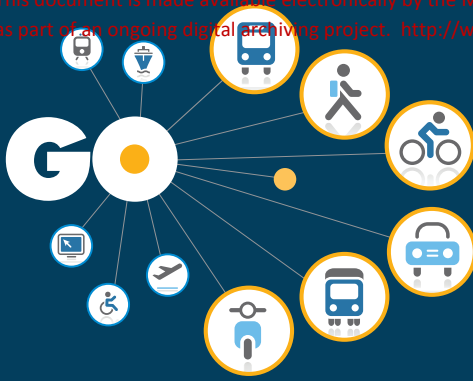


Minnesota **GO**
A Collaborative Vision
for Transportation



20-Year State Highway Investment Plan 2018-2037



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January 2017

Dear People of Minnesota,

I am pleased to share with you the Minnesota 20-Year State Highway Investment Plan. This plan is the result of extensive collaboration during the past two years between the Minnesota Department of Transportation and residents, stakeholders and partners throughout Minnesota. It was updated along with the Statewide Multimodal Transportation Plan. MnDOT received over 12,000 responses from Minnesotans during the joint public outreach process. I want to thank everyone who took the time to participate both online and in-person and provide input on the plan.

MnSHIP directs capital investment for Minnesota's state highway system over the next twenty years. This fiscally constrained plan identifies investment priorities given current and expected funding. MnSHIP describes how MnDOT will use capital investments to repair, replace and improve the 12,000-mile state highway system. The plan also includes an estimate of the investment needs for the highway system based on the costs required to meet performance-based targets and other key system goals. MnDOT takes into account many factors in developing MnSHIP, including federal and state laws, MnDOT policy and current and projected conditions of the state highway system.

MnSHIP reflects the challenging reality of transportation funding and investment in Minnesota. The state highway system is aging. Much of the system was originally constructed during the buildout of the interstate system between the 1950s and the 1980s, and is now reaching the end of its service life. It will require increased capital investment and additional maintenance in the years ahead. As part of the MnSHIP process, MnDOT staff forecasted that the department will have approximately \$21 billion to invest in state highways over the next twenty years, compared to approximately \$39 billion in estimated needs. This results in an unmet need of \$18 billion.

The 20-year investment direction established in MnSHIP focuses on maintaining the existing state highway system while making limited mobility investments. This approach reflects both MnDOT and stakeholder input and meets key requirements and agency commitments. It also continues a shift for MnDOT from building to maintaining the system. Despite this level of investment in maintaining the existing state highway system, the condition of the system is expected to deteriorate over the next twenty years.

The plan also reflects a commitment to accessibility for the state highway system. MnDOT believes that the transportation system must be accessible and safe for users of all abilities and incomes. To further that goal, MnSHIP increased the funding for accessible pedestrian infrastructure so that all state highways will be substantially compliant with the Americans with Disabilities Act no later than 2037. Under previous funding levels, compliance was expected to take more than fifty years.

The success of Minnesota's transportation system depends on the coordinated efforts of many public and private providers, and the investment priorities outlined in this plan provide a framework for those efforts. MnDOT will continue to involve residents, stakeholders and partners in the implementation of this plan and in future policy and investment decisions. Together, we can maintain and build a multimodal transportation system that achieves the Minnesota GO Vision to maximize the health of people, the environment and our economy.

Sincerely,



Charles A. Zelle
Commissioner

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Executive Summary

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THE PURPOSE OF MNSHIP

The **20-Year Minnesota State Highway Investment Plan** directs capital investment for Minnesota's state highway system. The plan must identify investment priorities given current and expected funding. It is updated every four years, as required by Minnesota Statute. This MnSHIP update spans the 20-year planning period from 2018 to 2037.

The Minnesota Department of Transportation takes into account many factors in developing MnSHIP. The plan prioritizes future investments to address the widening gap between highway revenues and construction costs. MnSHIP also considers federal and state laws, MnDOT policy, and current and expected future conditions on the state highway system. These factors are described in more detail in **Chapter 2, "Key Factors and Assumptions."**

MnSHIP describes how MnDOT will use capital investments to repair, replace, and improve the state highway system. The plan does not address how MnDOT funds the operation of the system or day-to-day maintenance.

RELATIONSHIP TO MNDOT'S PLANS AND PROGRAMS

MnSHIP is part of a "family of plans" that connects vision and policy direction for transportation in Minnesota to how MnDOT selects projects and makes improvements on the state highway system. The **Statewide Multimodal Transportation Plan** describes statewide objectives and strategies that help MnDOT and its partners make progress toward the **Minnesota GO 50-Year Vision**. MnSHIP links policies and objectives in the Minnesota GO 50-Year Vision and the Statewide Multimodal Transportation Plan with capital investments on the state highway system.

Investment Category Descriptions

MnDOT invests in the state highway system through various types of capital improvement projects. Some projects enhance the condition of existing infrastructure, while others add new infrastructure to the system. MnDOT tracks capital investment in highways by investment categories. Investment categories are components of projects. A single MnDOT project can include investment from multiple different investment categories. The 2013 version of MnSHIP identified 10 investment categories. This MnSHIP update includes four additional investment categories. The individual categories are separated into five major investment objective areas as illustrated in **Figure ES-1**.

Figure ES-1: MnSHIP Investment Categories and Objective Areas

SYSTEM STEWARDSHIP	TRANSPORTATION SAFETY	CRITICAL CONNECTIONS	HEALTHY COMMUNITIES	OTHER
<ul style="list-style-type: none"> Pavement Condition Bridge Condition Roadside Infrastructure Condition Facilities Jurisdictional Transfer 	<ul style="list-style-type: none"> Traveler Safety 	<ul style="list-style-type: none"> Twin Cities Mobility Greater MN Mobility Freight Bicycle Infrastructure Accessible Pedestrian Infrastructure 	<ul style="list-style-type: none"> Regional + Community Improvement Priorities 	<ul style="list-style-type: none"> Project Delivery Small Programs

20-Year Revenue Projection

During the next 20 years, MnDOT estimates that \$21 billion in revenue will be available for capital investment on the state highway system – approximately \$1 billion per year. This estimate assumes that no new major sources of revenue will be introduced and that the majority of MnDOT’s future revenues will originate from the four main revenue sources (federal aid, state gas tax, tab fees and motor vehicle sales tax).

MnDOT anticipates that the actual amount of funding it receives from the State Trunk Highway Fund will increase by approximately 2 percent per year over the next 20 years. However, two key trends will make it increasingly difficult for MnDOT to sustain current conditions on the state highway system:

- Construction costs are growing more quickly than revenues: Expected revenues will lose buying power as construction costs continue to grow at an annual rate of 4.5 percent.

- Revenue growth continues to be slow: Vehicles are becoming more fuel efficient and vehicle miles travelled has remained flat over the last decade.

Summary of Needs

In developing its assumptions for MnSHIP, MnDOT projected the investments necessary to meet state highway transportation needs through 2037. This need was determined by the costs required to meet performance-based targets and other key system goals, such as advancing the state's economic vitality and supporting Minnesotans' quality of life. The total need for the Minnesota state highway system is calculated to be approximately \$39 billion over 20 years. MnDOT estimates it will have \$21 billion to invest in the state highway system over the same time period, resulting in an \$18 billion funding gap. **Figure ES-3** shows the distribution of the \$39 billion need by investment category. This level of investment would ensure that the state highway system meets all federal and state performance requirements and makes substantial progress toward realizing the Minnesota Go Vision. It would also allow MnDOT to effectively manage its greatest risks in each investment category.

Figure ES-2: Comparison of Investment Needs and Available Revenue

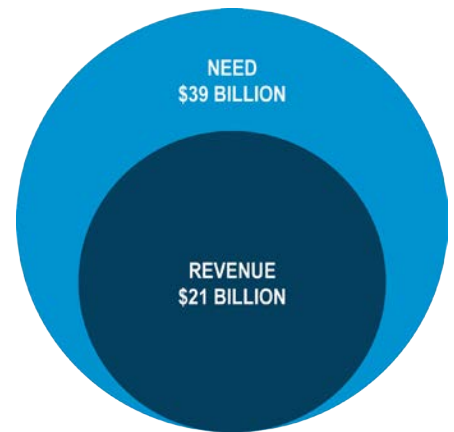
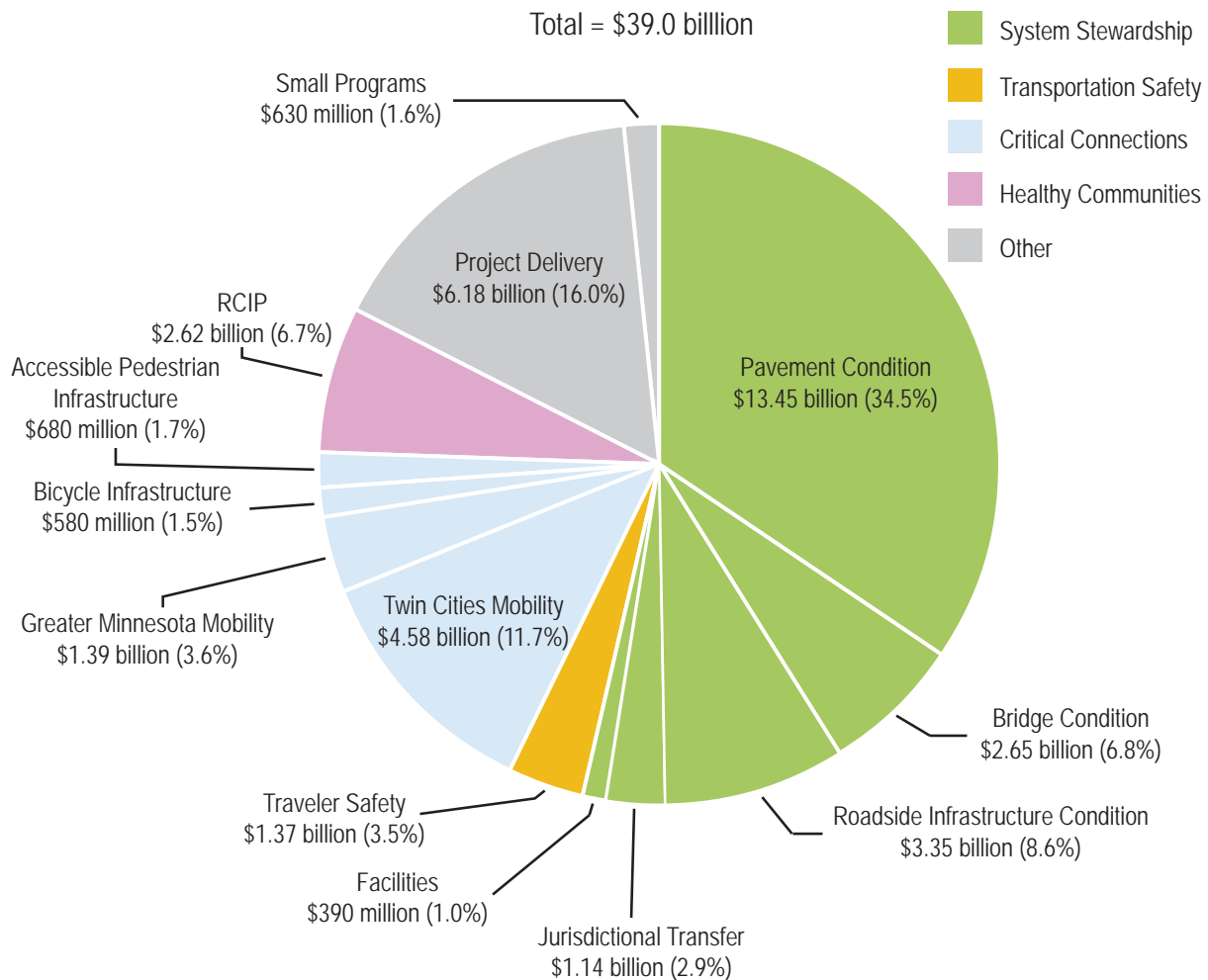


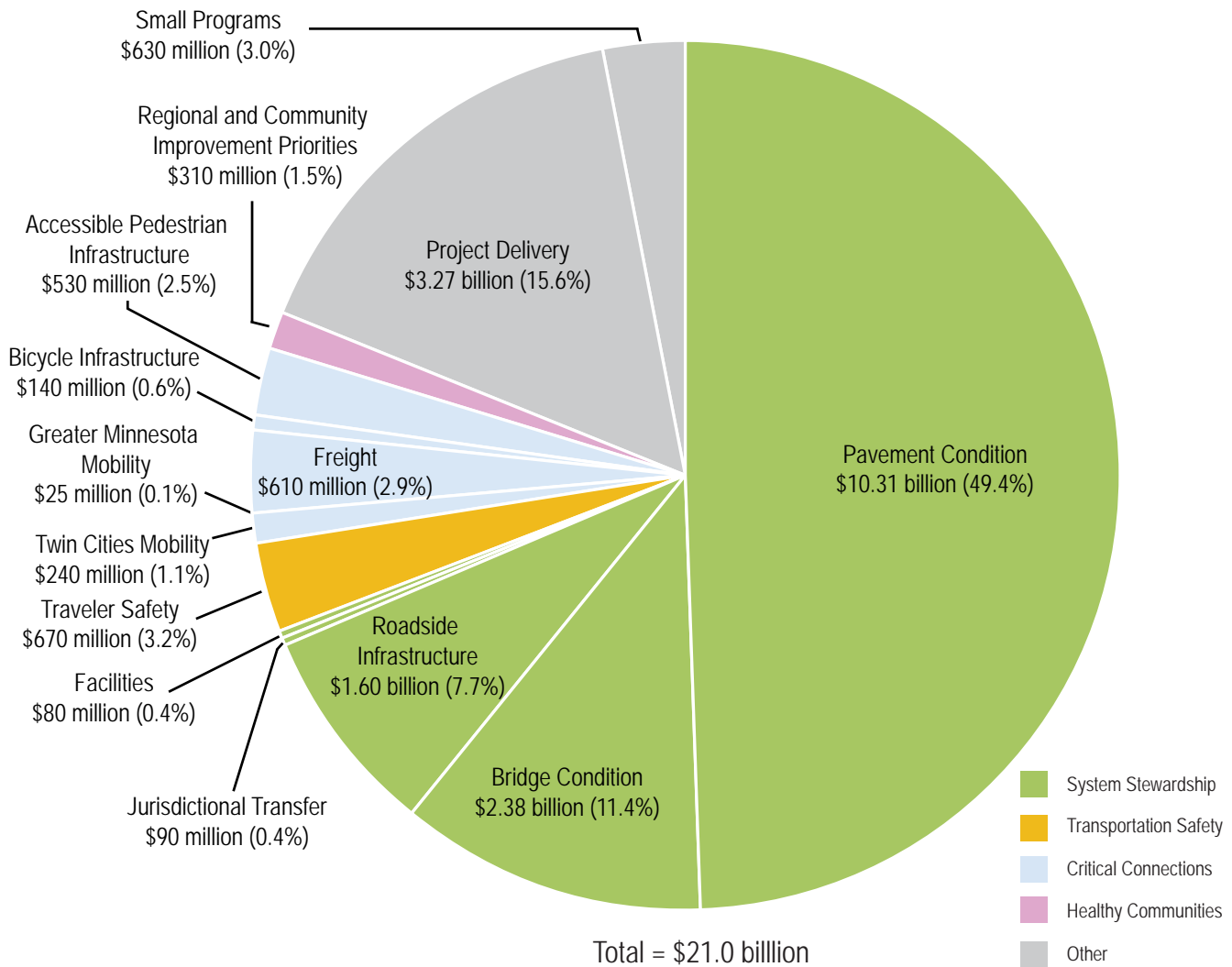
Figure ES-3: Transportation Needs During the Next 20 Years (by Investment Category)



Investment Summary

The 20-year investment direction established in MnSHIP focuses on maintaining the existing state highway system while making limited mobility investments. This approach reflects both MnDOT and stakeholder input and meets key requirements and agency commitments. It also continues a shift for MnDOT from being a builder of the system to the maintainer and operator of the system. The investment direction does not impact the projects already developed and programmed in Years 2018 through 2021. The priorities identified in this plan will be reflected in investments and projects starting in 2022. **Figure ES-4** shows the distribution of expenditures through all years of the plan. Information on the investment direction in MnSHIP can be found in **Chapter 5, "Investment Direction."**

Figure ES-4: 20-Year Capital Highway Investment Direction



BIGGEST STRENGTHS

The investment direction makes progress toward goals in all four investment objective areas. MnDOT's priorities reflect the public's input that calls for a diversified approach, as well as one that prioritizes maintenance of the transportation system. Outcomes for each investment area include:

- **System Stewardship:** MnDOT focuses a majority of investment on maintaining the condition of roads, bridges, and roadside infrastructure. Federal targets for pavement and bridge condition are likely to be met.
- **Transportation Safety:** MnDOT will continue to focus on lower cost, proactive treatments aimed at preventing fatalities and serious injuries.
- **Critical Connections:** MnDOT commits to achieving substantial compliance with the Americans with Disabilities Act no later than 2037. MnDOT also commits to planned mobility investments in the Twin Cities metro area through 2023.
- **Healthy Communities:** Through the Transportation and Economic Development program, investments will be made to address local concerns through partnerships, design add-ons, and a few stand-alone projects to support economic competitiveness and quality of life.

BIGGEST DRAWBACKS

The investment approach offers a limited response to increasing infrastructure and multimodal needs. Several challenges remain, including:

- **System Stewardship:** Conditions of roads, bridges, and roadside infrastructure decline on NHS and non-NHS routes.
- **Transportation Safety:** Only a limited number of locations with a sustained crash history will be addressed.
- **Critical Connections:** The number and scope of mobility improvements decreases substantially, potentially reducing the ability to maintain reliable travel times in the Twin Cities area and Greater Minnesota. Resources are not available to address growing areas of the state.
- **Healthy Communities:** The investment direction limits MnDOT's ability to address local concerns.

PLAN OUTCOMES

MnDOT will make progress in all investment areas, but not all performance targets will be met (**Figure ES-5**). Pavement and bridge conditions are expected to worsen between 2018 and 2037. Travel time reliability in the Twin Cities is expected to decline due to projected regional growth.



Figure ES-5: Total Investments, Outcomes and Current Condition

INVESTMENT CATEGORY	OBJECTIVE AREA	CURRENT CONDITIONS (2017)	PROJECTED OUTCOME(S) IN 2037	TOTAL INVESTMENT (2018-2037)
Pavement Condition	System Stewardship	<p>Meet MnDOT targets and Governmental Accounting Standards Board 34 thresholds for NHS and Non-NHS pavement condition.</p> <ul style="list-style-type: none"> • Interstate: 1.9% poor • NHS: 3.0% poor • Non-NHS: 4.0% poor 	<p>NHS and Non-NHS pavement condition worsen. Interstate condition worsens but meets federal target. Maintain GASB 34 threshold on the NHS.</p> <ul style="list-style-type: none"> • Interstate: 4.0% poor • NHS: 8.0% poor • Non-NHS: 18.0% poor 	\$10.31 billion
Bridge Condition	System Stewardship	<p>Meet GASB 34 thresholds for NHS and Non-NHS for bridge condition. Only Non-NHS meets MnDOT targets for bridge condition.</p> <ul style="list-style-type: none"> • NHS: 4.5% poor • Non-NHS: 1.3% poor 	<p>Non-NHS bridge conditions worsen, while NHS bridge condition is maintained. GASB 34 thresholds are met but NHS thresholds are not.</p> <ul style="list-style-type: none"> • NHS: 5.0% poor • Non-NHS: 7.0-8.0% poor 	\$2.38 billion
Roadside Infrastructure Condition	System Stewardship	<p>Roadside infrastructure condition does not meet targets.</p> <ul style="list-style-type: none"> • Culverts: 13.0% poor • Deep Storm Water Tunnels: 24.0% poor • Overhead Sign Structures: 30.0% poor 	<p>The condition of all roadside infrastructure assets will be maintained. Condition targets for culverts, deep storm water tunnels and overhead sign structures will not be met.</p> <ul style="list-style-type: none"> • Culverts: 14.0-15.0% poor • Deep Storm Water Tunnels: 23.0-24.0% poor • Overhead Sign Structures: 25.0% poor 	\$1.60 billion
Jurisdictional Transfer	System Stewardship	<p>2,653 miles of misaligned roads. Transfer of misaligned roads will continue.</p>	<p>MnDOT will transfer over 900 miles of roadway between the state and local agencies.</p>	\$90 million
Facilities	System Stewardship	<p>6.0% of rest areas in good condition and nearly half in poor condition. Repair or replacement of weigh scales is not keeping pace with need.</p>	<p>6.0% of rest areas will remain in good condition. Weigh scale and weigh station replacement will not keep pace resulting in outdated or inoperable sites.</p>	\$80 million
Traveler Safety	Transportation Safety	<p>Safety improvements are made proactively with low cost/high benefit projects. Total fatalities and serious injuries have plateaued after decade-long decline.</p>	<p>Safety improvements made at a reduced rate. There is limited ability to address locations with high sustained crash rates. Total fatalities and serious injures may see an increase.</p>	\$670 million
			TOTAL	\$21.0 BILLION

INVESTMENT CATEGORY	OBJECTIVE AREA	CURRENT CONDITIONS (2017)	PROJECTED OUTCOME(S) IN 2037	TOTAL INVESTMENT (2018-2037)
Twin Cities Mobility	Critical Connections	Congestion remains relatively flat. MnPASS express lanes and spot mobility improvements are completed where needed.	Travel time reliability likely to decrease. Investments made in two MnPASS corridors and six spot mobility improvements between 2018 and 2023.	\$240 million
Greater Minnesota Mobility	Critical Connections	A few corridors of mostly urban highways have decreased reliability during peak travel times.	Corridors likely to see decreased travel time reliability. 6-10 low-cost capital improvements are completed.	\$25 million
Freights	Critical Connections	-	-	\$610 million
Bicycle Infrastructure	Critical Connections	The condition of the state bicycle network is maintained and new bicycle improvements are being made where needed.	Reduced investment in new improvements and maintenance of existing bicycle infrastructure leads to deterioration of bicycle network.	\$140 million
Accessible Pedestrian Infrastructure	Critical Connections	Progress is being made towards ADA-compliant pedestrian infrastructure. Non-ADA pedestrian improvements are limited. • Sidewalks not ADA compliant: 54.0%	Infrastructure on the pedestrian network will be substantially compliant with standards. Some non-ADA projects will increase pedestrian access.	\$530 million
Regional and Community Improvement Priorities	Healthy Communities	Economic development and quality of life improvements are being made through partnerships and project upgrades.	MnDOT will respond to 2-5 economic development opportunities per year through the TED program.	\$310 million
Project Delivery	Other	Invest the amount necessary to deliver projects in the other categories.	Invest the amount necessary to deliver projects in the other categories.	\$3.27 billion
Small Programs	Other	-	Continue to invest in small programs such as off-system bridges and historic properties.	\$630 million
			TOTAL	\$21.0 BILLION

RELATIONSHIP OF MNSHIP INVESTMENT DIRECTION TO PROJECT SELECTION

MnSHIP is not a project-specific plan. The investment direction established in MnSHIP is by investment category. MnDOT's districts select projects that follow the MnSHIP investment direction and help make progress toward MnDOT goals and objectives. These projects are presented in the

10-Year Capital Highway Investment Plan. The first four years of the CHIP make up the **State Transportation Improvement Program**. Projects in the STIP are well-defined and typically considered a commitment. The projects identified in the final six years of the CHIP are not commitments; they are anticipated to change as project development progresses and needs are better understood. The CHIP is updated annually to address new project-level information as well as infrastructure conditions and system performance. MnDOT districts are responsible for designing, delivering, and constructing selected projects.

Projects are implemented annually through the STIP which documents the projects that MnDOT will fund and deliver over the upcoming four years. Annual updates of the STIP allow MnDOT to make timely changes that incorporate new investment decisions based on new plan strategies, investment priorities, or system performance. Further information on project selection can be found in **Chapter 5, "Investment Direction"** and **Appendix E: Financial Summary**.

PRIORITIES FOR ADDITIONAL FUNDING

During the second round of the public outreach process, MnDOT asked stakeholders what their priorities would be should MnDOT receive any additional funding. The public was asked to prioritize which categories they would like to see MnDOT invest in, beyond what is being invested through the proposed investment direction. MnDOT senior leadership and key staff were also asked their preference for investing additional revenue. **Figure ES-6** on the following page shows the ranking of stakeholder and MnDOT priorities for additional funding. Stakeholders and the public generally agreed that any extra funding MnDOT receives for capital improvements on the state highway network should be spent maintaining and repairing MnDOT's existing assets. For the public, poorly maintained pavements and bridges were seen as a safety issue. Both groups believed investment in capacity or mobility improvements are priorities but disagreed on the preferred investment category. There was also agreement that main street improvements are important.



Figure ES-6: 20-Year Capital Highway Investment Direction



Based on input from the public and transportation stakeholders and MnDOT's own internal priorities, MnDOT would prioritize spending additional funding on:

- Maintaining and repairing existing assets on the state highway system
- Strategically improving mobility and reliability at high priority locations on the National Highway System
- Reconstructing Main Streets

Such activities would allow MnDOT to limit the number of bridges and miles of pavement in poor condition, bringing the highway system closer to Interstate and NHS performance targets. Additional funding would increase MnDOT's ability to address deteriorating culverts, signage and other supporting infrastructure. MnDOT would also be able to address more urban reconstruction, or Main Street, projects. These projects allow local governments to improve amenities and facilities along the state highway. Mobility improvements in the Twin Cities area would be consistent with the Met Council's Transportation Policy Plan, such as constructing MnPASS lanes, and follow the strategies for Twin Cities Mobility listed in MnSHIP. Mobility improvements in Greater Minnesota would focus on the locations with the greatest performance issues and focus on low-cost/high benefit improvements. Completing these additional priority projects would allow MnDOT to cost-effectively meet long term performance targets and further advance the Minnesota GO Vision for transportation.

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20-Year State Highway Investment Plan

Chapter 1

PLAN OVERVIEW

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PLAN OVERVIEW

Minnesota's 12,000-mile state highway system plays a key role in supporting the state's economy and quality of life. Businesses rely on the system to move their goods and raw materials throughout the state. In addition, state highways connect Minnesotans to other transportation networks and to state, national and global markets.

The Minnesota Department of Transportation is responsible for constructing, operating, and maintaining this system. The **20-Year Minnesota State Highway Investment Plan** is MnDOT's vehicle for deciding and communicating capital investment priorities for the system for the next 20 years. MnSHIP is updated every four years and was last completed in 2013. This chapter provides an overview of Minnesota's state highway system and describes the role of MnSHIP in managing this important transportation network.

The key messages of Chapter 1 are:

- MnSHIP identifies capital investment priorities based on projected funding for Minnesota's 12,000-mile state highway system.
- MnDOT updates MnSHIP every four years to reflect changes in policy, transportation needs and trends, and revenue.
- MnSHIP connects vision and policy direction for transportation in Minnesota to project selection on the state highway system.
- Investments on the state highway system are allocated into 14 categories that make up five investment areas: System Stewardship, Transportation Safety, Critical Connections, Healthy Communities, and Other.



The Purpose of MnSHIP

MnSHIP directs capital investment for Minnesota's state highway system. The plan must identify investment priorities given current and expected funding. It is updated every four years, as required by Minnesota statute. This MnSHIP update spans the 20-year planning period from 2018 to 2037.

MnDOT takes into account many factors in developing MnSHIP. The plan prioritizes future investments to address the widening gap between highway revenues and construction costs. MnSHIP also considers federal and state laws, MnDOT policy, and current and expected future conditions on the state highway system. These factors are described in more detail in **Chapter 2, "Key Factors and Assumptions."**

MnSHIP describes how MnDOT will use capital investments to repair, replace, and improve the state highway system. The plan does not address how MnDOT funds the operation of the system or day-to-day maintenance. While decisions made in MnSHIP can clearly affect the operations and maintenance of the system, MnDOT is only in the beginning stages of explaining these impacts more effectively. This MnSHIP update starts to show how the lack of revenue for construction projects affects the experience of the user as well as MnDOT's operations budget.

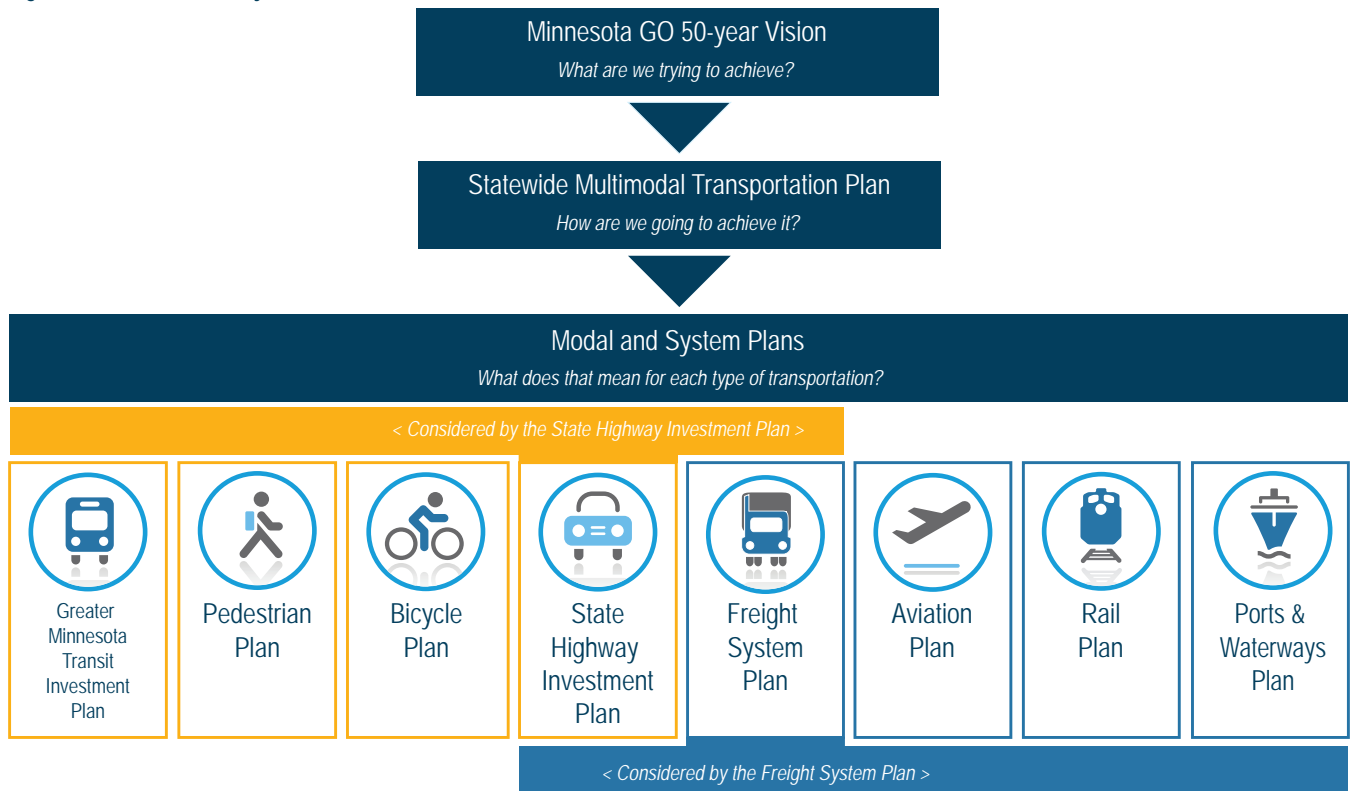
RELATIONSHIP TO MNDOT'S PLANS AND PROGRAMS

MnSHIP is part of a "family of plans" that connects vision and policy direction for transportation in Minnesota to how MnDOT selects projects and makes improvements on the state highway system. The "family of plans" is shown in **Figure 1-1**. Together the plans serve as a framework for implementing a multimodal transportation system throughout Minnesota.

MnDOT updates the **Statewide Multimodal Transportation Plan** every four years. The plan describes statewide objectives and strategies that help MnDOT and its partners make progress toward the **Minnesota GO 50-Year Vision**. The SMTP is about more than just roadways and more than just MnDOT. However, MnDOT uses the SMTP objectives and strategies to inform a number of modal and system plans. These plans include MnSHIP as well as the [State Aviation System Plan](#), the [Statewide Bicycle System Plan](#), the [Statewide Freight System Plan](#), the [Statewide Ports & Waterways Plan](#), the [State Rail Plan](#), the [Greater Minnesota Transit Investment Plan](#), Statewide Pedestrian Plan and a collection of supporting plans. These modal and system plans are updated every four to six years. Some help to set specific investment direction, others focus more on general policy guidance, and some do both.

MnSHIP is a system investment plan because it sets investment direction for the state highway system. MnDOT has used performance-based planning to develop MnSHIP for more than ten years. As a performance based plan, MnSHIP uses measures and targets to assess system performance, identify needs, and develop investment priorities. Since MnSHIP is limited to existing and projected funding, the need for investments to be driven by performance-based criteria is increased. MnSHIP links policies and objectives in the Minnesota GO 50-Year Vision and the Statewide Multimodal Transportation Plan with capital investments on the state highway system.

Figure 1-1: MnDOT Family of Plans



Relationship of MnSHIP Investment Direction to Project Selection

Figure 1-2: Policy to Projects



Guided by the Minnesota GO Vision and the Statewide Multimodal Transportation Plan, MnSHIP's investment priorities are set through an extensive planning process.

At the beginning of this process, technical work groups met to discuss current and projected conditions for state highways. MnDOT used performance measures and technical expertise to evaluate how different highway investments might advance the Minnesota GO Vision and the Statewide Multimodal Transportation Plan as well as system performance targets. MnDOT developed alternative investment approaches to solicit input from the public, local government transportation officials, and MnDOT staff on investment priorities. MnDOT used this input to set the investment direction for the state highway system for the next 20 years.

MnDOT's districts select projects that follow the MnSHIP investment direction and help make progress toward MnDOT goals and objectives. These projects are presented in the [10-Year Capital Highway Investment Plan](#). The first four years of the CHIP make up the [State Transportation Improvement Program](#). Projects in the STIP are well-defined and typically considered a commitment. The projects identified in the final six years of the CHIP are not commitments because they are anticipated to change as project development progresses and needs are better understood. The CHIP is updated annually to address new project-level information as well as infrastructure conditions and system performance. MnDOT districts are responsible for designing, delivering, and constructing selected projects.

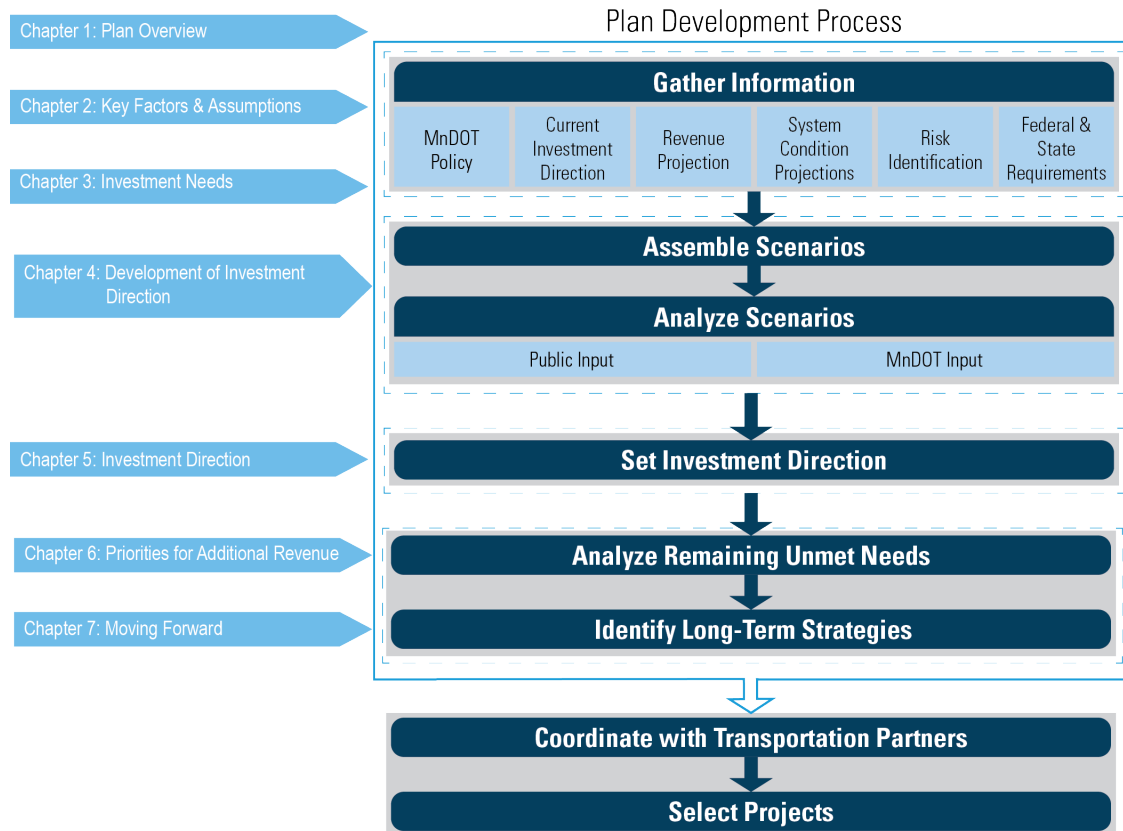
MnDOT districts work closely with a broad range of stakeholders through **Area Transportation Partnerships**. These partnerships provide a collaborative decision-making process for the selection of local projects that are recommended to receive federal funds. In addition, ATPs provide a local perspective on the district's list of programmed projects in the STIP.

Projects are implemented annually through the STIP which documents the projects that MnDOT will fund and deliver over the upcoming four years. Annual updates of the STIP allow MnDOT to make timely changes that incorporate new investment decisions based on new plan strategies, investment priorities, or system performance. MnDOT's high-level project selection process is shown in **Figure 1-2** and further information on project selection can be found in **Chapter 5, "Investment Direction"** and **Appendix E: Financial Summary**.

