Run Airport. These yards lack capacity for significant future growth in demand for intermodal service, so spillover demand will be met by capacity supplied by Chicago and other Midwestern U.S. intermodal hubs, adding cost and time delay to Southeast Michigan shippers.

The Michigan Department of Transportation, along with all four Class I railroads, has developed a project named the Detroit Intermodal Freight Terminal (DIFT), that would both update rail infrastructure in Southeast Michigan and consolidate several smaller intermodal yards into one area in Detroit for three of the four participating railroads. The DIFT is located near the center of railroad traffic in Michigan; its implementation will decrease rail delays for both freight and passenger trains, increase intermodal capacity, and route trucks carrying intermodal containers to and from the yard away from residential streets in southwest Detroit. One of the component projects, West Detroit, is already complete. West Detroit made a direct connection to two rail lines that are the current route for passenger service from Pontiac to Chicago, saving around 10 minutes of travel time per trip. The remaining DIFT projects are scheduled for implementation between 2025 and 2045.

Challenges

Economic support
Southeast Michigan's transportation system is vital to economic development and prosperity for residents and businesses. The transportation network carries freight throughout the region and connects businesses to markets around the globe. Freight transportation infrastructure is an important criterion for site selectors who are seeking speedy and reliable transportation access to targeted clusters of business customers as well as reaching end-consumer markets.

Labor and technological change
As discussed in Chapter 2, the aging population and labor shortages could have implications for the future workforce. This impacts the movement of freight as truck drivers retire and fewer people choose driving trucks as a career. A shortage of drivers will increase the cost of goods. Trucking companies are making investments in advanced technologies to expand the automated capabilities of truck driving and experimenting with truck platooning and other operations. These strategies will reduce the number of people needed to drive trucks in the future.

U.S./Canada border

With almost $600 million in goods crossing Southeast Michigan ports of entry per day, any disruption in operation of the international bridges and tunnels has significant economic implications for Southeast Michigan as well as much of the U.S. and Canada. Reliable operation of the crossings and customs processing has implications as to whether Southeast Michigan businesses can reach the Greater Toronto Area with one-day truck drive. Even more concerning is the lack of redundancy in border crossing capacity if one of the major bridges or tunnels is rendered unusable. Construction of the Gordie Howe International Bridge and modernization of the Blue Water Bridge U.S. customs plaza are major steps towards addressing both the redundancy and reliability challenges.

Congestion

The cost of moving freight is determined by multiple factors. Among them are equipment costs, driver compensation, fuel costs, and the time to reliably deliver the load to its destination. Severe daily congestion will increase truck travel time, which decreases the distance the truck can travel in a day, limiting the reach of shippers and increasing fuel and driver costs. Increasing the reliability and speed of highways reduces cost for Southeast Michigan businesses, increasing their competitiveness and decreasing costs to consumers.

I-94, Southeast Michigan

'Last-Mile' connections

While freight travels mostly on long stretches of freeway or rail, almost every freight trip starts and ends with a truck traveling on a local road. Areas with industrial or commercial development will have trucks that need to move to and from freeways. These roadways should be designed to handle the weight, have signals that are appropriately timed to provide better progression, have intersections designed to accommodate truck turning movements, and have pedestrian and bicycle accommodations that allow all users to travel safely. These 'last-mile' connections for truck trips have the highest variability in conditions and the greatest effect on the safety, access, and environmental conditions in local communities.

Regional shipping options

With the exception of trips to and from Canada, Southeast Michigan has few freight trips that pass through the region. This is partly beneficial in that it reduces the severity of congestion and the cost of additional highway capacity that would be needed if many trips were passing through. However, it also means that commercial marine ports, air cargo services, and rail intermodal yards are also sized to serve the volume of business generated by Southeast Michigan alone. Maritime, air cargo, and rail carriers operate most efficiently when there is a high volume of goods to ship. Larger freight hubs, like Chicago for air and rail, match the Chicago region's local freight with freight from around the Midwest, providing shippers with more service offerings, expanded delivery options, and lower costs.

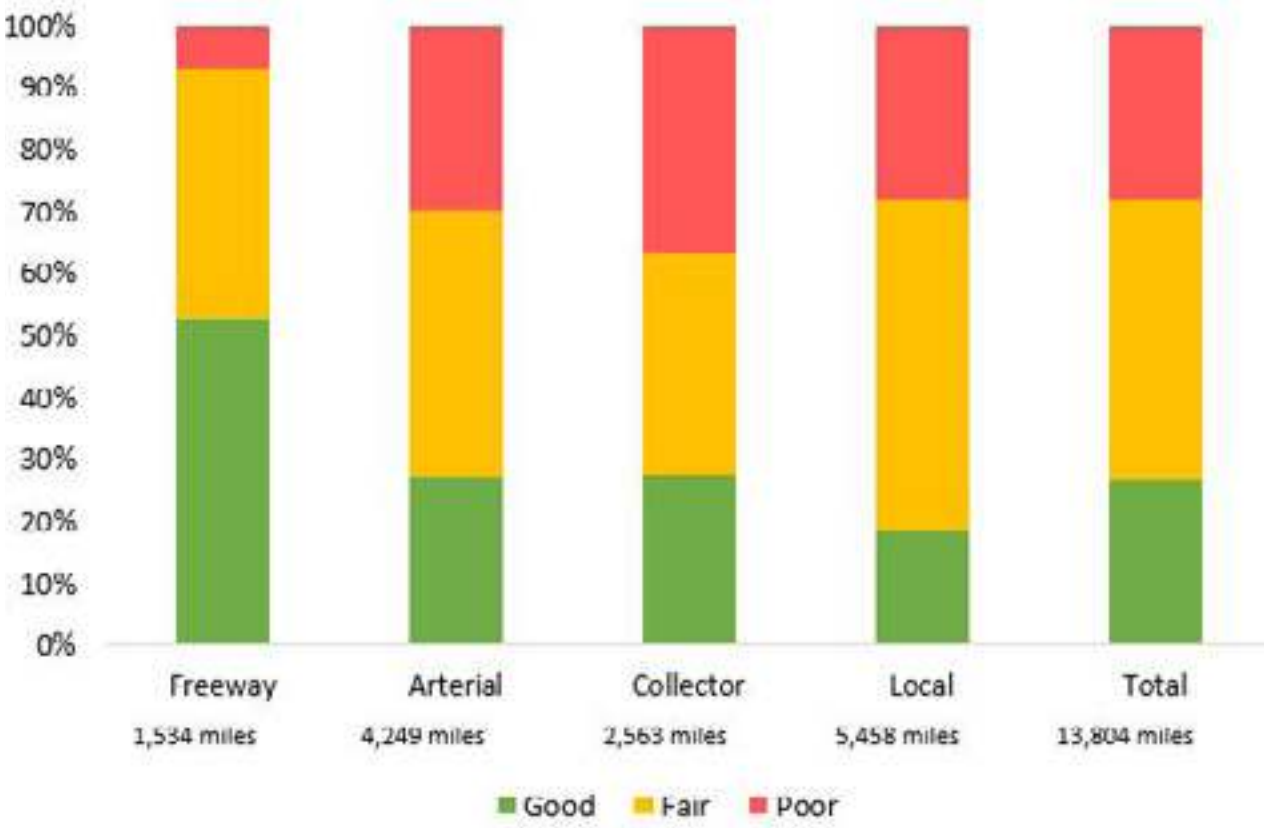
Infrastructure condition

Trucks

Truck operators rely on the nationwide network of public highways that are designed to carry the weight of standard truck axle loads. Roads that deteriorate into poor condition become ineffective at distributing the weight and both damage trucks and are damaged by trucks. Keeping pavement structurally intact where trucks travel is critical to preserving pavement and truck access. Per trip, trucks typically travel longer distances than passenger vehicles. They primarily use interstate freeways for long-distance travel, then high-volume arterials to get close to their final destination. As needed, trucks travel on smaller collector and local roadways. In general, the pavement on freeways and arterials, where trucks travel most, is in better condition than collectors and local roads.

Underinvestment in road maintenance and reconstruction has led to a decline in pavement condition in general. Maintaining the quality of freeway pavement while restoring the growing number of arterials and local roads that connect to freight destinations is an ongoing challenge that will require planning, coordination, and a sustained increase in resources devoted to road construction.

Figure 32
Pavement Condition by Road Classification, Southeast Michigan, 2017-2018



Environment
Moving goods carries inherent risk to health, safety, and environmental quality. Freight transportation networks move of all types of goods, from raw materials to finished products, from heavy to light, from food to hazardous materials. Transporting goods by trucks, rail and marine vessels also leads to potential environmental impacts to air and water. Emissions generated from the vessel engines contribute air pollutants, such as ozone precursors including NOx and VOCs.

In addition to the air pollutants, accidents and spills from freight transportation can impact local waterways. The Huron-to-Erie corridor is the primary source of drinking water for the region's population. Spills of materials and goods due to marine vessel or other freight accidents along this important waterway create risks of contamination to the drinking water network. This leads to increased costs and resources to local communities to properly treat the water for public consumption. Additionally, as vehicles age, oil, gas, and other contaminants are released from the vehicles and deposited onto the roadways. Rain events wash those contaminants into our open water bodies, contributing to polluted waters.

The heavy weight of the vehicles and loads increase the amount of time and space needed to start and stop; caution is needed when traveling by car, bike, or on foot near trains and trucks to keep extra space, stay out of blind spots, and avoid sudden changes in direction.

Regional Policies and Actions
Freight

The following policies establish an overarching framework for a safe and efficient freight network for Southeast Michigan.

Support the Regional Economy through the reliable movement of goods, efficient trade connections, expanded labor mobility, and support for tourism and local placemaking

- Identify challenges to "last-mile" freight access through coordination with local governments and freight stakeholders.
- Apply the SEMCOG Congestion Management Process to evaluate highway performance and identify operational practices that improve freight mobility.
- Employ advances in connected and automated technology that improve safety, traffic operations, and travel reliability.
- Promote development and implementation of projects that improve the efficiency of moving freight between travel modes.
- Consider deliveries as one of the essential uses of curb space in commercial areas.
- Provide sufficient truck parking to facilitate efficient local deliveries and preparation for cross-border trips.
- Coordinate with freight stakeholders to develop policies and implement advanced technologies (drones, truck platooning, and automation) in ways that increase safety, reduce negative impacts on local communities, and contribute to economic productivity.

Preserve Infrastructure through fiscally-responsible, data-driven asset management practices

- Support road agencies to use a data-driven approach to identify fixes for roadways and implement asset management plans.
- Evaluate the condition the regional network of Class A All-Season roadways to assess for deterioration of critical freight connections.
- During closures for road construction, plan alternate routes that are suitable, both for trucks displaced by the construction and for trucks accessing the construction site.
- Reduce constraints to freight transportation resulting from closed and load-limited bridges.
- Coordinate with freight facility owners to improve the condition, availability, and competitiveness of regional logistics and freight transfer operations at airports, marine ports, and rail/truck terminals.

Integrate Environmental Protection into the transportation system, enhancing community health and increasing the overall resiliency of infrastructure

- Implement *The Southeast Michigan Traffic Safety Plan*.
- Identify safety risks where high truck freight volumes and pedestrian/bicycle facilities intersect.
- Improve the visibility and efficiency of truck routes to reduce trips through residential areas.
- Reduce emissions from freight transportation to improve air quality and maintain compliance with standards.
- Strengthen emergency response coordination for potential spills along transportation networks and the Huron-to-Erie corridor.
- Implement green infrastructure to collect and filter contaminants before they reach open water bodies.

Intercity Transportation

By the Numbers

- Detroit Metropolitan Airport is the 19th busiest airport in North America by passenger volume and 32nd busiest in the world
- More than $1 billion has been invested to improve Southeast Michigan passenger rail since 2009
- 623 passenger rail route miles in Southeast Michigan serve 20 communities

Trends

Intercity transportation service provides travel options between cities – usually on a fixed route and schedule. Southeast Michigan provides multiple options for traveling in and out of the region by air- plane, bus, and train. Improvements to the passenger intercity system offer businesses and leisure travelers shorter travel times, additional train frequencies, improved reliability, and connections be- tween urban centers and smaller communities in Southeast Michigan and beyond.

Air

Detroit Metropolitan Airport (DTW) is Southeast Michigan's primary connection point for air passenger traffic to national and international destinations. Detroit is the 19th busiest airport in North America by passenger volume and 32nd busiest in the world. In 2017, domestic and international passengers totaled over 34 million. Passengers and workers access DTW by car, bus, shuttles, taxis, and transportation network companies. In addition, there are a variety of airports that support charter passenger, corporate, and personal flights.

Expanded public transportation service to DTW is an objective in regional transit plans, but only two are currently in service. The Michigan Flyer-Air Ride service offers 12 daily round-trips between Ann Arbor and DTW, with additional round-trip service between two stops in Ann Arbor and DTW. In 2018, a high-frequency, limited-stop bus service began providing direct connection between downtown Detroit and DTW along the FAST Michigan route serviced by SMART. Additional direct bus services to DTW are featured in proposed plans to expand regional transit service.

Bus

Traveling by intercity bus provides a low-cost option for travelers to reach destinations outside of Southeast Michigan. Intercity buses pool many travelers in one vehicle, reducing the number of independent trips between cities, which contributes to reduced fuel consumption and auto emission.

Southeast Michigan has several carriers providing intercity bus service to large and mid-sized cities in the upper Midwest. These carriers include Indian Trails, Greyhound, Miller Transportation, Baron's Bus Line, Megabus, and Michigan Flyer. Across these carriers, travelers can access cities within Michigan along I-96 as well as destinations along I-94 to Chicago, IL and I-75 south to Toledo, OH. Miller Transportation also operates a demonstration route providing two daily round-trips between Detroit and Port Huron.

Intercity buses can be accessed through various stations in Southeast Michigan, including Ann Arbor, Dearborn, Detroit, Lincoln Park, Pontiac, Southfield, and Ypsilanti. These stations are often co-located with other transportation services, such as city bus stops, Amtrak stations, and central business districts with taxi and ride hailing services (such as Uber and Lyft). Some carriers opt to make stops near freeway exits.

Rail

MDOT provides capital and operating assistance, technical support and safety oversight of Michigan's passenger rail system. The department also sponsors three separate intercity passenger rail routes that are operated by Amtrak. Two of these routes, Blue Water and Wolverine, connect Port Huron to Chicago and Pontiac to Detroit and Chicago, respectively. Seven stations within the region provide access to train transportation between the two routes. The Blue Water service (Port Huron station) offers one round trip daily between Chicago and Port Huron and the Wolverine services offers three round trips daily between Chicago and Detroit/Pontiac. These two passenger rail corridors serve 20 communities and consist of 623 route miles in Southeast Michigan. In 2017, the Wolverine route ridership was 459,000 and the Blue Water route ridership was 189,000.

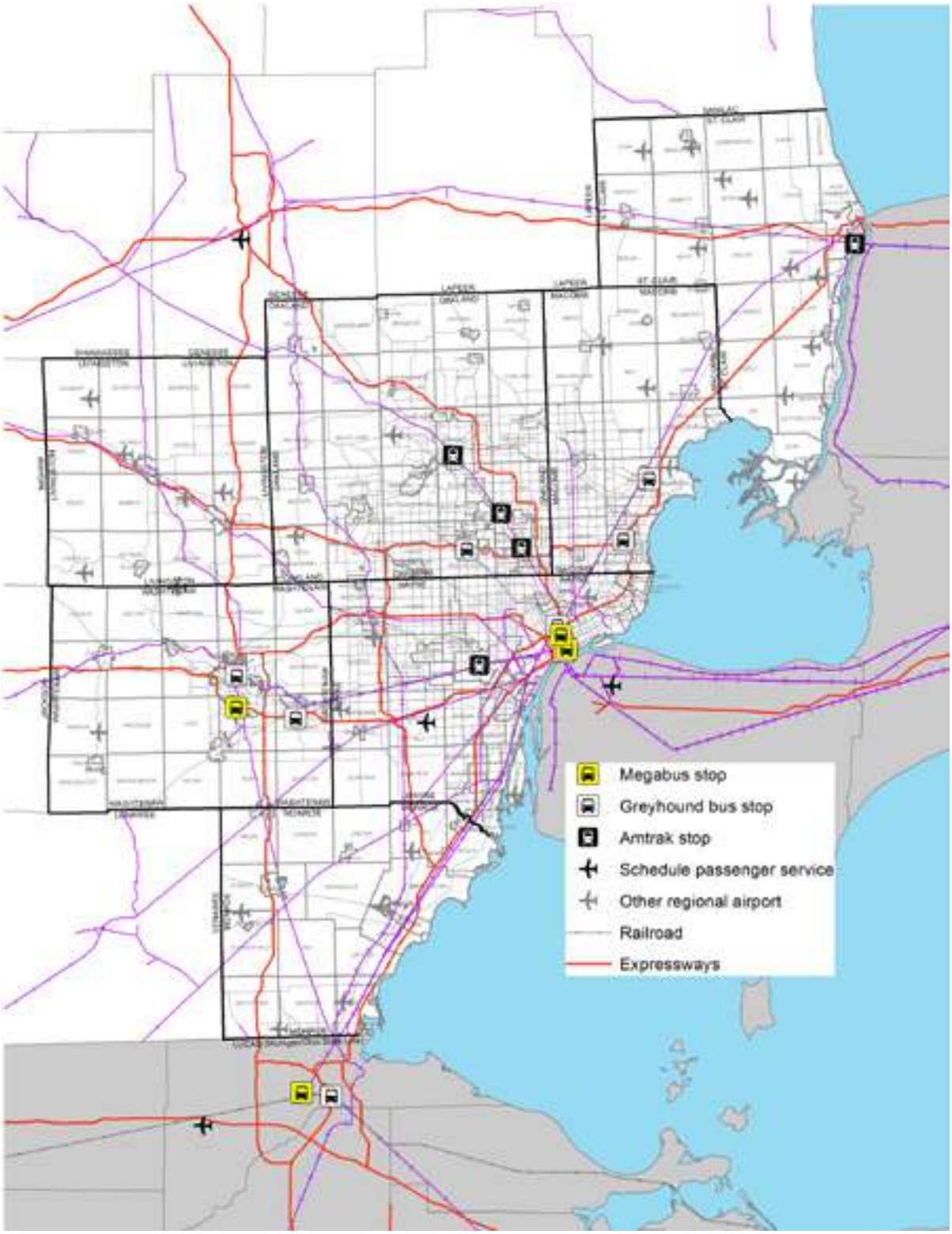

Amtrak Train Crossing Bridge, Southeast Michigan

Since 2009, $1 billion has been invested by MDOT and the Federal Government in passenger rail for new engines and passenger cars, new and enhanced stations, and other capital projects designed to eliminate chokepoints and improve travel times. Much of this effort focuses on the Wolverine service with the goal of increasing passenger speeds up to 110 mph. Since 2012, passenger trains have traveled up to 110 mph on the Amtrak-owned portion of the accelerated rail corridor between Kalamazoo, Michigan and Porter, Indiana. All routes are expected to have new equipment by 2022.

International connections

Southeast Michigan hosts several road and rail connections with Canada, but there are few surface intercity public transportation options for traveling to and from Canada. Greyhound operates three weekday trips from Detroit to Toronto. Canadian intercity rail service to Toronto can be accessed across the Detroit River in Windsor, and across the St. Clair River in Sarnia. Travel between Chicago, Detroit, and Toronto would be enhanced by continuous rail service connecting these large metropolitan areas.

Figure 33
Intercity Routes, Southeast Michigan



Challenges

Access

Passenger rail providers work to reduce the gaps in the system, but improvements are needed. The lack of north/south rail service between Southeast Michigan and Toledo reduces rail-service options for east coast and southern state destinations. The lack of connection between Southeast Michigan and Canada also imposes international access issues and decreases opportunity for economic activity. Reducing the barrier for access to the international border requires working cooperatively with the Federal Railroad Administration (FRA), Amtrak, MDOT, Via Rail, Canada, and homeland security.

Although there have been recent improvements with the limited-stop SMART bus from Downtown Detroit to DTW, public transportation to and from the airport still does not adequately connect people to the places they need to go around the region.

Detroit Metro Airport

Lack of funding

A fully functioning transportation system requires funds that adequately address capital, operating, and long-term maintenance expenses. While we invest heavily on capital improvements, revenue for passenger rail operations cannot be sustained on fares alone which makes the need for other sources of revenue pertinent. While the state continues to financially support service through its annual budget, this is not guaranteed. Financially supporting all of the various portions of the transportation system with a dedicated and stable source would result in Southeast Michigan being more economically competitive with other regions across the country and would assist in reaching other goals including overall regional quality of life.

Regional Policies and Actions

Intercity Transportation

The following policies establish an overarching framework for intercity transportation in Southeast Michigan.

Increase Access to jobs and core services, regardless of race, gender, ethnicity, national origin, age, physical ability, or income

- Increase options and enhance connections between intercity bus and rail to improve the intercity system.
- Support the maintenance and enhancement of integrated and intermodal transportation connections throughout the region.
- Develop connected and automated vehicle services that support existing and future intercity connections.

Support the Regional Economy through the reliable movement of goods, efficient trade connections, expanded labor mobility, and support for tourism and local placemaking

- Provide technical assistance for initiatives seeking to enhance the performance of the transportation system.
- Promote safe and efficient passenger rail connections for people traveling within Southeast Michigan and connecting to other regions.

Pavement

By the Numbers

- 25,000 miles of public roads in Southeast Michigan
- 40% of roads are in poor condition (2017)
- 43% of roads are in fair condition (2017)
- 17% of roads are in good condition (2017)
- 74% of Southeast Michigan residents dissatisfied with the condition of roads and bridges

Pavement is a foundational element of Southeast Michigan's transportation system. All road users – car, bus, bicycle, and freight haulers – depend on quality pavement for a safe, predictable trip. Extending pavement life depends on consistent monitoring and using fixes that are appropriate to the age and condition of the pavement.

SEMCOG, along with MDOT, county road agencies, and other local partners to collect pavement condition data using the Pavement Surface Evaluation and Rating (PASER) system on federal-aid-eligible roads. This effort results in a pavement score of good, fair, or poor. Good pavements require little-to-no maintenance. Fair pavements are most effectively treated with capital preventive maintenance. Poor pavements need structural improvement, such a rehabilitation or reconstruction.

SEMCOG seeks to invest in projects that match the condition of the roadway with appropriate fixes. This is done by selecting a variety of solutions that maximize capital preventive maintenance. These projects are cost effective at extending the life of the road, while deferring more expensive rehabilitation or reconstruction.

Trends

Conditions of road pavement in Southeast Michigan are getting worse. Despite asset management approaches to preserve pavement quality, the percentage of lane miles of road in fair condition has steadily declined, while the percentage of roads in poor condition has increased (Figure 34). The large jump in roads going from fair condition to poor condition increases the overall cost of fixing the roads, as projects for roads in poor condition are significantly more expensive. Asset management helps direct investment towards maintaining roads in good and fair condition and reducing costly road replacement. However, at current investment levels, the condition of Michigan roads is projected to continue to deteriorate.

Figure 34
Pavement Condition 2008-2017, Southeast Michigan

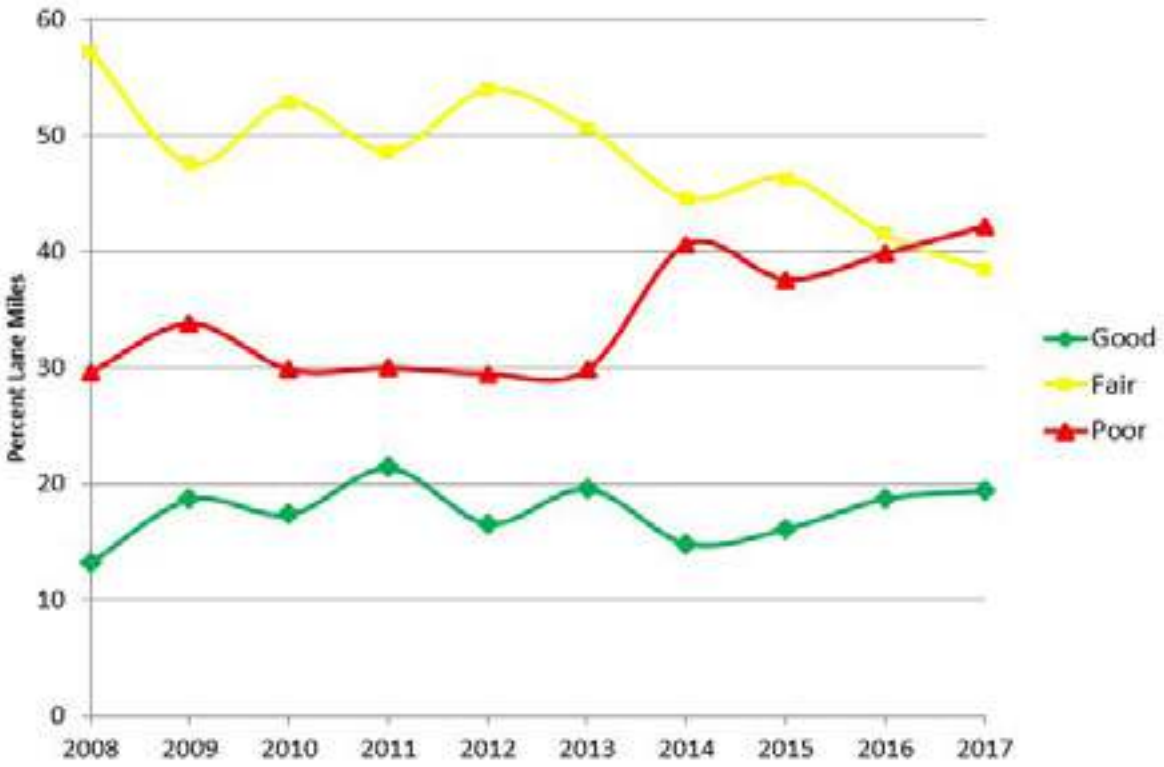
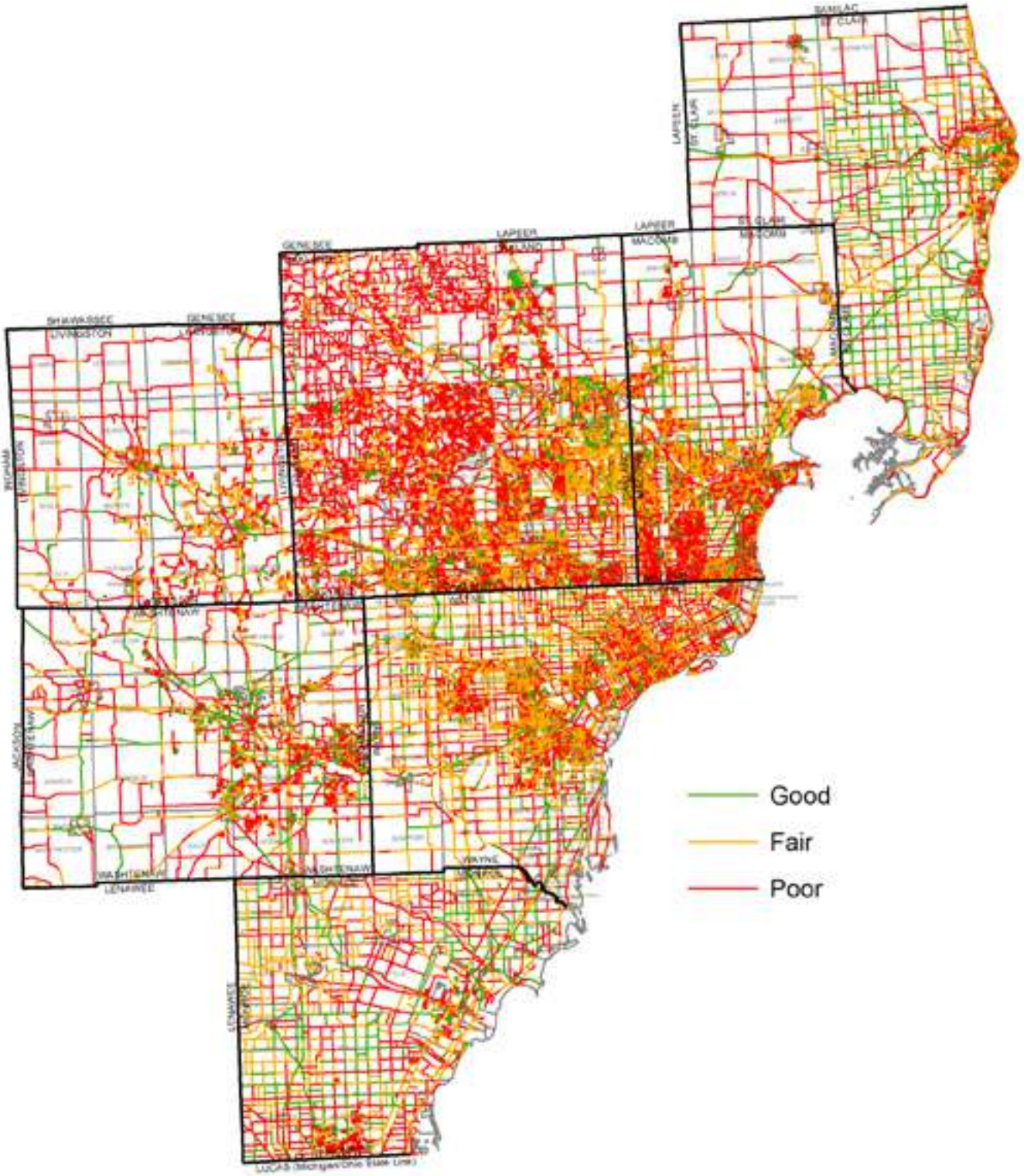


Figure 35

Pavement Condition, Southeast Michigan, 2017



Challenges

Funding

Funding is one of the defining challenges of the 2045 RTP. Michigan has been spending much less on roads than the rest of the nation for decades. Nationally, Michigan ranked last in total expenditures for roads per capita. It costs over $1.2 million on average to reconstruct one lane mile of road. In 2015, Michigan spent $370 per person where other state and local governments across the nation were spending an average of $536 per person for roads. This discrepancy becomes even more significant when comparing Michigan to neighboring states, Illinois, Indiana, Minnesota, Ohio, Pennsylvania, and Wisconsin. The average road expenditures for these six states is $660 per person.

