June 2024

2050 REGIONAL TRANSPORTATION PLAN
VISION2050

Regional Transportation Plan for Southeast Michigan

SEMCOG | SOUTHEAST MICHIGAN COUNCIL OF GOVERNMENTS

Vision 2050:
Regional Transportation Plan for Southeast Michigan

Abstract

Vision 2050, the Regional Transportation Plan for Southeast Michigan serves as the guiding framework for transportation investment in the region through the year 2050. It outlines how nearly $38 billion will be strategically allocated to address critical transportation needs, ensuring a more connected and prosperous region. The plan highlights future mobility challenges, including those posed by an aging population, emerging technologies, and funding shortfalls. Regional policies and actions outline strategies to improve education, equity, funding, preservation, resilience, safety, and shared prosperity. Implementing 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. More details can be found on the SEMCOG website www.semcog.org/rtp

Preparation of this document is 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, Federal Transit Administration, and other federal and state funding agencies as well as local membership contributions and designated management agency fees.

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Acknowledgements

SEMCOG extends its gratitude to everyone who contributed time and expertise to the development of Vision 2050, the Regional Transportation Plan for Southeast Michigan. Valuable input came from various sources, including stakeholder engagement meetings, interactive public surveys, open public comments, and consultations with key agencies.

We especially thank SEMCOG's Transportation Coordinating Council, Executive Committee, regional and local partner agencies, Federal-Aid Committees, the Michigan Department of Transportation (MDOT), and the Federal Highway Administration (FHWA) for their guidance in creating this plan. Their collaboration and feedback were critical in establishing the guiding principles and overarching regional policies outlined in the document.

Table of Contents

List of Data Displays

Tables

Figures

Executive Summary

Purpose

Vision 2050, the Regional Transportation for Southeast Michigan (RTP) serves as the guiding framework for developing and managing the regional multimodal transportation system. This plan will help stakeholders and partners prioritize investments in our region for over the next two decades. The purpose of this plan is to set a shared regional vision for the transportation system that prioritizes safety, equity, and resilience.

This plan was developed through extensive collaboration with the public and regional stakeholders to ensure Vision 2050 reflects regional needs and prioritizes projects that will have the greatest impact on the system. More than a static document, this plan is dynamic, able to adapt and respond to the ever-changing needs of the region. Vision 2050 will be reviewed regularly, and updated to address emerging trends, technological advancements, and shifting needs in the community.

Equity in Transportation Planning

Ensuring everyone in Southeast Michigan has access to jobs, education and core services is essential for a well-developed transportation system. Part of developing an ideal system is addressing transportation barriers and disparities and promoting a fair and accessible network. Historically, fragmented planning between land use and transportation has resulted in decreased safety, inaccessibility, and harmful environmental impacts. However, SEMCOG and regional stakeholders are committed to mitigating these impacts by introducing flexible transportation planning that prioritizes safety and complete streets developed on a human-level scale for everyone.

There is a crucial link between transportation and housing. Nearly one quarter of people in Southeast Michigan live within a Justice 40 census tract. This means over one million people in the region live in neighborhoods identified as socioeconomically disadvantaged. Reliable, multimodal transportation connections to employment are essential to ensuring everyone in Southeast Michigan can thrive. Additionally, the need for ubiquitous regional broadband access is recognized as a necessity for transportation infrastructure, transit operations, and educational and economic opportunities.

Emerging Technology

Emerging transportation technologies are reshaping Southeast Michigan's transportation system, offering increased accessibility, reduced emissions, and economic growth. Electric vehicles (EVs), despite still higher costs, are gaining traction in the region. As more charging infrastructure is being built, the shift to zero emission vehicles, including hydrogen fuel cell vehicles (FCVs) could significantly reduce emissions and improve regional air quality.

Southeast Michigan is also a leader in connected and autonomous vehicle (CAV) technology. CAVs promise increased safety, reduced congestion, and improved mobility, essential for a region with an aging population. Testing facilities in the region and pilot initiatives drive innovation. Other technologies like micromobility, drone delivery and others also contribute to Southeast Michigan's dedication to being leaders in sustainable transportation solutions.

Policies

The transportation system is a core component for Southeast Michigan, facilitating access to jobs, education, and other core services. As the region grows and transportation needs shift, so to also must the transportation system. Vision 2050 introduces seven core policies designed to create a safe, equitable, and resilient transportation system.

Policy	
	**Education** Educate and foster collaboration among local governments, transportation agencies, utility providers, and residents to enhance knowledge about and efficiency of the transportation system.
	**Equity** Ensure equitable access regardless of age, race, gender, ethnicity, national origin, physical or cognitive ability, or income.
	**Funding** Increase funding and broaden local options to ensure adequate resources and coordination for meeting regional transportation needs to achieve fiscal sustainability.
	**Preservation** Use asset management practices, technology, and cost-effective transportation solutions to preserve infrastructure.
	**Resilience** Integrate infrastructure coordination, equitable stormwater management, and comprehensive resiliency planning into the transportation system to achieve greater public health and environmental benefits.
	**Safety** Increase safety for all travelers, especially for the most vulnerable road users.
	**Shared Prosperity** Promote a thriving regional economy by facilitating seamless movement of goods, efficient trade connections, enhancing labor mobility, and fostering tourism and local placemaking.

2050 RTP Projects

Southeast Michigan's transportation system is a robust network of freeways, arterials, local roads, bridges, railroads, transit systems, border crossings, trails, and intercity connections. Transportation providers and stakeholders must not only meet the needs of the current system but must also consider the emerging trends and technologies that will inevitably come along in the future. A flexible system capable of ensuring safety, expanding access, improving equity, and being resilient to environmental impacts all while sustaining existing infrastructure is crucial.

Vision 2050 contains $38 billion in investments to improve the transportation system. This includes 570 projects, with nearly $11 billion dedicated to public transportation improvements.

Road projects account for the remaining $27 billion. Figure 1 provides a breakdown of these projects by type, including pavement preservation, major projects exceeding $100 million, road operations, safety enhancements, bridge repairs, capacity changes, and non-motorized infrastructure.

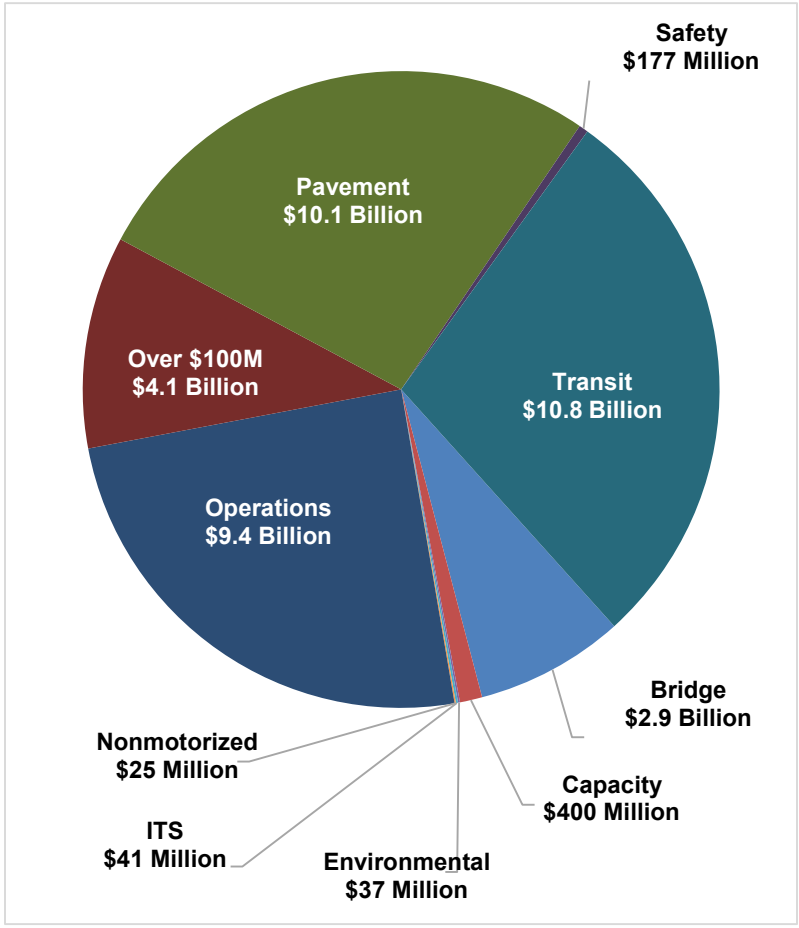
Chapter 6 further explains the technical analysis conducted for Vision 2050, describes the financial plan and outlines funding sources for the projects. A complete list of each project is available on the Vision 2050 hub.

Implementation

Southeast Michigan's future transportation system requires careful planning to ensure safety, accessibility, and resilience, and Vision 2050 outlines a strategic framework to meet those needs. Our transportation system connects people to jobs, schools and core services. This plan builds on the *2045 Regional Transportation Plan for Southeast Michigan* and is a collaborative effort with regional partners and Federal-Aid Committees (FACs) to address new and evolving regional priorities and turn Vision 2050 into reality.

Figure 1

Vision 2050 Projects by Type, Southeast Michigan

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Chapter 1: Introduction

SEMCOG, the Southeast Michigan Council of Governments, is a voluntary association of local governments fostering cooperative efforts to move Southeast Michigan forward. As a designated Metropolitan Transportation Organization (MPO), SEMCOG is responsible for transportation planning in the seven-county Southeast Michigan region which includes Livingston, Oakland, Macomb, Monroe, St. Clair, Washtenaw, and Wayne counties.

SEMCOG helps facilitate coordinated planning and decision-making to address regional challenges and opportunities. This includes transportation planning, environmental stewardship, economic development, and quality-of-life improvements. By bringing together local governments and agencies, SEMCOG encourages sustainable growth, transportation infrastructure development, and the preservation of natural resources, enhancing the region's overall well-being. Through its commitment to regional collaboration and comprehensive planning, SEMCOG plays a crucial role in shaping the future of Southeast Michigan, fostering economic prosperity, and improving the quality of life for its residents.

SEMCOG Vision and Core Values

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.

SEMCOG core values are shown on the next page.

Figure 2
SEMCOG Core Values

Visionary - We work holistically, inspiring innovative regional and local solutions.

Strategic - We are intentional, yet flexible to leverage opportunities.

Collaborative & Inclusive - We are respectful, approachable, and embrace difference perspectives to meet the diverse needs of our region.

Integrity - We are committed to the ethical and honest stewardship of our fiscal, natural, and built resources.

Knowledgeable – We strive for excellence through sound data and research and continuous learning, ensuring we are a credible and influential voice for Southeast Michigan.

SEMCOG Committees

Policy decisions at SEMCOG are made by local elected officials, ensuring that regional strategies are closely aligned with local community interests. Elected officials participate on SEMCOG's policy-making bodies: the General Assembly and the Executive Committee, which review and consider recommendations from SEMCOG staff, standing committees and task forces.

In the decision-making process, SEMCOG actively involves an array of regional stakeholders, comprised of local government representatives, the business sector, and various citizen and special-interest groups, to ensure that adopted policies are comprehensive and reflective of Southeast Michigan's diverse interests. Table 6 shows each SEMCOG committee and its common functions.

Table 1

SEMCOG Committees

Committee	Functions
Transportation Coordinating Council	▪ Develops the Regional Transportation Plan implements and monitors the TIP
Executive Committee	▪ Acts on policies and legislative positions ▪ Reviews regional plans and studies ▪ Financial control body
General Assembly	▪ Acts on major regional plans ▪ Approves budgets and dues ▪ Elects SEMCOG officers

General Assembly

The General Assembly, comprised of delegates and alternates representing each of SEMCOG's member communities and institutions, is vital in shaping SEMCOG's regional initiatives. This assembly actively engages in the formulation and execution of key regional plans, budgetary considerations, the SEMCOG dues structure, in addition to overseeing the election of SEMCOG officers.

Executive Committee

The Executive Committee, a subset of the General Assembly, serves as SEMCOG's primary operational and financial oversight team. This committee actively proposes, discusses, and scrutinizes regional studies and plans, taking decisive action on policies and legislative positions to drive effective implementation.

Transportation Coordinating Council

The Transportation Coordinating Council (TCC), a standing committee, plays a pivotal role in developing the RTP. TCC is made up of elected officials, transportation practitioners, and concerned citizens. Beyond formulating the plan, TCC actively monitors its implementation through the TIP. This committee recommends transportation projects and necessary amendments, providing regular reports to the Executive Committee for seamless coordination and progress tracking in transportation planning and development.

Figure 3

Vision 2050 Connection to Other Plans

Vision 2050 – The Regional Transportation Plan for Southeast Michigan

Vision 2050 is Southeast Michigan's primary policy guide for transportation investment, providing a long-term vision for the regional transportation system. Updated every four years, the RTP is a flexible document that can be adjusted to reflect evolving conditions, revised needs, and changing priorities.

The transportation system in Southeast Michigan is essential to our regional way of life and economy. Vision 2050 serves several critical functions:

- **Addressing Future Mobility**: Outlining transportation funding for the next 20+ years.
- **Responding to Trends**: Adapting to regional, state, and national developments.
- **Prioritizing Strategies**: Allocating investments and funding based on expected revenues.
- **Ensuring Equity**: Preventing disproportionate adverse impacts on low-income communities.
- **Protecting the Environment**: Supporting initiatives to safeguard the natural surroundings.

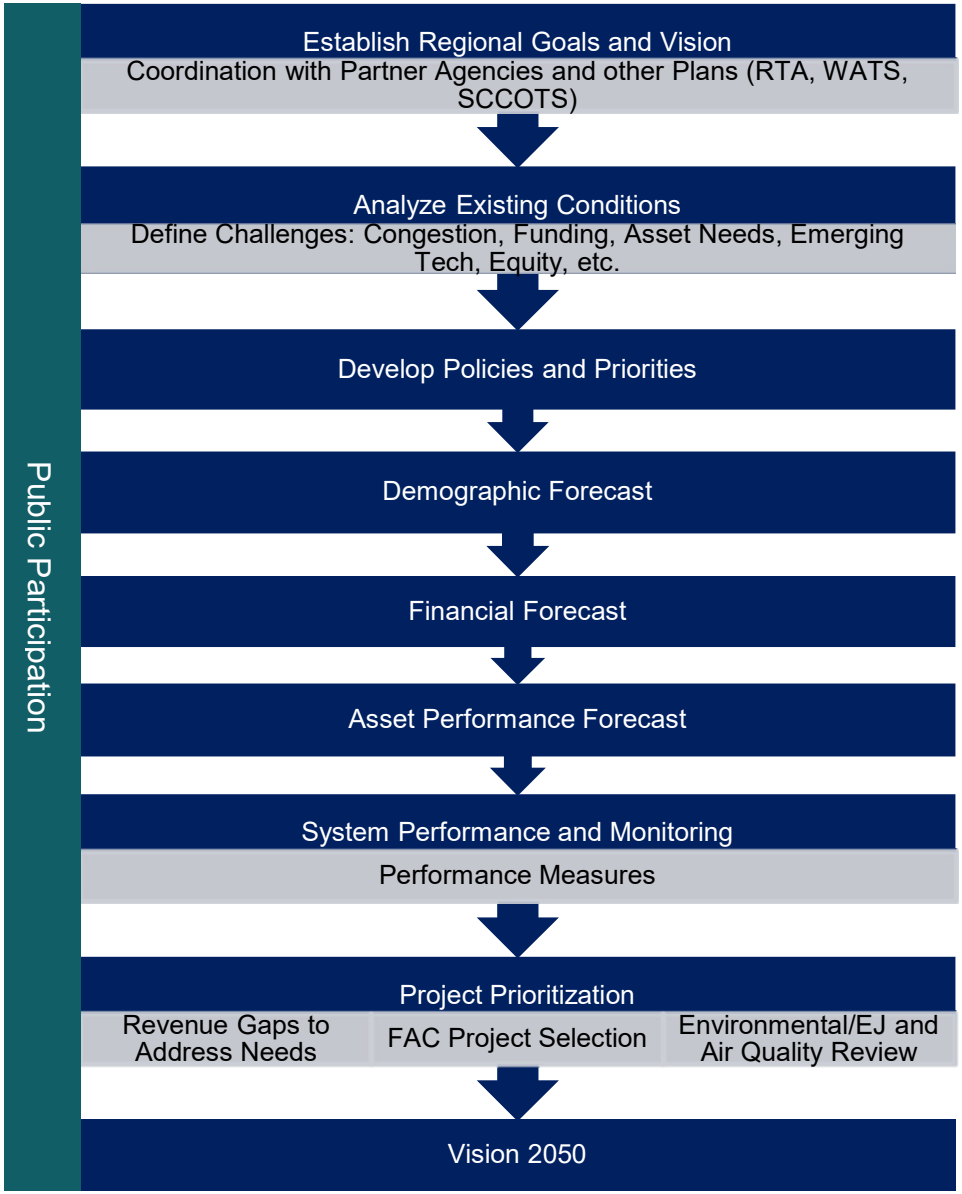
Meeting Federal Requirements

The Infrastructure Investment and Jobs Act (IIJA), the most recent federal surface transportation legislation enacted in 2021, continues the legacy of performance-based transportation planning that identifies performance areas based 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.

SEMCOG is responsible for developing and maintaining a regional transportation plan for Southeast Michigan. This plan, Vision 2050, guides how federal transportation funds are allocated to ensure a well-connected and efficient transportation

Figure 4

RTP Development Process



network. SEMCOG also manages the short-term Transportation Improvement Program (TIP), conducts research, provides data analysis, and offers technical assistance to its member communities, empowering them to make informed decisions that benefit the region.

Vision 2050 was developed to comply with state and federal regulations for planning transportation. To implement the requirements of IIJA, SEMCOG works in partnership with Michigan Department of Transportation (MDOT), the Federal Highway Administration (FHWA), the Federal Transit Administration (FTA), and other MPOs across Michigan through the Michigan Transportation Planning Association (MTPA).

SEMCOG follows a multistep, iterative process to develop the regional transportation plan as shown in Figure 4

With our region of nearly five million people, federal planning law regulates that a **continuing**, **comprehensive**, and **cooperative** process must take place for the multimodal transportation system. While developing *Vision 2050,* SEMCOG must consider a range of strategies for guiding investment, ensure that all relevant agencies and organizations, including the public, are involved, and outcomes are monitored and reevaluated in an ongoing manner.

Connecting to Other Plans

Vision 2050 is not the only transportation plan for Southeast Michigan. In addition to many local, regional, and state plans that impact the region, SEMCOG develops complementary plans in alignment with our core value of holistic planning. Each plan must support the policies and strategies adopted in *Vision 2050.* The following section will highlight those additional plans. Figure 3 shows how Vision 2050 connects to other plans.

Southeast Michigan Transportation Safety Plan

The Southeast Michigan Transportation Safety Plan, adopted in 2023, is the comprehensive safety action plan for the region. It employs a data-driven approach to roadway crash analysis and offers an aspirational framework aimed at eliminating fatalities and serious injuries on Southeast Michigan roadways through the Safe System Approach. This updated plan provides a comprehensive examination of the entire transportation network and systems, prioritizing the most vulnerable road users who face the highest risks of fatality and injury.

Additionally, the updated plan introduces a newly adopted vision of zero traffic fatalities and serious injuries by 2050. This vision is in alignment with the Michigan Strategic Highway Safety Plan and the National Roadway Safety Strategy.

Bicycle and Pedestrian Mobility Plan

The Bicycle and Pedestrian Mobility Plan was adopted in 2020. The plan provides a framework for promoting safe and connected non-motorized travel in Southeast Michigan. It outlines regional priorities, offers practical solutions for local adoption, and includes strategies for education and ongoing evaluation as part of its regional policies and actions.

Increasing Shared Prosperity for a Resilient Economy

This document is the Comprehensive Economic Development Strategy (CEDS) for Southeast Michigan and provides a structured framework for regional development, focusing on three foundational pillars: Place, Business, and Talent. Serving as both a roadmap for the region and a criterion for the U.S. Economic Development Administration (EDA) in grant evaluations, the strategy outlines 22 distinct policies designed to achieve its overarching objective to address the complex challenges and opportunities facing the seven-county area.

The Economic and Demographic Outlook for Southeast Michigan through 2050
The 2050 Regional Forecast, adopted in 2023, offers a thirty-year analysis of changes in population, households, jobs, and land use for each community in the seven-county region. This forecast is crucial for understanding future population and employment trends in our area. Insight into the locations of future households and jobs guides our planning for essential infrastructure improvements, such as roads, bridges, water, and sewer systems.

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

Congestion Management Process
The Congestion Management Process (CMP) follows the U.S. Department of Transportation's eight-step methodology to incorporate multimodal alternative strategies aimed at effectively managing congestion. The CMP provides valuable data and insights to decision-makers involved in regional transportation planning to enhance the flow of people and goods. The CMP is integral to creating a more efficient and sustainable transportation system.

Green Infrastructure Vision for Southeast Michigan
Adopted in May 2014, this plan describes long-term goals for the green infrastructure network, along with policies to achieve an integrated regional framework. The vision highlights opportunities for roadway design to make critical contributions to improving regional water quality by reducing stormwater runoff.

Water Resources Plan for Southeast Michigan
As the designated water quality management agency for Southeast Michigan, SEMCOG has been actively involved with water resource planning since the 1970s. The Water Resources Plan for Southeast Michigan builds upon two prior plans – the 1978 and 1999 Water Quality Management Plans for Southeast Michigan. Its focus is 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 sets the framework for 28 regional policies that address the core challenges in the region, while supporting ongoing achievements in protecting and restoring Southeast Michigan's water assets.

Southeast Michigan Water Infrastructure Planning Guide (WIPG)
The WIPG is an addendum to the 2018 Water Resources Plan. The planning guide is an interactive site that provides background, priorities & policies, and resources for water infrastructure in the region.

Strategic Framework for Growing our Resilience, Equity, and Economy with Nature (GREEN)
Southeast Michigan GREEN is an initiative to address some of the region's most pressing challenges – managing floods, fostering climate resilience, improving community health, protecting our natural assets – all while creating vibrant places where people want to live and where businesses will thrive. With a focus on implementation, Southeast Michigan GREEN provides a regional framework that demonstrates the impact of local projects, positioning them for successful funding and partnership opportunities.

Parks and Recreation Plan for Southeast Michigan
Adopted in May 2019, this plan ensures that the region's recreation system, parks, and trails meet the quality of life, health, and accessibility needs of its residents and visitors. The plan also includes a detailed accessibility analysis of all parks and trails in the region by walking, biking, driving, and public transit.

Plans from Partner Agencies

SEMCOG also coordinates with partner agencies on transportation plans within our seven-county region. Plans from partner agencies within the SEMCOG region are developed in concurrence with the policies and actions adopted in Vision 2050.

Michigan Department of Transportation
The Michigan Mobility 2045 Plan is a comprehensive roadmap for Michigan's transportation system. The plan incorporates scenario planning to evaluate outcome from potential economic and technology changes and funding benefits, particularly increased safety funding that could prevent hundreds of fatalities annually. SEMCOG and MDOT worked together in developing the regional and state plans.

Regional Transit Authority
The Regional Master Transit Plan update was adopted in February 2024. The plan offers solutions driven by public input to foster a more equitable, efficient, and connected transit system. The RTA's Regional Transit Master Plan is an illustrative component to the Vision 2050.

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 2050 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.

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 recently developed its 2050 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.

Southeast Michigan is home to a complex network of transportation assets as shown in Figure 5

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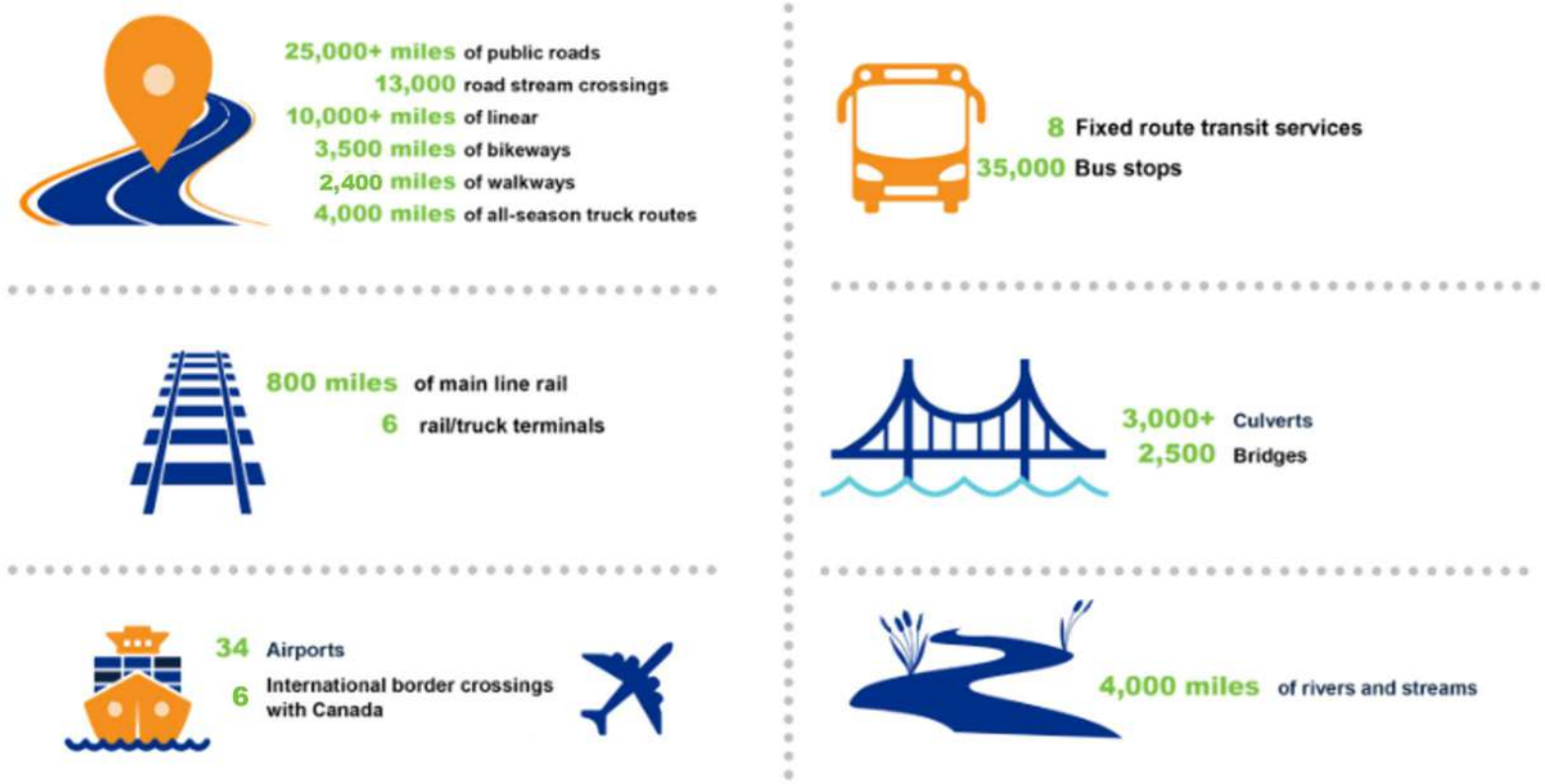
Transportation Assets in Southeast Michigan

Figure 5

Transportation Assets in Southeast Michigan



In Southeast Michigan, multiple agencies are responsible for the transportation system. These agencies include:

- Local governments
- County road agencies
- Public transit providers
- State and federal agencies
- St. Clair County Transportation Study (SCCOTS)
- Washtenaw Area Transportation Study (WATS)
- SEMCOG.

Federal Aid Committees

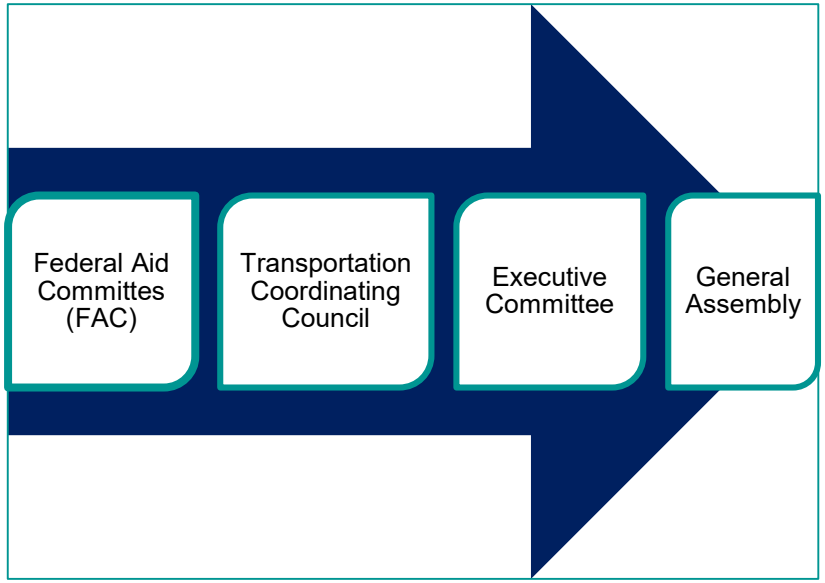
This comprehensive transportation network is coordinated through SEMCOG and eight Federal-Aid Committees (FACs). Each of the seven counties and the City of Detroit has an FAC which coordinates and prioritizes recommendations for projects to be included in the RTP and TIP. FAC membership includes local communities, county road commissions, transit agencies, and MDOT. SEMCOG has a non-voting membership in each FAC and attends all the full FAC meetings to provide technical assistance when requested, as well as regional, state, and national transportation information to committee members to assist in informing their decisions. Each FAC has its own process for selecting and scoring projects for recommendation. SEMCOG helps to inform this process by providing regional plan information, data and analyses.

The St. Clair and Washtenaw FACs are run by the St. Clair County Transportation Study and the Washtenaw Area Transportation Study, respectively. These two agencies are transportation studies organized under State law and as such have additional responsibilities such as providing supplemental analysis, recommendations and support.

FACs use knowledge of local conditions to prepare lists of federal-aid road projects for recommendation by the Transportation Coordinating Council and approval by the SEMCOG Executive Committee.

Figure 6

Project Coordination Process



The SEMCOG Executive Committee is authorized by the General Assembly, SEMCOG's policymaking body, to review and decide which projects will or will not be included in the official TIP list. The project coordination flowchart is shown in Figure 6.

Structure of Vision 2050

Vision 2050, the regional transportation plan for Southeast Michigan, highlights an integrated planning process that supports strategic decision-making by:

- Identifying deficiencies and trends that shape the region.
- Engaging with the public and stakeholders to establish collective priorities and goals,
- Recommending projects to achieve the vision; and
- Implementing policies and actions.

The subsequent chapters describe the breadth and complexity of the region's transportation system and future strategies for developing an equitable, sustainable, and comprehensive system for everyone in Southeast Michigan.

Chapter 2: Guiding Principles and Input – highlights the strategies and tools used to develop Vision 2050, including results for stakeholder and public workshops and surveys.

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

Chapter 4: Emerging Technologies – explores new technologies that can fill gaps in the transportation system and lower costs for service providers and users.

Chapter 5: Equity in Transportation Planning – discusses the challenges and solutions to ensuring the transportation system serves the needs of all users in Southeast Michigan.

Chapter 6: Financial Plan – discusses the expected revenues needed to pay for future transportation projects.

Chapter 7: Policies and Performance Measures – highlights the adopted federal performance measure targets for safety, pavement and bridge, systems performance and freight, congestion mitigation/air quality, and public transportation. regional policies and actions adopted in this plan, as well as strategies and champions for plan implementation.

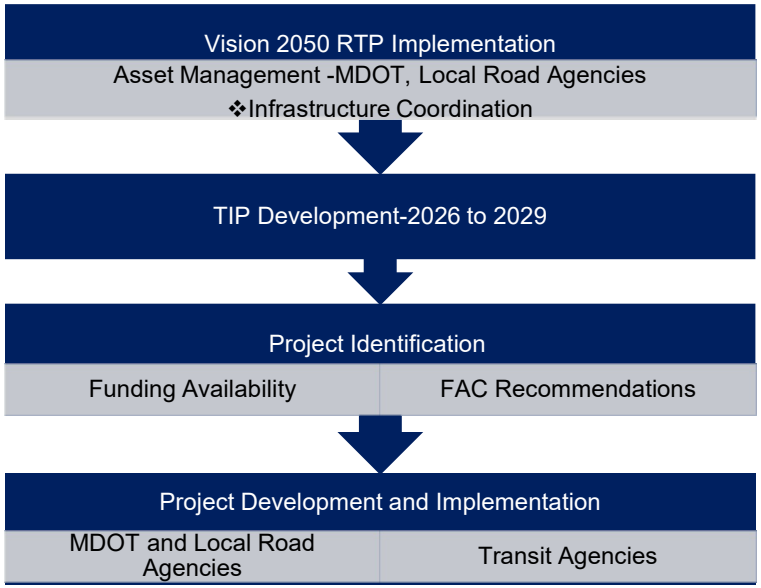
Chapter 8: Implementation – highlights the regional policies and actions adopted in this plan, as well as strategies and champions for plan implementation.

Beyond Vision 2050

Vision 2050 is designed to serve as a guiding document for developing other regional plans and programs. It is envisioned as a dynamic, living document that adapts to regional changes. And as the region evolves, Vision 2050 should be actively utilized to inform and guide actions over the next four years, ensuring its relevance and responsiveness to the shifting needs and priorities of the community. Figure 7 highlights the plan implementation process to project development.

Figure 7

Vision 2050 RTP Implementation




REGIONAL AMBASSADORS
SEMCOG
LEADERSHIP
SEMCOG
RESILIENCE
PROPOSED STRATEGIES
SEMCOG
VISION 2050 REGIONAL TRANSPORTATION PLAN
EDUCATION
PROPOSED STRATEGIES
SEMCOG
VISION 2050 REGIONAL TRANSPORTATION PLAN
FUNDING
PROPOSED STRATEGIES
SEMCOG
EXIT

Chapter 2:
Guiding Principles and Input

Collecting input is vital for the development of a comprehensive regional transportation plan. SEMCOG used a variety of methods to engage both transportation stakeholders and the broader public on regional needs and desires for the future transportation system. The following section highlights the strategies used by SEMCOG to gather input for Vision 2050.

Guiding Principles

The guiding principles for Vision 2050 express regional values for transportation planning activities, policy and project development, and performance targets.

- Educate and engage local leaders and residents.
- 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.

Table 2

Public Input Quick Facts

10 Stakeholder and visioning workshops	294 survey responses
9,000+ Vision 2050 Hub views	28 comments on the draft plan
9 online advertisements	10 board and committee meetings
3 Virtual Draft Reviews	3 Media interviews

Public Participation Plan

The first step for engagement on Vision 2050 was an update of SEMCOG's Public Participation Plan (PPP). The PPP outlines the activities, strategies, and tools SEMCOG may use during Vision 2050 development, and other plans and initiatives being developed at SEMCOG.

The goals of the Public Participation Plan are to:

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

Consultation Agency Outreach

The consultation agency outreach process expands participation 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.

While there may be overlap between the consultation agency and public engagement process, which is discussed later in this chapter, the two efforts are distinct. The primary difference is the target audience for consultation agencies includes formal groups and organizations, while public outreach is directed towards individuals regardless of their affiliation. Agencies involved in the consultation outreach are planning partners across the region in various roles including natural resources, education, conservation, environmental justice, community and economic development, tribal interests, freight, transit, border crossings, aviation, among other groups.

Consultation with these agencies and planning partners provides opportunities to gather the needs of the larger community, compare and coordinate planning approaches, and communicate a vision for a transportation system that crosses multiple jurisdictions. SEMCOG interacts with many of these agencies on an ongoing basis to ensure its plans and programs are aligned throughout the development process from identification to implementation.

Public and Elected Official Outreach

Throughout the Vision 2050 development process, SEMCOG has engaged with public and elected officials for input into engagement strategies and policy and action development. A workshop was held in February 2023 for members of the regional Transportation Coordinating Committee to gather input from officials across the region on engagement strategies. Those officials indicated the best ways to engage the public were to host meetings, on-site and in-person, utilize social media, multimedia

channels (video and audio), and a hub information website. Each of those strategies was incorporated into the Public Participation plan adopted in June 2023.

SEMCOG also surveyed TCC on regional priorities to indicate what the top regional priorities are. According to TCC, the main priorities for the region were:

- Increasing safety;
- Increasing funding options;
- Increasing accessibility;
- Preserving infrastructure; and
- Integrating environmental protection into the transportation system.

Vision 2050 Hub

To enhance accessibility and communication throughout Vision 2050 development, SEMCOG established a website to function as the central platform for resources, data, and plan updates. This hub website is a crucial resource for continually updating information related to Vision 2050 throughout its development and will continue during the plan's implementation phase.

This platform ensures stakeholders and the public have easy access to information, including resources vital to the planning process, up-to-date data, and real-time updates on the progress of Vision 2050. As the plan evolves, the hub website will serve as a dynamic tool for issuing relevant information, fostering collaboration, and maintaining transparency.

Utilizing the hub website as a central repository guarantees that stakeholders can stay informed and engaged, enabling seamless communication and coordination throughout the various stages of Vision 2050's development and implementation.