Organization of Chapters

The chapters in this plan are based on the steps in the plan's development process, presented together in **Figure 1-3**. The first step in the MnSHIP planning process involves gathering information from various sources. **Chapter 2: Key Factors and Assumptions** covers the state and federal legislative requirements for MnSHIP as well as current system conditions and revenue

Figure 1-3: MnSHIP Chapters and Development Process

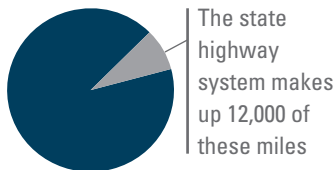


available for the plan. **Chapter 3: Investment Needs** describes the amount of money needed to meet performance targets and key objectives for each investment category.

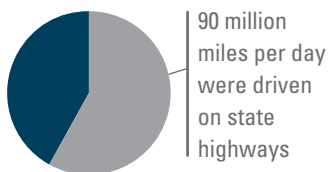
The second step in the MnSHIP process involves developing investment scenarios and selecting a preferred scenario. Three scenarios were developed and presented to the public and transportation stakeholders during public outreach. The details of this process are described in **Chapter 4: Development of Investment Direction**.

The third step in the MnSHIP planning process is setting the investment direction. Once the results from public outreach were analyzed, MnDOT gathered input from internal staff and developed an investment direction for MnSHIP. This direction describes how MnDOT is going to invest in the state highway system for the next 20 years. The details of this investment direction

There are more than 141,000 miles of roadways in Minnesota



In 2015, more than 161 million miles per day were driven on Minnesota's roads



are presented in [Chapter 5: Investment Direction](#).

The fourth step in the MnSHIP process is assessing the impacts and outcomes of the investment direction. [Chapter 6: Priorities for Additional Revenue](#) identifies gaps between the MnSHIP investment direction and desired outcomes and it identifies priorities for investment should additional revenue be made available. [Chapter 7: Moving Forward](#) identifies strategies to maximize the benefits of MnDOT's investment on the state highway system.

Once MnSHIP is complete, MnDOT districts select projects that follow the investment direction and strategies established in the plan. These planned and programmed projects are presented in the 10-Year CHIP.

Minnesota's State Highway System

The state highway system is a multimodal network serving many different transportation users. These users include motorists, freight carriers, transit passengers, bicyclists and pedestrians. It also connects these users to other transportation systems, such as transit networks, rail, aviation, and waterways, as well as county and city roads.

The importance of the state highway system is demonstrated by its use. At 12,000 miles, the system comprises only 8 percent of Minnesota's total roadway miles, yet carries almost 60 percent of the **vehicle miles traveled** and moves the majority of freight. State highways are central to many communities in Minnesota and their conditions directly affect residents' quality of life.

A strong economy depends upon a well-maintained and well-connected transportation network. Minnesota businesses rely on the state highway system's size, connections, and pavement and bridge conditions to carry freight throughout the state. To keep Minnesota economically strong into the future, MnDOT needs to maintain and improve the state highway system. The size and the age of Minnesota's transportation system demonstrate the scope of the state highway system's investment need:

- 50 percent of state highway pavements are more than 50 years old
- 40 percent of state highway bridges are more than 40 years old
- Minnesota ranks in the bottom half nationally for interstate pavement condition (33rd out of 50)¹
- Minnesota ranks 13th nationally for bridge condition on state highways²

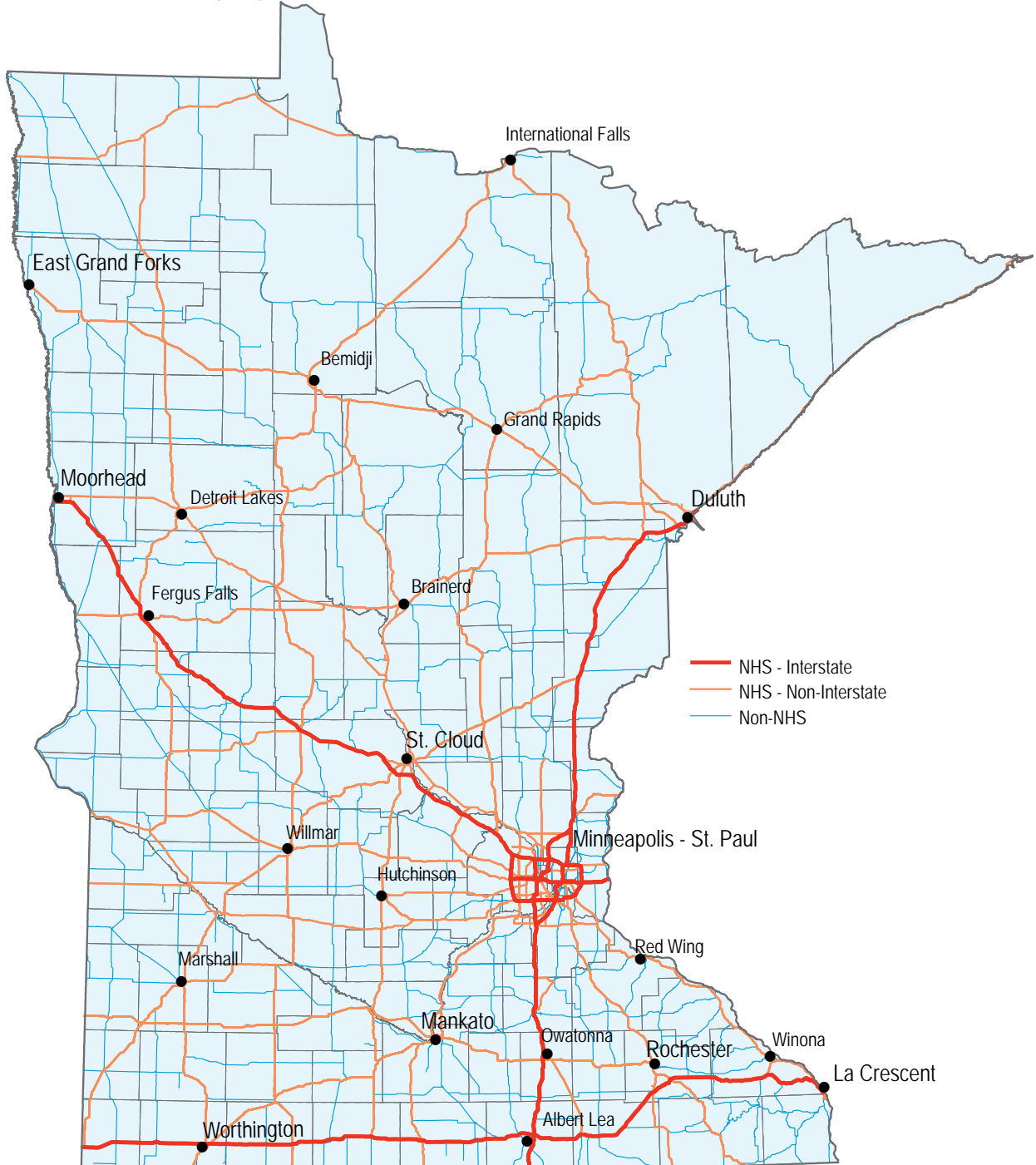
¹ Federal Highway Administration 2014 Highway Statistics

² <http://www.fhwa.dot.gov/bridge/nbi/no10/owner15.cfm#f>

WHICH ROADS MAKE UP THE STATE HIGHWAY SYSTEM?

The state highway system includes all Interstate highways, U.S. highways and Minnesota state highways. These roads fall into two categories: **National Highway System** roadways and non-NHS roadways. NHS roadways serve statewide and inter-state travel and are the primary connections between large urban areas throughout the state and beyond. Non-NHS state highways provide important connections for regional and local travel and generally carry lower traffic volumes. **Figure 1-4** shows the extent of the state highway system.

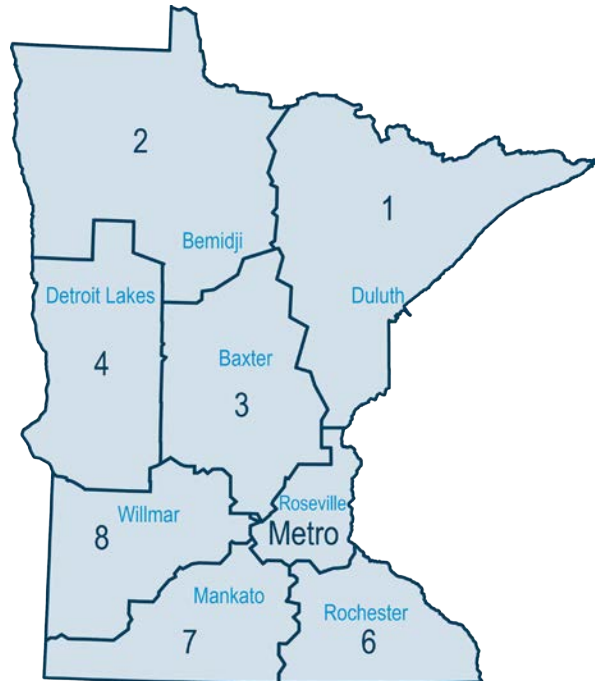
Figure 1-4: Minnesota's state highway network



MNDOT'S ORGANIZATION AND MANAGEMENT OF THE STATE HIGHWAY SYSTEM

State highway construction and maintenance responsibilities are divided into eight MnDOT districts. **Figure 1-5** maps the district boundaries. MnDOT's Central Office headquarters are located in St. Paul, near the state Capitol building.

Figure 1-5: MnDOT district boundaries and their headquarters



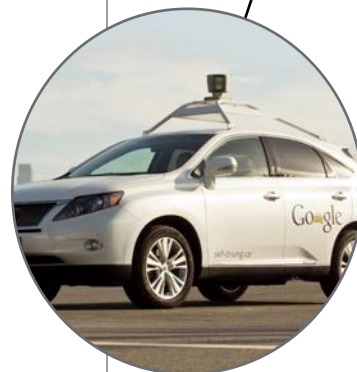
What Trends Are Influencing Transportation?

The Minnesota GO 50-Year Statewide Vision and the Statewide Multimodal Transportation Plan identify challenges and opportunities facing Minnesota's transportation. Because transportation infrastructure can last up to 50 years or longer, it is important for MnDOT to monitor trends that influence the use and condition of the state's transportation system. This allows MnDOT to adapt roadway designs and operations as needed. Included in these considerations are:

- **Minnesota's aging population.** Minnesota's population as a whole will age significantly in the next 20 years. Just less than 14 percent of Minnesotans are over the age of 65.¹ The number of seniors in Minnesota will continue to grow until hitting a peak in the year 2035. At that point there are projected to be more than 1.2 million seniors in Minnesota (20 percent of Minnesotans). In 2035, for the first time, more Minnesotans will be older than 65 than under 18.

¹ U.S. Census Bureau, 2010-2014 American Community Survey 5-Year Estimates

- **More Minnesotans living in urban settings.** Minnesota is becoming more urban in all parts of the state. Just over 70 percent of residents lived in urban areas with more than 2,500 people.² The number of people living in rural areas has stayed fairly level since 1900. Minnesota's urban population has grown during the same time. The State Demographer projects most Minnesota counties will grow in population over the next 30 years. The largest population growth is projected to occur in the Twin Cities region, with a smaller rate of growth in Greater Minnesota's urban communities.
- **Aging Infrastructure.** Minnesota faces a wave of aging pavements and bridges that are in need of maintenance or reconstruction. MnDOT typically reconstructs roadways when they are between 60 and 70 years old. Bridge replacement typically occurs at 70-80 years old. Additional needs for maintenance can be found on Minnesota's airports, railroads, ports, and waterways. These needs add to a seemingly ever-growing list of investments that must be made to maintain the quality of the state's public systems.
- **New technology and mobility as a service.** New companies and technologies have made people re-think how they travel, especially in urban areas. Mobility as a service offers new options to use the system through the "sharing economy." One example of mobility as a service is car sharing, which is available through companies like Zipcar in the Twin Cities, Mankato, and Winona. Other ride matching services like Uber and Lyft have seen rapid growth in recent years. Self-driving vehicles are emerging rapidly and have the potential to dramatically change the way society travels.
- **Climate change.** Climate change is already having major impacts in Minnesota and will continue to have impacts into the future. What these impacts will be is not always clear. More varied temperatures, precipitation levels, and frequency of extreme weather events will stress the transportation system. It is possible that these changes could increase maintenance costs and affect the way that Minnesotans travel.
- **Persistent budget challenges.** In the face of transportation funding challenges (discussed in detail in **Chapter 2: Key Factors and Assumptions**), MnDOT and its partners are placing more focus on innovative design, shared services, and other collaborative solutions to address and prioritize transportation needs.



² 2010 U.S. Census; The U.S. Census definition of urban is any community with a population over 2,500

Investment Category Descriptions

MnDOT invests in the state highway system through various types of capital improvement projects. Some projects enhance the condition of existing infrastructure, whereas others add new infrastructure to the system. There are many competing priorities for investment along the state highway system. MnDOT is responsible for selecting investments that best balance these priorities. This is especially challenging given the widening gap between MnDOT's projected transportation revenues and investment needs.

MnDOT tracks capital investment in highways by investment categories. Investment categories are components of projects. A single MnDOT project can include investment from multiple different investment categories. The 2013 version of MnSHIP identified 10 investment categories. This MnSHIP update includes four additional investment categories. The individual categories are separated into five major investment objective areas as illustrated in **Figure 1-6**.

Figure 1-6: MnSHIP Investment Categories and Objective Areas

SYSTEM STEWARDSHIP	TRANSPORTATION SAFETY	CRITICAL CONNECTIONS	HEALTHY COMMUNITIES	OTHER
<ul style="list-style-type: none"> Pavement Condition Bridge Condition Roadside Infrastructure Condition Facilities Jurisdictional Transfer 	<ul style="list-style-type: none"> Traveler Safety 	<ul style="list-style-type: none"> Twin Cities Mobility Greater MN Mobility Freight Bicycle Infrastructure Accessible Pedestrian Infrastructure 	<ul style="list-style-type: none"> Regional + Community Improvement Priorities 	<ul style="list-style-type: none"> Project Delivery Small Programs



SYSTEM STEWARDSHIP: CATEGORY DESCRIPTIONS

System Stewardship includes five investment categories: Pavement Condition, Bridge Condition, Roadside Infrastructure Condition, Facilities, and Jurisdictional Transfer.

Pavement Condition

MnDOT preserves the structural integrity and smoothness of its pavements through investment in the Pavement Condition category. MnDOT seeks to maximize the share of state highway pavement in good condition and minimize the share in poor condition. This category includes the repair or replacement of existing pavement on the state highway system. Typical improvements to pavements include:

- Overlays – Putting new pavement on top of old pavement to smooth the road surface
- Mill and overlays – Removing a few inches of the existing pavement and then putting new pavement on top
- Reconstruction projects – Completely rebuilding the road and the road base

MnDOT's largest and most widely used asset is its pavements. On an average day, there are more than 90 million vehicle miles traveled on Minnesota state highways. Most new pavements last approximately 15 to 30 years before deteriorating to a level that requires repair. Once pavements fall into poor condition, the costs to fully repair them increase significantly. As a result, larger capital investments are necessary on poor condition roadways if MnDOT wants to restore them to smooth pavement conditions.

Bridge Condition

The Bridge Condition category includes the repair or replacement of existing bridges on the state highway system. Construction of new bridges on the state system is also included in this category. Typical bridge improvements include replacement, rehabilitation, and painting. The Bridge Condition category does not include surrounding or supporting elements for bridges, such as signs, pavement markings, or lighting.

More than 4,500 of Minnesota's 20,000 bridges are on the state highway system and are maintained by MnDOT. Most bridges last 70 to 80 years before needing replacement, if maintained regularly. By planning bridge investments in a timely and cost-effective manner, MnDOT is able to maintain these vital connections.

Statewide Multimodal Transportation Plan

SYSTEM STEWARDSHIP OBJECTIVE

Strategically build, manage, maintain, and operate all transportation assets. Rely on system data and analysis, performance measures and targets, agency and partners' needs, and public expectations to inform decisions. Use technology and innovation to get the most out of investments and maintain system performance. Increase the resiliency of the transportation system and adapt to changing needs.



Roadside Infrastructure Condition

Roadside Infrastructure Condition includes an array of supporting infrastructure found on the state highway system. This infrastructure enhances the safe, informed and efficient movement of people and goods throughout the state.

Roadside infrastructure elements include:

- Drainage and culverts that carry water away from or under the road
- Guardrails, including cable-median barriers, and fencing that protect people and infrastructure
- Traffic signals, lighting, and **Intelligent Transportation Systems** that enhance safety and provide information
- Overhead signs and other structures, such as noise walls, retaining walls, and concrete barriers
- Signage, including traffic and directional signs
- Pavement markings

Roadside infrastructure improvements are often completed with a pavement or bridge project. MnDOT also conducts stand-alone projects, such as culvert replacement projects along segments of road with poor drainage or culverts.

Facilities

The Facilities investment category is a new category in this MnSHIP update. It includes the repair and maintenance of existing state highway rest areas and truck weigh stations. This category does not include buildings such as district headquarters, truck garages, or other operational buildings.

Rest areas serve as a refuge for drowsy drivers, support freight movement, and promote state and regional tourism. By providing adequate and properly spaced rest areas along the state highway network, MnDOT can meet the demand and expectations of the traveling public. Weight enforcement conducted at weigh stations ensure that freight being shipped to and through Minnesota is not overweight. Enforcement of Minnesota's truck size and weight laws increases safety and reduces damage to roadways and bridges.

Jurisdictional Transfer

Jurisdictional Transfer is a new investment category for this update of MnSHIP. It includes the costs associated with transferring ownership of a road to or from MnDOT. There is significant cost to complete jurisdictional transfers because roads are typically improved before they are transferred. When an agency has jurisdiction of a street or highway, that agency is responsible for the upkeep of that facility. These responsibilities remain with the agency until the jurisdiction is transferred to another roadway authority.



The objective of Jurisdictional Transfer is to ensure that Minnesota roads are owned and operated by the right level of government. Jurisdictional transfer is important because properly aligned roads provide the right level of service, and better meet customer expectations for maintenance, ride quality, and safety. Roads that are a low priority for one agency may be a higher priority for another agency. Jurisdictional transfer allows for a better alignment of roadway ownership with agencies' priorities.

TRANSPORTATION SAFETY: CATEGORY DESCRIPTION

Traveler Safety

The Traveler Safety category includes investments in new highway safety improvements. Typical improvements include lower cost, high-benefit engineering solutions such as rumble stripes, lighting, signage, and new cable median barriers. MnDOT also invests in higher-cost treatments, such as signals, and reduced conflict intersections (e.g. roundabouts, median refuges, and reduced crossing u-turns). These higher-cost improvements are used to address sustained crash locations.

Vehicle crashes are the leading cause of death for people under the age of 25 and the fourth leading cause of death overall in the nation. Crash-related deaths and serious injuries create significant costs for individuals, families, and society. On average, more than one person died every day in 2015 on Minnesota roads (411 total) and more than three were seriously injured. MnDOT and its partners have made reducing fatalities and serious injuries a top priority through:

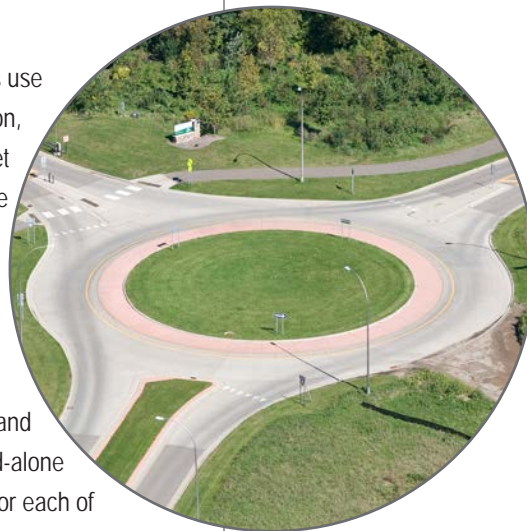
- **The Toward Zero Deaths initiative.** MnDOT and its partners use a data-driven, multi-disciplinary “four Es” approach – education, engineering, enforcement, and emergency services – to target and reduce fatalities and serious injuries. By implementing the TZD¹ approach, the state of Minnesota has seen a dramatic decline in traffic fatalities during the past decade.
- **Proactive lower cost, high-benefit safety features.** Lower cost safety improvements may be newly installed as part of a pavement project, including edge treatments (rumble stripes and rumble strips), guardrail, and pavement markings, or as stand-alone projects. MnDOT has also developed **District Safety Plans** for each of its eight districts. The plans prioritize strategies at high-risk locations and identify appropriate treatments that are proven to reduce fatal and serious injury crashes.

¹ www.minnesotatzd.org

Statewide Multimodal Transportation Plan

TRANSPORTATION SAFETY OBJECTIVE

Safeguard transportation users as well as the communities the systems travel through. Apply proven strategies to reduce fatalities and serious injuries for all modes. Foster a culture of transportation safety in Minnesota.



Statewide Multimodal Transportation Plan

CRITICAL CONNECTIONS OBJECTIVE

Maintain and improve multimodal transportation connections essential for Minnesotans' prosperity and quality of life. Connections should help achieve progress in meeting performance measures and targets and to maximize social, economic, and environmental benefits. Strategically consider new connections.



- **Improvements at sustained crash locations.** These are locations with a consistently high crash rate over a five-year period compared to similar locations across the state. Improvements at these locations tend to be higher-cost intersection improvements and can be targeted for motorized and non-motorized modes. Projects in this category include improvements such as roundabouts and passing lanes.
- **Railway-Highways Crossings.** Traveler Safety funding is also used to address at-grade railway-highway crossings. Funding can be used for signal upgrades, crossing closures and consolidations, removal of visual obstructions, and roadway geometrics and grades.

CRITICAL CONNECTIONS: CATEGORY DESCRIPTIONS

There are five categories in which MnDOT invests to improve transportation connections: Twin Cities Mobility, Greater Minnesota Mobility, Bicycle Infrastructure, Accessible Pedestrian Infrastructure, and Freight. These investment categories comprise the Critical Connections investment area.

Twin Cities Mobility

The Twin Cities Mobility investment category includes projects to improve travel time reliability in the Twin Cities area. Congestion plays a major role in the daily lives of people in the Twin Cities area and is a serious and costly disruption for freight movement within and through the region. Managing congestion improves quality of life, safety, and air quality. Roughly half of all roadway travel in Minnesota occurs within the Twin Cities area, which contains just 9 percent of the total roadway miles in the state. In 2015, the Metropolitan Council completed its [2040 Transportation Policy Plan](#). This plan continues a shift away from reliance on major highway capacity expansion projects toward lower-cost high-benefit strategies. The investment strategies for the Twin Cities Mobility category in MnSHIP align with the investment direction established in the 2040 Transportation Policy Plan, although available funding does not meet needs. Twin Cities Mobility investments include:

- **Active Traffic Management:** Operational improvements to help manage the effects of congestion, which include variable message signs, freeway ramp metering, dynamic signing and re-routing, dynamic shoulder lanes, reversible lanes, dynamic speed signs, and lane specific signaling.
- **Spot mobility improvements:** Lower cost, high-benefit projects that improve traffic flow and provide bottleneck relief at spot locations. These projects include freeway and intersection geometric design changes, short auxiliary lane additions, bus-only shoulders, and traffic signal modifications to ease merging and exiting traffic.

- **MnPASS express lanes:** Priced managed lane projects that provide a predictable, congestion-free travel option for transit users, those who ride in carpools, or those who are willing to pay. MnPASS lanes currently operate on I-394, I-35W, and I-35E. During peak drive times, MnPASS lanes are free for buses, vehicles with two or more occupants, and motorcycles; but single-occupant vehicles are charged a fee through an electronic device attached to the windshield.
- **Major capacity investments:** Projects aimed at enhancing mobility, safety, multimodal, or freight movements such as improved or new interchanges. General-purpose lanes may be considered in order to correct lane continuity or in other rare instances where MnPASS has been evaluated and found not to be feasible.

The strategies listed above also benefit transit in many ways, such as bus-only shoulders, high occupancy vehicle bypass ramps, and MnPASS express lanes.

Greater Minnesota Mobility

The Greater Minnesota Mobility investment category replaced the Interregional Corridor Mobility category used in the previous MnSHIP. Through federal legislation, the National Highway System was expanded and performance measures for mobility on the NHS are being developed. Also, MnDOT's Statewide Freight System Plan identified the NHS as the freight priority network for trucking. For these reasons, the investment category was modified to reflect that the NHS is now the priority network for mobility investment in MnSHIP. Improvements in this category include projects that improve travel time reliability for people and freight on the NHS outside of the Twin Cities area. Typical investments include low-cost improvements such as upgraded signals, turn lanes, intersection improvements, or passing lanes.

Greater Minnesota Mobility's investment objective is to improve travel time reliability on the NHS. This network accounts for a majority of vehicle and freight traffic on Minnesota's highway system. Less reliable travel times along the system result in increased travel time and fuel costs. For freight, these disruptions decrease production, disrupt delivery schedules, and increase the costs of doing business.

Freight

The **Fixing America's Surface Transportation Act**, enacted in 2015, established a new **National Highway Freight Program** that allocates federal dollars to improve the efficient movement of freight. In response, MnDOT established a new Freight category for MnSHIP. The Freight category includes projects that are eligible for funding as part of the National Highway Freight Program. Eligible uses of program funds are broad and include improvements such as climbing lanes, traffic signal optimization, and railway-highway grade separation, among many others. As part of the FAST Act, states must





complete a freight investment plan to identify where these program funds will be spent. More detail on the program can be found on the Federal Highway Administration [website](#).²

Bicycle Infrastructure

The Bicycle Infrastructure category includes reconstructed and new infrastructure to accommodate bicyclists along or across state highways. Typical improvements include bike lanes, signage for bicycle routes, crossings over or under state highways, at-grade crossings, and maintaining shoulders on identified priority routes.

Bicycle facilities are an important and growing part of the multimodal transportation network. MnDOT has the authority to add bicycle facilities on or across state highways and coordinates bicycle planning efforts with local units of governments to improve the state bicycle network and support local travel opportunities.

Historically, MnDOT has invested in bicycle infrastructure projects as part of other infrastructure investments, such as pavement or bridge projects. Beginning with the MnSHIP update in 2013, MnDOT started tracking bicycle infrastructure investments separately in order to better assess and address bicycle investment needs. The recently completed [Statewide Bicycle System Plan](#) provides guidance for investing in local and regional bicycle connections, a state bikeway network, and separated bicycle facilities. The plan recommends that 70 percent of the investments in this category fund projects to support local and regional networks with the remaining investment in an enhanced State Bikeway Network.

Accessible Pedestrian Infrastructure

The Accessible Pedestrian Infrastructure category includes reconstructed and new infrastructure to ensure safe, accessible, and convenient options for pedestrians travelling along or across state highways. Typical improvements include projects to bring curb ramps into compliance with the [Americans with Disabilities Act](#) standards, installation of [accessible pedestrian signals](#), and pedestrian improvements such as crosswalks, sidewalks, signals, curb extensions, benches, and pedestrian refuges. MnDOT frequently coordinates Accessible Pedestrian Infrastructure improvements with other bridge and pavement projects to maximize the impact of MnDOT investments.

Pedestrian infrastructure is important because it serves the most basic and primary form of travel that is accessible to everyone. MnDOT's pedestrian network consists of more than 600 miles of sidewalk, more than 20,500 curb ramps, and more than 100 pedestrian bridges.

In 2015, the state adopted the [Minnesota Olmstead Plan](#). As it relates to [transportation, the Olmstead plan](#) requires that "people with disabilities will

² <http://www.fhwa.dot.gov/fastact/factsheets/nhfpfs.pdf>

have access to reliable, cost-effective and accessible transportation choices that support the essential elements of life such as employment, housing, education, and social connections." As a result, MnDOT has taken action to address the needs of people with disabilities by instituting changes to its policies and business practices. MnDOT is committed to addressing existing non-compliant curb ramps, non-compliant sidewalks, and intersections without accessible pedestrian signals installed.

HEALTHY COMMUNITIES: CATEGORY DESCRIPTION

Regional and Community Improvement Priorities

Regional and Community Improvement Priorities are regional and locally-driven priorities beyond system performance needs. The RCIP investment category helps MnDOT deliver a well-rounded transportation investment program that advances objectives for which MnDOT may not have statewide performance targets. These objectives include improving multimodal connections, community livability, economic competitiveness, environmental health, and quality of life in Minnesota. RCIPs also include discretionary grant programs such as the Transportation Economic Development program.

Typical improvements include intersection improvements that support multimodal connectivity, bypass or turning lanes, access management solutions, spot capacity expansion projects, or flood mitigation investments.

OTHER: CATEGORY DESCRIPTION

Project Delivery

The Project Delivery category includes investments necessary to ensure the timely and efficient delivery of projects constructed on the state highway system. Resources are needed in a number of areas to effectively work with partners on improvements, deliver quality capital projects, and optimize MnSHIP investment. These areas include:

- Right of way - to purchase property adjacent to projects for construction and construction staging
- Consultant services to hire private consultants to supplement MnDOT staff and provide special expertise in preliminary engineering and detailed design work
- Construction incentives to promote or increase the likelihood of a desired outcome, such as early completion or meeting certain performance outcomes
- Supplemental agreements - to address unanticipated issues that develop during construction such as unknown contaminated soil

Statewide Multimodal Transportation Plan

HEALTHY COMMUNITIES OBJECTIVE

Make fiscally responsible decisions that respect and complement the natural, cultural, social, and economic context. Integrate land uses and transportation systems to leverage public and private investments.

Small Programs

The Small Programs category includes investments that are not specifically identified or prioritized within MnSHIP, but make up a part of MnDOT's overall capital investment. Small Programs typically respond to short-term, unforeseen issues or are used to fund one-time specialized programs that do not fit into a MnSHIP investment category. If funding is required beyond the short-term, an effort is made to incorporate the program into a MnSHIP investment category during the next MnSHIP update. Small Programs in MnSHIP include:

- Historic properties. This program addresses historic properties within MnDOT right of way
- Greater Minnesota Transit Investment. A small portion of funding is set aside for capital investments for transit in Greater Minnesota
- Off-System Bridges. Through federal funds, some funding is set aside to address local bridges not on the state highway system. This funding is separated and managed centrally in Small Programs

More information on investment areas and categories can be found in [Appendix I: Investment Category Folios](#).



Notable Changes in this MnSHIP

Notable changes and improvements in this document compared to the 2013 MnSHIP include:

- Pursuing a more robust public and stakeholder input process that expanded the audience for MnDOT planning efforts and piloted new engagement techniques
- Identifying planned projects for six years beyond commitments in the STIP
- Identifying four new investment categories: Facilities, Freight, Jurisdictional Transfer, and Small Programs to better account for investments on the state highway system
- Responding to the new planning and programming requirements in federal legislation by creating a dedicated program for freight investment
- Designating the National Highway System as the priority network for investments on the state highway system
- Increasing investment in Project Delivery to address a better understanding of costs associated with delivering highway projects



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20-Year State Highway Investment Plan

Chapter 2

KEY FACTORS AND ASSUMPTIONS

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KEY FACTORS AND ASSUMPTIONS

MnDOT considered or accounted for several key factors in establishing investment priorities for the state highway system. Some of these factors pose large challenges to both managing the existing infrastructure and making improvements to the system. These challenges include a widening gap between highway revenues and construction-related costs, federal and state legislative and performance requirements, MnDOT policy, and a large and aging highway system in need of repair and reconstruction. MnDOT analyzed these and other factors to guide the development of MnSHIP.

The key messages of Chapter 2 are:

- State law requires a fiscally constrained, performance-based 20-year capital investment plan for the state highway network every four years.
- MnDOT will have approximately \$21 billion to invest in state highways over the next 20 years.
- The recent federal bill, the **Fixing America's Surface Transportation Act**, increases emphasis on freight investments through the creation of the National Highway Freight Program.
- MnDOT policy emphasizes investment toward the Minnesota GO Vision to maximize the health of the people, the environment, and the economy.
- The state highway system is aging. Because of its age, it will need increased capital improvements as well as additional maintenance in the years ahead.

MnSHIP is a fiscally constrained plan, meaning it sets investment priorities only for the revenues that are expected to be available over the next 20 years. Appendix E: Financial Summary presents an in-depth review of Minnesota's state highway funding.

Revenue Outlook

MnSHIP is a fiscally constrained plan, meaning it sets investment priorities only for the revenues that are expected to be available during the next 20 years. MnDOT identified the various revenue sources that are used to fund the state highway system and analyzed the trends affecting these revenues. This analysis provided the information necessary to develop revenue assumptions and projections for the 20-year planning period. **Appendix E: Financial Summary** presents an in-depth review of Minnesota's state highway funding.

Taxes and fees from four main revenue sources fund transportation improvements on Minnesota's state highways. These sources are:

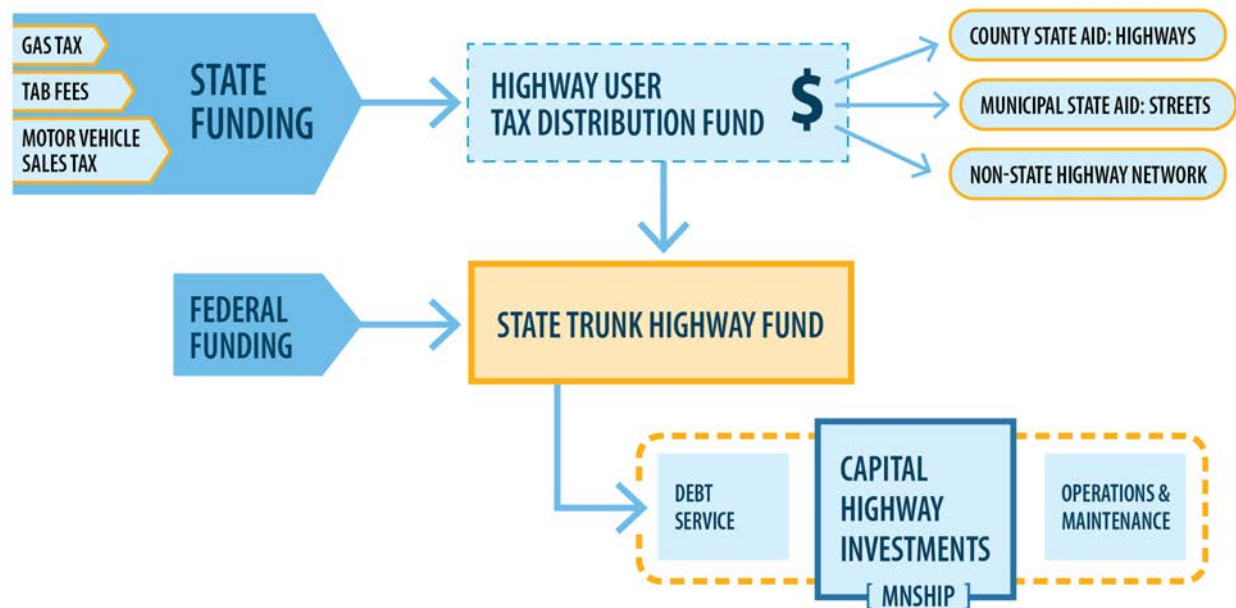
- Federal-aid (gas tax and General Funds)
- State gas tax (motor fuel excise tax)
- State tab fees (motor vehicle registration tax)
- State motor vehicle sales tax

The revenues from federal-aid go directly to the State Trunk Highway Fund (**Figure 2-1**), which funds capital improvements on the state highway system. Revenues from the main state sources, as well as smaller revenue sources, are pooled into the **Highway User Tax Distribution Fund** and divided between state highways, county roads, and city streets based on a Minnesota constitutional formula. Approximately 5 percent of these funds are set aside for the Non-State Highway Network (which includes the Flexible Highway Account, Township Roads Account, Township Bridges Account and the Department of Natural Resources). The remaining 95 percent is split among the State Trunk Highway Fund, County State Aid Highways, and Municipal State Aid Streets. The portion allocated from the highway fund to the State Trunk Highway Fund (62 percent) must first go toward any existing debt repayment from state highway bonding and is then divided among operations and maintenance activities and capital improvements on state highways. MnSHIP only considers the revenue available for capital improvements.

IMPACT OF TRANSPORTATION BONDS ON MNDOT'S REVENUES

In addition to the four main sources of funding, Minnesota also sells transportation bonds to support highway improvements. However, bonds should be understood as a financing approach, as they must be repaid with interest. For example, a series of transportation bonds were authorized in Minnesota Laws of 2008, **Chapter 152** (also known as the "Chapter 152 Bridge Improvement Program") for \$1.2 billion in bridge improvements on the state

Figure 2-1: Revenue Sources



highway system through 2018. To repay its Chapter 152 bonds, Minnesota currently has a 3.5 cent per gallon surcharge on top of its 25 cent per gallon gas tax rate.

More recently, the Legislature authorized \$300 million in bonds through the **Corridors of Commerce** program. In the absence of any new, non-bond revenue, the bonds have to be repaid, with interest, from the \$21 billion in revenue available for MnSHIP.

The primary purpose of these and other transportation bonds is to enable MnDOT to accelerate the delivery of projects and avoid construction cost increases due to inflation. While bonding is an important financing tool, there are practical limits to using debt to fund transportation improvements. MnDOT’s current policy is to allow no more than 20 percent of annual state revenues to go toward debt repayment. MnDOT is currently near the highest allowable bond repayment level, reaching close to \$240 million, or 17.5 percent during its highest year in 2018 before declining over the next 10 to 15 years. Minnesota state law requires MnDOT to make its annual debt repayments prior to making any other investments. Any potential bonding that comes after the adoption of this plan is not reflected in the investment direction set forth by MnSHIP.