Over the decades Michigan has relied on three basic sources of road funding – fuel taxes, registration fees, and federal funds. While the state legislature passed a transportation bill in 2015, there is still a large gap in the funding needed to address the deterioration. Exploring other sources of revenue used for roads in other states such as general funds, property tax, bonds, sales tax, income taxes, tolls, and other options is important. (This topic was discussed in detail in Chapter 2: Guiding Decisions: Defining Challenges.)

Figure 36

Pavement Condition and Financial Need, Southeast Michigan

We need to invest an additional

$1.2 Billion

annually within our region for the next 25 years to bring our roads back to 80% good or fair

Climate resiliency

Michigan is a cold weather state. Changing precipitation patterns create additional challenges to improving pavement condition across the region. The declining condition of underground infrastructure, such as stormwater collection and conveyance systems, and the ability to adequately manage runoff from the roadway further accelerates the decline in pavement condition. This creates additional infrastructure funding needs beyond just pavement rehabilitation.

The transportation and water infrastructure systems are not adequate to manage extreme precipitation events that have occurred more frequently in the last decade. Similarly, the freeze/thaw cycle, or the time between water freezing and melting is also occurring more frequently and plays a role in weakening of pavement. The expanding and contracting of water as it freezes and thaws allows for water to get into existing cracks in the road and pushes outward as it freezes, ultimately resulting in larger cracks and potholes and increasing the costs of winter road maintenance.

I-696 Flooding, Royal Oak, 2014

Regional Policies and Actions

Pavement

The following policies establish an overarching framework for long-term pavement condition management in Southeast Michigan.

Measure Transportation System Performance to facilitate strategic investment through developing, collecting, analyzing, and disseminating data

- Work with regional partners and road agencies to collect pavement condition data for Southeast Michigan's road network.
- Support road agencies' use of a data-driven approach to identify fixes for roadways and implement asset management plans.
- Coordinate with road agencies to set condition targets based on available resources and pavement management best practices.
- Conduct an annual analysis of pavement condition performance target setting and program adjustments.

Educate and Collaborate with local governments, transportation agencies, utility providers, and residents to improve understanding and operation of the transportation system

- Publish an annual Transportation Improvement Program (TIP) Survey, which looks at projects that are implemented during each fiscal year to compare pavement investments across time.
- Maintain an up-to-date public website with regional pavement condition data.
- Support activities of the Transportation Asset Management Council and Michigan Infrastructure Council to coordinate infrastructure activities throughout Southeast Michigan and the State of Michigan.
- Coordinate with road agencies, underground infrastructure utilities, and the private sector on road projects for most efficient and cost effective solutions.

Preserve Infrastructure through fiscally-responsible, data-driven asset management practices

- Share information on best practices in pavement design and engineering.
- Implement road projects that make the most cost-effective use of resources while focusing on maintenance to maximize the life of existing roads.
- Support development of local asset management plans that are regularly monitored and updated and coordinated with other infrastructure systems.
- Improve conditions that meet the needs for connected and automated vehicle deployment.

Increase Funding and Expand Local Options to provide resources that are sufficient to meet regional transportation needs

- Work with regional and state leaders to explore alternative funding options.
- Develop educational materials that demonstrate the resource gap and identify possible solutions.

Safety

By the Numbers

- More than 360 people die each year from traffic crashes
- About 40% of all fatalities involved a pedestrian, bicyclist, or motorcyclist
- From 2012 to 2016, $224 million has been invested in traffic safety improvement projects in Southeast Michigan
- Fatality and serious injury rate has dropped 4% since 2008
- Over 30,000 bike lights, LED armbands and wristbands, and informational pamphlets have been distributed through Walk.Bike.Drive. Safe educational campaign

Arriving safe is the most important result of any trip. Southeast Michigan's transportation system is essential in connecting people with each other as well as jobs, schools, recreation, and other amenities. Unfortunately, with over 100,000 crashes annually, every day there are people who do not complete a trip with their property, health, or life intact.

Improving the safety of people traveling in Southeast Michigan requires an ongoing commitment to reducing risks throughout the transportation system. This commitment requires a comprehensive approach that includes expanding vehicle and roadway safety features, changing the design of high-crash areas, providing facilities dedicated for cyclists and pedestrians, and adopting technologies that reduce human errors and distraction, and educating all road users on laws and best safety practices.

SEMCOG seeks to improve the safety of all road users through applying a comprehensive and coordinated approach that follow the Four Es of Traffic Safety: Engineering, Education, Enforcement, and Emergency Services (Table 3).

Table 3
Four Es of Traffic Safety

Engineering	Education
• Intersection treatments (signal optimization and visibility) • Lane departure treatments (rumble strips and cable barrier) • Signs and pavement markings • Access management • Traffic calming	• Pre-driver safety training • School safety curricula • Targeted driver education • Multi-media public information and education campaign • Stakeholder training on new and proven countermeasures
Enforcement	**Emergency Services**
• Laws and policies that can result in fines or penalties • Police training programs on laws and unsafe behaviors • High-visibility enforcement and patrolling • Coordination between police and traffic engineers to identity safety issues	• Partnerships and coordination among first responders • Training in traffic incident management (Mi-TIME) • Promotion of safe, quick clearance and vehicle removal laws • Use of high-visibility apparel for first responders • Post incident debriefings and after action reports

Southeast Michigan Traffic Safety Plan

SEMCOG strives to assist local governments and transportation agencies in addressing traffic safety by using a data-driven approach to identify the region's key safety needs and guide investment decisions.

To address the region's traffic safety challenges, the 2045 Regional Transportation Plan draws from the policies and strategies in the Southeast Michigan Traffic Safety Plan. Crash, traffic volume, and roadway data were used to identify safety emphasis areas and recommendations for implementing region-wide safety strategies based on the Four Es of Traffic Safety (see above). SEMCOG updates regional analysis using updated traffic safety data every year and makes the data available in user-friendly formats for local agencies. SEMCOG also evaluates the effectiveness of implemented traffic safety projects through before-and-after studies, which inform future investments.

SEMCOG has identified specific roads and intersections that exceed expected crash rates. This analysis is used to prioritize locations for engineering countermeasures. It also helps identify potential locations for conducting an independent formal safety performance examination, known as a Road Safety Audit.

Trends

Traffic crashes in Southeast Michigan remained steady in 2017. According to traffic crash data, there were 145,427 total crashes, down less than one percent from 2016, but still up nine percent from 2008. Traffic fatalities decreased for the first time in seven years, down to 369 in 2017 from 430 in 2016. The 14 percent decline was the largest decrease in fatalities in the past decade. Serious injuries increased for the second consecutive year, up eight percent to 2,235 in 2017 (Table 4).

Table 4

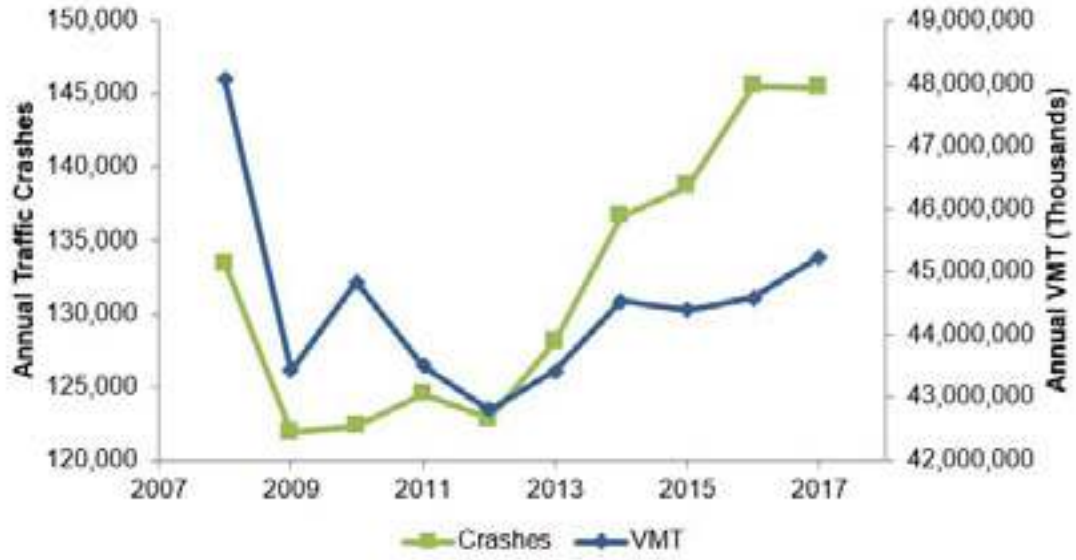
Crashes, Fatalities, Serious Injuries 10-year Trends, 2008-2017

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	10-Year Trend
Crashes	133,440	121,905	122,309	124,527	122,832	128,088	136,636	138,710	145,510	145,427	
Fatalities	342	340	333	340	361	363	371	387	430	369	
Serious Injuries	2,542	2,589	2,357	2,263	2,267	2,145	2,002	1,913	2,076	2,235	

Similar trends are occurring across the state and country. Under current economic conditions with sustained growth, an increase in the amount of driving, or Vehicle Miles Traveled (VMT), is expected. More VMT typically means an increase in the number of crashes. In addition, since 2013 the growth rate of traffic crashes has outpaced growth of travel. Figure 37 shows traffic crashes rising faster than travel volumes.

Figure 37

Annual Traffic Crashes and VMT 2008-2017



Challenges

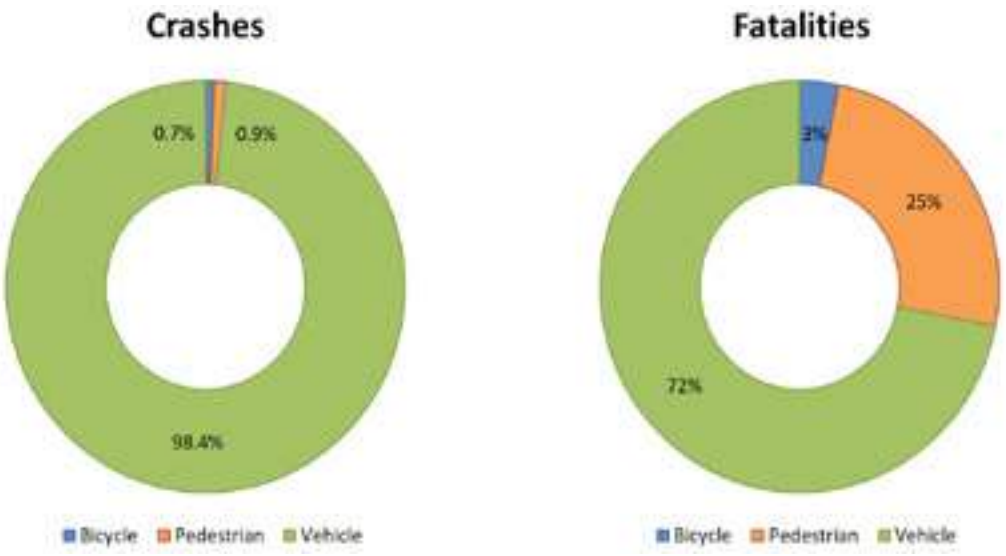
Biking and walking

Biking and walking are increasingly popular travel modes for shorter trips. Pedestrians and cyclists involved in traffic crashes are especially vulnerable to serious injury or death. As shown in Figure 38, pedestrian- and bicyclist-involved crashes in Southeast Michigan accounted for less than two percent of total crashes, yet accounted for 28 percent of all traffic fatalities over the last five years (2013-2017).

To increase safety for walking and biking, local and regional networks of trails, paths, and on-road facilities will need to expand to provide safe walking and biking travel to people with a wide range of abilities, and include designs that provide safe access to people with disabilities. In addition, it is essential to provide education for people who walk, bike, and drive. Law enforcement plays a major role in promoting safe travel practices and increasing awareness of the rules-of-the-road for all travelers. *SEMCOG's Bicycle and Pedestrian Travel Plan for Southeast Michigan* provides details on planned local and regional pedestrian and bicycle facilities.

Figure 38

Pedestrian and Bicyclist Crashes and Fatalities, 2013-2017



Distracted driving

Distractions while driving, biking, and walking have always been a traffic safety issue as diverted attention reduces the reaction time a person has to respond. With smart phones and other electronic devices, there are more opportunities for distraction. While smart phones can provide access to navigation and other services that assist travelers, they are also used for personal and professional communication, entertainment, and diversion. Crash data has not historically tracked distraction as a crash variable but, in 2016, the Michigan UD-10 police report forms started collecting distracted driving data. We can expect better data analysis for distracted driving in the future.

In the meantime, traffic safety education should focus on the risks of distraction. There should be limited use of technology while driving, walking, and biking. Car manufacturers and smart phone developers are creating tools that limit smart phone capabilities while driving to reduce distracted driving habits.

Lane departure

Lane departure crashes (e.g., crashes that occur when vehicles cross over a centerline or veer off the road to the right) have increased fatality rates due to high-speed and head-on collisions. These crashes can be mitigated with low-cost systemic engineering countermeasures that can be implemented on many roads across the region. Examples of countermeasures that reduce lane departures include paved shoulders, centerline and shoulder rumble strips, safety edge, and retro-reflective pavement markings. Lane departure crashes have the most fatalities of any emphasis area in the *Southeast Michigan Traffic Safety Plan*, accounting for 38 percent of all traffic fatalities over the last 10 years.

Regional Policies and Actions
Safety

The following policies provide a framework to enhance the safety of the transportation system for all users.

Increase Safety for all travelers, regardless of mode

- Implement the *Southeast Michigan Traffic Safety Pla*n.
- Promote low-cost, high-impact traffic safety engineering countermeasures.
- Promote emerging connected and automated vehicle technology and infrastructure.

Measure Transportation System Performance to facilitate strategic investment through developing, collecting, analyzing, and disseminating data

- Implement safety strategies on priority locations and emphasis areas.
- Coordinate with road agencies to identify and program traffic safety projects.
- Conduct an annual analysis of safety performance target setting and program adjustments.

Educate and Collaborate with local governments, transportation agencies, utility providers, and residents to improve understanding and operation of the transportation system

- Provide training and information on the use of countermeasures and identify areas for continuous education that partner well with enforcement.
- Identify locations and implement programs that use a multidisciplinary approach to improve safety by conducting local enforcement and educational outreach.
- Continue to promote educational campaigns such as Walk.Bike.Drive. Safe

Anticipate the Socio-economic Challenges of an Aging Region including sustaining mobility for all ages and mitigating labor shortages

- Promote senior driving focused engineering countermeasures and roadway design.
- Promote resources for aging drivers to maintain safe mobility.
- Increase access to safe transportation options for all road users, including those with limited mobility.
- Integrate connected and automated technology and other advanced features on roadways so that persons with limited mobility can safely travel, regardless of mode.

Security

Trends

Transportation planning typically focuses on improving performance of everyday travel that remains consistent day to day, changing slowly across months and years. In contrast, transportation security planning focuses on preparing for rare events that have acute, unpredictable, and disruptive effects, threatening nearby lives, property, and environmental quality. They can range widely, from severe rain or snowstorms, to armed or explosive attacks to public community space, to infrastructure or utility failure, to a sports championship parade. These events can affect a small area or the entire region. Transportation systems are crucial in such events, allowing people to move to safety, providing clear paths for emergency response, and supplying the affected area with goods and equipment needed for recovery.

Planning for these situations means preparing ahead of an event, designing resilient infrastructure and communication systems. It also means deploying an effective, rapid, and scalable response that adjusts to the particular emergency at hand. Finally, it means being able to direct resources for a speedy recovery.

Security planning involves professionals from a wide range of fields working together. Emergency management staff organize preparation, response, and recovery activities. Intelligent Transportation System (ITS) planners prioritize investments in responsive traffic signals. Transportation engineers design resilient facilities. Transportation operations staff communicate road and transit system conditions. Emergency response personnel stand ready to respond, while local planners include emergency response considerations in master plans and site designs.

The safe, reliable, and secure operation of transportation systems depends on effective management and operations of regional systems supported by broad-based collaboration and coordination among service providers, public safety agencies, and other regional stakeholders.

Challenges

Preparedness

Having an updated, emergency management and response plan assists communities in preparing for low-frequency, high-risk events. These plans help prioritize areas with vulnerable populations or critical infrastructure. These plans also identify what resources should be supplied and which agencies are coordinating the response.

Regional traffic operations centers and dispatch centers help deploy emergency responders, as well as inform the public through dynamic message signs, emergency broadcasts, and real-time data alert applications. Various entities can engage in preparedness training through emergency response or special events scenario role playing and table-top exercises to have actionable plans for various events. It is also important to identify and eliminate barriers for emergency responders, such as at rail and highway crossings where backups could dramatically impact response times.

Special events attract large numbers of people and disrupt the normal flow of the transportation system. Coordination between road and transit agencies, public safety, and emergency responders, and event planners is crucial during special events.

Response

With numerous jurisdictions, agencies, and service providers responsible for traffic safety operations in Southeast Michigan, fast communications between entities is crucial. By participating in The Regional Concept for Transportation Operations (RCTO) for Southeast Michigan, agencies in the region have worked together to create a common architecture that allows for coordinated emergency response across local jurisdictions. The top four RCTO objectives are:

- Identifying priority corridors for investment of intelligent transportation systems;
- Retiming traffic signals regularly for better progression;
- Clearing incidents quickly and safely; and
- Disseminating operations information to first responders and all road users.

Recovery

Being able to quickly return to normal transportation operating conditions helps all aspects of recovering from a major event. This allows needed supplies to be delivered to the affected area, as well as the resumption of trade, school, work, and community activities to lessen the duration of the disruption. Infrastructure that was damaged needs to be evaluated, designed, and replaced. Emergency processes must coordinate across agencies and levels of government in a way that prioritizes projects and balances immediate need with long-term resiliency.

Established communication networks can assist communities, coordinate volunteers, and initiate recovery plans during and after emergencies by implementing emergency response plans. In addition to these plans, it is also important to provide access to accurate data so that residents and responders are informed of access to critical recovery resources such as hospitals, schools, and community centers. All affected agencies and governments should engage in post-incident assessments to evaluate lessons learned for improvement after an event to better plan and prepare for future events.

Regional Policies and Actions
Security

The following policies provide a framework to enhance the security of the transportation system for all users.

Educate and Collaborate with local governments, transportation agencies, utility providers, and residents to improve understanding and operation of the transportation system

- Support development and communication of regional preparedness and evacuation planning (e.g., emergency management plans) as well as education campaigns for road users to know how to respond in emergency situations.
- Prioritize training for responders and operations coordinators.
- Participate with ongoing initiatives, such as Southeast Michigan's Urban Area Security Initiative (SEMi UASI).
- Support development of efficient, coordinated responses through incident management task forces (e.g., Regional Transportation Operations Coordinating Committee).

Use Technology to cost effectively improve the transportation system

- Promote coordinated technologies across jurisdictions though ITS Regional Architecture technologies for emergency planning.
- Coordinate efforts for regional partners to share data needed for effective response.
- Communicate with and include private providers of public transportation in data discussions related to safety and security of the transportation system.

Tourism

By the Numbers

Southeast Michigan is home to...

- 1,100 flights per day to and from Detroit Metro Airport
- More than 140 museums
- 3 casinos
- More than 225,000 seats in the region's 30 largest entertainment venues
- More than 450 miles of designated water trails
- More than 200 public beaches
- 140,000 acres of parkland, 80% of which is in large regional parks greater than 200 acres

Travel related to tourism and recreation is an important function of Southeast Michigan's transportation system. In addition to highways and airports that connect the region to the rest of the U.S. and the world, many Southeast Michigan tourism attractions are accessible via the transportation network. These attractions can generate travel demand, impact traffic congestion and air quality, and play a significant role in the region's economy.

Coordinating efforts between tourism, recreation, and transportation planning agencies can help enhance access and mobility throughout the transportation system. The specific needs associated with developing and serving tourism travel can be addressed by understanding tourism attractions and accessibility, travel information and marketing, and how inter-agency collaboration can enhance these efforts.

Trends

Tourism attractions in Southeast Michigan range from urban centers with theaters, sports arenas, and museums, to rural areas with wildlife preserves and "U-pick" farms and orchards. In addition, regional parks and natural assets connected by trails are key attractions. Investments in new transportation facilities can both support the operation and development of attractions (parks, beaches, stadiums, or entertainment venues) and function as attractions in their own right (scenic byways, marinas, or hiking and biking trails). Here are examples of tourism assets found across the region:

Sports and recreation
Southeast Michigan is home to various sports and recreational assets – parks, hiking and biking trails, beaches, waterways, and stadiums.

Multiple professional and collegiate sports teams play in facilities that range from large stadiums and arenas such as Ford Field, Comerica Park, the University of Michigan Stadium, and Little Caesers Arena to mid-sized and smaller facilities such as Keyworth Stadium, Jimmy John's Field, Oakland University's O'rena, and Eastern Michigan's Rynearson Stadium. Each of these sports venues rely upon a reliable and convenient transportation system that allows residents and tourists to attend, enjoy, and depart.

SEMCOG's ParkFinder tool increases awareness about these sports and recreation opportunities in Southeast Michigan. The interactive online map and mobile application includes an inventory of the attractions located across the region. Compiling data from local, county, regional, state, and national parks, this resource helps direct visitors and residents to Southeast Michigan's natural assets based on their preferred location, size, and amenities. Information in this tool was also the basis for analysis of access to parks as a part of the Access to Core Services in Southeast Michigan report. In 2018 ParkFinder was enhanced with more than 1,000 miles of 360-degree imagery of the region's major hiking and biking trails and waterways. Through this Trail Explorer tool, residents and visitors can virtually explore the region's natural assets to plan and be inspired to visit and enjoy.

Arts and entertainment
The transportation system provides access to core activities, and other quality-of-life contributors. Museums, entertainment venues, and casinos serve as regional destinations that attract residents and visitors in general or for special events.

Additionally, Southeast Michigan is home to a wide variety of walkable and commercially active downtowns that draw visitors from across the region, state and beyond. These unique destinations range from historic and picturesque main streets in more rural areas, to bustling commercial areas in the region's more suburban areas, to high density and growing urban central business districts. Each of these destinations receive thousands of visitors annually to shop, recreate, enjoy entertainment, or simply tour.

Accommodations and travel
Transportation facilities provide access and function as attractions in their own right. A primary example of this is the Pure Michigan Byways Program, established in 2014. Administered collaboratively by MDOT and the Michigan Economic Development Corporation (MEDC), the designation highlights roads with outstanding qualities and aligns transportation facilities with statewide travel and tourism initiatives. Routes are designated based on intrinsic qualities that contribute to the character of the roadway, including scenic, cultural, natural, archaeological, historical, and recreational significance. In Southeast Michigan, this designation is held by Woodward Avenue (in Oakland and Wayne Counties), M-12 (spanning the southern Lower Peninsula), and Dixie Highway (stretching from the Ohio border to downtown Monroe).

The Detroit Metro Convention & Visitors Bureau (DMCVB) promotes metro Detroit regionally, nationally, and internationally as a convention, business meeting, and tourism destination. The organization brings together the metro Detroit and Windsor area business community, civic organizations, and local government offices in Macomb, Oakland, and Wayne Counties to market the region as a dynamic tourism destination. DMCVB helps us better understand tourism destinations and demands.

Challenges

Inter-agency collaboration
As an industry, tourism is diverse and involves a variety of public and private entities. Collaboration and cooperation between these entities is increasingly recognized as key to the success of both individual tourism attractions and more holistic tourism destinations.

The National Cooperative Highway Research Program created a framework for evaluating how working relationships can facilitate joint projects between state transportation and tourism agencies. The following are areas where tourism can be integrated into transportation planning:

- Policy coordination,
- Transportation planning process, and
- Project development.

Access

Tourism and recreational travel present unique demands for the region's transportation system. De- pending on an attraction, any facility or mode may be equally relevant to travel, including roads and bridges, rail and transit, pedestrian and bicycle facilities, even navigable waterways. Peak activities can shift with the seasons, weekends, holidays, or the specific timing of special events. Ensuring that regional assets are accessible to residents and visitors from various modes of transportation must be considered when assessing Southeast Michigan's transportation network.

SEMCOG's report, *Access to Core Services in Southeast Michigan*, found that transit services to large regional parks only reach seven percent of the region's households within a 30-minute trip. In recent years, multi-modal planning efforts to Southeast Michigan's large regional parks have become more common, and support the growth and accessibility of these destinations. For example, in 2016, the Detroit Department of Transportation (DDOT) extended transit service to Belle Isle Park in Detroit, which set attendance records for Michigan state parks that year, attracting four million visitors.

Regional Policies and Actions

Tourism

The following policies establish an overarching framework for transportation connections to tourism opportunities in Southeast Michigan.

Support the Regional Economy through the reliable movement of goods, efficient trade connections, expanded labor mobility, and support for tourism and local placemaking

- Develop effective coordination processes between stakeholders to support the tourism and travel industry.
- Encourage expansion of a multi-modal transportation system that ensures accessibility to all, and is well connected to regional assets including parks, trails, and downtown areas.

Educate and Collaborate with local governments, transportation agencies, utility providers, and residents to improve understanding and operation of the transportation system

- Establish a central, easily accessible, and inclusive information system to capture and share timely, relevant, and reliable industry research.
- Support the goals and policies of SEMCOG's Parks and Recreation Task Force.
- Use and expand SEMCOG's ParkFinder and Trail Explorer tools and application to educate residents and visitors of the opportunities and amenities available in Southeast Michigan.
- Coordinate trail planning and development activities among regional stakeholders to maintain an inventory of existing conditions, understand local priorities, and support efforts to develop, promote, and manage the region's trails as a connected system.