The Vision 2050 hub hosted a dedicated resource page that granted project sponsors access to transportation data, allowing them to develop and send transportation projects for inclusion in the plan. Through its interactive features and intuitive interface, the hub fostered collaboration and appeared as an indispensable tool in shaping the future of transportation within our region.

Future uses for the Vision 2050 hub will be discussed in Chapter 8. The hub will be a crucial tool for implementing the policies and projects to follow in this regional transportation plan.

Stakeholder Visioning Workshops

SEMCOG conducted stakeholder consultations in May and June 2023 to gather feedback on draft Vision 2050 policies and identify actionable strategies for implementation. Building on SEMCOG's 2045 RTP, participants evaluated the relevance of the draft policies for Vision 2050.

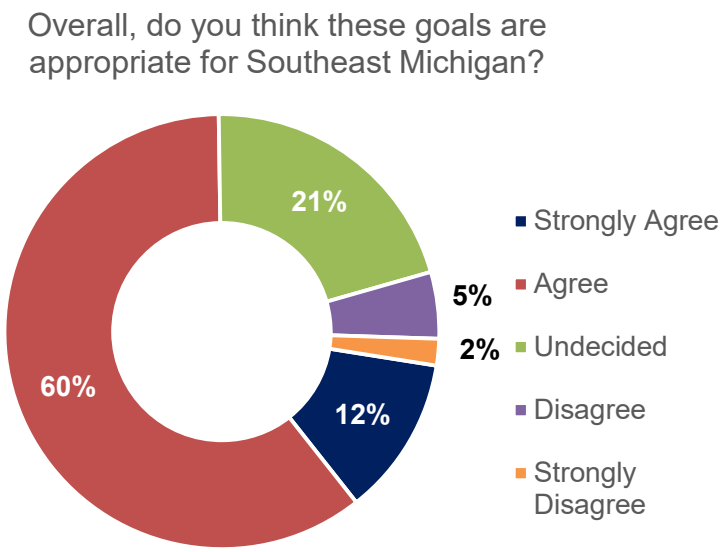
Stakeholder workshops were held throughout the SEMCOG region and virtually:

- May 2, 2023 – Novi Civic Center, Oakland County
- May 3, 2023 – Gibraltar Community Park, Wayne County
- May 4, 2023 – Warren Community Center, Macomb County
- June 13, 2023 – Virtual Zoom Meeting

Each meeting included a presentation on Southeast Michigan's transportation network, demographics, and the purpose of the RTP. Attendees participated in small group discussions focused on the ten draft policies, identifying key considerations for each.

Figure 8

Stakeholder Workshop Survey



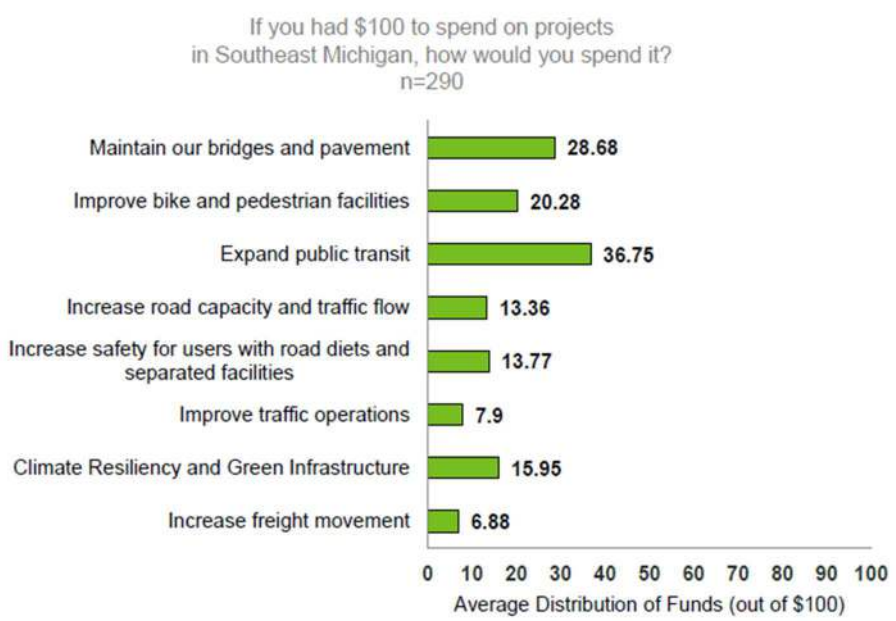
Stakeholders participated in a post-meeting survey to gauge support for the draft goals and rank the priority of draft action strategies for each policy. Results indicate overall agreement with the draft policies (Figure 8). Based on stakeholder feedback, SEMCOG's Vision 2050 team revised the ten draft policies, consolidating them into seven streamlined policies. These revised policies were presented for public input during Summer 2023 workshops.

Public Workshops

SEMCOG conducted a series of open-house workshops in July and August 2023 to gather public feedback on revised Vision 2050 draft goals. These goals were initially developed following stakeholder workshops.

Figure 9

Budget Priorities for Southeast Michigan



The public workshops adopted an open-house format. Presentations and facilitated discussions were replaced with video displays highlighting transportation trends. Attendees engaged with SEMCOG staff to discuss regional needs. Revised draft policies and actions were presented on large sheets, and participants used stickers to vote on preferred actions. Comment cards were provided for additional input.

Survey

Following public workshops, SEMCOG conducted an online survey to further assess community preferences and concerns about the transportation system. The survey focused on community priorities, satisfaction with local infrastructure, safety perceptions, public transit effectiveness, and the impact of the COVID-19 pandemic.

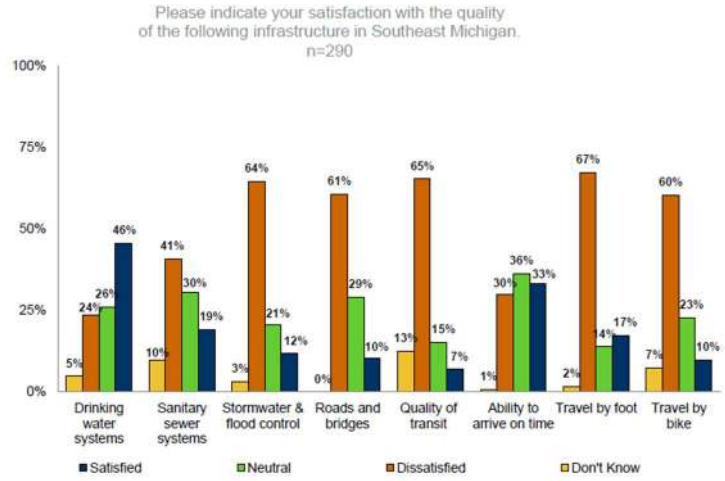
SEMCOG promoted the survey on social media, newsletters, committee meetings, paid advertisements, direct mail, flyers, and community events. The survey was hosted on the Vision 2050 interactive hub and received over 9,000 page views in October 2023.

Survey responses indicated high community support for expanding public transportation in Southeast Michigan, followed closely by maintaining roads and bridges, shown in Figure 9.

Respondents expressed dissatisfaction with the state of most transportation systems shown in Figure 10, particularly public transportation quality, bicycle/pedestrian infrastructure, and stormwater infrastructure.

Figure 10

Satisfaction with Quality of Infrastructure



A full summary of the survey results, along with the stakeholder and public workshops is available on the Vision 2050 hub.

Vision 2050 Policies

Policies shape actions, strategies, and project selection to meet regional goals. Seven policies in Vision 2050, seven policies outline priorities for the regional transportation system. These policies were developed by reviewing past RTP goals and analyzing stakeholder and public input. Table 3 shows and describes the seven policies for Vision 2050. Associated strategies and actions for the policies are described in detail in Chapter 7.

Table 3
Vision 2050 Policies

Policy	
	**Education** Educate and foster collaboration among local governments, transportation agencies, utility providers, and residents to enhance knowledge about and efficiency of the transportation system.
	**Equity** Ensure equitable access regardless of age, race, gender, ethnicity, national origin, physical or cognitive ability, or income.
	**Funding** Increase funding and broaden local options to ensure adequate resources and coordination for meeting regional transportation needs to achieve fiscal sustainability.
	**Preservation** Use asset management practices, technology, and cost-effective transportation solutions to preserve infrastructure.
	**Resiliency** Integrate infrastructure coordination, equitable stormwater management, and comprehensive resiliency planning into the transportation system to achieve greater public health and environmental benefits.
	**Safety** Increase safety for all travelers, especially for the most vulnerable road users.
	**Shared Prosperity** Promote a thriving regional economy by facilitating seamless movement of goods, efficient trade connections, enhancing labor mobility, and fostering tourism and local placemaking.

The Vision 2050 policies that will shape future regional priorities and investments also correspond with national planning factors established by Federal Highway Administration, shown in Table 4.

Table 4

Vision 2050 Policies and National Planning Factors

National Planning Factors							
Support Economic Vitality	✓		✓			✓	✓
Increase Safety	✓	✓	✓	✓	✓	✓	
Increase Security	✓		✓				
Increase Access and Mobility	✓	✓	✓	✓			✓
Improve Environment			✓	✓			
Enhance Integration and Connectivity Across Modes	✓	✓	✓		✓	✓	✓
Promote Systems Management and Operations	✓		✓			✓	✓
Emphasize Preservation			✓	✓			
Improve Resiliency and Reliability			✓		✓		
Enhance Travel and Tourism	✓	✓	✓				✓

Chapter 3: Current Conditions and Challenges

Regional Demographics

Key Takeaways

- Southeast Michigan's population is projected to reach 5.1 million by 2050, a 6.4% increase from 2020.
- The senior population (65+) will grow significantly by 2050, highlighting a need for accessible transportation options.
- Total employment is forecast to grow to over 3 million jobs by 2050.
- Southeast Michigan's real personal income per capita is expected to be 5.2% higher than the national average by 2050.

Key Actions

Connect population centers in the region to the places they live with infrastructure and services that support a high quality of life.

Prioritize equity by identifying and mitigating transportation barriers, developing transit fare structures, and offering specialized services to ensure inclusive access for all community segments including the aging population.

Developing a comprehensive regional transportation plan must include an exploration of not only the current conditions of the assets and components that make up the transportation system but also the demographic landscape in Southeast Michigan. This chapter will provide a detailed description of regional demographics, shedding light on the existing conditions, trends, and challenges faced by the vital components of the transportation system.

Planning for future transportation means we need to know where people will live, work, and play in Southeast Michigan. SEMCOG's 2050 Regional Development Forecast (RDF) outlines population, household, and employment projects, providing an analysis of the region's future economic and demographic landscape. This data provides valuable insight and identification of imminent challenges that require attention. The RDF is the bedrock for SEMCOG's long-range planning activities and indispensable for both local government and private-sector planning. With a 30-year outlook, this forecast lays out the groundwork for anticipating socioeconomic and land use changes, forming the basis for crucial infrastructure planning—regional success.

Population

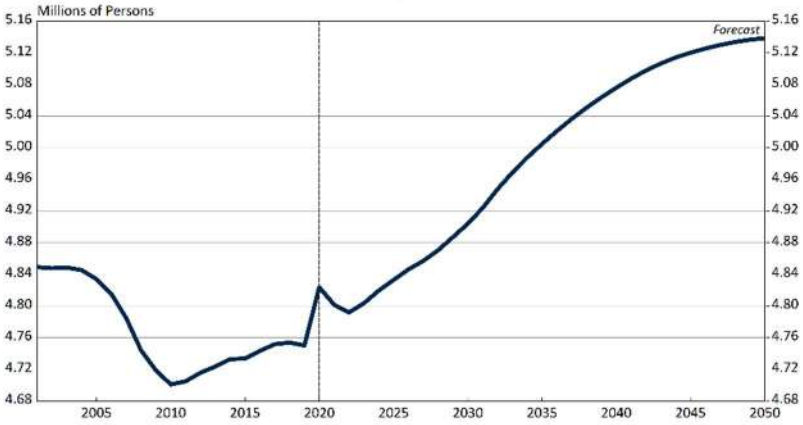
Southeast Michigan will be home to over 5.1 million people by the year 2050, 6.4% higher than the 2020 population. Between 2020 and 2050, SEMCOG forecasts the population in Southeast

Michigan will grow at an average rate of 0.21% per year, which outpaces the 0.15% the State of Michigan (Figure 11).

Despite these growth projections, however, Southeast Michigan's population growth is expected to be modest and lag the national pace of 14% growth by 2050.

Figure 11

Southeast Michigan's Population, 2000-2050



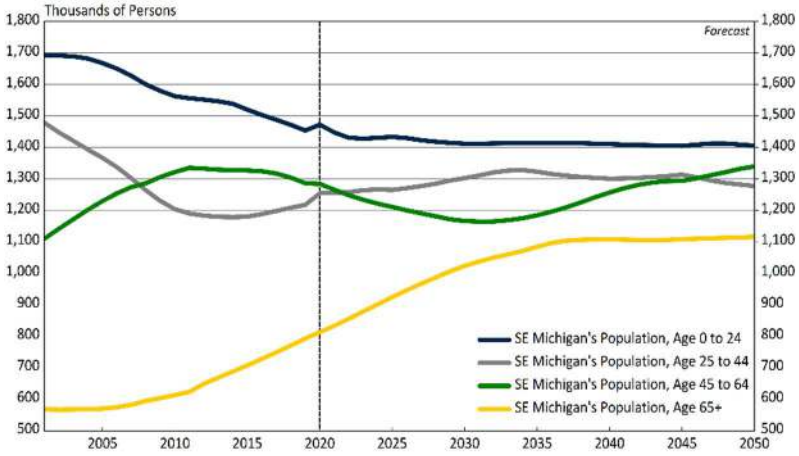
In 2020 and 2021, the region's population declined, as the COVID-19 pandemic reduced births and international migration and increased deaths. We are forecasting that Southeast Michigan's population will return to 2019 levels in 2025 and will continue to grow through 2050, albeit at a diminishing rate after 2040. We project that the population in Southeast Michigan will reach 5.139 million in 2050, 6.4% higher than in 2020.

The population of seniors (age 65 and older) in Southeast Michigan is expected to grow rapidly through 2037, with a gain of 290,159 over seventeen years. After 2037, however, the region's senior population is forecast to grow much more slowly, with a cumulative growth of only 12,800 residents between 2037 and 2050. This cohort's share of the area's total population grows from 16.9% in 2020 to 21.9% in 2037, before slipping to 21.7% in 2050.

The aging population in Southeast Michigan will require enhanced options on the transportation system to accommodate mobility and accessibility for a large population likely to not use their own personal vehicles in the future (Figure 12).

Figure 12

Southeast Michigan's Population by Age Category, 2000-2050



Employment

Employment is also expected to continue to grow through the year 2050. SEMCOG forecasts total employment in the region to increase by 9.0% between 2019 and 2050, from 2.7 to 3.2 million jobs. Again, this lags the national employment growth of 14.9% over the same period. It is important to note that the Base Year for the Demographic forecast is 2020, to align with the 2020 Decennial Census. The base year for the Employment forecast

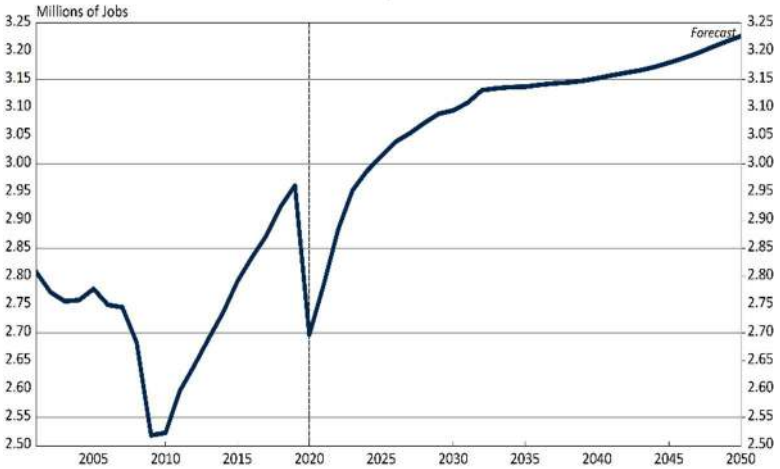
is 2019, as 2020 employment was artificially low due to the COVID recession.

Income is another important dimension of Southeast Michigan's economic profile. Historically, personal income per capita in Southeast Michigan has been slightly higher than the national average. This holds true in the 2050 RDF, as Southeast Michigan is forecast to have real personal income per capita 5.2% above the U.S. level.

The expected increases in population, employment, and income will naturally lead to increased use of the transportation system. More trips on our roadways and transit systems enhance the need to ensure regional investments in the transportation system can keep up with the needs of people in Southeast Michigan.

Figure 13

Southeast Michigan Employment (BEA Measure), 2000-2050



Unfortunately, the pandemic recession reversed the area's employment gains from the previous decade, at least temporarily as Southeast Michigan lost 214,540 wage and salary jobs in 2020. The 2050 forecast shows that the region is well on its way. to recovering these lost jobs, as we project the region recovers all jobs lost by 2024, putting employment that year 0.9% above 2019 levels. The 2050 forecast shows that total employment in the region will increase by 284,441, or 8.6%, from 2019 to 2050. We project that national employment will grow by 14.9% over the same period.

More in-depth data about economic and demographic forecasts can be found in *The Economic and Demographic Outlook for Southeast Michigan through 2050: A Baseline and Four Alternative Scenarios* available on SEMCOG's website.

Infrastructure

2050 REGIONAL TRANSPORTATION PLAN
VISION 2050

Key Takeaways

- Southeast Michigan has 25,000 miles of public roads.
- The percentage of roads in good condition has increased since 2019.
- Southeast Michigan has more than 3,000 bridges.
- More than 335 miles of roads are at high risk for flooding in the region.
- More than 10,000 miles of storm sewer conveyance along primary roads.

Key Actions

Establish a comprehensive asset management program to assess, manage, and monitor the condition and performance of infrastructure assets including roads, bridges, and transit systems, employing data collection systems such as sensors for informed maintenance and rehabilitation prioritization.

Explore and utilize diverse funding and financing mechanisms, including federal, State, and regional grants, public-private partnerships, and bonds, to secure necessary resources for committed infrastructure preservation efforts.

Prioritize investments in stormwater infrastructure and greenways to mitigate flooding, reduce transportation-related greenhouse gas emissions, and improve air quality to promote public health.

Movement in our region relies on a network of roads, bridges, and transit assets to keep people and goods moving. These transportation systems also exist alongside and sometimes within our valuable natural resources. Understanding how these elements interact is crucial for shaping the future of our interconnected city and its environment. This section discusses the current states of our regional pavement and bridges and later highlights interactions with natural resources. We'll explore the challenges from these interactions and the resources available that set the stage for developing strategies that build a more resilient transportation system for all.

Pavement

Pavement is foundational to the transportation system and there are 25,000 miles of public roads in Southeast Michigan. Every road user, regardless of mode, depends on high-quality pavement for safe and reliable travel so maximizing pavement longevity is very important. This requires systematic monitoring of conditions and applying suitable solutions tailored to age and condition.

To evaluate the road conditions in Southeast Michigan, SEMCOG works with MDOT, county road agencies and other partners to collect and document pavement condition data for all lane miles of roads in Southeast Michigan that are eligible for

federal funds. Roads are rated on a two-year cycle using the Pavement Surface Evaluation and Rating (PASER) system on federal-aid-eligible roads. The pavement is given a score of good, fair, or poor. Good pavements require minimal maintenance. Fair pavements are most effectively treated with capital preventive maintenance, and poor pavement needs structural improvement, such as rehabilitation or reconstruction.

Figure 14 shows pavement ratings in 2022 for all the federal-aid eligible roads in Southeast Michigan using the good, fair, and poor scale.

Figure 14

Pavement Condition, Southeast Michigan 2022

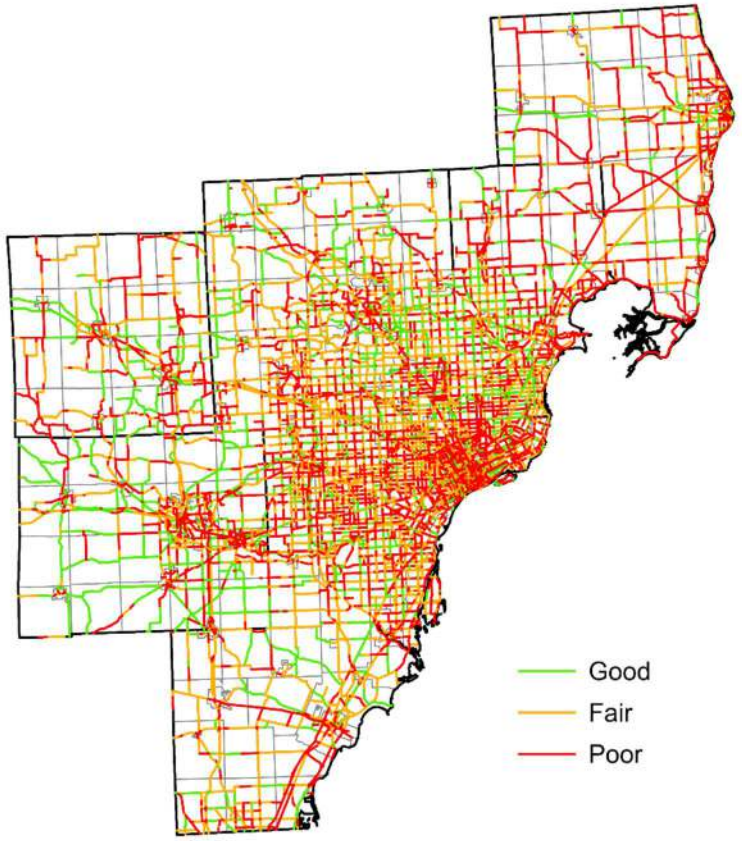


Figure 15
SEMCOG Pavement Condition, 2012-2022

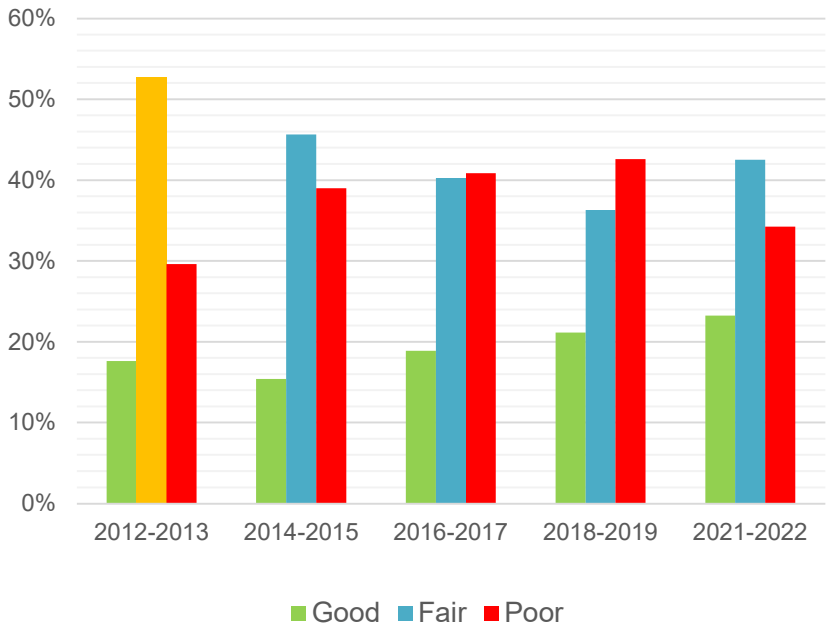
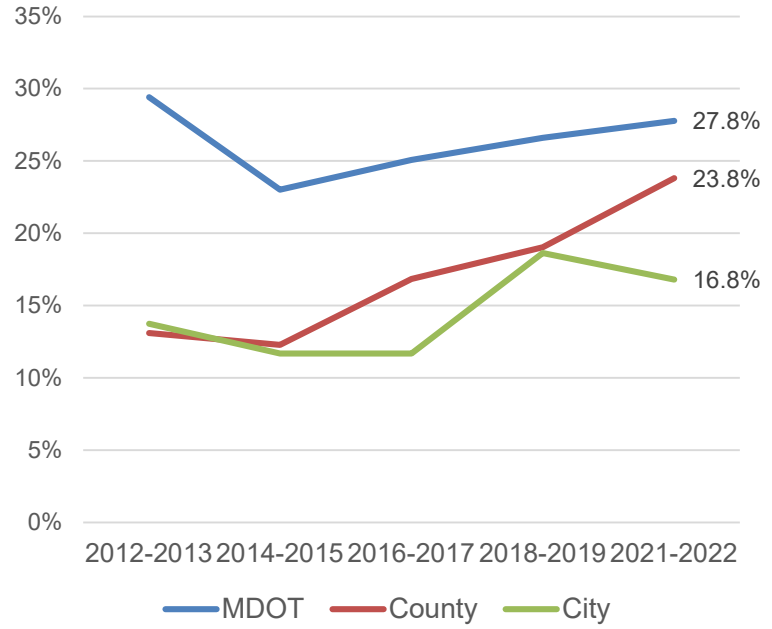


Figure 16
Percentage of Roads in Good Condition by Jurisdiction



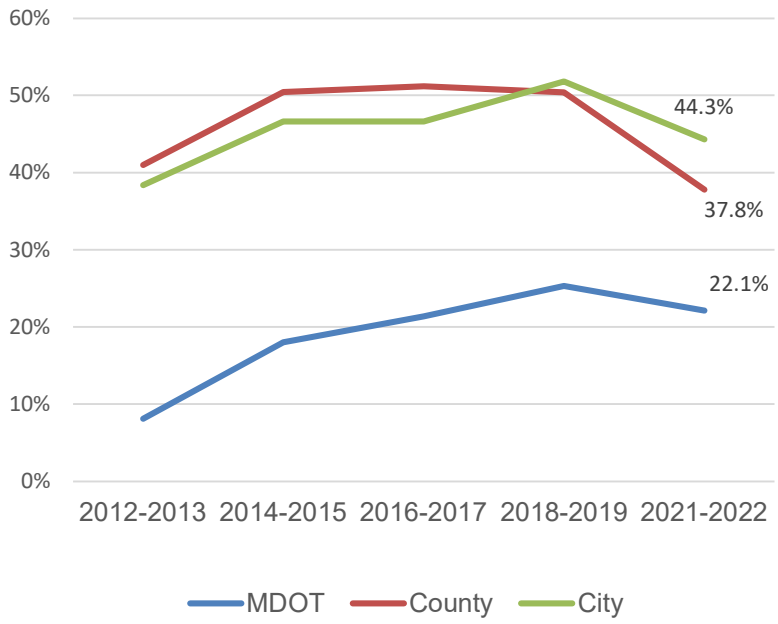
Over the past 10 years, Southeast Michigan roadways in good condition have increased as shown in Figure 15. During the 2021-2022 road rating cycle over 23% of roads are rated good, an improvement from the 18% reported a decade prior.

Examining pavement condition by jurisdiction highlights a greater proportion of MDOT and county roads are in good condition when compared with roads in cities and villages as shown in Figure 16.

While decreasing, the number of roads in poor condition in counties is greater than the share for MDOT roads as shown in Figure 17 Implementing asset management strategies helps guide investments towards preserving roads in good and fair condition, prolonging the road's life and mitigating the need for expensive road replacement.

Figure 17

Federal Aid Eligible Roads in Poor Condition by Owner



Challenges

Resilience and Extreme Weather Events

Severe flooding events pose a significant risk to the infrastructure of roads, bridges, culverts, and pump stations in Southeast Michigan. The Southeast Michigan Flood Risk Tool Dashboard is an interactive tool that assigns risk of flooding to regional roads, bridges, culverts, and pump stations. More than 335 miles of roads are at high risk for flooding in the region.

The declining condition of underground infrastructure, including stormwater collection and conveyance systems (which manage the flow of stormwater), coupled with challenges in effectively managing runoff from roadways, hastens the decline of pavement conditions. Similarly, the freeze/thaw cycle, or the time between water freezing and melting is also occurring more frequently and plays a role in weakening pavement. The expansion and contraction of water during freezing and thawing allows for water to get into existing cracks in the road and push outward as it freezes. This process leads to the formation of larger cracks and potholes, consequently escalating the costs associated with winter road maintenance.

Funding Gap

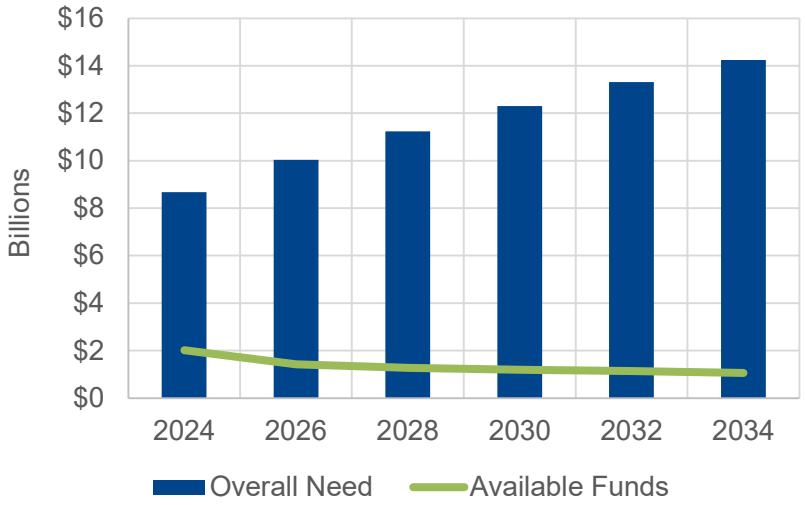
Additional funding is crucial to maintain and improve pavement quality. Increased federal and State revenues, along with bonding initiatives, have supported essential road repairs. However, Southeast Michigan's transportation system still demands significant investments to address current and future needs as shown in

Achieving a state of good or fair condition for Southeast Michigan's federal aid-eligible roads by 2034 would require an additional $5.1 billion per year in additional investment.

The Rebuilding Michigan bonding and funding from the federal Infrastructure Investment and Jobs Act (IIJA) added resources to the transportation program within the State. But more sustained and stable funding is needed to address pavement and other infrastructure needs.

Figure 18

Pavement Preservation Needs vs. Available Funds



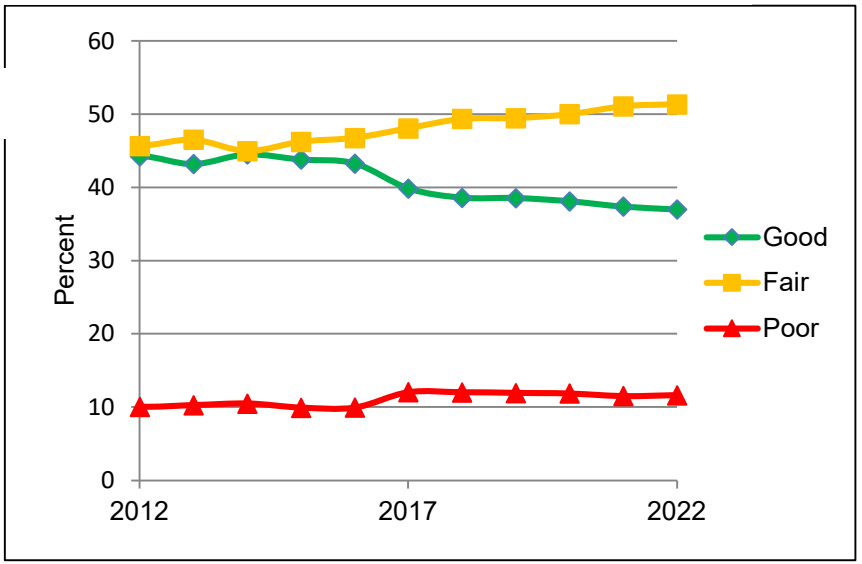
Bridge

Bridges, structures spanning more than 20 feet, are essential to Southeast Michigan's transportation system. With over 3,000 bridges crossing rivers, streams, railroads, and roadways, they shape the region's mobility. A bridge's design directly influences traffic flow, freight capacity, bike and pedestrian access, and even emergency response times.

Keeping these bridges healthy and maintained is vital. Their design should promote accessibility, ease congestion, and adapt to changing travel needs. This is no small feat as bridges cover over 27 million square feet across the region, making construction and maintenance more costly than other road projects.

Figure 19

Southeast Michigan Bridge Condition (2012-2022)



SEMCOG utilizes MDOT's Michigan Structure Inventory and Appraisal (MSIA) database to track bridge conditions. Each bridge component (deck, superstructure, substructure) receives a rating from 0-9, and an overall classification of good, fair, or poor. While the total number of bridges in fair condition are increasing, those in good condition are declining, and those in poor condition remain steady. See Figure 19 for a breakdown of conditions between 2012 and 2022.

These ratings serve as the foundation for road agencies to establish maintenance priorities for regional bridges.

Challenges

Funding

Maintenance and replacement of bridges incur substantial costs. Sustaining bridges in a state of good repair requires significant annual investment aimed at ensuring they meet or exceed their expected useful life. Neglecting regular maintenance ultimately results in an unsustainable number of bridges needing full replacement. Prioritizing a regular cycle of capital preventative maintenance is crucial for efficiently spending transportation dollars in a way that best preserves the structural integrity and extends the service life of the road network. SEMCOG advocates for transportation funding needs, emphasizing the significance of adopting an asset management approach for the most cost-effective preservation of road and bridge assets.

The Local Bridge Bundling program has addressed many significant local bridge needs, which could not have been addressed through conventional funding methods. This State program was limited and will need a permanent funding source in the future.

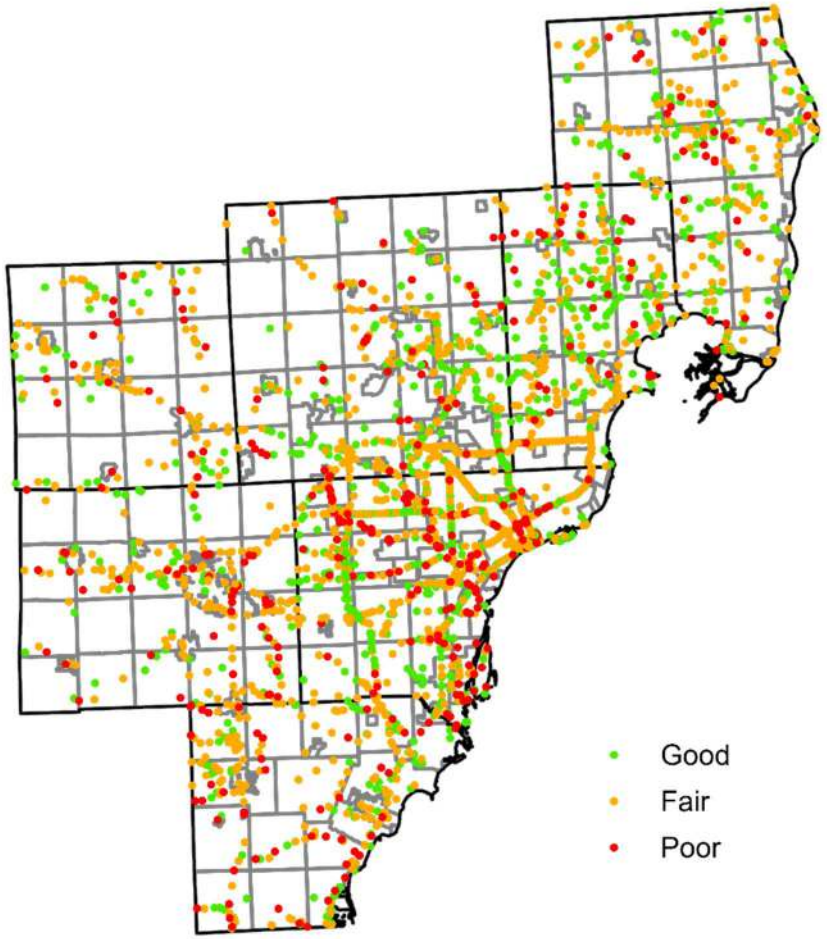
Pedestrian and Nonmotorized Access

Bridges are essential for creating continuous networks for pedestrian and bicycle travel. Bridges lacking 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. Modifying a bridge to include pedestrian and bicycle features after construction is challenging and often limited.

One approach used to address access for non-motorized travel not accommodated by roadway bridges is to provide dedicated pedestrian and bicycle overpasses and underpasses. These dedicated bridges can range from short connections over

Figure 20

Bridge Condition, Southeast Michigan 2022



waterways to longer bridges over limited-access freeways and high-speed, high-volume arterial roads. Separating 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 non-motorized 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.