20-YEAR REVENUE PROJECTION

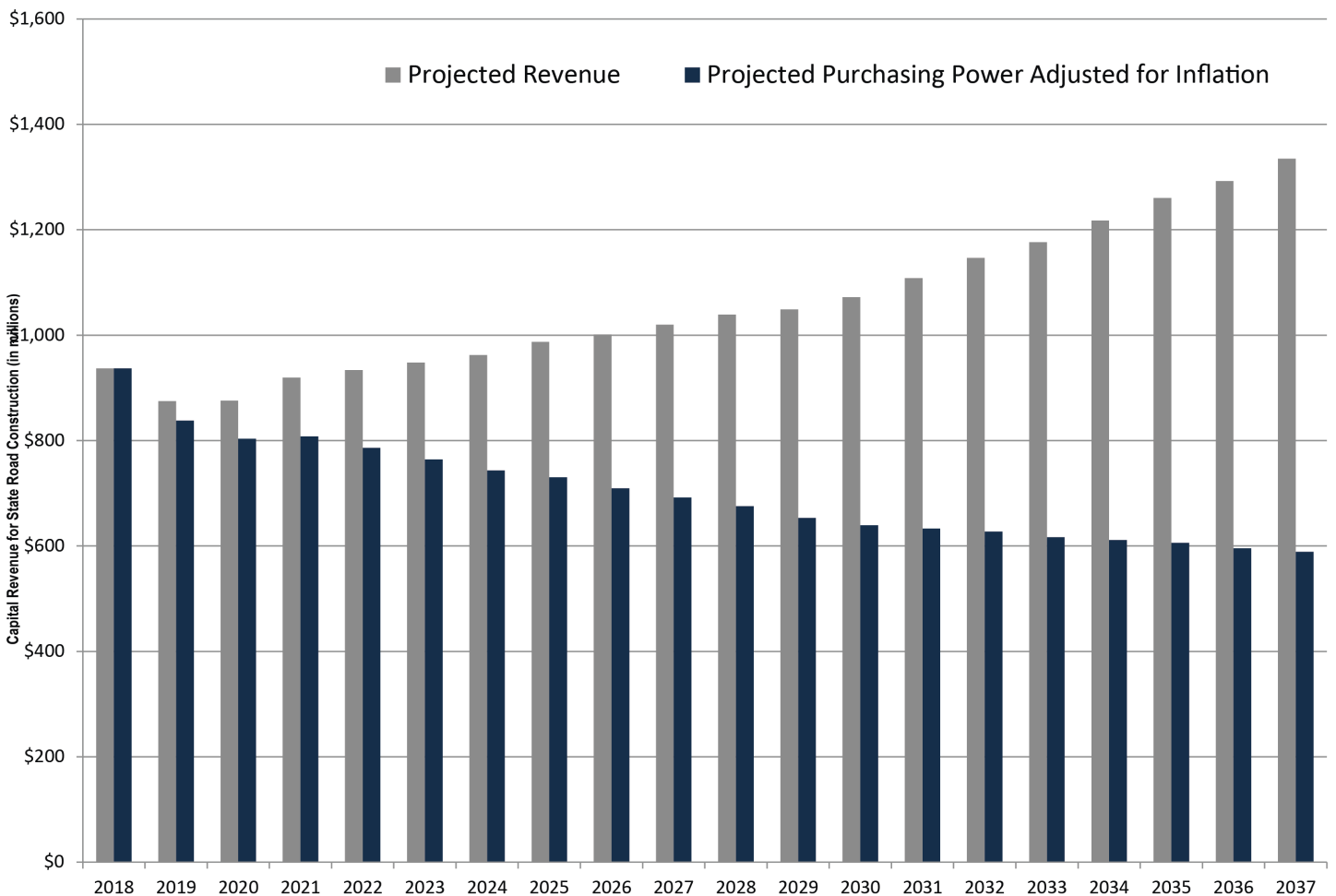
During the next 20 years, MnDOT estimates that \$21 billion in revenue will be available for capital investment on the state highway system – approximately \$1 billion per year. This estimate assumes that no new major sources of

revenue will be introduced and that the majority of MnDOT's future revenues will originate from the four main revenue sources shown in [Figure 2-1](#).

MnDOT anticipates that the actual amount of funding it receives from the State Trunk Highway Fund will increase by approximately 2 percent per year over the next 20 years. However, two key trends will make it increasingly difficult for MnDOT to sustain current conditions on the state highway system:

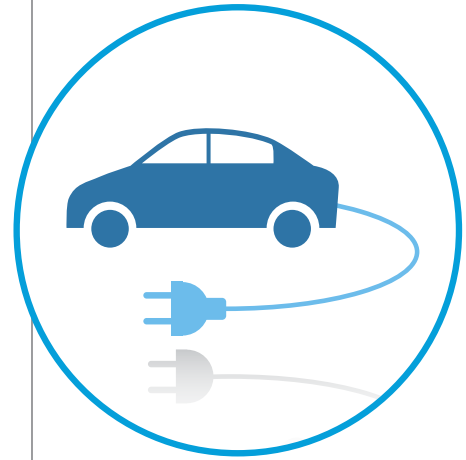
Construction costs are growing more quickly than revenues. Expected revenues will lose buying power over time as construction costs (e.g., fuel, raw materials, equipment, and labor) continue to grow at an annual rate of approximately 4.5 percent—a slight tapering off from the past decade—exceeding the annual revenue growth rate of approximately 2 percent (see [Appendix E: Financial Summary](#)). This imbalance was also a factor in the 2013 Minnesota State Highway Investment Plan, and is expected to persist as a long-term planning challenge. [Figure 2-2](#) illustrates the impact of 4.5 percent inflation on annual buying power (blue) versus nominal revenues (grey) in future years of construction. The net effect is that inflation will erode over half the buying power of revenues by 2037, given the assumptions stated above.

Figure 2-2: Anticipated Construction Revenue by Year Including Adjustments for Inflation



Revenue growth continues to be slow. There are several explanations for why MnDOT expects revenues to grow more slowly between 2018 and 2037 as compared to previous years. These include:

- **Vehicle fuel efficiency is improving.** Minnesotans, as well as Americans in general, are driving more fuel-efficient vehicles and consuming less gasoline. Increased fuel efficiency has been required by the federal government through the **Corporate Average Fuel Economy** program. While improved fuel economy means lower vehicle air pollutant emissions and a positive impact on the environment, improved fuel economy also means fewer gas taxes collected, and the gas tax is one of the major sources of both federal and state revenue for transportation.
- **Increase in hybrid and electric vehicles.** Due to advances in engine and battery technologies, hybrid and electric vehicles are becoming more popular. These vehicles, whose lowered emissions are more environmentally friendly, consume less or no fuel. As a result, they contribute fewer revenues to the State Trunk Highway Fund.
- **People are driving about the same distance.** There was significant growth in the number of miles traveled on the highway system in the 1990s and early 2000s; however, this growth leveled off in 2004. While per capita VMT remains about the same, total VMT has shown a slight increase in the past couple of years. Total VMT is still expected to continue to increase along with economic and population growth over the next 20 years, but per capita VMT is projected to remain relatively flat due to demographic, technological, and behavioral changes. As a result, state motor fuel excise taxes will grow but not drastically. Federal-aid revenues, based on motor fuel excise taxes and transfers from the U.S. General Fund, are also expected to grow slowly over the next 20 years; increases in recent years are far less than decades past.



Federal Law

A new federal surface transportation bill, FAST Act, was signed into law on Dec. 4, 2015. It authorized approximately \$305 billion in federal funding for fiscal years 2016 through 2020 for transportation projects. Minnesota's apportioned amount is consistent with the previous federal surface transportation bill, **Moving Ahead for Progress in the 21st Century**. The FAST Act continues many of the requirements first established in MAP-21 including the use of performance measures and emphasizing investment on the NHS.

The requirements in the FAST Act will affect MnDOT, as well as MnDOT's transportation partners, in several ways. **Appendix F: Federal and state Legislative Requirements** details the role the Statewide Multimodal

Transportation Plan and MnSHIP have in addressing the requirements in the FAST Act.

IMPACT OF THE FAST ACT ON MNSHIP

- **Requires states to make progress toward nine national goals for the National Highway System.** The national goal areas are (1) safety, (2) infrastructure condition, (3) congestion reduction, (4) system reliability, (5) freight movement and economic vitality, (6) environmental sustainability, (7) reduced project delivery delays, (8) improved resiliency and reliability of the transportation system and reduction or mitigation of stormwater impacts of surface transportation, and (9) enhancement of travel and tourism
- **Requires states to adopt a long-range 20-year statewide transportation plan.** The plan must use a performance-based approach to transportation decision-making to support the national goals. For MnDOT, MnSHIP is the plan that meets this requirement.
- **Focuses performance requirements on the NHS.** The FAST Act continues MAP-21's focus on managing the NHS to a higher level to make sure federal revenue is being used to meet national goals. It authorizes USDOT to establish performance measures to ensure progress toward the nine national goal areas. The legislation sets the target for NHS bridges in poor condition and USDOT will set targets for interstate pavement condition. States will set performance targets for most measures in coordination with **Metropolitan Planning Organizations** and providers of public transportation. MPOs are federally designated transportation planning organizations in urbanized areas over 50,000. A single effective date for finalizing all federal performance measures is expected in late 2016. States will adopt targets in coordination with MPOs within one year after final rulemaking; and MPOs will adopt targets within 180 days after states.
- **Creates a program to fund freight projects.** Perhaps the biggest change stemming from the FAST Act is a dedicated source of \$12 billion in federal dollars for the National Highway Freight Program. Funds under this program are distributed to the states by a formula, and must be used for eligible projects that improve the efficient movement of freight across the National Highway Freight Network. The program is directed towards the highway network; however, up to 10 percent of the funds each state receives can be used for public or private freight facilities such as rail, water and intermodal facilities. Minnesota will receive approximately \$20 million a year for this program.



State Requirements

State policy and legislative requirements had a strong influence on the development of MnSHIP. State legislative requirements for MnSHIP are contained in Minnesota Statutes, section 174.03.

In addition to state legislative requirements, state performance requirements were a key factor for MnSHIP. In 2001, Minnesota adopted the **Government Accounting Standards Board Statement 34** financial reporting requirements for the value and condition of its major infrastructure assets. One of the primary purposes of GASB 34 is to demonstrate to the public, and others, that the agency is maintaining its infrastructure in an acceptable condition and does not have any undisclosed liabilities looming in the future.

MnDOT is also responsible for carrying out programs initiated by the Minnesota State Legislature for projects on the state highway system, such as Corridors of Commerce.

IMPACT OF STATE REQUIREMENTS ON MNSHIP

- **State Legislative Requirements.** In 2010, state law defined requirements for the creation of a statewide highway 20-year capital investment plan (i.e., MnSHIP). The law required MnDOT to create a fiscally constrained, performance-based 20-year capital investment plan for the state highway system every four years. As part of the capital investment plan, MnDOT must analyze and track the effect of recent investments, identify needs, establish priorities for projected revenue, and identify strategies to ensure the efficient use of resources. State legislative requirements specific to MnSHIP and the MnSHIP chapter in which they are addressed are presented in **Figure 2-3**.
- **State Performance Requirements.** MnDOT reports to GASB by measuring the average pavement condition and bridge condition on the state highway system. Without additional revenues and investment, it is expected that by the end of MnSHIP (2037), pavement conditions will fall below the GASB thresholds. Allowing the state's assets to deteriorate beyond these thresholds could increase the cost of borrowing money for all state and local units of government in Minnesota, as the condition of those assets influences the bond rating of the entire state—not just that of MnDOT. In addition, system conditions falling below GASB 34 thresholds would indicate that other adverse outcomes are occurring on state highways, such as pavement failures requiring expensive fixes, more bridges with weight restrictions, and increased travel costs for all users.



Figure 2-3: Chapters in MnSHIP Addressing Minnesota Legislative Requirements for MnSHIP

2012 MINNESOTA STATUTES FOR MNSHIP (CHAPTER 174, SECTION 3, SUBD. 1C)	LOCATION IN MNSHIP
Incorporates performance measures and targets for assessing progress towards the state’s transportation goals, objectives and policies identified [in this statute] for the state trunk highway system and for the Statewide Multimodal Transportation Plan.	<ul style="list-style-type: none"> • Chapter 2 • Chapter 3
Summarizes trends and impacts for each performance target over the past five years.	<ul style="list-style-type: none"> • Chapter 2
Summarizes amount and impact of investments over the past five years on each performance target, including a comparison of prior plan projected costs with actual costs.	<ul style="list-style-type: none"> • Chapter 2 • Appendix F
Identifies the investments required to meet the established performance targets over the next 20-year period.	<ul style="list-style-type: none"> • Chapter 3 • Appendix I
Projects available for state and federal funding over the 20-year period, including any unique, competitive, time-limited, or focused funding opportunities.	<ul style="list-style-type: none"> • Chapter 2 • Appendix E
Identifies strategies to ensure the most efficient use of existing transportation infrastructure, and to maximize the performance benefits of projected available funding.	<ul style="list-style-type: none"> • Chapter 5 • Chapter 7
Establishes investment priorities for projected funding, including a schedule of major projects or improvement programs for the 20-year period together with projected costs and impact on performance targets.	<ul style="list-style-type: none"> • Chapter 5 • CHIP
Identifies those performance targets identified under clause (1) not expected to meet the target outcome over the 20-year period together with alternative strategies that could be implemented to meet targets.	<ul style="list-style-type: none"> • Chapter 6 • Chapter 7



Three main improvements were made in this MnSHIP update to further align MnDOT's capital investment priorities with state legislative requirements.

Initially, MnDOT responded by including a list of major projects in the appendix of the 2013 MnSHIP. MnDOT has since created a stand-alone list of planned projects 10 years in advance called the **10-Year Capital Highway Investment Plan**. This represents an expanded planning effort, as districts must account for funding uncertainty, limited information on future needs, and unanticipated events that affect the timing and scope of the identified projects. Including this extended plan of projects is a step toward a more transparent, reliable, and predictable planning process that enables the public to better understand MnDOT's decision-making process. This plan allows districts to conduct broader public engagement efforts surrounding projects in all 10 years. It also helps to achieve better transportation outcomes.

Second, MnDOT separated its capital investment projects into 14 investment categories to continue to more accurately track and analyze the effect of investments on performance targets and other agency goals. This expanded approach helped MnDOT establish its state highway investment priorities in a more detailed way. By breaking projects down into different investment categories, MnDOT can more reliably associate the amount of money it spends to achieve specific outcomes and goals of the agency. MnDOT has been tracking its investments in this manner since 2014, MnSHIP also presents information on past investment levels and their associated performance outcomes in this update. Future updates of MnSHIP will incorporate the impact of investment in each category.

Third, MnSHIP summarizes the dollar amount and impact of investments over the past five years on each performance target. The summary will include a comparison of projected costs with actual project costs. Details on this analysis are available in **Appendix F: Federal and State Legislative Requirements**.

In addition to the state legislative requirements specific to MnSHIP, the Minnesota State Legislature has also identified 16 goals of the state transportation system. These goals have guided the development of MnDOT's Family of Plans. **Appendix F: Federal and State Legislative Requirements** includes a table that lists each goal and its connection to the **Minnesota GO Vision**, the **Statewide Multimodal Transportation Plan**, and MnSHIP.



MnDOT created a stand-alone list of planned projects 10 years in advance called the **10-Year Capital Highway Investment Plan (CHIP)**. The CHIP is a step toward a more transparent, reliable, and predictable planning process that enables the public to better understand MnDOT's decision-making process.

MnDOT Policy

MnSHIP is one of MnDOT's system investment plans and is a member of MnDOT's Family of Plans. The Minnesota GO Vision and the Statewide Multimodal Transportation Plan provide over-arching guiding principles and objectives for transportation in Minnesota. The system investment plans use the guiding principles, objectives, and strategies from the Minnesota GO Vision and Statewide Multimodal Transportation Plan to guide investment decisions on the various transportation systems that MnDOT oversees.

MINNESOTA GO VISION AND STATEWIDE MULTIMODAL TRANSPORTATION PLAN

The Minnesota GO planning framework starts with the Minnesota GO Vision. Adopted in 2011, the Vision established eight guiding principles to move toward a multimodal transportation system that maximizes the health of people, the environment, and the economy. These principles are to be used collectively and are intended to guide policy and investment direction.

Figure 2-4: Minnesota GO Guiding Principles



MINNESOTA GO GUIDING PRINCIPLES

Leverage public investments to achieve multiple purposes. The transportation system should support other public purposes, such as environmental stewardship, economic competitiveness, public health, and energy independence.

Ensure accessibility. The transportation system must be accessible and safe for users of all abilities and incomes and provide access to key resources and amenities.

Build to a maintainable scale. Consider and minimize long-term obligations – do not overbuild; reflect and respect the surrounding physical and social context.

Ensure regional connections. Key regional centers need to be connected to each other through multiple modes of transportation.

Integrate safety. Systematically and holistically improve safety for all forms of transportation; be proactive, innovative, and strategic in creating safe options.

Emphasize reliable and predictable options. The reliability of the system and predictability of travel time are frequently as important as or more important than speed.

Strategically fix the system. Some parts of the system may need to be reduced while other parts are enhanced or expanded to meet changing demand.

Use partnerships. Coordinate across sectors and jurisdictions to make transportation projects and services more efficient.

The Statewide Multimodal Transportation Plan was updated in combination with MnSHIP. It identified objectives and strategies in five policy areas to make progress toward the Vision. The plan focused on multimodal solutions that ensure a high return-on-investment. The objectives and strategies are listed in no particular order and all are critical focus areas for the upcoming years. More information on these policy links can be found in [Appendix F: Federal and State Legislative Requirements](#).

Figure 2-5: Statewide Multimodal Transportation Plan Objectives

STATEWIDE MULTIMODAL TRANSPORTATION PLAN OBJECTIVES
Open Decision Making. Make transportation system decisions through processes that are inclusive, engaging, and supported by data and analysis. Provide for and support coordination, collaboration, and innovation. Ensure efficient and effective use of resources.
Transportation Safety. Safeguard transportation users as well as the communities the systems travel through. Apply proven strategies to reduce fatalities and serious injuries for all modes. Foster a culture of transportation safety in Minnesota.
Critical Connections. Maintain and improve multimodal transportation connections essential for Minnesotans' prosperity and quality of life. Connections should help achieve progress in meeting performance measures and targets and to maximize social, economic, and environmental benefits. Strategically consider new connections.
System Stewardship. Strategically build, manage, maintain, and operate all transportation assets. Rely on system data and analysis, performance measures and targets, agency and partners' needs, and public expectations to inform decisions. Use technology and innovation to get the most out of investments and maintain system performance. Increase the resiliency of the transportation system and adapt to changing needs.
Healthy Communities. Make fiscally responsible decisions that respect and complement the natural, cultural, social, and economic context. Integrate land uses and transportation systems to leverage public and private investments.

COMPLETE STREETS

MnDOT incorporates a complete streets approach as part of every project delivered. On all projects, MnDOT evaluates and balances the needs of all users (pedestrians, bicyclists, freight, transit, motor vehicles, etc.) during planning, scoping, design, construction, operations and maintenance of the state highway network. Project development analysis includes the access and mobility needs of user groups moving both along state highways and crossing state highways. The objective is not all modes on all roads, but rather interconnected and integrated networks for all users. Districts must



evaluate opportunities to address the needs of all users both at the individual project level and when developing **Statewide Transportation Improvement Programs** and 10-Year Capital Highway Investment Plans.

PERFORMANCE MEASURES POLICY

MnDOT formally adopts performance measures and targets through public planning processes or through review and approval by designated management groups. The MnSHIP planning process is one of the methods of adopting measures and targets. The measures included in this document are the formally adopted measures and targets for their associated investment category. MnDOT carefully considers existing commitments, relative priorities, and tradeoffs when adopting or modifying performance measures and targets.

All adopted performance measures and corresponding targets are included in the list of formally adopted performance measures and targets available on the MnDOT Performance Measures website¹.

PRIORITY NETWORK

MnDOT realized the importance federal legislation placed on managing and maintaining NHS roadways to higher standard and officially made it the state's priority highway network in 2015. The rationale for designating the NHS as the priority highway network included:

- Federal legislation requires performance measurement on the NHS.
- MnDOT's Freight Plan analyzed six different networks and identified NHS roadways as the priority freight network based on usage and flows.
- The NHS was used in the 2013 MnSHIP as a primary network for investing in pavements and bridges.
- Performance measures on the NHS are federally required.

Defining the NHS as the priority network allows MnDOT to better communicate the agency's work to the public while investing in roadways that carry the majority of vehicle trips.

¹ <https://www.dot.state.mn.us/measures/>



Current System Conditions and Long-Term Trends

The state highway system is a large and aging network. It requires a mix of maintenance and capital investments in order to keep the system in a state of good repair. MnDOT actively seeks to minimize costs over the life of its assets through maintenance and capital investments. In particular, MnDOT's pavements face a growing need for reconstruction over the life of the plan.

Since the early 1990s, MnDOT has used performance measurement to evaluate its services and to guide its plans, projects, and investments. MnDOT tracks the condition of the state highway system and publishes this information in its Annual Minnesota Transportation Performance Report.

Historically, MnDOT has set targets designed to achieve optimal or desired performance levels in particular investment categories. These targets have typically been based on lowest life-cycle costs, customer expectations, or a policy priority. Others have been trend-based – set by looking at trends and outcomes associated with historical spending levels. More recently, MnDOT has established targets that it determines to be an acceptable risk, such as those targets identified for roadside infrastructure assets. While MnDOT continues to use some of these targets to estimate its investment needs, the current and projected future funding reality has made many performance targets such as NHS pavements and many roadside infrastructure components, unachievable in most cases.

The following sections describe the current conditions and long-term trends for each MnSHIP investment category.

SYSTEM STEWARDSHIP: CONDITIONS AND TRENDS

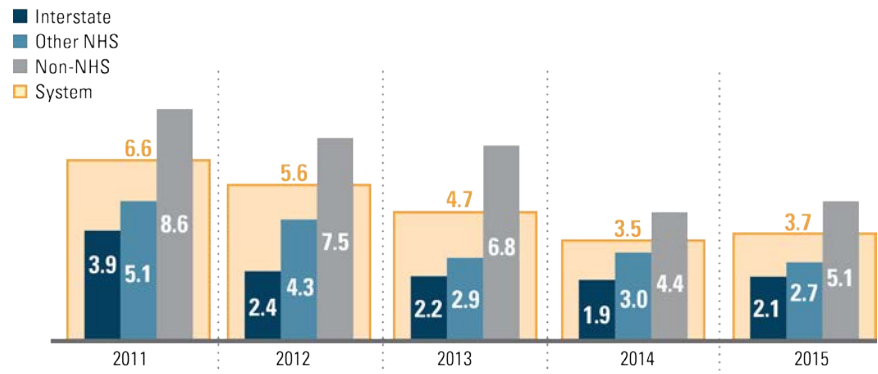
Pavement Condition

Pavement deterioration is a serious risk facing MnDOT's state highway system – more than half of its pavements were constructed 50 or more years ago. MnDOT measures pavement conditions by tracking the percentage of Interstate, other NHS, and non-NHS in good and poor condition. Targets for NHS and non-NHS pavement condition are used to calculate needs (see [Chapter 3, "Investment Needs"](#)). MAP-21 and the FAST Act require MnDOT to assess NHS pavement conditions with yet-to-be finalized measures (and targets for Interstates) set by USDOT.

As shown in [Figure 2-6](#), the percentage of pavements in poor



Figure 2-6: Percentage of Pavement Miles on State Highway System in Poor Condition

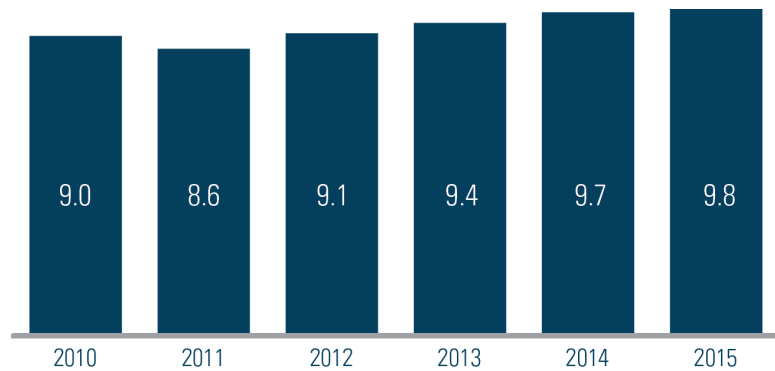


condition remained steady from 2014 to 2015, following a four year trend of improving pavement quality statewide. Overall, 3.7 percent (500 miles) of state highway miles were in poor condition in 2015, compared to 6.6 percent in 2011. The percentage of poor condition pavements varies between the three different types of state highway roads:

- **Interstate pavements:** 2.1 percent poor (39 miles), 74.5 percent good (1,383 miles)
- **Other NHS pavements:** 2.7 percent poor (155 miles), 71.5 percent good (4,104 miles)
- **Non-NHS pavements:** 5.1 percent poor (341 miles), 66.2 percent good (4,426 miles)

Overall, the average remaining service life of all state highway pavements has increased slightly over the past 6 years as shown in Figure 2-7.

Figure 2-7: Average Remaining Service Life in Years (all state highways)



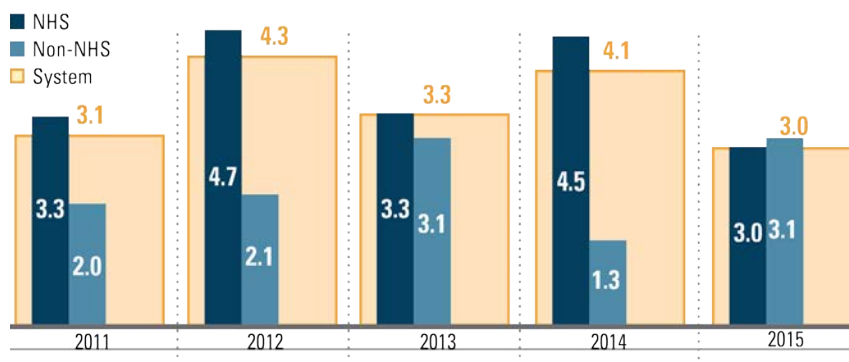
Bridge Condition

MnDOT is committed to a regular schedule of condition assessment and preventive maintenance to keep its bridges in good condition. Approximately 35 percent of MnDOT's bridges are more than 50 years old. Like state highway pavements, aging bridges require more costly improvements to be maintained in serviceable condition.

MnDOT measures its performance in Bridge Condition by reporting on the percent of deck area in poor condition through regular inspections. The condition measure includes ratings of the deck, the substructure and the superstructure evaluations of bridges on the state highway system. MnDOT set a goal that the share of NHS bridges in good structural condition should be 55 percent and those in poor structural condition should be 2 percent or less, measured by deck area. Bridges rated as being in poor condition are safe to drive on, but are approaching the end of their useful lives. Structurally unsafe bridges are closed promptly.

MnDOT is not currently meeting its target for NHS bridges in poor condition but is meeting targets for non-NHS bridges, as shown in **Figure 2-8**. As of 2014, the percent of NHS bridges in poor condition (4.5 percent) exceeded the maximum target of 2 percent poor but improved from a high of 4.7 percent poor in 2012.

Figure 2-8: Percentage of Bridge Deck Area in Poor Condition



Roadside Infrastructure Condition

MAP-21 required states to develop a risk-based Transportation Asset Management Plan for pavements and bridges on the NHS to improve or preserve asset condition and the performance of the system. MnDOT elected to expand the TAMP beyond the MAP-21 requirements and include all state-owned roads and bridges as well as highway culverts, deep storm water tunnels, overhead signs, and high-mast light towers. Since completion of the TAMP, MnDOT has expanded asset management planning to other roadside infrastructure - highway lights, intelligent transportation systems, noise walls, and signals. Both efforts identified performance measures and targets for assets not identified in federal legislation or the 2013 MnSHIP. These assets are included in this MnSHIP update. Additionally, the related infrastructure condition performance measures and targets will become part of MnDOT's formally adopted measures and targets. Performance for many roadside infrastructure assets is identified as part of an inspection process and typically measured by condition or age.

The TAMP process included an accurate assessment of current conditions for culverts, deep storm water tunnels and overhead sign structures. State owned



culverts are at 10 percent poor, while 24 percent of deep storm water tunnels are in poor condition and 30 percent of overhead sign structures are in poor condition.

Currently, MnDOT is able to address some of its roadside infrastructure needs as components of other projects. However, MnDOT has not been able to fix most assets at optimal points in their life cycles under the current investment program. Roadside infrastructure conditions will likely deteriorate unless additional investments are made.

Facilities Condition

Facilities is a new investment category. It includes all 52 MnDOT-owned rest areas and 10 weight enforcement operational buildings and weigh scales. The Facilities investment category does not include buildings such as district headquarters or other operational facilities. In 2015, MnDOT completed an assessment of all agency owned facilities. The assessment will help guide the development of performance measures and targets for facilities that don't currently have them. Performance for rest areas is based on the physical condition of the building and surrounding pavement and is ranked on a scale between excellent/good to extremely poor/beyond service life. Currently, the assessment determined that 6 percent of state owned rest areas were in good to excellent condition. At the current level of investment, nearly half of rest areas will be beyond their service life by the end of the plan, potentially resulting in the closure of rest areas. Weigh scales will also become outdated or closed, making it more difficult to enforce weight restrictions.

Jurisdictional Transfer

MnDOT does not currently measure performance in Jurisdictional Transfer. As part of the recently completed [Minnesota Jurisdictional Realignment Study](#), MnDOT identified segments of road that could potentially be transferred based on ease of transfer. The study established a goal of reassigning jurisdiction of 1,181 miles of road. At the current rate, the goal will be achieved by 2080. During the past 10 years, MnDOT has transferred 170 miles of state highway roads primarily to counties. An average of 17 miles are transferred each year resulting in road improvements for communities throughout the state. Investment in Jurisdictional Transfer will allow MnDOT to continue to work with our local government partners to agree on and commit to additional roadway transfers that would align the travelers expectations of the facility with the proper level of investment and also lower future maintenance and capital costs to MnDOT.

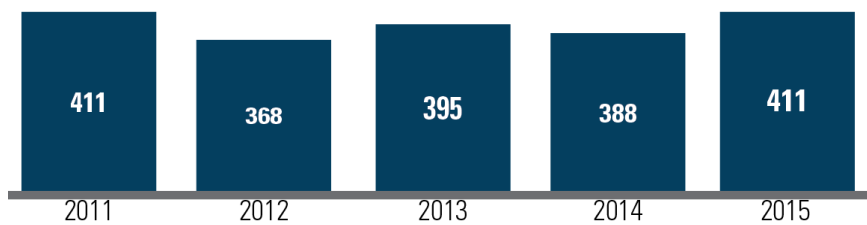
TRANSPORTATION SAFETY: CONDITIONS AND TRENDS

Traveler Safety

MnDOT tracks total traffic fatalities and serious injuries from vehicle crashes. MnDOT uses targets set by the Toward Zero Deaths program to measure its progress in Transportation Safety. MnDOT aims to help the state reach 300 or fewer fatalities and 850 or fewer serious injuries by 2020.

On an average day in 2015, at least one person died on Minnesota highways (411 deaths total in **Figure 2-9**). This vehicle crash-related fatality total is above the statewide **Toward Zero Deaths** goal of fewer than 300 deaths per year. With 1,127 serious injuries in 2015, Minnesota was below the TZD target of 1,200 or fewer serious injuries. After steep declines in fatalities at the end of the last decade, traffic and bicycle related fatalities have remained constant since 2011 while pedestrian and motorcycle fatalities saw an increase in 2015

Figure 2-9: Minnesota Traffic Fatalities on All State and Local Roads

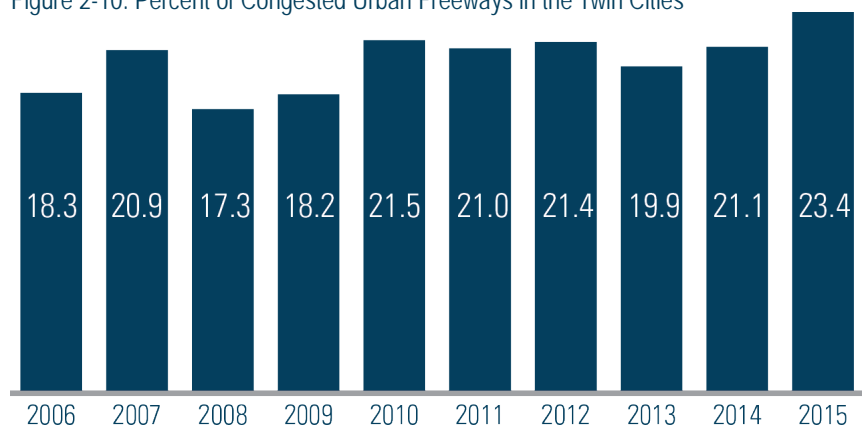


CRITICAL CONNECTIONS: CONDITION AND TRENDS

Twin Cities Mobility

MnDOT tracks congestion on Twin Cities NHS urban freeways by measuring the percentage of miles where vehicles are traveling below 45 miles per hour during morning or evening peak periods (5 to 10:00 A.M. and 2 to 7:00 P.M.). There was a large increase in congestion between 2014 (21.1 percent) and 2015 (23.4 percent). As shown in **Figure 2-10**, congestion increased steadily over the last two years. Increased economic activity and forecast population gains could worsen congestion over the plan years.

Figure 2-10: Percent of Congested Urban Freeways in the Twin Cities



MAP-21 requires MnDOT to adopt a system performance measure that advances the national goal of system reliability on the NHS. There is an additional requirement to develop a performance measure related to traffic congestion and on-road mobile source emissions in the Twin Cities metropolitan area. MnDOT will coordinate with the Metropolitan Council and other key stakeholders when it begins the process of developing the target.

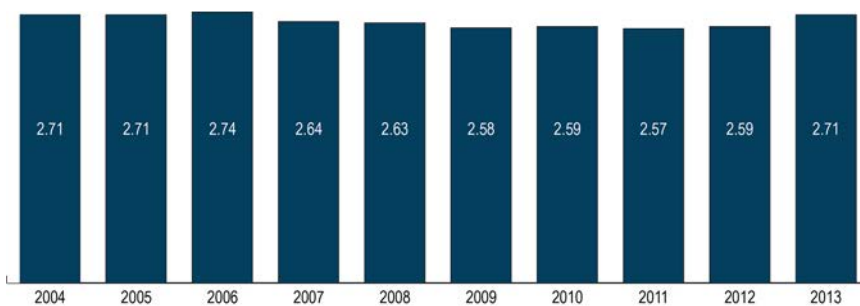
Greater Minnesota Mobility

MnDOT anticipates new federal performance measures and targets for mobility to be set for the NHS as a result of MAP-21. A notice of proposed rulemaking has been issued. Once the federal rules have been finalized, MnDOT can begin the process of setting the final targets. During the development of this plan, MnDOT received travel time data from the Federal Highway Administration. In 2015, the majority of the NHS roads in Greater Minnesota performed well with limited delays. Only a few corridors currently experience travel time delay. However, beyond 2021, several corridors could see an increase in travel time delay due to improving economic conditions.

Freight

Freight includes the movement of all goods that originate or terminate in Minnesota across all modes. This includes trucks and other heavy commercial vehicles, rails, water ports, pipelines and air transport. Truck-only trips remain the primary means of shipping goods by value, but the share moved by other modes is increasing. 2013 saw an increase in heavy commercial vehicle miles traveled on Minnesota highways, along with an increase in tons of freight shipped through rail (Figure 2-11). The Freight Investment Plan will help identify how the FAST Act Freight Program funds get invested on the new National Highway Freight Network.

Figure 2-11: Heavy Commercial Vehicle Miles Traveled on Minnesota State Highways 2004-2013 (billions)



Bicycle Infrastructure

MnDOT invests approximately 2 percent of pavement project costs and approximately 3 percent of bridge project costs, toward Bicycle Infrastructure improvements. While MnDOT does not currently measure statewide progress toward any specific performance measures related to bicycle facilities, it does track bicycle commuting trips within Minnesota's six most populous cities. While there was a drop in bicycle commuter trips throughout the state between the historic high of 2013 and 2014, daily bike ridership has remained consistent since 2006 and once a week ridership has remained relatively steady over the same period.

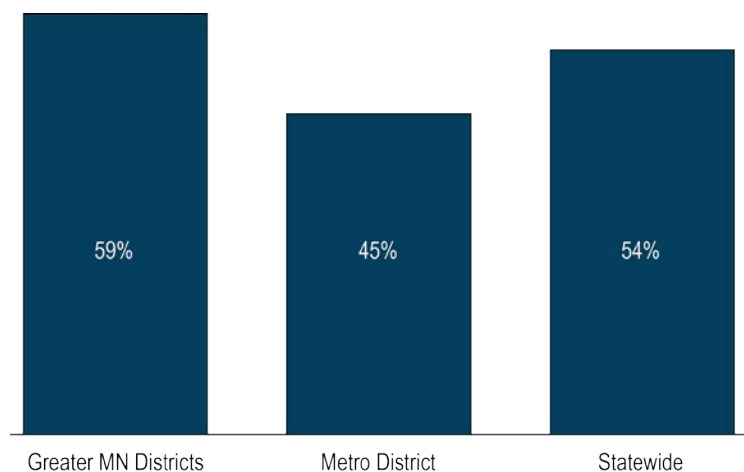
MnDOT finalized the **Statewide Bicycle System Plan** that provides direction for integrating bicycling into Minnesota's transportation network. This includes plans for each of the eight MnDOT districts as well as tools for practitioners to use in selecting facilities to be included in projects. The plan also recommends performance measures to help MnDOT prioritize and coordinate bicycle infrastructure investments on the state highway system.

Accessible Pedestrian Infrastructure

MnDOT uses two performance measures to track progress in Accessible Pedestrian Infrastructure. MnDOT tracks the percent of signalized intersections with **accessible pedestrian signals** and the percentage of the 620 miles of sidewalks within MnDOT's right of way that are not compliant with the **1990 Americans with Disabilities Act**. MnDOT is making progress toward its goal of equipping all signalized state highway intersections with accessible pedestrian signals by 2030. As of 2014, 36 percent of all intersections had these signals installed, up from 28 percent in 2012. The current percentage of sidewalks that are non-compliant is 54 percent, as shown in **Figure 2-12**.

Sidewalks can be non-compliant for having a narrow width, a steep slope, having barriers, or being in poor condition.

Figure 2-12: Percent of State Highway Sidewalk Miles that are not Compliant with ADA Requirements in 2014



MnDOT also tracks the number of curb ramps that comply with the ADA standards. MnDOT continues to face challenges in achieving its curb ramp accessibility targets due to funding and project timing constraints. Of the more than 21,000 curb ramps inventoried throughout the state, less than half (approximately 10,000) were completely or partially meeting ADA standards. MnDOT's policy is to replace curb ramps that do not meet ADA requirements in all reconstruction and alteration level projects.