Transit

By the Numbers

- Southeast Michigan invests $67 per capita on transit operations compared to Atlanta at $123 and Cleveland at $158 per capita
- Every $1 spent on public transportation generates $4 in economic returns
- 20% of transit dependent households are beyond a 30-minute walk to fixed route transit
- Without regular bus service, over 66,000 riders indicate they would not be able to make the trips they need to on daily basis.
- More than 35,000 bus stops in the region

Southeast Michigan's transportation system is a cornerstone of the region's economy and quality of life. The mobility it provides our residents, businesses, and visitors is vital to everyday activities. The region needs a balance of viable transportation options. Providing practical choices for the safe, efficient movement of people and goods is crucial for maintaining and enhancing economic competitiveness and quality of life in the region. Like a diverse economy, providing a balance of viable options for trip making creates a more efficient system that is better equipped to handle existing and new demands.

A properly designed and implemented transit system will improve our overall transportation system and our ability to compete with other regions for business, industry, and tourism. It is important that we provide affordable public transportation to people who do not have access to motor vehicles. It is also important to provide a viable transportation option to those who usually drive.

To achieve such a system, transit service must be frequent enough to meet needs across both the core bus service areas as well as rapid transit corridors, that cross multiple service areas and are supported by integrated feeder bus service. The system must also include demand responsive service to accommodate those with special needs including the elderly. Given the current funding transit agencies are challenged to provide core bus service.

Figure 39 shows the current core bus and rail services of the region's eight fixed-route transit providers; six bus and two rail. These include TheRide (AAATA) in Ann Arbor, Blue Water Area Transit (BWAT) in Port Huron, Detroit Department of Transportation (DDOT), M-1 Rail (QLine), the People Mover (DTC) in Detroit, Lake Erie Transit (LET) in Monroe, Suburban Mobility Authority for Regional Transportation (SMART) and the University of Michigan Parking and Transportation Services (UMI). Each system has its own service area and unique ridership demands.

Figure 40 shows areas with high transit demand in terms of population and employment that supports transit service. The major problem with current bus service is the frequency and duration, not its location. Although it should be expanded in certain locations, service coverage is generally good. In fact, our fixed route bus system provides access to 37 percent of the population and 45 percent of the jobs.

Historically this has been the case and the problem has been with service hours, frequency, reliability, and quality. In recent years the Regional Transit Authority (RTA) and all of the operators have made much progress on all of these fronts by becoming more efficient than they were. They have modernized much of their equipment, expanded services and have taken coordination to unprecedented levels. Despite this progress, funding limitations keep them from developing the robust transit system needed to be competitive with regions with which we compete economically.

Figure 39
Fixed-Route Public Transit Providers, Southeast Michigan

Blue Water Area Transit
Operates 9 bus routes in the City of Port Huron and Fort Gratiot Township with demand response service in Marysville, Fort Gratiot, Burtchville and Port Huron Township.

Detroit Department of Transportation
The largest transit provider in the region operates 53 bus routes in the City of Detroit, Hamtramck, and Highland Park, with limited service to surrounding communities.

Lake Erie Transit
Operates 8 bus routes in the City of Monroe.

M-1 Rail
Owns and operates the QLine streetcar with 12 stations along Woodward Avenue from Congress to Grand Boulevard. M-1 RAIL operates up to six cars to achieve 8-minute headways during special events and five trains at 10-minute headways during all other times.

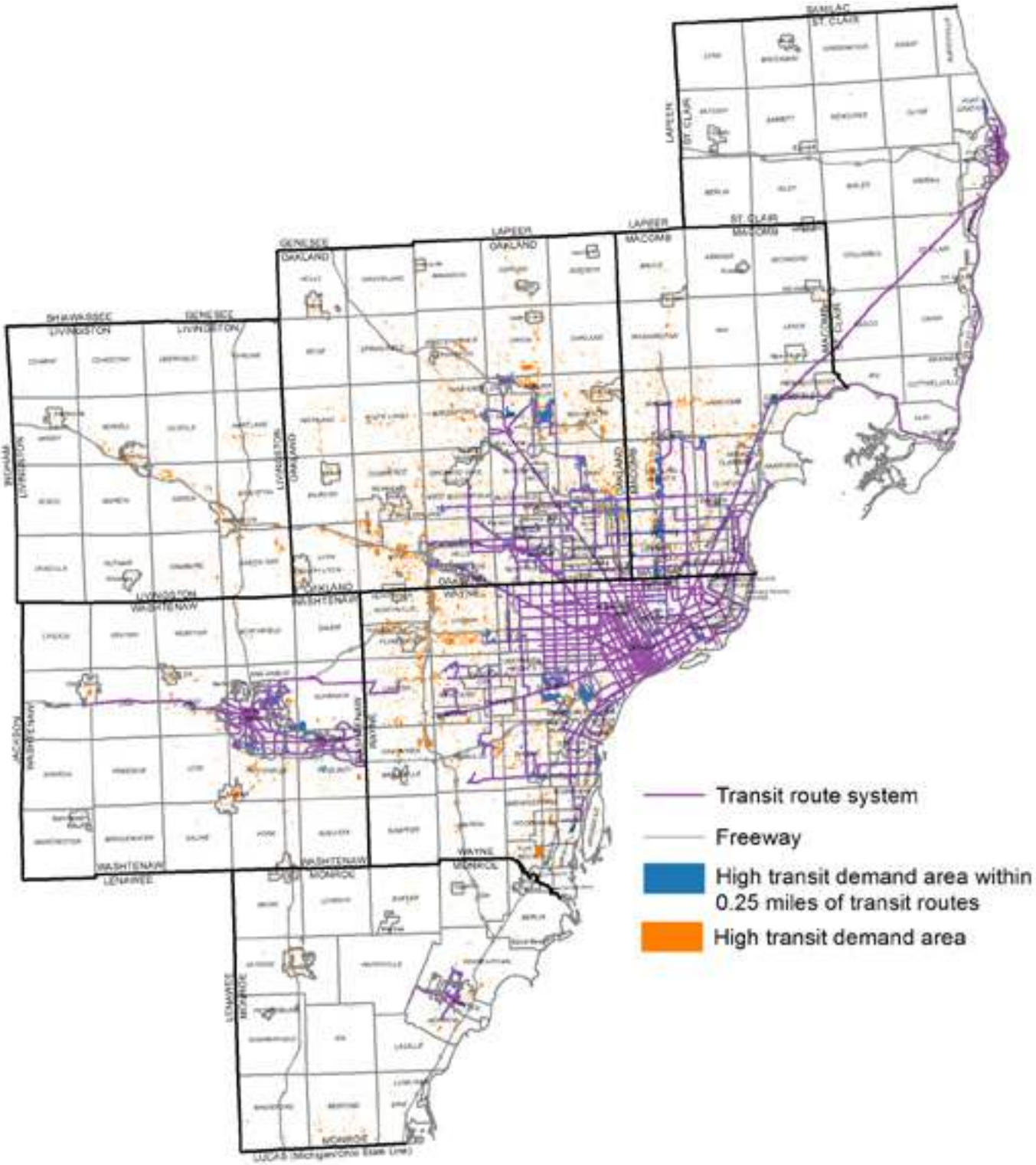
Suburban Mobility Authority for Regional Transportation
Operates 47 bus routes at more than 5,300 stops in the suburban communities of Macomb, Oakland and Wayne counties with express service to and from Detroit.

The People Mover
Uses fully automated guideway technology on an elevated 2.9-mile loop as a circulator with 13 stops in downtown Detroit.

TheRide
Operates 34 bus routes at over 1,500 designated stops in the City of Ann Arbor, Ypsilanti, and several surrounding communities in Washtenaw County.

University of Michigan
Serves the employees, students and visitors at the University of Michigan Ann Arbor campus with 13 routes connecting the north,central, south and medical campuses to each other as well as commuter connections.

Figure 40
Existing Fixed-Route Transit and High-Demand Areas, Southeast Michigan



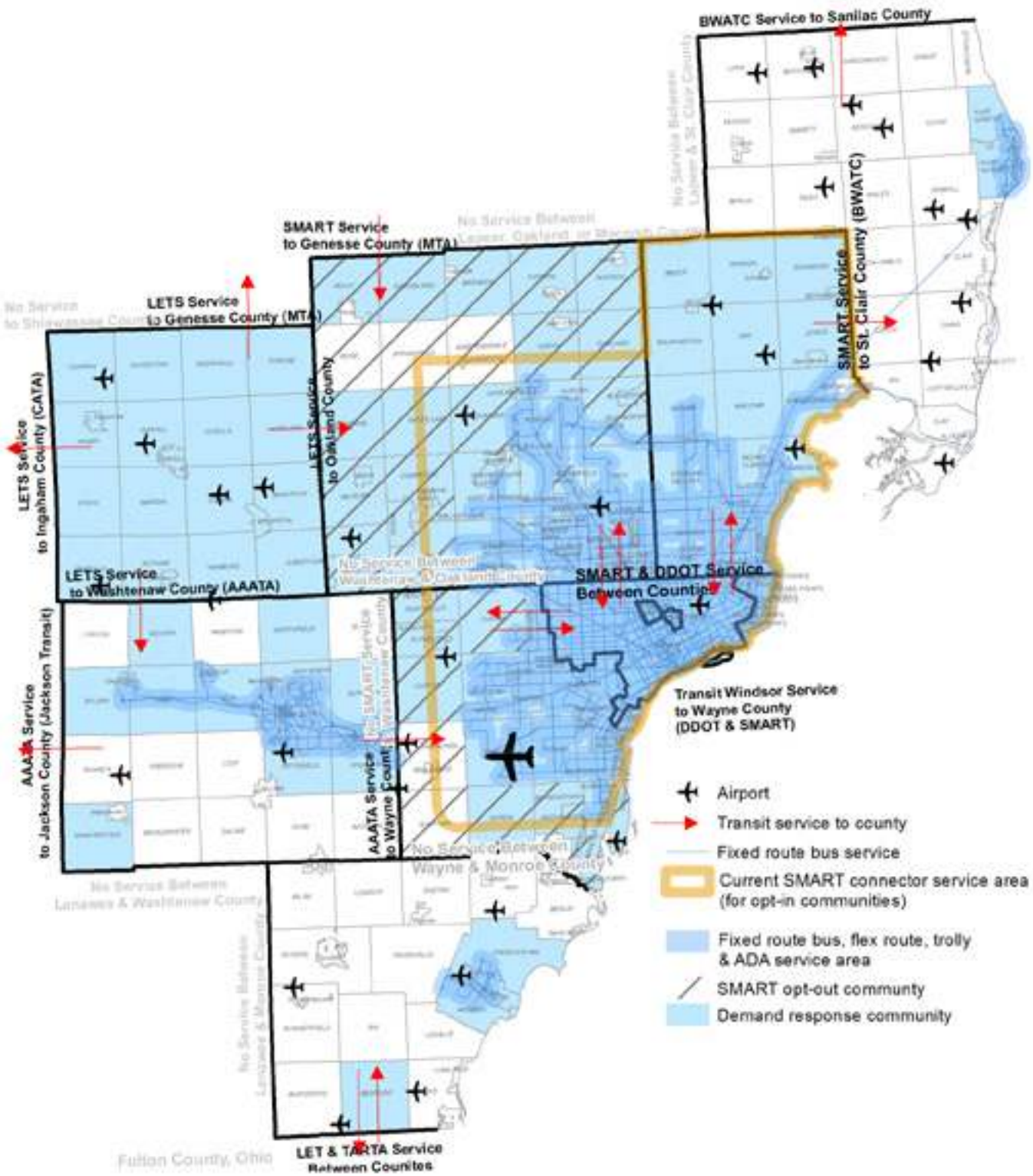
To meet the mobility needs outside of areas that support fixed route service, BWAT, DDOT, TheRide, LET and SMART provide paratransit and demand response services to individuals with disabilities or areas where fixed route service is not available. Paratransit and demand response services require advanced reservation as well as coordination for trips that cross service area boundaries. Various local agencies across the region also provide transit options to residents.

SEMCOG worked in partnership with MDOT, United Way for Southeast Michigan and consultants from the KFH Group along with regional transit agencies and MPOs as part of the Governor's Aging and Mobility initiative to better understand the existing transit conditions in the region and identify unmet needs and gaps in mobility. This planning effort documented gaps in the current system that prohibit cross county and cross system trips. As a result, a list of potential strategies, activities, and projects were developed to be considered by local stakeholders for possible improvements to the system.

Figure 41 shows the areas of the region that currently provide demand response and paratransit service. The arrows show connections between service areas. In unshaded areas, there is no demand response service. However, there is some limited paratransit service for the elderly and people with disability (called specialized services). Paratransit service provides very specialized transportation for those who are not able to utilize the fixed-route bus service. Users of this service must be ADA certified and usually requires an application process.

The impact of the present restrictions on paratransit use means that many individuals living outside fixed-route service areas have severely reduced mobility due to a lack of transportation options requiring them to have an automobile or rely on someone who does.

Figure 41
Paratransit Service Areas, Southeast Michigan



The RTP incorporates a seven-county transit vision, *Improving Transit in Southeast Michigan: A Framework for Action* which calls for enhancement of the existing transportation system by incorporating a variety of transit service levels and an array of features and amenities. The framework also calls for a detailed service plan for smaller service geographies, which the Regional Transit Authority for Southeast Michigan (RTA) fulfilled for four counties in 2016. In 2018, the RTA began updating the Regional Master Transit Plan with an effort called the RTA's *Connect Southeast Michigan Transit Plan*. This vision seeks to improve frequency and reliability, modernize and innovate, provide more local input on expanded local services and provide a seamless rider experience. These principles have been incorporated into the RTA plan which was then incorporated into the RTP for Macomb, Oakland, Washtenaw, and Wayne Counties.

SEMCOG works with its transit partners to implement the transit plan by:

- Providing technical and policy assistance, data, staffing, and work space to the RTA.
- Providing technical assistance to the eight fixed-route operators ranging from estimating ridership for proposed service to identifying appropriate bicycle connections.
- Conducting ridership surveys to aid in planning and service enhancement decisions.
- Assisting communities in enhancing local transit services and connections to regional services.
- Collecting data to enhance service performance on operations such as the QLine.
- Providing safety analyses and campaign materials for use on buses and trains, such as Walk. Bike.Drive Safe.
- Partnering on grant applications such as the RTA's Michigan Mobility grant and Regional Coordinated Human Services grant.
- Developing capital asset management performance measures to monitor progress through the Transportation Improvement Program (TIP).
- Providing planning grants to enhance small community mobility services.
- Supporting agencies by providing data and information to maintain, enhance, and improve service throughout the region.
- Providing assistance to communities, transit operators, and road agencies to identify enhancements for walking and biking access to transit.

SEMCOG continues to support the RTA and regional leaders to refine their transit plan, reach consensus for adoption and getting it on the ballot for funding. The *Connect Southeast Michigan* plan provides a vision that will:

- Upgrade frequency of service to 15 minutes throughout day along the region's busiest transit corridors.
- Create new express routes connecting regional destinations, such as major employers, hospitals, universities, schools, and DTW airport.
- Provide more investment in flexible transit service for expanded paratransit, senior shuttles, shopping, education and medical campus circulators to better meet the mobility needs of the region's residents outside fixed-route bus service areas.
- Reduce chokepoints to facilitate faster and more reliable travel times for both transit and vehicular traffic.
- Commuter rail service between Ann Arbor and Detroit.
- Expand funding to create innovative public private partnerships with New Mobility services that are both being developed around a future Connected and Autonomous Vehicle operating environment and new mobility providers.

Trends

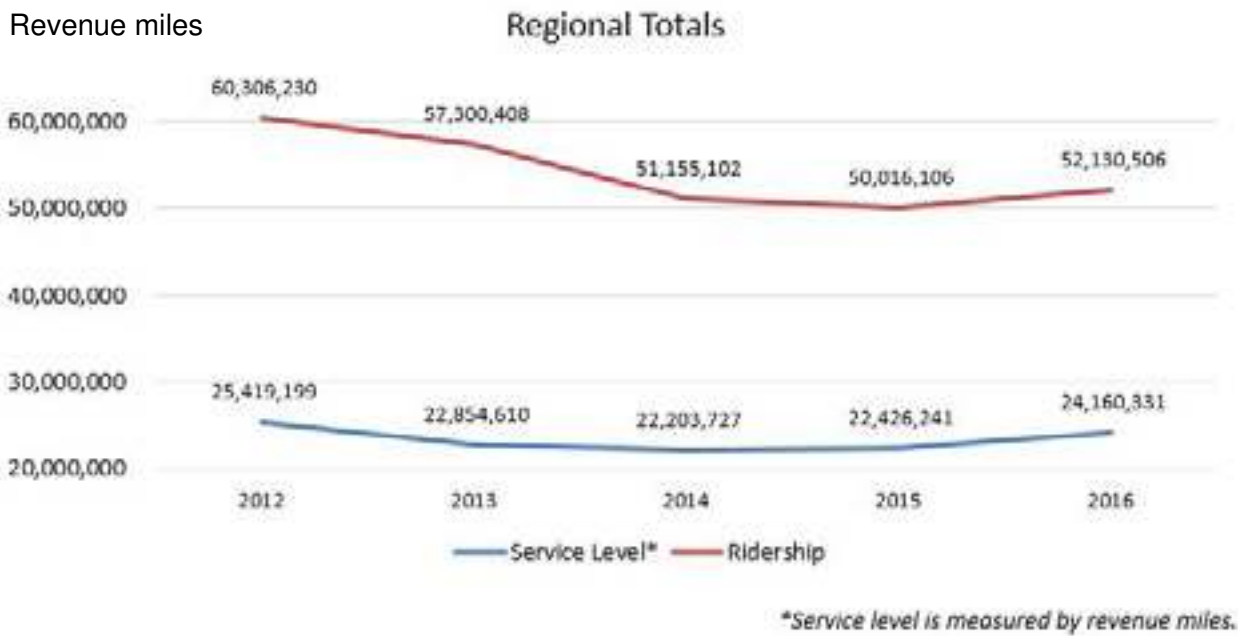
Ridership

The great recession led to a decrease in property value and thus a significant decline in revenues due to reductions in property tax collections for transit service in the region. Transit operators responded by paring back service to focus on key service components. As a result, the region experienced an improvement in service efficiency for several years, until limited funds led to some service levels being reduced to a point that it stopped meeting the needs for many riders. As a result, overall ridership decreased by 23 percent from 2010 to 2015 when service levels began to rise again.

Figure 42 shows changes in ridership generally follow the productivity measures for revenue miles which decreased by 26 percent from 2010 to 2014. In the last few years, the region's transit providers have added new buses, new service and schedule changes including 24-hour service on certain routes in the DDOT service area and improved on time performance. As a result, ridership increased four percent from 2015 to 2016.

In 2016, the region's transit operators served over 170,000 fixed route passengers each weekday. During that same year, AAATA, BWAT, DDOT, and SMART also provided 3.5 million paratransit and demand response transportation trips for people unable to use the fixed route system. Annual ridership was over 52 million passengers in 2016.

Figure 42
Annual Service Level and Ridership Comparison



*Service level is measured by revenue miles.

Challenges

Meeting mobility needs

Based on the 2010 Regional On-Board Transit survey, nearly 52 percent of riders did not have access to a vehicle on the survey day and this number increased to 60 percent in the DDOT service area, which covers more than 50 percent of the regional daily riders. If the transit system was not available on the day surveyed, 30 percent of riders would try to get a ride with someone else and another 30 percent would forgo the trip.

Mobility is complex in that it involves the relationship of accessibility and time, but a very basic element is the availability of options. Auto, bus, rail, bike share, Uber/Lyft, etc. are some of the options available in the region. Reliable fixed-route transit service that connects people to jobs and services efficiently is a critical component. For residents outside of the fixed-route transit service area, demand response and community transit service provide accessibility, but there are significant gaps in service. The need for expanded demand response services for seniors, people with disability, and other disadvantaged populations is a challenge.

Options for transit service that is not a fixed-route transit service is limited. This type of service accounts for the wide variety of public transportation services and supports that provide mobility to people throughout the region. This service includes:

- Demand response service to residents with special transportation needs who are unable to use fixed route transit.
- Demand response or community transportation service to areas where fixed route transit is not feasible.
- First and last mile connections to help residents get to and from transits stations.

Paratransit

Paratransit is a form of transportation service that is more flexible and personalized than conventional, fixed route, or fixed schedule service. Paratransit service is adjusted to individual needs. Examples of paratransit service includes rideshare, dial-a-ride, vanpool, and subscription service.

The region's growing elderly population coupled with the needs of people with disabilities will increase the demand for paratransit options. The need for transit providers to increase the frequency of service, add coverage areas and deploy more vehicles along with the associated costs will present a major challenge. Mobility management services to help people understand their travel options and match users to the most appropriate travel choice, regardless of transportation provider are important. The role of autonomous vehicles and microtransit solutions, such as e-scooters, are already being developed to address these types of mobility challenges.

In general, the paratransit service areas needs to be increased, and the paratransit level of service needs to be improved. Figure 41 shows the physical gaps in coverage. Typically, operations are limited to weekdays with very limited service hours.

Frequency

The transit system in Southeast Michigan should provide a service that users can rely on to get them where they need to go, when they need to be there. Routes must be available during days and times that are most needed. If transit is available so infrequently that riders are forced to arrive at their destinations much earlier or later than necessary, the service frequency is not adequate therefor resulting in a system that is not efficient or competitive. Frequencies provided by the region's transit agencies are made within available budget constraints. If transit providers had more resources, more routes would be served at frequencies of 15-minutes or better, which is an industry defined standard for rapid transit service.

Reliability

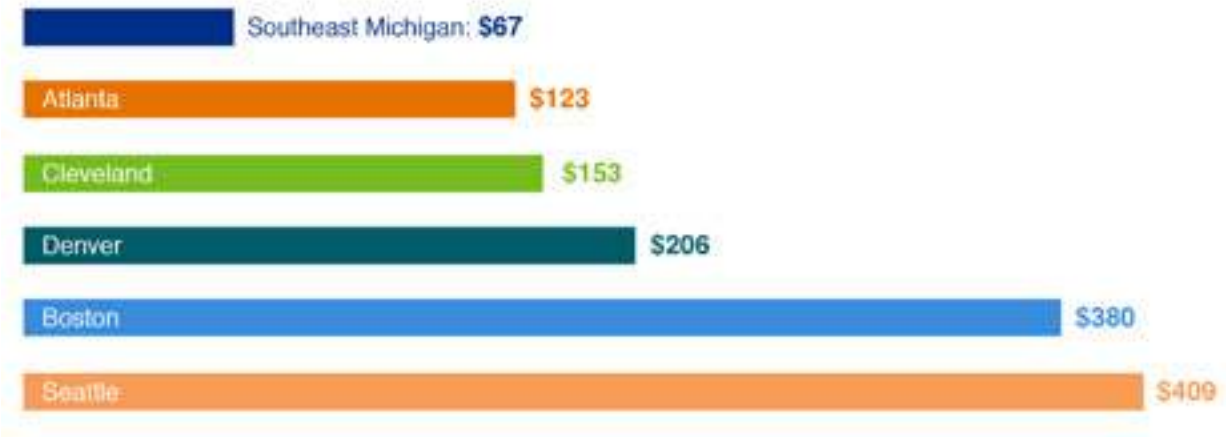
Travelers must have confidence that their vehicle will consistently arrive and drop off on time. As part of providing reliable service the spans of services for transit and mobility options must match the demands of the workforce, health care, schools, and entertainment schedules which don't always follow a first shift or "9 to 5" routine schedule. Communities need to have the flexibility to design mobility services around consumer demands. There must also be real-time information in ways that all users can access including when the next vehicle will arrive at a given location. It is understood that travel time for transit will be longer than auto trips, but the total duration of the trip using transit must be reasonably competitive to other options consumers may have in the region.

Passenger expectations
Technology is rapidly changing the way we produce and consume goods, communicate, as well as how we travel. Consumers of mobility services today want easy access to all mobility options available to them, a clear understanding of how much that trip will cost, easy "one-click" payment options, modern conveniences such as Wi-Fi while traveling, and the ability to transfer seamlessly across modes to reach their final destination. Gone are the days of one-size fits all transportation options. As technology advances, the region will come to expect greater options on how to schedule, pay, and plan their next move.

Funding
A major challenge for transit is funding. Implementing new and expanded services and modernizing equipment requires additional capital and operating funds. Support for transit in the region lags behind almost every other region of similar size and economy. Quality transit requires additional investments to meet the mobility needs of residents in the region. Another major barrier to more frequent and reliable service is that large parts of the region are allowed to opt-out of funding transit. This creates a patchwork framework of services where busses run through an opt-out community but there are no stops.

Southeast Michigan spent about $270 million in transit services in 2016, or $67 per capita. This is significantly lower than peer regions, even those with lower populations. Regional peers include similarly sized regions such as Atlanta, and traditional manufacturing based economies such as Cleveland (Figure 43). The most recent year which comparable data from the National Transit database is available is 2016.

Figure 43
Transit Funding Comparisons Per Capita, 2016



Regional Policies and Actions
Transit

The following policies establish an overarching framework for a connected and equitable transit system in Southeast Michigan.

Increase Access to jobs and core services by expanding travel choices regardless of race, gender, ethnicity, national origin, age, physical ability, or income

- Evaluate the transportation system's ability to reach desired destination and choices in terms of quality and quantity of options
- Support the expansion and development of transportation technologies that improve access and mobility.
- Support initiatives to better coordinate transit providers within the region that will increase mobility.
- Increase service levels and regional connections for all residents.

Support the Regional Economy through the reliable movement of goods, efficient trade connections, expanded labor mobility, and support for tourism and local placemaking

- Support initiatives that improve the performance of the overall transportation system.
- Encourage the development of a dedicated funding source for transit service in the region.
- Analyze transit access to major tourism facilities to improve visibility and use for choice riders.

Measure Transportation System Performance to facilitate strategic investment through developing, collecting, analyzing, and disseminating data

- Establish region wide Transit Asset Management targets and incorporate components in the Transportation Improvement Program.
- Collaborate with transit and new mobility providers such as bikeshare and e-scooters to collect and share data.

Educate and Collaborate with local governments, transportation agencies, utility providers, and residents to improve understanding and operation of the transportation system

- Continue to partner with the Regional Transit Authority on building capacity in order to enhance mobility options, to improve quality of life for residents, and to increase regional economic viability.
- Support partnership between the various regional transit providers to create an integrated fare system for easy access and transfers.
- Support education about transportation options to help residents overcome barriers that prevent many from using the existing public transit services, to include but not limited to, the use of system maps and schedules, trip planning tools and making transfer between systems or to other transportation modes.
- Create awareness on the impact and importance of public transportation investments in the region.

Anticipate the Socio-economic Challenges of an Aging Region including sustaining mobility for all ages and mitigating labor shortages

- Provide information and resources to help aging residents become familiar with their transportation options.
- Encourage communities to consider the aging population when engaging in the planning process.
- Continue to collaborate with and promote Safe Drivers Smart Options: Keys to Lifelong Mobility as part of Michigan's statewide strategy to support the safe mobility of aging adults.

Increase Funding and Expand Local Options to provide resources that are sufficient to meet regional transportation needs

- Support efforts of the Regional Transit Authority to increase transit investment through a voter approved tax mileage and leverage additional revenues to expand and improve transit in the region.
- Support efforts to increase flexibility for transit funding to be spent on operations.
- Encourage projects that integrate first mile, last mile connections to transit to increase accessibility.
- Provide assistance to help our partners plan and make investments needed for more dynamic and flexible transit options through the use of autonomous vehicles.

Transportation Demand Management

By the Numbers

In 2018, by switching trips, participants in the Commuter Challenge...

- Logged 8,200 alternative green commute trips totaling over 147,000 miles
- Saved $26,000 in fuel expenses
- Burned 351,000 calories by biking and walking
- Reduced carbon dioxide emissions by over 1,000 pounds

Transportation Demand Management (TDM) seeks to increase efficiency in the transportation system reducing the need for high-cost capacity projects. TDM strategies include:

- Carpooling and vanpooling: reducing the number of single occupant vehicle trips
- Telecommuting: reducing the need to travel to work
- Variable work hours: reducing the need to travel during peak hours when roads are congested
- Encouraging transit use: reducing the number of single occupant vehicle trips

Strategies increase awareness of alternative commute travel options and provide incentives and information to encourage and help individuals modify their travel behavior. The use of a comprehensive set of TDM strategies can have significant regional benefit including improving air quality and reducing congestion.