Resilience and Extreme Weather Events

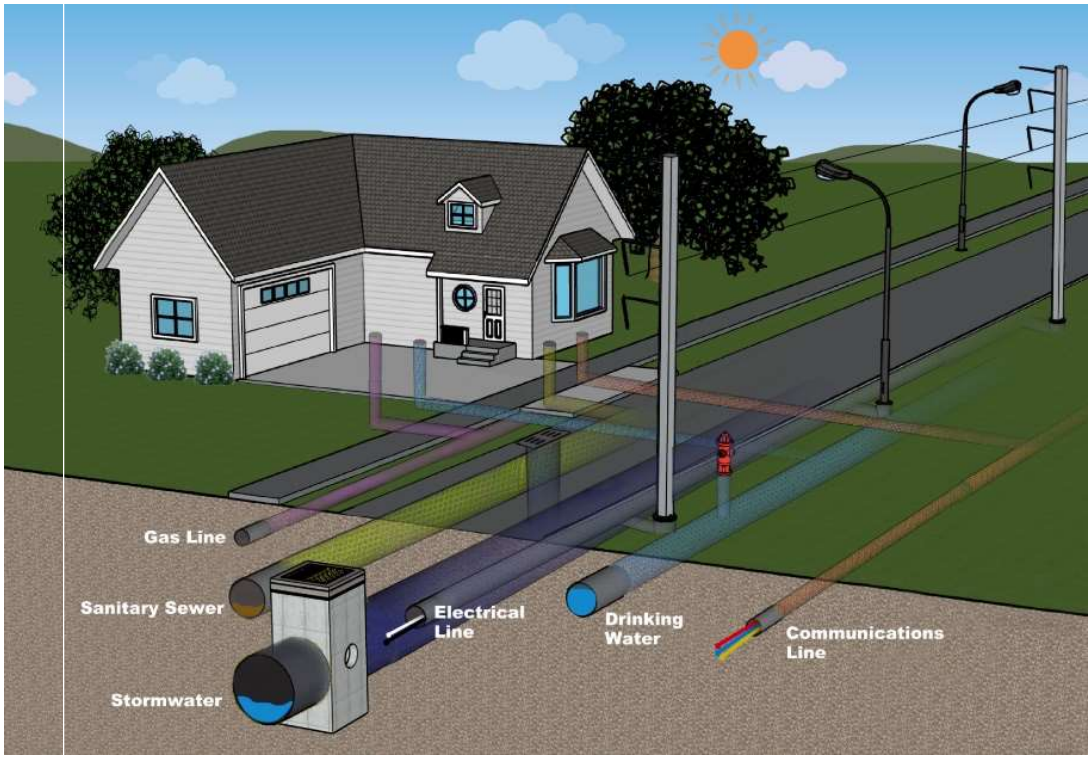
Resilience to flooding and extreme weather events is crucial for bridge infrastructure. SEMCOG's *Climate Resiliency and Flooding Mitigation Study* in 2020 identified flooding risk scores for roads, bridges, culverts, and pump stations in Southeast Michigan. These results are shared in an interactive dashboard available on the SEMCOG website, the Southeast Michigan Flood Risk Tool. Most bridges in the SEMCOG region are at either low or moderate flood risk; with most of the high-risk bridges are in Wayne County and the remaining high-risk bridges located in Macomb and Oakland Counties. The continued use of federal emergency relief funds will also play a role in the future adaptation and mitigation of this known risk. SEMCOG is using this work and building on its findings in future projects. These projects help prioritize infrastructure assets for future investment considerations.

Water Infrastructure

The region's water resources, and quality of life are supported by infrastructure including drinking water, wastewater, stormwater, transportation, and private utilities. This public infrastructure provides drinking water to millions of people, manages wastewater from homes and businesses, treats and conveys stormwater runoff from rainfall, and connects local and regional economies to world-class water recreation activities.

Figure 21

Cross-Section of Utilities Below Roadways



Much of the region's drinking water distribution along with the wastewater and stormwater conveyance systems are located along transportation corridors creating significant opportunities to address both transportation and water infrastructure in a collaborative, integrated approach. Additionally, the transportation network collects and conveys much of the stormwater runoff from surrounding land area.

Asset Management Planning

FHWA promotes asset management as an ongoing process of cost-effectively maintaining, preserving, upgrading, and operating physical assets. Asset management planning integrates the data inventories of conditions of important assets, such as pavement and bridges, and contrasts with estimated revenues to achieve those investments. Transportation asset management plans (TAMP) attempt to prescribe a schedule for replacements and repairs to address assets in poor condition and achieve performance goals. MDOT is required to submit a Transportation Asset Management Plan every four years through Federal rule. The State TAMP includes information for the entire National Highway System, including NHS owned by locals.

The Michigan Infrastructure Council (MIC) was formed to lead the development of a statewide framework for long-term infrastructure initiatives. Integrated asset management is the foundation for this framework. Both the Transportation Asset Management Council (TAMC) and the Water Asset Management Council (WAMC) report to the MIC and lead statewide asset management strategies for transportation and water infrastructure respectively.

TAMC sets the state-wide strategy for asset management, requiring federal aid road conditions to be rated in a two-year cycle. Furthermore, Public Act 325 of 2018 required public

agencies with more than 100 miles of road under their jurisdiction to submit transportation asset management plans to the TAMC.

WAMC, the 'sister council' to TAMC, assists communities in the development and/or enhancement of their drinking water, wastewater, and stormwater asset management programs through the development of water infrastructure asset management templates. Public Act 324 of 2018 established WAMC and requires agencies that serve more than 1,000 individuals and own or operate drinking water, wastewater or stormwater assets to submit water asset management plans.

A common element of the WAMC and TAMC asset management plans requires agencies to describe efforts to coordinate infrastructure improvements. The MIC receives annual reporting from WAMC and TAMC on the asset condition and investments of water and transportation infrastructure across the state.

Effective transportation and water infrastructure asset management leads to improved levels of service, extended asset life, reduced lifecycle and project costs, and fewer disruptions to the public from construction projects.

These asset management initiatives feed directly into the region's new infrastructure coordination element in transportation planning.

Infrastructure Coordination

In Southeast Michigan, numerous agencies are tasked with constructing and maintaining transportation infrastructure, alongside those responsible for managing water, stormwater, and private utilities. Effective coordination among these entities is vital for enhancing infrastructure, reducing project costs, and minimizing disruptions to the system.

Many public and private utilities – drinking water, wastewater, gas, electric, and communications -- are located beneath roadways and through the transportation planning processes, these connections with utilities are often overlooked.

There is a need to develop a comprehensive coordination framework. Leveraging limited funding across agencies and coordinating planning cycles can optimize resources and maximize the impact of infrastructure investments. Integrating coordination steps into the planning cycle is critical to align projects effectively, achieve cost savings, and minimize disruptions to residents and businesses while work is completed.

SEMCOG has plans to develop and utilize existing tools for local agencies to share information, facilitate collaboration, and streamline project planning and implementation processes across various agencies and jurisdictions. Through concerted efforts and innovative approaches to coordination, we can enhance the resilience, efficiency, and sustainability of Southeast Michigan's infrastructure network.

In 2022, SEMCOG facilitated two infrastructure coordination workshops, which were attended by representatives from transportation agencies, water utilities, and private utilities. Through discussion, the group agreed that the well-established transportation planning process would be the most appropriate place to start infrastructure coordination integration.

Looking at the transportation planning cycle, a step for infrastructure coordination will be included after program development. This provides utility stakeholders with an opportunity to coordinate, review draft projects, and align funding opportunities and timeframes.

Infrastructure coordination is not a single step added to the planning process, but a shift in the process that involves each step in the cycle. During project selection and programming, it's critical for

MDOT and EGLE to coordinate and align funding opportunities to support cross-sector coordination. During project delivery, permit alignment is necessary. During the regional planning process, it is important to seek input from other utility providers.

The actual process for incorporating these steps into the planning cycle is discussed further in Chapter 8, *Implementation*.

Challenges

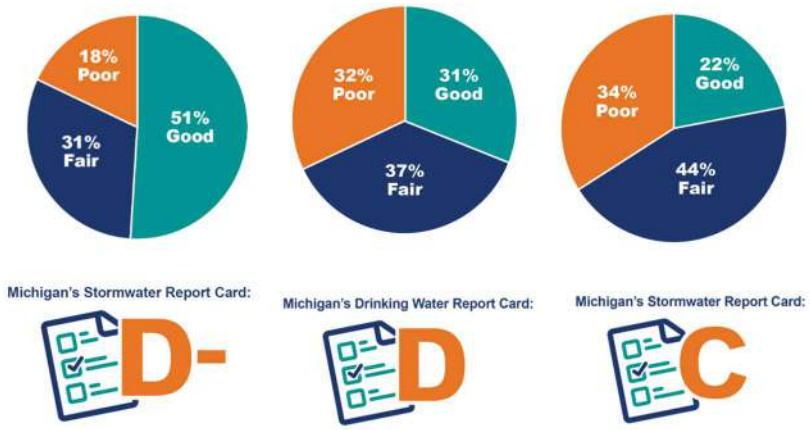
Infrastructure Age and Condition

Much of the region's water infrastructure was installed following World War II. During that time, the region grew tremendously with the federal government assuming more than 60% of costs. Now the federal investments are less than 10%, and much of the infrastructure is now reaching the end of its useful life.

The Southeast Michigan Water Infrastructure Planning Guide is an addendum to the Water Resources Plan and reflects on the regional priorities for drinking water, wastewater, and stormwater infrastructure. Nearly a third of the region's water infrastructure is in poor condition. Annual investments of over $3 billion are needed to maintain the thousands of miles of underground pipes, including drinking water distribution and wastewater/stormwater conveyance systems.

Figure 22

Projected Water Infrastructure System Condition and ASCE Infrastructure Report Card



The 2023 Michigan American Society of Civil Engineers (ASCE) Infrastructure Report Card assigned grades to water infrastructure shown in Figure 22.

Funding

Unlike the consistent federal-aid funding for transportation, water infrastructure funding is based on local water and sewer rates structures. Local agencies operate and maintain these systems to protect public health and environmental water quality. Additionally, grants and loans from State and federal agencies also make up a substantial portion of funding opportunities but are not sustainable. The costs for water infrastructure improvements, including ongoing operation and maintenance are continually rising. This is due to many factors including rising construction and material costs, lack of available contractors, increasing regulatory requirements, presence of emerging contaminants and more frequent flooding events. Newly introduced stormwater utility legislation will help address needed stormwater infrastructure improvements. This funding opportunity will also indirectly address stormwater management for roads. Finally, strategic cost savings can be achieved as transportation and stormwater infrastructure improvements are coordinated more efficiently.

Resilience and Extreme Weather Events

Stormwater management and infrastructure resilience are priority challenges for water infrastructure and are directly connected to transportation infrastructure. Conveying runoff away from private property, buildings, and roadways to minimize local flooding and property damage is the primary role of stormwater infrastructure. Unfortunately, changing precipitation patterns with more frequent intense and extreme wet weather events will continue.

In 2014, the region received 6 inches of rainfall in an 8-hour period, causing $1.8 billion in damages and a federal disaster declaration.

In the summer of 2021, Southeast Michigan was again inundated with extreme flooding that overwhelmed the transportation network, caused basement backups, and created transportation and public health hazards.

The *Southeast Michigan Current and Future Precipitation* report, recognized as a national example for future rainfall projections, forecasts precipitation/rainfall for mid-century and end-of-century. Existing rainfall and future projections related to the design of stormwater infrastructure for transportation projects are shown in Table 5.

Table 5

Existing and Future Rainfall Estimates for a Sample Location in Southeast Michigan

Stormwater Infrastructure Type	Existing NOAA Atlas 14[1]	Mid-Century Projection (2050)
Flow Conveyance (10-year 24-hour)	3.31 inches	> 5 inches
Flood Control (25-year 24-hour)	4.01 inches	> 6 inches
Flood Control (100-year 24-hour)	5.24 inches	> 8 inches

Table 6 demonstrates that stormwater infrastructure across the region that was built to meet standards in place at that time will not effectively manage future rainfall projections. This clearly means that flooding during normal and increased precipitation events will continue and increase in magnitude without intentionally directing significant investments to addressing stormwater infrastructure.

Various alternatives exist in early transportation planning to more directly and collaboratively address resiliency and stormwater management:

- Coordinating stormwater feasibility analyses with watershed partners prior to project selection
- Aligning stormwater improvements with other stormwater infrastructure partners
- Seeking opportunities for nature-based solutions
- Coordinating wetland mitigation in priority areas and
- Installing green infrastructure to manage road runoff.

[1] Precipitation frequency estimates published by NOAA.

Environment

Key Takeaways	Key Actions
• Transportation accounts for 35% of greenhouse gas emissions. • 92% of transportation emissions come from passenger and freight motor vehicles. • Increased impervious surfaces from transportation infrastructure contribute to stormwater runoff, impacting water quality.	Enhance the resilience of the transportation system to climate change and extreme weather events, with a particular focus on mitigating adverse effects in disadvantaged communities through measures such as implementing early warning systems and increasing storm sewer capacity. Prioritize investments in stormwater infrastructure and greenways to mitigate flooding, reduce transportation-related greenhouse gas emissions, and improve air quality to promote public health.

Southeast Michigan's transportation system – a network of roads, bridges, bike paths, public transportation – along with the vehicles and people it carries, significantly impacts the region's physical environment. These impacts include air quality, water resources, natural habitats, and the health of our green infrastructure network.

Air Quality

Air quality is influenced by emissions from mobile sources like cars, trucks, trains, and ships, but localized air quality is also affected by transportation infrastructure and active construction projects. Water resources, natural resources, and the green infrastructure network are influenced by existing and new transportation infrastructure. The transportation network provides a connection to water and natural resources and features for recreational enjoyment but also represents the land use type with the highest levels of impervious cover directly impacting the region's water resources.

Recognizing the interplay between transportation and the environment is pivotal for effective regional planning and enhancing the quality of life in the region. As the federally designated planning agency for transportation, air and water quality, and economic development SEMCOG facilitates collaborative regional approaches to addressing the region's most pressing challenges.

These challenges and priorities include:

- Maintaining the ozone attainment designation
- Addressing new PM2.5 standards
- Reducing greenhouse gas emissions
- Expanding the green infrastructure network

- Managing stormwater runoff and improving the quality of rivers, lakes, and streams
- Tackling infrastructure resiliency due to extreme precipitation flooding and
- Enhancing coordination of public and private infrastructure improvements

Each of these challenges is further described in this chapter along with the roles of transportation in enhancing environmental quality and public health.

National Ambient Air Quality Standards

SEMCOG serves as the designated lead local air-quality planning agency per the federal Clean Air Act. In this capacity, SEMCOG actively engages in initiatives aimed at achieving and sustaining national ambient air quality standards (NAAQS) throughout the region. The EPA establishes NAAQS for six principal pollutants, called "criteria pollutants," that may be present in outdoor air, are considered harmful to public health and the environment, and come from numerous and diverse sources. The six principal pollutants include:

- Carbon monoxide (CO)
- Particulate matter (PM)
- Nitrogen Dioxide (NO_2)
- Lead (Pb)
- Ozone (O_3) and
- Sulfur dioxide (SO_2)

Emissions from cars, trucks, aircraft, and other vehicles or industrial machinery include CO, PM, NO_2, and Pb. Vehicle emissions are not a source of SO_2. O_3 is not emitted directly but is created by the chemical reactions between NO_x and volatile organic compounds (VOCs) with oxygen in the atmosphere and in the presence of sunlight. Both NO_2 and VOCs are emitted by cars, power plants, industrial boilers, and refineries.

The Environmental Protection Agency (EPA) evaluates whether places, like the SEMCOG region, meet federal air quality standards. These areas receive designations of:

- **Attainment**: The region meets or is under the national air quality standard.
- **Nonattainment**: The region is exceeding the national air quality standard.
- **Maintenance**: The region previously exceeded the standard, but now is attaining the standard (pollutant levels are at or below the standard) and is now monitoring to ensure projects do not create more emissions than allowed.

The Clean Air Act also mandates transportation conformity. This means that federal agencies cannot fund projects that conflict with a state's air quality goals. In areas designated as nonattainment or maintenance, transportation conformity applies to updates and amendments of transportation plans and programs. This specifically addresses pollutants like ozone, particulate matter, nitrogen dioxide, and carbon monoxide.

In 2023, the entire Southeast Michigan region was redesignated to attainment/maintenance status for ozone. Complementary efforts to reduce mobile emissions involve endorsing pedestrian and bicycle travel, ridesharing, telecommuting, and the utilization of public transit. These initiatives will continue into the near future to maintain the ozone attainment designation status.

Current Southeast Michigan air quality designations are outlined in Table 6. These designations are often referred to as attainment, nonattainment or maintenance. While the ozone designation has been upgraded to attainment/maintenance, EPA anticipates future ozone regulatory standards will continue to decrease. For example, the current ozone standard is 70 parts per billion (ppb). EPA has promoted the idea of reducing the standard to 65 ppb. Air quality monitors in the region hover around 70 ppb. If EPA does lower the regulatory standard, it may result in additional regulatory implications for economic

development, industrial air permits and potentially vehicle emissions and testing programs.

The EPA recently finalized rules lowering the particulate matter standard for fine particles ($PM_{2.5}$) which are 2.5 micrometers in diameter and smaller. Also referred to as soot, the $PM_{2.5}$ primary (health-based_ annual standard was revised from 12 micrograms per cubic meter to 9.0 micrograms per cubic meter reflecting on new science about the public health effects. The EPA will determine which areas of the country meet the standard (i.e. initial attainment/nonattainment designations) within 2 years. Sources of fine particles include vehicles, smokestacks and fires. They also form when gases from power plants, industrial processes and gasoline and diesel engines react in the atmosphere.

Table 6
SEMCOG Region Air Quality Designations

Pollutant	Current Designation	Standard (Year Established)	Current Designated Year	Area	Transportation Conformity Required?
Ozone	Maintenance	8-Hr: 70 ppb (2015)	2023	Entire region	Yes
Fine Particulate (24-Hr)	Maintenance	35 ug/m^3 (2006)	2013	Entire region	Yes
Fine Particulate (Annual)	Attainment	12 ug/m^3 (2012)	2015	Entire region	No
Carbon Monoxide (CO)	Attainment (ended Maintenance)	1-Hr: 35 ppm 8-Hr: 9 ppm (1971)	2019	Portions of Wayne, Oakland & Macomb counties	No
Sulfur Dioxide	Nonattainment	1-Hr: 75 ppb (2010)	2013 & 2016	Narrow strip of Southeastern Wayne County & Partial St. Clair County	No

Greenhouse Gas Emissions

Gases that trap heat in the atmosphere are commonly referred to as greenhouse gases and include:

- Carbon dioxide (CO_2)
- Methan (CH_4)
- Nitrous oxide (N_2O) and
- Fluorinated gases.

While greenhouse gases are not directly regulated under the National Ambient Air Quality Standards (NAAQS) or transportation conformity requirements, there's a growing emphasis on GHG reduction at both federal and State levels. Actions aiming to significantly reduce GHG emissions include:

The Environmental Protection Agency (EPA) - provides funding for the development of climate action plans through the Climate Pollution Reduction Grants (CPRG) under the Inflation Reduction Act.

The State of Michigan developed the Michigan Healthy Climate Plan, a roadmap for reducing GHG emissions and achieving carbon neutrality.

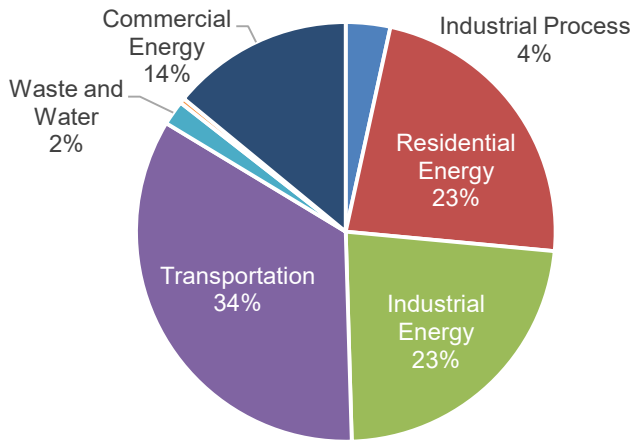
To support local agencies in addressing anticipated GHG reduction requirements and accessing future funding, SEMCOG has conducted a baseline inventory of emissions. This inventory follows the Global Protocol for Community-Scale Greenhouse Gas Inventory (GPC), a widely used standard. The 2019 baseline assessed emissions across key sectors:

- Transportation
- Stationary Energy
- Solid Waste and Water Treatment
- Agriculture, Forestry, and Land Use
- Commercial and Industrial Energy
- Industrial Processes

Among these sectors, the transportation sector emerged as a pivotal contributor, representing 34% of the total greenhouse gas emissions in the region as shown in Figure 23.

Figure 23

Transportation CO2 Emissions by Source

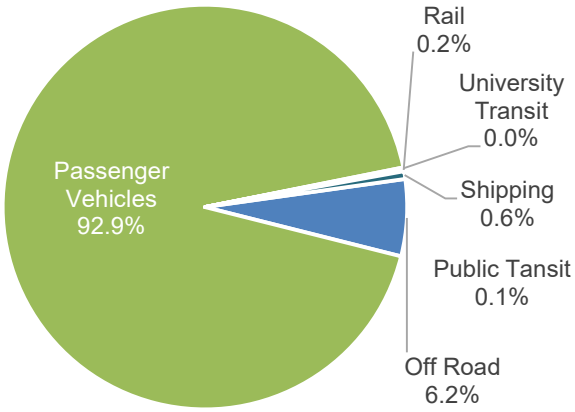


Analysis of transportation emissions reveals that on-road passenger vehicles and freight trucks are the dominant sources, contributing a substantial 92% of total emissions. Other contributors include off-road vehicles and equipment, waterborne shipping, freight and passenger rail, and public transit as shown in Figure 24.

This analysis highlights the dominance of on-road vehicles, passenger and freight, on the regional carbon footprint. Balancing the need to reduce emissions with the transportation sector's vital economic role requires strategic interventions focused on decarbonization alongside economic development.

Figure 24

Regional Transportation Contributors of Greenhouse Gases



While not yet a conformity requirement, FHWA's new GHG performance measures provide a framework for tracking emissions on the National Highway System. Implementation is expected by September 2024, with MDOT and SEMCOG required to set declining GHG reduction targets (using 2022 as a baseline). MDOT will establish 2- and 4-year statewide goals, and SEMCOG is expected to align its 4-year targets with the *Michigan Healthy Climate Plan*.

As the entire region, including local communities, prepares for the future, a strategic focus on decarbonizing on-road vehicles will address environmental concerns and drive economic growth. Key strategies include:

- Transitioning to alternative fuel vehicles,
- Promoting sustainable transportation practices, including public transit infrastructure, and
- Investing in innovative technologies.

Natural Resources

In Southeast Michigan, natural resources include:

- Green Stormwater Infrastructure – including rain gardens, bioswales, bioretention, community gardens, porous pavement and green streets.
- Resilient Natural Landscapes – including urban tree canopy, wetlands, woodlands, riparian corridors and coastal areas.
- Protected and Public Lands – including agriculture, conservation land, parks and trails.

The transportation network provides vital connectivity to the region's natural resources. Notable regional natural resource assets include the world's only international wildlife refuge – the Detroit River International Wildlife Refuge – and the largest coastal wetland system in the Great Lakes – St. Johns Marsh.

Additionally, the green infrastructure network includes a vast array of green stormwater infrastructure that enhances natural and water resources and helps alleviate infrastructure resiliency challenges. Smaller features such as rain gardens and bioretention facilities improve the quality of stormwater runoff from impervious surfaces like roads and bridges. Larger, nature-based solutions are designed to reduce localized flooding from public and private property and protect transportation and water infrastructure from flood damage.

Collectively these natural landscapes and green stormwater infrastructure features provide positive benefits to air quality. The increased vegetation promotes carbon sequestration while also buffering and filtering dust and air pollution.

Challenges

The quality and geographic extent of these landscapes and amenities are also affected by transportation projects. Impacts on connectivity, habitat, wildlife diversity, water quality, and threatened and endangered species can either degrade or enhance these resources. Transportation projects address these elements through the environmental review process. SEMCOG's regional initiatives to directly prioritize the preservation and enhancement of natural resources support this review process.

For example, the Southeast Michigan GREEN Initiative focuses on Growing Our Resilience, Equity, and Economy with Nature and addresses pressing regional challenges – managing floods, fostering climate resilience, improving community health, and protecting natural assets – all the while creating vibrant places to live.

Specifically, the Green Dashboard defines quantifiable metrics to increase green infrastructure across the region.

Transportation projects can enhance natural resources and work towards the GREEN metrics by considering various alternatives in the transportation planning process:

- Increasing tree planting and tree canopy
- Coordinating wetland mitigation in priority areas
- Enhancing riparian corridors
- Installing green infrastructure to manage road runoff and
- Seeking opportunities for nature-based solutions.

The green infrastructure network provides numerous qualities of life benefits including resilience, equity, economic and nature amenities. Transportation investments also regionally impact many of these priorities and can support working towards the GREEN Initiative metrics.

Water Resources

Southeast Michigan has nearly 400 miles of Great Lakes shoreline that is often called the Lake Huron to Lake Erie Corridor. With over 4,000 miles of rivers and streams major river systems include the Clinton, Huron, Raisin, Rouge, and St. Clair River watersheds.

As the designated water quality management agency for Southeast Michigan, SEMCOG has been actively involved with water resource planning since the 1970s. The region's water resources reflect the abundance of fresh water and are a key economic driver for attracting business investment and talent. Manufacturing, agricultural, mining and energy production industries are all dependent on water availability. Combining that with the recreation and tourism industry in Michigan, freshwater resources are a primary driver for quality of life in southeast Michigan.

Challenges

Water Quality

The water quality of rivers, lakes and streams is directly affected by stormwater runoff conveyed through a vast stormwater infrastructure network. This network is comprised of a variety of systems and management practices all designed to manage runoff from small and large rain events. Storm drains, roadside ditches, enclosed stormwater pipes and culverts make up part of this system directing runoff into the region's rivers, lakes, and streams as represented by the local watershed boundaries. While significant strides have been achieved in improving the quality of the region's water resources, the region still has impaired water resources.

Areas of Concern (AOCs), designated by the International Joint Commission under the Great Lakes Water Quality Agreement, highlight locations where human activity has severely limited beneficial uses of the water. Locally, these AOCs include the

watersheds of the Rouge River, Clinton River, River Raisin, St. Clair River, and Detroit River.

Impervious Surface Runoff

Impervious surfaces generally are concrete or asphalt roads, driveways or parking lots. With more than 35% of all impervious cover in the region, the transportation network is a primary source of stormwater runoff to local waterways. Additionally, with the intensified challenges of shifting precipitation patterns, existing roadway stormwater infrastructure struggles to manage increasingly frequent and intense weather events.

Pollutants from roadways like sediment, oil grease, and nutrients that flow as runoff can directly affect local water quality and public health. Pro-active measures during the transportation planning process can help to enhance water resources by considering various options during the transportation planning process, including:

- Incorporating best management practices, like green stormwater infrastructure.
- Coordinating wetland mitigation and expansion opportunities in priority areas
- Engaging with watershed stakeholders to comprehensively address regional flooding challenges.

A 2017 SEMCOG survey found that 63% of respondents believe that more spending should be directed toward developing roadway infrastructure that minimizes water pollution and flooding. Unfortunately, the complicated network of infrastructure is also challenged by a significant lack of funding to support improvements. Transportation agencies must often compromise on the necessary stormwater management improvements to prioritize needed transportation infrastructure improvements.

Opportunities exist to strategically align infrastructure initiatives that are further described in the *Infrastructure* section. Specifically, the newest initiative led by the Michigan Infrastructure Council aligning with MDOT and SEMCOG is directly benefiting an improved infrastructure coordination element as part of transportation planning. Integrated infrastructure coordination will address water quality challenges, mitigate flooding, minimize disruptions to residents, provide cost savings, and lead to economic and social benefits.

Environmental Sensitivity and Ecosystem Services

SEMCOG conducts an Environmental Sensitivity Analysis to assess the environmental impacts of planned transportation projects. The overarching objective is to construct and maintain a transportation network that not only minimizes adverse effects but also enhances public access to environmental resources.

An update to the existing Environmental Sensitivity Analysis is currently underway, which will incorporate additional mapping, flooding risk assessments, and updated data to inform potential environmental impacts. Combined with a new Environmental and Ecosystem Services Tool, stakeholders will not only understand potential environmental constraints but will also select potential mitigation alternatives with additional economic valuation.

System Operations

Key Takeaways

- Southeast Michigan has more than 8,700 miles of federal-aid eligible roads.
- Freeway congestion has decreased from pre-pandemic levels while congestion on arterials has increased. .
- Annual average freeway delay costs between 2021 and 2023 = $356 million
- Commuter Connect saved users over $180,000 in travel expenses between June 2022 and June 2023.

Key Actions

Connect everyone in the region to the places they live with infrastructure and services that support a high quality of life.

Continue to enhance regular meetings and working groups involving local governments, transportation agencies, utility providers, and private sector stakeholders to encourage collaborative initiatives and knowledge sharing.

Facilitate adopting emerging technologies and explore innovative construction techniques to enhance infrastructure durability, longevity, and efficiency, while preparing communities for modern infrastructure development without adding undue capacity.

Considering the high costs of transportation infrastructure, prioritizing operational enhancements is increasingly more important. To promote these enhancements and increase system efficiency, flow and reliability, SEMCOG uses multiple strategies to monitor delays including actively tracking regional congestion using real-time speed data. The region's congestion management strategies identify both acute and long-term bottlenecks on freeways and arterials and SEMCOG provides the data freely to partner agencies to aid in improving the regional system.

Additionally, SEMCOG coordinates with regional stakeholders to establish best practices for management traffic crashes, implement intelligent transportation systems (ITS), and promote tools and strategies to reshape travel behaviors. These efforts aim to create a safer, more reliable, and more sustainable transportation system without the high costs associated with additional infrastructure.

Congestion

Congestion has been a significant concern on Southeast Michigan's roadways, impacting regional economies, environments, and quality of life. Rising population, economic development, and evolving lifestyles all contribute to this challenge. As more people use the transportation system, especially during peak travel times, increased demand strains existing infrastructure and leads to congestion.

Congestion causes extended travel times, hindering access to work, school, and vital services. Goods cannot move efficiently or r during congestion hampering economic activity, and congestion increases vehicle idling and emissions leading to poorer air quality and health.

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

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

Peak travel periods are classified as:

- Morning Peak: 6:30 a.m. to 9 a.m.
- Evening Peak: 3:30 p.m. to 7 p.m.

Congestion Characteristics

- **Intensity** - refers to the relative severity of congestion. It is measured through quantitative performance measures that consistently relate the different levels of congestion.
- **Extent** - refers to the number of commuters, roadways, or users affected by congestion.
- **Duration** refers to the amount of time congested conditions persist.
- **Variability** - refers to the changes in congestion that occur on different days or at different times of day.

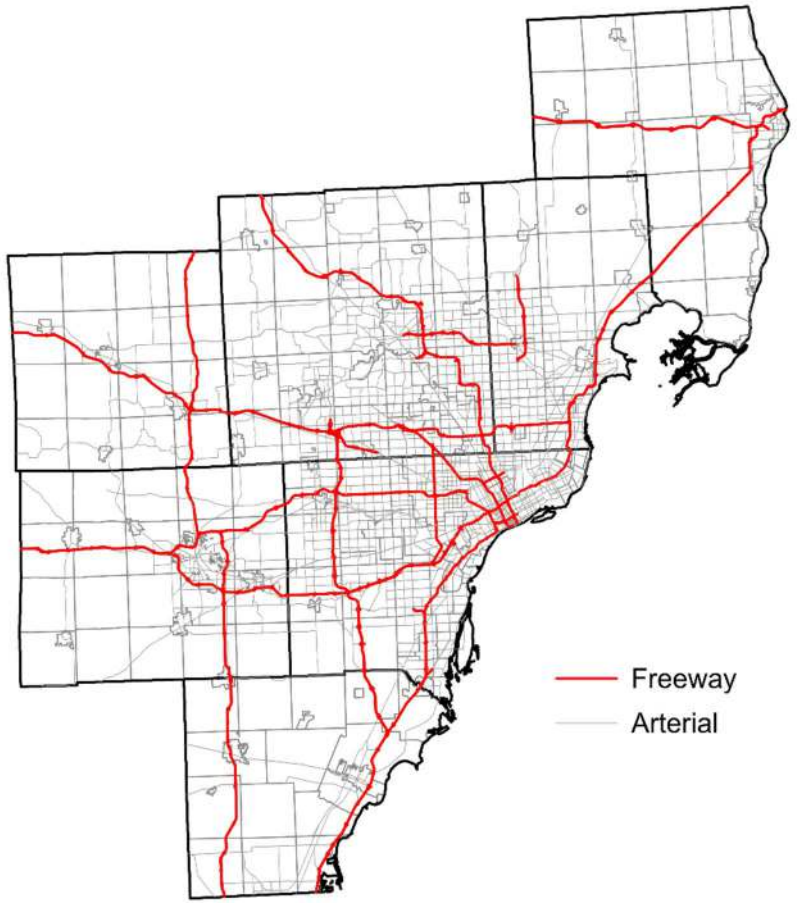
Congestion Sources

Many factors, often in conjunction with one another, can cause congestion on a road network. These factors include:

- High demand typical of peak travel periods recurring on typical weekdays,
- traffic incidents (such as vehicle crashes),
- weather,
- construction, and
- other non-recurring events

Figure 25

Freeway and Arterial System Map



Southeast Michigan's extensive road network spans over 8,700 miles, including more than 5,000 miles of freeways and arterials (Figure 25), as well as collector roads, local roads, and ramps.

Since 2019, spurred in large part by the Covid-19 pandemic, freeway congestion has decreased. In 2023, both the total congested miles (103) and congested hours (56,785 cumulative) were significantly below pre-pandemic levels in 2019, when over 252 miles were congested for a cumulative total of 82,468 hours based on real-time speed data.

This decrease in congested on freeways resulted in an increase on arterials. Due to shifting travel patterns during and post pandemic, congested miles and congested hours have increased from 2019 levels. It remains to be seen whether these changes will persist, but it should be noted that arterial congested miles and hours peaked in 2022 at 494 miles and 147,495 hours, respectively. However, both of those figures decreased in 2023 with only 396 miles of congested roads for 127,981 hours.

SEMCOG works with State, county, and local partners to combat congestion by using data and collaborating on regional best practices to develop and implement strategies that optimize existing infrastructure, promote alternative modes of travel, and manage demand effectively.

Data

SEMCOG uses many data sources to aid transportation planning and systems operations monitoring. This data provides SEMCOG with a detailed view of roadway performance and locates bottlenecks and congestion on the road system.

RITIS

SEMCOG uses archived real-time speed data to monitor and analyze roadway performance along freeways and arterials. This data is provided using the Regional Integrated Transportation Information System (RITIS) platform developed by the University of Maryland-College Park. SEMCOG has used real-time speed data for more than a decade for its congestion management program.

Travel Demand Forecast Model

SEMCOG also maintains and updates the regional Travel Demand Forecasting Model (TDFM) to simulate current and future travel conditions. The TDFM considers impacts from planned transportation projects using forecasted population and employment totals. The network component of the SEMCOG TDFM includes more than 8,700 miles. The TDFM estimates traffic volumes, volume-to-capacity ratios (V/C), speed, and travel time data for each network link. Travel is grouped into five weekday travel periods that correspond with typical commute patterns of road users:

- AM peak (6:30 a.m.-9 a.m.)
- Midday (9 a.m.-3 p.m.)
- PM peak (3 p.m.-6:30 p.m.)
- Evening (6:30 p.m.-10 p.m.)
- Night (10 p.m.-6:30 a.m.)

SEMCOG also periodically contracts with big data vendors to collect emerging location-based (LBS) data to track and analyze travel patterns. SEMCOG makes the data available under these data purchases available to members and stakeholders.

Congestion Management Strategies

SEMCOG maintains the Congestion Management Process (CMP), which is a systematic approach that provides information on transportation system performance and assesses alternative congestion management strategies 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.

Included in the CMP is a toolbox of congestion mitigation strategies road agencies and decision-makers can use to develop projects that improve regional mobility and accessibility.

SEMCOG also provides congestion data to members as requested for individual project assessments or to develop strategies for operational improvements.

Intelligent Transportation Systems

Intelligent Transportation Systems (ITS) help make transportation systems safer and more efficient by using computers and electronic technologies to improve communications and data processing. ITS helps operators better monitor and manage the transportation system, respond to incidents more quickly, and provide traffic information back to the public.

ITS enables and encourages collaboration, data sharing, communication, and cross-jurisdiction system integration. ITS is a proven alternative solution to reduce congestion, improve traffic flow, minimize traffic incidents, and improve safety and air quality.

SEMCOG has worked with local road agencies to secure funding and implement traffic signal modernization projects across the region. These signal modernization projects involve upgrading and improving traffic signal systems. Often this includes installing and refining adaptative traffic signal equipment that automatically adjusts signal timings based on real traffic conditions. Other signal projects include priority programs for first responder and traffic systems that can increase safety and minimize traffic flow disruption.

SEMCOG has also worked with MDOT to implement flex lanes or dynamic lanes in the region. Flex lanes like US-23 between Ann Arbor and Brighton manage traffic capacity by adjusting lane configurations based on real-time conditions. During peak times these lanes are opened to accommodate additional traffic and closed when demand decreases. These lanes use existing infrastructure, reducing costs, and have a significant impact on travel time reliability improvements.

ITS Architecture

Recently, SEMCOG coordinated with MDOT to update the statewide regional ITS Architecture including infrastructure in the SEMCOG region. ITS Architecture provides a framework for cataloging systems and infrastructure being deployed in a region. The Architecture highlights linkages between agencies and jurisdictions and encourages cooperation and coordination to ensure that systems work seamlessly throughout the region.