In addition, MnDOT will continue to update its inventory of pedestrian facilities within MnDOT's right-of-way and to reconstruct sidewalks as part of ADA projects and pavement and bridge projects.

HEALTHY COMMUNITIES: CONDITIONS AND TRENDS

Regional and Community Improvement Priorities

MnDOT measures its progress with respect to RCIPs by conducting customer satisfaction studies and consistently seeking input and collaboration opportunities with stakeholders. Beginning in 2010, MnDOT has responded in part to regional concerns and collaboration opportunities through the use of the **Transportation Economic Development** Program. The program is a joint effort between MnDOT and the Minnesota **Department of Employment and Economic Development** established to support highway improvement and public infrastructure projects that create jobs and support economic development.

OTHER: CONDITIONS AND TRENDS

Project Delivery

Project Delivery is critical to ensuring timely and efficient delivery on all projects constructed on the state highway system. While performance is not measured for this category, MnDOT tracks how much it has spent on Project Delivery investments as part of its overall investment program.

Historically, Project Delivery has accounted for approximately 16 percent of MnDOT's annual capital investment program. However, the Project Delivery percentage changes year-to-year based on the mix of investments it supports. For example, when MnDOT delivers a program that includes a number of expansion projects, it invests more on Project Delivery due to the increased need for right-of-way purchases and design of more complex projects. When the majority of MnDOT's program consists of asset preservation projects in settings that are not complex such as rural areas, a smaller percentage of its overall program goes toward Project Delivery. MnDOT strives to reduce the overall need for Project Delivery through innovative design, early project identification, and shared services.



Chapter 3

INVESTMENT NEEDS

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INVESTMENT NEEDS

Substantial capital investments are needed to keep Minnesota's 12,000-mile state highway system in a condition that supports a strong economy and a high quality of life for Minnesotans. Chapter 3 provides a cost analysis of the investments needed on the state highway system through the year 2037 in five investment objective areas: System Stewardship, Transportation Safety, Critical Connections, Healthy Communities, and Other. It discusses investment need for each MnSHIP investment category within the objectives areas and explains how MnDOT developed its needs assumptions.

The chapter also includes an estimate of the amount of funding needed to achieve performance targets and other key objectives in each investment category through the next 20 years.

The key messages of Chapter 3 are:

- MnDOT estimated its 20-year investment needs for the state highway system by aiming to achieve both performance targets and other key system goals consistent with the Minnesota GO Vision.
- Approximately \$39 billion is needed over the next 20 years to achieve performance targets and other key system goals.
- Available revenue is estimated at \$21 billion. As a result, the annual average shortfall is estimated at \$900 million to meet all targets and goals.

Definition of Needs in MnSHIP

Transportation needs are defined as either the costs necessary to meet performance-based targets or the costs related to achieving key system goals. Satisfying both sets of transportation needs would allow MnDOT to align outcomes on the state highway system with the objectives outlined in the **Minnesota GO Vision** and the **Statewide Multimodal Transportation Plan** and/or manage the largest risks in its investment categories. MnDOT calculated the needs of each investment category based on this definition.

To arrive at the costs associated with meeting performance-based targets and other key goals for the state highway system, technical work groups used both performance measures and risk assessment to define performance levels in each investment category. Each performance level outlines a different amount of potential investment along with the improvements, outcomes, risks, and strategies associated with it. The highest performance level across the investment categories typically corresponds to the total need. The total need for the state highway system is estimated to be \$39 billion over 20 years, compared to \$21 billion in available revenue.

Appendix I: Investment Category Folios provides more detail regarding the performance levels for each category.

NEEDS ASSOCIATED WITH ACHIEVING PERFORMANCE TARGETS

As described in **Chapter 2. Key Assumptions and Factors,** MnDOT has used performance measures to help guide capital investment and operational decisions since the 1990s. The process of tracking, reviewing and reporting on conditions on the state highway system helps MnDOT and the public evaluate the impact and effectiveness of MnDOT programs.

Every year since 2008, MnDOT has published the Annual Minnesota Transportation Performance Report, which contains detailed information on the areas in which MnDOT tracks performance. The report includes a description of historical trends, current conditions, how MnDOT makes progress toward achieving targets, and anticipated outcomes based on planned investments through the four-year **State Transportation Improvement Program**.

Historically, MnDOT has set targets designed to achieve optimal or desired performance levels in particular investment categories. These targets have typically been based on lowest life-cycle costs, customer expectations or a policy priority. Others have been trend-based – set by looking at trends and outcomes associated with historical spending levels. More recently, MnDOT has also established performance targets that it determines to be an acceptable risk.

MnDOT used performance measures and costs associated with implementing performance-related strategies to develop its needs estimates in the following MnSHIP categories:

- Pavement Condition
- Bridge Condition
- Roadside Infrastructure Condition
- Traveler Safety
- Twin Cities Mobility
- Greater Minnesota Mobility
- Accessible Pedestrian Infrastructure

NEEDS ASSOCIATED WITH OTHER KEY SYSTEM GOALS

State highway system needs also include investments that are important for delivering an efficient and diversified program of capital improvements that achieve multiple benefits. While the categories listed below do not currently have established performance measures or targets, they are critical in helping MnDOT to make progress toward the Minnesota GO Vision:

- Jurisdictional Transfer
- Facilities
- Freight
- Bicycle Infrastructure
- Regional and Community Investment Priorities
- Project Delivery
- Small Programs

Without current performance measures or targets, MnDOT used alternative methods to estimate the needs in these categories. Needs were based on the following:

- **The cost to achieve multimodal transportation objectives.** The investment needs for Bicycle Infrastructure, and a portion of the needs for Accessible Pedestrian Infrastructure improvements—those unrelated to **1990 Americans with Disabilities Act** compliance—are based on advancing current levels of investment to more adequately promote a



multimodal transportation network, as described in the Minnesota GO Vision, Statewide Multimodal Transportation Plan, and the ADA Transition Plan.

- **The cost to manage greatest risks.** MnDOT calculated needs for the RCIP category by determining the amount needed to manage the greatest risks in this category.
- **The cost to support delivery of the capital program.** Project Delivery needs were calculated as the costs necessary to bring projects from conception to completion based on historical expenditures in this area.
- **The cost to implement programs.** Investment need for the Small Programs and Freight categories is the expected amount of money available for those programs. The Freight category includes funding from the National Highway Freight Program, which is a new federal program created by the **Fixing America's Surface Transportation Act**.

Please note: Needs below are listed by objective category, however, the order does not reflect priority.



Summary of Needs

In developing its assumptions for MnSHIP, MnDOT projected the investments necessary to meet state highway transportation needs through 2037. As discussed above, the need was determined by the costs required to meet performance-based targets and other key system goals, such as advancing the state's economic vitality and supporting Minnesotans' quality of life. The total need for the Minnesota state highway system is calculated to be approximately \$39 billion over 20 years. **Figure 3-1** shows a comparison between available revenue and total need. **Figure 3-2** shows the distribution of need by investment category. This level of investment would ensure that the state highway system meets all federal and state performance requirements and makes substantial progress toward realizing the Minnesota GO Vision. It would also allow MnDOT to effectively manage its greatest risks in each investment category. **Figure 3-3** summarizes what MnDOT would be able to accomplish in each investment category under a program with no fiscal constraints.

Figure 3-1: Comparison of Investment Needs and Available Revenue

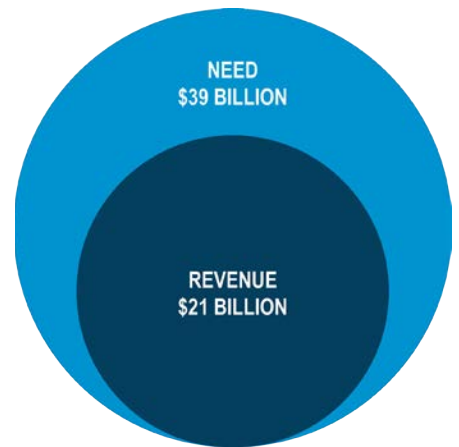


Figure 3-2: Transportation Needs During the Next 20 Years (by Investment Category)

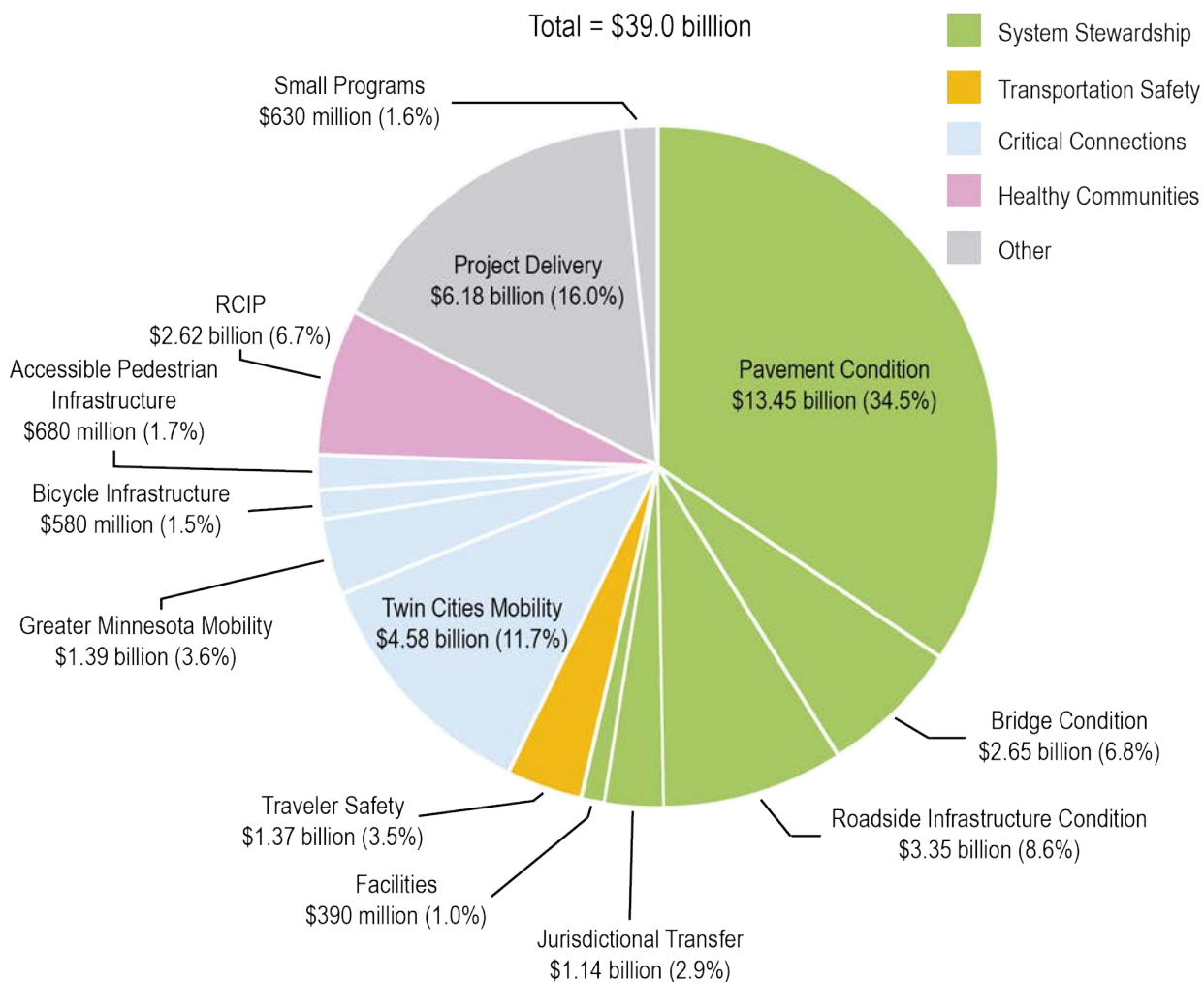


Figure 3-3: Transportation Needs During the Next 20 Years (by Investment Category)

INVESTMENT CATEGORY	OBJECTIVE AREA	20-YEAR OUTCOMES BASED ON PERFORMANCE TARGETS OR OTHER KEY SYSTEM GOALS	ESTIMATED 20-YEAR NEED	TOTAL (%) OF NEED
Pavement Condition	System Stewardship	Meet pavement performance target of 2.0% poor condition on Interstates, 4.0% percent poor condition on non-Interstate NHS, 10.0% poor condition on non-NHS.	\$13.44 billion	34.5%
Bridge Condition	System Stewardship	Meet bridge performance target of 2.0% poor condition on NHS bridges, 8.0% poor condition on non-NHS bridges.	\$2.65 billion	6.8%
Roadside Infrastructure Condition	System Stewardship	Meet performance target of 10.0% poor condition for culverts and tunnels, 6.0% poor condition for signals, lighting, signs/sign structures, and ITS, 2.0% poor condition for noise walls.	\$3.35 billion	8.6%
Jurisdictional Transfer	System Stewardship	Fully implement the 2014 Minnesota Jurisdictional Realignment Report by repairing and transferring approximately 1,200 miles of roadway (centerline).	\$1.14 billion	2.9%
Facilities	System Stewardship	No rest areas or weigh stations beyond service life.	\$390 million	1.0%
Traveler Safety	Transportation Safety	Meet an aggressive traffic fatalities target by implementing District Safety Plans at an increased rate, investing at most sustained crash locations.	\$1.37 billion	3.5%
Twin Cities Mobility	Critical Connections	Build out the majority of MnPASS Express Lane and increase investments in strategic mobility.	\$4.58 billion	11.7%
Greater Minnesota Mobility	Critical Connections	Invest in all operational and capital improvements at locations experiencing high travel time delay in Greater Minnesota.	\$1.39 billion	3.6%
Bicycle Infrastructure	Critical Connections	Maintain existing bicycle facilities in good condition, complete stand-alone bikeway projects, and designate 8 state bikeways.	\$580 million	1.5%
Accessible Pedestrian Infrastructure	Critical Connections	Bring all sidewalks, curb ramps, and signalized intersections to total ADA-compliance by 2037, double non-ADA pedestrian projects.	\$680 million	1.7%
Regional and Community Improvement Priorities	Healthy Communities	Expand partnerships with stakeholders, cooperative agreements, regional priorities, proactive flood mitigation, main street reconstructions and increased landscaping.	\$2.62 billion	6.7%
Project Delivery	Other	Efficiently deliver projects through adequate consultant services, supplemental agreements, construction incentives, and right-of-way acquisition.	\$6.18 billion	16.0%
Small Programs	Other	Continue to fund unforeseen issues and historic property improvements.	\$630 million	1.6%
TOTAL			\$39 BILLION	100%

SYSTEM STEWARDSHIP NEEDS

MnDOT estimates that it would cost \$20.98 billion to meet performance targets and other key objectives for System Stewardship through 2037.

SYSTEM STEWARDSHIP	INVESTMENT NEED
Pavement Condition	\$13.44 billion
Bridge Condition	\$2.65 billion
Roadside Infrastructure Condition	\$3.35 billion
Jurisdictional Transfer	\$1.14 billion
Facilities	\$390 million
Total	\$20.98 billion

Pavement Condition Needs

Using the **Pavement Management System** model, MnDOT projected its future pavement needs for MnSHIP by calculating the 20-year investment needed to fulfill its performance goals. MnDOT used the following targets for the Interstate system, non-Interstate NHS, and non-NHS roadway pavement miles:

- **Interstate pavements:** 2.0 percent (or less) in poor condition
- **Other NHS pavements:** 4.0 percent (or less) in poor condition
- **Non-NHS pavements:** 10.0 percent (or less) in poor condition

These are targets that would best position MnDOT to meet its federal and state requirements while also meeting customers' ride quality expectations.

Pavement Condition need is estimated to be \$13.44 billion. At this level of investment in Pavement Condition, MnDOT would be able to:

- Invest in NHS and non-NHS roads to meet all pavement condition targets by 2037

Bridge Condition Needs

MnDOT measures its bridge performance based on structural condition, and has established targets for bridges on NHS and non-NHS highways:

- **NHS bridges:** 2.0 percent (or less) in poor condition (by deck area)
- **Non-NHS bridges:** 8.0 percent (or less) in poor condition (by deck area)

MnDOT uses the **Bridge Replacement and Improvement Management** prioritization tool to identify its bridge investments. The total need amount in Bridge Condition is based on investing in all state highway bridges at optimal points in their life-cycles over the next 20 years. BRIM also accounts for other factors in ranking priority for bridge projects, such as traffic volume, highway



classification and special vulnerabilities.

Bridge Condition need is estimated to be \$2.65 billion. At this level of investment in Bridge Condition, MnDOT would be able to:

- Meet all performance-based bridge needs including bridge culverts, tunnels, pedestrian bridges, and MnDOT-owned railroad bridges

ROADSIDE INFRASTRUCTURE CONDITION NEEDS

MnDOT measures its Roadside Infrastructure Condition performance based on structural condition and has established targets for some assets in the investment category. As part of the **Transportation Asset Management Plan** process, MnDOT developed goals or outcomes used to set targets for culverts, deep storm water tunnels, and overhead sign structures. MnDOT used the following targets for estimating need:

- **Culverts:** 10.0 percent (or less) in poor condition
- **Deep storm water tunnels:** 10.0 percent (or less) in poor condition
- **Overhead sign structures:** 6.0 percent (or less) in poor condition

MnDOT used targets for estimating need for other Roadside Infrastructure Condition assets, including ITS infrastructure, lighting, noise walls, signs and traffic signals. However, these targets have yet to be officially adopted.

Roadside Infrastructure Condition need is estimated to be \$3.35 billion. At this level of investment in Roadside Infrastructure Condition, MnDOT would be able to:

- Meet performance targets (for those assets with accepted targets)
- Allocate a sizeable amount of funding to replace and repair assets at the end of their service life

MnDOT will continue to refine its approach to estimating needs in this category by improving its tracking of maintenance and capital investments, as well as inventories.

FACILITIES NEEDS

MnDOT completed an assessment of all MnDOT-owned facilities in 2015 to better understand the level of investment necessary to maintain these buildings in an acceptable condition. MnSHIP guides capital investments only in buildings and facilities along the state highway, which includes all rest areas and weigh stations (weigh scales and buildings).

Facilities need is estimated to be \$390 million. At this level of investment in Facilities, MnDOT would be able to:



- Invest to maintain at least 50 percent of rest areas in good condition
- Expand weight enforcement activities and improve technologies

JURISDICTIONAL TRANSFER NEEDS

MnDOT calculated the need for jurisdictional transfer based on an analysis of the alignment, or ownership, of Minnesota’s roads as outlined in the **2014 Minnesota Jurisdictional Realignment Project** report. The identified needs are capital improvements to roads required to make a transfer from MnDOT to county or local governments or vice versa over the next 20 years.

Jurisdictional Transfer need is estimated to be \$1.14 billion. At this level of investment in Jurisdictional Transfer, MnDOT would be able to:

- Leverage other state funding to repair and transfer 1,200 (centerline) miles of roads.

TRANSPORTATION SAFETY NEEDS

MnDOT estimates that it would cost approximately \$1.37 billion to meet its Transportation Safety needs through 2037.

TRANSPORTATION SAFETY	INVESTMENT NEED
Traveler Safety	\$1.37 billion

MnDOT estimated needs in Transportation Safety over the next 20 years by calculating the cost of implementing projects similar to those found in the **District Safety Plans** more quickly than the current rate. This would enable MnDOT to address many sustained crash locations while also continuing its support of the **Toward Zero Deaths** initiative.

Transportation Safety need is estimated to be \$1.37 billion. At this level of investment, MnDOT would be able to:

- Implement identified low-cost, proactive projects more quickly than at the current rate
- Invest at most sustained crash locations





CRITICAL CONNECTIONS NEEDS

MnDOT estimates that it would cost approximately \$7.23 billion to meet its targets and key objectives for Critical Connections through 2037.

CRITICAL CONNECTIONS	INVESTMENT NEED
Twin Cities Mobility	\$4.58 billion
Greater Minnesota Mobility	\$1.39 billion
Bicycle Infrastructure	\$580 million
Accessible Pedestrian Infrastructure	\$680 million
Total	\$7.23 billion

TWIN CITIES MOBILITY NEEDS

MnDOT calculated its 20-year needs for Twin Cities Mobility by projecting the costs associated with implementing mobility strategies listed in the Metropolitan Council's 2040 Transportation Policy Plan. In doing so, MnDOT would build out a majority of planned **MnPASS express lanes** and double **major capacity improvements** within the next 20 years while continuing to invest in **Active Traffic Management** and **spot mobility improvements**. With new **Federal Highway Administration** performance measures expected for Twin Cities area NHS reliability or congestion, MnDOT and the Metropolitan Council may need to adjust these mobility strategies within the 20-year timeframe of MnSHIP.

Twin Cities Mobility need is estimated to be \$4.58 billion. At this level of investment in Twin Cities Mobility, MnDOT would be able to:

- Continue expanding the Active Traffic Management system
- Invest in spot mobility improvements at an increased rate
- Build out a majority of planned MnPASS express lanes
- Substantially increase investment in major capacity projects

GREATER MINNESOTA MOBILITY

MnDOT calculated its 20-year needs for Greater Minnesota Mobility by analyzing highway corridors experiencing high travel time delay. Needs were calculated by estimating costs necessary to invest in all operational and capital improvements at these locations. With new FHWA performance measures expected for NHS reliability or congestion, MnDOT may need to adjust these mobility strategies within the 20-year timeframe of MnSHIP.

Greater Minnesota Mobility need is estimated to be \$1.39 billion. At this level of investment in Greater Minnesota Mobility, MnDOT would be able to:

- Invest in both low-cost operational improvements and high-cost capital

improvements at locations experiencing high travel time delay in Greater Minnesota

FREIGHT NEEDS

At this time, MnDOT has not estimated its 20-year needs for freight on the state highway system. The investment in the Freight category identified in MnSHIP reflects the amount provided for the National Highway Freight Program as part of the FAST Act. Needs related to freight movement have been identified in other investment categories so there is no separate need category for freight in this MnSHIP update. The forthcoming **Minnesota Freight Investment Plan** will identify priorities for spending money for freight improvements.

BICYCLE INFRASTRUCTURE NEEDS

To estimate its 20-year needs, MnDOT calculated the costs required to invest in bicycle facilities concurrently with bridge and pavement improvements and make enhancements to bicycle infrastructure through standalone projects. MnDOT has completed its **Statewide Bicycle System Plan** which provides direction on how to support bicycling on Minnesota state highways through partnerships with locals, establishment of a priority bicycle network and traditional investments. This planning effort helped identify the public's preference for more local routes and separated bike lanes. MnDOT will continue to work with regional and local partners to identify priority routes for investments.

Bicycle Infrastructure need is estimated to be \$580 million. At this level of investment in Bicycle Infrastructure, MnDOT would be able to:

- Keep existing bicycle facilities in good condition
- Make enhancements, such as separated bike lanes on yet-to-be-determined local priority networks
- Designate and sign eight state bikeways
- Continue to invest in the bicycle network concurrent with pavement and bridge projects

ACCESSIBLE PEDESTRIAN INFRASTRUCTURE NEEDS

MnDOT calculated the 20-year need for Accessible Pedestrian Infrastructure by determining the investment needed to bring all sidewalks and curb ramps into total compliance with ADA standards by 2037. MnDOT would also install **Accessible Pedestrian Signals** at all signalized intersections, and undertake strategic stand-alone projects to fill gaps in the sidewalk network or as part of complete streets projects.





Accessible Pedestrian Infrastructure need is estimated to be \$680 million. At this level of investment in Accessible Pedestrian Infrastructure, MnDOT would be able to:

- Meet full ADA compliance of its existing pedestrian network by 2037
- Double the current level of investment in sidewalk and pedestrian enhancement and expansion projects as a part of pavement and bridge projects

HEALTHY COMMUNITIES

REGIONAL AND COMMUNITY IMPROVEMENT PRIORITIES NEEDS

MnDOT estimates that it would cost approximately \$2.62 billion to meet its key objectives for **Regional and Community Improvement Priorities** or **RCIPs** through 2037.

REGIONAL AND COMMUNITY IMPROVEMENT PRIORITIES	INVESTMENT NEED
Regional and Community Improvement Priorities	\$2.62 billion

RCIPs cover a range of improvements for which MnDOT does not have performance-based goals. The investment need associated with this objective is based on MnDOT's recent efforts and historical expenditures in this area. Investment at this level will allow MnDOT to continue to address local and regional concerns, such as economic development, proactive flood mitigation, urban reconstruction, and landscaping. MnDOT recognizes that the current level of spending likely does not capture the full array of non-performance-based needs and opportunities across the state.

RCIP need is estimated to be \$2.62 billion. At this level of investment in RCIPs, MnDOT would be able to:

- Invest in three to seven transportation economic development projects per year
- Implement five to six urban reconstruction or Main Street projects per year
- Address high priority flood mitigation projects
- Expand landscaping investments in projects
- Expand opportunities to participate in local initiatives

OTHER NEEDS

MnDOT estimates that it would cost approximately \$6.81 billion to meet its key objectives for Project Delivery and Small Programs through 2037.

OTHER	INVESTMENT NEED
Small Programs	\$630 million
Project Delivery	\$6.18 billion
Total	\$6.81 billion

SMALL PROGRAMS NEEDS

MnSHIP assumes MnDOT will continue to need a fixed amount of funds throughout the 20-year timeframe to respond to short-term, unforeseen issues and continuing commitments. MnDOT currently plans approximately \$32 million per year or 3 percent of its total projected revenue to cover investments in Small Programs.

Assuming that the current investment level is held constant throughout the next 20 years, approximately \$630 million is needed to fund Small Programs. This MnSHIP update has reduced the size of Small Programs as rest area, weigh station and economic development investments have been incorporated into other MnSHIP investment categories.¹

If MnDOT does not fully spend its annual allocation for Small Programs in a given year, it directs the funds toward its highest unaddressed risks in the capital program.

PROJECT DELIVERY NEEDS

MnDOT estimates that achieving its targets and key objectives in the areas of System Stewardship, Transportation Safety, Critical Connections and Health Communities would require approximately \$6.18 billion in Project Delivery through 2037.

MnDOT analyzed the amount historically spent in this category to establish the proportion of the overall investment that would be required to design, engineer and construct projects during the next 20 years. Approximately 16 percent of MnDOT's annual capital investment typically goes to supporting the delivery of projects. The percentage of spending in project delivery has changed significantly since 2013 MnSHIP as a result of more thorough analysis of actual expenditures and increased requirements for MnDOT projects.

¹ See Facilities and Regional and Community Improvement Priorities investment categories.



Comparison to the Needs in 2013 MnSHIP

MnDOT's previous 20-year state highway investment plan, completed in 2013, identified a total need of \$30 billion. The plan projected \$18 billion in revenue which resulted in a \$12 billion funding gap. This MnSHIP update projected revenue of \$21 billion and a total need of \$39 billion, which resulted in an \$18 billion funding gap. Between 2013 and 2016, the estimated unmet need grew by \$6 billion. The primary reasons for growth in need include:

- The inclusion of two new categories (Jurisdictional Transfer and Facilities) which identify capital investment need not previously included in MnSHIP
- Better understanding of roadside infrastructure investment need due to asset management planning efforts
- Increased impacts of inflation as the years change from 2014-2033 to 2018-2037
- Increased Project Delivery investment as a result of the larger overall program as well as better estimation of need

However, not all needs have increased since 2013. The needs for Bridge Condition have decreased due to greater accuracy of the deterioration model and forecasted condition.





Chapter 4

DEVELOPMENT OF INVESTMENT DIRECTION

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DEVELOPMENT OF INVESTMENT DIRECTION

MnDOT used various factors including an extensive public engagement process to develop priorities for investments on the state highway system over the next 20 years. These priorities reflect the investment direction that identify levels of funding for MnSHIP investment. In developing the investment direction, MnDOT considered many criteria including:

- Federal and state requirements
- MnDOT policy goals and objectives
- Technical information on the condition of the state highway system
- Investment needed to maintain the system in a state of good repair
- Estimated revenue over the 20 years of the plan
- Management of key risks to the system
- Public and stakeholder input

The process helped MnDOT complete several key tasks including communicating future outcomes for the state highway system and gauging the degree to which different investment approaches align with public, stakeholder and agency expectations. The process also adjusted the investment direction to guide future capital investments.

The key messages of Chapter 4 are:

- MnDOT developed three investment approaches that highlight the potential 20-year outcomes on the state highway system to generate feedback and help shape investment priorities.
- The process used innovative strategies for in-person engagement, online engagement, and engagement of traditionally underserved communities.
- Participants in the public outreach process stated that MnDOT should invest in maintaining the existing pavement and bridges while making limited mobility improvements.
- MnDOT used the results of the public engagement process as well as internal MnDOT input to develop a 20-year investment direction.
- During a second round of public outreach, participants communicated they understood the rationale behind the investment decisions in MnSHIP but were generally dissatisfied about the investment direction and outcomes of the plan.

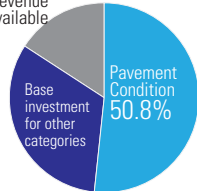
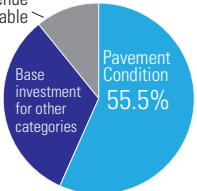
Development of Investment Approaches

To maintain existing infrastructure at today's condition levels for the next 20 years would require nearly all \$21 billion of MnSHIP's available revenue. Given the limited revenue, MnDOT identified investment trade-off decisions that balance numerous competing priorities. To illustrate these trade-off decisions, MnDOT developed performance levels for each investment category and then packaged different performance levels from each category into three investment approaches.

DEVELOPMENT OF PERFORMANCE LEVELS

During the summer of 2015, MnDOT formed workgroups for each investment category. These workgroups, composed of planning and engineering staff from MnDOT as well as staff from other agencies, assisted in creating performance levels. Performance levels represent different levels of investment for each investment category to reach specific outcomes identified by the workgroup. Each category had three to five performance levels (Performance Level 0 to Performance Level 2, 3, or 4). MnDOT used both performance measures and risk to define a potential range of investment in each category. The lowest performance level, PL0, represents the minimum level of investment that is acceptable given MnDOT's responsibility for public safety and basic system functionality. The highest investment levels allow MnDOT to meet the goals and objectives for each investment category and to make more progress toward the **Minnesota GO Vision**. Each performance level corresponds with a different set of improvements, outcomes, risks, and risk management strategies (**Figure 4-1**). **Appendix I: Investment Category Folios** provides more information on how performance levels were developed.

Figure 4-1: Excerpt from the Pavement Condition Investment Category Folio

	Performance Level 0 <i>Lowest cost, greatest risk</i>	Performance Level 1 <i>Lower cost, higher risk</i>
Investment Approach <i>(See Approach Folio)</i>	Approach C Corresponds with current investment	Approach A, B
Investment Level <i>Total</i> Years 5-10 (2022-2027) Years 11-20 (2028-2037)	\$8,447 M \$527.9 M/yr \$527.9 M/yr 	\$9,242 M \$577.6 M/yr \$577.6 M/yr 
Investment Description	Maintain current investment direction based on 2013 MnSHIP investment direction	Maintain Interstate at a level compliant with MAP-21. Maintain GASB 34 threshold on the NHS and Non-NHS system.

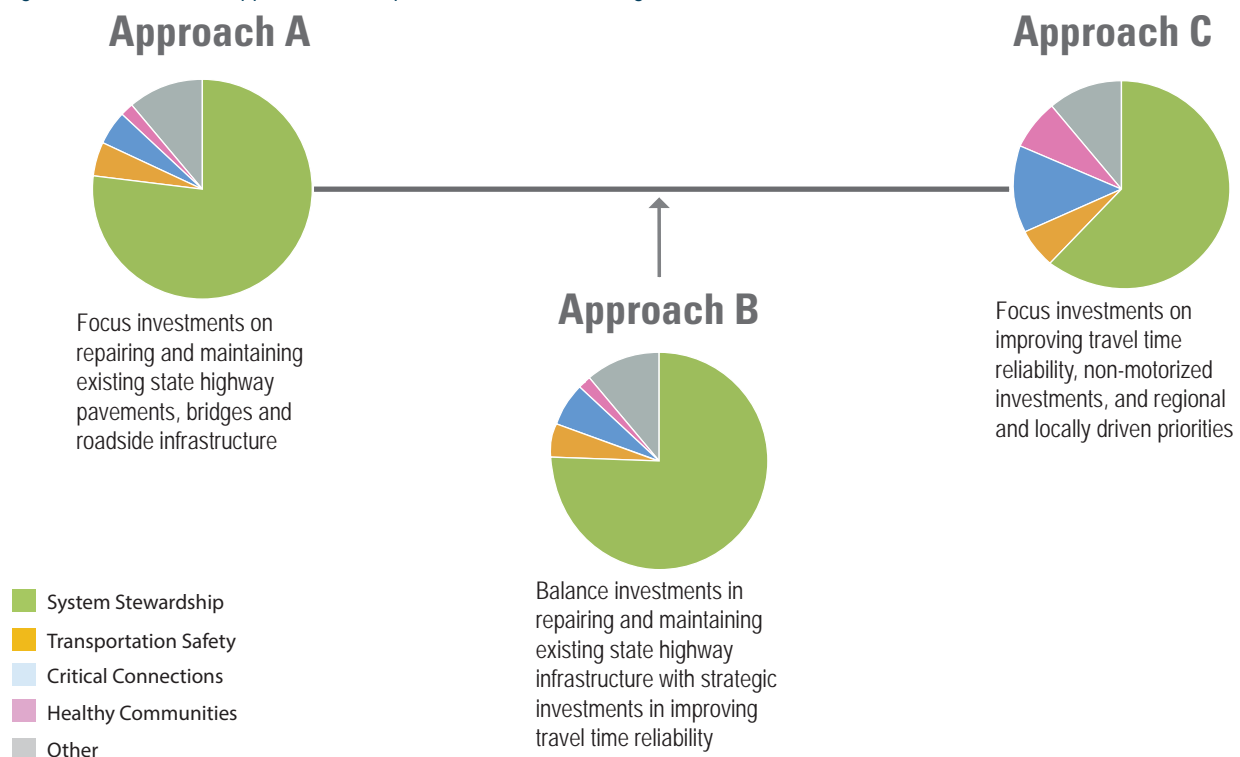
CONVERSION OF PERFORMANCE LEVELS INTO INVESTMENT APPROACHES

MnDOT packaged different combinations of performance levels for each of the investment categories into three investment approaches: A, B, and C. Each approach used the same baseline assumptions:

- \$21 billion in revenue is available over the next 20 years (2018-2037)
- The size of the state highway system will not change
- Each investment category must be funded to at least the lowest performance level (PL 0)
- The Project Delivery investment category requires a constant amount of funding to deliver the program based on historical spending patterns
- MnDOT will meet Americans with Disabilities Act substantial compliance standards for pedestrian infrastructure by 2037
- MnDOT needs to meet federal and state legislative requirements

MnDOT used these three approaches to show how available funding could be divided among the investment categories over the next 20 years based on different priorities. This demonstrates a range of possible outcomes and risks (Figure 4-2).

Figure 4-2: Investment Approach Developed for Scenario Planning



Public Engagement Summary

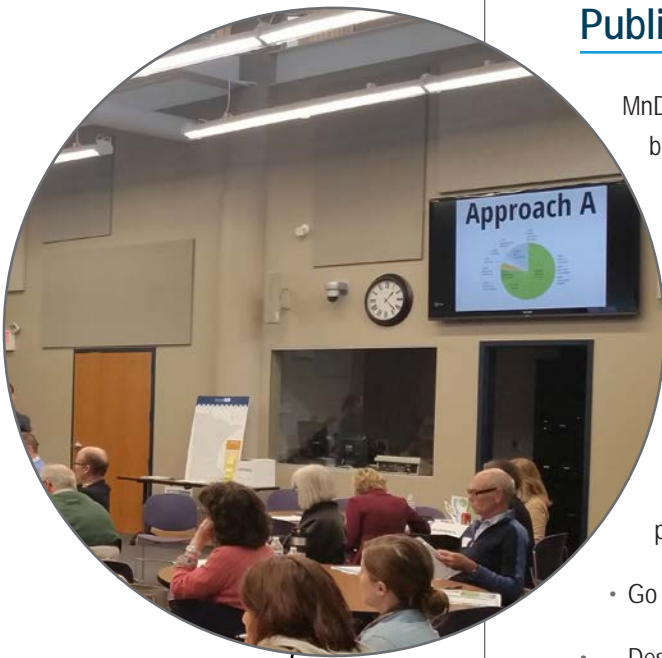
MnDOT conducted an eight-month joint public outreach process for both MnSHIP and the Statewide Multimodal Transportation Plan.

The process used innovative strategies for in-person engagement, online engagement, and engagement of traditionally underserved communities. MnDOT expanded its use of public engagement techniques from the 2013 plan including piloting several new tools to gather input from transportation partners, stakeholders and the public on priorities for investment. This feedback helped MnDOT identify priorities for developing the 20-year investment direction.

The MnSHIP engagement approach was based on the following principles:

- Go to the public and partners. Do not make them come to us
- Design tools to facilitate different levels of engagement. Individuals vary in interest and knowledge but everyone should be able to participate
- Be responsive and adaptive. Tailor tools and techniques to the needs of each specific group or event
- Partner with traditionally underserved communities to design an engagement approach that works for them
- Focus on involving more individuals and trying new things, but do not forget about traditional stakeholders and tested tools
- Collect data, regularly report on outreach activities, implement lessons learned, and fine-tune the approach

MnDOT made the decision to track demographics as a part of this outreach effort. All engagement tools that were completed anonymously asked participants to identify their zip code, age, gender, and race/ethnicity. Answering these questions was optional and voluntary. The project team collected and analyzed the data throughout the engagement effort to determine if certain populations were missed. The data helped refine the engagement strategy from month-to-month to address any shortfalls. After analyzing the data, MnDOT adjusted the engagement focus to increase the participation from traditionally underserved communities through targeted Facebook ads and a partnership with Emergency, Community, Health and Outreach (ECHO). The intended outcome was to reach a population that is representative of Minnesota's demographic makeup.