Trends

Shared mobility

The most significant trend in TDM is the use of technology. Mobile technology has enabled an array of new transportation services. Options such as ridehailing and active transportation modes such as bikeshare and e-scooters supplement and enhance existing shared transportation services such as ridesharing and transit.

Commuter Connect

In 2018, SEMCOG introduced Commuter Connect – the next phase of ridesharing in Southeast Michigan. Expanding upon the previous MiRideshare program, Commuter Connect provides trip planning and commuter-matching service for residents to improve their commute, whether carpooling, vanpooling, walking, biking, taking transit, or other modes. Commuter Connect's web-based interface and mobile application allows users to search for all available transportation options by simply entering an origin and destination. The trip-planning tool provides multiple transportation choices and routes, along with cost, calories burned, emissions, distance, and time estimates compared to driving alone.

SEMCOG promotes ridesharing with several incentive-based competitions and events. Through Commuter Challenge and Switch My Trip, single-passenger drivers are encouraged to try an alternative commute. Prizes are awarded to successful participants. Commuters who register and use an alternative commute can take advantage of the free Emergency Ride Home (ERH) program, which alleviates the fear of being stranded at work without transportation in the event of an emergency. This program provides a free ride home via a ridehailing service (Lyft, Uber) or taxi for employees who commute by carpool, vanpool, bike, or walk.

Changing from a solo commute, even for just one day a week, has these additional benefits:

- Save money
- Reduce stress
- Improve air quality by cutting carbon emissions
- Stay healthy by walking, biking, or taking transit
- Recapture valuable time by letting someone else drive either in a car/vanpool or on a bus
- Decrease personal driving expenses and maintenance costs

Challenges

Awareness and support
TDM offers multiple solutions to commuters. Commuter awareness and employer support are the keys to success. Employers can support TDM efforts through incentives such as parking pay out, flexible work hours, and offering transit passes to employees. SEMCOG's Commuter Challenge tool assists with increasing awareness and reducing the barrier to using various modes of transportation for commuting.

Curbside management
Parking, bus stops, bike lanes, ridehailing services, and freight or short-term goods delivery all increase competition for curb space. Challenges and opportunities of curbside management were discussed in detail earlier in this plan (Chapter 2: Guiding Decisions: Defining Challenges).

Regional Policies and Actions
Transportation Demand Management

The following policies provide framework to better coordinate Transportation Demand Management in Southeast Michigan:

Educate and Collaborate with local governments, transportation agencies, utility providers, and residents to improve understanding and operation of the transportation system

- Create awareness of the current TDM programs, as residents may be unaware of these commuting options. Include additional outreach to area employers, SEMCOG members, and the general public.
- Increase marketing and participation of the Southeast Michigan Commuter Connect Program.
- Support regional employers in implementing programs such as employee parking cash and other initiatives to provide incentives to promote alternative commute options.
- Increase education for planning and policy development for managing the use of curbside space balance demand.

Utilize Technology to cost-effectively improve the transportation system

- Continue to improve and update Southeast Michigan's Commuter Connect Program.
- Support and promote active management of transportation systems.
- Promote integration of automated vehicle technology to enhance travel options.
- Identify technological advancements that reduce cost for door-to-door service and expand mobility options for urban, suburban, and rural residents.

Chapter 4: Project Selection and Analysis

The focus of this chapter is on:

- Estimate of transportation needs
- Performance measures
- Financial plan
- Forecasting future travel
- Air quality conformity
- Environmental justice
- Environmental sensitivity
- Nonmotorized access to core services
- Congestion management
- Intelligent transportation systems

Estimate of Transportation Needs

The transportation system in Southeast Michigan is an extensive and mature network of freeways, arterials, local roads, bridges, railroads, transit systems, border crossings, trails, and intercity connections. To meet the current and future needs of Southeast Michigan, this system must both sustain existing infrastructure in a state of good repair as well as recondition the system to expand access, increase safety, improve local quality of life, reduce the impacts of large weather events, and implement innovations in transportation technology. After decades of underinvestment in maintaining and rebuilding the regional transportation system, sustaining existing transportation infrastructure alone vastly outpaces the expected level of investment through 2045. Below is a summary of anticipated transportation needs, adjusted for four percent inflation, over the course of the 2045 RTP.

Pavement: $39.1 billion

Pavement conditions in Southeast Michigan have been in decline. Currently only 60 percent of federal-aid-eligible roadways are in good or fair condition. Roads in poor condition need to be rebuilt from the base, making them significantly more expensive. SEMCOG's pavement analysis estimates that it will take $39.1 billion over 25 years to restore these roads to 80 percent good or fair condition. The entire amount of highway spending anticipated on the 2045 RTP is $26 billion. Close to 75 percent of this spending is planned for pavement preservation ($19 billion), which will not be sufficient to restore Southeast Michigan pavement to a state of good repair.

Bridges: $6.8 billion

Bridge conditions in Southeast Michigan have remained at around 90 percent in good or fair condition. In order to sustain this percentage, road agencies will need to fix around 350,000 square feet of bridge deck per year at an annual investment of $260 million per year or $6.8 billion over the course of the 2045 RTP.

Interstate modernization: $3.36 billion

Several sections of Southeast Michigan's highest volume interstates need rebuilt and reconfigured to address multiple deficiencies. These projects are already underway and will continue to be implemented within the plan years of the 2045 RTP. These modernization projects will reconstruct the pavement, eliminate left lane entrance and exit ramps on interchanges, add local connections across the interstates, incentivize ridesharing, improve resiliency to large storm events, and install safety features. Within the years covered by the 2045 RTP, the I-94 Modernization in Detroit will cost $1.92 billion, the remaining section of the I-75 Modernization in Oakland County will cost $1.26 billion, and the reconstruction of I-375 into a grade-level arterial highway will cost $183 million.

Border crossings: $0.16 billion

With the construction of the Gordie Howe International Bridge (GHIB) underway, the Detroit/Windsor transportation connection has taken a generational step forward in ensuring sufficient redundancy, customs processing capabilities, and cross-border communication. The upfront design and construction costs of the GHIB are covered by Bridging North America, the private partner selected by the Windsor Detroit Bridge Authority. Bridging North America and the Government of Canada will recoup their investment through collecting tolls on the GHIB. Southeast Michigan's other vital Port Huron/Sarnia crossing, The Blue Water Bridge, is still in need of a major update of its customs plaza to enable safe, secure, and efficient processing of people and goods crossing the international border. The Blue Water Bridge Plaza update will cost $157 million. The Ambassador Bridge will also need substantial repairs or replacement.

Transit projects: $20.9 billion

Southeast Michigan lags behind other U.S. metropolitan regions in transit investment and is insufficient to provide mobility in terms of service availability, frequency, reliability, and ease of use. The latest Regional Transit Authority for Southeast Michigan (RTA) draft transit plan calls for $170 million per year in additional for operations the four participating counties (Macomb, Oakland, Washtenaw, and Wayne). The RTA plan also identifies $696 million in capital needs over 20 years to implement this planned service. Livingston, Monroe, and St. Clair Counties also provide transit services. To sustain current levels of service for these counties $475 million will be invested in these counties. Over the 26 years of the 2045 RTP, this represents $20.9 billion in transit needs whereas the funding available to spend on transit operations and capital is $9.2 billion.

Rail projects: $1.4 billion

While private railroads own and operate the majority of rail infrastructure in Southeast Michigan, rail capacity, interlocker efficiency, and rail condition directly effects costs to industry, consumer goods, and passenger rail performance. The Michigan Department of Transportation (MDOT) in partnership with the four Class I railroads in Southeast Michigan, has developed a package of rail projects that would reduce rail delay, increase regional intermodal capacity, and provide passenger rail and safety benefits. This package is known as the Detroit Intermodal Freight Terminal (DIFT) and will cost $1.4 billion with a 50/50 public/private split. The total public investment needed for the DIFT is $711 million.

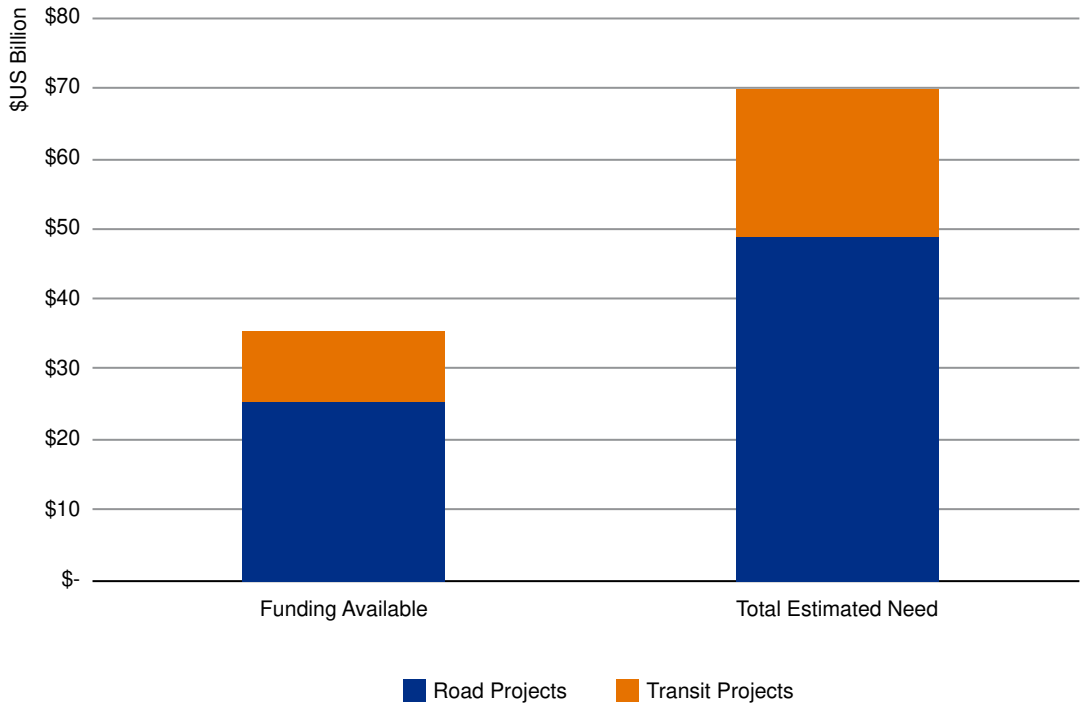
Cross-cutting needs

There are many essential aspects to the regional transportation system that cut across project need types. Instead they must be considered and applied across the entire extent of the transportation system. These cross-cutting needs are:

- Safety features;
- Traffic operations equipment and operations centers;
- Pedestrian and bicycle facilities, including regional trails;
- Freight accommodations; and
- Environmental mitigation and large-storm resiliency designs.

These needs are integrated into the planning of pavement, bridge, and transit projects based on local plans, travel volumes, development density, connection to other transportation facilities, and mix of uses. Addressing these needs tend to add to total project costs, but also improves how transportation systems serve all users. The exact amount of additional cost varies by project and is not expressed in this needs estimate. The 2045 RTP has policies and actions for these cross-cutting categories to improve context-specific application of these needs into all transportation projects.

Figure 44
Estimate of Transportation Needs, Southeast Michigan



Performance Measures

Transportation Performance Management Framework

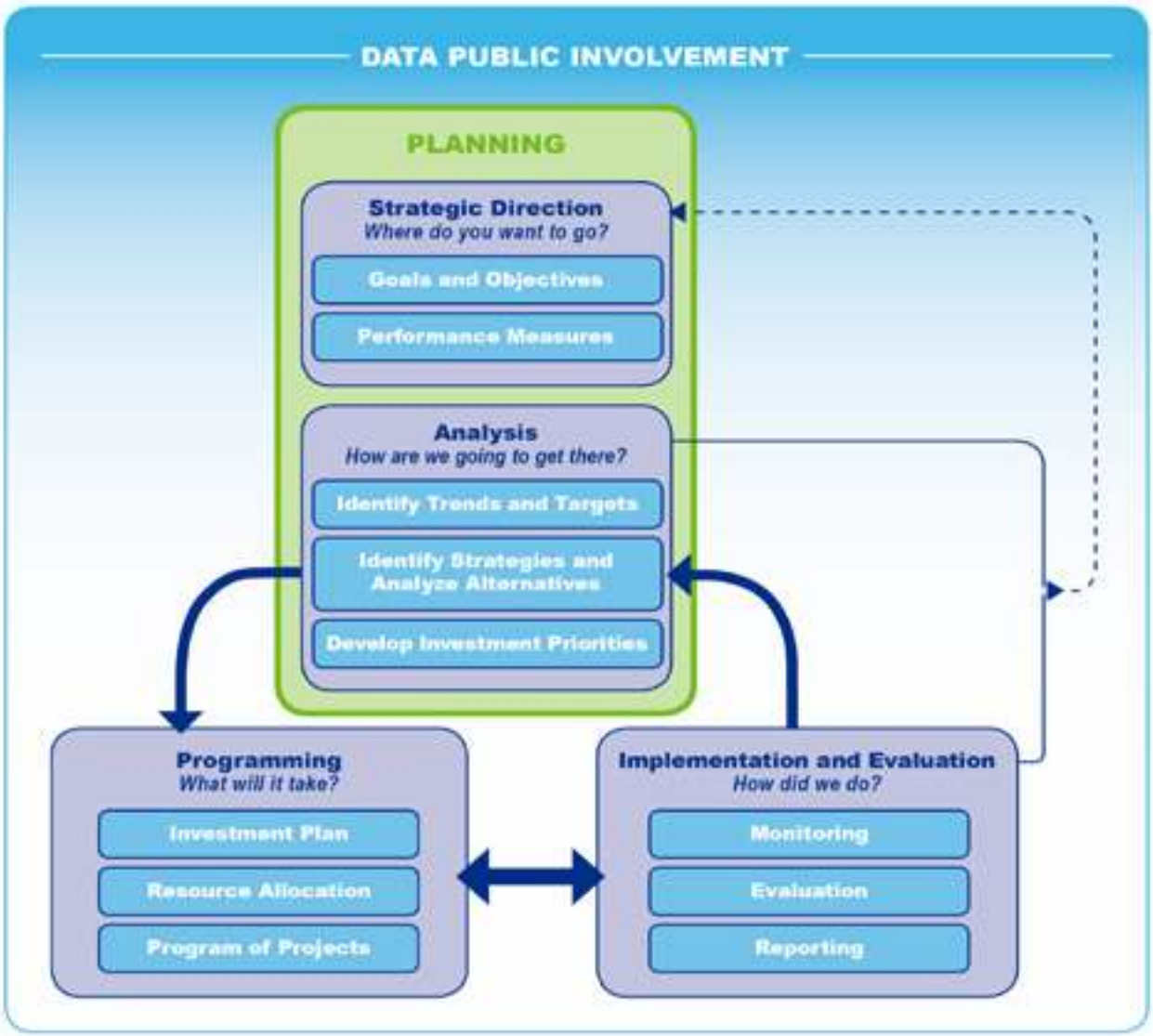
The U.S. Department of Transportation developed a model framework for Transportation Performance Management that establishes a feedback loop between performance results and future planning. These are the goals of the framework:

- Be systemically applied on a regular, ongoing process;
- Provide key information to help decision makers, allowing them to understand the consequences of investment decisions across transportation assets or modes;
- Improve communication between decision makers, stakeholders, and the traveling public; and
- Ensure targets and measures are developed in cooperative partnerships and based on data and objective information.

The framework sets up a process in which:

- A strategic direction is set,
- Standard analysis is conducted to identify trends and establish achievable future targets,
- Available funding is programmed to support the achievement of the targets, and
- Performance is monitored to evaluate and adjust future target setting and programming decisions.

Figure 45
Framework for Performance-based Planning and Programming



Roads and Highways National Performance Goals

The FAST Act directed the Federal Highway Administration (FHWA) to identify Transportation Performance Measures for six National Performance Goals. In response, SEMCOG adopted a highway performance management process that includes national Transportation Performance Measures. These will be used to inform SEMCOG's planning decisions. The six goals are:

- Safety – To achieve a significant reduction in traffic fatalities and serious injuries on all public roads
- Infrastructure Condition – To maintain the highway infrastructure asset system in a state of good repair.
- Congestion Reduction – To achieve a significant reduction in congestion on the National Highway System.
- System Reliability – To improve the efficiency of the surface transportation system.
- Freight Movement – To improve the national freight network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development.
- Environmental Sustainability – To enhance performance of the transportation system while protecting and enhancing the natural environment.

Public Transportation National Performance Goals

The FAST Act also directed the Federal Transit Administration (FTA) to develop a rule establishing a strategic process for operating, maintaining, and improving public capital assets effectively through their entire lifecycle. FTA established a Transit Asset Management rule that identifies four performance areas for transit providers to track asset conditions and create plans for systemically managing operations, maintenance, and capital investments. The four performance areas are:

- Rolling Stock – Revenue vehicles used in providing public transportation.
- Equipment – Articles of non-expendable, tangible property has a useful life of at least one year.
- Facilities – Buildings or structures that are used in providing public transportation.
- Infrastructure – The underlying framework or structures that support a public transportation system.

Since transit providers vary widely with the type and scale of assets, they are instructed to individually create Transit Asset Management Plans that identify assets and a condition evaluation approach that best fits their asset profile. Transit providers with more resources to dedicate to data and analysis, are encouraged to conduct evaluations of transit assets that match the scale and complexity of their asset profile.

In addition, transit agencies will be required to certify a Public Transit Agency Safety Plan (PTASP) that contains transit safety performance measures that track fatalities, injuries, safety events, and system reliability. The federal rulemaking process for these plans is not yet final. Southeast Michigan transit agencies must certify a PTASP and report targets for the transit safety performance measures to the State of Michigan and SEMCOG within a year of the final rule publication.

Table 5

Federal Performance Measure Areas and Measures

Performance Area	Performance Measures
Safety Performance	• Number of fatalities • Rate of fatalities • Number of serious injuries • Rate of serious injuries • Number of nonmotorized fatalities and nonmotorized serious injuries
Pavement and Bridge Asset Management	• Percent National Highway System (NHS) bridges in good and poor condition • Percent Interstate pavement in good and poor condition • Percent Non-Interstate NHS pavement in good and poor condition
System Performance	• Interstate travel time reliability • Non-Interstate travel time reliability • Truck travel time reliability
Congestion Mitigation and Air Quality	• Peak Hour Excessive Delay • On-Road Mobile Source Emissions for Carbon Monoxide (CO) and Particulate Matter (PM2.5); and • Non-Single Occupancy Vehicle (SOV) Travel
Public Transportation	• Transit Asset Management (TAM) Plans • State of Good Repair measures are identified by individual transit providers as part of TAM Plan. • Percent of revenue vehicles within a particular asset class that have met or exceeded their Useful Life Benchmark (ULB) • Percent of facilities with a condition rating below 3.0 on the FTA Transit Economic Requirements Model (TERM) Scale. • Public Transportation Agency Safety Plans • Fatalities • Injuries • Safety events • System reliability

Safety Performance

Federal Transportation legislation establishes a performance based planning framework and target setting requirements for States and Metropolitan Planning Organizations (MPOs). These are designed to focus the federal-aid program on national goals. The goal areas include safety, infrastructure condition, congestion reduction, system reliability, freight movement and economic vitality, environmental sustainability, and reduced project delivery delays.

The Highway Safety Improvement Program (HSIP) final rule (23 CRF Part 490) requires States and MPOs to establish targets for calendar year 2019 and annually thereafter for five safety performance measures based on five-year rolling averages for:

- Number of Fatalities,
- Rate of Fatalities per 100 million Vehicle Miles Traveled (VMT),
- Number of Serious Injuries,
- Rate of Serious Injuries per 100 million VMT, and
- Number of nonmotorized fatalities and nonmotorized serious injuries.

Table 6
Safety Performance Measure Targets

Safety Performance Measure	Baseline Through Calendar Year 2017	Calendar Year 2019 State Safety Target
Fatalities	981.4	1,023.2
Fatality Rate per 100 Million VMT	1.00	1.02
Serious Injuries	5,335.0	5,406.8
Serious Injury Rate per 100 Million VMT	5.47	5.41
Nonmotorized Fatalities & Serious Injuries	743.6	759.8

Pavement and Bridge Asset Management

Federal rules on performance management measures for pavement and bridge require establishment of two- and four-year performance targets to be achieved beginning in 2018 for the following performance measures:

Bridge

- Percent National Highway System (NHS) Deck Area in Good Condition
- Percent NHS Deck Area in Poor Condition

Pavement

- Percent of Interstate Pavement in Good Condition
- Percent of Interstate Pavement in Poor Condition
- Percent of Non-Interstate NHS in Good Condition
- Percent of Non-Interstate NHS in Poor Condition

The SEMCOG pavement and bridge two- and four-year targets (Table 7) were established in coordination with MDOT, other state MPOs, the Federal Highway Administration (FHWA), and the Federal Transit Administration (FTA). SEMCOG will continue coordination with federal, state, and local road agencies to plan and implement projects that contribute to meeting the targets.

Table 7
Pavement and Bridge Performance Measure Targets

Performance Area	Measures	Baseline Condition 2017	2-Year Target, 2020	4-Year Target, 2022
Bridge	Percent National Highway System (NHS) Deck Area in Good Condition	32.7%	27.2%	26.2%
	Percent NHS Deck Area in Poor Condition	9.8%	7.2%	7.0%
Pavement	Percent of Interstate Pavement in Good Condition	56.8%	N/A	47.8%
	Percent of Interstate Pavement in Poor Condition	5.2%	N/A	10.0%
	Percent of Non-Interstate NHS in Good Condition	49.7%	46.7%	43.7%
	Percent of Non-Interstate NHS in Poor Condition	18.6%	21.6%	24.6%

System Performance

The federal rules on performance management measures for travel time reliability requires establishment of two- and four-year performance targets to be achieved beginning in 2018 for the following performance measures:

- Level of Travel Time Reliability of the Interstate
- Level of Travel Time Reliability of the Non-Interstate (NHS)
- Freight Reliability Measure of the Interstate

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

The SEMCOG reliability two- and four-year targets (Table 8) were established in coordination with MDOT, other regions, the Federal Highway Administration (FHWA), and the Federal Transit Administration (FTA). SEMCOG will continue coordination with state, federal, and local road agencies to plan and implement projects that contribute to meeting the targets.

Table 8
System Performance Measure Targets

Measures	Baseline Condition 2017	2-Year Target, 2020	4-Year Target, 2022
Level of Travel Time Reliability of the Interstate	85.1%	75.0%	75.0%
Level of Travel Time Reliability of the Non-Interstate (NHS)	85.5%	N/A	70.0%
Freight Reliability Measure of the Interstate	1.38	1.75	1.75

Congestion Mitigation and Air Quality

This measure is an assessment of the Congestion and Air Quality Improvement (CMAQ) Program through measurement of total emissions reduction of on-road mobile source emissions.

This Transportation Performance Management Target applies to areas designated as nonattainment or maintenance for ozone, carbon monoxide, or particulate matter. SEMCOG and MDOT established separate targets for each of these criteria pollutants and applicable precursors. SEMCOG is designated as nonattainment or maintenance for carbon monoxide (CO) and particulate matter (PM2.5). Targets reflect the anticipated cumulative emissions reduction to be reported in the CMAQ Public Access System.

Table 9

CMAQ Performance Measures Targets

Measure	Baseline Performance 2017	2-Year Target, 2020	4-Year Target, 2022
Peak Hour Excessive Delay	18 hours 30 minutes	22 hours	N/A
On-Road Mobile Source Emissions for Carbon Monoxide (CO kg/day)	87,665.109	32,968.780	65,937.560
On-Road Mobile Source Emissions for Particulate Matter (PM2.5 kg/day)	653.357	417.410	834.820
Non-Single Occupancy Vehicle Travel (Percent of Total Workers)	16.0%	14.4%	14.4%

Public Transportation

Transit providers must develop Transit Asset Management (TAM) plans that track the asset conditions for rolling stock, equipment, and facilities while creating routines for systemically managing operations, maintenance, and capital investments. Since transit providers vary widely with the type and scale of assets, they must individually create TAM plans that identify assets and condition evaluation approach that best fits that providers' asset profile.

Initial targets for fiscal year 2017 were set by individual transit providers. SEMCOG coordinated with transit providers across Southeast Michigan to collect preliminary targets and used them to set preliminary regional targets, which are shown in Table 10 . SEMCOG considers these preliminary since they were established prior to the detailed assessment of assets that will occur as part of the TAM plans. Transit providers are required to prepare their TAM plans by October 2018 with updates every four years. SEMCOG will continue to use these updated measures to refine the regional targets.

Table 10
Transit Asset Management (TAM) Plans

Asset Category	Performance Measures	2017 Target
Rolling Stock		
Articulated Bus	Age- % of revenue vehicles within a particular asset class that have met or exceeded their Useful Life Benchmark (ULB)	0%
Bus		15%
Cutaway Bus		15%
Trolley		20%
Van		20%
Equipment		
Automobiles	Age- % of vehicles that have met or exceeded their ULB	15%
Trucks		70%
Facilities		
Passenger	Condition- % of facilities with a condition rating below 3.0 on the FTA Transit Economic Requirements Model (TERM) Scale	30%
Parking		0%
Maintenance		40%
Administrative		40%

Financial Plan

The 2045 RTP describes the surface transportation network of Southeast Michigan, identifies the needs of this system, and presents the region's policies for applying available resources to those needs. The 2045 RTP spans a period of 26 years. The RTP project list (Table 20) is required to be fiscally constrained, that is, the cost of projects programmed in the RTP cannot exceed the amount of funding "reasonably expected to be available" during that time.

The 2045 RTP financial plan documents the methods used to calculate funds reasonably expected to be available and compares this amount to proposed projects to demonstrate that the RTP is fiscally constrained. The financial plan also estimates the cost of operating and maintaining the transportation system in Southeast Michigan.

Sources of Transportation Funding

The basic sources of transportation funding in Michigan are motor fuel taxes and vehicle registration fees. These motor fuel taxes are excise taxes, i.e., levied on a per-gallon basis. The amount collected per gallon does not increase when the price of gasoline or diesel fuel increases. Over time, inflation erodes the purchasing power of any excise tax, unless the tax is indexed (can be adjusted to compensate) for inflation. Federal and state motor fuel taxes break down in this manner:

- Federal government tax is $0.184 per gallon on gasoline and $0.244 per gallon on diesel.
- Michigan state tax is $0.263 per gallon for both gasoline and diesel.
- Michigan also charges sales tax on motor fuel, but this funding is not applied to transportation.
- Michigan also collects annual vehicle registration fees when motorists purchase license plates or tabs. This is a crucial source of transportation funding. Currently, vehicle registration fees account for slightly less than half of the transportation funding collected by the state.

Cooperative Revenue Estimation Process

Estimating the amount of funding available for the 2045 RTP is a complex process. It relies on a number of factors:

- Economic conditions,
- Miles traveled by vehicles nationwide and in Michigan, and
- Federal and state transportation funding received in previous years.

Revenue forecasting relies on a combination of data and experience and represents a "best guess" of future trends. The revenue forecasting process is a cooperative effort. The Michigan Transportation Planning Association (MTPA), a voluntary association of public organizations and agencies responsible for the administration of federally-funded highway and transit planning activities throughout the state, formed the Financial Working Group (FWG) to develop a statewide standard forecasting process. FWG is comprised of members from the Federal Highway Administration (FHWA), Federal Transit Administration (FTA), Michigan Department of Transportation (MDOT), transit agencies, and metropolitan planning organizations (MPOs), including SEMCOG. The revenue assumptions in this financial plan are based on the factors formulated by FWG and approved by the MTPA. They are used for all RTP financial plans in the state.