Transportation Operations Centers

Traffic Operations Centers (TOCs) play a crucial role in enhancing travel efficiency and safety in Southeast Michigan. These centers are hubs for monitoring, collecting, and disseminating data, ultimately optimizing traffic conditions on freeways and arterials throughout the region. Currently, the SEMCOG region is equipped with five TOCs, operated by key agencies, including Macomb, Oakland, and Washtenaw Counties, the City of Detroit, and the largest TOC managed by the MDOT also situated in the City of Detroit.

Southeast Michigan Transportation Operations Center

The Southeast Michigan Transportation Operations Center (SEMTOC) is the hub of ITS technology applications at MDOT. SEMTOC is responsible for traveler information collection, analysis, and dissemination along 400 freeway miles. It is a world-class traffic management center that oversees a traffic monitoring system that gathers data feeds and coordinates with other agencies to support the management of travel, with the following core functions:

- Incident Management
- Traffic Information
- Freeway Courtesy Patrol (FCP) Dispatch
- Special Event Coordination
- Construction Coordination
- Data Warehouse

Traffic Incident Management

Traffic Incident Management includes a variety of services to respond to needs along the roadway using cameras, dynamic message sign (DMS) messaging, dispatch of FCP, and communicating with Michigan State Police. These tools allow for the proper response and handling based on the severity of the incident.

Travel Demand Management

Travel Demand Management (TDM) is a crucial part of our regional transportation plan aimed at making the transportation system more efficient while reducing the need for high-cost capacity projects. To make TDM effective, a variety of strategies must be employed including:

- Carpooling and vanpooling: Reduces the number of single-occupant vehicle trips.
- Telecommuting: Reduces the need for work commuting

- Variable work hours: Minimizes travel during peak hours when roads are most congested.
- Encouraging transit use: Further cuts down on single-occupant vehicle trips.

Implementing a wide range of TDM strategies can lead to notable benefits for the region, like better air quality and less traffic.

Shared mobility

Shared mobility has emerged as a significant tool in travel demand management. Using technology, particularly mobile-based innovation, new models of mobility and accessibility have

significantly shaped travel in Southeast Michigan allowing many people to travel without the need of personally owning a vehicle. Shared mobility services like Uber and Lyft, offer flexibility and convenience in travel while also providing operational and environmental impacts.

Commuter Connect

Commuter Connect, a collaborative effort between SEMCOG and The Ride is a platform designed to improve mobility and quality of life in Southeast Michigan. TDM strategies encourage sustainable travel choices by informing travelers about options like transit, ridesharing, walking, biking, and teleworking. Commuter Connect aims to optimize transportation systems, reduce traffic congestion, and lower vehicle emissions.

Commuter Connect offers benefits to commuters, employers, communities, and the region. Commuters enjoy improved access to jobs through expanded transportation options, financial savings on gas, vehicle maintenance, and potentially insurance, as well as reduced travel-related stress. Alternative commutes on transit can provide increased productivity and personal time while walking and biking can contribute to better health outcomes.

Employers benefit from enhanced worker productivity with less time lost to traffic and quicker movement of goods due to reduced congestion. *Commuter Connect's* employer tools support alternative commute promotion, aiding in employee recruitment and retention efforts.

Communities experience improved livability and quality of life. Encouraging walkable and bikeable commutes boosts foot traffic and community vibrancy while potentially improving overall resident health. Local governments can also utilize Commuter Connect to promote alternative commutes amongst their own employees.

At a regional level, Commuter Connect supports improved air quality aligning with federal requirements, offering an effective tool for balancing economic development with environmental goals. Data from the CMAQ program demonstrates the cost-effectiveness of TDM strategies in reducing emissions.

During the year leading up to June 2023, nearly 4,500 Commuter Connect users logged over 17,000 trips. This resulted in a reduction of approximately 300,000 vehicle miles traveled (VMT) and estimated savings of $188,000.

Challenges

Nonrecurring congestion

Unpredictable congestion from crashes or road construction disrupts travel reliability. This may cause economic harm, increase safety risks, and poorer air quality due to idling vehicles. This can lead to frustration and reduced trust in the transportation system. We must effectively manage crashes, leverage technology, and refine response strategies to build a more resilient and reliable regional transportation network.

SEMCOG monitors regional reliability through the National Transportation Performance Measures outlined in Chapter 7.

Funding

The CMP includes a toolbox of mitigation strategies and techniques that could be used to relieve congestion in the region. Often, however, there is not enough funding available to even maintain the existing system, so congestion-relieving projects cannot be implemented.

Safety

Key Takeaways

- Traffic fatalities and serious injuries are a public health crisis, as rates have increased in recent years.
- Regional safety targets of zero serious injuries and fatalities on Michigan roadways by 2050 were adopted in 2022.
- Priority should be given to protect the most vulnerable transportation system users.

Key Actions

Adopt and enforce safety and security measures across all transportation modes, and encourage mode shifts to reduce vehicle crashes, emissions, and address equity, safety, and climate goals.

Promote safer speeds in all roadway environments through a combination of thoughtful, context-appropriate roadway design, targeted education and outreach campaigns, and enforcement.

Implement the Southeast Michigan Transportation Safety Action Plan, using the Safe System Approach to prioritize actions that help eliminate traffic fatalities and serious injuries.

Every day, people in Southeast Michigan use the transportation network to get to work, school, medical appointments or out to the region's many recreation destinations. And getting there safely is the top priority for any of these trips. Unfortunately, with over 100,000 reported crashes annually, many individuals suffer damage to their property, sustain injuries, or tragically lose their lives. Historically, the number of traffic crashes and fatalities has trended downward. However, progress has stagnated over the past decade, and fatalities are on the rise. On average, more than one person is killed each day in Southeast Michigan, while six more are seriously injured.

SEMCOG is devoted to improving the safety of everyone on the road. We achieve this by adopting a meticulous and coordinated approach, rooted in the *Six Es of Safety*:

Engineering – improving roadway operations and physical aspects to increase safety.

- **Education** – increasing public awareness of transportation safety laws and infrastructure.
- **Enforcement** – ensuring road users follow traffic laws and practice safe behaviors.
- **Emergency Response** – providing post-crash care to minimize injuries and fatalities.
- **Equity** – ensuring the transportation system is safe for all users and initiatives benefit all demographic groups, with particular attention to transportation-disadvantaged groups and other groups with unique mobility considerations.
- **Evaluation** – tracking progress and assessing impacts of implemented strategies.

Figure 26
Safe Systems Approach

SEMCOG Transportation Safety Plan
In 2023, SEMCOG adopted the Southeast Michigan Transportation Safety Plan, building on the 2015 plan. This new plan offers an aspirational framework aimed at eliminating fatalities and serious injuries on Southeast Michigan roadways using the Safe System Approach. This updated plan takes a comprehensive look at the entire transportation network and systems, prioritizing the most vulnerable road users who face the highest risks of fatality and injury.

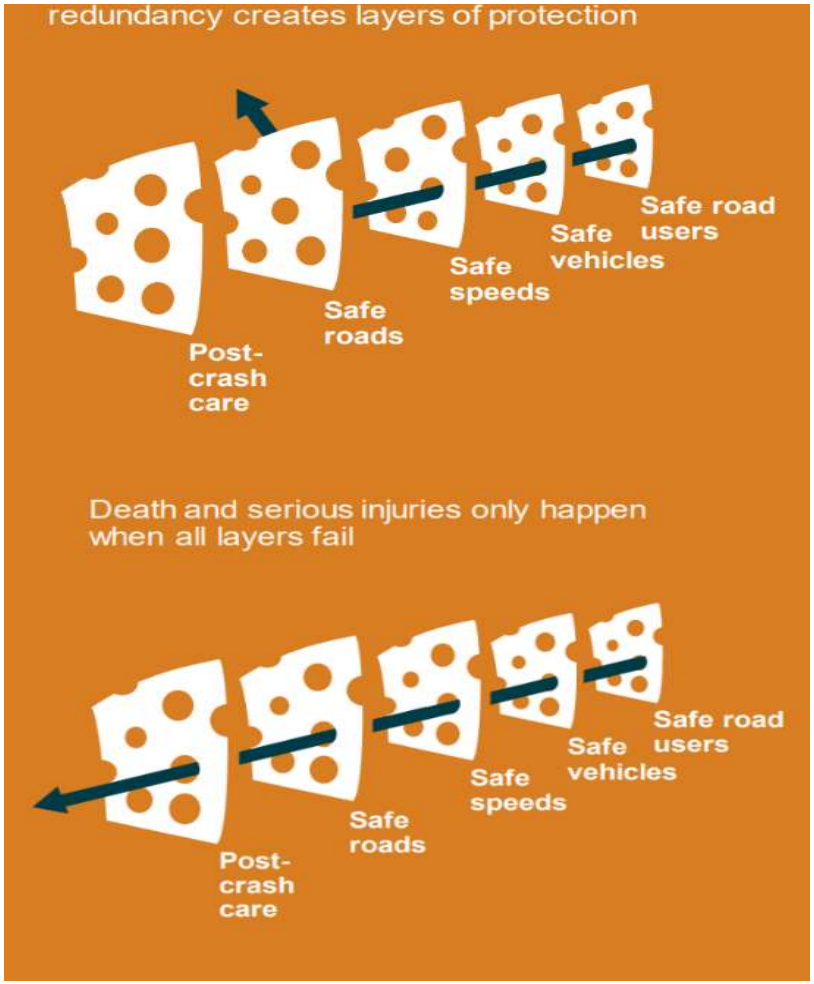
The updated plan introduces a newly adopted vision: zero traffic fatalities and serious injuries by 2050. This vision aligns with the Michigan Strategic Highway Safety Plan and the National Roadway Safety Strategy.

Zero traffic fatalities and serious injuries by 2050

Safe System Approach
The Safe System Approach (Figure 26) aims to drastically reduce road-related injuries and deaths. It emphasizes designing transportation systems that anticipate human errors and minimize impact forces. The core principle is that no road death is acceptable.

There are five elements to the Safe System: safer people, safer roads, safer vehicles, safer speeds, and post-crash care. All five elements are necessary to implement the Safe System Approach. These elements provide layers of protection, as illustrated by the "Swiss Cheese Model" of redundancy (Figure 27). Deaths and serious injuries occur only when all the layers fail.

Figure 27
Swiss Cheese Model of Transportation



Source: FHWA

The Safe System Approach demands a shift from just preventing crashes, to actively minimizing fatalities and serious injuries, especially for the most vulnerable road users. It prioritizes traffic calming designs, shares responsibility across the spectrum of road users and managers, and proactively addresses potential risks.

Figure 28
Traditional vs Safe System Approach

TIP Prioritization

The TIP is an implementation tool of the RTP. Incorporating safety into the TIP project selection process with the FACs is a key strategy for SEMCOG and its partners to reduce fatalities and serious injuries. In March 2022, an ad hoc group of representatives of each FAC met to initiate the discussion of TIP prioritization processes across the region. SEMCOG staff then met with each FAC individually to discuss unique processes, high-frequency crash locations, and leading crash factors, and answer questions regarding this initiative. After the first regional safety targets were approved in January 2023, the group reconvened and became the official TIP Prioritization Process Committee.

Throughout 2023, SEMCOG hosted meetings to provide an opportunity for all FACs to work collaboratively on this initiative. Over the course of these meetings, the group shared existing prioritization processes and any associated opportunities and challenges. In these discussions, attendees were learning from one another to understand options for moving forward **towards zero deaths**.

The TIP development period FY 2026 to 2029 will provide the opportunity for SEMCOG to work cooperatively with the counties and City of Detroit to review and provide additional strategies for safety planning and prioritization within the counties and cities. It was clear through the TIP prioritization meetings that many counties and cities have strategies that can be used as starting points.

Challenges

Many factors contribute to crashes, and crashes often involve multiple factors. These crash factors, or emphasis areas, fall under four broad categories: infrastructure, behavior, road user, and system administration. The Southeast Michigan Transportation Safety Plan identifies eighteen emphasis areas under these categories, including eight high-priority emphasis areas (described below) that have contributed to 86% of all fatal and serious injury crashes in the region.

Infrastructure

Intersections are planned points of conflict within the roadway network where motorized and non-motorized road users cross paths as they travel or turn from one route to another. Intersections make up an extremely small portion of the overall roadway network, yet more than a third of all fatalities and serious injuries occur at these locations. Safe intersection designs include features that anticipate human errors and reduce the risk of severe crashes. These include minimizing conflict points, reducing speeds, improving visibility, and providing protected space and time for people who walk and bike through the intersection.

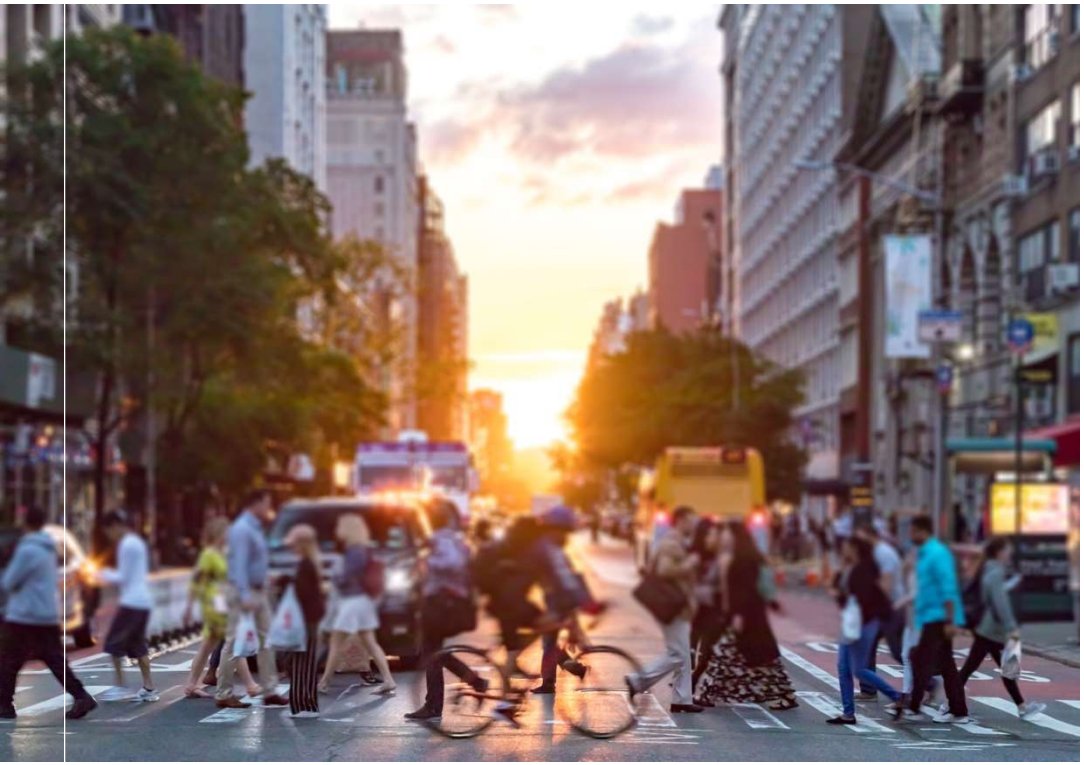
Lane departure crashes, sometimes called roadway departure crashes, are non-intersection crashes occurring when a driver either crosses the center line, edge line, or otherwise leaves their travel lane. Many factors can contribute to lane departure, including roadway characteristics like pavement condition and horizontal curvature, environmental factors and conditions with decreased visibility, or behavioral issues like driver impairment, speeding, or distraction. Lane departure crashes tend to be distributed across large areas of the highway network, especially on rural roads. As a result, in many cases, the systemic application of strategies that reduce unintentional lane departure, alert the driver when a lane departure occurs, and assist the driver in returning to the travel lane is an extremely effective approach to targeting lane departure crashes.

Additional infrastructure emphasis areas include access management to reduce the number of driveways and potential conflict points; rail grade crossing safety; and work zone safety in areas with highway construction, roadway maintenance, or utility work.

Behavior

Driving over the posted speed limit or driving too fast for current road conditions – also known as *speeding* – is a serious safety issue that increases both the rate and severity of crashes. Additional consequences of speeding include greater potential for losing control of the vehicle, increased stopping distance, reduced effectiveness of seat belts, and increased fuel consumption and cost. Roadway design, vehicle technologies, and context-appropriate speed limits are effective strategies to reduce the safety detriments of speeding.

Crashes involving alcohol or drug *impairment* are disproportionately more severe than other crashes. Despite



continuous efforts, impaired driving remains a devastating transportation safety and public health problem. In the last decade, alcohol and drug-involved crashes have been the number one factor in traffic fatalities in the SEMCOG region. Continued implementation of educational and outreach programs, as well as law enforcement, is needed to prevent further fatalities and serious injuries due to alcohol and drug impairment.

Proper use of *seatbelts* is the single most effective and immediate means of reducing death and injury in traffic crashes. Michigan's primary seat belt law has led to a consistent seat belt use rate of drivers and passengers well over 90% and above the nationwide use rate. However, back seat passenger seat belt use is unknown, and current law only requires passengers aged 15 and under to buckle up in the back seat. Furthermore, car seat issues for children from birth to three years old occur more than 81% of the time, and less than 55% of children ages four to seven years old are riding in booster seats. Increasing proper restraint use for vehicle drivers and passengers in all seating positions is key to reducing fatalities and serious injuries. Encouragement of proper restraint use – through education, enforcement, and policy enhancements – will help reduce unsafe behavior.

An additional behavior emphasis area is distracted driving – any visual, manual, or cognitive diversion from the primary task of driving.

Road User

Pedestrians are vulnerable road users without physical protection between themselves and vehicles. While pedestrian crashes represent a small percentage of overall crashes, they represent a disproportionate number of fatalities and serious injuries. Many people will continue to walk in environments with little or no pedestrian accommodations, as they often have no other choice. Many times, people will walk in the street due to insufficient maintenance on sidewalks; consistently clearing snow and fixing ADA hazards are opportunities to improve sidewalk usability.

Bicycling is an integral part of active transportation, especially for people who cannot drive or who do not have access to a private automobile. Bicyclists, like pedestrians, are vulnerable road users with no protection between their bodies and motor vehicles. Dedicated bicycle infrastructure, such as protected bike lanes and shared-use paths and educating motorists to understand their legal responsibility to safely share the road with bicyclists are some strategies to improve bicyclist safety.

Motorcycle riders are also much more vulnerable than passengers of vehicles when involved in a crash. Various factors, such as impairment and excessive speeds, have been identified as contributing factors to the occurrence of motorcycle crashes. The lack of proper licensing and training is also an area of major concern. The lack of protective equipment used by motorcyclists further exacerbates risks. Continued rider training and enhanced legislation, such as restoring the Michigan helmet law, will help improve safety among motorcyclists.

Additional road user emphasis areas include truck and bus commercial vehicles that are larger and heavier resulting in more severe crashes; drivers age 65 and older who may experience challenges concerning declining physical and cognitive performance that put them at risk of crashing when driving; and drivers age 20 and younger who may lack sufficient experience to recognize hazards or handle emergencies, and are more likely to engage in risky behaviors such as speeding and allowing shorter headways.

Systems

There are no high-priority systems emphasis areas. Additional systems emphasis areas include emerging technologies (e.g., electric vehicles, connected and automated vehicles, micro-mobility), that require infrastructure updates, user acceptance and training, and coordination for local emergency response; traffic incident management for clearing roadways, reducing traffic backups, and increasing the likelihood of survival for those involved in a crash; and traffic records and information systems.

Bicycle and Pedestrian Mobility

Key Takeaways	Key Actions
• 110% increase in walking and biking activities since 2019. • 92% increase in protected bike lane infrastructure. • 82 new TAP bike/pedestrian projects in Southeast Michigan.	Continue development and promotion of education materials, such as SEMCOG's Safe Streets public education initiative. Implement SEMCOG's Bicycle and Pedestrian Mobility Plan for Southeast Michigan which aims to develop a comprehensive active transportation system that meets the needs of people of all ages and abilities. Promote accessible multi-modal transportation to natural and cultural resources that support opportunities for recreation, tourism, and local businesses.

Bicycle and pedestrian mobility are essential to Southeast Michigan's transportation system. Most trips begin and end with walking or biking, even those involving cars or transit. SEMCOG prioritizes integrated planning to ensure seamless connections between walking and biking infrastructure, the greater transportation network, and key destinations. This approach supports environmental goals, promotes public health, enhances the economic vibrancy of downtowns, and provides mobility options for those without access to private vehicles.

Since 2019, walking and biking in the region increased by 110%. This surge is evident in 82 new Transportation Alternatives Program (TAP) bicycle and pedestrian projects in the region, reflecting a commitment to enhancing infrastructure and facilities for cyclists and pedestrians.

Adding 100 miles of newly signed bike routes further reinforces the region's dedication to fostering a more bike-friendly environment. Additionally, there has been a 92% increase in protected bike lane infrastructure in the region. This improvement is evidenced by 30 protected bike lane corridors across six communities and three counties. This collectively spans more than 50 miles of protected biking pathways.

To support and further encourage changes like these, a total of 33 Planning Assistance grants have been awarded to 64 communities. These grants play a pivotal role in facilitating planning initiatives aimed at increasing walking and biking opportunities. This multifaceted approach, encompassing infrastructure development, project initiation, and planning assistance, signifies a concerted effort to promote and prioritize walking and biking activities within the region.

Regional Bicycle and Pedestrian Corridors

Figure 30 shows regional bicycle and pedestrian corridors and existing infrastructure. These corridors can be used for Active Transporation and/or recreation, linking together communities,

counties. SEMCOG uses this data to work with partners to address infrastructure gaps and develop system improvements.

Figure 29

Regional Bicycle Facilities

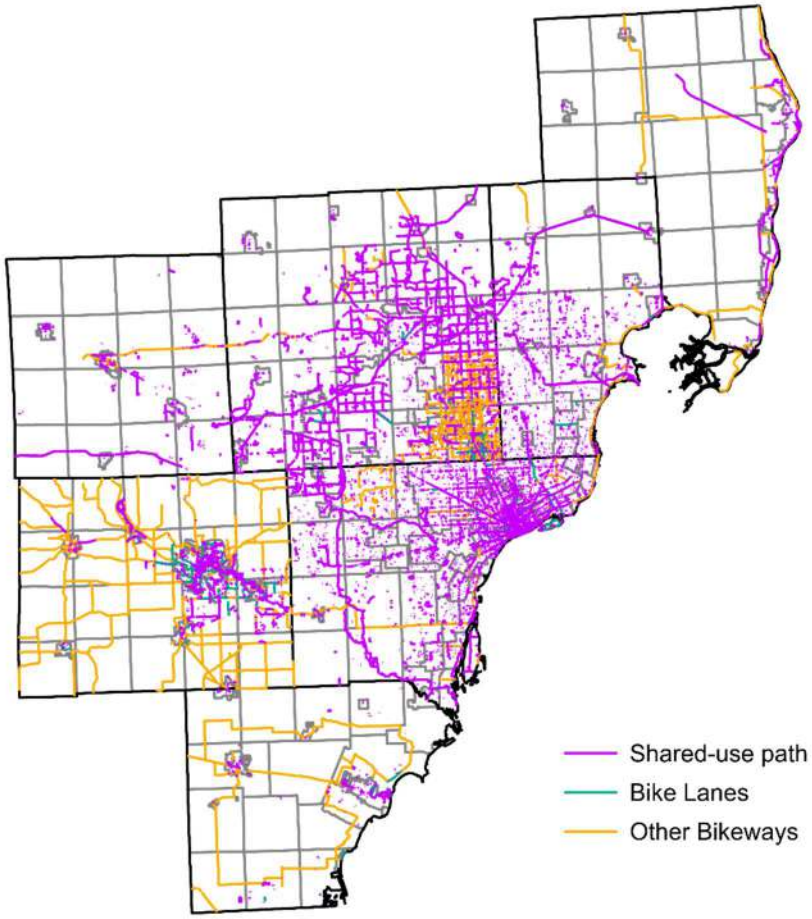
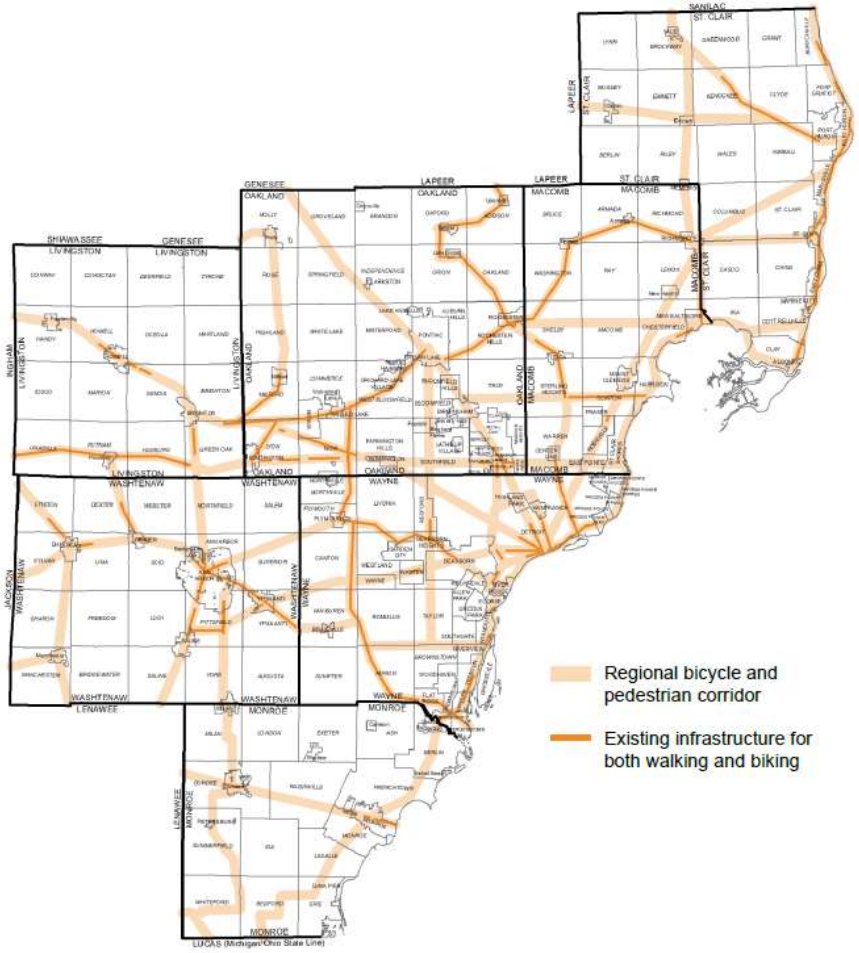


Figure 30

Regional Bicycle and Pedestrian Corridors



Approximately 34% of the regional corridor network is equipped with both pedestrian and bicycle infrastructure, covering a total of 329 miles. These identified routes, based on varying comfort levels are generalized paths aligning with local settings.

Bicycle

Biking provides a flexible, affordable, and healthy option for transportation and recreational needs. The bicycle network includes shared-use paths, bike lanes, and other roadway improvements, including share-lane markings, wide-paved shoulders, and designated bike routes.

In recent years, many communities have determined that bicyclists often need their dedicated infrastructure, separate from motorized traffic and pedestrians, leading to a growth in bike lanes. The hottest infrastructure topic is protected bike lanes and intersections, which provide physical buffer areas between motorists and people biking. Protected bike lanes are seen as a more favorable and safer solution that addresses the needs of people of all ages and abilities.

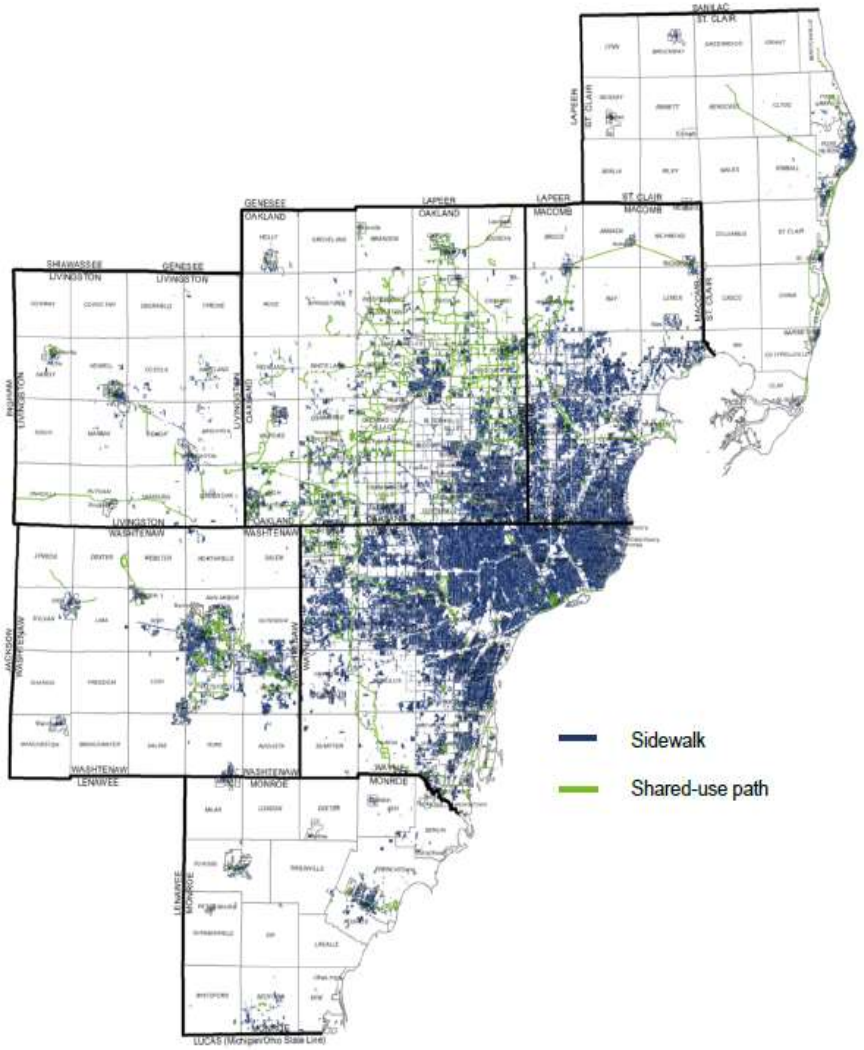
Technological advancements have also made electric bicycles, (e-bikes) a hot topic and cost-effective alternative to traditional bikes. E-bikes include an electric motor that can extend the distance users feel comfortable riding but come with their own safety concerns due to higher operation speeds. Similarly, electric scooters (e-scooters) have become a hot safety topic as they should be operated within the street or biking infrastructure rather than on sidewalks.

Walking

Walking is fundamental to mobility. Southeast Michigan has more than 24,000 miles of sidewalks and shared-use paths. Walkable access strengthens downtowns, increases resident's quality of life, and provides critical access for non-drivers and those desiring a more active lifestyle.

Figure 31

Regional Walking Infrastructure



Bicycle and Pedestrian Mobility Plan for Southeast Michigan

The Bicycle and Pedestrian Mobility Plan for Southeast Michigan, adopted in March 2020, sets forth a vision for cycling and pedestrian activities in our region. The plan serves as both a SEMCOG and MDOT plan for the region and outlines strategies to enhance the system's connectivity, utility, and safety for all users. The plan also addresses regional quality of life, health, and regional economic development objectives. Key findings from the plan include:

- Increased interest in bicycle and pedestrian mobility throughout the region.
- A desire and need to enhance safety and comfort for people walking and biking through infrastructure improvements.
- The importance of the bicycle and pedestrian system in increasing access to core services and amenities for people of all ages and abilities.
- The presence of gaps and connectivity challenges in the regional system; The role of a connected system in supporting healthy lifestyles and communities' recreation, tourism, and economic development opportunities.
- The necessity of collaboration and coordination among multiple stakeholders to develop and sustain a regional system.

Bicycle and Pedestrian Mobility Hub

SEMCOG has developed a bicycle and pedestrian mobility hub as a supplement to the mobility plan. This hub provides links to not only the mobility plan, but interactive maps on several topics including:

- Bicycle and Pedestrian Mobility Network
- Regional Bicycle and Pedestrian Corridors
- Equity and Demand Analysis
- Safety Analysis; and
- Local Community Bicycle and Pedestrian Plans

Challenges

System gaps

Addressing gaps in the bicycle and pedestrian networks supports improvements for safer and more reliable mobility. Pedestrian infrastructure gaps are typically found in less populated areas or infrastructure lacking connectivity and safe passage due to physical barriers. For example,, around 70% of Southeast Michigan households have access to pedestrian infrastructure within 100 feet of their home. The region will benefit from prioritizing locations lacking connectivity or access to pedestrian infrastructure near areas with high pedestrian concentrations or limited access to core services.

Funding

In addition to investing in expanding, maintaining, and closing gaps in walkway and bikeway networks, providing the proper resources towards operation and maintenance is needed. This includes striping, sweeping, snow removal, bridge maintenance, and repaving the infrastructure. Local budgets may find budgeting for operation and maintenance a challenge, as specialized maintenance equipment is needed for certain trails and bicycle facilities that are too narrow or delicate for standard maintenance vehicles.

Safety

Pedestrians and bicyclists are the most vulnerable roadway users in Southeast Michigan. According to SEMCOG's Transportation Safety Plan, 1% of crashes in the region have involved people walking, and 3% involved cyclists, but they accounted for nearly 12% and 3% of traffic fatalities and serious injuries.

The region will benefit from additional resources to educate the public on how bicyclists, motor vehicle drivers, and pedestrians should interact, such as the recently re-branded SEMCOG *Safe Streets* public education initiative. Currently, many drivers have little training on how to interact with new bicycling-related infrastructure or are unaware of bicycle-related traffic laws, such as Michigan's three-foot passing law. This includes certain bicyclists who have limited training regarding best safety practices or are unaware that they must comply with all traffic laws, which ultimately increases the risk to all users.

Transit and Intercity Transportation

	Key Takeaways	Key Actions
2050 REGIONAL TRANSPORTATION PLAN VISION 2050	• Public transit systems are essential for reducing traffic congestion and pollution, offering a more sustainable transportation option. • The $70 per capita spent on transit operations in Southeast Michigan trails most large US urbanized areas. • The public and elected officials increasingly see transit as essential to economic growth and a more equitable region. • Southeast Michigan has rail, bus, and air options for travel beyond metro Detroit, but improvements are needed, especially for international connectivity.	Support the RTA Regional Transit Master Plan and other regional transit provider plans. Increase flexibility for funding options between transit and other modes. Encourage transit-oriented development to maximize access to multi-modal transportation supporting placemaking and local business growth.

Transit is a cornerstone of every strong regional transportation system. Public transportation, comprising modes like buses, streetcars, and microtransit – shared transportation services usually acquired through a smartphone- offers a sustainable and efficient means of moving large numbers of people, helping to decrease reliance on single-occupancy vehicles. The benefits extend beyond merely alleviating congestion, healthy transit systems contribute to vibrant urban areas and lower greenhouse gas emissions, which help support sustainability goals.

There are two primary forms of public transit:

- **Fixed-route transit**, including buses, light rail, and streetcars that operate along designated paths with predetermined stops and schedules.
- **Demand-response services**, including paratransit and microtransit, provide flexible transit options on vehicles that adjust routes and scheduling based on requests from riders.

Transit offers essential mobility solutions for people without access to personal vehicles. Among these groups, the elderly, the young, people with disabilities, and those with financial constraints may encounter substantial challenges in accessing core services, like jobs, schools, and healthcare without access to transit services. Moreover, a strong transit system is indispensable to regional economic development by connecting people to jobs and opportunities. Accessible transit fosters a more interconnected and dynamic regional economy.

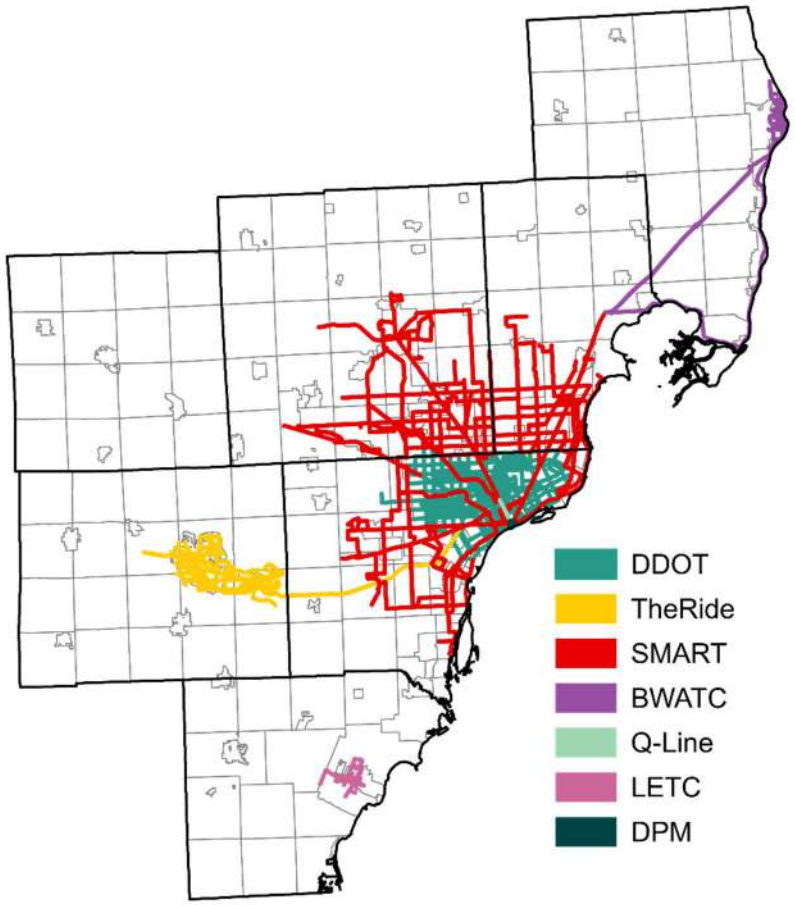
Recent regional elections have underscored support for funding and enhancing public transit in Macomb, Oakland, Wayne, and Washtenaw counties. This support reflects a growing recognition of the key role public transit systems can play in providing connection, accessibility, and regional development.