PUBLIC ENGAGEMENT

In-Person Engagement

MnDOT created multiple in-person opportunities for the public, stakeholders, and transportation partners to provide input on the priorities for the investment direction. MnDOT relied heavily on attending existing meetings, workplaces, and community events to seek input. In some cases, MnDOT had an hour on a meeting agenda to present. In other cases, MnDOT only had a few seconds to interact with people. With this in mind, MnDOT prepared multiple tools for various engagement settings to seek in-person input. Below are four different in-person settings used to gather input.

- Community Events
- Stakeholder Forums
- Partner and Stakeholder Briefings
- Workplace-Based Outreach

Online Engagement

MnDOT used several online tools to supplement the in-person engagement techniques. Online engagement was critical to reaching a larger audience. Online tools mirrored those used for in-person engagement. MnDOT created its first Online ADA Plan as part of the Public Participation Plan to ensure that all web-based engagement was accessible to persons with visual impairments. Below is a summary of the tools used for online engagement.

- Online Surveys
- Project Website
- Social Media
- Facebook Targeted Ads
- Stakeholder E-mail Updates

Traditionally Underserved Community Engagement

MnDOT provided specific outreach opportunities for traditionally underserved populations by piloting new engagement tools and techniques.

- Tribal Outreach
- Facebook Targeted Ads
- ECHO Outreach

A full public outreach summary is available in [Appendix G: Planning Context Summary](#).



PUBLIC ENGAGEMENT RESULTS

Scenario Preference

On average statewide, participants in the public outreach process preferred Approach B, no matter if they were transportation partners/stakeholders or the public. However, there were noticeable differences between the preferences of Twin Cities Metro Area and Greater Minnesota participants. As shown in **Figure 4-3**, Greater Minnesota preferred Approach A while the Twin Cities Metro Area preferred Approach B.

Scenario Rating

Participants who completed the survey rated Approach A the highest (**Figure 4-4**). However, Approach B rated very close to Approach A, only 1.7 lower. Similar to the results from the scenario preference, there were differences in the highest rated approach between Greater Minnesota and the Metro Area. Greater Minnesota rated Approach A highest while the Twin Cities Metro Area rated Approach B slightly higher than Approach A.

Most Important Investment Categories

At all outreach events, people selected their most important investment categories. The results are shown in **Figure 4-5**. Pavement Condition and Bridge Condition were the top two categories overall among both stakeholders and the public.

Figure 4-3: Most Frequently Selected Approach by Area

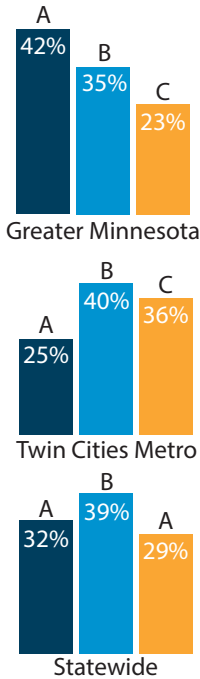


Figure 4-4: Highest Rated Approach by Area

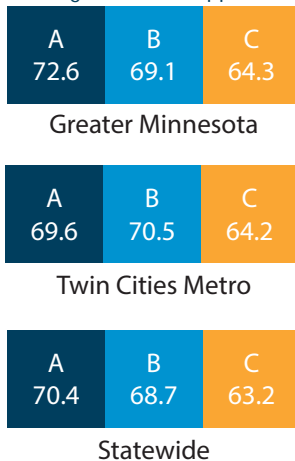


Figure 4-5: Most Selected Investment Categories

-  #1 - Pavement Condition
-  #2 - Bridge Condition
-  #3 - Roadside Infrastructure Condition
-  #4 - Regional/Community Improvement Priorities
-  #5 - Traveler Safety

Key Themes from Public Engagement

Participants provided a short statement that captured their preferred investment priorities. The following are the key themes identified from the results. **Figure 4-6** also summarizes comments received into a word cloud. The larger the word appears, the more often participants mentioned the word in comments received through outreach.

New Factors Influencing Investment Direction

MnDOT used the investment priorities in Approach B as the starting point to develop the investment direction based on the results of public outreach and internal analysis. To create an investment direction, MnDOT needed to address two new factors not considered in the development of the three approaches: a new federal transportation bill and a revised analysis of the amount of funding needed for Project Delivery.

FAST ACT

In December 2015, the federal government passed a new federal transportation bill. **Fixing America's Surface Transportation Act**. The FAST Act increased federal revenue projections in MnSHIP and created a new national freight program. MnDOT revised the 20-year revenue projections to account for these changes. The three approaches assumed \$20 billion. The new revenue projections assumed \$21 billion in available revenue over 20 years.

Roughly two thirds of the projected revenue increase is dedicated to the National Highway Freight Program. The FAST Act requires a freight investment plan to identify how funds from the National Highway Freight Program will be spent. Until then, MnSHIP is setting aside projected revenue from the National Highway Freight Program into a separate category called Freight. This category was not a part of the three approaches.

PROJECT DELIVERY REVISED ANALYSIS

A review of the investment needed to deliver projects determined that the funding used in the three approaches was too low (14 percent of the total program). MnDOT revised the analysis based on the average amount over the last three years and determined that spending needed to deliver projects was 16 percent of the capital program. The final investment direction reflects this change. MnDOT will use any efficiency in Project Delivery to program additional projects to maintain bridge and pavement conditions.



Setting of 20-Year Investment Direction

INVESTMENT CATEGORY ADJUSTMENTS

MnDOT needed to make changes from Approach B to handle the increase in Project Delivery in the MnSHIP investment direction. Several areas received lower amounts of investment to avoid any one category from receiving all of the impact. Changes included reducing Pavement Condition, Bridge Condition, Traveler Safety, Jurisdictional Transfer, Greater Minnesota Mobility and Bicycle Infrastructure.

SETTING A 20-YEAR INVESTMENT DIRECTION

In the 2013 MnSHIP, MnDOT divided the 20-year investment direction into two 10-year periods with different investment priorities. This allowed MnDOT to balance investment in expanding and maintaining the highway system in the first 10 years (2014-2023). During the second 10 years (2024-2033), a shift occurs as MnDOT focuses solely on maintaining the state highway system since the investment needed to preserve the system increases.

With this update to MnSHIP, the investment needed to maintain the system has grown. Likewise, MnDOT's ability to balance investments between expanding and maintaining the system is limited. If MnDOT were to continue with two separate 10-year investment periods, the differences between the two periods would be small. In addition, moving towards a 20-year investment direction eliminates the abrupt shift in investment priorities that existed in the 2013 version of MnSHIP. This change makes it easier for MnDOT districts to plan and deliver projects. For these reasons, MnDOT chose to develop a full 20-year investment direction instead of two 10-year investment periods.

The 20-year investment direction focuses on maintaining the existing state highway system while making limited mobility investments. Maintaining existing roadways surfaces, bridges, and other supporting infrastructure continues to make up more than two-thirds of total investment. Limited mobility investments are made in the Twin Cities Metro Area and Greater Minnesota.

Figure 4-8 shows a comparison between this investment direction and the 2013 investment direction and outlines the factors for changes made with this MnSHIP update. **Chapter 5** describes the investment direction and the outcomes that are projected.

Figure 4-8: Factors that Influenced the MnSHIP Investment Direction

INVESTMENT CATEGORIES	OBJECTIVE AREA	EXISTING INVESTMENT DIRECTION	UPDATED INVESTMENT DIRECTION	RATIONALE FOR ADJUSTING EXISTING DIRECTION
Pavement Condition	System Stewardship	48.6%	49.4%	Increase investment to maintain the system, though conditions decline. The NHS system is the priority network for investment and is held in better condition. MnDOT accepts more miles of non-NHS in poor condition. Public and internal feedback was to prioritize investment in maintaining the existing highway system.
Bridge Condition	System Stewardship	20.5%	11.4%	Recent increased investment has improved the condition of bridges. Greater accuracy of deterioration model and forecasted condition has led to increased efficiency of investments to maintain bridge condition. Enables MnDOT to invest less while maintaining acceptable bridge conditions.
Roadside Infrastructure Condition	System Stewardship	8.9%	7.7%	Maintain approximate current investment amount. Prioritize investment concurrent with pavement and bridge projects. Proactively address high-risk elements with stand-alone projects.
Jurisdictional Transfer	System Stewardship	N/A	0.4%	Invest in properly aligning the ownership of the system to provide the right level of service and better meet customer expectations.
Facilities	System Stewardship	N/A	0.4%	Maintain historical investment amount. Previously investment was split between Roadside Infrastructure and Small Programs
Traveler Safety	Transportation Safety	3.8%	3.2%	Slight reduction in investment in new safety improvements as many new improvements have been completed over the past decade. Primary factors in crashes include distracted driving which is difficult to address through capital investments. Rely on TZD program to focus on education and enforcement strategies to address these primary factors in crashes.
Twin Cities Mobility	Critical Connections	3.5%	1.1%	Maintain current investment through 2023 to deliver programmed and planned mobility projects. Consistent with Approach B, the most preferred approach.
Greater Minnesota Mobility	Critical Connections	0.0%	0.1%	Include investment to address mobility in Greater Minnesota as MnDOT develops the NHS performance measure. Consistent with Approach B, the most preferred approach.
Freight	Critical Connections	N/A	2.9%	Set-aside for investment from the National Highway Freight Program.
Bicycle Infrastructure	Critical Connections	1.2%	0.6%	Reduced investment in this category due to increased needs for maintaining the existing highway system, Project Delivery, and ADA improvements.
Accessible Pedestrian Infrastructure	Critical Connections	1.8%	2.5%	Increased investment needed to reach substantial ADA compliance with existing pedestrian infrastructure by 2037.
Regional and Community Improvement Priorities	Healthy Communities	3.8%	1.5%	Reduced investment in this category due to increased needs for maintaining the existing highway system, Project Delivery, and ADA improvements. Investment limited to the Transportation Economic Development program as well as cooperative agreements and minimal post-project landscaping needs.
Project Delivery	Other	8.3%	15.6%	Increased investment based on revised Project Delivery analysis.
Small Programs	Other	N/A	3.0%	Not included in overall investment direction in previous version of MnSHIP as investment was taken off the top. Reduced overall investment in Small Programs as several funding programs such as rest areas and weigh stations have been included in other investment categories.

Public Outreach on Draft Investment Direction

MnDOT conducted a second round of public outreach in spring 2016. This phase included four meetings across the state and one webinar to report on the results of fall 2015 outreach and gauge participants' understanding and acceptance of the content and outcomes of the draft investment direction.

Participants were generally dissatisfied about the investment direction and outcomes of the plan but understood why the trade-off decisions were made. The majority of participants thought the rationale behind the decisions was clear or very clear, signifying that MnDOT made progress toward a more transparent and accountable process. Although participants had differing priorities and did not agree with all of MnDOT's decisions, they frequently stated their appreciation for the structure, conversation, and transparency of both the fall and spring outreach processes.



WHAT IS POSITIVE ABOUT THE PLAN?

- It prioritizes maintaining the existing system first
- Mobility categories still get some level of funding
- It is the most responsible way to invest while still responding to the public's concerns
- MnDOT's continued, albeit limited, ability to partner with local agencies and stakeholders is preserved

WHAT IS NEGATIVE ABOUT THE PLAN?

- Funding levels are insufficient to meet stakeholder expectations
- No ability to meet most of the established targets for MnDOT's assets
- Not enough funding to complete urban reconstruction projects and improve main streets in towns across Minnesota
- Less funding for bicycle improvements than originally expected

OTHER TAKEAWAYS

- Need to educate stakeholders and legislators about funding shortfall
- Coordination with local partners is critical
- Pursue strategies to stretch available resources

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20-Year State Highway Investment Plan

Chapter 5

INVESTMENT DIRECTION

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INVESTMENT DIRECTION

The investment direction presented in this chapter prioritizes investments to maintain the existing state highway pavements and bridges while making limited mobility improvements over the next 20 years. The direction will guide investments so that transportation projects align with statewide goals as much as possible with available funding.

MnDOT districts select projects that are consistent with the investment direction in MnSHIP.

The key messages of Chapter 5 are:

- MnDOT will make progress in all investment areas, but not all performance targets will be met. Pavement condition is expected to decline significantly.
- MnDOT will put most of its available revenues toward maintaining the existing transportation system, which is consistent with public and stakeholder input.
- MnDOT will apply multiple strategies to optimize resources and achieve multiple purposes through its planned investments.

Project Selection

While MnSHIP sets MnDOT's investment priorities for a 20-year time period, MnDOT does not identify specific projects over the 20 years. MnDOT identifies potential projects in the first 10 years of the plan through the **10-Year Capital Highway Investment Plan**. The CHIP translates the 20-year investment direction into planned and programmed projects that collectively achieve the outcomes identified in MnSHIP. The CHIP consists of two time periods. Projects in years 1-4 are a part of the **State Transportation Improvement Program**. Projects are programmed and scheduled in the STIP. MnDOT is committed to delivering these projects over the next four years. Projects in years 5-10 are not yet committed. They are in the budget, but project timing, scope and cost may change. Together, projects in years 1-10 comprise the 10-Year CHIP. The following sections explain how the investment direction will influence project selection in each year of the 20-year plan.

INFLUENCE OF INVESTMENT DIRECTION ON PROJECT SELECTION IN YEARS 1-4

In the first four years (2018-2021) of MnSHIP, MnDOT committed to projects in the STIP based on the investment direction in the 2013 MnSHIP. MnDOT spent funding to scope and develop these projects using that investment guidance. MnDOT tries to avoid any changes to projects in the STIP, if possible. Therefore, MnDOT is not changing projects in years 2018 to 2021 to reflect the updated investment direction.

INFLUENCE OF INVESTMENT DIRECTION ON PROJECT SELECTION IN YEARS 5-10

MnSHIP investment direction will guide project selection from 2022 through 2027 with the publishing of the 2018-2027 10-Year CHIP. MnDOT developed the current 2017-2026 10-Year CHIP before the MnSHIP investment direction was finalized. The current projects listed in the 10-Year CHIP will be updated to reflect the MnSHIP investment direction and MnDOT will work to try to limit the changes to these projects. New projects will need to be identified to ensure that selected projects follow the investment direction in this plan.

INFLUENCE OF INVESTMENT DIRECTION ON PROJECT SELECTION IN YEARS 11-20

MnDOT does not identify individual projects beyond 10 years in MnSHIP. Investment in those years is identified by investment category only. However, the CHIP is updated annually so new projects are added to Year 10 with each version of the CHIP. These new projects will follow the investment direction established in this document.

Additional information on project selection and investment programs can be found in [Appendix E: MnSHIP Financial Summary](#).

Investment Summary

The 20-year investment direction focuses on maintaining the existing state highway system while making limited mobility investments. This approach reflects MnDOT and stakeholder input and meets key requirements and agency commitments. It also continues a shift for MnDOT from being a builder of the system to the maintainer and operator of the system. The investment direction does not affect the projects already developed and programmed in years 2018 through 2021. The priorities identified in this plan will be reflected in investments and projects starting in 2022. [Figure 5-1](#) shows the distribution of expenditures through all years of the plan.

[Figure 5-2](#) on the following page summarizes the total amount of investment for MnSHIP. It also includes current conditions and associated outcomes for each of the 14 investment categories.

Figure 5-1: 20-Year Capital Highway Investment Direction

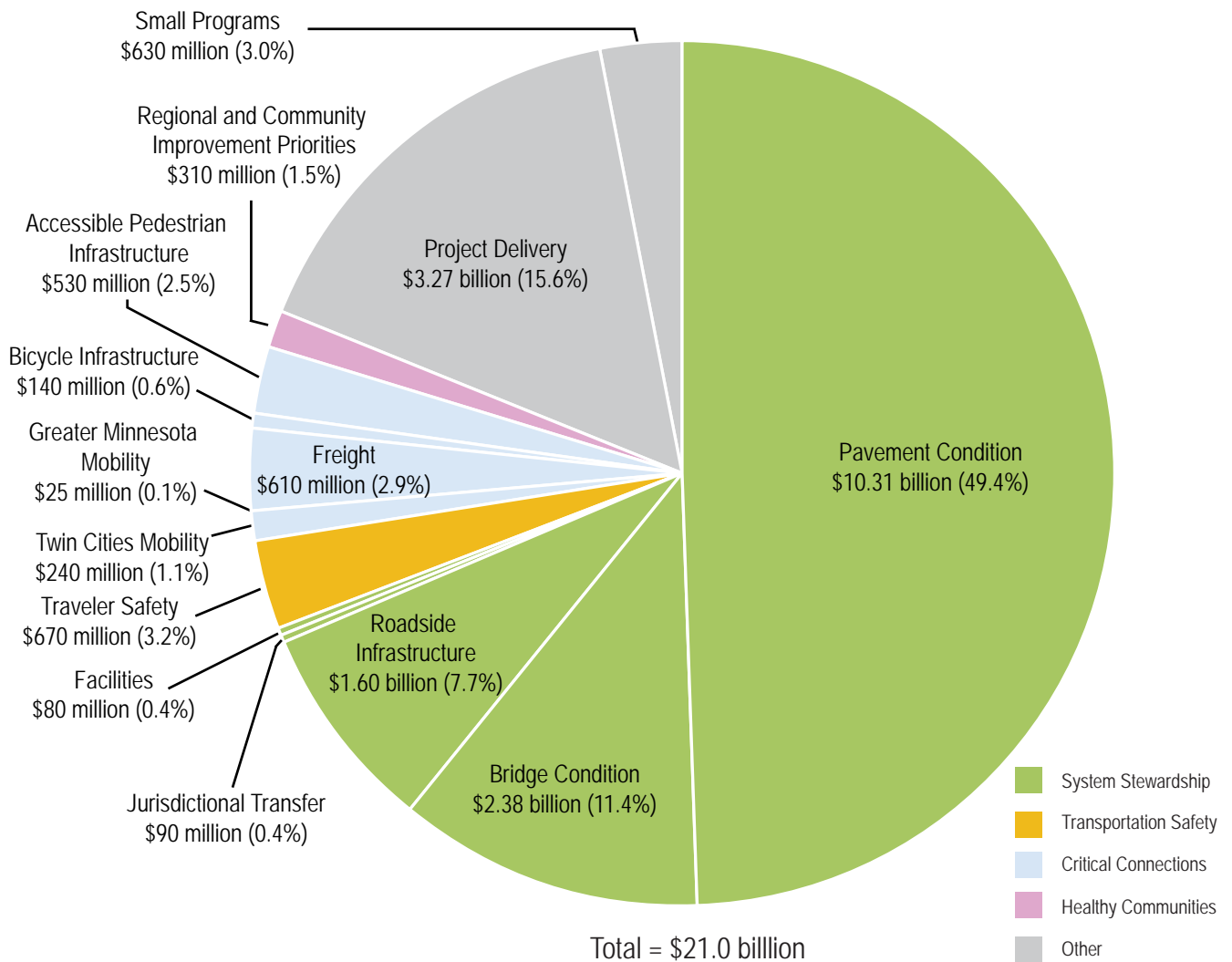


Figure 5-2: Total Investments, Outcomes and Current Condition

INVESTMENT CATEGORY	OBJECTIVE AREA	CURRENT CONDITIONS (2017)	PROJECTED OUTCOME(S) IN 2037	TOTAL INVESTMENT (2018-2037)
Pavement Condition	System Stewardship	<p>Meet MnDOT targets and Governmental Accounting Standards Board 34 thresholds for NHS and Non-NHS pavement condition.</p> <ul style="list-style-type: none"> • Interstate: 1.9% poor • NHS: 3.0% poor • Non-NHS: 4.0% poor 	<p>NHS and Non-NHS pavement condition worsen. Interstate condition worsens but meets federal minimum thresholds. Maintain GASB 34 threshold on the NHS.</p> <ul style="list-style-type: none"> • Interstate: 4.0% poor • NHS: 8.0% poor • Non-NHS: 18.0% poor 	\$10.31 billion
Bridge Condition	System Stewardship	<p>Meet GASB 34 thresholds for NHS and Non-NHS for bridge condition. Only Non-NHS meets MnDOT targets for bridge condition.</p> <ul style="list-style-type: none"> • NHS: 4.5% poor • Non-NHS: 1.3% poor 	<p>Non-NHS bridge conditions worsen, while NHS bridge condition is maintained. GASB 34 thresholds are met but NHS thresholds are not.</p> <ul style="list-style-type: none"> • NHS: 5.0% poor • Non-NHS: 7.0-8.0% poor 	\$2.38 billion
Roadside Infrastructure Condition	System Stewardship	<p>Roadside infrastructure condition does not meet targets.</p> <ul style="list-style-type: none"> • Culverts: 13.0% poor • Deep Storm Water Tunnels: 24.0% poor • Overhead Sign Structures: 30.0% poor 	<p>The condition of all roadside infrastructure assets will be maintained. Condition targets for culverts, deep storm water tunnels and overhead sign structures will not be met.</p> <ul style="list-style-type: none"> • Culverts: 14.0-15.0% poor • Deep Storm Water Tunnels: 23.0-24.0% poor • Overhead Sign Structures: 25.0% poor 	\$1.60 billion
Jurisdictional Transfer	System Stewardship	<p>2,653 miles of misaligned roads. Transfer of misaligned roads will continue.</p>	<p>MnDOT will transfer over 900 miles of roadway between the state and local agencies.</p>	\$90 million
Facilities	System Stewardship	<p>6.0% of rest areas in good condition and nearly half in poor condition. Repair or replacement of weigh scales is not keeping pace with need.</p>	<p>6.0% of rest areas will remain in good condition. Weigh scale and weigh station replacement will not keep pace resulting in outdated or inoperable sites.</p>	\$80 million
Traveler Safety	Transportation Safety	<p>Safety improvements are made proactively with low cost/high benefit projects. Total fatalities and serious injuries have plateaued after decade-long decline.</p>	<p>Safety improvements made at a reduced rate. There is limited ability to address locations with high sustained crash rates. Total fatalities and serious injures may see an increase.</p>	\$670 million
			TOTAL	\$21.0 BILLION

INVESTMENT CATEGORY	OBJECTIVE AREA	CURRENT CONDITIONS (2017)	PROJECTED OUTCOME(S) IN 2037	TOTAL INVESTMENT (2018-2037)
Twin Cities Mobility	Critical Connections	Congestion remains relatively flat. MnPASS express lanes and spot mobility improvements are completed where needed.	Travel time reliability likely to decrease. Investments made in two MnPASS corridors and six spot mobility improvements between 2018 and 2023.	\$240 million
Greater Minnesota Mobility	Critical Connections	A few corridors of mostly urban highways have decreased reliability during peak travel times.	Corridors likely to see decreased travel time reliability. 6-10 low-cost capital improvements are completed.	\$25 million
Freights	Critical Connections	-	-	\$610 million
Bicycle Infrastructure	Critical Connections	The condition of the state bicycle network is maintained and new bicycle improvements are being made where needed.	Reduced investment in new improvements and maintenance of existing bicycle infrastructure leads to deterioration of bicycle network.	\$140 million
Accessible Pedestrian Infrastructure	Critical Connections	Progress is being made towards ADA-compliant pedestrian infrastructure. Non-ADA pedestrian improvements are limited. • Sidewalks not ADA compliant: 54.0%	Infrastructure on the pedestrian network will be substantially compliant with standards. Some non-ADA projects will increase pedestrian access.	\$530 million
Regional and Community Improvement Priorities	Healthy Communities	Economic development and quality of life improvements are being made through partnerships and project upgrades.	MnDOT will respond to 2-5 economic development opportunities per year through the TED program.	\$310 million
Project Delivery	Other	Invest the amount necessary to deliver projects in the other categories.	Invest the amount necessary to deliver projects in the other categories.	\$3.27 billion
Small Programs	Other	-	Continue to invest in small programs such as off-system bridges and historic properties.	\$630 million
			TOTAL	\$21.0 BILLION

Figure 5-3: Investment Direction by Time Periods

INVESTMENT CATEGORIES	FY2018-2021	FY2022-2023	FY2024-2037
Pavement Condition	33.5%	47.3%	52.9%
Bridge Condition	15.6%	8.2%	9.7%
Roadside Infrastructure	8.7%	6.9%	7.7%
Jurisdictional Transfer	0.0%	0.5%	0.5%
Facilities	0.0%	0.4%	0.5%
Traveler Safety	4.2%	3.1%	3.1%
Twin Cities Mobility	5.7%	6.8%	0.0%
Greater Minnesota Mobility	0.0%	1.4%	0.0%
Freight	2.8%	2.7%	3.0%
Bicycle Infrastructure	0.8%	0.5%	0.6%
Accessible Pedestrian Infrastructure	1.8%	2.4%	2.7%
RCIP	3.3%	1.2%	1.0%
Project Delivery	14.3%	15.7%	16.0%
Small Programs	6.1%	2.8%	2.3%

Distribution of investments over the 20 year is not uniform. The investment direction has three phases as it transitions from the previous 2013 investment direction to the update investment direction in this MnSHIP. **Figure 5-3** shows the difference in investment breakdown over the 20 year time frame.

The first four years (2018-2021) of the MnSHIP investment direction represents the current projects which are being programmed in the STIP. Projects were selected based on 2013 investment direction guidance.

The next two years (2022-2023) of the investment direction reflects a transition between the 2013 MnSHIP investment direction and the updated investment direction in this plan. While the investment direction in these two years begins to shift towards an increased focus on maintaining the existing system over expanding the system there is continued investment in mobility projects. This represents the continued commitment to invest in mobility projects through 2023 identified in the 2013 plan and continued in this update.

After 2023, the investment direction reflects the priority to maintain the existing highway system. With no investment in mobility projects after 2023, investments in pavement condition, bridge condition, and roadside infrastructure increase.

BIGGEST STRENGTHS

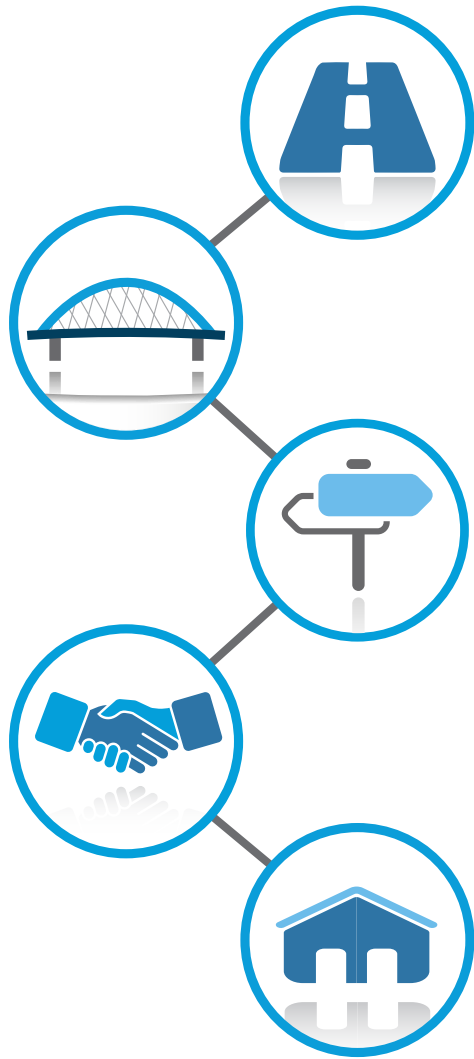
The investment direction makes progress toward goals in all four investment objective areas. MnDOT's priorities reflect the public's input that calls for a diversified approach, and one that prioritizes maintenance of the transportation system. Outcomes for each investment area include:

- **System Stewardship:** MnDOT focuses a majority of investment on maintaining the condition of roads, bridges and roadside infrastructure. Federal pavement and bridge condition minimum thresholds are likely to be met.
- **Transportation Safety:** MnDOT will continue to focus on lower cost, proactive treatments aimed at preventing fatalities and serious injuries.
- **Critical Connections:** MnDOT commits to achieving substantial compliance with the **Americans with Disabilities Act** no later than 2037. MnDOT also commits to planned mobility investments in the Twin Cities metro area through 2023.
- **Healthy Communities:** Through the **Transportation and Economic Development** program, investments will be made to address local concerns through partnerships, design add-ons and a few stand-alone projects to support economic competitiveness and quality of life.

BIGGEST DRAWBACKS

The investment approach offers a limited response to increasing infrastructure and multimodal needs. Several challenges remain, including:

- **System Stewardship:** Conditions of roads, bridges and roadside infrastructure decline on NHS and non-NHS routes.
- **Transportation Safety:** Only a limited number of locations with a sustained crash history will be addressed.
- **Critical Connections:** The number and scope of mobility improvements decreases substantially, potentially reducing the ability to maintain reliable travel times in the Twin Cities area and Greater Minnesota. Resources are not available to address growing areas of the state.
- **Healthy Communities:** The investment direction limits MnDOT's ability to address local concerns.



System Stewardship

The MnSHIP investment direction aligns with the System Stewardship objective and strategies in the Statewide Multimodal Transportation Plan. This objective emphasizes maintaining the state's existing NHS highways, keeping the transportation system on a sustainable track for the future, considering multiple needs in programming and collaborating with partners.

MnDOT will not be able to invest in all assets at optimal points in their life-cycles due to funding limitations. Throughout the 20-year plan, MnDOT will prioritize infrastructure improvements on NHS routes and hold these roads to a higher performance standard than non-NHS routes. This approach allows MnDOT to comply with federal law and manage risks related to statewide travel.

While MnSHIP's emphasis is on maintaining the existing system, MnDOT strives to achieve multiple objectives through coordinated investments. For example, drainage infrastructure (Roadside Infrastructure Condition) helps pavements last longer. Funding Bridge Condition at a high level of performance for all years of the plan supports traveler safety. Investing in Pavement Condition can enhance the bicycle and pedestrian network.

MnDOT will ensure that the dollars spent in System Stewardship achieve optimal outcomes through:

- **Innovation:** Developing new materials, design standards, and procedures
- **Low-cost maintenance and repairs:** Using recycled materials, innovative design, and preventive maintenance treatments to extend the useful life of infrastructure without increasing costs
- **Alternate bidding:** Planning for two comparable repair strategies (concrete versus bituminous) for some projects so contractors can bid the most cost-effective solution

In addition to MnSHIP, MnDOT will continue to use planning and research to guide its stewardship of state highway assets. MnDOT completed its first risk-based asset management plan, the **Transportation Asset Management Plan**, in 2013. The plan helps MnDOT coordinate pavement, bridge and roadside infrastructure investments to make the most effective use of limited dollars. It will be updated to include additional assets such as MnDOT buildings along the state highway, noise walls, pedestrian infrastructure (e.g. sidewalks and curb ramps, traffic signals and lighting) and intelligent transportation systems.

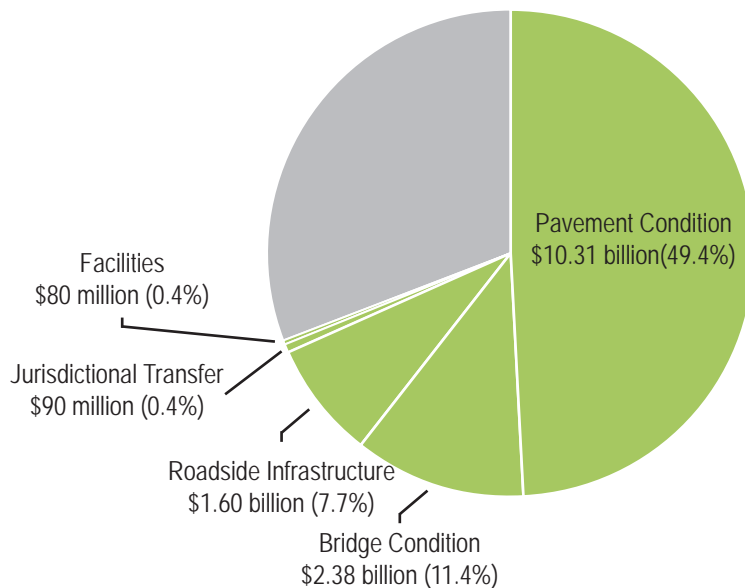
INVESTMENT PRIORITIES

Figure 5-4 shows that system stewardship is expected to constitute approximately 69 percent (\$14.6 billion) of MnDOT's overall program for the 20-year planning period of MnSHIP.

PAVEMENT CONDITION

Projects that qualify as Pavement Condition investments include overlays, mill and overlays and reconstruction of existing roads.

Figure 5-4: System Stewardship Investments in MnSHIP



Project Selection

MnDOT uses its **Pavement Management System** to predict future pavement conditions and develop a list of suggested fixes on NHS and non-NHS routes. The system uses funding assumptions based on statewide investment goals established in MnSHIP. The management system creates a preliminary 10-year list of potential projects. Projects on the NHS are selected through the **Statewide Performance Program** to achieve statewide outcomes on the NHS system. MnDOT districts then modify the list based on a number of considerations such as local knowledge of conditions, input from stakeholders and timing of other projects in the area. The result is a list of projects that are included in the CHIP.

Districts also plan pavement improvements on non-NHS routes through the **District Risk Management Program**. In this program, the districts have more flexibility to set priorities for non-NHS pavement projects provided that the projects collectively meet the MnSHIP investment guidance.

More information on the SPP and DRMP programs can be found in **Appendix E: MnSHIP Financial Summary**.

Outcomes

Overall, MnDOT expects that the miles of pavement in poor condition will increase significantly by the end of the 20-year planning period. No MnDOT performance targets will be met. However, interstate pavements are expected to meet federal minimum thresholds. Pavement condition is expected to decline due to two key factors: 1) limited funding and 2) the age of Minnesota's roadways, many of which were constructed over 40 years ago and require more expensive fixes. Conditions on the NHS and non-NHS are projected to decline most significantly.

At the end of the MnSHIP plan horizon (2037), the percentage of pavement in poor condition is expected to be:

- **Interstate pavements:** 4.0 percent (40 miles)
 - Will not meet MnDOT target (2.0 percent or less poor)
 - Is expected to meet federal minimum thresholds through 2037
- **Other NHS pavements:** 8.0 percent (230 miles)
 - Will not meet MnDOT target (4 percent or less poor)
- **Non-NHS pavements:** 18.0 percent (795 miles)
 - Will not meet MnDOT target (10.0 percent or less poor)
 - Will not meet GASB 34 threshold (~15 percent or less poor)

System Investment Strategies

MnDOT may implement any of the following strategies to address the risks that remain with the level of investment in Pavement Condition:

- Focus on reactive maintenance activities (e.g. pothole patching) to avoid hazardous conditions
- Use of operational budget for maintenance of pavements
- Short-term fixes to address immediate needs
- Load posting, or restricting heavy vehicles, on select roadways

BRIDGE CONDITION

Bridge Condition includes the replacement, repair and painting of bridges.

Project Selection

As is the case with Pavement Condition, MnDOT prioritizes more investments in Bridge Condition on NHS roads than on non-NHS state highways.



MnDOT's Bridge Office uses the **Bridge Replacement and Improvement Management** process and statewide goals to recommend bridge projects based on condition and risk factors. Risk factors can include the length of a potential detour and traffic volumes on the bridge. The bridge office and district offices generate a list of bridge projects for NHS (through the SPP) and non-NHS bridges (through the DRMP) based on the results of the BRIM process. In modifying the BRIM results, districts consider stakeholder input and local expertise to coordinate timing with other planned projects in the region.

Districts primarily choose projects with long-term fixes for NHS bridges and focus investment on non-NHS bridges in the greatest need of repair.

Outcomes

Bridge conditions on the NHS and non-NHS will worsen overall. However, the projected condition of NHS and non-NHS bridges is expected to meet the federal minimum thresholds and the GASB 34 minimum conditions thresholds. Only non-NHS bridges will meet all MnDOT targets.

The percentage of bridge deck area in poor condition is expected to be as follows in 2037:

- **NHS Bridges:** 6.0 percent
 - Will not meet MnDOT target (2.0 percent or less poor)
 - Will likely meet the federal minimum threshold (10.0 percent or less poor)
 - Meets GASB threshold (8.0 percent or less poor)
- **Non-NHS bridges:** 7.0 - 8.0 percent
 - Will likely meet MnDOT target (8.0 percent or less poor)
 - Meets GASB threshold (20.0 percent or less poor)

System Investment Strategies

MnDOT may implement any of the following strategies to address the risks that remain with the level of investment in Bridge Condition:

- Maintenance activities focused on preventive repairs
- Deferment of long-term fixes

ROADSIDE INFRASTRUCTURE CONDITION

Roadside Infrastructure Condition elements include culverts, traffic signals, signs, lighting, retaining walls, fencing, noise walls, guardrails, overhead structures, **Intelligent Transportation Systems**, and pavement markings.





Project Selection

MnDOT often repairs or replaces roadside infrastructure as part of a larger pavement and bridge project. Sometimes, MnDOT carries out corridor-wide, stand-alone roadside infrastructure projects for assets such as culverts, signage, or lighting. Roadside infrastructure damaged from weather or crashes are usually repaired as part of routine maintenance and funded through the operations and maintenance budget.

Outcomes

In general, by 2037, the condition of the system's roadside infrastructure elements is expected to remain relatively stable. However, NHS routes will receive more frequent upgrades to roadside infrastructure elements compared to non-NHS routes due to the relative frequency of pavement and bridge projects.

The percentage of roadside infrastructure in poor condition is expected to be as follows in 2037:

- **Culverts:** 14.0-15.0 percent
 - Will not meet target (10.0 percent or less poor)
- **Deep Storm Water Tunnels:** 23.0-24.0 percent
 - Will not meet target (10.0 percent or less poor)
- **Overhead Signs (structure only):** 25.0 percent
 - Will not meet target (6.0 percent or less poor)

System Investment Strategies

MnDOT may implement any of the following strategies to address the risks that remain with the level of investment in Roadside Infrastructure Condition:

- Repair and replace infrastructure in poor condition or infrastructure beyond its service life
- Replace infrastructure with greatest exposure to the traveling public, mostly through pavement/bridge projects

JURISDICTIONAL TRANSFER

Jurisdictional Transfer investments are needed capital investments to improve highways so they can be transferred from MnDOT to county or local governments or vice versa over the next 20 years.

Project Selection

Typically, a planned project is modified to include longer-term improvements

and/or additional enhancements with agreement that a local agency would take ownership of the road. Transferring a road requires the agreement of MnDOT and the local agency.