Sources of Federal Highway Funding

Federal transportation funding comes from motor fuel taxes (mostly gasoline and diesel). Receipts from these taxes are deposited in the federal Highway Trust Fund (HTF). Funding is then apportioned to the states through formulas in law. The current law governing these apportionments is the Fixing America's Surface Transportation (FAST) Act. Through this law, Michigan receives approximately $1.1 billion in federal-aid highway funding annually. This funding is apportioned through a number of programs designed to accomplish different objectives, such as road repair, bridge repair, safety, and congestion mitigation. A brief description of the major funding sources follows.

National Highway Performance Program (NHPP)
This funding supports condition and performance on the National Highway System (NHS) and to constructs new facilities on the NHS. The National Highway System is the network of the nation's most important highways, including the Interstate and US highway systems. In Michigan, most roads on the National Highway System are state trunklines (i.e., "I-," "US-," and "M-"roads), but can also include certain locally-owned principal roads.

Surface Transportation Block Grant Program (STBG)
This program funds construction, reconstruction, rehabilitation, resurfacing, restoration, preservation, and/or operational improvements to federal-aid highways and replacement, preservation, and other improvements to bridges on public roads. Michigan's STBG apportionment from the federal government is split, with approximately half allocated to areas of the state based on population and half that can be used throughout the state. In addition, seven of the eight federal-aid committees in Southeast Michigan also receive STBG-Rural funding, which can only be used on federal-aid roads in rural areas. STBG can also be flexed (transferred) to transit projects.

Highway Safety Improvement Program (HSIP)
The HSIP funds are used to correct or improve a hazardous road location or feature, or address other highway safety problems. Projects can include intersection improvements; shoulder widening; rumble strips; and safety improvements for pedestrians, bicyclists, or disabled persons; highway signs and markings; guardrails; and other activities. The State of Michigan retains all safety funding and uses a portion on the state trunkline system, distributing the remainder to local agencies through a competitive process.

Congestion Mitigation and Air Quality Improvement (CMAQ)
Intended to reduce emissions from transportation-related sources. There is currently an emphasis on certain projects that reduce particulate matter (PM), but funds can also be used for traffic-signal retiming, actuations, and interconnects; dedicated turn lanes; roundabouts; travel demand management such a rideshare and vanpools; transit; and nonmotorized projects that divert non-recreational travel from single-occupant vehicles. In Southeast Michigan, MDOT uses half of the funding for CMAQ-eligible projects on the state trunkline system; the other half is distributed by SEMCOG to eligible highway and transit projects based on a scoring system. Traffic operations centers (TOCs) in Macomb County, Oakland County, and the City of Detroit also receive funding through a statewide set aside.

Transportation Alternatives Program (TAP)
TAP funds can be used for a number of activities to improve the transportation system environment, such as nonmotorized projects, preserving historic transportation facilities, outdoor advertising control, vegetation management in rights-of-way, and planning and constructing projects that improve the ability of students to walk or bike to school. Funds are split between the state and various larger urbanized areas based on population. The SEMCOG region has received approximately $5 million annually, distributing funds on a competitive basis (Additional information on the TAP program is in Chapter 3).

Base and assumptions used in forecast calculations of federal highway funds
Each year, funding targets (the estimated funding amount Southeast Michigan is anticipated to receive) are calculated for each of these programs, based on federal apportionment documentation and state law. Targets can vary from year to year due to factors including actual vs. estimated receipts of the Highway Trust Fund, the authorization (the annual transportation funding spending ceiling), and the appropriation (how much money is actually approved to be spent). Targets for fiscal year 2018, as provided by MDOT on November 30, 2017, were used as the baseline for the forecast. The Financial Work Group of the MTPA developed a two percent annual increase in federal-aid highway funds for the first 10 years (2018-2027) of the forecast, then a 2.4 percent annual increase for the remainder of the forecast (2028-2045).

Sources of State Highway Funding

There are two main sources of state highway funding – the state motor fuel tax and vehicle registration fees.

The state law governing collection and distribution of state highway revenue is Public Act 51 of 1951, commonly known as “Act 51.” All revenue from the motor fuel tax and vehicle registration fees is deposited into the Michigan Transportation Fund (MTF). Act 51 contains a number of complex formulas to distribute the funding, but essentially, once funding for certain grants and administrative costs are removed, approximately 10 percent of the remainder is deposited in the Comprehensive Transportation Fund (CTF) for transit. The remaining funds are then split between the Michigan Department of Transportation (MDOT), county road commissions, and municipalities (incorporated cities and villages) in a proportion of 39.1 percent, 39.1 percent, and 21.8 percent, respectively.

Major changes to state transportation revenue collection have occurred since the last RTP update. A package of bills was enacted in Fall 2015 to:

- Increase the motor fuel tax to $0.263/gallon from $0.19/gallon (gasoline) and $0.15/gallon (diesel), effective January 1, 2017;
- Raise vehicle registration fees by an average of 20 percent, effective January 1, 2017;
- Transfer $150 million from the state’s General Fund to highways in fiscal year (FY) 2019;
- Transfer $325 million from the state’s General Fund to highways in FY 2020;
- Transfer $600 million from the state’s General Fund to highways in FY 2021 and subsequent years; and
- Adjust the motor fuel tax for inflation by up to five percent annually, starting in January 2022.

These changes are estimated to increase MTF funding at least one-third over 2015 levels by 2021.

MTF funds are critical to operating the road system in Michigan. Since federal funds cannot be used to operate or maintain the road system (items such as snow removal, mowing grass in the rights-of-way, paying the electric bill for streetlights and traffic signals, etc.), MTF funds are a source for funding these items for local communities and road commissions. Most federal transportation funding must be matched with 20 percent non-federal revenue. In Michigan, most match funding comes from the MTF. Federal funding cannot be used on local public roads, such as subdivision streets. Here again, MTF is the main source of revenue for maintaining and repairing these roads.

Funding from the MTF is distributed statewide to incorporated cities, incorporated villages, and county road commissions, collectively known as "Act 51 agencies." The formula is based on population and public road mileage under each Act 51 agency's jurisdiction.

Base and assumptions used in forecast calculations of state highway funds

The base for the financial forecast of state funding is the FY 2017 distribution of MTF funding as found in MDOT Report 139. This report details distribution of funding to each eligible Act 51 agency in the state. Adding all of the distributions to cities, villages, and county road commissions in the Southeast Michigan provides an overall distribution total for the region.

The Financial Working Group predicted an annual increase of 3.7 percent in MTF revenues for the first 10 years of the forecast (2018-2027), decreasing to 2.3 percent annually during the remaining years of the forecast (2028-2045).

Sources of Hybrid State/Federal Funding

Michigan has a number of programs that use both state funding and federal funding. These programs are collectively known as the Transportation Economic Development Fund (TEDF). The TEDF is split into several categories:

- TEDF Category A: Highway projects to benefit targeted industries;
- TEDF Category C: Congestion mitigation in designated urban counties (in Southeast Michigan, these are Macomb, Oakland, and Wayne);
- TEDF Category D: All-season road network in rural counties (in Southeast Michigan, these are Livingston, Monroe, St. Clair, and Washtenaw);
- TEDF Category E: Forest roads;
- TEDF Category F: Roads in cities that are located in rural counties; and
- The Local Bridge program.

TEDF Category B no longer exists. Categories A and F are awarded on a competitive basis, and Category E is not awarded in Southeast Michigan.

The Local Bridge program is funded through a portion of the state motor fuel tax. It is supplemented with Surface Transportation Block Grant Program (STBG) funding retained by the state. The Local Bridge program is competitive, with funds being awarded by Local Bridge Committees in each of the MDOT planning regions. Three of these regions are located in whole or part in Southeast Michigan: Metro (Macomb, Oakland, and Wayne Counties), Bay (St. Clair County), and University (Livingston, Monroe, and Washtenaw Counties).

Base and Assumptions Used in Forecast Calculations of Hybrid State/Federal Highway Funds

The base year used to calculate the TEDF Category C and TEDF Category D is FY 2018. The federal amounts are increased by the agreed-upon MTPA/Financial Workgroup factors. However, the state portion is a fixed amount set in Act 51. Local bridge funding is based upon a five-year average of bridge awards to agencies in the SEMCOG region, and then increased by the agreed-upon rate for federal funds.

Sources of Local Highway Funding

Local highway funding can come from a variety of sources – transportation millages, general fund revenues, and special assessment districts. Locally-funded transportation projects that are not of regional significance are not required to be included in the RTP. This makes it difficult to determine how much local funding is being spent for roads in Southeast Michigan. Additionally, special assessment districts and millages generally have finite lives, so an accurate figure for local transportation funding would require knowledge of what millages and special assessment districts were in effect in each year of the RTP period. Given that there are seven counties and 229 cities, villages, and townships in Southeast Michigan, this level of accuracy is difficult.

State Trunkline Funding

The State of Michigan maintains an extensive network of highways across the state and within Southeast Michigan. All highways with an "I," "M," or "US" designation, such as I-75, US-23, or M-1, are part of this network, known as the State Trunkline System. The State Trunkline System in Southeast Michigan is comprised of more than 6,700 lane-miles of highway, hundreds of bridges and culverts, signs, traffic signals, safety barriers, soundwalls, and other capital projects that must be periodically repaired, replaced, reconstructed, or renovated. The agency responsible for the State Trunkline System is the Michigan Department of Transportation (MDOT). MDOT provides each MPO, including SEMCOG, with projections of estimated trunkline highway funding for the period covered in the 2045 RTP.

Innovative Financing Strategies – Highway

A number of innovative financing strategies have been developed over the past two decades to help stretch limited transportation dollars. Some are purely public sector; others involve partnerships between the public and private sectors. Some of the more common strategies are discussed below.

Toll Credits

This strategy allows states to count funding they earn through tolled bridges (after deducting facility expenses) to be used as "soft match," rather than the usual cash match for federal transportation projects. States have to demonstrate "maintenance of effort" when using toll credits; in other words, they must show that the toll money is being used for transportation purposes and that they're not reducing their efforts to maintain the existing system by using the toll credit program. Toll credits have been an important source of funding for the State of Michigan in the past because of the three major bridge crossings and one tunnel crossing between Michigan and Ontario. Toll credits have also helped to partially mitigate the funding shortfalls in Michigan, since insufficient non-federal funding is insufficient to match all of the federal funding apportioned to the state.

State Infrastructure Bank (SIB)
Established in a majority of states, including Michigan. Under the SIB program, states can place a portion of their federal highway funding into a revolving loan fund for transportation improvements such as highway, transit, rail, and intermodal projects. Loans are available at three percent interest with a 25-year-loan period to public entities such as political subdivisions, regional planning commissions, state agencies, transit agencies, railroads, and economic development corporations. Private and nonprofit corporations developing publicly owned facilities may also apply.

Transportation Infrastructure Finance and Innovation Act (TIFIA)
This nationwide program, significantly expanded under MAP-21, provides lines of credit and loan guarantees to state or local governments for development, construction, reconstruction, property acquisition, and carrying costs during construction. TIFIA enables states and local governments to use the borrowing power and credit worthiness of the United States to fund finance projects at far more favorable terms than they would otherwise be able to do on their own. Repayment of TIFIA funding to the federal government can be delayed for up to five years after project completion with a repayment period of up to 35 years. Interest rates are also low.

Bonding
Bonding is borrowing, where the borrower agrees to repay lenders the principal and interest. Interest may be fixed over the term of the bond or variable. The amount of interest a borrower will have to pay depends in large part upon its perceived credit risk; the greater the perceived chance of default, the higher the interest rate. In order to bond, a borrower must pledge a reliable revenue stream for repayment. For example, this can be the toll receipts from a new transportation project. In the case of general obligation bonds, future tax receipts are pledged.

States are allowed to borrow against their federal transportation funds, within certain limitations. While bonding provides money up front for important transportation projects, it also means diminished resources in future years, as funding is diverted from projects to paying the bonds' principal and interest. Michigan transportation law requires money for bond payment and other debts be taken off the top before the distribution of funds for other purposes. Therefore, the advantages of completing a project more quickly needs to be carefully weighed with the disadvantages of reduced resources in future years.

Advance construct/advance construct conversion
This strategy allows a community or agency to build a transportation project with its own funds (advance construct) and then be reimbursed with federal funds in a future year (advance construct conversion). Tapered match can also be programmed, where the agency is reimbursed over a period of two or more years. Advance construct allows for construction of highway projects before federal funding is available; however, the agency must be able to build the project with its own resources and then be able to wait for federal reimbursement in a later year.

Public-private partnerships (P3)
Funding available through traditional sources, such as motor fuel taxes, are not keeping pace with the growth in transportation system needs. Governments are increasingly turning to public-private partnerships (P3) to fund large transportation infrastructure projects. An example of a public-private partnership is Design/Build/Finance/Operate (DBFO). In this arrangement, the government keeps ownership of the transportation asset, but hires one or more private companies to design the facility, secure funding, construct the facility, and operate it, usually for a set period of time. The private-sector firm is repaid most commonly through toll revenue generated by the new facility.

Operations and Maintenance of the Federal-Aid Highway System

Construction, reconstruction, repair, and rehabilitation of roads and bridges are only part of the total cost of the highway system. It must also be operated and maintained. Operations and maintenance are those items necessary to keep the highway infrastructure functional for vehicle travel such as snow and ice removal; pothole patching; rubbish removal; maintaining rights-of-way, traffic signs, and signals; clearing highway storm drains; and paying the electrical bills for street lights. Traffic signals other similar activities, and the personnel and direct administrative costs necessary to implement these projects are also apart of operating and maintaining the system. These activities are as vital to the smooth functioning of the highway system as good pavement.

Federal transportation funds cannot be used for operations and maintenance of the highway system. Since the RTP only includes federally-funded transportation projects (and non-federally-funded projects of regional significance), it does not include operations and maintenance projects. While in aggregate, operations and maintenance activities are regionally significant, the individual projects do not rise to that level. However, federal regulations require an estimate of the amount of funding that will be spent operating and maintaining the federal-aid-eligible highway system over the FY 2020-2045 plan period. This section of the Financial Plan provides an estimate for Southeast Michigan and details the method used to estimate these costs.

According to MDOT's FY 2018-2022 Five-Year Transportation Program, approximately $317 million was available for "routine maintenance" for the state trunkline highway system (roads with "I-," "US-," and "M-" designations) throughout the state during fiscal year 2018. About 22.8 percent of the lane miles in the state trunkline system are located in Southeast Michigan. Assuming a roughly equal per-lane-mile operations and maintenance cost, MDOT expended approximately $72.3 million in Southeast Michigan on these activities in FY 2018, or $10,654 for each of the 6,786 lane miles of trunkline highway in Southeast Michigan. Maintenance costs were increased four percent per year over the life of the 2045 RTP to adjust for inflation (year of expenditure adjustment, see "Highway Commitments and Projected Available Revenue" section below) to provide a total of nearly $3.5 billion estimated operations and maintenance costs on the state trunkline system in Southeast Michigan from 2020-2045.

Local Act51 road agencies (county road commissions, incorporated cities, and incorporated villages) are responsible for operating and maintaining the roads they own, including those roads they own that are designated as part of the federal-aid system. The main source of revenue available to these agencies to operate and maintain the roads is the Michigan Transportation Fund (MTF). The estimate of available funding is based on the assumption that each lane-mile of road in the system has an approximately equal operations and maintenance cost. There are 14,750 lane miles of locally-owned road on the federal-aid network in Southeast Michigan. Therefore, applying the per-lane-mile cost of maintenance derived from MDOT's 2018-2022 Five-Year Transportation Program to the number of lane miles of locally-owned federal-aid eligible road in Southeast Michigan yields an annual maintenance cost of $157.15 million in base year 2018, or a total of slightly more than $7.5 billion over the life of the 2045 RTP, adjusted for year of expenditure.

Adding the trunkline and locally-owned per-lane mile costs yields a total of $229.45 million in base year 2018 for estimated operations and maintenance cost on the entire federal-aid system in Southeast Michigan, or a total of just under $11 billion over the life of the 2045 RTP, adjusted for year of expenditure.

Highway Commitments and Projected Available Revenue

The transportation plan must be fiscally constrained; that is, the cost of projects programmed in the TIP and RTP cannot exceed revenues "reasonably expected to be available" during the relevant plan period. Funding for core programs such as NHPP, STP, HSIP, and CMAQ are expected to be available to the region based on historical trends of funding from earlier, similar programs in past federal-surface-transportation laws. Likewise, state funding from the Michigan Transportation Fund (MTF) and the hybrid state/federal programs, Transportation Economic Development Fund Categories C and D, and Local Bridge, or something similar to them, are also expected to be available between FY 2020 and FY 2045. Funds from other programs are generally awarded on a competitive basis and are, therefore, impossible to predict. In these cases, projects are not amended into the RTP until proof of funding availability (such as an award letter) is provided. Funds from federal competitive programs are not included in the revenue forecast.

All federally-funded projects must be in the plan. Additionally, any non-federally-funded but regionally significant projects must be included. In these cases, project submitters demonstrate that funding is available and what sources of non-federal funding are to be used.

Projects programmed in the plan are known as commitments. As mentioned previously, commitments cannot exceed funds reasonably expected to be available. Projects must also be programmed in year of expenditure dollars, meaning that they must be adjusted for inflation to reflect the estimated purchasing power of a dollar in the year the project is expected to be built. The MTPA/Financial Work Group has decided on an annual inflation rate of four percent for projects over the plan period. This means that a project costing $1 million in FY 2020 is expected to cost $1.04 million in FY 2021, $1.082 million in FY 2022, and so on. Since the amount of growth in available funding is forecasted to be less than the rate of inflation, less work can be done each year per dollar of available funding.

Demonstration of fiscal constraint – Highway

Table 11 shows the summary fiscal constraint for highway projects. It shows that the amount available to program highway projects equals the amount programmed for highway projects during the time horizon of the 2045 RTP (2020-2045). Funding has been aggregated to the federal, state, and local source levels.

Table 11

Demonstration of Fiscal Constraint – Highway

Funding Source	Available (Millions)	Programmed (Millions)
Federal	$21,128.85	$21,128.85
State	$3,767.77	$3,767.77
Local	$1,060.32	$1,060.32
Total	$25,956.93	$25,956.93

Sources of Federal Transit Funding

Federal revenue for transit comes from federal motor fuel taxes, just as it does for highway projects. Some of the motor fuel tax collected nationwide is deposited in the Mass Transit Account of the Highway Trust Fund (HTF). Federal transit funding is similar to federal highway funding as there are several core programs where money is distributed on a formula basis and other programs that are competitive in nature. Here are brief descriptions of some of the most common federal transit programs.

Section 5307

This is the largest single source of transit funding apportioned to Michigan. Section 5307 funds can be used for capital projects, transit planning, and projects eligible under the former Job Access Reverse Commute (JARC) program (intended to link people without transportation to available jobs). Some of the funds can also be used for operating expenses, depending on the size of the transit agency. One percent of funds received are to be used by the agency to improve security at agency facilities. Distribution is based on formulas including population, population density, and operating characteristics related to transit service. Urbanized areas of 200,000 population or larger receive their own apportionment. Areas between 50,000 and 199,999 population are awarded funds by the governor from the governor's apportionment. In Southeast Michigan, the Detroit Urbanized Area's (UZA) apportionment is split between the Detroit Department of Transportation (DDOT), the Suburban Mobility Authority for Regional Transportation (SMART), and the Detroit Transportation Corporation (People Mover), while the Ann Arbor UZA apportionment is used by the Ann Arbor Area Transportation Authority (AAATA). Blue Water Area Transportation Commission (BWATC) in St. Clair County, Livingston Essential Transportation Services (LETS) in Livingston County, and the Lake Erie Transportation Commission (LETC) in Monroe County receive Section 5307 funding from the state.

Section 5310, Elderly and Persons with Disabilities
Funding for projects to benefit seniors and disabled persons when service is unavailable or insufficient and transit access projects for disabled persons exceeding Americans with Disabilities Act (ADA) requirements. Section 5310 incorporates the former New Freedom program. Urbanized areas in Southeast Michigan with populations over 200,000 (the Ann Arbor, Detroit, and Toledo Urbanized Areas) receive an apportionment of Section 5310 funding directly from the federal government. The State of Michigan allocates funding in remaining areas of the region on a per-project basis.

Section 5311, Non-Urbanized Area Formula Grant
Funds for capital, operating, and rural transit planning activities in areas under 50,000 population. Activities under the former JARC program (see Section 5307 above) in rural areas are also eligible. The state must use 15 percent of its Section 5311 funding on intercity bus transportation. The State of Michigan operates this program on a competitive basis.

Section 5337, State of Good Repair Grants
Funding to state and local governmental authorities for capital, maintenance, and operational support projects to keep fixed guideway systems in a state of good repair. Recipients are required to develop and implement an asset management plan. Fifty percent of Section 5337 funding is distributed via a formula accounting for vehicle revenue miles and directional route miles; 50 percent is based on ratios of past funding received. The Detroit Transportation Corporation (People Mover) is currently the only recipient of Section 5337 funding in Southeast Michigan.

Section 5339, Bus and Bus Facilities
Funds under this program are available to replace, rehabilitate, and purchase buses and related equipment, as well as construct bus-related facilities. Each state receives a fixed amount, with the remaining funding apportioned to transit agencies based on various population and service factors.

In addition to these funding sources, transit agencies can also apply for Surface Transportation Program and Congestion Mitigation and Air Quality Improvement (CMAQ) program funds. In Southeast Michigan, approximately one-half of each year's local CMAQ allocation is reserved for transit projects.

Base and assumptions used in forecast calculations of federal transit funds
Each year, funding targets (the estimated funding amount Southeast Michigan is anticipated to receive) are calculated for each of these programs, based on federal apportionment documentation and state law. Targets can vary from year to year due to factors including actual vs. estimated receipts of the Mass Transit Account of the Highway Trust Fund, the authorization (the annual transportation funding spending ceiling), and the appropriation (how much money is actually approved to be spent). SEMCOG works with MDOT's Office of Passenger Transportation (OPT) to develop transit funding targets.

Sources of State Transit Funding

The majority of state-level transit funding is derived from the same source as state highway funding – the state tax on motor fuels. Act 51 stipulates that 10 percent of receipts into the MTF, after certain deductions, is to be deposited in a sub-account of the MTF called the Comprehensive Transportation Fund (CTF). This is analogous to the Mass Transit Account of the Highway Trust Fund at the federal level. Additionally, a portion of the state-level auto-related sales tax is deposited in the CTF. Distributions from the CTF are used by public transit agencies for matching federal grants and also for operating expenses.

Base and assumptions used in forecast calculations of state transit funds

Calculations of state transit funds are based on historical data. MDOT OPT provides a state operating target that is based on 90 percent of the 15-year average (2003-2017) for these funds. These funds, in addition to local funding, comprise nearly all of the operating funds (wages and salaries, vehicle maintenance, maintenance of facilities, etc.) necessary to keep Southeast Michigan's public transit agencies functioning.

Sources of Local Transit Funding

Major sources of local funding for transit agencies include farebox revenues, general fund transfers from city governments, and transportation millages. All transit agencies in Southeast Michigan collect fares from riders. The Detroit Department of Transportation (DDOT) receives the largest amount of funding from a local government, the City of Detroit. Finally, several major transit agencies, including the Suburban Mobility Authority for Regional Transportation (SMART), the Ann Arbor Transportation Authority (AATA), and Blue Water Area Transportation Commission (BWATC) receive funds from dedicated transportation millages. SMART receives the largest amount of funding from this source.

Base and assumptions used in forecast calculations of local transit funds

The amount of local transit funding available is provided by the agencies themselves, based on their internal record keeping procedures.

Innovative financing strategies – transit

Sources of funding for transit are not limited to the federal, state, and local sources previously mentioned. As with highway funding, there are alternative sources of funding that can be utilized to operate transit service. Bonds can be issued (see discussion of bonds in the "Innovative Financing Strategies Highway" section). The federal government also allows the use of toll credits to match federal funds. Toll credits are earned on tolled facilities, such as the Blue Water Bridge in Port Huron. Regulations allow for the use of toll revenues (after facility operating expenses) to be used as "soft match" for transit projects. Soft match means that actual money does not have to be provided the toll revenues are used as a "credit" against the match. This allows the actual toll funds to be used on other parts of the transportation system, thus stretching the resources available to maintain the system.

Transit capital and operations

Transit expenditures are divided into two basic categories, capital and operations. Capital refers to the physical assets of the agency, such as buses and other vehicles, stations and shelters at bus stops, office equipment and furnishings, and certain spare parts for vehicles. Operations refers to the activities necessary to keep the system operating, such as driver wages and maintenance costs. Most expenses of transit agencies are operations expenses. The greatest share of transit expenditures in past years have been for operating. This is also true of the 2045 RTP, where capital expenses are approximately one-third of total planned expenses during the 2020-2045 period, whereas operations expenses are approximately two-thirds of total expenses.

Transit Commitments and Projected Available Revenue

As with highway projects, transit projects must be fiscally constrained to that funding reasonably expected to be available during the 2045 RTP time horizon. Table 12 demonstrates the summary fiscal constraint for transit projects. It shows that the amount available to program transit projects equals the amount programmed for transit projects during the time horizon of the 2045 RTP (2020-2045). Funding has been aggregated to the federal, state, and local source levels.

Table 12
Demonstration of Fiscal Constraint – Transit

Funding Source	Available (Millions)	Programmed (Millions)
Federal	$3,021.49	$3,021.49
State	$3,432.26	$3,432.26
Local	$3,223.09	$3,223.09
Total	$9,676.84	$9,676.84

Forecasting Future Travel

To develop the Regional Transportation Plan, it is critical that we understand how travel is likely to change over the next 25-30 years, and how these changes affect the policies and actions included in the transportation plan. SEMCOG has developed a complex Travel Demand Forecast Model (TDFM) that predicts how, where, and when people will travel in the future. The model has three primary data inputs:

- Detailed information on the transportation system (both roadways and transit);
- Characteristics of household, transit, and commercial vehicle travel in the region, obtained from extensive local survey data; and,
- Detailed socio-economic data for the region, including population, household size, income, jobs by employment sector, and more. This information is obtained from SEMCOG's Regional Development Forecast.

Using this data, the TDFM is able to predict the impact that specific changes in the transportation system will have on travel in the region. This data was then used to assist in the transportation decision-making process. For development of the 2045 RTP, the TDFM was used for a variety of analyses:

- Forecasting the overall changes in travel (both vehicular and transit) between 2015 and 2045, with and without implementation of the proposed projects in the 2045 RTP;
- Identifying the amount and duration of congestion on major roadways in the region;
- Measuring the accessibility of different population groups to jobs and various services (medical, shopping, education) to ensure that transportation investment decisions in the RTP did not disproportionately impact certain populations; and,
- Providing inputs to other RTP analyses including transportation conformity analysis, which ensures that vehicle pollutant emissions associated with proposed projects in the RTP will not worsen air quality or delay timely attainment of national standards, and
- Providing inputs to other RTP analyses including environmental justice analysis that ensures an equitable benefit, and no disproportionately high adverse impacts on any population resulting from transportation investments.

Table 13
Key Findings of Travel Demand Forecast Model 2045 RTP

2045RTP TDMF (Daily)	2015	2045
Vehicle Trips	14,870,960	15,836,302
Transit Boardings	183,006	205,990
Truck Trips	1,590,921	1,559,462
VMT	128,257,955	136,747,758
VHT	4,131,473	4,493,263
Average Speed	31.04	30.43

Air Quality Conformity

The federal Clean Air Act requires that federally-funded highway and transit projects contained in regional long-range transportation plans (RTP) and Transportation Improvement Programs (TIP) be consistent with the air-quality goals established in state air quality implementation plans (SIP). The process for demonstrating this consistency is called Air Quality Conformity. The purpose of Conformity is to ensure that projects in the plan will not cause new air quality violations, worsen any existing violations, or delay timely attainment of National Ambient Air Quality Standards (NAAQS).

The U.S. Environmental Protection Agency (EPA) has established NAAQS for six criteria pollutants: ozone, nitrogen dioxide, carbon monoxide (CO), lead, sulfur dioxide, and particulate matter. EPA designates an area as either "attainment" or "nonattainment" for each of these pollutants based on whether local air monitoring data shows it is meeting or not meeting these standards. Areas that were initially designated as "nonattainment" for a particular standard but later attain that standard are termed "maintenance" areas.