Southeast Michigan Transit Services

Southeast Michigan benefits from a network of transit providers offering a mix of public transit options. These multiple agencies provide both fixed-route (Figure 32) and demand-response services across the region. The Regional Transit Authority for Southeast Michigan, discussed later in this section, manages the services in Macomb, Oakland, Washtenaw, and Wayne Counties. Service providers in those counties are listed below:

- **Ann Arbor Area Transportation Authority (AAATA); TheRide**: TheRide operates several services including fixed route buses, vanpools, demand response and paratransit services in Ann Arbor, Ypsilanti, and other surrounding communities in Washtenaw County.
- **City of Detroit Department of Transportation (DDOT):** DDOT is the largest public transit provider of fixed-route services and demand response paratransit services in Michigan. Primarily serving the City of Detroit, DDOT service also extends to surrounding communities including Highland Park and Hamtramck.
- **Detroit People Mover (DPM):** - The Detroit People Mover operated by the Detroit Transportation Corporation is an elevated, automated guideway light rail system operating on a one-way loop to 13 stations in Downtown Detroit. The service operates daily and provides connection to other transit modes.
- **QLINE:** Also known as M-1 Rail, QLINE is a 3.3 mile long, free-fare, streetcar operating along Woodward Avenue in Detroit. QLINE operates from 8AM to midnight, Monday through Saturday and from 8AM until 9PM on Sunday. Riders can use QLINE to connect to DDOT, SMART, Detroit People Mover, and even MoGo bikeshare locations.
- **Suburban Mobility Authority for Regional Transportation (SMART):** SMART is a regional public transit provider operating in Macomb, Oakland, and Wayne Counties. SMART provides fixed route service, including local, limited-stop, and even express routes. Flex services (demand response trips provided using smaller vehicles like vans) and traditional demand response services are also provided.

Figure 32
Regional Transit Providers



For the remaining three counties in the seven-county planning area, Livingston, Monroe, and St. Clair, SEMCOG supports the following transit providers by identifying funding, programming projects, and assisting with implementation of services.

- **Blue Water Area Transit (BWATC)** is operated by the Blue Water Area Transportation Commission. Fixed-route bus services are provided six days per week in the City of Port Huron and Fort Gratiot Township. Demand response services are also provided in Marysville, Fort Gratiot, Burtchville, and Port Huron Townships.
- **Lake Erie Transit:** The service provides eight fixed route stops six days per week in Monroe, Michigan. Demand response and medical trip services are also available in Frenchtown Township and Bedford Township with services to Toledo, Ohio.
- **Livingston Essentials Transportation Service (LETS)** is a local, demand response service operating throughout Livingston County. Trips are available on a sliding fare scale depending on trip distance within and outside of Livingston County. Shuttle trips to Detroit Metro Airport are also available through the Michigan Flyer.

Regional Transit Authority of Southeast Michigan

As mentioned, the Regional Transit Authority (RTA) of Southeast Michigan is the agency responsible for leading the planning, oversight and implementation of public transit services and systems in Macomb, Oakland, Washtenaw, and Wayne Counties.

Since its formation in 2012, RTA's mission has been to manage and secure transit resources that significantly enhance mobility options, improve the quality of life for residents, and increase economic viability for the region. RTA tackles this mission by:

- Allocating State and federal funds,

- Creating, implementing, and maintaining a regional transit plan,
- Raising public funds for regional transit, and
- Identifying and implementing coordination directives.

RTA's regional transit guidance has been used to address deficiencies and meet mobility needs across the four counties representing the most populus areas of the region. RTA has advocated for solutions that tackle long-standing and current challenges, but also developing solutions emerging as needs evolve in the region. Under the RTA's leadership, the region has secured many transit enhancements, but to meet public demands a focus on adequately supporting and funding transit remains essential.

In addition to the major, fixed-route transit services highlighted earlier in this section, the RTA also operates additional services including:

D2A2 is a commuter bus pilot service connecting Detroit and Ann Arbor. The RTA has partnered with TheRide and Michigan Flyer to provide hourly service during the week and limited service on weekends.

Downtown Detroit to Airport Express (DAX) is a pilot bus express service from the RTA launched in March 2024. This service connects Downtown Detroit and the Detroit Metropolitan Airport operating daily providing up to 16 round trips daily.

RTA Regional Transit Master Plan

RTA's Regional Transit Master Plan (RTMP) was adopted in 2024 to serve as the guiding document for transit priorities, projects and investments across Macomb, Oakland, Washtenaw and Wayne Counties.

The RTMP outlines five goals:

1. **Fund Transformative Mobility -** Position Southeast Michigan for economic success by increasing funding and aligning regional policy advocacy.
2. **Improve Existing Services -** Upgrade the frequency, reliability, comfort, safety, and speed of existing transit

services, including fixed-route and demand-response services.

3. **Expand Transit Coverage -** Connect more people to more destinations in Southeast Michigan through an expanded regional transit system with a focus on expanding access for equity populations.
4. **Innovate Resilient Projects -** Implement expansion programs through active coordination and partnership with local transit providers and nonprofits.
5. **Sustain Future Programs -** Implement innovative programs and pilot projects to improve transit, increase flexibility, and encourage transit providers to adopt new technologies.

These five goals will be achieved through ten regional strategies:

1. Invest in and implement a rapid transit network.
2. Increase frequency, reliability, and hours on fixed-route services.
3. Build on and coordinate demand-response services.
4. Grow mobility access to local communities and regional destinations.
5. Regionalize trip planning and fare payment systems.
6. Enhance ride quality and promote on-board safety.
7. Upgrade multimodal connections to and between services.
8. Advance accessibility, comfort, and well-being at transit stops.
9. Recruit, develop, and retain a thriving workforce.
10. Modernize and maintain infrastructure in a state of good repair.

SEMCOG's collaboration RTA for Vision 2050 involves the concurrent adoption of the RTMP's goals. This coordination underscores a commitment to advancing the long-term vision for regional mass public transit.

Bikeshare

MoGo – a bikeshare system available across the City of Detroit and surrounding communities. The system is comprised of more than 600 bikes at more than 80 stations designed for both short commutes and as connection to other transit services.

Challenges

System gaps

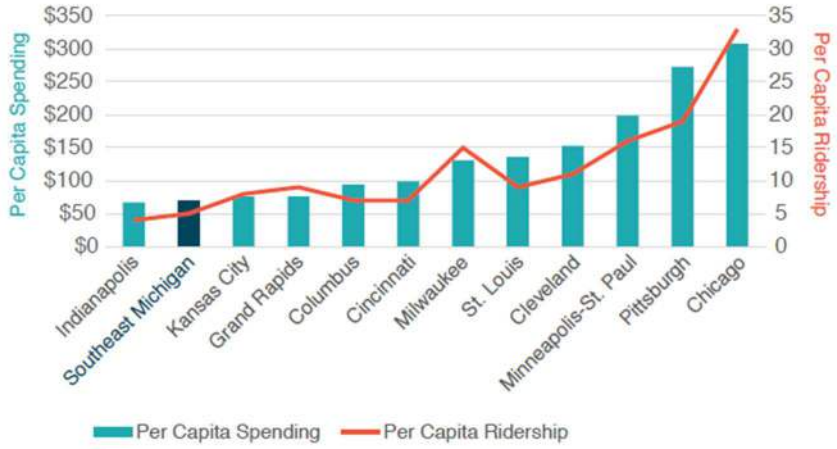
The region's transit system is comprised of several providers that vary in size and services. With a large spatial footprint and multiple providers, the system can be characterized as fragmented. Filing the gaps in the system can expand access for people to get to jobs, schools, and other core services.

Funding

A lack of local dollars allocated to transit hinders the region's efforts to significantly improve transit. Shown in Figure 33 as reported in the RTA's RTMP, when comparing the 25 most-populous urbanized areas (UZAs), Southeast Michigan is eleventh in ranking, but spends around $70 per capita on transit operations compared to $252 on average from the top 25 largest UZAs. This disparity is due to a large segment of local funding being dependent on property tax millages, which allows select communities to opt-out of service. This piecemeal approach to funding increases spatial variability in the region.

Figure 33

Operations Expenditures per Capita, 2022



Source: RTA Regional Transit Master Plan, 2024

Operating expenses support most of the local funding needed for transit operations, which includes the labor for drivers and mechanics. While Southeast Michigan has been awarded several federal grants, this amount has not included funding for large-scale projects. Many regions across the country have utilized local sales taxes or vehicle registration fees to fund operating and capital expenses for transit. These are two options available to Southeast Michigan that would benefit the maintenance, enhancement, and expansion of the region's transit system.

Accessibility

Many factors may keep people from accessing the available transit system, including physical barriers and inadequate infrastructure, lack of information, and affordability. For example, lack of ramps or curb cuts can impede people with mobility impairments from accessing transit stops or facilities. Poorly maintained or missing infrastructure like sidewalks and crosswalks can increase difficulty for individuals with disabilities and older adults accessing bus stops.

In addition, public transit can be unaffordable for lower-income people, limiting their mobility. Many public transit systems and providers across the United States have started offering fare-free services. A consistent, dedicated source of funding for transit in Southeast Michigan that lowers or altogether eliminates transit fares would assist in addressing this issue.

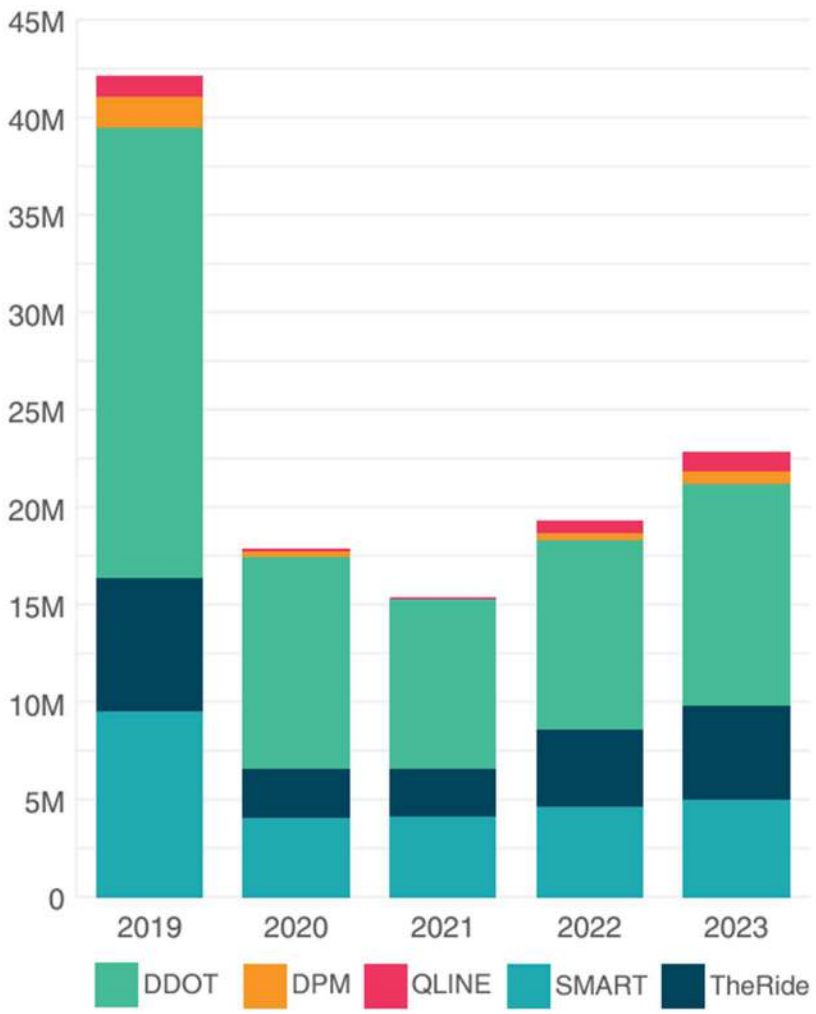
Covid-19 Pandemic

The Covid-19 pandemic drastically disrupted public transit systems nationwide, leading to a sharp decline in ridership and ongoing operational challenges. To mitigate the impact, the federal government provided over $375 million in Covid-19 recovery funding through the CARES, CRRSAA, and ARP Acts. While many operations have begun to rebound in recent times, many transit agencies continue to be affected by these setbacks.

A persistent challenge is a shortage of essential workers, such as bus drivers and mechanics. This shortage has hampered the ability to recruit and retain qualified personnel, directly impacting service levels. Riders who depend on public transit have experienced reduced frequencies, longer wait times, and more limited options.

As highlighted in RTA's RTMP, ridership is improving, but still lag behind pre-pandemic levels as shown in Figure 34. Currently, providers are evaluating their services so that they can best support the public.

Figure 34
Transit Ridership, 2019-2023



Source: RTA Regional Transit Master Plan, 2024

Intercity Transportation

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 airplane, bus, and train. Improvements to the passenger intercity system offer businesses and leisure travelers shorter travel times, additional train frequencies, improved reliability, and connections between urban centers and smaller communities in Southeast Michigan and beyond.

In Southeast Michigan, there are two long-distance passenger rail routes, collectively spanning 623 miles and connecting a total of 20 communities. The area is also served by seven intercity bus services, providing vital links between various destinations and four regional airports for regularly scheduled passenger services.

Rail

MDOT plays a vital role in Michigan's passenger rail system, providing capital, operating assistance, technical support, and safety oversight. It sponsors intercity passenger rail routes operated by Amtrak, including the Blue Water and Wolverine routes, connecting Port Huron to Chicago and Pontiac to Detroit and Chicago, respectively.

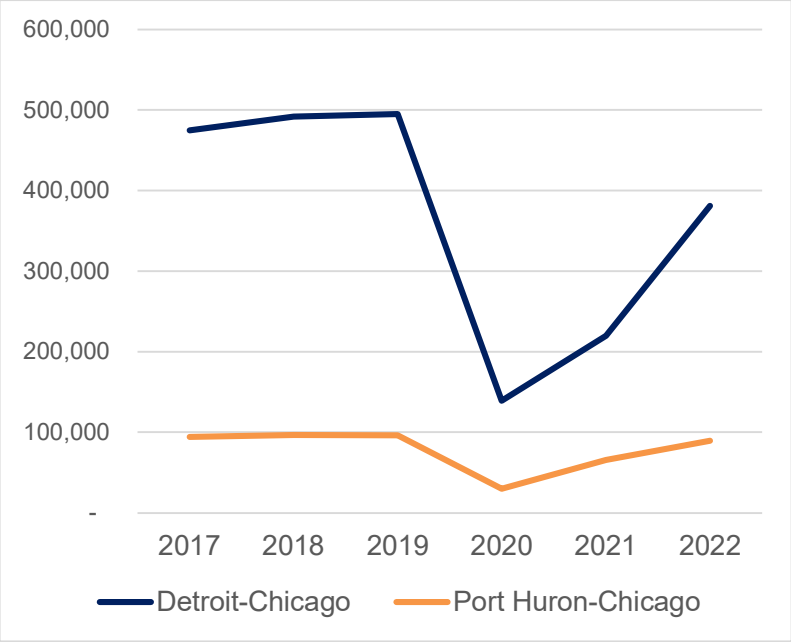
After relatively stable ridership during the years preceding the Covid-19 pandemic, ridership on these routes declined significantly in 2020. Since then, ridership has rebounded as travel patterns normalize as shown in Figure 35.

MDOT has secured funding to extend the Wolverine route to Windsor, Ontario, and the Ohio Rail Development Commission received funding for the Cleveland-Toledo-Detroit Corridor through the FRAs corridor ID program. This corridor will enhance connectivity between Cleveland, Toledo, and Detroit, utilizing existing alignments.

Additionally, the Midwest Interstate Passenger Rail Commission (MIPRC) and the Federal Railroad Administration (FRA) released the Midwest Regional Rail Plan (MWRRP) envisioning a comprehensive passenger rail network linking major cities and smaller towns. Proposed corridors include Detroit to Toledo and Toronto, as well as routes within Michigan, connecting Detroit to Grand Rapids and Grand Rapids to Kalamazoo.

Figure 35

Regional Amtrak Ridership, 2017-2022



Bus

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 and I-75 south to Toledo.

There are many regional bus stations including those in 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).

RTA in partnership with the Ann Arbor Area Transportation Authority has created a new service, *D2A2*. This commuter bus service connects Detroit and Ann Arbor, MI. The service provides hourly trips 16 hours a day during the week (6:00 a.m.-11:00 p.m.) and limited-service on Saturday and Sunday.

Air

Detroit Metropolitan Airport (DTW) is Southeast Michigan's primary connection point for air passenger traffic to national and international destinations. DTW can be accessed by cars, bus, shuttles, taxis, and transportation network companies. Other regional airports support charter passenger, corporate, and personal flights.

Improving transit access to DTW is important as there are currently limited services available. The Michigan Flyer-Air Ride service offers daily round-trips between DTW and Ann Arbor. As of 2024, the RTA has begun operating a bus shuttle service between downtown Detroit and DTW.

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. The City of Windsor, Ontario's *Transit Windsor* operates a route between Windsor and Detroit using the Detroit-Windsor Tunnel. The Tunnel bus operates a short, fixed route through Downtown Detroit seven days a week. Greyhound operates daily trips from Detroit to Toronto. *Via Rail* a Canadian intercity rail service to Toronto can be accessed from Windsor and Sarnia.

Challenges

Access

Passenger rail services in Southeast Michigan face critical gaps that hinder regional connectivity and international access. One prominent issue is the absence of north/south rail service between Southeast Michigan and Toledo, limiting travel options to east coast and southern state destinations. Additionally, the lack of a direct rail link between Southeast Michigan and Canada not only impedes international travel but also stifles potential economic activity.

Addressing these challenges requires collaborative efforts involving key stakeholders. Cooperation with the Federal Railroad Administration (FRA), Amtrak, MDOT, *Via Rail* Canada, and Homeland Security is imperative to reduce barriers to cross-border access. This collaboration should focus on developing and enhancing rail infrastructure to facilitate smoother travel between regions and countries.

Additionally, while recent services like RTA's Detroit Air Xpress service have shown promise, system redundancy and further improvements are necessary. Enhancing multiple public transportation options to and from the airport is vital to ensure seamless travel for people who live in Southeast Michigan and those who want to visit.

Addressing these gaps and enhancing connectivity, can unlock Southeast Michigan's full potential as a hub for regional and international travel, facilitating economic development and improving quality of life for people in the region.

Funding

A strong transportation system relies on diverse funding sources to cover capital, operational, and maintenance expenses. While capital investments are prioritized, passenger rail operations cannot rely solely on fares, meaning additional revenue streams are sorely needed. Securing stable funding is crucial for Southeast Michigan to enhance economic competitiveness and overall quality of life.

Recent funding initiatives, such as the Federal Railroad Administration's Corridor Identification Program, offer opportunities to improve passenger rail service in the region, like the proposed Cleveland-Toledo-Detroit Corridor. By leveraging funding strategically, Southeast Michigan can build a resilient transportation infrastructure to support growth and prosperity.

Freight, Border Crossing & Aviation

	Key Takeaways	Key Actions
2050 REGIONAL TRANSPORTATION PLAN VISION 2050	• The region's location and infrastructure make it a crucial link to Canada, the Great Lakes, the Midwest, and beyond. • In 2019, 212 million tons of freight worth $400 billion moved through Southeast Michigan. • 36% of US-Canada trade passes through the region's ports of entry. • DTW is the region's major hub for passenger and cargo traffic, with other airports playing supporting or specialized roles.	Improve domestic and international freight mobility and efficiency through technology, coordination, and infrastructure enhancements. Enhance overall transportation system performance and efficiency for economic growth and improved logistics. Maintain a balance between freight movement and community needs, while mitigating conflicts between all modes of transportation.

Southeast Michigan's geographical position, transportation infrastructure, and economic foundation together create an integral gateway to Canada, the Great Lakes/St. Lawrence Seaway, Chicago, the Midwest, Mexico, and beyond.

Freight

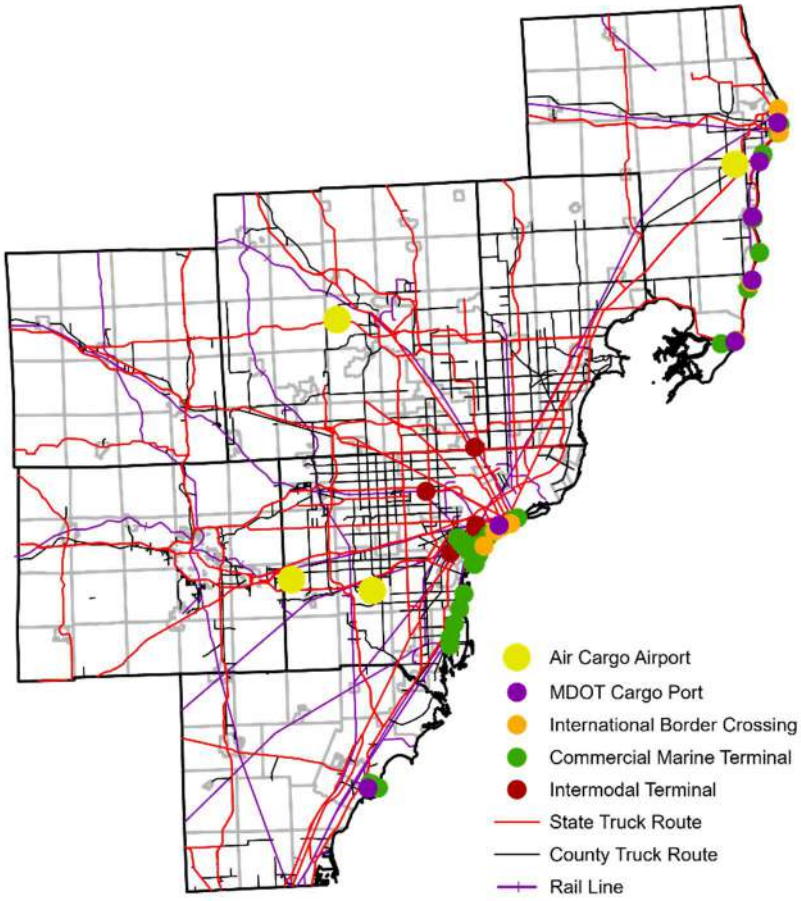
The freight system is vital for the growth and health of Southeast Michigan's regional economy. If freight movement becomes unreliable or inefficient, business costs rise, jeopardizing jobs and altering the business climate in Southeast Michigan. Planning for the policies and infrastructure that enable efficient freight movement while maintaining a balance between community and freight needs is crucial.

In 2019, 212 million tons of freight moved through Southeast Michigan, or about a value of $400 billion. The region's contribution to US-Canada border trade is noteworthy, with 36% of the total trade between the two nations passing through Southeast Michigan's ports of entry. These figures emphasize the region's economic impact and underscore the necessity for precise and strategic transportation planning to accommodate and optimize such substantial freight movement.

Freight System Components

Every component of the freight system in Southeast Michigan plays an essential role in delivering goods on time at a minimal cost per unit. Freight infrastructure and facilities create a network that links the different components and supports the flow of goods. This system is instrumental in supporting the regional economy. Major facilities include rail/truck intermodal terminals, cargo airports, marine ports, rail lines, highways, and international border crossings shown in Figure 36.

Figure 36
Regional Freight Facilities



Railroads

Southeast Michigan's freight rail system is a complex network of private and public railroads operating across international, national, regional, and local levels. Approximately 900 miles of rail lines traverse Southeast Michigan moving significant volumes of commodities including high value automobile parts and consumer goods. Rail represents approximately 15% of the region's freight movement by weight and 24% by total value. transport large volumes of commodities and higher-value automobile parts and consumer goods. Rail accounts for approximately 15% of goods moved by weight and 24% of the total value.

Marine

Marine ports are gateways for domestic and international trade. There are seven commercial marine ports and several public and private sector terminals in Southeast Michigan that transfer goods movement to other freight modes. Marine vessels on the Great Lakes transport vast amounts of coal, steel, gravel, and other commodities. Water-borne goods make up 11% of the weight and account for less than 1% of the overall value.

Air

Air travel is a key mode for moving goods quickly over long distances. Air cargo operations primarily handle low-weight, high-value items, supplying goods with short shelf lives (e.g., flowers and fish) and supporting factories when critical shipments face delays. Air transport constitutes less than 1% of total weight but nearly 6% of the total value. Four facilities handle air cargo in Southeast Michigan.

Trucking

Trucks are the most versatile mode of freight transportation, capable of moving a wide range of commodities over short and long distances. Southeast Michigan boasts a network of approximately 4,000 miles of all-season truck routes. Trucks play a central role in the regional freight system, acting as collection and distribution points for goods transported by other

modes. As shown in Figure 37, trucks handle most freight by weight (74%).

Accounting for movement by value, trucks again account for the highest share of freight. More valuable goods are much more likely to move through the air and rail as shown in Figure 38.

Figure 37
Freight Movement by Weight, 2019

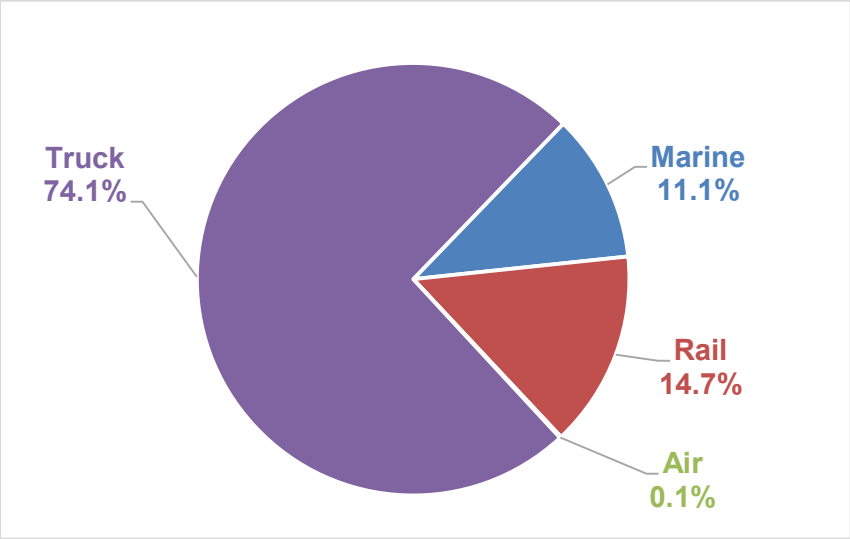
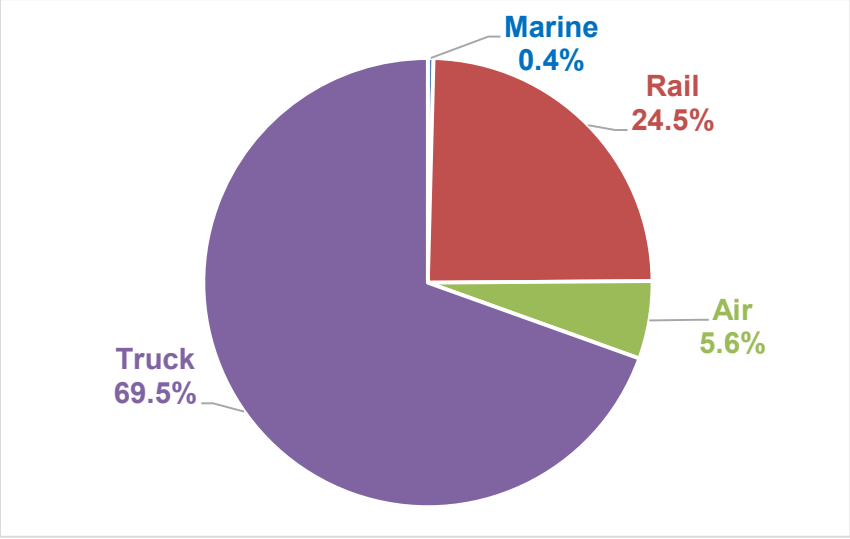


Figure 38
Freight Movement by Value, 2019



Challenges

In September 2023, SEMCOG hosted community freight stakeholders to discuss key issues of freight transportation in Southeast Michigan. Stakeholders in attendance represented local government, supply chain industry, logistics, rail, air, marine, environmental and community groups, and MDOT. At the meeting the following key issues were highlighted.

Truck Weight

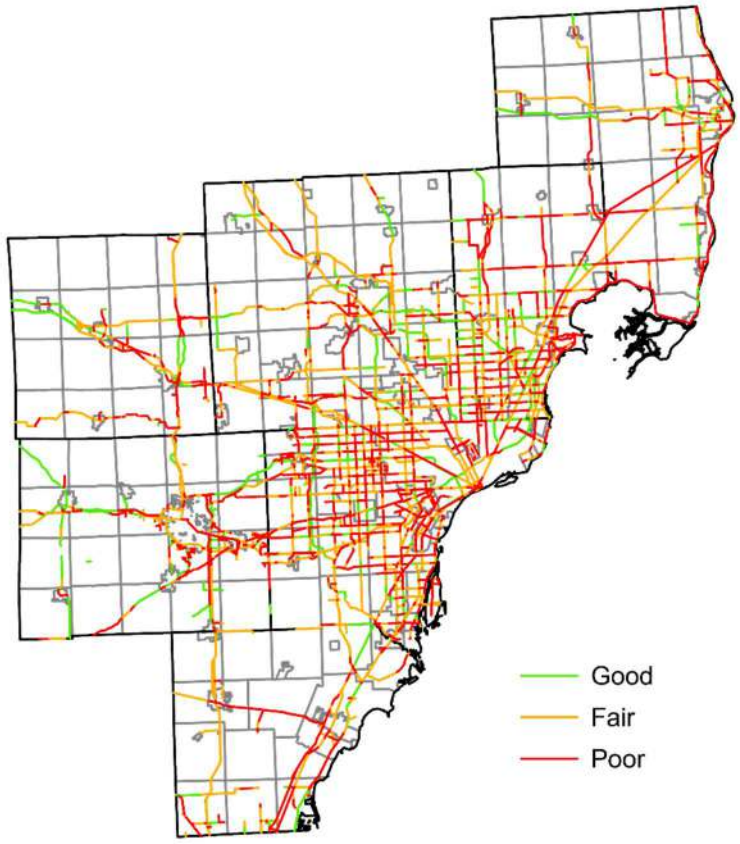
Trucking is vital for transporting goods but significantly impacts road infrastructure. Michigan has unique truck-weight regulations that allow for axle load configurations that exceed national limits. These regulations aim to reduce the number of trucks needed to move goods and align more with Canadian standards, however stress from heavy truck loads can accelerate pavement deterioration. Figure 39 shows pavement conditions on both State and county-owned all-season truck routes in Southeast Michigan. In 2022, 24% of the network was in good condition. 47% were in fair condition, and 29% were in poor condition.

Another concern of heavier trucks on roadways is safety. The heavier a truck is, the longer stopping distance is needed which can result in greater impacts during a crash or interactions with other vehicles or roadway users.

Truck Traffic in Residential Neighborhoods

All-season roads generally have higher traffic volumes of both freight and passenger vehicles and are in better physical condition than non-truck routes. Trucks also use local roads to make ‘last mile’ and ‘drayage’ connections to/from ports, factories, warehouses, distribution centers, and commercial and residential areas. Trucking on local roads results in safety concerns, noise and air pollution, congestion, and pavement wear and tear. Residential truck traffic has been a long-time concern in Southwest Detroit as heavy intermodal and port operations take place in and around residential neighborhoods. The intermodal connections and drayage operations are

Figure 39
Truck Pavement Condition, 2022



important to moving freight to, from, and within Southeast Michigan, but pose public health and safety concerns in the affected communities.

The Detroit Intermodal Freight Terminal (DIFT) Project is aimed at enhancing intermodal operations by the four Class I railroads serving Southeast Michigan. The DIFT looks at consolidating operations at the Livernois-Junction Yard in southwest Detroit, where NS and CSX currently operate. Maintaining the integrity, safety, and efficient operation of these connections while addressing equity and environmental justice is of critical importance.

Truck Parking

Truck parking is a critical issue in long-haul freight transportation. Adequate truck parking ensures safety on the roads, as fatigue is a primary cause of traffic incidents involving trucks. Near ports, trucking operations require designated staging areas and truck parking facilities to comply with mandated hours of service. However, limited parking options often compel trucks to park in residential neighborhoods, freeway exit/entry ramps, rest areas, and other areas near general traffic. This proximity has safety implications and highlights the urgent need for strategic planning to alleviate these challenges and enhance overall safety. Leveraging data from the American Transportation Research Institute (ATRI) to pinpoint parking clusters within the region can help gain deeper insights into appropriate parking options for long-haul truck drivers.

Emerging Technology

Stakeholders raised concerns during visioning workshops around EVs in the freight industry and emphasized the need to work closely with localities, industries, and associations to understand the necessary adaptations required for EV infrastructure. Stakeholders underscored the potential for using innovations like drones and AI to streamline shipping and procedures but stressed that integrating with existing systems has presented challenges that remain unsolved for the time being.

Safety, Security, and Resiliency

The freight system is susceptible to both natural disasters and human-caused events. Increased rain events pose flood risks on the freight network, disrupting the flow of goods and impacting the economy. Freight transportation networks move all types of goods, from raw materials to finished products, from heavy to light, from food to hazardous materials. Crashes and spills impact local waterways. The Huron-to-Erie corridor is the primary source of drinking water for the region's population. Material spills along this important waterway create risks of contamination to the drinking water network. This leads to increased costs and resources for local communities to properly treat the water for public consumption.

Crashes involving commercial vehicles often result in more severe injury outcomes because these vehicles are often larger, heavier, and stiffer. Commercial vehicle crashes account for 7% of the region's fatalities and serious injuries and 85% of commercial vehicle-involved fatalities are occupants of other vehicles. Blocked rail crossings also pose potential safety risks and can hinder emergency services' access to individuals and hospitals.

Efficient Movement of Goods

Increasing the reliability and speed of freight movement increases the economic competitiveness of the region and decreases costs to consumers. Freight bottlenecks delay the speed at which goods can reach their destinations. Congestion on highways results in idling trucks, increasing greenhouse gas emissions and insufficient routing options for rail increase distance, in turn increasing travel time and costs. The proposed Ottawa Lake Branch restoration project seeks to streamline routing by adding approximately eight miles of track between the Norfolk Southern rail line and Adrian Blissfield rail line. This would eliminate the need to reroute trains and provide direct connections for Lenawee and

Monroe Counties to Norfolk Southern's main east-west route, significantly reducing transport time.

Border Crossings

Stretching over an 87-mile border with Southwest Ontario, Southeast Michigan boasts the busiest and most valuable commercial border crossing in North America. As shown in Table 7, there are seven key international border crossings in this region, vital for connecting residents and facilitating the movement of goods on both sides of the border.

The significance of economic trade between the U.S. and Canada cannot be overstated. This two-sided trade relationship is the nation's largest, and the international crossings in Southeast Michigan serve as critical transportation links for the U.S. economy. Border facilities have a unique role in facilitating the movement of people and goods across these borders. Any disruption in their operations could have detrimental effects on the entire region.

Table 7

Border Crossing Facilities in Southeast Michigan

Facility	Freight	Passenger	US Owner	CA Owner
Detroit River Rail Tunnel	Yes	No	Canadian Pacific Railroad	Canadian Pacific Railroad
Detroit-Windsor Tunnel	Yes	Yes	City of Detroit	City of Windsor
Ambassador Bridge	Yes	Yes	Detroit International Bridge Company	Canadian Transit Authority
Paul M. Tellier Rail Tunnel	Yes	No	Canadian National Railway	Canadian National Railway
Blue Water Bridge	Yes	Yes	Michigan Department of Transportation	Blue Water Bridge Authority
Blue Water Ferry	Yes	Yes	Blue Water Ferry, Inc	Blue Water Ferry, Inc
Walpole Algonac Ferry	No	Yes	Walpole Algonac Ferry, Ltd.	Walpole Algonac Ferry, Ltd.