Outcomes

In combination with the \$50 million already allocated to jurisdictional transfers, this additional level of investment would allow MnDOT to repair and transfer more than 900 miles of roads.

System Investment Strategies

MnDOT may draw from the following strategies, when necessary, to prioritize projects and address risks that are associated with lower performance or investment in Jurisdictional Transfer:

- Leverage other dedicated funding
- Commit to correcting roads with highest degree of mismatched ownership (i.e. those identified in Track 0 of the [2014 Minnesota Jurisdictional Realignment Project](#) report)
- Balance investment between the Twin Cities area and Greater Minnesota
- Identify projects in the CHIP where investments could facilitate the transfer of ownership

FACILITIES

The Facilities investment category includes investments made to MnDOT buildings along state highways. These assets include rest areas, weight enforcement buildings and weigh scales. Facilities investments were previously made through either Roadside Infrastructure Condition or special capital programs.

Project Selection

New or renovated buildings are completed as stand-alone projects while pavement work on exit ramps or parking lots are typically completed in conjunction with another project on the adjacent highway.

Outcomes

At the level of investment included in MnSHIP, MnDOT expects the percentage of facilities needing significant renovation or replacement to increase. Investments in rest areas and weigh stations will be reactive, increasing maintenance costs and limiting MnDOT's ability to keep many facilities in a state of good repair.

System Investment Strategies

MnDOT may draw from the following strategies, when necessary, to prioritize projects and address risks that are associated with lower performance or



investment in Facilities:

- Prioritize health and safety-related repairs to rest areas unless replacement is warranted
- Focus investments on weigh scale mechanics and existing weigh station buildings

SYSTEM STEWARDSHIP OVERALL OUTCOMES

Pavement, NHS bridges and roadside infrastructure assets will continue to deteriorate over the next 20 years and as a result, MnDOT will:

- Not meet MnDOT targets for any pavement system.
- Meet state and federal minimum thresholds for bridge condition with a decrease in overall bridge system condition.

These targets represent desired performance levels, typically based on lowest life-cycle costs, customer expectations, or policy priorities. MnDOT used these targets to calculate its estimated 20-year needs in these categories, as described in **Chapter 3, “Investment Needs.”**

It should be noted that some roadside infrastructure assets, the Jurisdictional Transfer and Facilities categories do not have performance targets. In these cases, investments will be guided based on the goals MnDOT wants to achieve in each investment category.

Figure 5-5: System Stewardship Performance Targets and Outcomes

INVESTMENT CATEGORY	SYSTEM	TARGET	GASB 34 MINIMUM CONDITION THRESHOLD	PROJECTED OUTCOMES (2037)
Pavement Condition	Interstate	2.0% poor (or less)	10.0% poor (or less) (all NHS)	4.0% poor
Pavement Condition	Other NHS	4.0% poor (or less)	10.0% poor (or less) (all NHS)	8.0% poor
Pavement Condition	Non-NHS	10.0% poor (or less)	13.0% poor (or less)	18.0% poor
Bridge Condition	NHS	2.0% poor (or less)	8.0% poor (or less)	5.0% poor
Bridge Condition	Non-NHS	8.0% poor (or less)	20.0% poor (or less)	7.0-8.0% poor
Roadside Infrastructure Condition	Culverts	10.0% poor (or less)	N/A	14.0-15.0% poor
Roadside Infrastructure Condition	Deep Storm Water Tunnels	10.0% poor (or less)	N/A	23.0-24.0% poor
Roadside Infrastructure Condition	Overhead Sign Structures	6.0% poor (or less)	N/A	25.0% poor

Figure 5-5 shows MnDOT’s performance goals for Pavement Condition, Bridge Condition and certain Roadside Infrastructure assets when performance targets have been adopted. The anticipated pavement condition, bridge

conditions and roadside infrastructure on the state highway system are shown in the column on the far right. These outcomes meet the minimum thresholds established for GASB 34 and federal performance measures. However, many outcomes do not meet MnDOT targets.

Figure 5-6 summarizes the expected condition of all System Stewardship investment categories based on MnDOT's investment priorities for MnSHIP and compares them to the previous set of priorities established in the 2013 plan.

Figure 5-6: System Stewardship Outcomes and Total Investment

INVESTMENT CATEGORY	OBJECTIVE AREA	CURRENT CONDITIONS (2017)	PROJECTED OUTCOME(S) IN 2037	TOTAL INVESTMENT (2018-2037)
Pavement Condition	System Stewardship	<p>Meet MnDOT targets and GASB 34 thresholds for NHS and Non-NHS pavement condition.</p> <ul style="list-style-type: none"> • Interstate: 1.9% poor • NHS: 3.0% poor • Non-NHS: 4.0% poor 	<p>NHS and Non-NHS pavement condition worsen. Interstate condition worsens but meets federal minimum threshold. Maintain GASB 34 threshold on the NHS.</p> <ul style="list-style-type: none"> • Interstate: 4.0% poor • NHS: 8.0% poor • Non-NHS: 18.0% poor 	\$10.31 billion
Bridge Condition	System Stewardship	<p>Meet GASB 34 thresholds for both NHS and Non-NHS for bridge condition. Only Non-NHS meets MnDOT targets for bridge condition.</p> <ul style="list-style-type: none"> • NHS: 4.5% poor • Non-NHS: 1.3% poor 	<p>Non-NHS bridge conditions worsen, while NHS bridge condition is maintained. GASB 34 thresholds are met but NHS thresholds are not.</p> <ul style="list-style-type: none"> • NHS: 5.0% poor • Non-NHS: 7.0-8.0% poor 	\$2.38 billion
Roadside Infrastructure Condition	System Stewardship	<p>Roadside infrastructure condition is not meeting targets.</p> <ul style="list-style-type: none"> • Culverts: 13.0% poor • Deep Storm Water Tunnels: 24.0% poor • Overhead Sign Structures: 30.0% poor 	<p>The condition of all roadside infrastructure assets will be maintained. Condition targets for culverts, deep storm water tunnels and overhead sign structures will not be met.</p> <ul style="list-style-type: none"> • Culverts: 14.0-15.0% poor • Deep Storm Water Tunnels: 23.0-24.0% poor • Overhead Sign Structures: 25.0% poor 	\$1.60 billion
Jurisdictional Transfer	System Stewardship	<p>2,653 miles of misaligned roads. Transfer of misaligned roads will continue.</p>	<p>MnDOT will transfer more miles of roadway between the state and local agencies.</p>	\$90 million
Facilities	System Stewardship	<p>6.0% of rest areas in good condition and nearly half in poor condition. Repair or replacement of weigh scales is not keeping pace with need.</p>	<p>6.0% of rest areas will remain in good condition. Weigh scale and weigh station replacement will not keep pace resulting in outdated or inoperable sites.</p>	\$80 million
			TOTAL	\$14.46 B

Transportation Safety



TRAVELER SAFETY

Funding for traveler safety in MnSHIP will allow MnDOT to continue its comprehensive approach to improving traveler safety on state highways. As described in **Chapter 1. Plan Overview**, MnDOT currently uses a combination of three types of safety investments in its effort to improve safety and reduce the number of fatalities and serious injuries on Minnesota roads:

- Proactive lower cost, high-benefit safety features
- Sustained crash locations treatments
- Investments identified as part of the **Highway Safety Improvement Program**

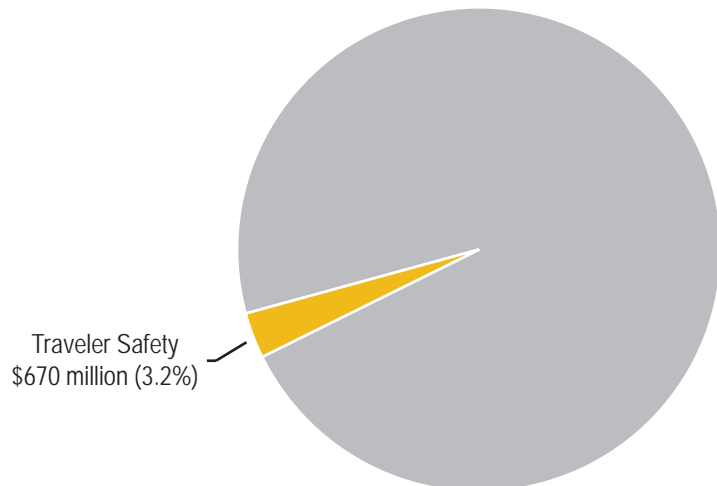
The Highway Safety Improvement Program is a federal program that emphasizes data-driven, strategic approaches to improving highway safety. HSIP projects correct a hazardous road location or address a highway safety problem.

The level of investment provides MnDOT limited ability to address locations with a sustained crash history. Due to changes in federal requirements, MnDOT will no longer provide capital funding for the **Toward Zero Deaths** initiative goals to promote enforcement and education efforts with its partners.

Investment Priorities

As shown in **Figure 5-7**, MnDOT anticipates spending approximately 3.2 percent of its program on Traveler Safety for the 20-year planning period of MnSHIP.

Figure 5-7: Traveler Safety Investment in MnSHIP



Project Selection

MnDOT selects safety projects on the NHS in coordination with its districts and the Office of Traffic, Safety and Technology. The mix of project types varies by district. Districts draw from two main sources to select projects:

- **District Safety Plans:** Each district uses its DSP to prioritize safety infrastructure projects and determine which strategic improvements to implement. In addition, the 10-Year Capital Highway Investment Plan includes Highway Safety Improvement Program investments.
- **Sustained crash locations list:** MnDOT's Office of Traffic, Safety and Technology identifies areas throughout the state that experience a high crash rate over a five-year period. Districts include high-priority projects at some of these locations.

The districts also estimate the costs associated with installing roadway safety infrastructure as part of other projects, namely pavement improvements.

Outcomes

MnDOT districts will continue installing safety features as part of pavement projects; however, the rate of implementing DSPs will be cut by one third. Lower cost, high-benefit safety infrastructure will be constructed at priority locations throughout the state highway system and select moderate to high-cost projects will be funded to address sustained crash locations. MnDOT will continue to participate in the TZD program.

Fatalities have been reduced substantially over the past 10 years. While MnDOT will continue to make investments in Traveler Safety, the goal of TZD cannot be achieved through infrastructure improvement alone. Even full implementation of all identified safety projects may do little to prevent fatalities and serious injuries resulting from driver behavior such as distracted or impaired driving.

System Investment Strategies

MnDOT may draw from the following strategies, when necessary, to prioritize projects and address risks that are associated with lower performance or investment in Traveler Safety:

- Invest in high priority, lower cost proactive projects
- Reactively install lighting at sustained crash locations

Figure 5-8 summarizes expected Traveler Safety outcomes based on MnDOT's investment priorities for MnSHIP and compares them to current conditions.

Figure 5-8: Transportation Safety Outcomes and Total Investment

INVESTMENT CATEGORY	OBJECTIVE AREA	CURRENT CONDITIONS (2017)	PROJECTED OUTCOME(S) IN 2037	TOTAL INVESTMENT (2018-2037)
Traveler Safety	Transportation Safety	Safety improvements are made proactively with low cost/high benefit projects. Total fatalities and serious injuries have plateaued after decade-long decline.	Safety improvements made at a reduced rate. There is limited ability to address locations with high sustained crash rates. Total fatalities and serious injures may see an increase.	\$670 million
			TOTAL	\$670 M



Critical Connections

Critical Connections includes mobility investments for many types of highway users, including those driving automobiles, freight carriers, bicyclists and pedestrians. MnSHIP's investment categories within Critical Connections recognize the importance of the multimodal connections detailed in the Statewide Multimodal Transportation Plan. The categories of Twin Cities Mobility and Greater Minnesota Mobility reflect that the state's mobility needs vary by geographical region, road volume and usage. Bicycle Infrastructure and Accessible Pedestrian Infrastructure help MnDOT better track its progress toward multimodal objectives on the state highway system, recognizing the need for building a safe transportation network that serves all Minnesotans. MnDOT also added one new investment category, Freight, for MnSHIP. The Freight investment category includes new federal funding that the upcoming Freight Investment Plan will determine how to invest.

INVESTMENT PRIORITIES

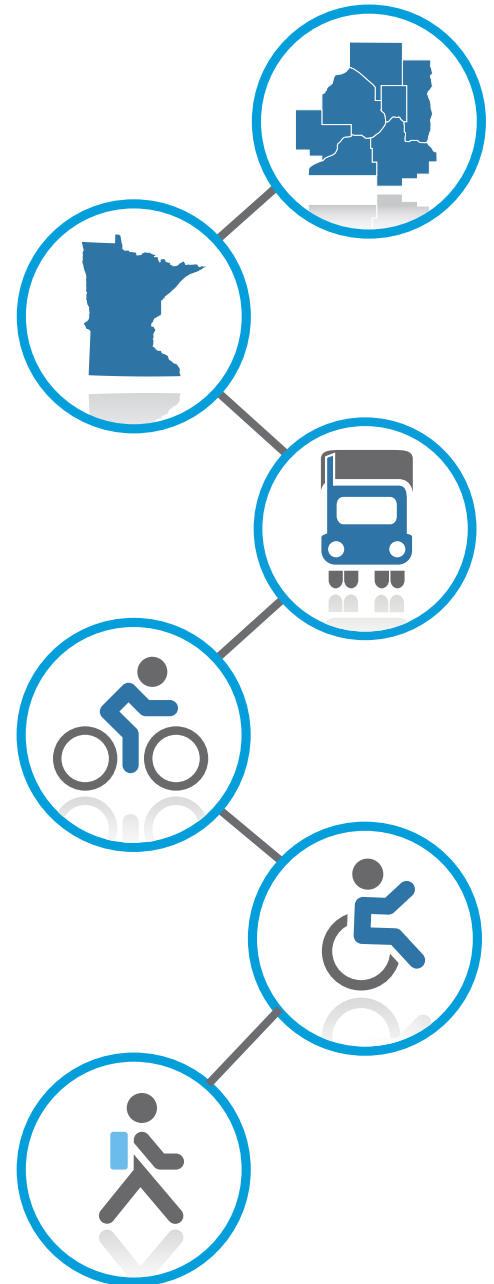
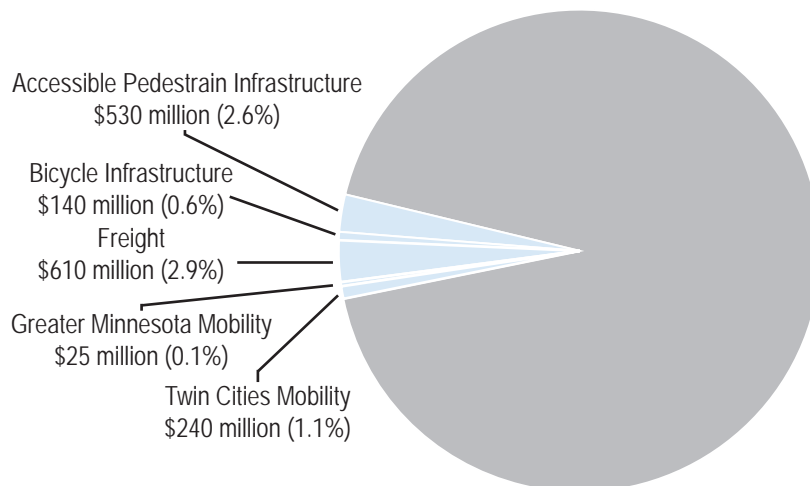
Critical Connections is expected to constitute 7.3 percent of MnDOT's investment through all years of the plan (Figure 5-9).

TWIN CITIES MOBILITY

The goal of the Twin Cities Mobility investment category is to enhance the movement of people, freight and transit on highways in the Twin Cities area. The Twin Cities Mobility investment category focuses on this by improving travel time reliability.

MnDOT's strategy for maintaining travel reliability in the Twin Cities metropolitan area has moved away from traditional highway expansion. Twin Cities mobility projects follow the strategies laid out by the Metropolitan Council, the regional **Metropolitan Planning Organization**, in its 2040

Figure 5-9: Critical Connections in MnSHIP



Transportation Policy Plan. The strategies include four types of highway mobility improvements:

- **Active traffic management**
- **Spot mobility improvements**
- **MnPASS express lanes**
- **Major capacity investments**

Project Selection

MnDOT's Metro District works in collaboration with the Metropolitan Council to develop a list of Twin Cities mobility projects that best align statewide goals within MnSHIP and the Council's Transportation Policy Plan. This approach addresses federal and state performance measures while also coordinating investments in other strategies that improve mobility on Twin Cities area highways through innovation, technology and multimodal options.

Many identified projects in Metro District's 10-Year Capital Highway Investment Plan originated in previous planning efforts, such as the Metropolitan Council's 2040 TPP, MnDOT's Congestion Management Safety Plan (for potential spot mobility projects) and MnPASS and other system studies completed in partnership with the Metropolitan Council. Twin Cities Mobility projects are often coordinated with bridge and pavement replacement projects to minimize travel disruptions and project costs.

Outcomes

Based on the investment direction in MnSHIP, MnDOT will be extremely limited in its ability to invest in Twin Cities Mobility. Over the 20-year plan period, MnDOT and the Metropolitan Council will invest in Twin Cities Mobility to implement the following:

- Approximately six spot mobility improvements
- Completion of MnPASS express lanes along two corridors

These projects will help improve travel reliability, but it is still anticipated to worsen through 2037 relative to today due to expected regional growth and the related increase in mobility needs across the system.

System Investment Strategies

MnDOT may draw from the following strategies, when necessary, to prioritize projects and address risks that are associated with lower performance or investment in Twin Cities Mobility:



- Focus on investments that provide reliable congestion-free options on Twin Cities metro area corridors
- Focus on low cost spot mobility projects that provide safety benefits and reduce delays

GREATER MINNESOTA MOBILITY

The goal of Greater Minnesota Mobility investments is to enhance the movement of people and freight in Greater Minnesota. It focuses on improving travel time reliability on the NHS through operational and low-cost capital improvements.

Project Selection

MnDOT prioritizes Greater Minnesota Mobility investments by considering the reliability of traffic flow on the NHS. Once the **Federal Highway Administration** finalizes the mobility performance measures for the NHS, MnDOT will set targets for those measures. These targets will inform where investments are necessary to meet the reliability and mobility goals for the NHS. MnDOT has not selected projects to be funded through Greater Minnesota Mobility for Years 1-4, as the category (formerly IRC Mobility) was not funded through MnSHIP 2013. MnDOT will re-evaluate the extent and location of performance-based needs on the NHS once performance measures are determined.

In addition to the investment in Greater Minnesota Mobility, there are projects listed in the 10-Year Capital Highway Investment Plans that will improve safety and mobility on the NHS in Greater Minnesota. These projects are currently categorized under other investment categories because they do not yet address a performance-based need.

Outcomes

Before specific projects are selected, MnDOT will need to establish performance targets for federal NHS mobility performance measures. The federal performance measures for mobility are not yet finalized. However, the investment in Greater Minnesota Mobility in MnSHIP could complete six to 10 operational and low-cost capital improvements on the NHS.

System Investment Strategies

MnDOT may draw from the following strategies, when necessary, to prioritize projects and address risks that are associated with lower performance or investment in Greater Minnesota Mobility:

- Focus investment to improve travel time reliability through operational improvements such as upgraded traffic signals, ITS, turn lanes and passing lanes



FREIGHT

The goal of the Freight investment category is to improve the efficient movement of freight. The investment in the Freight category identified in MnSHIP reflects the amount provided for the National Highway Freight Program as part of the federal transportation legislation, [Fixing America's Surface Transportation Act](#). Freight improvements on the highway system will be identified in the Minnesota Freight Investment Plan.

Project Selection

MnDOT has selected projects in Years 1-4 using funding from the [National Highway Freight Program](#). Additional projects will be selected using criteria from the Freight Investment Plan being led by MnDOT. MnDOT will work to develop a project selection process to identify projects in Years 5-10 of the CHIP once the investment plan has been completed.

Outcomes

MnDOT will project investment outcomes as part of the upcoming Freight Investment Plan. At this time, MnSHIP does not project outcomes for the Freight investment category.

System Investment Strategies

System investment strategies for the Freight investment category will be explored in the upcoming Freight Investment Plan.

BICYCLE INFRASTRUCTURE

MnDOT typically constructs bicycle improvements at the same time as pavement and bridge projects, but also implements some stand-alone projects in urban areas or areas with high volumes of bicycle traffic.

Project Selection

MnDOT districts identify their investments in Bicycle Infrastructure for Years 1-10 based on their highest risks and planned bridge and pavement projects for these years. Investments are generally made in conjunction with bridge or pavement projects. Bicycle improvements are occasionally made as a part of stand-alone bicycle projects.

The [Statewide Bicycle System Plan](#) completed in 2016, identifies priorities for the type of facility (separated bike lanes) and general locations for investment, such as in urban areas. Eventually bicycle and pedestrian planners, working with districts, will identify a priority bikeway network, which will include state highways and local roads. This effort will help MnDOT districts identify where bicycle facilities projects on state highways should be a priority.

Outcomes

MnDOT will invest in Bicycle Infrastructure at 75 percent of the current rate of investment. This will result in limited ability to make new improvements for bicycling and to maintain existing bicycle infrastructure as a part of pavement and bridge projects. Existing bicycle infrastructure will deteriorate and negatively affect the goal of promoting and increasing bicycling in Minnesota.

System Investment Strategies

MnDOT may draw from the following strategies, when necessary, to prioritize projects and address risks that are associated with lower performance or investment in Bicycle Infrastructure:

- Focus 70 percent of bicycle investments in urban areas and 30 percent of investments in rural areas
- Add to existing bridge and pavement projects to improve safety and connectivity of the state bikeway system

ACCESSIBLE PEDESTRIAN INFRASTRUCTURE

Improvements made to pedestrian infrastructure, whether as a result of ADA requirements or not, are typically implemented as part of pavement or bridge projects. However, stand-alone projects are also implemented where needed.

Project Selection

Each district has varying pedestrian and ADA infrastructure needs. The districts select their 10-year investments in this category based on planned bridge and pavement projects, ADA needs identified via MnDOT's ADA Transition Plan, and inventory and highest-risk pedestrian areas. Through collaboration between MnDOT districts and MnDOT's ADA Office, MnDOT identifies existing non-compliant sidewalks along any scheduled pavement or bridge project. MnDOT takes the opportunity to repair the sidewalk to bring it into compliance. Some additions of ADA-compliant facilities and elimination of pedestrian "gaps" are also completed where needed. Some stand-alone ADA projects can also be selected to repair non-compliant sidewalks in locations where there is not an upcoming pavement or bridge project identified.

Outcomes

MnDOT is committed to achieving substantial ADA compliance of the state pedestrian network by 2037. Districts will fund a range of pedestrian and ADA projects based on their needs. Investments will be primarily curb ramps, sidewalks and **Accessible Pedestrian Signals** at intersections, implemented concurrently with pavement and



bridge projects. MnDOT will be able to complete some stand-alone ADA improvements, focusing on complete streets and filling gaps in the sidewalk network.

System Investment Strategies

MnDOT may draw from the following strategies, when necessary, to prioritize projects and address risks that are associated with lower performance or investment in Accessible Pedestrian Infrastructure:

- Focus more investment in sidewalks, curb ramps and APS projects
- Make other pedestrian improvements via complete streets and complete gaps in the network

Figure 5-10 summarizes expected Critical Connections outcomes based on MnDOT's investment priorities for MnSHIP and compares them to current conditions.

Figure 5-10: Critical Connections Outcomes and Total Investment

INVESTMENT CATEGORY	OBJECTIVE AREA	CURRENT CONDITIONS (2017)	PROJECTED OUTCOME(S) IN 2037	TOTAL INVESTMENT (2018-2037)
Twin Cities Mobility	Critical Connections	Congestion remains relatively flat. MnPASS express lanes and spot mobility improvements are completed where needed.	Travel time reliability likely to decrease. Investments made in two MnPASS corridors and six spot mobility improvements between 2018 and 2023.	\$240 million
Greater Minnesota Mobility	Critical Connections	A few corridors of mostly urban highways have decreased reliability during peak travel times.	Corridors likely to see decreased travel time reliability. six to 10 operational and low-cost capital improvements are completed	\$25 million
Freight	Critical Connections	-	-	\$610 million
Bicycle Infrastructure	Critical Connections	The condition of the state bicycle network is maintained and new bicycle improvements are being made where needed.	Reduced investment in new improvements and maintenance of existing bicycle infrastructure leads to deterioration of bicycle network.	\$140 million
Accessible Pedestrian Infrastructure	Critical Connections	Progress is being made towards ADA-compliant pedestrian infrastructure. Non-ADA pedestrian improvements are limited. • Sidewalks not ADA compliant: 54.0%	Infrastructure on the pedestrian network will be substantially compliant with standards. Some non-ADA projects will increase pedestrian access.	\$530 million
			TOTAL	\$1.50 B

Healthy Communities

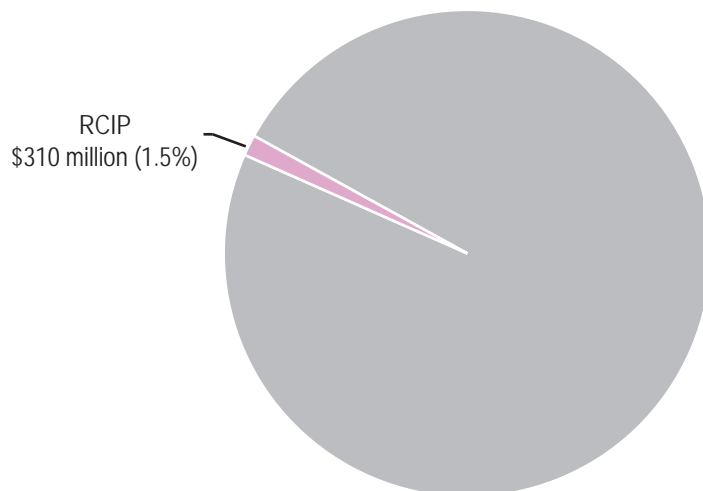
REGIONAL AND COMMUNITY IMPROVEMENT PRIORITIES

The **Minnesota GO Vision** and **Statewide Multimodal Transportation Plan** emphasize the importance of accountability, transparency and communication. Although MnDOT pursues these objectives in all investment areas, Regional and Community Improvement Priorities or RCIPs are the primary outlet for collaboration with local agencies. RCIPs help MnDOT to complete projects that enhance accessibility, increase communication with stakeholders and deliver transportation projects that maximize benefits to the community. Implementing RCIP projects allows MnDOT to partner with local agencies and leverage state resources to achieve multiple purposes.

Investment Priorities

MnDOT anticipates spending approximately 1.5 percent of its program on RCIPs in all years of the plan (**Figure 5-11**).

Figure 5-11: Healthy Communities in MnSHIP



Project Selection

MnDOT selects projects through statewide solicitations to partner with stakeholders and local jurisdictions to address non-performance-based needs. These statewide solicitations fund projects that leverage local funds to provide economic, quality of life and transportation benefits. An example of a statewide solicitation is the TED program.

Additional RCIP investment gives MnDOT districts flexibility to address non-performance based needs that are important to local transportation partners. These RCIP investments are often tied to pavement and bridge projects.



Outcomes

MnSHIP will invest \$310 million in RCIPs through 2037. Most investments will be completed through partnerships and design add-ons to existing projects. Stand-alone RCIP projects will be limited. The vast majority of improvements will be made through the Transportation Economic Development or TED program.

System Investment Strategies

MnDOT may draw from the following strategies, when necessary, to prioritize projects and address risks that are associated with lower performance or investment in RCIPs:

- Maintain the TED program
- Expand partnerships with local agencies/communities that leverage funds to complete larger projects

Figure 5-12 summarizes the outcomes related to Healthy Communities improvements on the state highway system based on MnDOT's investment priorities for MnSHIP and compares them to existing priorities.

Figure 5-12: Healthy Communities Outcomes and Total Investment

INVESTMENT CATEGORY	OBJECTIVE AREA	CURRENT CONDITIONS (2017)	PROJECTED OUTCOME(S) IN 2037	TOTAL INVESTMENT (2018-2037)
Regional and Community Improvement Priorities	Healthy Communities	Economic development and quality-of-life improvements are being made through partnerships and project upgrades.	MnDOT will respond to two to five economic development opportunities per year through the TED program.	\$310 million
			TOTAL	\$310 M

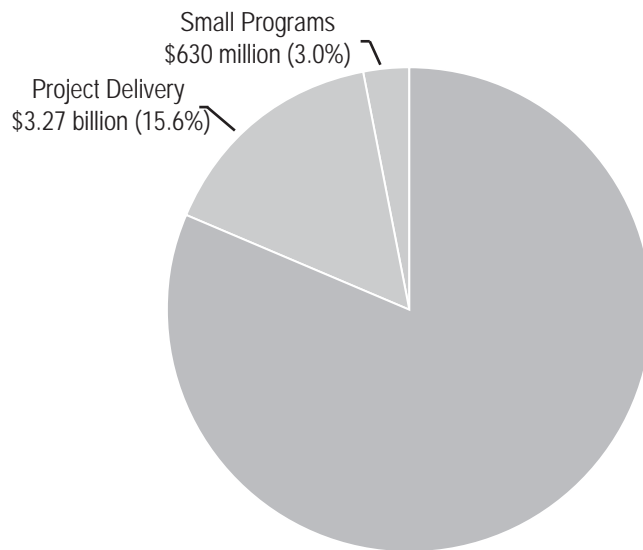


Other

INVESTMENT PRIORITIES

MnDOT anticipates spending approximately 18.6 percent of its program on Small Programs and Project Delivery in all years of the plan (Figure 5-13).

Figure 5-13: Other Investment in MnSHIP



SMALL PROGRAMS

Small Programs is used to fund short-term, unforeseen issues and one-time priorities needs as they arise. Some programs do not easily fit into a MnSHIP investment category. If funding is required beyond the short-term, an effort is made to incorporate the program into a MnSHIP investment category during the next MnSHIP update.

Components of Small Programs in MnSHIP include centrally managed programs and historic property investments.

Project Selection

The project selection process for Small Programs varies depending on the program. However, projects are typically prioritized and selected centrally instead of at the district level.

Outcomes

MnDOT will invest \$630 million in Small Programs through 2037.

PROJECT DELIVERY

Project Delivery includes critical components of projects that ensure the timely and efficient completion of highway projects. These components include right-

of-way costs, consultant services, supplemental agreements and construction incentives (see **Chapter 1. Plan Overview** for more detail on the components of Project Delivery). Historically, MnDOT has spent an average of 16 percent of total capital revenues on Project Delivery.

Project Selection

Investments in project delivery are the costs associated with delivering projects for the rest of the program. This category does not fund stand-alone projects.

Outcomes

MnDOT assumes that it will continue to spend approximately 16 percent of its funds in this category. This is consistent with recent averages due to the similarity in improvement types scheduled through 2037.

Figure 5-14 summarizes the outcomes related to Other improvements on the state highway system or as part of project delivery based on MnDOT's investment priorities for MnSHIP and compares them to existing priorities.

Figure 5-14: Other Outcomes and Total Investment

INVESTMENT CATEGORY	OBJECTIVE AREA	CURRENT CONDITIONS (2017)	PROJECTED OUTCOME(S) IN 2037	TOTAL INVESTMENT (2018-2037)
Project Delivery	Other	Invest the amount necessary to deliver projects in the other categories.	Invest the amount necessary to deliver projects in the other categories.	\$3.27 billion
Small Programs	Other	-	Continue to invest in small programs such as Off-System bridges and historic properties.	\$630 million
			TOTAL	\$3.9 B





Chapter 6

PRIORITIES FOR ADDITIONAL REVENUE

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PRIORITIES FOR ADDITIONAL REVENUE

Over the next 20 years, MnDOT estimates there will be \$21 billion in available revenues to address \$39 billion in identified transportation needs, resulting in a funding gap of approximately \$18 billion. Roughly one-quarter of this gap, or \$4 billion can be attributed to a reduction in buying power. Over the planning period, revenues are not expected to keep pace with forecasted inflation for the construction-related sector. The remainder of the gap represents unfunded capital improvements needed to maintain aging infrastructure and meet Minnesotans' growing transportation needs. Given this gap, there will be many unmet needs and priorities within MnSHIP's 20-year horizon.

This chapter includes a description of the remaining risks for each investment category and the feedback from public outreach and internal discussions which outline the investments that the agency would prioritize if any additional funding became available.

The key messages of Chapter 6 are:

- The funding gap in MnSHIP will result in significant unmet needs across all the investment categories which will affect both system conditions and the experience for the traveling public
- If additional resources become available, investment priorities will reflect the principles, policy objectives, and strategies put forth in the “family of plans” and the input received from the public and stakeholders in the development of this plan

UNMET NEEDS

The unmet needs presented in this chapter refer to the same set of needs presented in **Chapter 3, “Investment Needs.”** Due to the substantial differences between investment needs and available revenues, MnDOT does not expect to fund any investment category to its full needs amount through 2037. Therefore, MnDOT does not expect to be able to deliver a program of capital improvements that wholly meets the expectations of stakeholders and the travelling public.

For the state highway system, the difference between the 20-year needs and the amount MnDOT plans to spend in each investment category over this timeframe is shown in **Figure 6-1**. MnDOT estimates there will be a funding gap of approximately \$18 billion over the next 20 years. Both immediate investment needs and those expected to arise over the next 20 years will not be fully addressed. As a result, the state will not be making significant progress toward realizing the **Minnesota GO Vision** and MnDOT will fall short of meeting its performance-based goals.



Figure 6-1: Summary of Unmet Needs

INVESTMENT CATEGORY	20-YEAR NEEDS	20-YEAR EXPENDITURES	UNMET NEEDS	UNDER-FUNDED IMPROVEMENTS
Pavement Condition	\$13.44 billion	\$10.31 billion	\$3.13 billion	Non-Interstate, NHS and Non-NHS pavement condition
Bridge Condition	\$2.65 billion	\$2.38 billion	\$270 million	NHS bridge condition
Roadside Infrastructure Condition	\$3.35 billion	\$1.60 billion	\$1.75 billion	All elements such as culverts, signage, lighting
Jurisdictional Transfer	\$1.14 billion	\$90 million	\$1.05 billion	Transfer of optimal roadway miles
Facilities	\$390 million	\$80 million	\$310 million	Rest areas and weigh stations
Traveler Safety	\$1.37 billion	\$670 million	\$700 million	Sustained crash locations, proactive treatments
Twin Cities Mobility	\$4.58 billion	\$240 million	\$4.34 billion	MnPASS express lanes, major capacity and spot mobility improvements
Greater Minnesota Mobility	\$1.39 billion	\$25 million	\$1.36 billion	Low cost and high cost capital improvements to improve travel time delay
Freight	Not applicable	\$610 million	-	Freight needs are identified in other categories
Bicycle Infrastructure	\$580 million	\$140 million	\$440 million	Stand-alone bike projects, statewide bikeway projects
Accessible Pedestrian Infrastructure	\$680 million	\$530 million	\$150 million	Other pedestrian improvements not related to ADA compliance of existing infrastructure
Regional and Community Improvement Priorities	\$2.62 billion	\$310 million	\$2.31 billion	Significant investments to address local or regional quality of life and economic competitiveness. Flood mitigation
Small Programs	\$630 million	\$630 million	-	Not applicable
Investment Category Total	\$33 billion	\$18 billion	\$15 billion	-
Project Delivery costs	\$6.18 billion	\$3.27 billion	\$2.91 billion	Cost to deliver capital projects based on analysis of historic expenditure patterns
Investment Category Total Plus Project Delivery Costs	TOTAL=\$39 billion	TOTAL=\$21 billion	TOTAL=\$18 billion	

SYSTEM STEWARDSHIP: UNMET NEEDS

Pavement Condition

Based on the spending strategies outlined in **Chapter 5, “Investment Direction”** interstates will have twice as many miles in poor condition while all non-Interstates will have three to four times as many miles in poor condition at the end of the plan period. Pavements on any state system are not expected to meet their respective MnDOT statewide condition performance targets. Worsened road conditions will negatively affect the movement of vehicles, freight, and bicycles. These impacts will lead to an increase in maintenance costs and overall shortened life span of state highways.

Bridge Condition

The amount of National Highway System bridges in poor condition will increase slightly compared to today while non-NHS bridges in poor condition will increase threefold. This will potentially result in the need for weight restrictions on some bridges and more frequent service interruptions on the system, resulting in longer trips for carriers of critical goods and services. Total life cycle costs to maintain bridges will also increase.

Roadside Infrastructure Condition

Delaying the response to growing culvert and underground drainage needs is a high risk. In addition, delaying the response shifts the burden to replace or repair many roadside infrastructure elements from capital to operations and maintenance budgets. Delaying repairs does not align with optimal life cycle investments or public expectations and standards that could result in non-compliance with safety and accessibility standards.

Facilities

The condition of rest areas and weigh stations will continue to deteriorate. Weigh scales at weigh stations will become outdated and enforcing weight restrictions becomes ineffective and increasingly difficult. Rest areas will not make progress towards compliance with the **1990 Americans with Disabilities Act** standards, and a few rest areas may close as a result of delayed maintenance and repairs.

Jurisdictional Transfer

MnDOT has limited ability to find opportunities to realign roadways under the correct agency. Roadways that are currently owned by MnDOT but would better serve the traveling public if owned by a local agency will not be repaired or transferred. This results in potentially foregone savings from future maintenance and capital costs.



TRANSPORTATION SAFETY: UNMET NEEDS

Traveler Safety

Outcomes for Traveler Safety are difficult to project. Recent years saw a substantial decline in the annual number of fatalities and serious injuries on Minnesota roads due to a robust program of safety improvements and **Toward Zero Deaths** strategies. However, MnDOT's reduced investment in Traveler Safety over the next 20 years may cause this trend to slow or even reverse. Sustained crash locations will be left unaddressed. There are fewer opportunities to invest in new safety treatments and some existing safety features will deteriorate. The low fatality and serious injury rate goals set by the TZD program may be difficult to achieve without continued investment to support safety improvements. Other program resources – safety education, enforcement, and emergency services – will become even more important in keeping fatal and serious injury rates low but new federal law restricts MnDOT's continued funding participation in these areas.