Pollutants Analyzed for Conformity in Southeast Michigan

Air quality conformity analysis is required for all areas currently designated as "nonattainment" or "maintenance" for CO, particulate matter, or ozone. Below is a summary of Southeast Michigan's current air quality status for each of these pollutants.

Carbon monoxide
In southeast Michigan, an area containing portions of three counties (Macomb, Oakland, and Wayne) was originally designated nonattainment back in the early 1990s. However, this area has been attaining the standard since 1995 and was re-designated as a "maintenance" area for this pollutant in 1999.

Fine particulate matter (PM2.5)
The entire seven-county region was originally designated nonattainment for both the 1997 annual (15 µg/m3) and 2006 24-hour (35 µg/m3) PM2.5 standards. However, since the implementation of Michigan's State Implementation Plan (SIP) for this pollutant, levels have declined significantly and all air monitors have been measuring levels well below the standards since 2009. Consequently, the U.S. EPA has re-designated the region as a "maintenance area" for these two standards in 2013. In 2015, southeast Michigan was designated as "attainment" for the tougher 2012 annual standard (12 µg/m3) and the 1997 annual standard was revoked by the EPA in 2016. Thus, conformity analysis for this pollutant is only required for the 24-hour standard for the region.

Ozone
The entire region was originally designated nonattainment for the 1997 ozone NAAQS of 0.08 ppm. Following successful implementation of Michigan's SIP for this pollutant, the region was re-designated as "maintenance" in 2009. In 2012, Southeast Michigan was designated as "attainment" for the 2008 ozone NAAQS of 0.075 ppm and the 1997 ozone NAAQS was revoked in April 2015. Due to the federal appeals court ruling in February 2018 regarding EPA's 1997 ozone NAAQS revocation, areas including SEMCOG are required to demonstrate that transportation projects continue to conform with the 1997 ozone standard. In addition, the entire seven-county region was designated nonattainment for the new stricter 2015 ozone NAAQS of 0.070 ppm by the EPA effective in August 2018. The results of eight-hour ozone conformity analysis are included in this report.

Overview of Conformity Analysis Process

To analyze conformity, emissions generated by all vehicles on Southeast Michigan's roadway system are estimated using a complex set of computer models. The models estimate the expected change in these emissions due to the combination of:

- Anticipated growth in the region, and
- The implementation of regionally-significant transportation projects that either increase or decrease roadway capacity (e.g., building of new roads, adding or reducing the number of traffic lanes on existing roads). The impact of major transit projects is also included.

This report provides the results of SEMCOG's air quality conformity analysis for SEMCOG's 2045 regional transportation plan (RTP), as well as detailed documentation on the modeling process used to conduct this analysis.

Results of Transportation Conformity Analysis

Carbon monoxide (CO)

Table 14 shows the results of the carbon monoxide (CO) conformity analysis for the Southeast Michigan "maintenance" area. This area includes the tri-county region of Macomb, Oakland, and Wayne. Conformity for this pollutant is demonstrated when forecasted emissions for specific future years do not exceed the EPA-approved mobile source emission budgets set forth in Michigan's SIP for CO. The data in Table 14 show that forecasted CO emissions for all analysis years are well below the SIP budget for this pollutant. Thus, conformity is demonstrated.

Table 14

Results of CO Conformity Analysis – Budget Emissions Test

Scenario	CO Emissions (tons/day)	Tri-County Winter Weekday VMT (in millions)
Conformity Budget	3,843.0	NA
2020	557.8	88.9
2025	414.1	89.5
2035	249.8	91.3
2045	222.5	94.0

24-Hour fine particulate matter (PM2.5)

Table 15 shows the results of the 24-hour fine particulate matter (PM2.5) conformity analysis for the Southeast Michigan attainment/maintenance area. This area includes the entire seven-county SEMCOG region. In accordance with EPA conformity guidance on the 24-hour PM2.5 standard, the analysis uses daily emissions inventories for the season in which most 24-hour PM2.5 violations occur. Research by the Michigan Department of Environmental Quality and SEMCOG's Air Quality Study (SEMAQS) group found that PM2.5 concentrations in Southeast Michigan tend to be highest during the winter season. Thus, vehicle emissions for an average winter day are used for this conformity analysis.

Mobile source emission budgets for the 24-hour standard were approved by the EPA in 2013, when the region was re-designated as an attainment/maintenance area. Conformity is demonstrated if forecasted 24-hour PM2.5 and nitrogen oxide (NOx) emissions for specific future years do not exceed these budgets. The data in Table 15 show that forecasted emissions of both PM2.5 and NOx are well below the established budgets for all analysis years. Thus, conformity is demonstrated.

Table 15

Results of Daily PM2.5 Conformity Analysis – Budget Emissions Test

Analysis Year	Emissions (tons/day)		Regional Winter Weekday VMT (in millions)
	Primary $PM_{2.5}$	NO_x	
Conformity Budget	16.0	365.0	NA
2020	4.9	94.0	115.1
2025	3.3	58.7	116.4
2035	2.1	31.4	119.2
2045	2.1	29.1	123.0

Ozone

Table 16 shows the results of the ozone conformity analysis for SEMCOG's 1997 ozone "maintenance" area and 2015 ozone "nonattainment" area. This area includes the entire seven-county SEMCOG region. Conformity is demonstrated if forecasted emissions for specific future years do not exceed the EPA-approved mobile source emission budgets set forth in Michigan's State Implementation Plan (SIP) for ozone.

The data in Table 16 show that forecasted emissions in the SEMCOG region for the two pollutants causing ozone formation-volatile organic compounds (VOC) and nitrogen oxides (NOx) - are well below the 1997 established mobile source emissions budgets for all analysis years. Thus, conformity is demonstrated.

Table 16
Results of Eight-Hour Ozone Conformity Analysis – Budget Emissions Test

Analysis Year	Emissions (tons/day)		Regional Winter Weekday VMT (in millions)
	VOC	NO_x	
Conformity Budget	106.0	274.0	NA
2020	57.1	92.6	137.8
2025	41.7	56.3	139.3
2035	23.9	27.8	142.7
2045	21.4	25.2	147.2

Similarly, for CO, since the "maintenance" area for this pollutant only includes Macomb, Oakland, and Wayne Counties, MOVES' county-level run was utilized, and Wayne County was chosen to represent the fuel characteristics used in these three SEMCOG counties. The critical local inputs, including vehicle miles of travel (VMT), vehicle hours of travel (VHT), speed distribution, ramp fractions, and vehicle population were developed from data in just these three counties. CO emissions are highest during the winter months, therefore only December, January, and February are included to produce average weekday emissions in CO conformity analysis.

More information on the development of these local inputs is provided in specific sections below.

Projects Included in the Conformity Analysis

This analysis included all capacity-related projects proposed for SEMCOG's 2045 RTP, plus those already in SEMCOG's 2040 RTP with the fiscal year between 2017 and 2019. A complete list of the projects included in this analysis can be found in Appendix X.

Coordination With Michigan Transportation Conformity

Interagency Workgroup

Coordination process

On July 18, 2018, the Michigan Transportation Conformity Interagency Workgroup (MITC-IAWG) held a conference call to review proposed projects to SEMCOG's 2045 RTP. A summary of this call is provided in Appendix X. A copy of this conformity analysis documentation was sent to each member of the MITC-IAWG for review and comment.

Environmental Justice

Transportation investments have both positive and negative impacts that may be localized in a particular community or portion of a community. Environmental justice requires that these impacts be distributed fairly among population groups especially focusing on those population groups that have been traditionally disadvantaged. SEMCOG, in responding to this important challenge, implements a process to assess the impacts of the transportation planning process and the 2045 RTP on the target populations.

The target populations are minorities (African-American, Asian-American, Native American, and Hispanics), low-income households, senior citizens, and households without cars. Information about these populations can be found in the Appendix X. SEMCOG identified three principles to ensure environmental justice considerations were properly integrated into the transportation planning process:

- Ensure adequate public involvement of target populations in regional transportation decision making.
- Assess whether there were disproportionately high and adverse impacts on the target populations resulting from federal programs (e.g., travel time).
- Ensure that the target populations receive an equitable share of benefits from federal transportation investments.

Several quantitative measures were applied in order to assess the impacts of the plan. Although these measures cannot take into account every possible facet of environmental justice, SEMCOG believes they are good indicators as to whether significant environmental justice issues are present. When applied at the regional level, the measures indicated the 2045 RTP creates no environmental justice problems. It is important to keep in mind that this analysis was done at a regional, transportation-systemwide level. Additional refinement will be made as individual projects go through project development. The complete environmental justice analysis of the 2045 RTP is available in the separate Environmental Justice Technical Analysis in the Appendix X.

Environmental Sensitivity

Transportation infrastructure (roads, bridges, trails, transit routes, and rail) and the people and vehicles that use it impact the physical landscape. It is important to consider this interaction when planning, designing, constructing, and maintaining the transportation system. SEMCOG has developed a regional analysis of possible impacts of planned transportation projects on the environment along with a series of guidelines for mitigating those impacts.

SEMCOG defined and identified environmentally sensitive resources in the region using a buffer analysis to assess the likelihood that planned transportation projects may impact these resources. Ideally, any possible impacts on environmentally sensitive areas would be avoided. Realistically, this is not always possible and the results of the analysis indicate that each of the defined environmentally sensitive resources could potentially be impacted by proximity to planned projects. This is not to say, however, that transportation projects impacting the environment should not be implemented. The goal is to balance transportation needs with environmental protection and construct and maintain a transportation system that minimizes negative impacts and, where possible, actually increases appropriate public access to environmental resources. Where impacts cannot be avoided, mitigation activities should be considered. To that end, SEMCOG promotes good planning practices via a series of guidelines for consideration by road and transit implementing agencies.

Table 17 summarizes the number of projects in the entire *2045 Regional Transportation Plan for Southeast Michigan* including project changes proposed in this Fall 2018 amendment.

Table 17
Possible Project Impacts, 2045 Regional Transportation Plan for Southeast Michigan

Project Type (Total Number of Projects **Planned)**	**Number of Projects Potentially Impacting Resources**										
	Water Resources[1]	Wetlands	Flood Prone Areas	Groundwater Resources[2]	Woodlands	Parks $ Rec Areas	Historic Sites	Cemeteries	Heritage Routes Natural Beauty Roads	Historic Bridges	Nonmotorized Facilities
Bridge (8 projects)	1	0	2	1	7	1	0	0	1	0	0
Congestion - Capacity (27 projects)	24	21	12	1	27	4	0	1	1	1	7
Congestion - Non-Capacity (2 projects)	2	2	1	0	2	1	1	0	0	0	0
Pavement (27 projects)	23	23	15	2	27	13	3	4	3	0	5

[1]Water resources consist of lakes and streams, designated trout lakes/streams, and Natural Rivers.
[2]Groundwater resources consist of wellhead protection areas and sinkholes.

Nonmotorized Access to Core Services

SEMCOG's non-motorized accessibility analysis evaluates how well transportation infrastructure serves travel demands at the local or neighborhood levels. It focuses on walking and biking trips to essential core service destinations for everyone, and for Environmental Justice (EJ) population in particular. Such destinations include jobs, retail space, health centers, libraries, schools, and parks. The purpose of this accessibility analysis in 2045 RTP is twofold. First, it updates some benchmarks in SEMCOG's Access to Core Services analysis using the latest land use, transportation, and demographic data, to evaluate the effectiveness and efficiency of the current local road system. Secondly, it supplements Environmental Justice analysis with a complete set of non-motorized accessibility indicators for both 2015 and 2045. It helps us better understand how various population groups, especially the disadvantaged populations, are connected locally to essential services in the base year and forecast horizon.

SEMCOG conducted non-motorized accessibility analysis with high-level geographic details, in terms of land parcels and local road system. Essential access point data, such as jobs, retail space, and other types of service locations, were geocoded in GIS (Geographic Information System) to individual parcels with x and y coordinates. Based on Michigan Geographic Framework (MGF) dataset, SEMCOG developed a local road system by eliminating all non-road features and non-walkable road segments, such as freeways. In addition, specific walk and bike accessible features such as regional trails were added to provide a more complete and sensible walkable network. On the demographic side, SEMCOG used 2015 synthesized individual household and population data as well as 2045 Regional Development Forecast (RDF) outputs as demographic overlays. All data were then taken into the main analysis platform, the accessibility module in RDF model based on UrbanSim, to calculate network-based accessibility indicators. Preselected travel time thresholds by travel mode are used to query and summarize population distributions at various accessibility levels.

To provide consistent and comparable results to both Access to Core Services and Environmental Justice studies, this analysis measured job and retail access in the same way as EJ analysis and generated other accessibility indicators identical to those in Access to Core Services analysis. In addition, the same population groups defined in EJ study were applied in this analysis, which included zero car households, low income households, EJ households (including both minority and low income households), minority population, and senior population. Due to the nature of non-motorized travels, SEMCOG adjusted some access destinations. For example, instead of a single access point representing each park in EJ auto and transit accessibility analyses, non-motorized park destinations could include multiple entrance points of the same park accessible by walking and biking.

The results show that in both 2015 and 2045 most disadvantaged populations have better access to essential services by walking or biking than the rest of Southeast Michigan residents. Two examples are job accessibility and health center accessibility (Figures 45 and 46). However, there are some spatial gaps between existing service locations and disadvantaged populations such as health center coverage for low-income households in some communities outside Detroit (Figure 47). Also, analysis of future accessibility changes reveals potential service reductions for particular demographic groups, at least based on the existing distribution of services and local road system. Examples include declining job accessibility for zero-car households (Figure 45) and declining health service accessibility for the minority populations in 2045 (Figure 46). Significant accessibility losses affect both quality of life and local economic opportunity.

Figure 45
Job Accessibility by 15-Minute Walk, Southeast Michigan

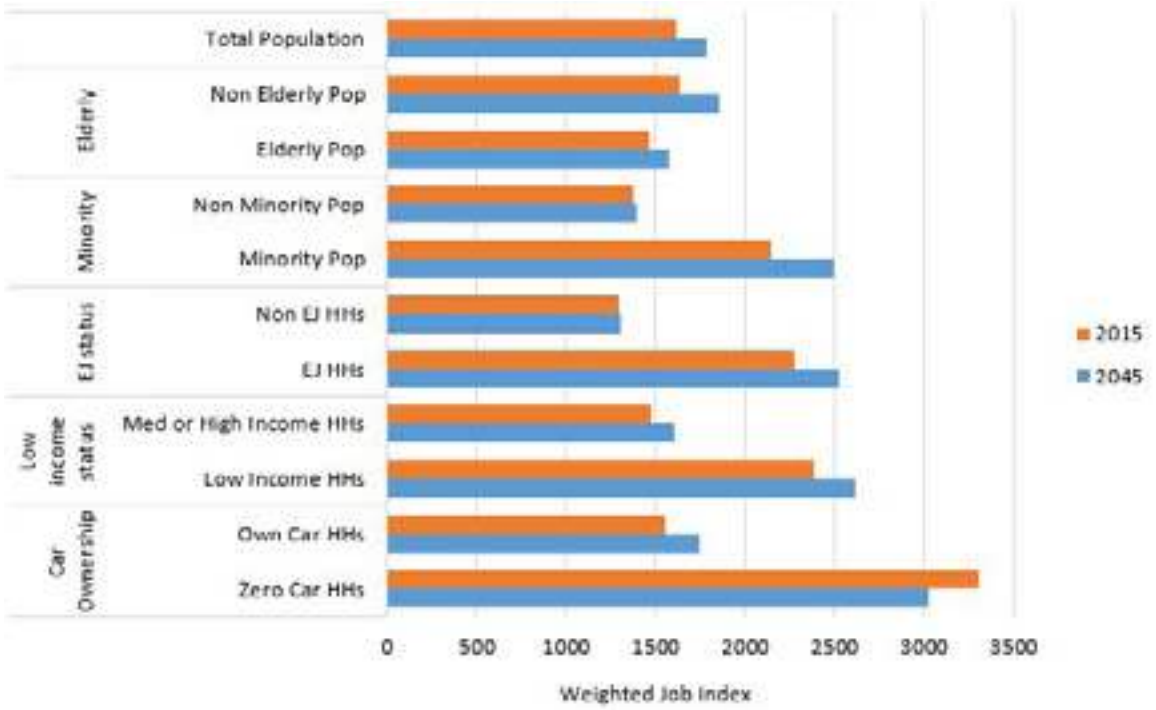


Figure 46
Percent of Population within 15-Minutes Bike Ride to Health Centers,
Southeast Michigan

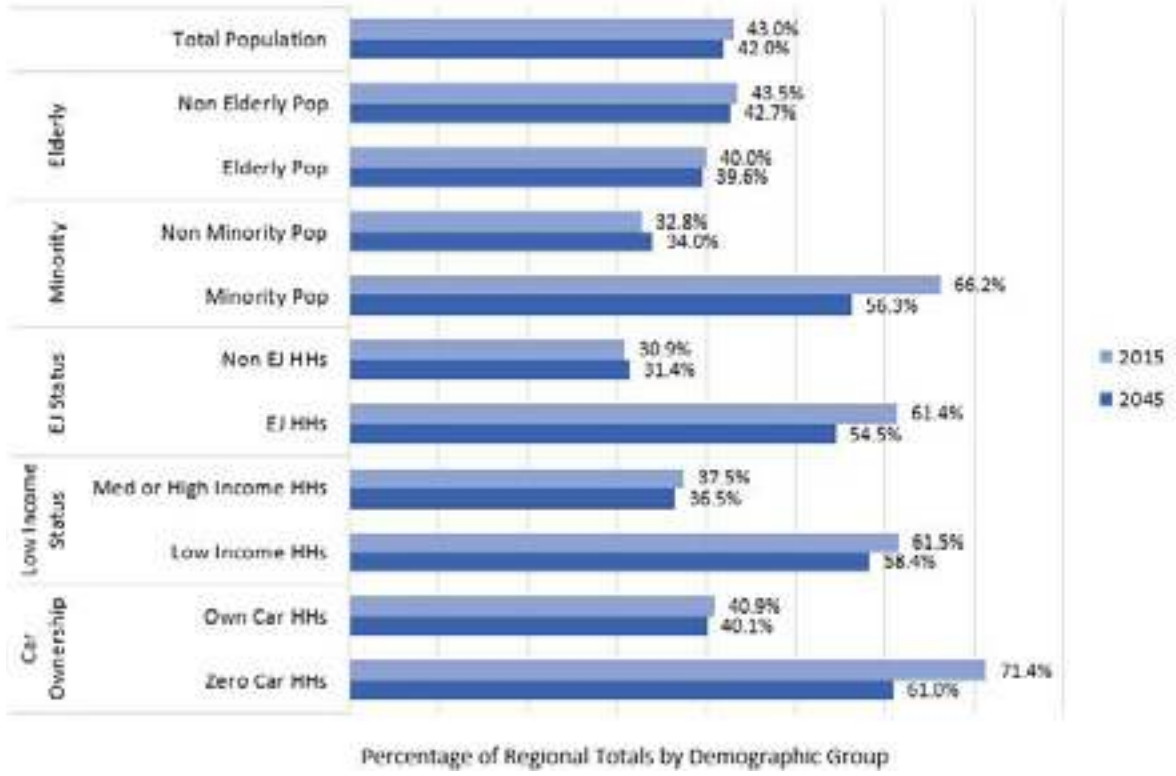
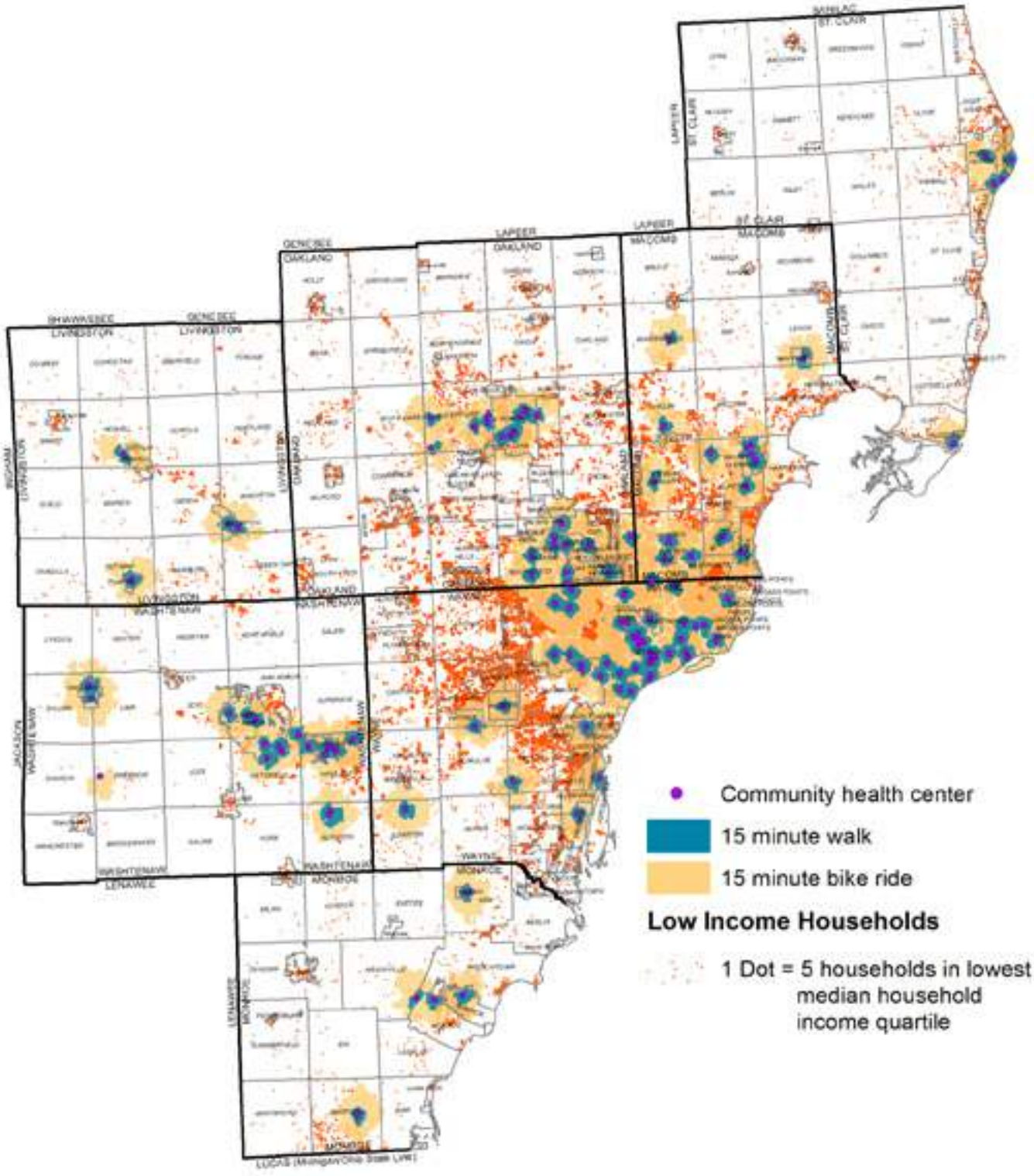


Figure 47

Access to Community Health Centers, 2015



Congestion Management Process

Capacity project evaluation

As part of 2045 Regional Transportation Plan (RTP) analysis and congestion management process (CMP) requirements, SEMCOG reviews and evaluates capacity-widening projects submitted by Michigan Department of Transportation (MDOT), federal-aid committees (FACs), and transportation management areas (TMAs). FHWA requires all the single-occupant-vehicle-capacity-adding projects in nonattainment areas must be evaluated through congestion management process (CMP).

Capacity-widening projects are evaluated for current and future years congestion problems based on archived real-time speed data and future speed data from travel demand forecasting model (TDFM) 2045 no-build scenario. A freeway or arterial roadway segment is considered congested if the freeway speed is below 35 mph and the arterial speed is below 20 mph. In addition to speed-data analysis, SEMCOG also analyzes crash data to identify any safety issues in the project scope limit. If the available data and analyses fail to identify any congestion and safety problems for any capacity improvement project, then SEMCOG requests additional information for such projects that explains the need for the capacity change and the data that was used to make this determination.

The evaluation process includes the following specific steps:

- Several smaller capacity projects in different RTP and TIP fiscal years along the same corridor were combined into one continuous project limit by corridor.
- For each combined capacity project, a project corridor was defined in addition to the project scope limit. This project corridor includes project scope limit plus one or two intersections approaches upstream and downstream of the project limit. The intent here is to identify problems also the in the vicinity of the project limit.
- Archived real-time speed data was obtained for each roadway segment of the project corridor from the two data sources using the RITIS platform: NPMRDS INRIX data and the general INRIX data. General INRIX data provides speed data for far more arterial corridors than NPMRDS INRIX, whereas NPMRDS data has much higher confidence level. Obviously, NPMRDS data was preferred over general INRIX data for analysis where both datasets are available for the entire corridor.
- Average hourly speed data was downloaded for 165 days from September 2017 through the end of September 2018 including only Tuesday, Wednesday, and Thursday, for each segment of the corridor by direction.
- For each corridor segment, the lowest hourly speed between 7 a.m. and 7 p.m. was determined by direction. Then, the minimum speed for the entire corridor was identified as the lowest speed among all the corridor segments in both directions.
- Future corridor speed was determined based on the lowest speed between AM and PM peak period among all corridor segments using the 2045 no-build TDF model runs.
- If the minimum speed for the project corridor is below or equal to 20 and 35 mph for arterials and freeways respectively, then the project is considered justified for congestion-related problems.
- Crash data analysis was also performed for capacity improvement projects using the average reported crash numbers from 2013-2017 (Source: SEMCOG crash database). For each project corridor, the maximum average crash number was identified as the highest yearly crash average among all the corridor segments by directions.

Using the above steps, current and future year (2045 no-build scenario) minimum speed and maximum yearly average crash number in the project corridor for all capacity projects were determined and are shown in Table 18. The majority of project corridors show both safety and congestion problems in current and future years. Only three of the total capacity-widening-project corridors failed to show congestion problems either in base or future years (highlighted in Table 18). However, these three corridors show a reasonable number of crashes and safety issues. Therefore, all the capacity widening projects are justified based on either congestion or safety problems. As a result, no additional information was requested from any FAC to support their submitted capacity-widening projects.