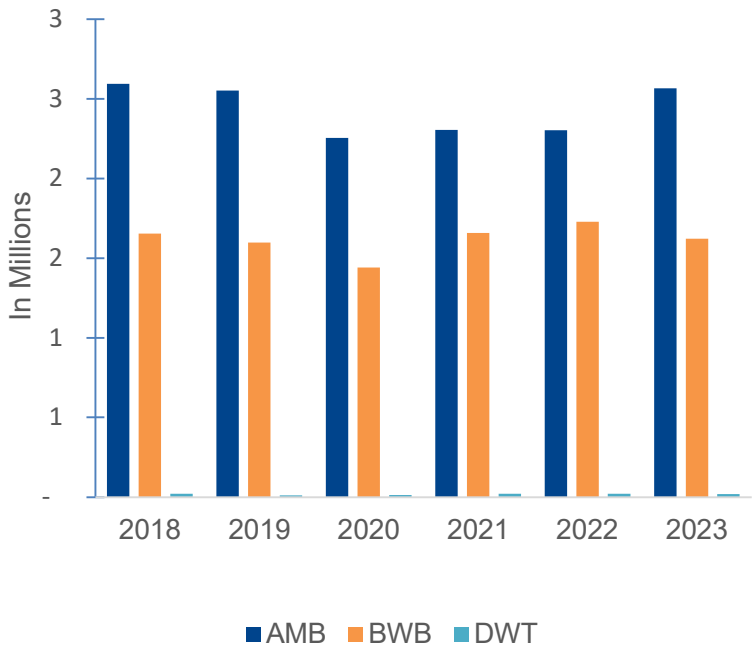
The Ambassador Bridge (AMB), Detroit-Windsor Tunnel (DWT), and Blue Water Bridge (BWB) are the primary highway border facilities, linking Southeast Michigan with Canada. The Detroit-Windsor Tunnel provides passengers direct access to downtown Windsor, while the Ambassador Bridge connects both passengers and freight traffic to Canada's Highway 401, a key route within the Montreal-Windsor-Detroit-Chicago corridor. The Blue Water Bridge (BWB) in Port Huron/Sarnia is another crucial crossing, again connecting Highway 402 with I-69 and I-94.

In 2019, 36% of the total trade between the U.S. and Canada occurred at border crossings in Southeast Michigan. Daily, an estimated $600 million worth of goods crossed Southeast Michigan border points. Extending beyond goods; 15.7 million passenger cars, trucks, and buses made their way through Southeast Michigan in 2019. The volume of vehicle traffic further emphasizes the critical role this region plays in connecting people and commerce across the U.S.-Canada border.

The decline in passenger traffic at the AMB, DWT, and BWB is primarily attributed to the impact of the Covid-19 pandemic, as illustrated in Figure 40, depicting the decrease in international passenger traffic by border crossing. In 2019, a total of 11.5 million passenger vehicles crossed these three crossings. However, by 2021, this number significantly dropped to 3.2 million, marking a 72% reduction.

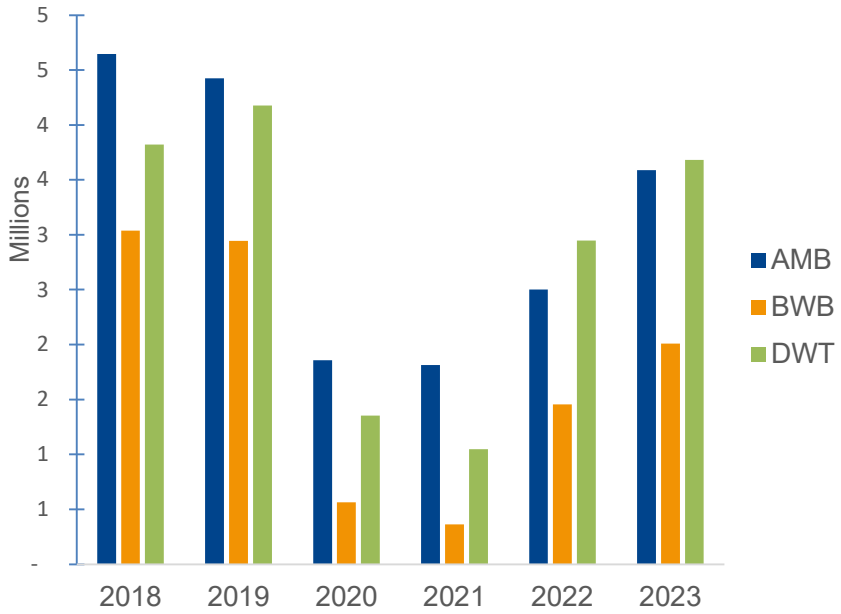
Figure 40

Annual International Passenger Traffic by Border Crossing



Despite the challenges, there has been a notable recovery by 2023, with a total of 9.3 million passenger vehicles recorded at all three crossings. Although the pandemic has had a lasting impact on passenger travel across international borders in Southeast Michigan, it is noteworthy that freight truck traffic has remained relatively consistent from 2019 to 2023, as indicated in Figure 41, depicting the stable truck traffic over all three border crossings.

Figure 41
Annual International Freight Traffic by Border Crossing



Gordie Howe International Bridge

Anticipated to open in 2025, the Gordie Howe International Bridge (GHIB) is expected to be one of North America's largest ports of entry. This six-lane bridge, connected to Detroit freeways, will be able to accommodate oversized, overweight, and trucks carrying hazardous materials. The GHIB is also designed to enhance system redundancy, increase capacity, improve border processing capabilities, travel times, and ensure end-to-end connectivity.

Beyond commercial and passenger vehicle traffic, the GHIB will feature a multi-use path dedicated to bike and pedestrian use. This holistic design aims to provide safe and accessible routes for alternative transportation modes, adding to the overall functionality and convenience of the Gordie Howe International Bridge.

Challenges

Aging Infrastructure and Closed Services

The AMB and the DWT are privately-owned crossings both approaching 100 years of age. Each crossing will need substantial repairs or replacement in the coming years. These repairs or replacements may disrupt travel patterns for both passenger and freight travel.

The Detroit Truck Ferry, which operated from 1990 until September 2023, provided a vital route for trucks carrying oversized, overweight, or hazardous materials not permitted on the AMB or DWT. Truckers who relied on this service will need to utilize the Gordie Howe International Bridge (GHIB) once it opens in 2025. Until then, the closest border crossing accommodating hazardous materials is the Bluewater Bridge in Port Huron.

Accessibility

Using any one of the international border crossings in Southeast Michigan almost requires a personal vehicle. Public transit users encounter issues of limited connectivity and inefficiency, with infrequent and inconvenient services hindering cross-border travel. Cyclists and pedestrians are unable to cross due to the lack of multi-use paths at the two bridges and tunnel. This may also adversely affect the aging population of the region who wish to travel to Ontario from Southeast Michigan and may no longer drive their own vehicles.

While the new Gordie Howe International Bridge will have multi-use paths when opened, there still will remain limited options for connectivity for people without access to vehicles. Addressing this challenge may require a significant increase in infrastructure, including integrating pedestrian-friendly pathways, dedicated cycling lanes, and improved public transit connectivity.

Aviation

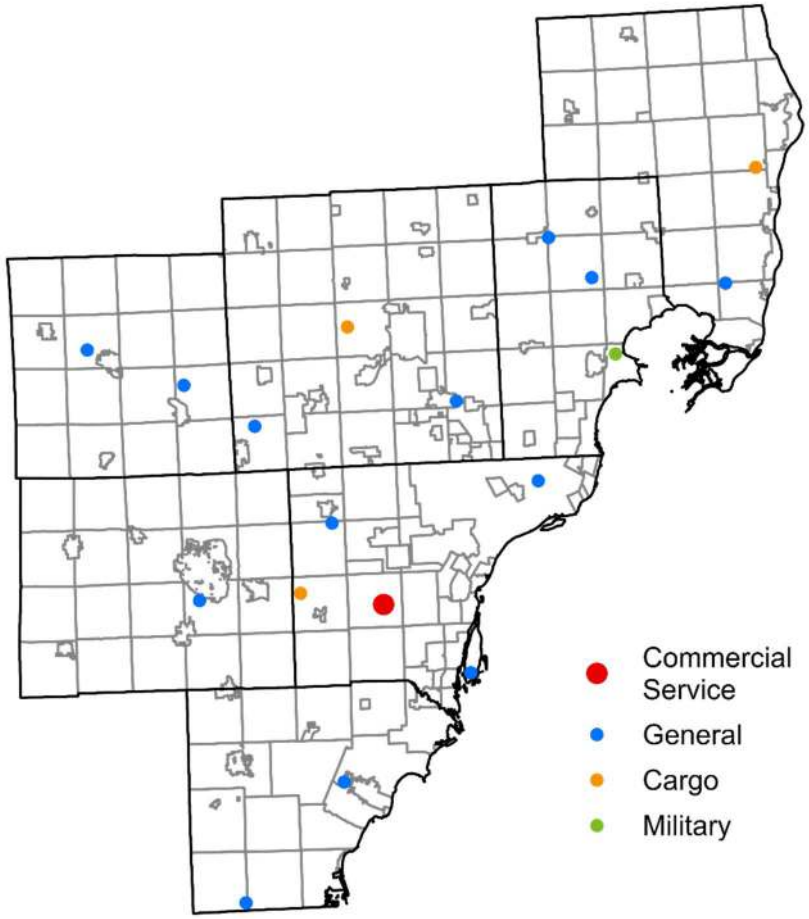
Southeast Michigan's aviation system is a key economic driver, facilitating both passenger travel and the movement of goods across regional, national, and international networks. Detroit Metropolitan Airport (DTW) serves as the region's primary commercial passenger hub, while Toledo Express Airport (TOL) and Windsor International Airport (YQG) provide additional options for travelers. Willow Run Airport (YIP), Oakland County International Airport (PTK), and St. Clair County International Airport (KPHN) specialize in international cargo operations. Selfridge Air National Guard Base supports military flights, and numerous other airports provide vital general aviation services. Regional airports are shown in Figure 42

Passenger Travel

Detroit Metro Airport is the 20th busiest airport in the US, by passenger volume, according to the Bureau of Transportation Statistics (BTS). DTW is accessible to passengers by cars, buses, shuttles, taxis, and transportation network companies. As of March 2024, the Downtown to Airport Express (DAX) service operated by the RTA provides 16 daily trips to DTW.

Figure 42

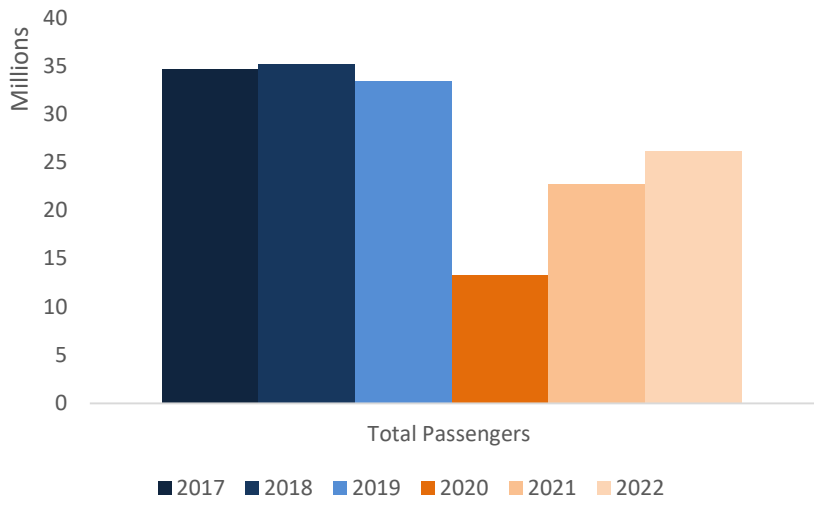
Regional Airports



Like many other airports nationwide, traffic volumes at DTW decreased significantly during the Covid-19 pandemic and periods of restricted air travel. In 2020, combined domestic and international passenger counts were 15 million, nearly a 60% decrease from just three years prior. However, by 2022 the number of passengers had risen to 26 million, an increase to nearly three-quarters of pre-pandemic levels as shown in Figure 43.

Figure 43

Detroit Metro Airport Passenger Traffic



Air Cargo

Air cargo, mainly focusing on lightweight yet high-value goods, generates significant activity at four Southeast Michigan airports (DTW, YIP, PTK, KPHN). These cargo service operations also play a pivotal role in supplying the automotive sector with essential components. Air cargo is typically transported in the following ways:

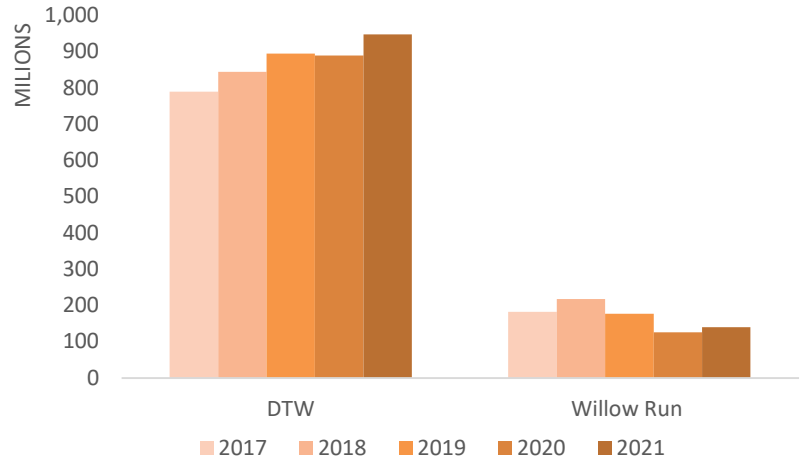
1. By express package delivery services (e.g., FedEx, UPS, and DHL) with dedicated air logistics.
2. By "belly-space" in scheduled flights of commercial passenger airlines (e.g., Delta); and
3. By all-cargo carriers who offer scheduled and unscheduled dedicated cargo flights to select high-volume airports.

In Southeast Michigan, air cargo constitutes over $22 billion in value shipped each year (5.6% of all annual freight value).

Unlike the decrease in passenger travel, cargo shipments through DTW and YIP were largely unimpacted throughout the Covid-19 pandemic as shown in Figure 44.

Figure 44

DTW and Willow Run Cargo, by Weight



Challenges

Preservation and Maintenance

Preserving airport infrastructure like airfield pavement and aircraft access is important, but so also is properly maintaining and improving off-airport property land uses, approach obstructions, noise sensitivity, and property rights.

Integrating New Technology

Over the life of Vision 2050, many new technologies are likely to emerge affecting aviation. Integrating these technologies may lead to temporary operational and funding issues, particularly at commercial airports. These facilities must be sure to address compatibility concerns with legacy systems, data sharing, privacy issues, and cyberattack vulnerabilities these new technologies may bring.

Drone delivery (discussed in Chapter Four) and autonomous aircraft utilizing sophisticated artificial intelligence are poised to revolutionize cargo operations. Integrating these systems into current system operations will require robust collaboration with a broad spectrum of stakeholders.

Access

Getting to the airport can be challenging for people without personal vehicles, particularly older people and those with cognitive or physical disabilities. Limited public transit options restrict access for those without vehicles. Addressing this challenge will require developing a more connected transit system directly linking airports, particularly Detroit Metropolitan Airport with the region.

Weather Disruptions

Even minor weather events can cause major disruptions at airports, grounding flights and delaying schedules. In a region like Southeast Michigan, major weather events including snow and rainfall can even limit access to airports. Ensuring redundancy and reliability on the transportation system can mitigate accessibility issues.

Runway Limitations

For some airports including those in St. Clair County short runway lengths pose a problem limiting cargo capabilities. Shorter runways can impact moving goods and decrease supply chain efficiencies.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Chapter 4: Emerging Technology

	Key Takeaways	Key Actions
2050 REGIONAL TRANSPORTATION PLAN VISION 2050	• Southeast Michigan is a major center for connected and autonomous vehicle (CAV) testing on public roads. • The increased popularity of electric scooters and bike-sharing programs in the region signals a trend towards sustainable, last-mile transportation solutions. • The continued growth of e-commerce and a focus on efficient last-mile delivery solutions highlight optimization of the use of the transportation system. • High vehicle costs and limited charging infrastructure may discourage adoption of electric vehicles.	Facilitate adopting emerging technologies and explore innovative construction techniques to enhance infrastructure durability, longevity, and efficiency, while preparing communities for modern infrastructure development without adding undue capacity.

Southeast Michigan has embraced new transportation technologies on our roads. The influx of these technologies and services is rapidly changing our regional system. Over the past decade technologies like micro-mobility (such as e-scooters), electric vehicles, smart vehicle features, and full automation have advanced significantly, and Southeast Michigan has been at forefront of these advances.

While many of these emerging technologies, like autonomous vehicles, hold promise for supplying more accessible mobility, reduced travel times, and safer movement, their integration into the existing and changing transportation system still must be carefully planned. Transportation planning must adapt to accommodate these innovative technologies and their effects on travel patterns, land use, and urban design in a multi-modal system.

Alternative Fuels

In the pursuit of a cleaner and more sustainable transportation system, alternative fuels appear as viable replacements for traditional fossil fuels. Electric vehicles (EVs) and hydrogen fuel cell vehicles (FCVs) may revolutionize the way we move. FCVs utilize hydrogen as a fuel source, emitting only water vapor, while EVs rely on electricity, cutting tailpipe emissions altogether. Both technologies offer distinct benefits and challenges, shaping the future of transportation.

Electric Vehicles

In 2023, 0.81% of all vehicles sold in Southeast Michigan were electric, up from 0.57% in previous year. As the promise of continued adoption and saturation in the region continues, there are two key current barriers to widespread uptake: the higher purchase cost typically associated with EVs and the real or perceived lack of EV charging infrastructure.

For EVs to become more prevalent in Southeast Michigan, increased infrastructure is needed. Replacement of gasoline fueled vehicles with EVs would bring positive environmental impacts, by eliminating tailpipe emissions, contributing to cleaner air and reduced greenhouse gas emissions. Considering the current sources of electricity (9.35% renewable and 90.65% non-renewable) in Michigan, by switching from a gasoline engine car to an all-electric vehicle, the annual emission per vehicle can be reduced by 70%, this number for switching to a plug-in hybrid is equal to 58% reduction.

Community Electric Vehicle Toolkit

Developed by SEMCOG for the State of Michigan, the Community EV Toolkit, shown in Figure 45, is a one-stop destination for access to key EV data, infrastructure and deployment statuses, community zoning and planning ordinances, community fleet electrification, funding opportunities, and local case studies and best practices.

The toolkit will be updated and expanded as needed to address emerging issues and changes with technology, markets, and federal and State rules and regulations.

Figure 45

SEMCOG and State of Michigan EV Hub – Southeast Michigan Region

Hydrogen Fuel Cell Vehicles

Hydrogen Fuel Cell Vehicles (FCVs) are a type of zero-emission vehicle that uses hydrogen gas to generate electricity within a fuel cell, which is then used to power an electric motor. These vehicles emit only water vapor, making them an environmentally friendly alternative to traditional gasoline-powered vehicles.

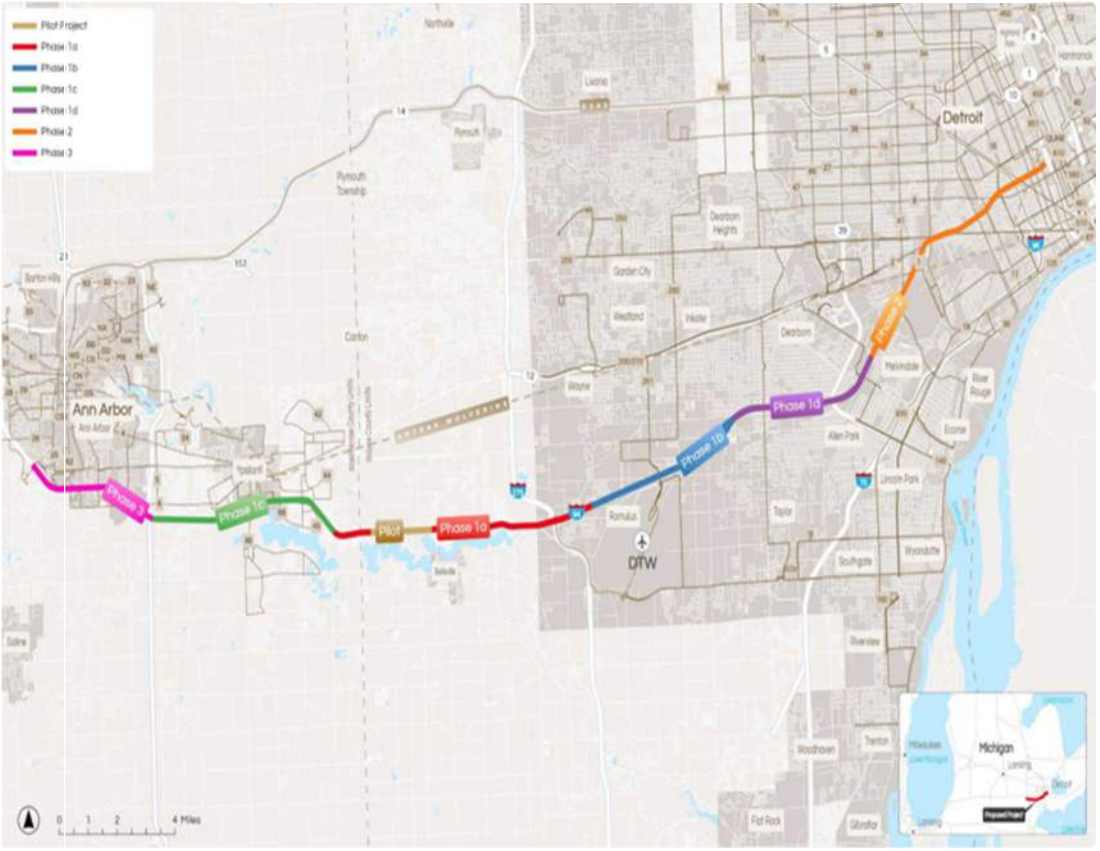
FCVs have the potential to play a significant role in reducing greenhouse gas emissions and achieving sustainable transportation in the region. However, their successful integration requires careful planning, including the establishment

of hydrogen refueling infrastructure and the incorporation of FCVs into public transit fleets.

Hydrogen fueling stations are being deployed in Southeast Michigan, enabling FCV owners to refuel. Developing this infrastructure creates jobs and attracts investments in the region's hydrogen economy.

Figure 46

Cavnue Connected Vehicle Project Corridor



Connected/Autonomous Vehicles

Connected and Autonomous vehicles (CAVs) have the potential to revolutionize transportation in Southeast Michigan. CAVs promise increased safety, reduced congestion, and improved mobility for people with disabilities or limited mobility. The adoption of CAVs may result in more efficient driving patterns, leading to reduced fuel consumption and lower emissions. However, careful planning is needed to ensure that CAVs are electric or low-emission vehicles to maximize their environmental benefits.

Michigan is a hub for CAV testing on public roads. Many companies, including automakers and tech firms, conduct tests on Southeast Michigan roadways developing and refining CAV technologies. These tests focus on improving vehicle-to-vehicle and vehicle-to-infrastructure communication, optimizing routes for fuel efficiency, and reducing traffic congestion. The CAV industry's growth in Southeast Michigan attracts investments and creates high-tech job opportunities.

Michigan Connected and Automated Vehicle Test Center (MCity)

MCity, located in Ann Arbor, is an ultramodern testing facility for connected and autonomous vehicles. It serves as a testing ground for CAV technologies, allowing automotive companies, startups, and researchers to develop and assess CAV systems in a controlled environment. MCity's work contributes to the development of safe and environmentally friendly CAVs in Southeast Michigan while also attracting tech companies and investments, boosting the local economy.

Cavnue

In August 2020, the MDOT announced Cavnue as the Master Developer for an innovative connected and automated vehicle (CAV) corridor project. This pioneering initiative will integrate technology and infrastructure to enhance safety, reduce congestion, and improve accessibility within the local community.

The project three-phase project is planned along a 39-mile segment of the I-94 corridor between Detroit and Ann Arbor. The

lanes would be open to both CAV and non-connected vehicles at the start of the project but possibly transitioning to CAV only once the adoption saturation of connected vehicles in the region rises. A three-mile pilot demonstration of the project is scheduled to open in Spring 2024.

Hyperloop and High-Speed Rail

The concept of high-speed transportation, such as Hyperloop and high-speed rail, has gained attention in recent years. These technologies have the potential to connect Southeast Michigan to neighboring regions at unprecedented speeds, reducing travel times and enhancing economic opportunities. High-speed transportation can significantly reduce the environmental impact of long-distance travel by replacing short-haul flights and personal vehicle trips.

A proposed high-speed rail project connecting Detroit to Chicago is under consideration. This project would significantly reduce travel times between the two cities, making it a practical alternative to air travel. Supplying a more energy-efficient mode of transportation contributes to reducing greenhouse gas emissions and congestion. Also, high-speed rail enhances connectivity and trade between emerging megaregions, helping the Southeast Michigan economy.

Micro-Mobility

Micro-mobility solutions, including electric scooters and bike-sharing programs, have gained popularity in urban areas. These options supply last-mile connectivity, reduce congestion, and promote sustainability. The use of electric scooters and bikes can reduce the carbon footprint of short trips, helping to mitigate air pollution and reduce the region's reliance on personal vehicles.

Drone Technologies

Unmanned aerial systems (UAS), commonly known as Drone technologies, have the potential to revolutionize logistics and transportation in Southeast Michigan. With recently passed legislation enabling increased drone usage, companies are emerging to capitalize on this opportunity and enhance drone delivery services in the region. Drone routing technology utilizing GIS is also advancing to allow shipments over “safe” airspace in compliance with federal aviation regulations. Drones can be utilized for various purposes, such as last-mile delivery of goods and aerial surveys for infrastructure maintenance. The integration of drones into delivery services not only offers efficiency but also contributes to reducing emissions associated with traditional delivery vehicles, thus making urban logistics more environmentally friendly.

Electric Vertical Take-Off and Landing Vehicles

Electric Vertical Take-Off and Landing (eVTOL) vehicles are a new frontier in urban mobility. These electric aircraft have the potential to supply rapid point-to-point transportation within and between cities. The use of electric propulsion in eVTOLs can significantly reduce greenhouse gas emissions compared to traditional aircraft, making urban air travel more sustainable.

Local aerospace companies and research institutions in Southeast Michigan are actively engaged in eVTOL research and development. These efforts aim to design and manufacture electric vertical take-off and landing vehicles that are quieter, more energy-efficient, and produce fewer emissions than traditional aircraft. The growth of the eVTOL industry in the region can lead to economic benefits through manufacturing and technology development.

E-commerce and Last-Mile Delivery

The rise of e-commerce has transformed consumer habits, leading to increased demand for last-mile delivery services. To address this shift, route and infrastructure optimization should be considered to accommodate efficient and sustainable e-commerce delivery solutions. Eco-friendly delivery options, such as electric delivery vans and cargo bikes, can significantly reduce emissions associated with last-mile delivery.

Also, pickup centers and lockers are becoming more available for streamlining deliveries for carriers. This can reduce the number of vehicles on the road and help congestion. Pickup

centers can also reduce the need for multiple delivery attempts to individual addresses, which can reduce vehicle emissions, improving regional air quality.

Artificial Intelligence

In transportation, Artificial Intelligence (AI) is often linked to self-driving vehicles. However, AI can improve many other aspects of the transportation system as well. AI can be used with traffic management systems to continuously monitor roadway conditions and optimize traffic flow. AI can also help with logistics, routing, and scheduling for freight systems. Non-motorized safety can be improved by predicting the path and location of pedestrians/cyclists. AI can also plan transit routes and schedules to be more efficient and effective.

Emerging transportation technologies offer Southeast Michigan an exciting opportunity to modernize its transportation infrastructure, improve mobility, and reduce environmental impacts significantly. These local project examples show the region's commitment to embracing these innovations, creating jobs, attracting investments, supporting local businesses, and contributing to a more sustainable and economically vibrant transportation landscape. By continuing to invest in and support these projects, Southeast Michigan can position itself as a leader in forward-thinking, sustainable transportation solutions that help residents and the region's economy.


FedEx Office
APEX

Chapter 5: Equity in Transportation Planning

	Key Takeaways	Key Actions
2050 REGIONAL TRANSPORTATION PLAN VISION 2050	• When transportation and housing costs are combined, the recommended maximum portion of household income spent on these necessities rises from 30% to 45%. • Over 1.2 million residents of Southeast Michigan live in communities designated as Justice40 areas, meaning they have been identified as disproportionately burdened by lack of investment. • Historically underserved communities are often less engaged in transportation planning processes, highlighting a challenge for equitable decision-making.	Prioritize equity by identifying and mitigating transportation barriers, developing fare structures, and offering specialized services to ensure inclusive access for all community segments including the aging population. Pursue funding opportunities and partnerships for the development of complete street projects that enhance connections between local neighborhoods, business districts, and regional transportation networks.

Access to jobs, education, healthcare, and other core services is dependent on the transportation options available. But often, the transportation system is not equally accessible to everyone in the region. Bridging the gaps in accessibility and increasing mobility for everyone in Southeast Michigan will take the efforts of many initiatives and strategies. SEMCOG is working to ensure the disparities in transportation access are addressed throughout the planning process, so a more equitable transportation system is developed.

Land Use and Transportation

The SEMCOG region comprises a diverse network of 232 communities, each with its own individual land use plans and zoning regulations. While this structure allows communities to tailor decisions to their specific needs, it can often lead to fragmented planning where land use decisions are made independent of their impact on the transportation network, and vice versa.

At times, transportation decisions may have been made without considering surrounding land uses, leading to inefficiencies and chances for connection between modes. For example, when planning a new route or expanding an existing transit route the needs of all transportation users need to be accounted for. Otherwise, the result may be a disjointed system with limited transit options and inadequate pedestrian and bicycle infrastructure.

Additionally, the lack of coordination between land use and transportation decision-making processes can exacerbate congestion, negatively affecting not only mobility but also air

quality due to heightened vehicle emissions and environmental resources due to runoff.

FHWA has promoted design practices that prioritize flexibility and a holistic approach, placing increased emphasis on accommodating transit, pedestrians, and bicyclists. This shift allows for the explicit consideration of economic, social, and environmental factors, which diverge from traditional design strategies that are largely focused on physical aspects, standards, and specifications.

Several planning techniques can support placemaking and the region's main streets and walkable areas. These techniques prioritize pedestrian-focused design and can transform corridors into human-scale spaces. Providing an emphasis on safe environments for transit, biking, and walking can enhance planned placemaking for areas with pedestrian-focused land uses. Any changes in the vehicle capacity or consideration of safety countermeasures should be studied with appropriate stakeholders and local partners.

Corridor Planning

Corridor planning includes assessing existing conditions, developing ideal future conditions and alternative options, and compiling incremental solutions for transitioning corridors. These studies are beneficial in areas and projects that are multi-jurisdictional. Specific benefits of a corridor plan are:

- Maximization of existing infrastructure
- Improved safety conditions
- Access or mobility improvements

Zoning and Mobility-Oriented Development

Zoning is a policy tool used to establish standards that enhance and maintain the efficiency of land use. Zoning can enhance human-scaled places by requiring build-to lines, frequency of crosswalks, medians, wider sidewalks, and more. Mobility-Oriented Development (MOD) is a zoning approach that aligns land uses with the multi-modal transportation network. MOD has evolved from a focus on transit connections to accounting for first- and last-mile connections, as well as overlapping modes including walking, bicycling, shuttles, ride-share, car-share, and more.

Mobility Hubs

Mobility hubs are designated areas that connect multiple transportation modes in a single, convenient location. These hubs are designed to make travel easier for people using more than one mode and reduce the number of personal vehicles on the road reducing congestion. These hubs can also help prioritize walking and cycling which has health and air quality benefits as well.

Suburban Mobility Authority for Regional Transit (SMART) is developing mobility hubs across their service areas that will establish places where multiple modes overlap. These hubs will offer supportive infrastructure to transfer people safely and efficiently from one mode to another, such as improved signage, lighting, shelters, and real-time transit information displays.

Road Diets and Traffic Calming

Traffic calming refers to many strategies designed to slow vehicle speeds and improve safety for all road users, particularly vulnerable cyclists and pedestrians. These strategies include physical changes to the road layout as well as signage encouraging drivers to slow down. Road diets are a specific type of traffic calming where the number of travel lanes are reduced on a street. This extra space can be used for increased pedestrian use, bike lanes, on-street parking, or other uses.

In addition to increased safety, these measures also may enhance the livability of a community. Space not used for vehicle travel can be repurposed for sidewalks, restaurant seating, or enhanced green space creating a more welcoming place. These measures can also increase access for users of all ages and

physical and cognitive abilities by encouraging walking, biking, and public transit use.

Communities should consider traffic calming and road diets to combat areas where traffic speeds are high, crashes are frequent, and there is a greater interplay between vehicles and pedestrians, and cyclists.

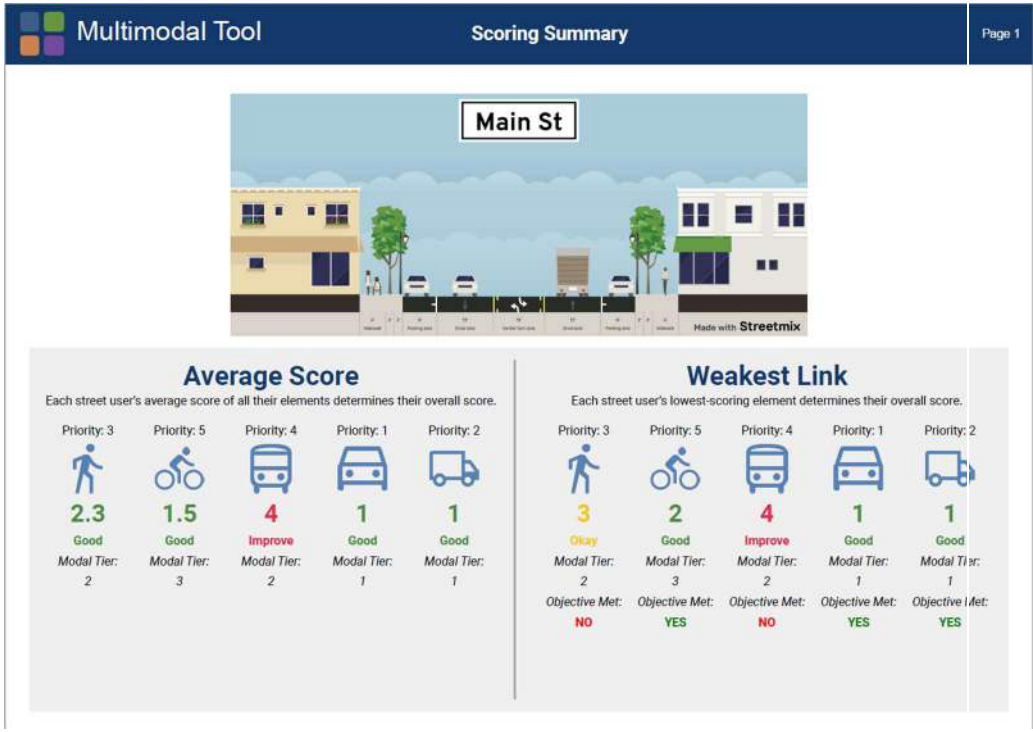
Complete Streets

Standard roadways are designed for vehicles to move the greatest number of people as fast as possible. However, using a Complete Street approach assures that the roadway is designed for *all users* including pedestrians, bicyclists, public transit riders, drivers, and more. Complete Streets often also include greening the streetscape to manage stormwater runoff from roadways. A complete streets approuch also emphasizes the needs of those who may expereince underinvestment or those that a traditional transportation approuch have overlooked, including older adults, people living with disabilities, people who don't have access to vehicles, amongst others.

SEMCOG | MDOT Multimodal Tool

To assist in the implementation of Complete Streets, SEMCOG and MDOT collaborated to create the Multimodal Tool. This tool is a digital planning instrument designed to help communities effectively plan, design, and assess complete streets catering to five key travel modes: automobiles, freight, pedestrians, bicycles, and transit. The Tool was prepared with the following objectives:

- Address growing competition between travel modes for limited space within the right-of-way.
- Help local communities understand what is permitted for each project and road jurisdiction.
- Provide a framework for communities to work with SEMCOG and MDOT to determine the order in which modes may be prioritized on certain corridors or within a district, and to work within operational standards.



Housing

The 2021 Bipartisan Infrastructure Law (BIL) includes a new provision focused on strengthening the connection between housing and employment within transportation planning. This provision underlines the role of long-range transportation plans in creating more equitable and accessible communities. Affordable housing alone is insufficient if residents lack access to jobs and essential services. Affordable housing typically costs less than 30% of a household's gross annual income. When combining housing and transportation costs, the income target increases to 45% of gross annual income.

During development of Vision 2050, SEMCOG organized a workshop to explore the connections between transportation and housing. The workshop brought together housing experts, stakeholders, and interest groups from across the region. Key topics included SEMCOG's 2050 Regional Demographic and Economic Forecast, as well as a Neighborhood Stability Analysis. This analysis focused on three primary indicators: changes in housing occupancy, shifts in population demographics, and evolving household types. For further details on this analysis, please visit the Vision 2050 Hub.

Participants underscored the critical need for a dependable, efficient, and safe multi-modal transportation system to effectively link housing with employment opportunities. This system should aim to minimize wait times, include alternative options, and ensure accessibility for those who rely on it the most. Attendees proposed the following strategies to help realize this goal:

Pre-Construction Transportation Analysis

Mobility-Oriented Development offering intentional connections between affordable housing and employment centers through transit.