CRITICAL CONNECTIONS - UNMET NEEDS

Twin Cities Mobility

MnDOT will fund Twin Cities Mobility through the first six years of the plan (years 2018-2023), leaving many anticipated needs unaddressed. Congestion in the metropolitan area will lead to greater freight costs, decreased quality of life, and lost productivity for metro area residents. MnDOT will not be well-positioned to address expected regional growth and anticipated increasing congestion and reliability issues, resulting in unpredictable travel times and potentially negative impacts to the state and regional economy. In the absence of any additional revenue, Twin Cities Mobility remains a high risk at the end of the planning period.

Greater Minnesota Mobility

In the absence of major investments to improve mobility needs in Greater Minnesota over the next 20 years, the NHS will be subject to less predictable travel times and unstable flow. As a result, MnDOT will be unable to make progress towards a number of objectives in communities across Minnesota, including improving multimodal connections, community livability, economic competitiveness, environmental health, and quality of life.

Freight

At this time, MnDOT has not estimated its 20-year needs for freight on the state highway system. The investment in the Freight category identified in MnSHIP reflects the amount provided for the National Highway Freight Program as

part of the FAST Act. Needs related to freight movement are identified in other investment categories so there is no separate need category for freight in this MnSHIP update. The upcoming Minnesota Freight Investment Plan will identify priorities to spend money for freight improvements.

Bicycle Infrastructure

Stand-alone bicycle improvements and priority state bikeways will not be funded during this period despite increasing demand for non-motorized transportation options. Bicycle facilities, including shoulders, will not be maintained well enough to ensure safe, easy access to bikeways. State highways may continue to be barriers to bicycle movement in many locations, although they will continue to allow bicycle movement along them.

Accessible Pedestrian Infrastructure

MnDOT plans to invest in pedestrian facilities and infrastructure to become substantially compliant with the ADA standards by the end of the 20-year period. This includes investments that are made concurrently with pavement and bridge projects, and stand alone improvement projects.

HEALTHY COMMUNITIES: UNMET NEEDS

Regional and Community Improvement Priorities

MnDOT does not plan to fund urban reconstruction projects in the RCIP category due to limited funds. These projects also accommodate improvements to local facilities. High priority roadways that are prone to flooding would remain at risk. At this funding level, there would be no opportunities for locally driven priorities such as capacity improvements without additional revenue.

OTHER: UNMET NEEDS

Small Programs

MnSHIP assumes MnDOT will continue to need a fixed amount of funds throughout the 20-year timeframe to respond to short-term, unforeseen issues and continuing commitments. MnDOT currently plans \$32 million per year or 0.3 percent of its total projected revenue to cover investments in Small Programs.

Assuming that the current investment level is held constant throughout the next 20 years, approximately \$630 million is needed to fund small programs. This MnSHIP update has reduced the size of Small Programs such as rest area, weigh station, and economic development investments, which have been incorporated into other MnSHIP investment categories.

If MnDOT does not fully spend its annual allocation for small programs in a given year, it directs the funds toward its highest unaddressed risks in the capital program.

Project Delivery

MnDOT estimates that achieving its targets and key objectives in the areas of System Stewardship, Transportation Safety, Critical Connections, and Healthy Communities would require approximately \$6.18 billion in Project Delivery through 2037. The MnSHIP investment direction includes \$3.27 billion for Project Delivery. An additional \$2.9 billion would be required for Project Delivery if MnDOT were to deliver a program that meets the needs in all of the MnSHIP investment categories.

MnDOT estimated the amount historically spent in this category to establish the proportion of the overall investment that would be required to design, engineer, and construct projects over the next 20 years. Approximately 16 percent of MnDOT's annual capital investment typically goes to supporting the delivery of projects. The percentage of spending in project delivery has changed significantly since 2013 MnSHIP as a result of more thorough analysis of actual expenditures and increased requirements for MnDOT projects.



RISK MANAGEMENT RESULTS

During the MnSHIP process, MnDOT identified 11 key risks related to implementing MnSHIP's capital investment priorities. The following section evaluates the effectiveness of MnSHIP's investment direction in managing these risks. The risks are grouped into the five Statewide Multimodal Transportation Plan objective areas. The risks and objective areas are displayed below.

SYSTEM STEWARDSHIP

What Success Looks Like: The useful life of transportation assets and system performance are maximized while placing an emphasis on the priority highway network resulting in minimized costs and impact to the state's economy, environment and quality of life.

Key Investment Risks:

- **Federal Performance Requirements:** Failure to achieve federal performance requirements on Interstate pavements and NHS bridges reduces flexibility to spend future revenue on other state priorities
- **Remaining Service Life:** The investment direction limits MnDOT's ability to perform the right fix at the right time, which leads to a decreased useful lifespan of the asset and more expensive fixes later
- **Operations Budget:** Maintenance costs rise, which places undue pressure on the operations budget and adds travel disruptions
- **Increased costs to users:** Poor asset management ultimately leads

to increased costs to users of the system and Minnesota's economy by placing weight limitations on bridges

TRANSPORTATION SAFETY

What Success Looks Like: Travelers of all modes and the communities the transportation system travels through are safeguarded. The state is able to plan, design, build, operate and maintain critical safety infrastructure and facilities to improve the safety of users across the system.

Key Investment Risks:

- **Safety Infrastructure:** Critical traveler safety features begin to deteriorate, limiting their effectiveness

CRITICAL CONNECTIONS

What Success Looks Like: Multimodal transportation connections and networks are maintained and expanded. Building the connections between workers and jobs, cities and regions, and between different modes maximizes social, economic and environmental benefits. Equitable access to goods, services and opportunities are provided.

Key Investment Risks:

- **Multimodal Priorities:** Reduced investment in critical connections limits MnDOT's ability to advance modal priorities
- **Mobility:** Limited investment impacts mobility of people and goods which negatively impacts economic health

HEALTHY COMMUNITY OBJECTIVE

What Success Looks Like: Higher priority is given to improvements which consider complementary land uses and the surrounding context that maximizes community benefits, limits long-term costs, and creates infrastructure that is reflective of the surrounding environment.

Key Investment Risks:

- **Urban Reconstruction:** A focus on statewide performance measures and asset management results in lack of investment in urban reconstruction projects
- **Responsiveness:** Limited investment reduces MnDOT's ability to support local economic development and quality of life opportunities

What Success Looks like: Supporting and implementing investments that preserve natural resources and prevent natural resources and natural events from causing damage to the transportation system.

Key Investment Risks:

- **Climate Change:** Inadequately addressing the effects of climate change and flooding leads to unplanned road closures and increased maintenance costs

OPEN DECISION MAKING

What Success Looks like: Make transportation system decisions through processes that are inclusive, engaging, and supported by data and analysis. Engage the public and stakeholders to understand their priorities and to also educate them on system wide goals along with project specific information.

Key Investment Risks:

- **Legislative Action:** Misalignment between MnSHIP investment direction and legislative priorities results in legislation that redirects financial resources and compromises plan outcomes

Figure 6-2 broadly illustrates the key investment risks posed by the investment direction, the likelihood that the risk will occur and the reason why MnDOT feels the risk is unlikely or highly likely to occur. The 11 risks vary in terms of their impact and require different amounts of resources to be partially or adequately mitigated. As discussed previously in this chapter, the risks associated with asset management are significant, more likely to occur, and the most costly to address.

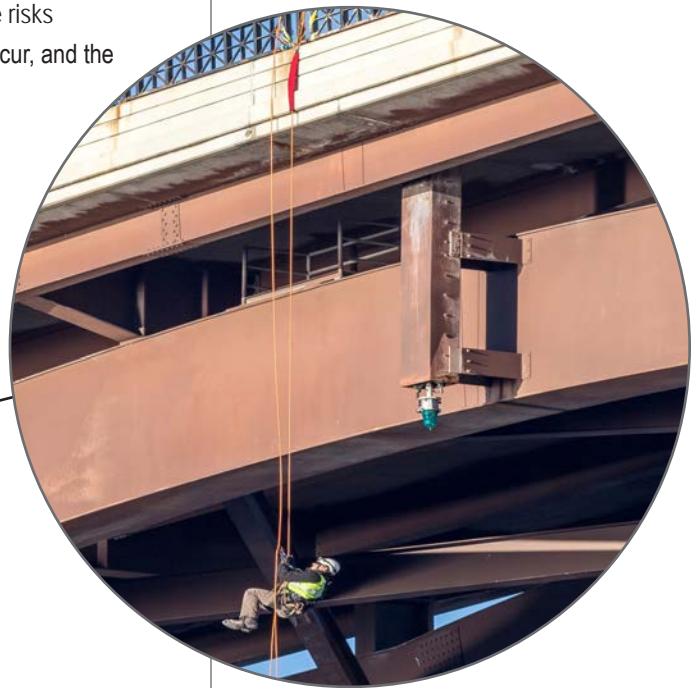


Figure 6-2: Key Investment Risks

KEY INVESTMENT RISK	CURRENT	FUTURE (2037)	REASONING
Federal Performance Requirements: Failure to achieve federal performance requirements on Interstate pavements and NHS bridges reduces flexibility to spend future revenue on other state priorities.	Low	Low	Interstate pavements and NHS bridge conditions are projected to meet federal requirements through 2037
Remaining Service Life: The investment direction limits MnDOT's ability to perform the right fix at the right time, which leads to a decreased lifespan of the asset and more expensive fixes later.	Medium	High	Limited investment in bridges and pavements may increase the use of reactive, short term fixes to avoid hazardous conditions especially on non-NHS pavements
Operations Budget: Maintenance costs rise, which places undue pressure on the operations budget and adds travel disruptions.	Medium	High	Limited investment in bridges and pavements may increase use of operational budget for maintenance of pavements especially on the non-NHS
Increased costs to users: Poor asset management ultimately leads to increased costs to users of the system and Minnesota's economy by placing weight limitations on bridges.	Low	Medium	Identified investment to maintain the condition of bridges should limit the risk of requiring weight limits on bridges
Safety Infrastructure: Critical traveler safety features begin to deteriorate, limiting their effectiveness.	Low	Low	Safety infrastructure maintained through investment in roadside infrastructure at current investment levels. MnDOT will continue to make new safety improvements on the system
Multimodal Priorities: Reduced investment in critical connections limits MnDOT's ability to advance modal priorities.	Medium	Medium	MnDOT commits to reaching substantial ADA compliance with existing pedestrian infrastructure; however, investment in new pedestrian and bicycle connections is limited
Mobility: Limited investment impacts mobility of people and goods which negatively impacts economic health.	Low	High	No investment in mobility after 2023, although the Transportation Economic Development program continues to fund small economic development projects. Congestion is likely to increase due to projected population growth
Urban Reconstruction: A focus on statewide performance measures and asset management results in lack of investment in urban reconstruction projects.	Medium	High	Investment direction limits MnDOT's ability to address urban reconstruction needs
Responsiveness: Limited investment reduces MnDOT's ability to support local economic development and quality of life opportunities.	Medium	High	Economic development projects continue through investment in the Transportation Economic Development program. Other investment in local/regional priorities is very limited
Climate Change: Inadequately addressing the effects of climate change and flooding leads to unplanned road closures and increased maintenance costs	High	High	No investment identified to proactively address potential vulnerabilities to flooding
Legislative Action: Misalignment between MnSHIP investment direction and legislative priorities results in legislation that redirects financial resources and compromises plan outcomes.	Medium	High	No investment in mobility after 2023. Legislature may re-direct resources to address mobility needs which could negatively impact plan outcomes

INCREASED REVENUE PRIORITIES

MnDOT estimates that it will have \$21 billion to spend on highway capital projects over the next 20 years. This amount is based on an analysis of MnDOT's projected revenue sources and the assumption that key revenue sources are expected to grow slightly each year during the plan. The revenue projection also assumes that there will be no additional temporary or permanent funding sources available. However, periodically MnDOT does receive new funding. For example, new revenue could come from:

- **One-time sources**, such as a solicitation from the Federal Highway Administration for projects that meet certain criteria
- **Temporary revenue increases**, such as the issuance of bonds. However, it should be noted that bonds require repayment with interest
- **Permanent revenue sources**, such as legislative action that increases the state motor vehicle fuel tax rate or that establishes alternate funding sources

PRIORITIES FOR ADDITIONAL FUNDING

During the second round of the public outreach process, MnDOT asked stakeholders what their priorities would be should MnDOT receive any additional funding through one of the sources mentioned above. The public was asked to prioritize which categories they would like to see MnDOT invest in, beyond what is being invested through the proposed investment direction. MnDOT senior leadership and key staff were also asked their preference for investing additional revenue. **Figure 6-3** below shows the ranking of stakeholder and MnDOT priorities for additional funding. Stakeholders and the public generally agreed that any extra funding MnDOT receives for capital improvements on the state highway network should be spent maintaining and repairing MnDOT's existing assets. For the public, poorly maintained pavements and bridges were seen as a safety issue. Both groups believed investment in capacity or mobility improvements are priorities but disagreed on the preferred investment category. There was also agreement that main street improvements are important.

Based on input from the public and transportation stakeholders and MnDOT's own internal priorities, MnDOT would prioritize spending additional funding on:

- Maintaining and repairing existing assets on the state highway system
- Strategically improving mobility and reliability at high priority locations on the NHS
- Reconstructing Main Streets

Figure 6-3: Priorities for Additional Funding

Stakeholder Priorities	MnDOT Priorities
 #1 - Bridge Condition	 #1 - Pavement Condition
 #2 - Pavement Condition	 #2 - Bridge Condition
 #3 - Roadside Infrastructure Condition	 #3 - Roadside Infrastructure Condition
 #4 - Traveler Safety	 #4 - Twin Cities Mobility
 #5 - RCIP - Main Street Improvements	 #5 - Traveler Safety
 #6 - RCIP - Capacity Expansion	 #6 - RCIP - Main Street Improvements

Such activities would allow MnDOT to limit the number of bridges and miles of pavement in poor condition, bringing the highway system closer to Interstate and NHS performance targets. Additional funding would increase MnDOT’s ability to address deteriorating culverts, signage and other supporting infrastructure. MnDOT would also be able to address more urban reconstruction, or Main Street, projects. These projects allow local governments to improve amenities and facilities along the state highway. Mobility improvements in the Twin Cities area would be consistent with the Met Council’s Transportation Policy Plan, such as constructing MnPASS lanes, and follow the strategies for Twin Cities Mobility listed in MnSHIP. Mobility improvements in Greater Minnesota would be focused on the locations with the greatest performance issues and focus on low-cost/high benefit improvements. Completing these additional priority projects would allow MnDOT to cost-effectively meet long term performance targets and further advance the Minnesota GO Vision for transportation.

CRITERIA FOR PRIORITIZATION OF EXPANSION PROJECTS WITH ADDITIONAL FUNDING

In recent years, the Minnesota Legislature has created funding programs to address needs of the state highway system, including mobility on the NHS and major bridge replacement. However, MnDOT has not created a planning and prioritization process to address project selection for these types of funding programs. The investment direction in MnSHIP focuses on bridge and pavement improvements. As noted above, with additional funding MnDOT would continue to invest in its bridges and pavements while also investing in other needs such as mobility. The prioritization process for bridge and pavement projects is well-established but prioritization of expansion projects

has not. Many expansion projects were funded through specific programs such as the Transportation Economic Development program or Corridors of Commerce program which included their own criteria for prioritizing projects.

To provide guidance on expansion project priorities, MnSHIP includes a work plan item in **Chapter 7, “Moving Forward,”** to establish criteria to evaluate expansion projects if additional money is provided by the legislature. In the meantime, MnDOT will consider the following criteria based on public outreach results and MnDOT priorities:

- Safety
- Mobility/reliability
- Freight benefits
- Multimodal benefits

Any projects funded and constructed on the state highway system should follow the guiding principles of the Minnesota GO Vision. In addition, projects should be consistent with the investment strategies in MnSHIP and the strategies and objectives in the Statewide Multimodal Transportation Plan. If projects are located within the boundaries of a Metropolitan Planning Organization, they should be consistent with the respective MPO long-range transportation plan.



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Minnesota **GO**
A Collaborative Vision
for Transportation

**20-Year
State Highway
Investment Plan**

Chapter 7

MOVING FORWARD

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MOVING FORWARD

As the gap between available revenue and total transportation needs continues to widen, MnDOT will use strategies and process improvements to ensure that the state achieves the maximum positive impact from all of the investments on state highways. These strategies will help close the gap between desired outcomes and the projected outcomes in MnSHIP. Several new planning processes are also underway and will be completed between now and the next MnSHIP update, including completing phase two of the Transportation Asset Management Plan, the Freight Investment Plan, and the Statewide Pedestrian System Plan. MnDOT also plans to make process improvements that will help the agency and stakeholders make more informed decisions on projects and investments.

Key messages of Chapter 7 are:

- MnDOT has identified several internal and external policy-oriented strategies to make the greatest impact with available revenue
- Between now and the next MnSHIP update, MnDOT will complete several new plans for different modes and assets to help better identify conditions, needs, targets and investments in those areas
- MnDOT will implement new process improvements to more accurately measure the impact of investment dollars to projects and maintenance costs

Strategies to Stretch Projected Revenue

MnDOT will pursue a mix of internally and externally oriented strategies that will stretch existing revenue to accomplish additional priorities beyond those identified in MnSHIP. In some cases, these strategies will require further study prior to implementation and support from MnDOT's transportation stakeholders. Whether these strategies are internal to MnDOT or rely on external decision-making, they can be a means for achieving more desirable outcomes on the state highway system.

INTERNAL STRATEGIES

Adjust performance expectations, where possible, to better match customer expectations with system performance. MnDOT sets its targets, in part, based on public expectations for the state highway system. This strategy would reevaluate targets given emerging risks, aligning them with realistic expectations for system performance. Although this strategy does not address investment needs on the system directly, it would allow MnDOT to ensure its performance-based management efforts are concerted, efficient, and supported by realistic public expectations.

Continue to educate and train key MnDOT staff on the total life cycle costs associated with proposed investments and the revenue forecasts. By effectively educating and training staff on the issue of a widening gap between revenues and public expectations, MnDOT will be better positioned to discuss what it can achieve with the revenues it has and what it could achieve if additional revenues become available.

Pursue research and innovation to improve efficiency and minimize impacts to the traveling public. With all the challenges facing Minnesota's transportation system, innovation is a key strategy. Creativity and innovation need to permeate every aspect of transportation service delivery, from how revenues are generated to how projects are constructed. An example of recent MnDOT innovation was the use of a Self-Propelled Modular Transporter in 2012 to move a bridge constructed off-site into place over interstate-35E in Saint Paul. This innovative construction method minimized roadway closures during construction.

Continue to employ high return-on-investment strategies that deliver the majority of benefits at a reduced cost. MnDOT has increased its use of performance-based designs throughout the agency. These designs help ensure MnDOT does not deliver projects beyond what is needed to meet agency performance targets or other key agency objectives. By continuing to expand the use of this design flexibility, MnDOT will increase its ability to help manage project costs and ensure that the most efficient investment is made to try to meet performance based designs.

Evaluate the capital and operations revenue split to best use revenues in keeping state highways safe and operable. If decreased investments are made in capital infrastructure, operations and maintenance costs typically increase. Determining the appropriate balance between how much is invested in capital infrastructure versus how much will be deferred and used for operations and maintenance is an important consideration moving forward.

Manage investments to achieve multiple objectives such as improving economic competitiveness, public health, and energy independence. Early coordination and participation in the planning process helps MnDOT combine resources and leverage investments to achieve improved outcomes. For example, in most cases, it is far more cost-effective to include a bicycle element or a freight accommodation during construction of a larger bridge or highway project than as an independent project.

Increase attention given to analyzing and accurately tracking investments and performance measures in several investment categories. In particular, there is room to improve performance tracking for Roadside Infrastructure Condition, Bicycle Infrastructure, and the non-ADA components of Accessible Pedestrian Infrastructure.

EXTERNAL STRATEGIES

MnDOT cannot or would not employ a strategy without significant collaboration with the Federal Highway Administration and other transportation stakeholders, such as other state agencies, local **area transportation partnerships**, and local units of government.

Continue evaluating the jurisdictional alignment of the state highway system to ensure transportation decisions occur at the right level of government. MnDOT, in conjunction with local governments across the state, completed a study that explored potential roadways for jurisdictional transfer. An additional assessment of state law and other policy considerations are necessary to determine how this type of system refinement will increase long-term system sustainability and place transportation decisions at the right level of government.

Coordinate with local units of government and other state agencies to achieve better transportation outcomes for the public, transportation stakeholders, and partners. By improving local participation, MnDOT will be better positioned to engage in collaborative planning efforts with stakeholders and to pursue outcomes that achieve multiple purposes. Successful examples of this include MnDOT's collaboration with the Minnesota Department of Health to develop Minnesota Walks a guide to make walking safe, convenient and desirable.





Advocate for flexible design standards and specifications. Flexible design allows greater sensitivity to local needs and demands of the surrounding environment without prescribing unnecessary or burdensome improvements. By decreasing road width, for example, MnDOT also decreases the initial cost of the project and the amount of pavement that it will need to maintain.

Broaden the education of stakeholders and policymakers on the total life cycle costs associated with proposed investments and the revenue forecasts. By effectively engaging stakeholders and policymakers on the issue of a widening gap between revenues and public expectations, MnDOT will be better positioned to discuss what it can achieve with the revenues it has and what it could achieve if additional revenues become available.

Work Plan

MnSHIP covers the 20-year period between 2018 and 2037. It is updated every four years to reflect changes in federal and state policy, system conditions, and revenue projections. The current MnSHIP update refined MnDOT's planning and programming process to address these changes. Between now and the next MnSHIP update, MnDOT will continue to update and improve this process and adjust investment priorities as conditions evolve. MnDOT has been implementing and will continue to work on the following efforts over the coming years:

NEW PLANNING ACTIVITIES

- **Complete phase two of the Transportation Asset Management Plan.** MnDOT completed phase one of the Transportation Asset Management Plan after being selected as one of three states to participate in a pilot program by the FHWA. The second phase of the plan expands the number of assets analyzed which will help MnDOT report on life-cycle costs, condition, and inform investment decisions in the next MnSHIP update.

Related Objectives: System Stewardship, Transportation Safety

- **Complete the Freight Investment Plan.** Minnesota's Freight Investment Plan, currently under development, will provide a fiscally constrained list of priority projects important to freight, and describe how federal formula funds would be invested and matched. The plan will help identify how the FAST Act freight program funds get invested on the new National Highway Freight Network created by the freight program. Developed cooperatively with private and other public entities, the plan will also provide guidelines in project development and operational decisions, all in accordance with the FAST Act.

Related Objectives: System Stewardship, Critical Connections

- **Complete the Statewide Pedestrian System Plan.** The Statewide Pedestrian System Plan will identify a pedestrian priority network for pedestrian improvements. An established pedestrian priority network would help guide general pedestrian improvements and communicate opportunities for investment to MnDOT districts and local partners. The plan will be guided by [Minnesota Walks](#), a collaborative effort between MnDOT and the Minnesota Department of Health designed to be a shared roadmap for how all Minnesotans can have safe, desirable, and convenient places to walk and roll.

Related Objectives: Critical Connections

PROCESS IMPROVEMENTS

- **Improve the transparency and consistency of MnDOT's project selection process.** There are several actions MnDOT will undertake to improve transparency. These actions include implementing best practices to improve transparency of the project selection process and local agency involvement and establishing a method to track spending of local dollars on the state highway system.

Related Objectives: Open Decision Making

- **Establish criteria for prioritization of expansion projects with additional funding.** The prioritization process for bridge and pavement projects is well-established but expansion projects have been funded through criteria specific to programs that have changed over the years. This effort will allow MnDOT to be prepared to prioritize and deliver new projects should additional revenue become available.

Related Objectives: Open Decision Making, Critical Connections

- **Establish mobility targets:** Once the FHWA publishes final rules for system performance measures, MnDOT will have one year to establish mobility targets for the Twin Cities and the state. These measures and targets will influence future mobility investment decisions.

Related Objectives: Critical Connections

- **Improve bicycle investment reporting and project scoping:** The Statewide Bicycle System Plan was completed in 2016. Accurate tracking of progress toward meeting bicycle investment objectives will require better data on the type and location of bicycle infrastructure improvements. Improving the cost estimates for different types of bicycle facilities will also help districts better account for investments made and documented through the annual **10-Year Capital Highway Improvement Plan** process.



Related Objectives: Critical Connections

- **Quantify the impact capital investments have on maintenance and operations needs and expenditures:** Reduced capital investment can often result in increased operations and maintenance needs. MnDOT will examine the relationship between capital investments and operations and maintenance since preventive maintenance is often seen as helping to extend the life of the facility or asset.

Related Objectives: System Stewardship, Open Decision-Making

- **Refine and expand the components that are incorporated into the bridge tracking model:** Refinement of associated bridge elements (e.g. approach work, bicycle and pedestrian elements) would provide more accurate project costs. Reaching consensus with the bridge office and districts as to what should be included would help districts manage their budgets. Incorporating culverts, railroad bridges, tunnels and pedestrian bridges would allow MnDOT to better prioritize bridge needs and plan for repairs and maintenance.

Related Objectives: System Stewardship

- **Implement standard inspection protocols for pedestrian improvements:** In recent years, MnDOT has completed a sidewalk inventory on the state highway system. As a follow-up, MnDOT would standardize data collection of system condition and ADA compliance by establishing inspection intervals and processes.

Related Objectives: Critical Connections

- **Better inclusion of ancillary pavements into total pavement needs and assets, such as signage and lighting at rest areas and weigh stations, into roadside infrastructure needs:** This effort will help to clearly communicate rest area and weigh station needs to MnDOT districts.

Related Objectives: System Stewardship

- **Continue coordination of planned projects with partners:** Stakeholder engagement efforts will continue to ensure strong connections between the Minnesota GO Vision and project selection. Projects in Years 5-10 of the CHIP will be the subject of additional project development conversations between MnDOT and its partners to ensure that funds leverage the highest possible outcomes.

Related Objectives: Healthy Communities, Open Decision Making

- **Quantify the benefits of jurisdictional transfer:** Outcomes include maintenance and operations benefits and long and short-term capital

savings as a result of a transfer. This analysis should be expanded to specific segments.

Related Objectives: System Stewardship, Open Decision Making

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Appendices

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20-Year State Highway Investment Plan

Appendix B

RELATED LINKS

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RELATED LINKS

Minnesota GO

<http://www.dot.state.mn.us/minnesotago/vision.html>

Statewide Multimodal Transportation Policy Plan

<http://www.minnesotago.org/learn-about-plans/statewide-multimodal-transportation-plan>

Minnesota State Highway Investment Plan

<http://www.minnesotago.org/learn-about-plans/minnesota-state-highway-investment-plan>

Statewide Bicycle System Plan

<http://www.dot.state.mn.us/bike/system-plan/index.html>

Statewide Freight System Plan

<http://www.dot.state.mn.us/planning/freightplan/index.html>

Transportation Asset Management Plan

<http://www.dot.state.mn.us/assetmanagement/index.html>

10-Year Highway Capital Work Plan

<http://www.dot.state.mn.us/planning/10yearplan/index.html>

Minnesota Walks

<http://www.dot.state.mn.us/peds/plan/>

ADA Transition Plan

<http://www.dot.state.mn.us/ada/transitionplan.html>

Highway Systems Operation Plan

<http://www.dot.state.mn.us/planning/program/hsop.html>

Strategic Highway Safety Plan

<http://www.dot.state.mn.us/trafficeng/safety/shsp/index.html>

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20-Year State Highway Investment Plan

Appendix C

ACRONYMS AND GLOSSARY

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ACRONYMS AND GLOSSARY

Acronyms

ADA	Americans with Disabilities Act
APS	Accessible Pedestrian Signals
ATM	Active Traffic Management
ATP	Area Transportation Partnership
BRIM	Bridge Replacement and Improvement Management
CAFE	Corporate Average Fuel Economy
CIMS	Corridor Investment Management Strategy
CHIP	Capital Highway Investment Plan (10-Year)
CMSP	Congestion Management Safety Plan
DEED	Department of Employment and Economic Development
DOT	Department of Transportation
DRMP	District Risk Management Program
DSP	District Safety Plan
FAST-ACT	Fixing America's Surface Transportation Act
FHWA	Federal Highway Administration
GASB 34	Government Accounting Standards Board Statement 34
HSIP	Highway Safety Improvement Program
HUTDF	Highway User Tax Distribution Fund
IRC	Interregional Corridor
ITS	Intelligent Transportation System
MAP-21	Moving Ahead for Progress in the 21st Century Act

MNDOT	Minnesota Department of Transportation
MNIT	Minnesota Information Technology Services
NEPA	National Environmental Policy Act
NHPP	National Highway Performance Program
NHS	National Highway System
PAC	Partnership Advisory Committee
PMS	Pavement Management System
PQI	Pavement Quality Index
RCIP	Regional and Community Improvement Priorities
RDC	Regional Development Commission
RSL	Remaining Service Life
RQI	Ride Quality Index
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act - a Legacy for Users
SAM	Safety and Mobility
SITSP	Statewide Intelligent Transportation System Plan
SPP	Statewide Performance Program
STIP	State Transportation Improvement Program
TAMP	Transportation Asset Management Plan
TED	Transportation Economic Development
TFAC	Transportation Finance Advisory Committee
TIMS	Total Information Management System
TZD	Toward Zero Deaths
USDOT	United States Department of Transportation
VMT	Vehicle Miles Traveled

Glossary of Terms

10-YEAR CAPITAL HIGHWAY INVESTMENT PLAN

The 10-Year Capital Highway Investment Plan (CHIP) details MnDOT's capital highway investments for the next ten years on the state highway system. The document serves as a check to ensure that MnDOT is meeting the investment levels and performance outcomes identified in MnDOT's 20-year State Highway Investment Plan (MnSHIP).

1990 AMERICANS WITH DISABILITIES ACT (ADA)

Required MnDOT to provide accessible crossings and use of its infrastructure for those using a wheelchair or other assistive devices. MnDOT works with its ADA Accessibility Advisory Committee to comply with ADA regulations. In 2010, MnDOT completed an ADA Transition Plan (revised in 2011) to prioritize policies and improvements, and to ensure that its facilities, activities, and programs are accessible to all.

A

ACCESSIBLE PEDESTRIAN SIGNAL (APS)

A device that communicates information about pedestrian timing in nonvisual format such as audible tones, verbal messages, and/or vibrating surfaces.

ACTIVE TRAFFIC MANAGEMENT (ATM)

Operational improvements to help manage the effects of congestion. Includes traffic cameras, changeable message signs to alert freeway users to incidents ahead, and ramp meters.

ADVANCE PRESERVATION PROGRAM

AREA TRANSPORTATION PARTNERSHIP (ATP)

A group of traditional and non-traditional transportation partners including representatives from MnDOT, Metropolitan Planning Organizations, Regional Development Commissions, counties, cities, tribal governments, special interests, and the public that have the responsibility of developing a regional transportation improvement program for their area of the state.

AUTONOMOUS VEHICLE

A vehicle that has the capability of sensing its environment and navigating without human input. Also known as driverless car or self-driving car.

B

BRIDGE REPLACEMENT AND IMPROVEMENT MANAGEMENT (BRIM)

The process used by MnDOT to decide which bridges need to receive future investment, using input from District bridge engineers and planners, risk assessments, and traditional structural ratings.

C

CONGESTION MANAGEMENT AND SAFETY PLAN (CMSP)

Congestion Management and Safety Plan (CMSP) was undertaken to identify a list of lower-cost/high-benefit projects that seek to maximize mobility and reduce crash risk at key congestion and safety problem locations. The final result is a list that informs the select projects for additional scoping and eventual programming/implementation.

CORPORATE AVERAGE FUEL ECONOMY (CAFE)

The standard fuel economy for cars and light trucks that must be met for vehicle model years 2017 and beyond. The CAFÉ program is designed to reduce fuel consumption and greenhouse gases. Currently, the 2016 CAFÉ level is set at 35.5 mpg and is expected to increase to 55 mpg by 2025.

CORRIDOR INVESTMENT MANAGEMENT STRATEGY (CIMS)

A corridor-based initiative that brings MnDOT together with its local, modal, and state partners to identify opportunities for collaborative and innovative investment. It offers a means to share information and identify opportunities to apply MnDOT's suite of lower cost, high benefit investment strategies that address safety, access, and mobility.

CORRIDORS OF COMMERCE

In 2013 the Minnesota Legislature created the Corridors of Commerce program by authorizing the sale of up to \$300 million in new bonds for the construction, reconstruction and improvement of state highways. One of the primary intents of the legislation was to use the funding to prepare potential projects for future construction.

D

DEPARTMENT OF EMPLOYMENT AND ECONOMIC DEVELOPMENT (DEED)

Minnesota's principal economic development agency. MnDOT and DEED are partnered in the Transportation Economic Development program, which accomplishes multiple goals of transportation improvement and economic growth.

DISTRICT RISK MANAGEMENT PROGRAM (DRMP)

One of two investment programs for years 1-10 of MnSHIP (alongside the Statewide Performance Program). This program funds investments in projects that address conditions on non-NHS highways and unique conditions at the district level. This program allocates funding to MnDOT districts, which identify and prioritize projects under this program.

DISTRICT SAFETY PLAN (DSP)

Prioritizes proactive strategies at high-risk locations, and identifies appropriate treatments that are proven to reduce fatal and serious injury crashes.

F

FEDERAL-AID

Federal-aid refers to funds made available by Congress for states' use in building and maintaining highways. The Federal-aid program has been in effect since 1916, and has drawn primarily from the Highway Trust Fund since the fund's inception in 1956. The Federal share for most state highway projects is typically between 80 to 90 percent.

FIXING AMERICA'S SURFACE TRANSPORTATION (FAST) ACT

The Fixing America's Surface Transportation (FAST) Act is a five-year surface transportation law that provides long-term funding certainty for federal fiscal years 2016-2020. It is the first federal transportation bill enacted in over ten years that provides long-term funding for infrastructure planning and investment. Minnesota will receive over \$4 billion in funding over the five-year period. The law is preceded by Moving Ahead for Progress in the 21st Century (MAP-21).

G

GOVERNMENT ACCOUNTING STANDARDS BOARD STATEMENT 34 (GASB 34)

Establishes generally accepted accounting principles that are utilized by auditors charged with evaluating state and local government financial statements. Statement 34 requires that major infrastructure assets acquired or having major additions or improvements since June 15, 1980, be capitalized in financial statements.

H

HIGHWAY SAFETY IMPROVEMENT PROGRAM (HSIP)

A federal program that emphasizes data-driven, strategic approaches to improving highway safety. Projects in this program are designed to correct hazardous road locations or otherwise address highway safety problems.

HIGHWAY USER TAX DISTRIBUTION FUND (HUTDF)

The state collects a motor fuel tax, a motor vehicle tax (MVST), and vehicle registration fees which feed the Highway User Tax Distribution Fund. Ninety-five percent of the HUTDF is divided by legislative mandate between Minnesota's municipal state-aid roadway system, county state-aid roadway system, and the State trunk highway system.

I

INTELLIGENT TRANSPORTATION SYSTEM (ITS)

The application of advanced technology to solve transportation problems and support the movement of people, goods and services. Examples of the technology include: ramp meters, sensors, cameras, road closure flashers, Dynamic Message Signs, Intersection Conflict Warnign System, Electronic Toll System,

INVESTMENT CATEGORY

A division of capital expenditures on the state highway system identified by objective (e.g. pavement condition, mobility, etc.).

M

MAJOR CAPACITY INVESTMENTS

Major capacity investments can include highway-to-highway interchanges, freight related improvements, and corridor-wide improvements.

METROPOLITAN PLANNING ORGANIZATION (MPO)

Regional planning agency designated by law with the lead responsibility for the development of a metropolitan area's transportation plans and to coordinate the transportation planning process. All urban areas over 50,000 in population are required to have an MPO if the agencies spend Federal funds on transportation improvements. There are eight Metropolitan Planning Organizations in Minnesota. Primary functions of an MPO include: maintenance of a long-range transportation plan, development of a Transportation Improvement Program (TIP), and development of a Unified Planning Work Program (UPWP).

MINNESOTA GO

The long-term vision and guiding principles that set the direction for a multimodal transportation system that supports Minnesotans' quality of life, economy, and natural environment. This plan was developed based on public input, MnDOT expertise, and current conditions, and serves to inform subsequent planning efforts such as the Statewide Multimodal Transportation Plan and MnSHIP.

MNPASS EXPRESS LANES

Express lanes in the Twin Cities area that provide a predictable travel option for commuters. These lanes are free for buses, carpools, and motorcycles; single-occupant vehicles are charged an electronic fee. During periods of higher congestion (where travel speeds fall below 50 mph), the price for entering a MnPASS express lane rises.

MOVING AHEAD FOR PROGRESS IN THE 21ST CENTURY (MAP-21) ACT

The federal surface transportation bill authorized on July 6, 2012, and establishing new requirements for federal highway programs. MAP-21 expanded the number of highways in the National Highway System (NHS) to include Interstates, most U.S. Highways, and other principal arterials in Minnesota. It also established national goals and requires USDOT and state DOTs to establish performance measures for the NHS in several categories.

N

NATIONAL HIGHWAY FREIGHT PROGRAM

A new program introduced as part of the Fixing America's Surface Transportation (FAST) Act. The purpose, among other goals, of the National Highway Freight Program (NHFP) is to improve efficient movement of freight on the National Highway Freight Network (NHFN).

NATIONAL HIGHWAY SYSTEM (NHS)

The highway system designated by MAP-21 that comprises the most used national highways including Interstates, most U.S. highways, and other principal arterials.

O

MINNESOTA OLMSTEAD PLAN

The Olmstead plan details how the state of Minnesota will eliminate unnecessary segregation of persons with disabilities and ensure that persons with disabilities receive services in the most integrated setting appropriate to their needs.

P

PARTNERSHIP ADVISORY COMMITTEE (PAC)

A 30-person committee that helped steer the MnSHIP public outreach process and general plan development. It consisted of Metropolitan Planning Organization (MPO) directors, Regional Development Commission (RDC) planners, and representatives from MnDOT county and city partners.

PAVEMENT MANAGEMENT SYSTEM (PMS)

The system used by MnDOT to collect and track pavement condition information on all state highways, and to estimate what pavement conditions will be in future years given a certain level of investment.