Table 18

Regional Transportation Plan Capacity Project List, Southeast Michigan

TEMP PROJECT ID	FAC	PROJECT TITLE	PROJECT LIMITS	PROPOSED WORK	Min. Speed mph (Sep17-18) in Proj. Limit	Min. Speed mph (Sep17-18) in Proj. Corridor	TDFM 2045 Speed in Corridor	Max. Yearly crash Avg. (2013-2017) in Corridor
45RTP-3	Huron Valley	Old US-23	Grand River Ave to Spencer Rd	Widen 2 to 5 lanes	26	26	25	14
45RTP-29	Macomb	23 Mile Rd	Card Rd to RomeoPlank	Widen from 2 to 5 lanes	22	18	15	50
45RTP-75	Macomb	Romeo Plank Rd	21 Mile to 23 Mile Rd	Widen from 2 to 5	17	12	12	NA
45RTP-98	Macomb	North Ave	21 Mile to 23 Mile	Widen from 2 to 5 lanes	26	21	16	22
45RTP-112	Macomb	Mound Rd	I-696 to M-59	Add 1 lane each direction	18	18	13	75
45RTP-134	Macomb	Hayes Rd	23 Mile to 26 Mile Rd	Widen 2 to 5 lanes	19	19	16	NA
45RTP-133	Macomb	26 Mile Rd	M-53 to Schoenher	Widen 2 to 5 lanes	21	21	20	21
45RTP-108	Oakland	Beck Rd	8 Mile to PontcTrail	Widen from 3 to 5 lanes	18	18	18	40
45RTP-23	Oakland	Baldwin Rd	Gregory to Waldon	Widen Rd	23	19	16	NA
45RTP-115	Oakland	Rochester Rd	Barclay to Trimway	Widen from 5 lanes to 4 lane blvd	36	26	18	32
45RTP-167	Oakland	Orchard Lake Rd	13 Mile to 14 Mile	Widen from 5 lanes to 4 lane blvd	18	18	19	50
45RTP-168	Oakland	Pontiac Trail	Decker to Welch	Widen from 2 to 5 lanes	17	17	14	NA
45RTP-169	Oakland	Southfield Rd	Mt Vernon to Bevrly	Widen from 5 lanes to 4 lane blvd	18	18	14	82
45RTP-177	Wayne	Canton Center	Geddes to Palmer	Add center-left turn lane	28	28	15	26
45RTP-199	Oakland	Meadowbrook Rd	10Mile to 12 Mile	Widen from 3 to 5 lanes	19	19	17	13
45RTP-197	Oakland	12 Mile Rd	Beck to Dixon	Widen from 2 to 4 lane blvd	19	19	15	18
45RTP-200	Oakland	10 Mile Rd	S Lyon to Haggerty	Widen from 2 to 5 lanes	29	29	31	26
45RTP-xxx	MDOT	M-153	Sheldon to Lotz Rd	Reconstruct to Blvd.	19	19	18	149
45RTP-140	MDOT	I-75	N of 13 Mile to N of M-102 (Eight Mile	Reconstruct and widen	25	25	26	53
45RTP-142	MDOT	I-94	I-96 to Conner Ave	Trunkline modernization	18	18	25	31

ITS Architecture

Intelligent Transportation Systems (ITS) refers to computer and electronic technologies, communications, or information processing to improve the safety and efficiency of the transportation system. ITS helps operators better monitor and manage the transportation system, respond to incidents more quickly, and disseminate traffic-related information back to the public. Examples of ITS technologies used in Southeast Michigan are:

- Dynamic message signs
- Closed-circuit TV cameras
- Roadway vehicle detection sensors
- Coordinated signal systems
- Transportation operations centers

ITS enables collaboration, communication, and cross-jurisdiction/agency system integration. ITS is a proven alternative solution to reduce congestion, increase traffic flow, enhance safety, and improve air quality. Projects included in the 2045 RTP conform with the regional ITS architecture.

Chapter 5: Projects in the 2045 RTP

There are 174 projects in the 2045 RTP totaling $35.7 billion. Figure 48 maps all projects included in the 2045 RTP that have a specific location. This map represents $5.4 billion (15%) of the $35.7 billion in investments planned through 2045.

The remainder of the projects are either investments in transit vehicles and operations or spending on routine road projects, which are not individually identified. Table 19 breaks down the funding for each of the GPAs.

Table 20 outlines all the projects included in the plan organized by county and then project year.

Projects that meet the 2045 RTP policies but do not have a reasonably identified source of funding are included as part of an illustrative list that can be found in Appendix X.

Table 19
2045 RTP General Program Account Project Funding

Highway General Program Accounts	
Pavement	$18,536,306,667
Safety/Operations	$1,067,934,470
Bridge	$617,971,080
Livability and Sustainability	$363,987,108
Highway GPA Total	$20,586,199,325
Transit General Program Accounts	
Operations	$6,401,670,102
Capital	$3,275,167,310
Transit GPA Total	$9,676,837,412
All General Program Accounts	
GPA Total	$30,263,036,737
Mapped Projects	
Total	$5,472,235,196
2045 RTP	
Total	$35,735,271,933

Figure 48
2045 RTP Projects, Southeast Michigan

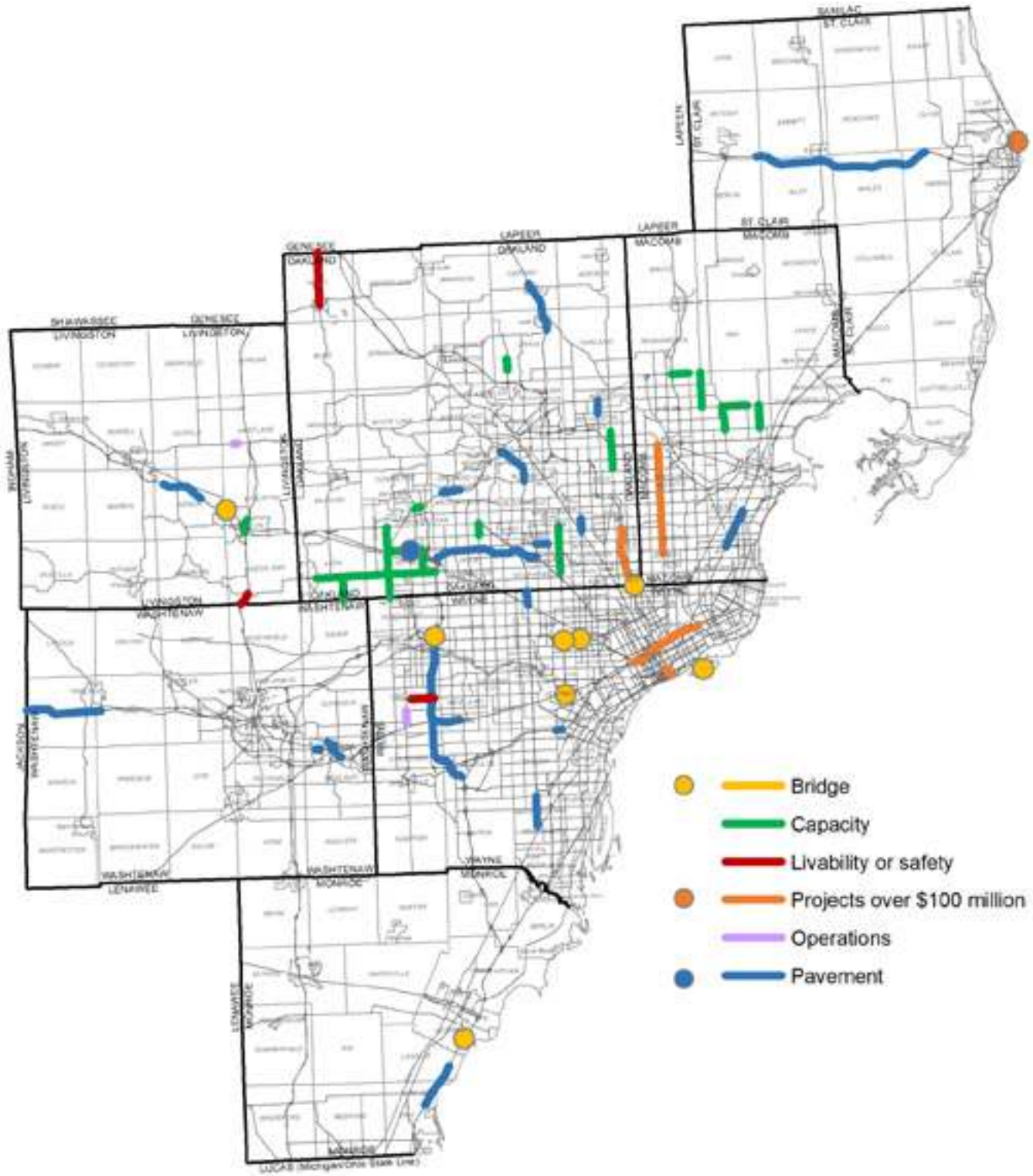


Table 20
2045 RTP Projects

RIN	FAC	COUNTY	LEAD AGENCY	YEAR(S)	PROJECT TITLE	PROJECT LIMITS	PROPOSED WORK	PROJECT TOTAL	ON MAP	TYPE
13303	Huron Valley	Livingston	LCRC	2020	Old US-23	Grand River Ave to Spencer Rd	Widen from two to five lanes and reconstruct	$5,484,860	Y	Capacity
13343	MDOT	Livingston	MDOT	2020	US-23 NB	Eight Mile Rd to M-36	Construct new noise wall	$2,138,573	Y	Livability
13346	MDOT	Livingston	MDOT	2020	M-59 (Highland Rd)	Cullen Rd to 950 ft E of Hartland Woods Dr	Construct center-left turn lane	$1,790,112	Y	Operations
13338	MDOT	Livingston	MDOT	2023	I-96	Chilson Rd to Dorr Rd	Concrete inlay in right lane	$17,044,160	Y	Bridge
13396	MDOT	Livingston	MDOT	2023	I-96	I-96 BL (on-ramp) over I-96	Replace bridge	$1,203,346	Y	Bridge
13370	Huron Valley	Livingston	Various	2023	Bridge Replacement	Countywide	Remove and reconstruct bridge(s) to be determined	$973,600	N	Bridge
13376	Huron Valley	Livingston	Various	2024	Reconstruct roadway	Countywide	Reconstruct roadway(s) to be determined	$3,162,500	N	Pavement
13388	Huron Valley	Livingston	Various	2025-2034	Bridge replacement	Countywide	Remove and reconstruct bridge(s) to be determined	$1,184,000	N	Bridge
13391	Huron Valley	Livingston	Various	2025-2034	Reconstruct roadway	Countywide	Reconstruct roadway(s) to be determined	$3,947,500	N	Pavement
13393	Huron Valley	Livingston	Various	2025-2034	Reconstruct roadway	Countywide	Reconstruct roadway(s) to be determined	$4,682,500	N	Pavement
13395	Huron Valley	Livingston	Various	2025-2034	Bridge replacement	Countywide	Remove and reconstruct bridge(s) to be determined	$1,440,800	N	Bridge
13443	Huron Valley	Livingston	Various	2035-2045	Reconstruct roadway	Countywide	Reconstruct roadway(s) to be determined	$5,697,500	N	Pavement
13445	Huron Valley	Livingston	Various	2035-2045	Bridge Replacement	Countywide	Remove and reconstruct bridge(s) to be determined	$1,752,800	N	Bridge
13447	Huron Valley	Livingston	Various	2035-2045	Reconstruct roadway	Countywide	Reconstruct roadway(s) to be determined	$7,207,500	N	Pavement
13449	Huron Valley	Livingston	Various	2035-2045	Bridge Replacement	Countywide	Remove and reconstruct bridge(s) to be determined	$2,132,800	N	Bridge

RIN	FAC	COUNTY	LEAD AGENCY	YEAR(S)	PROJECT TITLE	PROPOSED LIMITS	PROPOSED WORK	PROJECT TOTAL	ON MAP	TYPE
13544	Macomb	Macomb	MCDR	2020	23 Mile Rd	900 ft W of Card Rd to 900 ft W of Heydenreich Rd	Reconstruct and widen from two to five lanes	$8,173,172	Y	Capacity
50002	Macomb	Macomb	MCDR	2020, 2021, 2022, 2023, 2024	Mound Rd	I-696 to M-59	Reconstruct; add one lane each direction from 17 Mile Rd to M-59; add ITS, safety and ped/bike features.	$217,000,000	Y	Over $100m
13550	Macomb	Macomb	MCDR	2021	23 Mile Rd	Nine hundred (900) ft W of Heydenreich Rd 600 ft E of Romeo Plank Rd	Reconstruct roadway and widen from two to five lanes	$8,198,684	Y	Capacity
13319	MDOT	Macomb	MDOT	2021	M-3 (Gratiot Ave) NB	11 Mile Rd to 14 Mile Rd	Reconstruct	$35,970,000	Y	Pavement
13569	Macomb	Macomb	MCDR	2022	Romeo Plank Rd	Two thousand eight hundred (2800) ft N of 21 Mile Rd to 1000 ft N of 23 Mile Rd	Reconstruct and widen from two to five lanes; possible conversion of 22 Mile Rd and Romeo Plank Rd to a roundabout.	$9,111,600	Y	Capacity
13597	Macomb	Macomb	MCDR	2023	North Ave	21 Mile Rd to 1000 ft N of 22 Mile Rd	Reconstruct roadway and widen from two to five lanes	$8,100,000	Y	Capacity
13601	Macomb	Macomb	MCDR	2025-2034	North Ave	One thousand (1000) ft N of 22 Mile Rd to 1000 ft N of 23 Mile Rd	Reconstruct roadway and widen from two to five lanes	$10,463,432	Y	Capacity
13602	Macomb	Macomb	MCDR	2025-2034	Hayes Rd	23 Mile Rd to 1000 ft N of 24 Mile Rd	Reconstruct roadway and widen from two to five lanes	$10,559,816	Y	Capacity
13609	Macomb	Macomb	MCDR	2025-2034	Hayes Rd	One thousand (1000) ft N of 24 Mile Rd to 1000 ft N of 25 Mile Rd	Reconstruct roadway and widen from two to five lanes	$10,813,848	Y	Capacity

RIN	FAC	COUNTY	LEAD AGENCY	YEAR(S)	PROJECT TITLE	PROJECT LIMITS	PROPOSED WORK	PROJECT TOTAL	ON MAP	TYPE
13611	Macomb	Macomb	MCDR	2025-2034	Hayes Rd	One thousand (1000) ft N of 25 Mile Rd to 1000 ft N of 26 Mile Rd	Reconstruct roadway and widen from two to five lanes	$10,745,805	Y	Capacity
13605	Macomb	Macomb	Various	2025-2034	26 Mile Rd	Eight hundred (800) ft E of M-53 (Christopher Columbus Fwy) to 1000 ft E of Schoenherr Rd	Reconstruct roadway and widen from two to five lanes	$11,497,362	Y	Capacity
13162	Monroe	Monroe	LETC	2020	General Local Transit Operating	LETC Service Area	Operating costs of local transit agency	$1,798,095	N	Transit Operations
13380	MDOT	Monroe	MDOT	2020	I-275 Bike Path	Bridges 1 and 2 of 58171	Misc. bridge work	$247,595	Y	Ped/Bike
13165	Monroe	Monroe	LETC	2021	General Local Transit Operating	LETC Service Area	Operating costs of local transit agency	$1,815,536	N	Transit Operations
13327	MDOT	Monroe	MDOT	2021	I-75	Erie Rd to Otter Creek Rd	Reconstruct	$72,000,000	Y	Pavement
13328	MDOT	Monroe	MDOT	2021	I-75	Four bridges on I-75 in Monroe County	Replace bridges	$17,020,000	Y	Bridge
13337	MDOT	Monroe	MDOT	2021	I-75	LaPlaisance Rd bridge over I-75	Replace bridge	$10,200,000	Y	Bridge
13168	Monroe	Monroe	LETC	2022	General Local Transit Operating	LETC Service Area	Operating costs of local transit agency	$1,833,147	N	Transit Operations
13171	Monroe	Monroe	LETC	2023	General Local Transit Operating	LETC Service Area	Operating costs of local transit agency	$1,850,928	N	Transit Operations
13174	Monroe	Monroe	LETC	2024	General Local Transit Operating	LETC Service Area	Operating costs of local transit agency	$1,868,882	N	Transit Operations

RIN	FAC	COUNTY	LEAD AGENCY	YEAR(S)	PROJECT TITLE	PROJECT LIMITS	PROPOSED WORK	PROJECT TOTAL	ON MAP	TYPE
30002	Monroe	Monroe	LETC	2025-2034	General Local Transit Operating	LETC Service Area	Operating costs of local transit agency	$19,730,724	N	Transit Operations
30004	Monroe	Monroe	LETC	2035-2045	General Local Transit Operating	LETC Service Area	Operating costs of local transit agency	$24,292,041	N	Transit Operations
13437	Oakland	Oakland	RCOC	2020	Baldwin Rd (ACC only)	Gregory Rd to Waldon Rd	Widen Rd	$2,392,176	Y	Capacity
13433	Oakland	Oakland	RCOC	2020, 2021	Currie Rd	Eight Mile Rd to Ten Mile Rd	Pave gravel roadway	$4,500,000	Y	Capacity
13397	MDOT	Oakland	MDOT	2020, 2021, 2022, 2023, 2024, 2025 - 2034, 2035 - 2045	I-75	N of 13 Mile to N of M-102 (Eight Mile Rd)	Reconstruct and widen; construct drain tunnel	$1,260,400,000	Y	Over $100m
13326	MDOT	Oakland	MDOT	2020	M-24 (Lapeer Rd)	Goldengate St to Harriet St	HMA mill and resurface, reconstruction, and miscellaneous work	$25,500,000	Y	Pavement
13520	Oakland	Oakland	RCOC	2020	North Holly Rd	300 ft N of Grange Hall Rd to N Oakland County Line	Pavement reconditioning and safety improvements	$4,625,000	Y	Safety
13435	Oakland	Oakland	RCOC	2020	Pontiac Trail	Green Lake Rd to Arrowhead Rd	Reconstruct roadway	$3,998,665	Y	Pavement
13419	Oakland	Oakland	RCOC	2021	12 Mile Rd	at Novi Rd	Reconstruct roadway	$1,000,000	Y	Pavement
13420	Oakland	Oakland	RCOC	2021	12 Mile Rd	Lahser Rd to Evergreen Rd	Reconstruct roadway	$4,375,000	Y	Pavement
13417	Oakland	Oakland	RCOC	2021	Livernois Rd [ACC only]	Avon Rd to Walton Blvd	Rehabilitate roadway	$3,600,000	Y	Pavement
13421	Oakland	Oakland	Troy C.	2021, 2022	Rochester Rd (AC, ACC)	Barclay Dr to Trinway Dr	Widen from five lanes to four-lane boulevard	$18,427,195	Y	Capacity

RIN	FAC	COUNTY	LEAD AGENCY	YEAR(S)	PROJECT NAME	PROJECT LIMITS	PROPOSED WORK	PROJECT TOTAL	ON MAP	TYPE
13372	MDOT	Oakland	MDOT	2023	I-696	I-275 to Lahser Rd	Two-course HMA overlay and misc. work	$60,060,000	Y	Pavement
13375	MDOT	Oakland	MDOT	2023	US-24 (Telegraph Rd)	Long Lake Rd to Orchard Lake Rd and Maple Rd intersection	Concrete pavement inlay and misc. work	$24,090,000	Y	Pavement
13310	Oakland	Oakland	Various	2024	Beck Rd	12 Mile Rd to West Rd	Widen from three to five lanes	$30,000,000	Y	Capacity
13317	Oakland	Oakland	Novi C.	2025-2034	Beck Rd	Eight Mile Rd to Ten Mile Rd	Widen from two to five lanes	$12,200,000	Y	Capacity
13408	Oakland	Oakland	Wixom C.	2025-2034	Beck Rd	West Rd to Pontiac Trail	Widen from three to five lanes	$40,000,000	Y	Capacity
13312	Oakland	Oakland	Royal Oak C.	2025-2034	Coolidge Rd	13 Mile Rd to 14 Mile Rd	Reconstruct	$6,000,000	Y	Pavement
13404	Oakland	Oakland	RCOC	2025-2034	Orchard Lake Rd	13 Mile Rd to 14 Mile Rd	Widen from five lanes to four-lane boulevard	$28,115,956	Y	Capacity
13406	Oakland	Oakland	RCOC	2025-2034	Pontiac Trail	Decker Rd to Welch Rd	Widen from two to five lanes	$8,141,344	Y	Capacity
13409	Oakland	Oakland	RCOC	2025-2034	Southfield Rd	Mt Vernon St to Beverly Rd	Widen from five lanes to four-lane boulevard	$40,000,000	Y	Capacity
13412	Oakland	Oakland	RCOC	2035-2045	12 Mile Rd	E of Beck Rd to W of Dixon Rd	Widen from two to four lane boulevard	$25,287,855	Y	Capacity
13414	Oakland	Oakland	Novi C.	2035-2045	Beck Rd	Ten Mile Rd to Grand River Ave	Widen from two to five lanes	$27,254,066	Y	Capacity
13411	Oakland	Oakland	Novi C.	2035-2045	Meadowbrook Rd	Ten Mile Rd to 12 Mile Rd	Widen from three to five lanes	$29,218,507	Y	Capacity
13415	Oakland	Oakland	RCOC	2035-2045	Ten Mile Rd	South Lyon E CL to Haggerty Rd	Widen from two to five lanes	$60,000,000	Y	Capacity
40000	Regional	Regional	N/A	2020	GPA Local Bridge	Regionwide	Bridge capital preventive maintenance (CPM) and rehabilitation	$16,264,318	N	Bridge

RIN	FAC	COUNTY	LEAD AGENCY	YEAR(S)	PROJECT NAME	PROJECT LIMITS	PROPOSED WORK	PROJECT TOTAL	ON MAP	TYPE
40007	Regional	Regional	N/A	2020	GPA Local Road	Region-wide	Road capital preventive maintenance (CPM), resurfacing, and rehabilitation	$83,286,486	N	Pavement
40014	Regional	Regional	N/A	2020	GPA Local Traffic Operations or Safety	Region-wide	Traffic operations and safety projects	$27,697,058	N	Operations/ Safety
40021	Regional	Regional	N/A	2020	GPA Local Transit Capital	Region-wide	Transit capital projects	$87,528,167	N	Transit Capital
40028	Regional	Regional	N/A	2020	GPA Local Transit Operations	Region-wide	Transit operating projects	$35,016,731	N	Transit Operations
40035	Regional	Regional	N/A	2020	GPA Local Transportation Livability and Sustainability	Region-wide	Projects promoting livability and sustainability	$10,685,239	N	Livability
40042	Regional	Regional	MDOT	2020	GPA Trunkline Bridge	Region-wide	Bridge capital preventive maintenance (CPM) and rehabilitation	$16,589,639	N	Bridge
40046	Regional	Regional	MDOT	2020	GPA Trunkline Livability and Sustainability	Region-wide	Projects promoting livability and sustainability	$84,360	N	Livability
40048	Regional	Regional	MDOT	2020	GPA Trunkline Road	Region-wide	Road capital preventive maintenance (CPM), resurfacing, and rehabilitation	$7,165,883	N	Pavement
40054	Regional	Regional	MDOT	2020	GPA Trunkline Traffic Operations or Safety	Region-wide	Traffic operations and safety projects	$22,084,280	N	Operations/ Safety
13141	Regional	Regional	SMART	2020	General Local Transit Operating	SMART service area	Operating costs of local transit agency	$35,746,440	N	Transit Operations
40001	Regional	Regional	N/A	2021	GPA Local Bridge	Region-wide	Bridge capital preventive maintenance (CPM) and rehabilitation	$16,398,223	N	Bridge
40008	Regional	Regional	N/A	2021	GPA Local Road	Region-wide	Road capital preventive maintenance (CPM), resurfacing, and rehabilitation	$83,831,531	N	Pavement

RIN	FAC	COUNTY	LEAD AGENCY	YEAR(S)	PROJECT NAME	PROJECT LIMITS	PROPOSED WORK	PROJECT TOTAL	ON MAP	TYPE
40015	Regional	Regional	N/A	2021	GPA Local Traffic Operations or Safety	Regionwide	Traffic operations and safety projects	$29,295,495	N	Operations/ Safety
40022	Regional	Regional	N/A	2021	GPA Local Transit Capital	Regionwide	Transit capital projects	$89,988,822	N	Transit Capital
40029	Regional	Regional	N/A	2021	GPA Local Transit Operations	Regionwide	Transit operating projects	$35,615,140	N	Transit Operations
40036	Regional	Regional	N/A	2021	GPA Local Transportation Livability and Sustainability	Regionwide	Projects promoting livability and sustainability	$10,626,389	N	Livability
40043	Regional	Regional	MDOT	2021	GPA Trunkline Bridge	Regionwide	Bridge capital preventive maintenance (CPM) and rehabilitation	$40,334,418	N	Bridge
40047	Regional	Regional	MDOT	2021	GPA Trunkline Livability and Sustainability	Regionwide	Projects promoting livability and sustainability	$329,560	N	Livability
40049	Regional	Regional	MDOT	2021	GPA Trunkline Road	Regionwide	Road capital preventive maintenance (CPM), resurfacing, and rehabilitation	$8,546,119	N	Pavement
40055	Regional	Regional	MDOT	2021	GPA Trunkline Traffic Operations or Safety	Regionwide	Traffic operations and safety projects	$29,610,318	N	Operations/ Safety
13142	Regional	Regional	SMART	2021	General Local Transit Operating	SMART service area	Operating costs of local transit agency	$36,093,180	N	Transit Operations
40044	Regional	Regional	MDOT	2022	GPA Trunkline Bridge	Regionwide	Bridge capital preventive maintenance (CPM) and rehabilitation	$37,948,400	N	Bridge
40002	Regional	Regional	N/A	2022	GPA Local Bridge	Regionwide	Bridge capital preventive maintenance (CPM) and rehabilitation	$15,816,923	N	Bridge
40009	Regional	Regional	N/A	2022	GPA Local Road	Regionwide	Road capital preventive maintenance (CPM), resurfacing, and rehabilitation	$97,166,742	N	Pavement
40016	Regional	Regional	N/A	2022	GPA Local Traffic Operations or Safety	Regionwide	Traffic operations and safety projects	$29,418,267	N	Operations/ Safety

RIN	FAC	COUNTY	LEAD AGENCY	YEAR(S)	PROJECT NAME	PROJECT LIMITS	PROPOSED WORK	PROJECT TOTAL	ON MAP	TYPE
40023	Regional	Regional	N/A	2022	GPA Local Transit Capital	Region-wide	Transit capital projects	$92,540,564	N	Transit Capital
40030	Regional	Regional	N/A	2022	GPA Local Transit Operations	Region-wide	Transit operating projects	$36,327,030	N	Transit Operations
40037	Regional	Regional	N/A	2022	GPA Local Transportation Livability and Sustainability	Region-wide	Projects promoting livability and sustainability	$10,857,725	N	Livability
40050	Regional	Regional	MDOT	2022	GPA Trunkline Road	Region-wide	Road capital preventive maintenance (CPM), resurfacing, and rehabilitation	$28,190,000	N	Pavement
40056	Regional	Regional	MDOT	2022	GPA Trunkline Traffic Operations or Safety	Region-wide	Traffic operations and safety projects	$27,137,738	N	Operations/ Safety
13321	MDOT	Regional	MDOT	2022	Areawide PRN	Clinton R watershed	Wetland mitigation	$626,992	N	Environment
13143	Regional	Regional	SMART	2022	General Local Transit Operating	SMART service area	Operating costs of local transit agency	$36,443,284	N	Transit Operations
40003	Regional	Regional	N/A	2023	GPA Local Bridge	Region-wide	Bridge capital preventive maintenance (CPM) and rehabilitation	$16,175,876	N	Bridge
40010	Regional	Regional	N/A	2023	GPA Local Road	Region-wide	Road capital preventive maintenance (CPM), resurfacing, and rehabilitation		N	Pavement
40017	Regional	Regional	N/A	2023	GPA Local Traffic Operations or Safety	Region-wide	Traffic operations and safety projects	$29,976,538	N	Operations/ Safety
40024	Regional	Regional	N/A	2023	GPA Local Transit Capital	Region-wide	Transit capital projects	$95,154,049	N	Transit Capital
40031	Regional	Regional	N/A	2023	GPA Local Transit Operations	Region-wide	Transit operating projects	$37,056,736	N	Transit Operations

RIN	FAC	COUNTY	LEAD AGENCY	YEAR(S)	PROJECT NAME	PROJECT LIMITS	PROPOSED WORK	PROJECT TOTAL	ON MAP	TYPE
40038	Regional	Regional	N/A	2023	GPA Local Transportation Livability and Sustainability	Regionwide	Projects promoting livability and sustainability	$11,084,978	N	Livability
40045	Regional	Regional	MDOT	2023	GPA Trunkline Bridge	Regionwide	Bridge capital preventive maintenance (CPM) and rehabilitation	$11,542,931	N	Bridge
40057	Regional	Regional	MDOT	2023	GPA Trunkline Traffic Operations or Safety	Regionwide	Traffic operations and safety projects	$17,658,802	N	Operations/ Safety
13144	Regional	Regional	SMART	2023	General Local Transit Operating	SMART service area	Operating costs of local transit agency	$36,796,784	N	Transit Operations
40004	Regional	Regional	N/A	2024	GPA Local Bridge	Regionwide	Bridge capital preventive maintenance (CPM) and rehabilitation	$16,357,640	N	Bridge
40011	Regional	Regional	N/A	2024	GPA Local Road	Regionwide	Road capital preventive maintenance (CPM), resurfacing, and rehabilitation	$68,536,422	N	Pavement
40018	Regional	Regional	N/A	2024	GPA Local Traffic Operations or Safety	Regionwide	Traffic operations and safety projects	$32,345,675	N	Operations/ Safety
40025	Regional	Regional	N/A	2024	GPA Local Transit Capital	Regionwide	Transit capital projects	$97,842,827	N	Transit Capital
40032	Regional	Regional	N/A	2024	GPA Local Transit Operations	Regionwide	Transit operating projects	$37,804,755	N	Transit Operations
40039	Regional	Regional	N/A	2024	GPA Local Transportation Livability and Sustainability	Regionwide	Projects promoting livability and sustainability	$11,890,672	N	Livability
40051	Regional	Regional	MDOT	2024	GPA Trunkline Road	Regionwide	Road capital preventive maintenance (CPM), resurfacing, and rehabilitation	$492,665,417	N	Pavement
13145	Regional	Regional	SMART	2024	General Local Transit Operating	SMART service area	Operating costs of local transit agency	$37,153,713	N	Transit Operations