Education campaign aimed to dispel stigmas associated with public transportation.

Education, workforce development, and employment are all positively impacted by access to multiple modes of transportation. Whether individuals are engaging in in-person or remote education, training and work, it is important to have a transportation system that supports evolving hybrid arrangements and also provides flexible access to services such as childcare and schools.

The U.S. Department of Housing and Urban Development's guidebook on *Creating Connected Communities*, identifies the importance of improving transportation choices for low- and moderate-income households. It states that "transportation costs are directly related to a key characteristic of housing: location, including proximity to employment, schools, and other essential destinations." Connected communities provide residents with access to affordable housing and multiple transportation modes. This in turn can "help reduce households' transportation costs, connect workers to jobs, and facilitate upward mobility promote health and safety, contributing to a more resilient local economy, and improving the efficiency of public spending."

Access to Core Services

An accessible transportation system must ensure equitable access to essential services for everyone in the community. Many people in the region, including those with limited incomes, older people, people with disabilities, and others, cannot rely on automobiles as the primary source of mobility. 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.

While walking and bicycling offer potential access to core services, especially for those with limited incomes, numerous constraints, including distance, physical or cognitive limitations,

and inadequate infrastructure, often make these modes impractical or inaccessible.

SEMCOG identifies seven core services crucial for accessibility: fixed-route transit, employment centers, supermarkets, healthcare facilities, parks, schools, and libraries.

The 2016 Access to Core Services in Southeast Michigan Report developed common measures of accessibility for comparison across the region, established benchmarks to identify gaps and challenges where accessibility is low, set regional policies and local actions to be implemented by various stakeholders, and integrate accessibility measures and policies into regional transportation planning and decision-making processes.

SEMCOG anticipates updating the original Access to Core Services report with updated data and methodology utilizing advanced travel modeling, along with an analysis or the lasting impacts of the Covid-19 pandemic.

Detroit Workforce Mobility Equity Analysis: Gap Analysis Report

In May 2022, the Regional Transit Authority (RTA) published the Detroit Workforce Mobility Equity Analysis: Gap Analysis Report which discusses existing access barriers between housing and employment within Detroit city limits.

Although jobs exist within Detroit, many don't align with the skills and education of low-income residents. This mismatch, compounded by the concentration of suitable opportunities in the suburbs, creates a significant barrier to employment for many Detroiters, hindering economic mobility and community development.

Major takeaways from this report include:

- The presence of transit service alone does **not** indicate whether the service is useful to all workers, especially marginalized, low-income workers and job seekers.
- Coordination with large employers (hospitals, factories, etc.) is necessary to ensure that siting decisions properly account for access for job seekers and that connections from and to transit stops are accessible.

Broadband

Broadband, essentially a high-speed internet connection, is indispensable to transportation infrastructure and operations and for people who use it for mobility and socioeconomic benefit. High-speed internet can support activities where there are barriers to transportation, and mobility or where individuals may need to access services remotely.

Broadband and Transportation

Today and in the future, transportation systems are increasingly reliant on internet-connected infrastructure for deployment, monitoring, and maintenance. Broadband connectivity plays a critical role in arterial and freeway operations, and in managing central signal systems, dynamic message signs, and other smart infrastructure components.

Transit providers leverage broadband to track vehicles, optimize operations, and enhance fare systems, improving overall system efficiency. Also, autonomous and connected vehicles depend on broadband access to deliver information to drivers, potentially enhancing safety and reliability on regional roadways.

Additionally, broadband connectivity can contribute to optimizing freight movements, further enhancing the efficiency of transportation networks.

Finally, broadband infrastructure enables telecommuting, which has become increasingly prevalent in modern work environments. Broadband connections allow employees to work remotely, reducing the need for daily commuting and mitigating traffic congestion. Telecommuting not only offers flexibility for workers but also contributes to reducing greenhouse gas emissions and improving air quality by decreasing vehicle traffic during peak hours.

Economic Development and Broadband Access

Broadband access is a catalyst for economic growth as well. It provides opportunities for job and education access and is an engine for economic activity. Livelihoods are enabled and enhanced through access to high-speed internet, not only to facilitate telecommuting, but also for activities such as online banking and finance, e-commerce, online job training, and the enabling of labor pools in certain employment sectors such as information technology, telecommunications, and computer science and engineering.

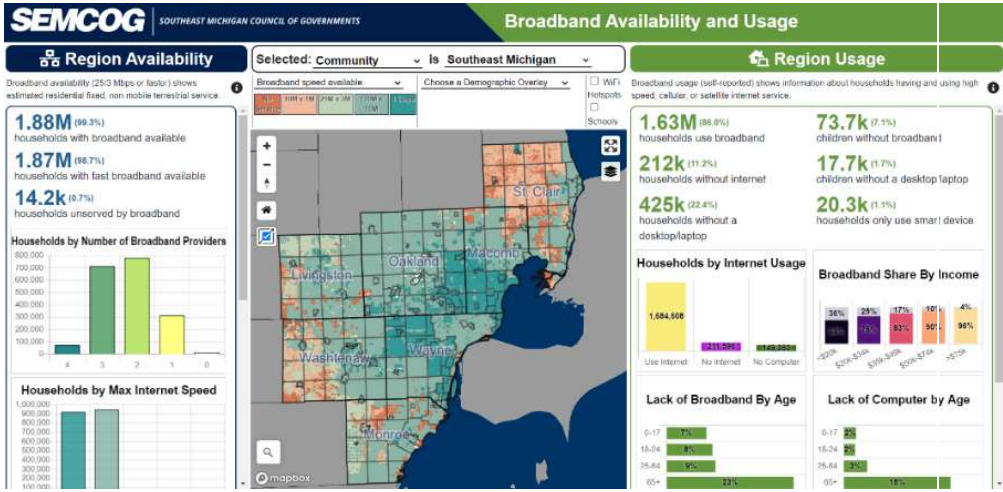
While broadband is expected to increase the use and quantity of local facilities, there is an exciting opportunity to enhance the link between *broadband, placemaking, and transportation.*

However, disparities are present across educational, economic, and racial lines which may preclude people from opportunities to work remotely as a commuting option. A greater proportion of those working from home in 2021 had at least a bachelor's degree, and had an annual income of at least $100,000 annually, while those with less education or lower income saw less than 50% engaged in remote work. In addition, 62% of Asian workers and 30% of White workers worked from home, compared to just 18% of Black workers and 16% of Hispanic workers.

For stakeholders to understand where service gaps persist, SEMCOG developed the *Broadband Availability and Usage Tool*. The tool uses a combination of American Community Survey data (2016-2020 Five-Year Estimates); availability and provider data from Connected Nation Michigan; and building data from SEMCOG to provide data on where service is available and at what speeds, as well as how many service providers are present in a given location, with additional demographic data on who lacks broadband access.

Figure 47

SEMCOG Broadband Availability and Usage Tool



Justice40

Ensuring equity in SEMCOG's planning work has long been a priority and closely aligns with the federal Justice40 initiative to empower communities experiencing disproportionate and adverse human health and environmental burdens. The federal commitment to Environmental Justice for underserved and underinvested communities is to deliver 40% of the overall benefits of investments (funding through the Bipartisan Infrastructure Law). Over a quarter of Southeast Michigan's

population, or 1.2 million people, live within a Justice40 census tract, based on a recent SEMCOG analysis.

USDOT identifies three major components for implementing the Justice40 Initiative. These include understanding:

- The needs of a community through meaningful public engagement.
- How a community is impacted by lack of transportation investments and options.
- What benefits a project may create, who will receive them, and how the project's benefits will create positive outcomes that will reverse how a community is experiencing disadvantage through increasing affordable transportation options, improving safety, reducing pollution, connecting Americans to good-paying jobs, fighting climate change, and/or improving access to resources and quality of life.

As a result of the increased emphasis on ensuring equity in transportation planning, SEMCOG is coordinating a Justice40 Communities Task Force to ensure participation from **all** communities in regional planning. This task force will:

- Coordinate and share experiences and opportunities.
- Highlight best practices and successes.
- Provide input and guidance into plan and initiatives development.
- Guide and assist in public input and engagement approaches.
- Ensure technical assistance and funding opportunities are accessible to all communities.
- Provide feedback on educational programs and training topics through SEMCOG Universities, etc.

SEMCOG began this task force in January 2024, and it will guide the agency's implementation of Justice40 transportation policy and planning.

A Vision 2050 Equity Team was utilized to coordinate and address the role of equity in the RTP. The team included county representatives from each FAC, MDOT, and the RTA. During workshops, the team discussed how to administer the Justice40 initiative by identifying tools that road agencies could utilize within the transportation planning process. SEMCOG also detailed its planning practices including Environmental Justice analysis and Equity Emphasis Areas. SEMCOG also introduced many resources and tools to be used with regional equity planning as highlighted below.

Equitable Transportation Community Explorer is an interactive web application that uses 2020 census tracts and data, to explore the cumulative burden communities experience, because of underinvestment in transportation, in the following five components: Transportation Insecurity, Climate and Disaster Risk Burden, Environmental Burden, Health Vulnerability, and Social Vulnerability.

SEMCOG's Equity Emphasis Area Dashboard provides key demographic and socioeconomic variables by county, community, and census tract across the region. The Equity Emphasis Area Dashboard also describes relative concentrations of vulnerabilities across the region using a "0-4" composite score. This draws attention both to which areas have the most burdens and to the primary vulnerabilities in each area.

The Climate and Economic Justice Screening Tool (CEJST) considers communities (at the census tract level) that are disadvantaged if they have disproportionately high numbers of low-income households and exceptionally high exposure to one or more environmental burdens.

SEMCOG's GREEN Dashboard describes green infrastructure and natural resource allocation by county, community and census tract across the region, highlighting areas that lack tree cover or natural spaces, and then highlighting the impacts of these gaps in terms of factors such as climate resilience, health equity, and attracting workforce.

Environmental Justice Analysis

As part of Vision 2050 development, SEMCOG performs analysis on future transportation projects to assess their impacts on target populations in Southeast Michigan. Detailed information about this analysis is available in Chapter 7.

Challenges

Community Engagement

Community engagement in transportation planning extends beyond public notices and comment periods. True engagement is informing people, building trust, incorporating diverse perspectives, and empowering communities to shape their transportation future. However, achieving this ideal is very challenging, particularly in historically underserved communities that have experienced disinvestment or negative impacts from past projects.

Shared Prosperity**,** Equity**, and** Education provide a powerful structure for addressing challenges to community engagement. Prioritizing shared prosperity, regional agencies can demonstrate commitment to building a transportation system beneficial for everyone, not just select groups and locations. This means ensuring new infrastructure and service improvements contribute to accessibility, economic development, jobs, and vibrant placemaking for all Southeast Michigan communities, regardless of income, demographics or locale.

Prioritizing equity as a core principle builds trust by acknowledging the historical and ongoing transportation disadvantages faced by certain communities. This means actively seeking out diverse voices through inclusive engagement strategies, conducting data-driven analyses to identify and address disparities, and prioritizing projects that improve equitable access to essential destinations and opportunities.

Funding and Prioritization

Securing funding and prioritizing strategic investment is crucial for realizing Vision 2050. However, this challenge is complex and fraught with competing priorities from various stakeholders. Add in the legacy of inequitable transportation investments and the equation is further complicated.

Historically, in our region funding has favored car-focused infrastructure. This has led to sprawl, disinvestment in transit, and limited accessibility for those without vehicles. Addressing these inequities requires a transformation of priorities, but such efforts often face resistance from changing "*what has always been done*." Funding is finite and needs outstrip available money across the board, competing priorities often make it difficult to secure long-term, consistent funding for transportation initiatives.

Funding, Education, and Equity can help address historical biases toward car-focused infrastructure, build consensus on shared priorities, and generate support for advocating funding initiatives.

Land Use

Land use patterns can impact transportation needs and opportunities. Past transportation investments have led to dependence on cars, limited public transit access, and increased congestion. On the other side we know, compact, mixed-use development facilitates walking, cycling, and transit use, which can lead to more vibrant communities and a stronger economy.

Equity, Preservation, Resilience, and Shared can be used by communities to better link transportation and housing and prioritize projects that increase walkability and proximity to

essential services. Prioritizing efficient infrastructure can free up resources to revitalize existing communities. Also coordinating project planning and development across agencies encourages better land use.

Limited Data

Staying informed about transportation investments and policies requires access to data on travel patterns, demographics, infrastructure conditions, and community needs. However, when available data is limited, this poses a significant challenge and may obfuscate the magnitude of project impacts, hinder the ability to target mitigation strategies or track progress towards meeting transportation system goals.

Collaboration and Education can unlock knowledge about available data and allow partnering agencies, stakeholders, and community organizations to make data-driven decisions to create an equitable transportation system.

Gathering important information about sociodemographic, disability populations, and needs and concerns encourages Equity in project planning and prioritization leading to Shared Prosperity across the region, not just concentrated in small areas.

Chapter 6: Financial Plan

	Key Takeaways	Key Actions
2050 REGIONAL TRANSPORTATION PLAN VISION 2050	• Vision 2050 highway funding: ~$27.1 billion. • Vision 2050 transit funding: ~$10.9 billion. • Funding for transportation projects is limited and the need outweighs available funding. • Innovative funding strategies including toll credits and public private partnerships can stretch limited funding.	Enhance transportation agencies' ability to leverage funding from multiple sources, including public, private, and federal grants. Explore additional funding sources for transportation projects including targeted millages and encouraging legislation for new funding sources like tolling for transportation facilities and regional tax policies.

Strategic financial planning is critical for ensuring Vision 2050 aligns with future funding expectations. Understanding the anticipated funding levels for Southeast Michigan is essential, along with identifying the specific sources supporting both road and transit projects.

This section highlights the estimated funding resources reasonably expected to be available to implement the future vision for the transportation system in Southeast Michigan, and the policies developed to implement that vision. It also contains a description of the methodology used to calculate these estimates.

The estimation of expected revenues demonstrates that the project list in Vision 2050 is constrained to fiscal resources reasonably expected over the 26-year plan period. Additionally, the financial plan includes an estimate of the fiscal resources reasonably expected to be available for operating and maintaining the federal-aid-eligible road network in the region over the same timeframe.

Transportation Funding Sources

The basic sources of State transportation funding in Michigan are *motor fuel taxes*, *vehicle registration fees,* State *general fund revenues and a portion of the marijuana tax*. Motor fuel is taxed by both the federal and state governments. Federal funds are generated by the federal gas tax but are also transferred from the federal general fund.

Forecasting Future Funding

Estimating the amount of funding available for Vision 2050 is complex. It relies on several factors, including economic conditions, miles traveled, fuel economy trends, and federal and state transportation funding received in previous years. Revenue forecasting relies on assumptions for these trends, which are generally agreed on across the state.

The process for documenting the assumptions made when forecasting funding is a cooperative effort. The Michigan Transportation Planning Association (MTPA) is an association of regional, State, and federal agencies responsible for the administration of federally funded highway and transit planning activities throughout the state. MTPA members developed rates of funding change and project inflation that are used statewide in long-range transportation plans, including SEMCOG's Vision 2050.

Highway Funding

"Highway funding" is a shorthand term for all funding that is not transit-related, i.e., funding for roads, bridges, non-motorized, safety, congestion management, and other related activities. Highway funding comes from a variety of federal, State, and local resources, including private-sector resources. This section summarizes all sources of highway funding presently available.

Federal-Aid 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. Apportionment is the distribution of funds through formulas in law. The current law governing these apportionments is the Infrastructure Improvement and Jobs Act (IIJA), also known as the Bipartisan Infrastructure Law, or BIL. Under this law, Michigan will receive approximately $1.45 billion in fiscal year (FY) 2024, which is apportioned through nine programs. A description of each program can be found in a supplemental document on the Vision 2050 hub.

Federal-aid funding targets (the estimated federal-aid funding amount Southeast Michigan is anticipated to receive) are periodically calculated for various federal programs, based on federal apportionment documentation and state law. Targets can vary from fiscal year to fiscal year due to factors including actual vs. estimated receipts of the Highway Trust Fund, the authorization (how much money can be spent), and the appropriation (how much money is approved to be spent).

State Highway Funding

The state law governing the collection and distribution of state highway revenue is Public Act 51 of 1951, commonly known as "Act 51." State-generated highway funding from the Michigan Transportation Fund (MTF) is distributed 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.

Act 51 contains complex distribution formulas for the funding, but essentially, once funding for certain grants and administrative costs are removed, approximately ten% of the remainder is deposited in the Comprehensive Transportation Fund (CTF) for transit.

MTF funds are essential to the operation of the public road system in Michigan. Federal-aid funds cannot be used to operate or maintain the road system (items such as snow removal, mowing the rights-of-way, electricity costs for streetlights and traffic signals, etc.) MTF funds are cities, villages, and county road commissions' main source of funding for these items. Most federal transportation funding must be matched with approximately 20% of non-federal revenue. In Michigan, most match funding comes from the MTF. Also, federal-aid funding cannot be used for roads that are not included in the federal-aid system, such as subdivision streets, so MTF is the main source of revenue for the maintenance and repair of these roads.

Combined Federal-Aid and State Highway Funding

Michigan has programs that use both state funding and federal funding. These programs are:

- Transportation Economic Development Fund (TEDF) Category C: Congestion mitigation in designated urban counties (in Southeast Michigan, these are Macomb, Oakland, and Wayne counties);

- TEDF Category D: For projects on the all-season road network in rural counties (in Southeast Michigan, these are Livingston, Monroe, St. Clair, and Washtenaw counties); and
- Local Bridge Program, which is a competitive program managed by the state.

In this Financial Plan, amounts received by local agencies participating in competitive programs operated by the state or FHWA are estimated based on past awards (such as TEDF, CMAQ etc.).

Local Highway Funding

Local highway funding can come from a variety of sources, including transportation millages, general fund revenues, special assessment districts, or private funds. Locally-funded transportation projects that are not of regional significance are not required to be included in this plan. A review of city, village and township budget documents for communities within the SEMCOG region indicates many local governments are supplementing federal and state road funds with their own resources. Much of this revenue is being spent on projects not included in the plan. It is therefore assumed that locally generated funding shown in Vision 2050 is constrained to reasonably available revenues.

State Trunkline System

Michigan maintains an extensive network of highways across the state and within the Southeast Michigan Region. All highways with an "I," "M," or "US" designation (e.g., I-75, US-23, M-1), are part of this network, known as the State Trunkline System. The part of the State Trunkline System located in Southeast Michigan is comprised of thousands of lane-miles of roadway, hundreds of bridges and culverts, signs, traffic signals, safety barriers, sound walls, and other capital items that must be periodically repaired, replaced, reconstructed, or renovated. MDOT is responsible for the State Trunkline System and provided SEMCOG with financial information on the amount that the agency estimates will be expended for capital projects on the trunkline system during Vision 2050 period.

Innovative Financing Strategies

Several innovative financing strategies have been developed 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 receive credits through tolled facilities (after deducting facility expenses) to be used as "soft match," rather than using the usual match for federal transportation projects. States must 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 Michigan because of the four major crossings between Michigan and Ontario. Toll credits have also helped to partially mitigate the transportation funding shortfalls in Michigan, since non-federal funding is frequently insufficient to match all the federal funding apportioned to the state. Use of these credits is granted through MDOT.

State Infrastructure Bank (SIB)

Established in most states, including Michigan. Under the SIB program, a state can deposit a portion of its federal-aid highway funding into a revolving loan fund for transportation improvements. Loans are available at 3% interest and a 25-year term to public entities. Private and nonprofit entities developing publicly owned facilities can also apply.

Transportation Infrastructure Finance and Innovation Act (TIFIA)

This federal program 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 of the United States to fund finance projects at far more favorable terms than they would otherwise receive 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.

Bonding

Bonding is borrowing; 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. To bond, a borrower must pledge a reliable revenue stream for repayment, such as toll and future tax receipts.

Advance Construct (AC)

AC allows a community or agency to build a transportation project with its own funds (advance construct) and then be reimbursed with federal-aid highway funds in a future fiscal year (advance construct conversion). AC projects can also be programmed where the agency is reimbursed over a period of two or more years. AC allows for the construction of projects before federal-aid funding is available if the agency has the resources to build the project up-front.

Public-Private Partnerships (P3)

Public-private partnerships are becoming increasingly popular for infrastructure. 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, and construct and operate it, usually for a set period. The private-sector firm is usually repaid through toll revenue from the new facility.

Operations and Maintenance of the Federal-Aid Highway System

Capital costs 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 defined as those items necessary to keep the highway infrastructure functional for vehicle travel, other than capital costs (construction, reconstruction, repair, and rehabilitation of the infrastructure). Operations and maintenance include items such as snow and ice removal, pothole patching, rubbish removal, maintaining rights-of-way, maintaining traffic signs and signals, clearing highway storm drains, paying the electrical bills for streetlights and traffic signals, and other similar activities, as well as the personnel and direct administrative costs necessary to implement these projects. These activities are as vital to the smooth functioning of the highway system as good pavement.

Federal-aid highway funds cannot be used for operations and maintenance of the highway system. Since Vision 2050 only includes federally-funded capital highway projects (and non-federally-funded capital highway projects of regional significance), it does not include operations and maintenance expenses. 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 Vision 2050 period. This section of the Financial Plan provides an estimate for Southeast Michigan and details the method used to estimate these costs.

MDOT's current estimate of operations and maintenance (O&M) costs for one lane-mile of road is about $24,000 each year. Applying this estimate to the entire federal-aid-eligible road network in Southeast Michigan and using MDOT's annual rates of increase for anticipated future O&M costs, yields an annual median O&M cost for the entire system in Southeast Michigan of $217.6 million for the state-owned (trunkline) portion of the

network and $444.6 million for locally-owned roads on the federal-aid network. Over the entire 26-year period covered by Vision 2050, it's estimated that approximately $17.36 billion will be spent on operations and maintenance of the entire federal-aid-eligible road network in Southeast Michigan. This O&M funding is **in addition to** the amount for highway projects discussed in the next section of this chapter.

Fiscal Constraint of Highway Projects

Vision 2050 is fiscally constrained, meaning the cost of projects programmed in the plan do not exceed projected revenues reasonably expected to be available during the plan period. This is based on funding estimates provided to SEMCOG by MDOT for Local federal-aid highway projects. This is added to the estimated cost of routine MDOT trunkline highway capital projects through fiscal year 2050, and the cost trunkline projects in the Vision 2050 period, such as the I-94 Freeway Modernization. Funding for competitive sources such as Safety, CMAQ, TAP, and Local Bridge are likewise based on historic funding levels but are kept in their own categories in fiscal years where funds are not yet awarded. Thus, these funding categories are self-constrained.

Table 8 shows the fiscal constraint for highway projects. It shows that the amount available to program highway projects equals the amount programmed during the time horizon of Vision 2050. Funding has been aggregated to the federal, state, and local source levels.

Table 8

Fiscal Constraint of Highway Projects, *Vision 2050*

Estimated Available (Millions)	Programmed (Millions)
$27,137.5	$27,137.5

Note: *Amounts rounded to the nearest $100,000.*

The corresponding revenues for projects are included within Vision 2050 if the project contains federal funding or is non-federally funded but considered regionally significant. State or local matching funds, for federal sources are also included. Many State or locally funded projects for road repair or maintenance is not shown in the Vision 2050 project list; however, it is shown in the discussion of estimated costs to operate and maintain the federal highway system (see "Operations and Maintenance of the Federal-Aid Highway System").

Transit Funding

Federal-Aid Transit Funding

Federally generated revenue for transit comes from federal motor fuel taxes, just as it does for highway projects. Some of the federal motor fuel tax collected nationwide is deposited in the Mass Transit Account of the Highway Trust Fund (HTF). Federal-aid transit funding is like federal-aid highway funding in that there are several core programs where money is distributed on a formula basis and other programs that are competitive in nature. Brief descriptions of some of the most common federal-aid transit programs can be found on the Vision 2050 hub website.

Each fiscal year, the Federal Transit Administration (FTA) issues funding apportionments for states, urbanized areas, and/or individual public transit agencies, depending on the rules of each program. Transit agencies use this apportionment information to estimate the amount of federal- aid funding they will receive in that fiscal year, under the general oversight of MDOT's Office of Passenger Transportation (OPT). Current statewide procedures are to consider the federal amounts programmed into Vision 2050 by each public transit agency to be constrained to reasonably expected available revenues.

State Transit Funding

Most state-transit funding is derived from the same source as state highway funding, the state motor fuel tax, and vehicle registration fees. Act 51 stipulates that 10% of revenues into the MTF, after deductions, flow into the Comprehensive Transportation Fund (CTF). 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 for operating expenses, which are not eligible for federal-aid funding, except for certain, limited items.

MDOT OPT provides each transit agency with estimates of how much CTF funding it will receive and specifies the purpose(s) for which it can be used. For example, some distributed funds are used for local bus operations, while others are used to match federal funding, and yet other CTF funds can be used for a variety of other purposes. In keeping with the general procedures for federal transit funds, the state-generated transit funding amounts programmed into the RTP by each agency are constrained to reasonably expected available revenues.

Local Transit Funding

Major sources of locally-generated 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, in this case, the City of Detroit. Finally, several major transit agencies, including the Suburban Mobility Authority for Regional Transportation (SMART), the Ann Arbor Area Transportation Authority (AAATA), and Blue Water Area Transportation Commission (BWATC) receive funds from dedicated transportation millages. SMART receives the largest amount of funding from this source.

Locally generated transit funding amounts programmed into the RTP by each agency are considered constrained to reasonably expected available revenues.

Other Sources of Transit Revenue

Highway and transit projects reflected in the Vision 2050 are constrained to reasonably available revenues.

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 used to operate transit services. 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, stretching the resources available.

Fiscal Constraint of Transit Projects

As with highway projects, transit projects must be fiscally constrained to funding reasonably expected to be available during the period covered by Vision 2050. Table 9 shows the summary fiscal constraint for transit projects. It shows that the amount available to program transit projects equals the amount programmed for transit projects in Vision 2050. Funding has been aggregated to the federal, state, and local source levels.

Table 9

Fiscal Constraint of Transit Projects, *Vision 2050*

Estimated Available (Millions)	Programmed (Millions)
$10,886.4	$10,886.4

Note: *Amounts rounded to the nearest $100,000.*


DO
NOT
PASS

Chapter 7: Performance Measures and Projects

	Key Takeaways	Key Actions
2050 REGIONAL TRANSPORTATION PLAN VISION 2050	• SEMCOG sets targets for six National Transportation Performance Measures. • SEMCOG also monitors four public transportation performance measures for regional providers. • In 2022, SEMCOG's Executive Committee adopted safety performance for zero serious injuries and fatalities on Michigan roadways by 2050. • Vehicle emissions for particulat matter and nitrogen oxides are modeled to decrease by 2050.	Incorporate green infrastructure into transportation projects, explore innovative environmental solutions including plantings for freeway medians, and evaluate the environmental impact of road cleaning materials and electric vehicle charging station placements Adopt sustainable practices like using environmentally friendly materials, and develop resilience plans to mitigate climate change impacts, ensuring infrastructure preservation aligns with environmental stewardship goals.

Performance measures play a critical role in shaping Vision 2050, offering vital insights into the effectiveness of transportation system strategies. These measures are tailored locally to address the specific needs and goals for Southeast Michigan, while also aligning with broader national transportation objectives. By employing both local and national performance measures, we actively ensure that the transportation strategies not only cater to the unique requirements of our region but also actively contribute to the attainment of overarching national transportation goals.

As outlined in Chapter 2, the regional transportation planning process establishes the vision, policies, and actions. Transportation performance measures also add a framework from FHWA to further guide SEMCOG regional transportation partners towards project selections that support this framework and ideally progress towards the regional policies.

Performance Based Planning

Federal requirements promote performance-based planning, which emphasizes ongoing monitoring and evaluation of transportation plans, Vision 2050 included. Periodically adjustments and updates can be made to address any subsequently identified issues, emerging needs, and technologies like those outlined in Chapter 4.

National Performance Goals

Roads and Highways

FHWA identified six national transportation planning goals for roads and highways:

- **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 the performance of the transportation system while protecting and enhancing the natural environment.

Public Transportation

FTA established a Transit Asset Management rule identifying four performance areas for transit providers to track asset conditions and create plans for systematically 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.

National Transportation Performance Measures

Federal transportation legislation established a performance-based planning framework, performance measures, and target-setting requirements for states and regions. These are designed to focus the federal-aid program on national goals that address:

Safety

The Federal Highway Administration (FHWA) and National Highway Traffic Safety Administration (NHTSA) established three performance measures to measure safety. These measures are reported as five-year rolling averages:

- Number of fatalities
- Rate of fatalities per 100 million vehicle miles traveled (VMT)
- Rate of serious injuries per 100 million VMT
- Number of non-motorized fatalities and serious injuries.

Pavement and Bridge Condition

Pavement targets are set for:

- Percentage of pavements on the Interstate System in Good condition
- Percentage of pavements on the Interstate System in Poor condition
- Percentage of the non-interstate National Highway System in Good condition
- Percentage of the non-interstate National Highway System in Poor condition

The federal pavement performance measure uses a combination of the International Roughness Index (IRI), percent cracking, percent rutting, and percent faulting to indicate pavement condition.

The IRI is an automated road profiling system that measures the variation of a road's surface. While SEMCOG and Michigan use the Pavement Surface Evaluation and Rating (PASER) road condition rating system as a tool to indicate a road's structural integrity, other states use many other rating systems to track pavement conditions. IRI allows condition ratings to be both automated and comparable across states.

This performance measure applies to both the federal interstate system and the rest of the National Highway System (NHS), which includes principal arterials and other roads that are important to the nation's economy, defense, and mobility.

Bridge condition ratings are based on three bridge elements: the deck, the superstructure that supports the deck, and the substructure. The overall bridge condition rating is based on the worst rating across the three elements. Bridges are inspected regularly with bridges rated good or fair inspected every other year and bridges rated poor inspected every year. The bridge condition ratings are stored in the National Bridge Inventory (NBI).

This federal performance measure uses the NBI ratings for all bridges carrying the NHS, which includes the Interstates, principal arterials, and other roads that are important to the nation's economy, defense, and mobility. Non-NHS bridges are not included in this measure. This performance measure is also weighted by the overall deck area of individual bridges so that bridges with large decks will affect the performance measure more than bridges with smaller decks. SEMCOG's regional pavement condition performance measure is also based on data from the NBI, but since this federal performance measure is limited to the NHS and weighted by deck area, the regional and federal performance measures are not comparable.

System Reliability

Reliability performance measures use vehicle speed data to quantify the reliability of travel on Interstates and the non-interstate National Highway System (NHS). Two- and four-year targets are set for:

- The percentage of person miles traveled on the Interstate System that are considered reliable.
- The percentage of person miles traveled on the non-Interstate NHS that are considered reliable.

The two measures shown above express the percentage of person-miles traveled on roads that are reliable. These measures attempt to instruct travelers how often they can expect to travel in reliable conditions. A road is considered reliable when the difference between normal travel times (50th percentile) and congested travel times (80th percentile) is below 50%. In other words, a road segment that takes one minute to travel under normal conditions would be considered reliable if the time it takes to travel under congested conditions is less than one and a half minutes.

Freight reliability is assessed by a Truck Travel Time Reliability (TTTR) Index. This is used to determine the consistency or predictability in travel times for trucks on specific routes of road segments (FHWA). Reporting is divided into five peak hour travel time periods which include peak daytime periods, an overnight period, and weekend periods. The TTTR ratio is measured by the ratio of congested peak period travel time (95th percentile) and the normal peak period (50th percentile) for each segment on the interstate system. The highest TTTR value is used to determine the reliability of the Interstate system for truck traffic or freight reliability. SEMCOG establishes two- and four-year targets for the ratio of the congested period travel time to the normal period travel time, weighted by the length of the Interstate segment, for the entire Interstate system in the state.

Congestion Mitigation and Air Quality

The federal rules on performance management measures for Congestion Mitigation and Air Quality (CMAQ) require establishing performance targets every 2 and 4 years,

respectively. As these targets were first established in 2018, SEMCOG, in cooperation with MDOT, has updated the 4-year targets as required. Targets must be established for urbanized areas with populations greater than 200,000 with any part of a designated nonattainment or maintenance area for criteria pollutants. For the SEMCOG region, this includes the urbanized areas of Detroit, Ann Arbor, and Toledo, OH.

Three measures are established to assess the performance of the CMAQ program.

- On-Road Mobile Source Emissions: Total Emission Reductions
- Traffic Congestion Annual Hours of Peak Hour Excessive Delay Per Capita
- Traffic Congestion: Percent of Non-Single Occupancy Vehicle (SOV) Travel

On-Road mobile source emissions is an assessment of the effectiveness of the CMAQ program in reducing emissions from on-road motor vehicles. These measures are required for each criteria pollutant that is designated as nonattainment or maintenance, which for Southeast Michigan includes carbon monoxide (CO) and fine particulate matter ($PM_{2.5}$).

The Peak Hour Excessive Delay (PHED) measures the duration of severe congestion on freeways and arterials in Southeast Michigan. Data for this measure uses probe speed data from personal and vehicular connected devices. PHED is the cumulative time roadway segments are operating either below 20 miles per hour or below 60% of the posted speed limit. To have the measure be closer to the impact on an individual peak-hour traveler's life, the total cumulative delay for a road segment is divided by the number of vehicles traveling on that segment. PHED factors in both highway travel speeds and travel volumes.

Percent Non-Single Occupancy Vehicle (SOV) Travel measures the proportion of trips that use travel options that reduce vehicular trips through carpooling, vanpooling, transit, walking, biking, or telecommuting. Increasing the number of people choosing non-SOV travel helps reduce congestion and air pollution. Increasing non-SOV travel reduces the number of vehicles running in the region while providing travel alternatives to people who want to reduce solo travel and people without access to a private vehicle.

Table 10

SEMCOG Region National Planning Targets

National Planning Targets by Program Area	Baseline	2-Year Targets	4-Year Targets
Safety Performance			
Number Of Fatalities	410.4		406.4
Rate Of Fatalities (Per 100 million VMT)	0.976		0.956
Number of Serious Injury	2,126.8		2,108.8
Rate Of Serious Injuries (Per 100 million VMT)	5.029		5.009
Number Of Non-Motorized Fatalities and Non-Motorized Serious Injuries	376.0		366.0
Infrastructure Coordination			
Percent of Pavement Lane Miles on the Interstate in Good Condition	70.4%	59.2%	56.7%
Percent Of Pavement Lane Miles on Non-Interstate National Highway System (NHS) In Good Condition*	41.6%	33.1%	33.1%
Percent Of Pavement Lane Miles on The Interstate in Poor Condition*	1.8%	5.0%	5.0%
Percent Of Pavement Lane Miles on Non-Interstate NHS In Poor Condition*	8.9%	10.0%	10.0%
Percent of bridge deck area on the NHS in good condition	21.8%	15.2%	12.8%
Percent of bridge deck area on the NHS in poor condition	7.0%	6.8%	5.8%
Systems Performance (Reliability)			
Interstate Travel Time Reliability	97.1%	85%	85%
Non-Interstate Travel Time Reliability	94.4%	80%	80%
Truck Travel Time Reliability Index	1.31	1.60	1.60
Congestion Mitigation and Air Quality			
Detroit			
Peak Hour Excessive Delay (PHED)			18
Non-Single Occupancy Vehicle (SOV) Travel			15.5
On-Road Mobile Source Emissions for Carbon Monoxide (CO)		595 kg/day	1,191 kg/day
On-Road Mobile Source Emissions for Particulate Matter (PM2.5);		5,227 kg/day	10,455 kg/day
Ann Arbor			
Peak Hour Excessive Delay (PHED)			16 hours
Non-Single Occupancy Vehicle (SOV) Travel			29.7%
Toledo			
Peak Hour Excessive Delay (PHED)			7 hours
Non-Single Occupancy Vehicle (SOV) Travel			15%

Public Transportation
Transit Asset Management (TAM) refers to a strategic and systematic process for managing public transportation assets to maximize their performance, efficiency, and lifespan. Since transit providers vary widely with the type and scale of assets, they are instructed to individually create TAM 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.

Each transit agency is required to develop its own TAM plan and establish State of Good Repair (SGR) targets annually, reporting to the Federal Transit Administration's National Transit Database (NTD) if it owns, operates, or manages capital assets used in public transportation and receives federal financial assistance.

A transit agency's SGR target represents a measurable goal for managing the condition of assets, prioritizing resource allocation effectively to achieve and sustain assets in a state of good repair. Although SEMCOG does not own or operate transit assets, we collaborate with regional transit providers every four years to develop SGR targets for Southeast Michigan in coordination with the following transit providers:

- Ann Arbor Area Transportation Authority (TheRide)
- Blue Water Area Transit (BWATC)
- Detroit Department of Transportation (DDOT)
- Detroit Transportation Corporation (DTC); operates the Detroit People Mover
- Lake Erie Transit (LET)
- Livingston Essential Transportation Service (LETS)
- M-1 Rail; operates the Q-line in Detroit.
- Suburban Mobility Authority for Regional Transportation (SMART)

Regional State of Good Repair Targets

Since transit providers vary widely with the type and scale of assets, they individually establish SGR targets based on their asset profile and condition. The target-setting process for the SEMCOG region involves taking the total number of targeted assets and dividing it by the total number of assets in each respective category (rolling stock, equipment, and facilities). The FTA's default Useful Life Benchmark (ULB) was used in conjunction with the inventory data submitted to SEMCOG by transit providers. For each asset category, the performance measure is a characterization of the percentage of the number of assets that are not in a state of good repair. The data from the transit agencies on each of the categories of capital assets was used to approximate the regional SGR. Table 11

SEMCOG Region 4-Year Regional Transit Asset Management Targets

Table 11 shows Southeast Michigan's 4-year regional transit asset management targets established in 2024.

Table 11

SEMCOG Region 4-Year Regional Transit Asset Management Targets

Asset Category	Performance Measures	2024 Regional Target
Rolling Stock e.g., buses	Age: Percentage of revenue vehicles that have met or exceeded their Useful Life Benchmark (ULB)	25%
Equipment e.g., non-revenue vehicles and maintenance equipment	Age: Percentage of equipment that has met or exceeded their Useful Life Benchmark (ULB)	50%
Facilities e.g., administrative buildings and bus shelters	Condition: Percentage of facilities with a condition rating adequate or below on the FTA Transit Economic Requirements Model Scale	3%
Infrastructure e.g., Right-of-Way, Track, Traction Power, and Communication and Control	Percentage of track segments (by mode) that have performance restrictions. Track segments are measured to the nearest .01 of a mile	0%

While national transportation performance measures set a comprehensive benchmark, project selection in Southeast Michigan balances these goals with the diverse needs of our region. Collaboration with federal aid committees is central to this process, enabling the identification of projects that simultaneously advance national performance targets and support regional priorities.

Vision 2050 Projects

Vision 2050 serves as a blueprint for addressing Southeast Michigan's transportation challenges. Through data-driven assessments and stakeholder collaboration, it identifies specific system needs and guides project development that enhances safety, mobility, equity, and accessibility.

Vision 2050 provides a framework of specific goals and objectives for improving Southeast Michigan's transportation system, backed by a regional vision introduced in Chapter 2.

A key activity in developing Vision 2050 is to identify and prioritize significant future transportation projects for the region. Vision 2050 includes a program of projects that can be completed to improve the transportation system within the constraints of expected revenues in the future.

In April 2023, SEMCOG initiated a call for projects for regional transportation agencies, which includes MDOT, county road agencies, cities and village and transit agencies. Funding within the RTP represents federal funds, so transportation agencies need to be eligible to receive federal aid to qualify. Pavement projects can only be submitted on federal aid eligible roads. To submit future transportation projects that address system issues and align with regional planning goals beyond projects already included in the regional TIP which covers the first two years of the Vision 2050 RTP. SEMCOG provided stakeholders with comprehensive data resources and guidance, including a webinar on RTP goals and expectations.

Vision 2050 includes more than 570 mappable projects in Southeast Michigan representing nearly $7 billion in transportation investments as shown in Figure 48. The complete Vision 2050 project list can be found on the Vision 2050 hub website.

Figure 48
Vision 2050 Projects by Type, Mappable Projects.

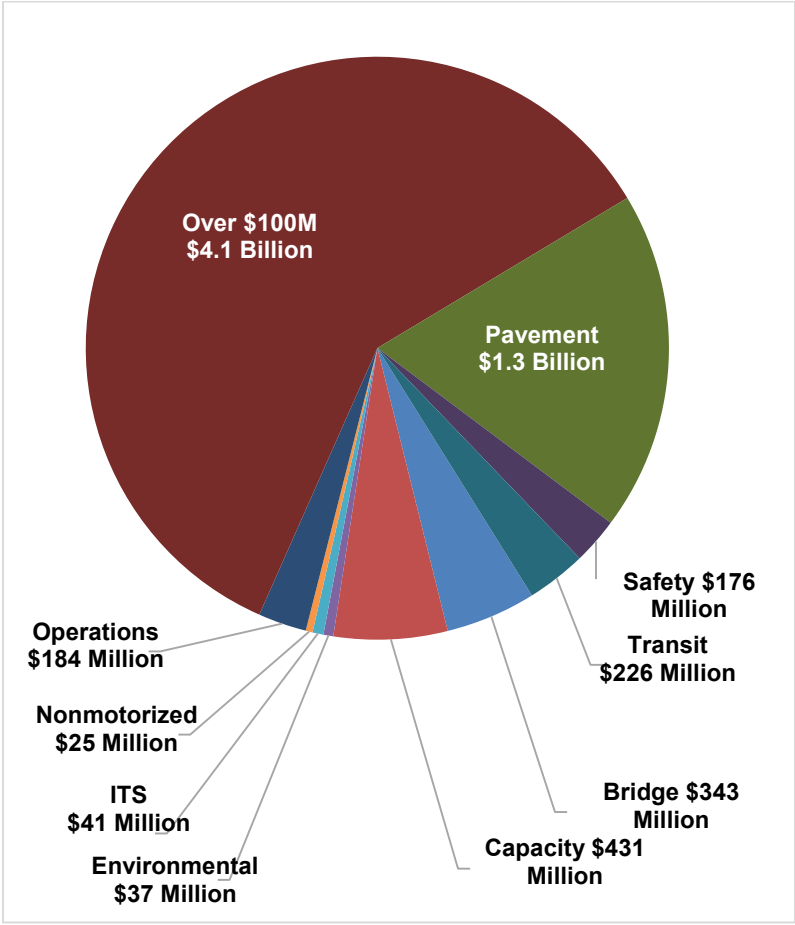


Figure 49 shows each Vision 2050 project that has a specific location. Because much of the expected revenues are planned closer to the time of construction or delivery, these funds are planned as general program account totals. A general program account is a grouping of similar projects that are routine and do

not involve reconstruction, capacity improvements and/or the estimated work does not exceed $10 million. The GPA charts through 2050 reflect how these funds are estimated to be allocated by work over the course of the plan. The total within the GPA categories through 2050 is $31 billion. The total project commitment including the mapped projects is $38 billion.

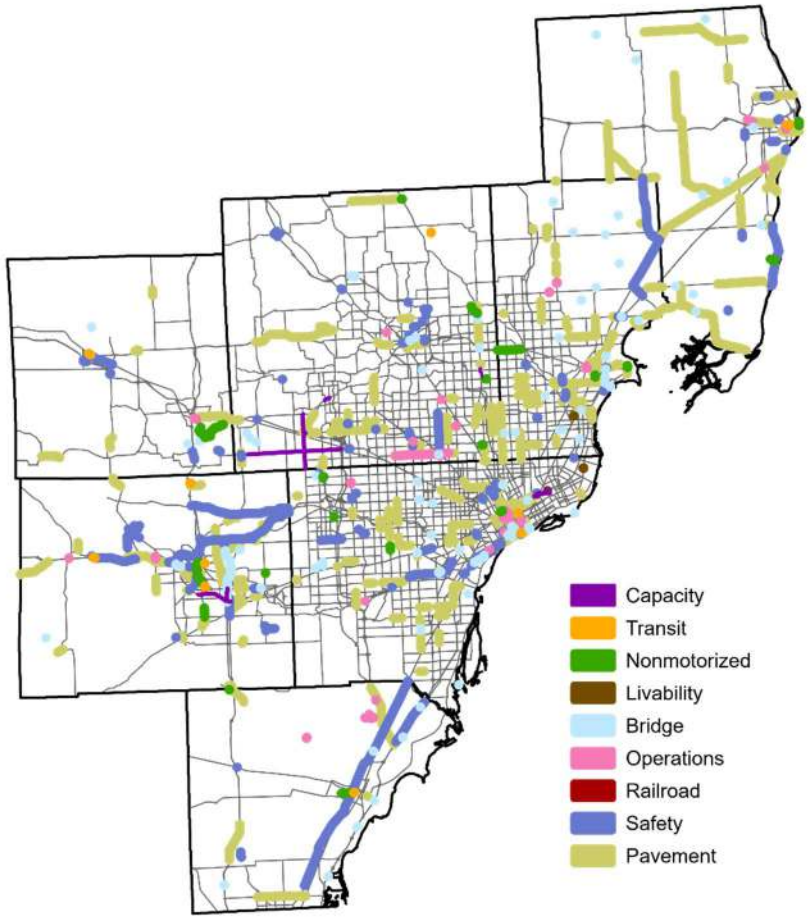
Table 12

Vision 2050 General Program Account Project Funding

Highway General Program Account	
Pavement	$7,687,053,132
Safety/Operations	$9,204,952,530
Bridge	$3,691,682,056
Total	**$20,583,687,718**
Transit General Program Account	
Operations	$4657816165
Capital	$5,901,363,909
Total	**$10,559,180,074**
All GPA Total	**$31,142,867,792**

Figure 49

Vision 2050 Mappable Projects



Forecasting Future Travel

Developing Vision 2050 requires an understanding of *how* travel will likely change over the life of the plan and how these changes affect the policies and actions included in the RTP. SEMCOG develops and maintains a Travel Demand Forecast Model (TDFM) that predicts *how*, *where*, and *when* people will travel in the future. The model has three primary data inputs based on the base years 2019 and 2020:

- 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 socioeconomic 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.

The TDFM offers a powerful tool for predicting the effects of transportation system changes on travel patterns across the region. The model facilitates informed decision-making. For Vision 2050, the TDFM proved invaluable in several key areas:

- **Projecting Travel Shifts** - Analyzing projected changes in vehicular and transit travel patterns between 2025 and 2050, factoring in the potential impact of projects proposed within the 2050 RTP.
- **Quantifying Congestion** - Assessing the severity and duration of traffic congestion on major regional roadways.
- **Ensuring Equitable Access** - Analyzing how transportation investment decisions in the RTP might affect accessibility to jobs, healthcare, shopping, and educational services for different population groups to support prioritizing an equitable distribution of benefits.
- **Supporting Air Quality Compliance** - Contributing data to transportation conformity analysis ensuring vehicle emissions from proposed RTP projects comply with air quality standards and help achieve national goals.
- **Environmental Justice Focus** - Providing analysis to support environmental justice by ensuring disadvantaged population groups do not bear a disproportionate burden of negative impacts resulting from transportation investments.

Table 13

Vision 2050 TDFM Results

Out Put	Base Year: 201/2020	Forecast: 2025	Forecast: 2050
Vehicle Trips	15,676,421	15,952,598	16,822,338
Transit Boardings	172,818	166,531	170,752
Truck Trips	2,191,572	2,297,515	2,391,006
VMT	130,253,028	133,083,041	141,144,217
VHT	4,285,65	4,410,804	4,842,967
Average Speed	30.39	30.17	29.14

Key TDFM Observations

Based on the TDFM, the SEMCOG area is forecast to see increases in vehicle and truck trips and miles and hours traveled by 2050. These increases are aligned with the increases in

population and employment shown in the demographic forecast section of Chapter 3.

Transit boardings are forecast to decrease by 2050 based on the future year transit network which is based on current routes. These outputs underscore the importance of setting policy in the region and encouraging the expansion and implementation of public transit services in the region.

Air Quality Conformity

The federal Clean Air Act mandates that any road or transit project that receives federal money and is included in regional transportation plans or improvement programs must align with the air-quality objectives set in state-level air quality plans. This alignment process is known as Air Quality Conformity. The main goal of Conformity is to make sure that the projects planned will not lead to new air quality problems, make current problems worse, or slow down the improvement of air quality to meet national standards.

The U.S. Environmental Protection Agency (EPA) has set National Ambient Air Quality Standards (NAAQS) for six main pollutants: ozone, nitrogen dioxide, carbon monoxide, lead, sulfur dioxide, and particulate matter. The EPA then labels each area as either *attainment* or *nonattainment* for each pollutant, depending on whether the local air quality meets or exceeds the standards. If a place improves its air quality to fall below the standard, it's then called a *maintenance* area.

Pollutant Analysis

In Southeast Michigan, any area labeled as *nonattainmen*t or *maintenance* for carbon monoxide, particulate matter, or ozone must undergo an air quality conformity analysis. Here's a brief overview of the current air quality situation in Southeast Michigan for each of these pollutants.

Carbon Monoxide

For carbon monoxide, a section of Southeast Michigan that includes parts of three counties—Macomb, Oakland, and Wayne—was initially marked as not meeting the air quality standards in the early 1990s. But since 1995, this area has met the required standards and, in 1999, it was officially recognized as a "maintenance" area for this pollutant, meaning it continues to meet the clean air requirements. The 20-year maintenance period expired in 2019, so now the region is not required to perform the conformity analysis for this pollutant.

Fine Particulate Matter ($PM_{2.5}$)

The entire seven-county area of Southeast Michigan was once classified as not meeting the air quality standards for fine particulate matter ($PM_{2.5}$) set in 1997 and 2006. However, after Michigan put its State Implementation Plan (SIP) into action to address this pollutant, the air quality improved significantly. Since 2009, all the air quality monitors in the region have recorded $PM_{2.5}$ levels that are well below the set standards. As a result, in 2013, the U.S. EPA changed the region's status to a "maintenance area" for these $PM_{2.5}$ standards. By 2015, Southeast Michigan had also achieved the more stringent 2012 annual $PM_{2.5}$ standard, and the EPA withdrew the 1997 annual standard in 2016. Now, the region only needs to perform conformity analysis for the 24-hour $PM_{2.5}$ standard.

Ozone

Originally, the whole region of Southeast Michigan didn't meet the 1997 ozone air quality standards, which required levels to be below 0.08 parts per million (ppm). After Michigan effectively put its plan for reducing ozone into action, the area's status was upgraded to "maintenance" in 2009. By 2012, the region was meeting the updated 2008 ozone standards of 0.075 ppm. In August 2018, the EPA identified the entire seven-county region as not meeting the even stricter 2015 ozone standard of 0.070 ppm. However, since the implementation of Michigan’s SIP for this pollutant, all air monitors have been measuring levels below the standards. Therefore, on May 19, 2023, the EPA

redesignated the region to "attainment/maintenance area" for the 2015 ozone NAAQS. This report includes the findings from the eight-hour ozone conformity analysis for the region.

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.

Below are the findings and process for the air quality analysis conducted for Vision 2050, as well as detailed documentation on the modeling process used to conduct this analysis.

Results of Transportation Conformity Analysis

24-Hour Fine Particulate Matter (PM2.5)

Table 14 shows the results of the 24-hour fine particulate matter ($PM_{2.5}$) 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 $PM_{2.5}$ standard, the analysis uses daily emissions inventories for the season in which most 24-hour $PM_{2.5}$ violations occur. Research by the Michigan Environment, Great Lakes, and Energy (EGLE) and SEMCOG's Air Quality Study (SEMAQS) group found that $PM_{2.5}$ 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.

On-road 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 $PM_{2.5}$ and nitrogen oxide (NO_x) emissions for specific future years do not exceed these budgets. The data in Table 14 show that forecasted emissions of both $PM_{2.5}$ and NO_x are well below the established budgets for all analysis years. Thus, conformity is demonstrated.

Table 14

Results of Daily $PM_{2.5}$ Conformity Analysis - Budget Emissions Test

Analysis Year	$PM_{2.5}$ (Tons per winter weekday)	NO_x (Tons per winter weekday)	Regional Winter Weekday VMT (millions)
Conformity Budget - 2025 Interim Year	16	365	NA
2025	2.85	62.08	121.74
2030	2.34	39.39	124.02
2035	2.11	26.15	125.85
2040	1.99	21.27	127.19
2050	1.95	18.52	128.98

Ozone

Table 15 shows the results of the ozone conformity analysis for SEMCOG's 2015 ozone "attainment/maintenance" 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 maintaining the 2015 ozone NAAQS through 2035 in the region.

The data in Table 15 show that forecasted emissions in the SEMCOG region for the two pollutants causing ozone formation - volatile organic compounds (VOC) and nitrogen oxides (NOx) - are below the approved mobile source emissions budgets of 2015 ozone for all analysis years. Thus, conformity is demonstrated.

Table 15

Results of 8-Hour Ozone Conformity Analysis - Budget Emissions Test

Analysis Year	Emissions (Tons per summer weekday) VOC_5	Emissions (Tons per summer weekday) NO_x	Regional Summer Weekday VMT (millions)
Conformity Budget – 2025 Interim Year	47.86	104.35	NA
2025	41.52	61.94	145.72
2030	32.27	38.61	148.45
Conformity Budget 2035 Maintenance Year	44.67	102.41	NA
2035	27.86	24.18	150.65
2040	25.00	18.51	152.25
2050	21.51	15.27	154.39

Projects Included in the Conformity Analysis

This analysis included all capacity-related projects proposed for SEMCOG's 2050 RTP, plus those already in SEMCOG's 2045 RTP with their open-to-traffic dates set in future years. A complete list of the projects included in this analysis can be found on the Vision 2050 hub website.

Michigan Transportation Conformity Interagency Workgroup

On August 21, 2023, the Michigan Transportation Conformity Interagency Workgroup (MITC-IAWG) reviewed proposed Vision 2050 projects. The group identified which projects would require air quality modelling. A summary of this meeting, along with the list of projects reviewed is available on the Vison 2050 hub website.

The *Ozone and Fine Particulate Matter (PM2.5) Conformity Analysis* report was provided to each member of the MITC-IAWG for review and comment. The report is available on SEMCOG's website.

Environmental Justice

Investments in transportation can often be both beneficial and adverse, and those effects can be concentrated in specific communities. Environmental justice mandates that these impacts be equitably shared across different population groups, with particular attention to those groups that have historically been underserved. In addressing this critical issue, SEMCOG evaluates how the transportation planning activities and Vision 2050 will affect these key population segments.

The groups focused on these considerations include minority populations such as African Americans, Asian Americans, Native Americans, and Hispanics, as well as low-income households, senior citizens, and households that do not have access to a car. To integrate environmental justice effectively into the transportation planning process, SEMCOG has established three key principles:

- Guarantee meaningful participation by the target populations in making decisions about regional transportation.
- Evaluate whether the target populations are experiencing disproportionately high and negative effects from federal programs, such as increased travel times.
- Ensure that the target populations benefit fairly from the federal funds allocated to transportation projects.

Several quantitative measures were applied to assess the impacts of the RTP. While these measures cannot consider every possible factor of environmental justice, SEMCOG believes they properly identify where significant environmental justice issues are present. When applied at the regional level, the measures indicated the 2050 RTP creates no environmental justice problems. It is important to keep in mind that this analysis was done at a regional, transportation system-wide level. Additional refinement will be made as individual projects go through project development.

Environmental Sensitivity

Transportation infrastructure components, including roads, bridges, trails, transit routes, and railways, along with system users and vehicles, influence the physical environment. Recognizing the importance of these impacts is crucial during the planning, design, construction, and maintenance of the transportation network. SEMCOG has conducted a regional evaluation to anticipate the potential environmental consequences of proposed transportation projects shown in

Table 16. Additionally, it has formulated a set of guidelines aimed at lessening these impacts.

SEMCOG defined and identified environmentally sensitive resources in the region using a buffer analysis to assess the likelihood of planned transportation projects impacting these resources. Ideally, all possible impacts on environmentally sensitive areas would be avoided, however, 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 does not mean transportation projects impacting the environment should not be implemented. Rather, the goal is to balance transportation needs with environmental protection and construct and maintain a transportation system that minimizes negative impacts and, where possible, increases appropriate public access to environmental resources. Where impacts cannot be avoided, mitigation activities should be considered. SEMCOG promotes good planning practices via a series of guidelines for consideration by road and transit implementing agencies.

Table 16

SEMCOG Region Environmental Sensitivity

Project Type	Number of Projects Potentially Impacting Resources										
	Water Resources	Wetlands	Flood Prone Areas	Groundwater Resources	Woodlands	Parks & Rec Areas	Historic Sites	Cemeteries	Heritage Routes	Historic Bridges	Non-Motorized Facilities
Bridge	29	20	23	1	46	10	2	3	2	3	10
Congestion – Capacity	1	1	1	0	1	0	0	0	0	0	0
Congestion – Non-Capacity	0	0	0	0	0	0	0	0	0	0	0
Nonmotorized	4	3	4	1	5	3	2	0	0	0	2
Pavement	134	123	73	20	175	46	23	17	9	4	39


WARNING
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239

Chapter 8: Implementation

	Key Takeaways	Key Actions
2050 REGIONAL TRANSPORTATION PLAN VISION 2050	• Vision 2050 includes seven policies to support transportation system priorities. • The plan outlines several strategies for action-oriented collaboration and implementation.	Enhance transportation agencies' ability to leverage funding from multiple sources, including public, private, and federal grants. Explore additional funding sources for transportation projects including targeted millages and encouraging legislation for new funding sources like tolling for transportation facilities and regional tax policies.

Policies and Actions

Policies – Policies are guiding principles that establish goals and set a course for decision-making.

Actions – Actions are the specific steps and initiatives taken to achieve the goals outlined in the regional policies. The actions listed in this plan are not an exhaustive list. SEMCOG and stakeholders may develop additional actions that support the goals of the adopted policies.

As demonstrated throughout this plan the region's transportation plan encompasses a vast, complex, multimodal system. While SEMCOG does not own these assets, but as the MPO plays a critical role. SEMCOG convenes stakeholders to develop a shared vision for the system through our long-range planning process and conduct public outreach regarding infrastructure policies.

Vision 2050 policies and actions, outlined in the following pages, were crafted through extensive stakeholder and public engagement and directly address key transportation issues. Transportation partners, including MDOT, county road commissions, regional and local transportation providers, local governments, and various private sector groups, can leverage these policies and actions to inform their own processes and implementation plans.

As we move into the Transportation Improvement Program for FY 2026 to 2029, these policies and actions will also create a framework for prioritization and project selection within the region.

Education

Educate and foster collaboration among local governments, transportation agencies, utility providers, and residents to enhance knowledge about and efficiency of the transportation system.

Actions
Strengthen communication and collaboration among communities, transportation agencies, and stakeholders, including utility providers, to ensure integrated and cohesive transportation planning and decision-making processes.
Continue to enhance regular meetings and working groups involving local governments, transportation agencies, utility providers, and private sector stakeholders to encourage collaborative initiatives and knowledge sharing.
Leverage a variety of media outlets, including newspapers, television, and social media platforms, to disseminate updates on transportation projects and issues promptly and effectively to a broad audience.
Engage the community actively in understanding upcoming transportation projects through comprehensive education campaigns.
Foster public participation in transportation planning and increase awareness of infrastructure and maintenance costs.
Promote the integration of housing in transportation planning. Develop tools to support communities to plan for transit-oriented development.
Ensure inclusivity and accessibility in outreach efforts by considering individuals with disabilities and including materials in multiple languages that reflect the communities being served.

Equity

Ensure equitable access regardless of age, race, gender, ethnicity, national origin, age, physical or cognitive ability, or income.

Actions
Commit to continuous improvement through regular accessibility audits of transit infrastructure, ensuring reliability, efficiency, and universal accessibility, particularly for individuals with physical or cognitive disabilities.
Prioritize equity by identifying and mitigating transportation barriers, developing fare structures, and offering specialized services to ensure inclusive access for all community segments including the aging population.
Foster a culture of collaboration among multi-jurisdictional stakeholders and engage the community in transportation planning to ensure solutions are reflective of the region's diverse needs.
Establish and enhance multi-modal transit hubs with essential amenities to promote seamless connectivity and active transportation options, catering to diverse commuter needs.
Leverage technology and innovation to enhance transportation accessibility and inclusivity, ensuring a modern, user-friendly, and equitable transportation experience.
Adopt and enforce safety and security measures across all transportation modes, and encourage mode shifts to reduce vehicle crashes, emissions, and address equity, safety, and climate goals.
Establish clear metrics for assessing and reporting progress towards equitable transportation access, ensuring transparency, accountability, and continuous improvement in achieving equity objectives.
Implement SEMCOG's Bicycle and Pedestrian Mobility Plan for Southeast Michigan which aims to develop a comprehensive active transportation system that meets the needs of people of all ages and abilities.

Equity

Ensure equitable access regardless of age, race, gender, ethnicity, national origin, age, physical or cognitive ability, or income.

Actions
Ensure ADA access to walking, biking, and transit facilities and where possible promote universal design standards.
Support the RTA Regional Transit Master Plan and other regional transit provider plans

Funding

Increase funding and broaden local options to ensure adequate resources and coordination for meeting regional transportation needs to achieve fiscal sustainability.

Actions
Enhance transportation agency's ability to leverage funding from multiple sources, including public, private, and federal grants.
Increase infrastructure coordination among all local stakeholders.
Analyze transportation needs, resource gaps, develop solutions, and implement strategies.
Increase flexibility for funding options between transit and other modes.
Maximize funding for investments by developing data objectives and project prioritization.
Increase communication of available funding among SEMCOG and local stakeholders and educate legislators on the importance of long-term stable funding for transportation.
Explore additional funding sources for transportation projects including targeted millages and encouraging and encouraging legislation for new funding sources like tolling for transportation facilities and regional tax policies.
Explore and utilize diverse funding and financing mechanisms, including federal, state, and regional grants, public-private partnerships, and bonds, to secure necessary resources for committed infrastructure preservation efforts.

Preservation

Use asset management practices, technology, and cost-effective transportation solutions to preserve infrastructure.

Actions
Establish a comprehensive asset management program to assess, manage, and monitor the condition and performance of infrastructure assets including roads, bridges, and transit systems, employing data collection systems such as sensors for informed maintenance and rehabilitation prioritization.
Implement maintenance and rehabilitation strategies, aligned with asset management goals, to prolong infrastructure lifespan, ensure cost-effectiveness, and focus on preventive measures for sustainable asset preservation.
Facilitate adopting emerging technologies and explore innovative construction techniques to enhance infrastructure durability, longevity, and efficiency, while preparing communities for modern infrastructure development without adding undue capacity.
Adopt sustainable practices like using environmentally friendly materials, and develop resilience plans to mitigate climate change impacts, ensuring infrastructure preservation aligns with environmental stewardship goals.
Engage with the public, stakeholders, and local governments to gather input, align preservation efforts, and ensure a holistic consideration of preservation needs across all modes of transportation, fostering a collaborative approach to infrastructure preservation.
Establish key performance indicators to systematically measure, evaluate, and report the success of infrastructure preservation efforts, ensuring transparency, accountability, and continuous improvement.
Establish a comprehensive asset management program to assess, manage, and monitor the condition and performance of infrastructure assets including roads, bridges, and transit systems, employing data collection systems such as sensors for informed maintenance and rehabilitation prioritization.

Resiliency

Integrate environmental protection into the transportation system to improve community health and infrastructure resilience.

Actions
Prioritize investments in stormwater infrastructure and greenways to mitigate flooding, reduce transportation-related greenhouse gas emissions, and improve air quality to promote public health.
Enhance the resilience of the transportation system to climate change and extreme weather events, with a particular focus on mitigating adverse effects in disadvantaged communities through measures such as implementing early warning systems and increasing storm sewer capacity.
Incorporate green infrastructure into transportation projects, explore innovative environmental solutions including plantings for freeway medians, and evaluate the environmental impact of road cleaning materials and electric vehicle charging station placements.
Uphold environmental justice by ensuring funding and prioritization for areas historically burdened by pollution, refining Environmental Justice/Equity Screening (ES/EJ) analyses during the Transportation Improvement Program (TIP) Amendment Process.
Engage community stakeholders to understand and address their environmental and transportation concerns and launch educational campaigns to promote the benefits of transit, non-single occupancy vehicle (SOV) modes of transportation, and environmental preservation in relation to transportation planning.
Promote a balanced approach to greenfield, infill, and transit-oriented development while enhancing connectivity and walkability between different land uses to foster more sustainable and accessible communities.
Foster coordination among utility providers, road commissions, and agencies to establish and adhere to standardized practices for contractors. Prioritize maintenance and infrastructure longevity planning, considering environmental factors such as freeze/thaw cycles to ensure a durable and efficiently managed transportation infrastructure.

Safety

Increase safety for all travelers, especially for the most vulnerable road users.

Actions
Design roadway environments to mitigate human mistakes and account for injury tolerances, to encourage safer behaviors, and to facilitate safe travel by the most vulnerable users.
Expand the availability of vehicle systems and features that help to prevent crashes and minimize the impact of crashes on both occupants and non-occupants.
Build safe, comfortable, and complete networks for all modes, including pedestrians, cyclists, and transit riders.
Complete the ongoing effort to establish TIP prioritization processes for each FAC, including a safety prioritization component.
Increase communication and collaboration among transportation agencies and communities to identify funding opportunities for safety projects, encourage consistency in design across jurisdictions, and coordinate safe detour routes for all modes during construction projects.
Use access management principles to maintain and improve infrastructure for all modes.
Promote safer speeds in all roadway environments through a combination of thoughtful, context-appropriate roadway design, targeted education and outreach campaigns, and enforcement.
Encourage safe, responsible behavior by people who use our roads and create conditions that prioritize their ability to reach their destination unharmed.
Continue development and promotion of education materials, such as SEMCOG's Safe Streets public education initiative.
Support legislative efforts to improve behavior (e.g., speed and red-light camera enforcement, rear seatbelt use, motorcycle helmet use, license screening and testing).

Safety

Increase safety for all travelers, especially for the most vulnerable road users.

Actions
Target engineering, education, and enforcement efforts in priority locations identified in the Southeast Michigan Transportation Safety Plan.
Enhance the survivability of crashes through expedient access to emergency medical care, while creating a safe working environment for vital first responders and preventing secondary crashes through robust traffic incident management practices.
Implement the Southeast Michigan Transportation Safety Action Plan, using the Safe System Approach to prioritize actions that help eliminate traffic fatalities and serious injuries.

Shared Prosperity

Promote a thriving regional economy by facilitating seamless movement of goods, efficient trade connections, enhancing labor mobility, and fostering tourism and local placemaking.

Actions
Connect population centers in the region to the places they live with infrastructure and services that support a high quality of life.
Support efforts to develop local neighborhoods and business districts as dynamic and diverse places to live, work, and visit.
Promote accessible multi-modal transportation to natural and cultural resources that support opportunities for recreation, tourism, and local businesses.
Improve domestic and international freight mobility and efficiency through technology, coordination, and infrastructure enhancements.
Support enhancing energy infrastructure to successfully accommodate emerging technology sectors in the region.
Enhance overall transportation system performance and efficiency for economic growth and improved logistics.
Maintain a balance between freight movement and community needs, while mitigating conflicts between all modes of transportation.
Pursue funding opportunities and partnerships for the development of complete street projects that enhance connections between local neighborhoods, business districts, and regional transportation networks.
Encourage transit-oriented development to maximize access to multi-modal transportation supporting placemaking and local business growth.

The Road Ahead

Southeast Michigan's diverse communities, dynamic urban centers, and natural resources rely on a comprehensive and equitable transportation network. Some challenges can harm the future transportation system if left unaddressed. Ensuring safety for everyone who uses the system, supporting the evolving needs of an aging population, adopting emerging technologies, and promoting equitable access across the region regardless of age, income, and physical or cognitive ability are issues that demand innovative strategies and collaboration. Vision 2050 serves as a roadmap to navigate these challenges by shaping a resilient transportation network that integrates mobility options, fosters economic vitality, and enhances the quality of life for people in Southeast Michigan.

Through strategic planning and stakeholder engagement, Vision 2050 lays the groundwork for a sustainable, efficient, and inclusive transportation system that meets the needs of current and future generations.

SEMCOG's transportation planning is shaped by the continuous, cooperative, and comprehensive aspects of transportation planning:

- Continuous Recognizing transportation needs are constantly changing, SEMCOG will regularly update Vision 2050 updates to sustain relevance should shifts in demographics, emerging technologies, and funding dynamics occur.
- Cooperative Collaborating with stakeholders across transportation agencies, government, private entities, and – crucially – the public is vital to success. We champion community engagement and transparent decision-making to build trust and achieve widespread buy-in.
- Comprehensive Multimodal projects will focus on the intricate links between transportation, land use, social equity, environmental stewardship, and economic opportunity.

Vision 2050 and the Transportation Improvement Program

Project level changes to Vision 2050 will be made through the Transportation Improvement Program (TIP). The TIP is a short-term document that lists projects planned for construction, with identified funding sources. Like Vision 2050, the TIP must also be financially constrained with identified funding for each project. SEMCOG conducts five amendments to the TIP each year.

Corridors can be key gateways within our communities. Corridor planning is critical prior to funding a reconstruction project to ensure the transportation investment reflects community and regional objectives. SEMCOG and local stakeholders can use the policies included in Vision 2050 to inform corridor plans, transit alternative assessments, and enhance placemaking strategies in local communities.

Corridor plans can also provide a critical review of the assets that are in the corridor. With the understanding that everything we build ultimately has a price tag for maintenance down the road, reviewing speeds and capacities to determine if the number of lanes are needed. Reviewing corridor access points and land uses are important to determine if improvements can be made prior to any reconstruction of the corridor. Community policies promoting multimodal accessibility or placemaking can guide corridor plans improving connectivity and livability. Vision 2050 priorities can also support multi-modal alternatives to allow walking, biking and transit use to be more viable transportation options.

Project Prioritization

Regional transportation needs are greater than available funding. Also, many funding sources come with specific rules about what types of projects can use the funds, so developing the transportation system, infrastructure and transit, requires prioritizing projects aligned with the regional goals of the seven policies identified for Vision 2050.

For example, upon setting regional safety targets of reducing fatalities and serious injuries on Southeast Michigan roadways to zero by the year 2050, described in detail in Chapter 3, SEMCOG has initiated incorporating safety considerations into the project selection process. Ultimately the goal is to integrate each of the seven policies directly into the decision-making framework.

Integrating safety prioritization is a deliberate effort to prioritize projects that enhance safety on the transportation system, regardless of mode. Through collaboration with FACs, county road agencies, local officials, the foundation for a project selection process that fosters safer transportation infrastructure, tools, and best practices across the region is being set.

Moving forward, our commitment to incorporating safety considerations into the project selection process will serve as a model for integrating the remaining policy objectives into our decision-making framework. By aligning project selection with our policy goals and engaging stakeholders in the process, we aim to create a transportation system that not only enhances safety but also promotes equity, resilience, sustainability, and prosperity for all residents of Southeast Michigan

Infrastructure Coordination

The transportation planning process outlined in Chapter 1 provides a guide from policy development to project implementation and performance monitoring. To successfully achieve the goals of Vision 2050, there must be enhanced collaboration between various stakeholders. Chapter 3 introduced infrastructure coordination, aligning the efforts of road agencies, public works departments, and utility providers.

Figure 50 demonstrates how this coordination can be integrated into the regional planning process. Introducing infrastructure coordination before project selection and programming allows for identifying potential projects to be coordinated prior to inclusion in the TIP.

This infrastructure coordination step will strengthen communication to improve decision-making processes. It will also provide a mechanism for more discussion of impervious surfaces and the future resiliency of the transportation system.

Future Plans and Initiatives

Vision 2050 provides a framework for significant initiatives and strategies that will improve regional mobility, enhance quality of life, and support resilient development. Key initiatives to be undertaken following the plan's adoption include:

SEMCOG Regional Freight Plan

A detailed regional freight plan will be developed to promote efficient goods movement, improve connection and regional coordination, and optimize infrastructure. This plan will identify freight corridors, assess bottlenecks, and propose solutions to streamline the movement of goods and support shared prosperity.

Access to Core Services

The existing Access to Core Services plan will be updated to expand equity analysis in transportation access. This update will identify underserved areas and populations, explore solutions to bridge equity gaps, and mitigate accessibility issues to essential services and opportunities.

Figure 50
Infrastructure Coordination Cycle

Environmental Sensitivity Analysis
Existing environmental sensitivity analyses will be thoroughly reviewed and revised to provide a detailed inventory of environmentally critical areas. This update will support environmentally responsible decisions during project design.

Environmental Justice Analysis
Revised environmental justice analyses, including Justice 40 activities introduced in Chapter 4, will prioritize fairness and equal protection for all communities. These analyses will help identify communities that might be disproportionately impacted by transportation projects and explore mitigations to uphold environmental justice principles.

Greenhouse Gas Analysis
Ongoing updates to our Greenhouse Gas (GHG) analyses will assess transportation-related emissions. This data will support the implementation of strategies to foster sustainable transportation practices.

These initiatives represent a strategic path to realize the desired outcomes of Vision 2050. Through intentional implementation, including community collaboration, the transportation policies and priorities adopted in the plan will be key to creating a transportation system that serves our region efficiently, equitably, and sustainably.

Vision 2050 Interactive Hub

The Vision 2050 Hub is a key tool for adding transparency, collaborative planning, and successful implementation of this RTP. Key features of the hub include streamlined access to plan information, engagement opportunities, maps, and a repository of data on various transportation topics. To support policy implementation, the plan is to incorporate performance measure tracking and analysis functions as relevant datasets are refined and updated. This dynamic platform exemplifies our commitment to data-driven decision-making and a transportation system shaped by meaningful public participation.

Maintaining the Vision

Vision 2050 is designed to be a living document plan meant to be responsive to the changing needs of Southeast Michigan. As populations and travel plans shift over time and technology rapidly transforms the region, this plan should remain adaptable and responsive. To remain relevant and effective, Vision 2050 policies and actions will be monitored and adjusted over time through the Transportation Coordinating Council and Executive Board. Updates to policies, actions, projects, and any annual reporting will be posted to SEMCOGs website and the Vision 2050 hub for public access.

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