RIN	FAC	COUNTY	LEAD AGENCY	YEAR(S)	PROJECT NAME	PROJECT LIMITS	PROPOSED WORK	PROJECT TOTAL	ON MAP	TYPE
40012	Regional	Regional	N/A	2025-2034	GPA Local Road	Region-wide	Road capital preventive maintenance (CPM), resurfacing, and rehabilitation	$1,080,822,547	N	Pavement
40005	Regional	Regional	N/A	2025-2034	GPA Local Bridge	Region-wide	Bridge capital preventive maintenance (CPM) and rehabilitation	$183,996,672	N	Bridge
40012	Regional	Regional	N/A	2025-2034	GPA Local Road	Region-wide	Road capital preventive maintenance (CPM), resurfacing, and rehabilitation	$1,080,822,547	N	Pavement
40019	Regional	Regional	N/A	2025-2034	GPA Local Traffic Operations or Safety	Region-wide	Traffic operations and safety projects	$339,376,696	N	Operations/ Safety
40026	Regional	Regional	N/A	2025-2034	GPA Local Transit Capital	Region-wide	Transit capital projects	$1,086,493,180	N	Transit Capital
40033	Regional	Regional	N/A	2025-2034	GPA Local Transit Operations	Region-wide	Transit operating projects	$440,893,005	N	Transit Operations
40040	Regional	Regional	N/A	2025-2034	GPA Local Transportation Livability and Sustainability	Region-wide	Projects promoting livability and sustainability	$128,004,009	N	Livability
40052	Regional	Regional	MDOT	2025-2034	GPA Trunkline Road	Region-wide	Road capital preventive maintenance (CPM), resurfacing, and rehabilitation	$5,862,312,238	N	Pavement
13135	Regional	Regional	SMART	2025-2034	Purchase Fixed-Route Buses	SMART service area	Purchase fixed-route buses	$29,790,930	N	Transit Capital
13138	Regional	Regional	SMART	2025-2034	Purchase Fixed-Route Buses	SMART service area	Purchase fixed-route buses	$24,797,850	N	Transit Capital
30001	Regional	Regional	SMART	2025-2034	General Local Transit Operating	SMART service area	Operating costs of local transit agency	$395,188,834	N	Transit Operations
13291	MDOT	Regional	MDOT	2025-2034, 2035-2045	Detroit Intermodal Freight Terminal (DIFT)	Various locations in SW Detroit	Intermodal facility	$711,100,000	Y	Over $100m
40006	Regional	Regional	N/A	2035-2045	GPA Local Bridge	Region-wide	Bridge capital preventive maintenance (CPM) and rehabilitation	$246,407,192	N	Bridge

RIN	FAC	COUNTY	LEAD AGENCY	YEAR(S)	PROJECT NAME	PROJECT LIMITS	PROPOSED WORK	PROJECT TOTAL	ON MAP	TYPE
40013	Regional	Regional	N/A	2035-2045	GPA Local Road	Regionwide	Road capital preventive maintenance (CPM), resurfacing, and rehabilitation	$1,655,050,131	N	Pavement
40020	Regional	Regional	N/A	2035-2045	GPA Local Traffic Operations or Safety	Regionwide	Traffic operations and safety projects	$483,333,603	N	Operations/ Safety
40027	Regional	Regional	N/A	2035-2045	GPA Local Transit Capital	Regionwide	Transit capital projects	$1,671,030,921	N	Transit Capital
40034	Regional	Regional	N/A	2035-2045	GPA Local Transit Operations	Regionwide	Transit operating projects	$651,458,521	N	Transit Operations
40041	Regional	Regional	N/A	2035-2045	GPA Local Transportation Livability and Sustainability	Regionwide	Projects promoting livability and sustainability	$180,424,176	N	Livability
40053	Regional	Regional	MDOT	2035-2045	GPA Trunkline Road	Regionwide	Road capital preventive maintenance (CPM), resurfacing, and rehabilitation	$8,943,047,906	N	Pavement
30002	Regional	Regional	SMART	2035-2045	General Local Transit Operating	SMART service area	Operating costs of local transit agency	$500,940,989	N	Transit Operations
13340	MDOT	St Clair	MDOT	2021	I-69 EB	Cox Doty Drain to M-19 (Kinney Rd)	Reconstruct freeway	$29,318,606	Y	Pavement
13377	MDOT	St Clair	MDOT	2023	I-69	M-19 (Kinney Rd) to Taylor Rd	Three-course HMA overlay	$19,722,419	Y	Pavement
13399	MDOT	St Clair	MDOT	2025-2034	Blue Water Bridge Plaza	City of Port Huron	Improve border plaza and relocate historic structures	$157,141,000	Y	Over $100m
13403	Washtenaw	Washtenaw	AAATA	2020	General Local Transit Operating	AAATA service area	Operating costs of local transit agency	$24,500,494	N	Transit Operations
50001	Washtenaw	Washtenaw	Ypsilanti	2020	West Cross St	Courtland St to Wallace Blvd	Reconstruct roadway	$1,091,000	Y	Pavement
13468	Washtenaw	Washtenaw	AAATA	2021	General Local Transit Operating	AAATA service area	Operating costs of local transit agency	$25,090,207	N	Transit Operations
13472	Washtenaw	Washtenaw	AAATA	2022	General Local Transit Operating	AAATA service area	Operating costs of local transit agency	$25,943,157	N	Transit Operations

RIN	FAC	COUNTY	LEAD AGENCY	YEAR(S)	PROJECT NAME	PROJECT LIMITS	PROPOSED WORK	PROJECT TOTAL	ON MAP	TYPE
13481	Washtenaw	Washtenaw	AAATA	2023	General Local Transit Operating	AAATA service area	Operating costs of local transit agency	$26,078,654	N	Transit Operations
13357	MDOT	Washtenaw	MDOT	2023	I-94	Jackson/ Washtenaw CoL to Freer Rd	Two-course mill and resurface	$29,900,568	Y	Pavement
13484	Washtenaw	Washtenaw	AAATA	2024	General Local Transit Operating	AAATA service area	Operating costs of local transit agency	$26,981,203	N	Transit Operations
30009	Washtenaw	Washtenaw	AAATA	2025-2034	General Local Transit Operating	AAATA service area	Operating costs of local transit agency	$275,704,853	N	Transit Operations
13543	Washtenaw	Washtenaw	Ypsilanti	2025-2034	Huron St N	Huron to Cross St	Reconstruct roadway	$1,369,000	Y	Pavement
13542	Washtenaw	Washtenaw	Ypsilanti	2025-2034	Maus Ave	Prospect St to Emerick St	Reconstruct roadway	$1,143,000	Y	Pavement
30010	Washtenaw	Washtenaw	AAATA	2035-2045	General Local Transit Operating	AAATA service area	Operating costs of local transit agency	$412,446,902	N	Transit Operations
13531	Washtenaw	Washtenaw	Ypsilanti	2035-2045	River St N	Michigan Ave (US-12 BR) to Forest Ave	Reconstruct roadway	$2,580,000	Y	Pavement
13341	Detroit	Wayne	DDOT	2020	General Local Transit Operating	DDOT Service Area	Operating costs of local transit agency	$113,473,807	N	Transit Operations
13235	Detroit	Wayne	DTC	2020	General Local Transit Operating	DTC service area	Operating costs of local transit agency	$5,619,260	N	Transit Operations
13353	MDOT	Wayne	MDOT	2020	I-275	I-275 NB and collector over M-14; I-275 SB over Schoolcraft Rd	Replace deck, substructure patching, pier cap replacement	$3,705,177	Y	Bridge
13323	MDOT	Wayne	MDOT	2020	I-275 SB	S of M-153 (Ford Rd) to Five Mile Rd	HMA mill and overlay	$34,600,000	Y	Pavement
13332	MDOT	Wayne	MDOT	2020	US-12 (Michigan Ave)	over M-39	Replace bridge	$6,287,359	Y	Bridge

RIN	FAC	COUNTY	LEAD AGENCY	YEAR(S)	PROJECT NAME	PROJECT LIMITS	PROPOSED WORK	PROJECT TOTAL	ON MAP	TYPE
13345	MDOT	Wayne	MDOT	2020, 2021	US-24 (Telegraph Rd)	Grand River Ave to N of Eight Mile Rd	Reconstruct	$16,550,000	Y	Pavement
13286	MDOT	Wayne	MDOT	2020, 2021, 2022	I-375	S of I-75/I-375 interchange to Jefferson Ave	Reconstruct	$183,000,000	Y	Over $100m
13285	MDOT	Wayne	MDOT	2020, 2021, 2023, 2025 - 2034, 2035 - 2045	I-94	I-96 to Conner Ave	Trunkline modernization	$1,918,200,000	Y	Over $100m
13423	Detroit	Wayne	DDOT	2021	General Local Transit Operating	DDOT Service Area	Operating costs of local transit agency	$113,841,183	N	Transit Operations
13236	Detroit	Wayne	DTC	2021	General Local Transit Operating	DTC service area	Operating costs of local transit agency	$5,673,767	N	Transit Operations
13324	MDOT	Wayne	MDOT	2021	I-275 SB	Northline Rd to M-153 (Ford Rd)	HMA mill and overlay	$49,520,000	Y	Pavement
50008	MDOT	Wayne	MDOT	2021, 2022, 2023	Ford Rd	Sheldon Road to Lotz Road	Reconstruct to boulevard, no added lanes	$40,000,000	Y	Pavement
13348	MDOT	Wayne	MDOT	2021, 2023	I-75	M-102 (Eight Mile Rd) bridge over I-75	Replace deck, partial painting, superstructure and sub repair	$14,844,183	Y	Bridge
13424	Detroit	Wayne	DDOT	2022	General Local Transit Operating	DDOT Service Area	Operating costs of local transit agency	$114,212,123	N	Transit Operations
13247	Detroit	Wayne	DTC	2022	General Local Transit Operating	DTC service area	Operating costs of local transit agency	$5,728,802	N	Transit Operations
13336	MDOT	Wayne	MDOT	2022	I-96	Hubbell Ave and Fullerton Ave bridges over I-96	Replace deck, substructure repairs	$6,046,950	Y	Bridge
13344	MDOT	Wayne	MDOT	2022	I-96	I-96 ramp over M-39 ramp and Service Road	Replace deck, full paint	$2,564,890	Y	Bridge
13331	MDOT	Wayne	MDOT	2022	Old-705 (Vista Way)	over Canoe Stream, Belle Isle	Replace bridge	$641,168	Y	Bridge
13425	Detroit	Wayne	DDOT	2023	General Local Transit Operating	DDOT Service Area	Operating costs of local transit agency	$114,586,660	N	Transit Operations
13248	Detroit	Wayne	DTC	2023	General Local Transit Operating	DTC service area	Operating costs of local transit agency	$5,784,371	N	Transit Operations

RIN	FAC	COUNTY	LEAD AGENCY	YEAR(S)	PROJECT NAME	PROJECT LIMITS	PROPOSED WORK	PROJECT TOTAL	ON MAP	TYPE
13374	MDOT	Wayne	MDOT	2023	I-94	Pelham Rd to E of M-39	Concrete pavement inlay and misc. work	$14,861,001	Y	Pavement
13325	MDOT	Wayne	MDOT	2023	US-12 (Michigan Ave)	Lotz Rd to Pershing St	HMA overlay and miscellaneous work	$9,900,000	Y	Pavement
13305	MDOT	Wayne	MDOT	2023	US-24 (Telegraph Rd)	Carter Rd to Pennsylvania Rd	HMA mill and resurface and misc. work	$14,300,000	Y	Pavement
13426	Detroit	Wayne	DDOT	2024	General Local Transit Operating	DDOT Service Area	Operating costs of local transit agency	$114,964,831	N	Transit Operations
13250	Detroit	Wayne	DTC	2024	General Local Transit Operating	DTC service area	Operating costs of local transit agency	$5,840,480	N	Transit Operations
30007	Detroit	Wayne	DDOT	2025-2034	General Local Transit Operating	DDOT Service Area	Operating costs of local transit agency	$1,171,272,566	N	Transit Operations
30005	Detroit	Wayne	DTC	2025-2034	General Local Transit Operating	DTC service area	Operating costs of local transit agency	$61,613,151	N	Transit Operations
30008	Detroit	Wayne	DDOT	2035-2045	General Local Transit Operating	DDOT Service Area	Operating costs of local transit agency	$1,271,569,778	N	Transit Operations
30006	Detroit	Wayne	DTC	2035-2045	General Local Transit Operating	DTC service area	Operating costs of local transit agency	$75,019,358	N	Transit Operations
13477	Wayne	Wayne	WDPS	2025-2034	Canton Center Rd [AC, ACC]	Geddes Rd to Palmer Rd	Add center-left turn lane; HMA resurfacing	$8,928,603	Y	Operations
							2045 RTP Total	**35,735,271,933**		

Chapter 6: 2045 RTP Policies and Actions

Throughout the plan, specific policies and actions were identified for each topic (Chapter 3). This chapter consolidates the actions proposed organized by the plan's 10 overarching policies.

Preserve Infrastructure through fiscally-responsible, data-driven asset management practices

Bridge

- Share information on best practices in bridge design, construction management, and maintenance practices.
- Implement construction projects that make the most cost-effective use of resources with a focus on maintenance to maximize the life of existing bridges.

Environment

- Develop a regional asset management system that directs infrastructure investments in a collaborative manner, reduces costs and provides more efficient service.
- Support local and regional opportunities to expand asset management programs, including collection of data and mapping in those areas lacking information.
- Inventory and conduct a condition and vulnerability assessment of culverts; categorize and prioritize for improvements.

Freight

- Support road agencies to use a data-driven approach to identify fixes for roadways and implement asset management plans.
- Evaluate the condition the regional network of Class A All-Season roadways to assess for deterioration of critical freight connections.
- During closures for road construction, plan alternate routes that are suitable, both for trucks displaced by the construction and for trucks accessing the construction site.
- Reduce constraints to freight transportation resulting from closed and load-limited bridges.
- Coordinate with freight facility owners to improve the condition, availability, and competitiveness of regional logistics and freight transfer operations at airports, marine ports, and rail/truck terminals.

Pavement

- Share information on best practices in pavement design and engineering.
- Implement road projects that make the most cost-effective use of resources while focusing on maintenance to maximize the life of existing roads.
- Support development of local asset management plans that are regularly monitored and updated and coordinated with other infrastructure systems.
- Improve conditions that meet the needs for connected and automated vehicle deployment.

Increase Safety for all travelers, regardless of mode.

Bicycle and Pedestrian Travel

- Educate lawmakers on the need for more uniform crosswalk laws
- Educate lawmakers, roadway designers, and local government officials on the impact of traffic speed on rate of serious injury crashes and fatalities
- Support community-led Americans with Disabilities Act (ADA) transition plans for sidewalks, paths, and crosswalks
- Support community-led maintenance and snow removal plans

Congestion

- Support campaigns that promote effective and safe first responder trainings.
- Develop and educate drivers on best practices to clear incidents quickly and safely.

Safety

- Implement the *Southeast Michigan Traffic Safety Pla*n.
- Promote low-cost, high-impact traffic safety engineering countermeasures.
- Promote emerging connected and automated vehicle technology and infrastructure.

Increase Access to jobs and core services, regardless of race, gender, ethnicity, national origin, age, physical ability, or income.

Intercity Transportation

- Increase options and enhance connections between intercity bus and rail to improve the intercity system.
- Support the maintenance and enhancement of integrated and intermodal transportation connections throughout the region.
- Develop connected and automated vehicle services that support existing and future intercity connections.

Transit

- Evaluate the transportation system's ability to reach desired destination and choices in terms of quality and quantity of options
- Support the expansion and development of transportation technologies that improve access and mobility.
- Support initiatives to better coordinate transit providers within the region that will increase mobility.
- Increase service levels and regional connections for all residents.

Utilize Technology to cost-effectively improve the transportation system.

Congestion

- Improve technology on priority corridors to provide drivers with real time travel information.
- Improve data sharing between road agencies and first responders.
- Implement best practices for work-zone design and alternate route detouring during construction.
- Manage demand for curbspace to balance connected and automated vehicle technology, pick-up, deliveries, parking, and nonmotorized travel.

Security

- Promote coordinated technologies across jurisdictions though ITS Regional Architecture technologies for emergency planning.
- Coordinate efforts for regional partners to share data needed for effective response.
- Communicate with and include private providers of public transportation in data discussions related to safety and security of the transportation system.

Transportation Demand Management

- Continue to improve and update Southeast Michigan's Commuter Connect Program.
- Support and promote active management of transportation systems.

Integrate Environmental Protection into the transportation system, enhancing community health and increasing the overall resiliency of infrastructure.

Environment

- Integrate environmental elements into the early transportation planning process.
- Utilize the environmental sensitivity analysis to inform transportation agencies of potential impacts.
- Support and facilitate collaboration between road agencies and local jurisdictions regarding stormwater management opportunities.
- Complete a climate resiliency analysis for regional transportation assets.
- Continue air quality conformity analysis for all transportation projects.
- Ensure that new projects will not cause new air quality violations, worsen existing violations, or delay timely attainment of NAAQS.
- Reduce stormwater water runoff entering combined sewer systems using green infrastructure or other stormwater management techniques.

Freight

- Implement *The Southeast Michigan Traffic Safety Plan*.
- Identify safety risks where high truck freight volumes and pedestrian/bicycle facilities intersect.
- Improve the visibility and efficiency of truck routes to reduce trips through residential areas.
- Reduce emissions from freight transportation to improve air quality and maintain compliance with standards.
- Strengthen emergency response coordination for potential spills along transportation networks and the Huron-to-Erie corridor.
- Implement green infrastructure to collect and filter contaminants before they reach open water bodies.

Support the Regional Economy through the reliable movement of goods, efficient trade connections, expanded labor mobility, and support for tourism and local placemaking.

Bicycle and Pedestrian

- Analyze and prioritize the pedestrian and bicycle system to ensure households that do not have access to an automobile have mobility options including pedestrian and bicycle facilities to core services including hospitals, schools, jobs, and grocery stores.
- Seek opportunities to connect the regional system and improve the pedestrian system of sidewalks
- Support the planning, branding, and advertising of the regional recreational trails and routes such as the Iron Belle Trail, Great Lake to Lake Trail, and US Bike Route system.
- Help communicate the location of regional recreational trails and routes through tools such as Southeast Michigan Trail Explorer and the Bikeways and Pathways online maps
- Continue to support efforts that strengthen the walkability, bikeability and placemaking ability of downtowns, villages, and trail towns.

Freight

- Identify challenges to “last-mile” freight access through coordination with local governments and freight stakeholders.
- Apply the SEMCOG Congestion Management Process to evaluate highway performance and identify operational practices that improve freight mobility.
- Employ advances in connected and automated technology that improve safety, traffic operations, and travel reliability.
- Promote development and implementation of projects that improve the efficiency of moving freight between travel modes.
- Consider deliveries as one of the essential uses of curb space in commercial areas.
- Provide sufficient truck parking to facilitate efficient local deliveries and preparation for cross-border trips.
- Develop drone policies that balance safety with efficient distribution of goods.

Intercity

- Provide technical assistance for initiatives seeking to enhance the performance of the transportation system.

Tourism

- Develop effective coordination processes between stakeholders to support the tourism and travel industry.
- Encourage expansion of a multi-modal transportation system that ensures accessibility to all, and is well connected to regional assets including parks, trails, and downtown areas.

Transit

- Support initiatives that improve the performance of the overall transportation system.
- Encourage the development of a dedicated funding source for transit service in the region.
- Analyze transit access to major tourism facilities to improve visibility and use for choice riders.

Educate and Collaborate with local governments, transportation agencies, utility providers, and residents to improve understanding and operation of the transportation system.

Bicycle and Pedestrian

- Create a taskforce of local, county, and state-wide stakeholders to update the Bicycle and Pedestrian Travel Plan to ensure challenges are incorporated and include strategies for addressing.
- Work with MDOT and county road agencies to develop multi-modal tools that are context sensitive to assist communities in planning bicycle and pedestrian facilities.
- Continue working with MDOT and Michigan Fitness Foundation on the TAP-Safe Routes to School selection process
- Educate users of the health benefits of walking and biking.

Bridge

- Monitor the outcomes of investments made through the Transportation Improvement Program (TIP) and update asset management plan strategies.
- Maintain a current public website with regional bridge condition data consistent with the Transportation Asset Management Council (TAMC).
- Expand infrastructure and asset management collaboration opportunities with other infrastructure assets such as water, sewer, utilities, roads.
- Identify opportunities to align bridge infrastructure projects with related local watershed projects.
- Educate the public regarding the cost of constructing and maintaining bridges.

Environment

- Seek opportunities to strengthen public-private partnerships to address unique air quality and water resource challenges.
- Work across jurisdictional boundaries and agencies to develop and implement capital improvement programs.
- Support partnerships such as the GLWA's One Water Partnership and the Partners for Clean Water.
- Enhance public education and awareness through Ozone Action, Commuter Connect and One Water programs.
- Support activities of the Water Asset Management Council and Michigan Infrastructure Council.

Pavement

- Publish an annual Transportation Improvement Program (TIP) Survey, which looks at projects that are implemented during each fiscal year to compare pavement investments across time.
- Maintain an up-to-date public website with regional pavement condition data.

Safety

- Provide training and information on the use of countermeasures and identify areas for continuous education that partner well with enforcement.
- Identify locations and implement programs that use a multidisciplinary approach to improve safety by conducting local enforcement and educational outreach.
- Continue to promote educational campaigns such as Walk.Bike.Drive. Safe

Security

- Support development and communication of regional preparedness and evacuation planning (e.g., emergency management plans) as well as education campaigns for road users to know how to respond in emergency situations.
- Prioritize training for responders and operations coordinators.
- Participate with ongoing initiatives, such as Southeast Michigan's Urban Area Security Initiative (SEMi UASI).
- Support development of efficient, coordinated responses through incident management task forces (e.g., Regional Transportation Operations Coordinating Committee).

Tourism

- Establish a central, easily accessible, and inclusive information system to capture and share timely, relevant, and reliable industry research.
- Support the goals and policies of SEMCOG's Parks and Recreation Task Force.
- Use and expand SEMCOG's ParkFinder and Trail Explorer tools and application to educate residents and visitors of the opportunities and amenities available in Southeast Michigan.
- Coordinate trail planning and development activities among regional stakeholders to maintain an inventory of existing conditions, understand local priorities, and support efforts to develop, promote, and manage the region's trails as a connected system.

Transportation Demand Management

- Create awareness of the current TDM programs, as residents may be unaware of these commuting options. Include additional outreach to area employers, SEMCOG members, and the general public.
- Increase marketing and participation of the Southeast Michigan Commuter Connect Program.
- Support regional employers in implementing programs such as employee parking cash and other initiatives to provide incentives to promote alternative commute options.
- Increase education for planning and policy development for managing the use of curbside space balance demand.

Transit

- Continue to partner with the Regional Transit Authority on building capacity in order to enhance mobility options, to improve quality of life for residents, and to increase regional economic viability.
- Support partnership between the various regional transit providers to create an integrated fare system for easy access and transfers.
- Support education about transportation options to help residents overcome barriers that prevent many from using the existing public transit services, to include but not limited to, the use of system maps and schedules, trip planning tools and making transfer between systems or to other transportation modes.
- Create awareness on the impact and importance of public transportation investments in the region.

Increase Funding and Expand Local Options to provide resources that are sufficient to meet regional transportation needs.

Bridge

- Work with regional and state leaders to explore alternative funding options that are sufficient and sustainable.
- Develop educational materials that demonstrate the resource gap and identify possible solutions.

Environment

- Work with local agencies and the legislature to support dedicated funding sources for water resources and infrastructure, natural resources and air quality programs.

Pavement

- Work with regional and state leaders to explore alternative funding options.
- Develop educational materials that demonstrate the resource gap and identify possible solutions.

Transit

- Support efforts of the Regional Transit Authority to increase transit investment through a voter approved tax mileage and leverage additional revenues to expand and improve transit in the region.
- Support efforts to increase flexibility for transit funding to be spent on operations.
- Encourage projects that integrate first mile, last mile connections to transit to increase accessibility.
- Provide assistance to help our partners plan and make investments needed for more dynamic and flexible transit options through the use of autonomous vehicles.

Anticipate the Socio-economic Challenges of an Aging Region including sustaining mobility for all ages and mitigating labor shortages.

Safety

- Promote senior driving focused engineering countermeasures and roadway design.
- Promote resources for aging drivers to maintain safe mobility.
- Increase access to safe transportation options for all road users, including those with limited mobility.
- Integrate connected and automated technology and other advanced features on roadways so that persons with limited mobility can safely travel, regardless of mode.

Transit

- Provide information and resources to help aging residents become familiar with their transportation options.
- Encourage communities to consider the aging population when engaging in the planning process.
- Continue to collaborate with and promote Safe Drivers Smart Options: Keys to Lifelong Mobility as part of Michigan's statewide strategy to support the safe mobility of aging adults.

Measure Transportation System Performance to facilitate strategic investment through developing, collecting, analyzing, and disseminating data.

Bicycle and Pedestrian

- Create a rating system for the bicycle and pedestrian network of bikeways and pathways.
- Seek opportunities to map and assess the pedestrian sidewalks and trails network for Southeast Michigan.
- Collect count data for all modes of travel to accurately depict the usage and future needs of the transportation system.

Bridge

- Work with state, county, and local road agencies and other bridge owners to develop, maintain and implement an asset management plan.
- Coordinate with bridge owners to set condition targets based on available resources and bridge-management best practices.
- Conduct an annual analysis of bridge condition performance target setting and program adjustments.
- Integrate climate resiliency risk analyses results for roads, bridges, culverts, and pump stations into asset management databases.

Congestion

- Monitor congestion levels, prioritize congested locations, and implement treatments.
- Use data to inform projects for inclusion in the short- and long-term planning process.
- Conduct annual analysis of congestion performance target setting and program adjustments.

Pavement

- Work with regional partners and road agencies to collect pavement condition data for Southeast Michigan's road network.
- Support road agencies' use of a data-driven approach to identify fixes for roadways and implement asset management plans.
- Coordinate with road agencies to set condition targets based on available resources and pavement management best practices.
- Conduct an annual analysis of pavement condition performance target setting and program adjustments.

Safety

- Implement safety strategies on priority locations and emphasis areas.
- Coordinate with road agencies to identify and program traffic safety projects.
- Conduct an annual analysis of safety performance target setting and program adjustments.

Transit

- Establish region wide Transit Asset Management targets and incorporate components in the Transportation Improvement Program.
- Collaborate with transit and new mobility providers such as bikeshare and e-scooters to collect and share data.

SEMCOG Officers
2018-2019

Phil Weipert
Chairperson
Commissioner,
Oakland County

Donald Hubler
First Vice Chair
Secretary,
Macomb Intermediate
School District

Chris Barnett
Vice Chairperson
Supervisor,
Orion Township

Mandy Grewal
Vice Chairperson
Supervisor,
Pittsfield Township

Brenda Jones
Vice Chairperson
President,
Detroit City Council

Eric Sabree
Vice Chairperson
Treasurer,
Wayne County

Robert Clark
Immediate Past Chair
Mayor,
City of Monroe

Kathleen Lomako
Executive Director