R

REGIONAL AND COMMUNITY IMPROVEMENT PRIORITIES (RCIP)

Collaborative investments that respond to regional and local concerns beyond system performance needs to support economic competitiveness, environmental health, and quality of life in Minnesota. The RCIP investment category assists MnDOT in delivering a well-rounded transportation investment program that advances objectives for which MnDOT may not have statewide performance targets, such as improving multimodal connections and community livability.

REGIONAL DEVELOPMENT ORGANIZATIONS (RDO)

Multi-county regional planning and development districts that encourage cooperation between citizens, local government officials, and the private sector. They are often catalysts for strategic planning in rural communities. They help identify local needs and priorities. In addition to planning, regions sponsor many programs, including services for the poor and elderly, job training, small business finance and minority enterprise programs. There are twelve Regional Development Commissions in Minnesota.

REMAINING SERVICE LIFE (RSL)

The time remaining until the condition of the pavement reaches a level unacceptable for use, at which point it would likely be reconstructed.

RIDE QUALITY INDEX (RQI)

MnDOT's smoothness index, which uses a zero-to-five rating scale (rounded to the nearest tenth) to represent the rating that a typical road user would give the pavement's smoothness while driving a vehicle.

S

SAFETY AND MOBILITY (SAM)

Grants toward the construction of highway interchange projects that promote safety and reduce congestion at four dangerous intersections in Greater Minnesota and the Twin Cities metropolitan area.

SHARE THE ROAD

A program administered by MnDOT's bicycle and pedestrian section, promoting road safety and awareness among drivers, bicyclists, and pedestrians. The program's priority is elimination of bicycle and pedestrian fatalities and crashes.

SPOT MOBILITY IMPROVEMENTS

Lower cost, high benefit projects to improve traffic flow and provide bottleneck relief. Examples include addressing safety hazards, improving intersection design, and constructing lanes to ease entering and exiting freeways.

STATEWIDE INTELLIGENT TRANSPORTATION SYSTEM PLAN

The purpose of the MnDOT Statewide ITS Plan (SITSP) is to identify immediate, short-term, and mid-term ITS needs necessary to meet the goals and objectives identified in MnDOT's 50 year vision.

STATEWIDE PERFORMANCE PROGRAM (SPP)

One of two investment programs for years 1-10 of MnSHIP (alongside the District Risk Management Program). This program funds investments in projects that address federal performance requirements identified in MAP-21, which require MnDOT to make progress toward pavement, bridge, safety, and congestion performance targets.

STATE TRANSPORTATION IMPROVEMENT PROGRAM (STIP)

MnDOT's four-year plan of projects for which it has received FHWA authorization and funding commitments.

STATEWIDE BICYCLE SYSTEM PLAN

MnDOT's plan for statewide bicycle investments, facilitated by the recent Statewide Bicycle Planning Study and related efforts. The plan advances active transportation by proactively integrating bicycle accommodations into MnDOT projects.

STATEWIDE MULTIMODAL TRANSPORTATION PLAN

Provides key objectives, related strategies, and performance measures that advance the Minnesota GO Vision. This plan advances a multimodal investment framework, and emphasizes transportation solutions that have high return-on-investment and produce multiple benefits across modes. Many elements of this plan can be found in this MnSHIP update.

T

TRANSPORTATION ASSET MANAGEMENT PLAN (TAMP)

The Moving Ahead for Progress in the 21st Century (MAP-21) Act requires States to develop a performance and risk-based transportation asset management plan (TAMP) that, at minimum, addresses the condition of pavements and bridges along the National Highway System (NHS). The objective of the TAMP is to establish a consistent and transparent statewide approach to planning, programming, and managing these physical assets to maintain a defined level of service in the most cost-effective manner.

TRANSPORTATION ECONOMIC DEVELOPMENT (TED) PROGRAM

A collaborative program between MnDOT and the Department of Employment and Economic Development established for the purpose of supporting highway improvement and public infrastructure projects that create jobs and support economic development.

TRANSPORTATION FINANCE ADVISORY COMMITTEE (TFAC)

Established by Governor Mark Dayton in 2012 to analyze potential revenue sources and non-traditional approaches to transportation funding and finance. The committee recommended pursuing a revenue increase that supports an economically competitive, world class transportation system.

TOWARD ZERO DEATHS (TZD)

A Minnesota Partnership led by the Department of Public Safety, the Department of Transportation, and the Department of Health, in cooperation with the Minnesota State Patrol, the Federal Highway Administration, Minnesota county engineers, and the Center for Transportation Studies at the University of Minnesota. TZD helps create a culture for which traffic fatalities and serious injuries are no longer acceptable through the integrated application of education, engineering, enforcement, and emergency medical and trauma services. These efforts are driven by data, best practices, and research.

TOTAL INFORMATION MANAGEMENT SYSTEM (TIMS)

A system that, if implemented, would help institutionalize the tracking of smaller investments embedded within a larger pavement or bridge project. TIMS would allow project managers to break a project into its component parts and help create a more accurate baseline for the next MnSHIP update. This would ultimately enable MnDOT to make better-informed investment decisions in the future.

V

VEHICLE MILES TRAVELED (VMT)

The total number of miles traveled by all vehicles on a given system. This measure provides an approximate sense for how heavily a roadway system is being used.

INTRODUCTION

The Minnesota Department of Transportation updated the Statewide Multimodal Transportation Plan and the 20-year Minnesota State Highway Investment Plan through one joint process. As part of the update process, MnDOT integrated public engagement with technical tasks for both plans. This appendix includes a summary of public and stakeholder engagement activities completed, audiences reached, results and outcomes. This summary includes engagement activities for all project stages.

Engagement Approach

MnDOT based the engagement approach for the plan update process on the following principles:

- Go to the public and partners. Do not make them come to us.
- Design tools to facilitate different levels of engagement. Individuals vary in interest and knowledge but everyone should be able to participate.
- Be responsive and adaptive. Tailor tools and techniques to the needs of each specific group or event.
- Partner with traditionally underserved communities to design an engagement approach that works for them.
- Focus on involving more individuals and trying new things, but do not forget about traditional stakeholders and tested tools.
- Collect data, regularly report on outreach activities, implement lessons learned and fine-tune the approach.

Engagement Phases

The joint plan update process included several engagement phases. The focus of engagement was different in each phase. The following table provides more detail.

Table D-1: Project phase and engagement focus

PROJECT PHASE	FOCUS OF ENGAGEMENT
Project initiation phase	Engagement for both plans consisted of getting the word out about the plan updates. MnDOT asked participants to provide input on the project scope, when appropriate.
Primary engagement phase (Phase 1)	SMTP engagement focused on the changes that are projected to occur in Minnesota over the next 20 years. MnDOT asked participants to identify which changes are most important for transportation partners to plan for.
	MnSHIP engagement focused on different investment scenarios. MnDOT asked participants to identify which scenario they preferred and which investment categories are most important.
Second engagement phase (Phase 2)	SMTP engagement focused on questions about how proposed policy changes would be implemented. MnDOT asked participants to weigh in and shape the agency's near-term work plan.
	MnSHIP engagement focused on getting feedback on the draft investment direction. MnDOT asked participants to rate the draft direction and comment about what they would change.
Formal public comment period	Engagement for both plans focused on getting the word out that drafts were available for review. MnDOT asked participants to provide comments, if interested.



ACTIVITIES COMPLETED

The following sections include a summary of the activities completed including a brief description of the activity, timeline and participation.

In-Person Engagement

There were more than 200 in-person engagement activities completed. Each activity is listed in the following sections. Date, location and estimated attendance are included for each activity.

PARTNER & STAKEHOLDER BRIEFINGS

MnDOT completed more than 200 in-person engagement activities as part of the plan update process. These events involved the general public and transportation partners / stakeholders. A variety of event types were used, including:

- Partner and stakeholder briefings
- Stakeholder forums
- Workplace-based outreach
- Community events
- Traditionally underserved community partnerships

In-person engagement activities occurred throughout all stages of the project. Each individual activity is listed in the following sections. Date, location and estimated attendance are included for each activity.

PARTNER & STAKEHOLDER BRIEFINGS

The project team conducted informational meetings with partner and stakeholder groups throughout the duration of the project. Generally speaking, MnDOT went to existing meetings to provide these briefings. In some cases, meetings were called specific to this project. Presentations were given using either PowerPoint or Prezi. MnDOT received feedback through meeting notes and paper worksheets, when appropriate. The focus of the meetings depended on the project stage. When applicable, the results section of this report provides more detail on the topics covered. Additionally, MnDOT has a greater responsibility to involve certain internal and external advisory partners due to federal and state law. In addition to providing informational briefings to these partners, MnDOT also asked the groups for guidance on the overall project direction. Partner and stakeholder briefings began in March 2014 and continued through November 2016. However, most of the briefings were concentrated in the primary engagement phase (October 2015 – March 2016) and the formal public comment period (September / October 2016).

External Meetings

- Metropolitan Planning Organization Directors in St. Cloud on February 6, 2015 (20 participants)
- La Crosse Area Planning Committee staff in Rochester on March 16, 2015 (1 participant)
- Duluth-Superior Metropolitan Interstate Council staff in Duluth on March 23, 2015 (5 participants)
- Metropolitan Council staff in Saint Paul on March 24, 2015 (5 participants)

- St. Cloud Area Planning Organization staff in St. Cloud on March 24, 2015 (3 participants)
- Mankato-North Mankato Area Planning Organization staff in Mankato on March 25, 2015 (2 participants)
- Fargo-Moorhead Council of Governments staff in Fargo on March 30, 2015 (4 participants)
- Grand Forks-East Grand Forks Metropolitan Planning Organization staff in East Grand Forks on March 30, 2015 (2 participants)
- Advocacy Council for Tribal Transportation in Thief River Falls on April 17, 2015 (20 participants)
- Metropolitan Planning Organization Directors in Arden Hills on May 8, 2015 (25 participants)
- AARP staff in Saint Paul on May 15, 2015 (1 participant)
- Metro Capital Improvements Committee in Roseville on June 12, 2015 (10 participants)
- Advocacy Council for Tribal Transportation in Walker on July 17, 2015 (20 participants)
- SMTP Heath Impact Assessment Scoping Advisory Group in Saint Paul on August 21, 2015 (9 participants)
- Regional Development Organization Transportation Planners in Duluth on August 26, 2015 (15 participants)
- Metropolitan Planning Organization Directors in Saint Paul on September 30, 2015 (20 participants)
- Metro Capital Improvements Committee in Roseville on October 9, 2015 (20 participants)
- Tribes and Transportation Conference in Morton on October 13, 2015 (10 attendees)
- Legislative committee members and staff in Saint Paul on October 21, 2015 (15 participants)
- Rochester-Olmsted Council of Governments Policy Board in Rochester on October 23, 2015 (20 participants)
- East Central Regional Development Commission in Mora on October 26, 2015 (25 participants)
- Area Transportation Partnership 4 in Fergus Falls on October 26, 2015 (15 participants)

- Area Transportation Partnership 1 Steering Committee in Hermantown on November 2, 2015 (40 participants)
- Grand Forks-East Grand Forks Metropolitan Planning Organization Technical Advisory Committee in East Grand Forks on November 10, 2015 (15 participants)
- La Crosse Area Planning Committee Technical Advisory Committee in La Crosse on November 11, 2015 (15 participants)
- Fargo-Moorhead Council of Governments Transportation Technical Committee in Fargo on November 12, 2015 (25 participants)
- Metropolitan Council Technical Advisory Committee Planning Committee in Saint Paul on November 12, 2015 (15 participants)
- Southwest Regional Development Commission in Slayton on November 12, 2015 (15 participants)
- West Central Initiative Foundation Transportation Advisory Committee in Fergus Falls on November 13, 2015 (12 participants)
- Area Transportation Partnership 7 in Mankato on November 13, 2015 (26 participants)
- Scenic Byway Workshop in Detroit Lakes on November 17, 2015 (50 participants)
- Legislative committee members and staff in Saint Paul on November 18, 2015 (12 participants)
- Grand Forks-East Grand Forks Metropolitan Planning Organization Board in East Grand Forks on November 18, 2015 (10 participants)
- Mankato-North Mankato Area Planning Organization Technical Advisory Committee in Mankato on Thursday, November 19, 2015 (20 participants)
- Headwaters Regional Development Commission in Bemidji on Thursday, November 19, 2015 (25 participants)
- Area Transportation Partnership 6 in Rochester on November 20, 2015 (10 participants)
- Area Transportation Partnership 8 in Olivia on November 19, 2015 (30 participants)
- Metropolitan Interstate Commission Harbor Technical Advisory Committee in Duluth on December 2, 2015 (30 participants)
- Upper Minnesota Valley RDC Transportation Advisory Committee in Appleton on December 3, 2015 (15 participants)

- University of Minnesota Center for Transportation Studies Freight and Logistics Symposium in Minneapolis on December 4, 2015 (11 participants)
- Sierra Club North Star Chapter Land Use and Transportation Committee in Minneapolis on December 7, 2015 (12 participants)
- Metropolitan Interstate Commission Technical Advisory Committee in Superior on December 8, 2015 (17 participants)
- Environmental Quality and Energy Committee in Fridley on December 8, 2015 (15 participants)
- Area Transportation Partnership 2 in Bemidji on December 10, 2015 (12 participants)
- St. Cloud Area Planning Organization Technical Advisory Committee in St. Cloud on December 10, 2015 (13 participants)
- Metro Capital Improvements Committee in Roseville on December 11, 2015 (22 participants)
- Minnesota Consortium for Citizens with Disabilities Transportation working group in Saint Paul on December 14, 2015 (12 participants)
- Minnesota Transportation Alliance in Saint Paul on December 14, 2015 (15 participants)
- Minnesota State Emergency Communications Board in Arden Hills on December 17, 2015 (25 participants)
- Metropolitan Council Technical Advisory Committee in Minneapolis on January 4, 2016 (30 participants)
- Federal Highway Administration Minnesota Division staff in Saint Paul on January 7, 2016 (9 participants)
- Citizens Concerned About Rail in Kenyon on January 7, 2016 (70+ participants)
- Minnesota Council of Airports in Saint Paul on January 8, 2016 (25 participants)
- City of Saint Paul Transportation Committee in Saint Paul on January 11, 2016 (5 participants)
- Fond du Lac staff in Cloquet on January 11, 2016 (1 participant)
- Area Transportation Partnership 3 in St. Cloud on January 14, 2016 (20 participants)
- Bois Forte council and staff in Tower on January 15, 2016 (8 participants)

- Renville County Team in Oliva on January 20, 2016 (13 participants)
- League of Minnesota Cities and Association of Minnesota Counties webinar on January 20, 2016 (36 participants)
- Arrowhead Regional Development Commission in Duluth on January 21, 2016 (30 participants)
- Legislative committee members and staff in Saint Paul on January 26, 2016 (18 participants)
- Saint Paul Port Authority in Saint Paul on January 26, 2016 (20 participants)
- Region 9 Development Commission Transportation Advisory Committee in Mankato on January 26, 2016 (14 participants)
- Mid-Minnesota Development Commission in Willmar on January 27, 2016 (18 participants)
- City Engineer's Association of Minnesota conference in Brooklyn Center on January 27, 2016 (35 participants)
- Eden Prairie City Council in Eden Prairie on February 2, 2016 (10 participants)
- Duluth–Superior Metropolitan Interstate Commission staff in Duluth on February 8, 2016 (6 participants)
- Grand Forks-East Grand Forks Metropolitan Planning Organization staff in East Grand Forks on February 9, 2016 (3 participants)
- Fargo-Moorhead Council of Governments staff in Fargo on February 10, 2016 (3 participants)
- Region 9 Development Commission Executive Board in Mankato on February 10, 2016 (15 participants)
- 35W Solutions Alliance in Bloomington on February 11, 2016 (22 participants)
- Region 7W Transportation Advisory Committee in St. Cloud on February 17, 2016 (18 participants)
- La Crosse Area Planning Commission staff in Saint Paul on February 24, 2016 (1 participant)
- St. Cloud Area Planning Organization Executive Board in St. Cloud on February 25, 2016 (28 participants)
- St. Cloud Area Planning Organization staff in St. Cloud on February 25, 2016 (3 participants)

- Environmental Quality Board staff in Saint Paul on February 26, 2016 (2 participants)
- Metropolitan Council staff in Saint Paul on March 1, 2016 (9 participants)
- Minnesota Pollution Control Agency staff in Saint Paul on March 1, 2016 (35 participants)
- Believers of Self-Advocacy in Spring Lake Park on March 3, 2016 (5 participants)
- Fond du Lac Directors in Cloquet on March 4, 2016 (15 participants)
- Grand Portage council and staff in Grand Portage on March 4, 2016 (15 participants)
- Northwest Regional Development Commission Transportation Advisory Committee in Thief River Falls on March 7, 2016 (22 participants)
- Metropolitan Council staff in Saint Paul on March 8, 2016 (3 participants)
- Mankato-North Mankato Area Planning Organization staff in Mankato on March 16, 2016 (2 participants)
- Mdewakanton Sioux staff in Shakopee on March 18 (2 participants)
- Minnesota County Engineers Associate Board in Saint Paul on March 30 (25 participants)
- Metropolitan Council staff in Saint Paul on April 5, 2016 (6 participants)
- Metropolitan Planning Organization Directors in St. Cloud on April 18, 2016 (8 participants)
- Federal Highway Administration Minnesota Division staff in Saint Paul on April 26, 2016 (8 participants)
- ISIAAH-GRIP in Saint Paul on May 5, 2016 (12 participants)
- Southwest Corridor Transportation Coalition in Chaska on May 6, 2016 (35 participants)
- Regional Development Organization Transportation Planners in Bemidji on May 18, 2016 (12 participants)
- Minnesota Pollution Control Agency staff in Saint Paul on May 23, 2016 (1 participant)
- Advocacy Council for Tribal Transportation in Granite Falls on July 28, 2016 (25 participants)
- Metropolitan Planning Organization Directors webinar on September 7, 2016 (8 participants)

- Area Transportation Partnership, Metropolitan Planning Organization and Regional Development Organization members and staff webinar on September 8, 2016 (10 participants)
- Region 9 Development Commission Transportation Advisory Committee in Mankato on September 8, 2016 (20 participants)
- Area Transportation Partnership 7 in Mankato on September 9, 2016 (30 participants)
- Area Transportation Partnership 8 in Willmar on September 9, 2016 (19 participants)
- Metro Capital Improvement Committee in Roseville on September 9, 2016 (22 participants)
- Passenger Rail Forum in Saint Paul on September 12, 2016 (17 participants)
- Northwest Regional Development Commission Transportation Advisory Committee in Warren on September 12, 2016 (15 participants)
- Region 7W Transportation Advisory Committee in St. Cloud on September 14, 2016 (10 participants)
- Area Transportation Partnership, Metropolitan Planning Organization and Regional Development Organization members and staff webinar on September 15, 2016 (5 participants)
- Region 7W Transportation Policy Board in St. Cloud on September 23, 2016 (12 participants)
- Metropolitan Council Transportation Committee in Saint Paul on September 26, 2016 (25 participants)
- Transportation Alliance Legislative Committee in Saint Paul on September 29, 2016 (14 participants)
- Area Transportation Partnership 3 in Baxter on October 6, 2016 (20 participants)
- I-35W Solutions Alliance in Bloomington on October 13, 2016 (20 participants)
- Metropolitan Planning Organization Directors in St. Cloud on November 7, 2016 (20 participants)

Internal MnDOT Meetings

- Planning Management Group in Arden Hills on March 12, 2014 (15 participants)
- MnDOT Tribal Liaison in Saint Paul on March 11, 2015 (2 participants)

- Senior Leadership Team in Saint Paul on April 14, 2015 (16 participants)
- Transportation Program Investment Committee in Saint Paul on April 16, 2015 (20 participants)
- Communications staff in Saint Paul on May 11, 2015 (3 participants)
- Planning Management Group in Arden Hills on May 13, 2015 (15 participants)
- Aeronautics planning staff in Saint Paul on May 26, 2015 (3 participants)
- Rail planning staff in Saint Paul on May 28, 2015 (4 participants)
- Port and waterways planning staff in Saint Paul on May 28, 2015 (1 participant)
- Metro District-Central Office planning coordination meeting in Roseville on May 28, 2015 (16 participants)
- Transit planning staff in Saint Paul on June 2, 2015 (2 participants)
- Freight planning staff in Saint Paul on June 3, 2015 (4 participants)
- Pedestrian planning staff in Saint Paul on June 4, 2015 (2 participants)
- All Planners Group video conference on June 11, 2015 (14 participants)
- Pre-Construction Managers Group / Construction Managers Group in St. Cloud on June 30, 2015 (30 participants)
- Public Affairs Coordinators video conference on July 16, 2015 (15 participants)
- Agency Vidcon video conference on July 17, 2015 (20 participants)
- Senior Leadership Team in Saint Paul on July 28, 2015 (10 participants)
- Metro District-Central Office planning coordination meeting in Roseville on July 30, 2015 (10 participants)
- Modal Planning and Program Management Division in Saint Paul on August 5, 2015 (7 participants)
- Senior Leadership Team in Saint Paul on Tuesday, August 18, 2015 (12 participants)
- Modal Planning and Program Management Division in Saint Paul on September 2, 2015 (7 participants)
- Planning Management Group in Arden Hills on September 9, 2015 (20 participants)
- Senior Leadership Team in Saint Paul on September 15, 2015 (12 participants)





- District Operations meeting in St. Cloud on September 23, 2015 (20 participants)
- State Communications Workshop in Arden Hills on October 7, 2015 (12 participants)
- Agency Vidcon video conference on October 9, 2015 (30 participants)
- Modal Planning and Program Management Division in Saint Paul on October 14, 2015 (8 participants)
- Senior Leadership Team in Saint Paul on October 20, 2015 (8 participants)
- Managers Workshop in Brooklyn Park on November 16, 2015 (50 participants)
- Modal Planning and Program Management Division in Saint Paul on December 9, 2015 (7 participants)
- Senior Leadership Team in Saint Paul on December 15, 2015 (12 participants)
- Senior Leadership Team in Saint Paul on January 19, 2016 (14 participants)
- Fully Utilizing Employees without Labels Employee Resource Group in Saint Paul on January 20, 2016 (10 participants)
- Modal Planning and Program Management Division in Saint Paul on February 3, 2016 (7 participants)
- District 1 staff in Duluth on February 8, 2016 (8 participants)
- District 6 staff in Kasson on February 9, 2016 (50 participants)
- District 2 staff in Bemidji on February 9, 2016 (19 participants)
- Metro District staff in Roseville on February 9, 2016 (15 participants)
- District 4 staff in Detroit Lakes on February 10, 2016 (5 participants)
- All Planners Group video conference on February 11, 2016 (20 participants)
- Senior Leadership Team in Saint Paul on February 20, 2016 (10 participants)
- District 3 staff in Baxter on February 18, 2016 (10 participants)
- District 8 staff in Willmar on February 22, 2016 (10 participants)
- District 2 staff in Bemidji on February 9, 2016 (19 participants)

- District 7 staff in Mankato on March 8, 2016 (5 participants)
- Senior Leadership Team in Saint Paul on March 15, 2016 (15 participants)
- District 7 planning and project management staff in Mankato on March 16, 2016 (8 participants)
- Agency Policy and Investment Direction Setting Meeting in Shoreview on March 22-23, 2016 (70 participants)
- Transportation Program Investment Committee in Saint Paul on April 5, 2016 (15 participants)
- Modal Planning and Program Management Division in Saint Paul on April 13, 2016 (10 participants)
- Senior Leadership Team in Saint Paul on April 19, 2016 (10 participants)
- Planning Management Group in Arden Hills on May 11, 2016 (12 participants)
- Senior Leadership Team in Saint Paul on May 17, 2016 (11 participants)
- Modal Planning and Program Management Division in Saint Paul on June 8, 2016 (7 participants)
- All Planners Group video conference on June 9, 2016 (14 participants)
- Transportation Program Investment Committee in Saint Paul on June 16, 2016 (20 participants)
- Senior Leadership Team in Saint Paul on June 20, 2016 (20 participants)
- Planning Management Group in Arden Hills on July 13, 2016 (20 participants)
- Senior Leadership Team in Saint Paul on July 19, 2016 (15 participants)
- Agency Vidcon video conference on August 19, 2016 (25 participants)
- Senior Leadership Team in Saint Paul on October 24, 2016 (10 participants)
- Planning Management Group in Arden Hills on November 9, 2016 (18 participants)
- Senior Leadership Team in Saint Paul on November 15, 2016 (5 participants)
- All Managers Meeting webinar on November 18, 2016 (60 participants)
- Executive Leadership Team in Saint Paul on November 21, 2016 (6 participants)



STAKEHOLDER FORUMS

MnDOT held all-day stakeholder forums to provide an opportunity for more in-depth input on specific questions and issues. The forums also provided an opportunity to facilitate a dialogue between different stakeholder perspectives. The forums included presentations by the project team using PowerPoint or Prezi. MnDOT received Feedback through meeting notes, paper worksheets and Mentimeter. The results section of this report provides more detail about the discussion topics. Stakeholder forums occurred in November 2015, as part of the primary engagement phase, and in April / May 2016, as part of the second engagement phase. The November forums also included a Greater Minnesota Transit Investment Plan discussion.

November Stakeholder Forums

- Stakeholder Forum 1 in Mankato on November 5, 2015 (32 participants)
- Stakeholder Forum 2 in Minneapolis on November 6, 2015 (70 participants)
- Stakeholder Forum 3 in Brainerd on November 9, 2015 (35 participants)

April / May Stakeholder Forums

- Stakeholder Forum 1 in Detroit Lakes on April 27, 2016 (10 participants)
- Stakeholder Forum 2 in Willmar on May 4, 2016 (23 participants)
- Stakeholder Forum 3 in Grand Rapids on May 5, 2016 (4 participants)
- Stakeholder Forum 4 in Apple Valley on May 9, 2016 (28 participants)
- Stakeholder Forum webinar on May 12, 2016 (6 participants)



WORKPLACE-BASED OUTREACH

The project team reached out to employers throughout Minnesota to offer a variety of engagement options, ranging from informational presentations to interactive activities. If interested in participating, employers selected an outreach method that worked for them and their employees. The goal of these events was to reach individuals who do not normally participate in the planning process by making it easy and convenient. For presentation-style events, the project team presented using PowerPoint or Prezi and received feedback through paper worksheets and Mentimeter. For survey-based events, MnDOT received feedback through GetFeedback surveys on iPads. When applicable, the results section of this report provides more detail about the topics covered. Workplace-based outreach was completed at the following organizations as part of the primary engagement stage (October 2015 – March 2016) and as part of the formal public comment period (September / October 2016). Engagement conducted at universities is also included in this category.

- HDR Engineering, Inc. in Golden Valley on October 6, 2015 (55 participants)
- Hennepin County in Minneapolis on December 4, 2015 (19 participants)
- WSB and Associates in Minneapolis on December 17, 2015 (31 participants)
- Rosen's Beverage in Fairmont on January 4, 2016 (11 participants)
- DARTS in Saint Paul January 6, 2016 (11 participants)
- General Mills in Minneapolis on January 12, 2016 (15 participants)
- MN GreenCorp Members in Saint Paul on February 1, 2016 (4 participants)
- University of Minnesota Interdisciplinary Transportation Student Organization / Center for Transportation Studies / Humphrey School of Public Affairs in Minneapolis on February 18, 2016 (9 participants)
- Bemidji State University in Bemidji on February 2, 2016 (50 participants)
- North Hennepin Community College in Brooklyn Park on February 11, 2016 (10 participants)
- Bemidji State University in Bemidji on September 15, 2016 (10 participants)

COMMUNITY EVENTS

The project team identified community events throughout the state as locations for engagement sessions. During the primary engagement phase, the sessions consisted of conducting surveys using GetFeedback surveys on iPads. The results section of this report provides more detail about the survey questions. During the public comment period, the engagement sessions focused primarily on spreading the word about the draft plans through information posters and handouts. The project team gave extra focus to events that helped reach traditionally underserved populations. MnDOT completed engagement at the following community events as part of the primary engagement phase (October 2015 – March 2016), plus the State Fair in August 2015, and as part of the formal public comment period (September / October 2016).

- Northfield Riverwalk Market Fair in Northfield on October 10, 2015 (25 participants)
- Zombie Pub Crawl in Minneapolis on October 17, 2015 (26 participants)
- Mankato Marathon in Mankato on October 18, 2015 (5 participants)
- Burnsville Halloween Fest in Burnsville on October 23, 2015 (1 participant)
- Minneapolis Farmers Market in Minneapolis on October 24, 2015 (50 participants)
- Anoka Halloween Parade in Anoka on October 31, 2015 (50 participants)
- Autumn Market in Glenwood on November 12, 2015 (30 participants)
- Norsefest Festival in Madison on November 14, 2015 (30-40 participants)
- Westridge Mall Craft Fair in Fergus Falls on November 14, 2015 (34 participants)
- Made in MN Expo in St. Cloud on November 21, 2015 (112 participants)
- Beneath the Village Wreath in Morton on November 21, 2015 (30 participants)
- Montevideo Lighted Parade in Montevideo on December 3, 2015 (12 participants)
- Midtown Global Market in Minneapolis on January 20, 2016 (35 participants)
- Bois Forte State of the Band in Tower on January 20, 2016 (150 participants)
- Midtown Global Market in Minneapolis on January 23, 2016 (35 participants)
- Minneapolis Public Library in Minneapolis on February 2, 2016 (35 participants)

- Cass Lake Lions Club in Cass Lake on February 29, 2016 (7 participants)
- Riverwalk Cinema in East Grand Forks on March 10, 2016 (23 participants)
- Duluth Skywalk in Duluth on March 11, 2016 (25 participants)
- St. Cloud Pride in St. Cloud on September 17, 2016 (40 participants)
- Harvest Fest Transportation Fair in Dodge Center on September 17, 2016 (20 participants)
- Open Streets Nicollet in Minneapolis on September 18, 2016 (100 participants)
- Fall Festival in Redwood Falls on September 23, 2016 (7 participants)
- Streets Alive! in Moorhead on September 24, 2016 (8 participants)
- Open Streets University of Minnesota in Minneapolis on October 1, 2016 (30 participants)
- Mankato River Ramble in Mankato on October 9, 2016 (40 participants)

ECHO Events

The project team partnered with Twin Cities Public Television / Emergency, Community, Health, Outreach to conduct engagement within traditionally underserved communities, specifically the Spanish-speaking, Hmong and Somali communities in Minnesota. The ECHO team translated the iPad surveys into these languages. MnDOT completed the following ECHO events in February / March 2016, as part of the primary engagement phase.

- Brian Coyle Center in Minneapolis on February 18, 2016 (22 participants)
- Hmong Village in Saint Paul on February 19, 2016 (53 participants)
- Culture Corner: Daughters of Africa in Worthington on January 20, 2016 (25 participants)
- Village Market in Minneapolis on February 25, 2016 (28 participants)
- Hmong Town Market in Saint Paul on February 26, 2016 (26 participants)
- St. Cloud University in St. Cloud on February 29, 2016 (48 participants)
- Plaza Latina in Saint Paul on March 4, 2016 (19 participants)
- Divine Mercy Catholic Church in Faribault on March 6, 2016 (21 participants)
- City of Landfall in Landfall on March 7, 2016 (29 participants)

State Fair

The Minnesota State Fair marked the first public engagement event for the project. The project team conducted activities in the general MnDOT booth at the fair. The engagement activities included transportation trivia and a dot exercise to gain input from fairgoers. The results section of this report provides more detail about the specific questions asked. The fair ran from mid-August to Labor Day, 2015.

- **Number of responses:** approximately 5,500

TRADITIONALLY UNDERSERVED COMMUNITY PARTNERSHIPS

As a part of the public participation plan development, the project team held meetings with community leaders from traditionally underserved populations to identify potential engagement strategies. These meetings were held between October and December 2015, as part of the primary engagement phase.

- New American Academy Leadership in Edina on October 6, 2015
- Nobles County Integration Collaborative in Minneapolis on October 21, 2015
- AARP in Saint Paul on October 29, 2015
- Twin Cities Public Television / Emergency, Community, Health, Outreach (TPT / ECHO) in Saint Paul on December 23, 2015

PUBLIC HEARING

During the formal public comment period, MnDOT held a public hearing on October 6, 2016 from 4:00 to 6:00 pm. The hearing provided an opportunity for individuals to comment on the draft plans in person. The project team announced the date and time of the hearing in the State Register, in a press release and on social media. The hearing occurred in Saint Paul, connected to 15 video conference locations throughout Minnesota.

Online Engagement

Online engagement began in October 2015 and reached thousands of online participants. The majority of online engagement activities took place during the primary engagement phase (October 2015 – March 2016). However, some activities occurred throughout the duration of the project. The following sections summarize each activity.

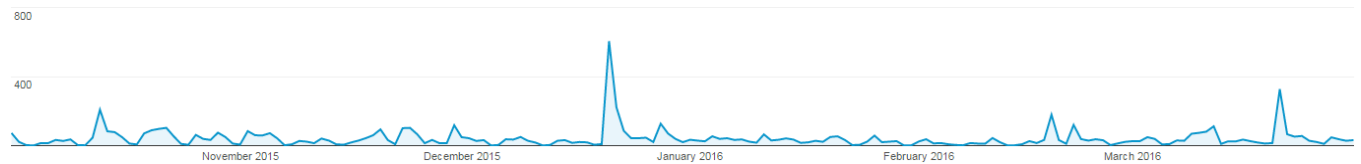
PROJECT WEBSITE

MnDOT launched an interactive project website in October 2015 at www.MinnesotaGO.org. The website remained active throughout the duration of the project and will continue to remain a planning resource for the foreseeable future. The data below summarizes activity from October 2015 through March 2016, the most active period of online engagement.

- **Sessions:** 7,567
- **Users:** 4,919
- **Average session duration:** 3 minutes 14 seconds
- **Average pages per session:** 2.7



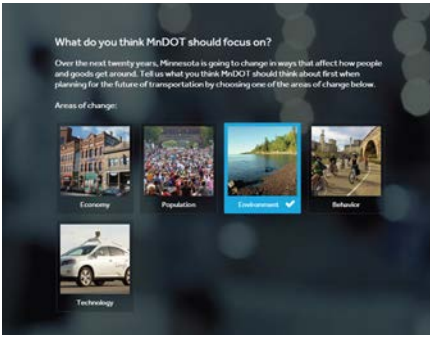
Figure D-1: Monthly website sessions through March 2016



The website saw spikes in website activity connected to the stakeholder emails on October 13, December 21 and March 18 and with social media posts. Top Minnesota cities generating website traffic included Minneapolis, Saint Paul, Rochester, Duluth, Saint Cloud, Plymouth, Mankato, Saint Louis Park, Bloomington and Burnsville.

Table D-2: Top 10 Minnesota cities generating website traffic

CITY	SESSIONS
Minneapolis	729
Saint Paul	562
Rochester	100
Duluth	83
Saint Cloud	69
Plymouth	69
Mankato	68
Saint Louis Park	64
Bloomington	63
Burnsville	59



WEB SURVEYS

MnDOT launched the first round of online surveys as part of the primary engagement phase (October 2015 – March 2016). The project team made the surveys available through the project website and advertised them via social media and stakeholder emails. MnDOT used a variety of survey tools and included surveys compliant with the Americans with Disabilities Act and Spanish-language surveys. MnDOT launched a second round of online surveys as part of the second engagement phase (April / May 2016). The results section of this report provides more detail about the questions asked through each survey.

October 2015 through March 2016 Surveys

- **Launch date:** October 1, 2015 (November 5, 2015 for the MnSHIP MetroQuest Survey)
- **Survey tools:** GetFeedback, MetroQuest, SurveyMonkey and Qualtrics.
- **Number of participants:**
 - **Website Surveys:** 2,293
 - **Social Media Surveys:** 2,820

April / May 2016 Surveys

- **Launch date:** April 12, 2016
- **Survey tools:** GetFeedback, SurveyMonkey and Qualtrics.
- **Number of website surveys:** 50

SOCIAL MEDIA

MnDOT began a social media strategy related to this project in October 2015. Activity continued through the duration of the project. The strategy primarily used the Minnesota GO Facebook and Twitter profiles. The frequency of social media activity varied based on the project phase. The most active social media presence occurred during the primary engagement phase (October 2015 – March 2016). Overall, the strategy focused on driving traffic to the project website for more information and educational materials, promoting surveys and other feedback opportunities and interacting with followers to gain input directly through Twitter polls. Additionally, MnDOT developed a coordinated social media campaign to connect this project and other planning efforts. The following sections summarize the social media activity related to this project.

- **Frequency of posts:** Weekly, on average, during engagement-focused periods
- **Facebook views:** 250,000+ (October 2015 – March 2016)
- **Twitter impressions:** 47,200+ (October 2015 – March 2016)



Facebook Ads

The project team ran Facebook ads three times during the primary engagement phase and twice during the formal public comment period. The ads during the primary engagement phase focused on directing people to the project website and encouraging them to complete the online surveys. The ads during the formal public comment period focused on letting people know the draft plans were available for review and comment and directing them to the online comment tool. Some Facebook ads targeted specific groups, such as women, Minnesotans of different ethnic affinities, Spanish-speaking Minnesotans and specific geographic areas. The project team used targeted ads to help reach groups underrepresented through other engagement methods. The results from the ad runs are shown in the following tables.

Figure D-3: Facebook targeted ad results - primary engagement phase

FACEBOOK AD SET	AMOUNT INVESTED	REACH	CLICKS	POST LIKES	POST COMMENTS	POST SHARES	PAGE LIKES	COST PER CLICK	SURVEY PARTICIPANTS	COST PER SURVEY
Total or average	\$5,875	500,797	7,490	562	127	178	152	\$0.78	2,248	\$2.61
Round 1 SMTP (11/18/15 – 12/01/15) - Target: All Minnesotans	\$500	35,025	521	35	4	8	2	\$0.96	181	\$2.76
Round 1 MnSHIP (11/18/15 – 12/01/15) - Target: All Minnesotans	\$500	45,231	538	23	29	4	4	\$0.93	176	\$2.84
MnSHIP Women Test (12/22/15 – 12/25/15) - Target: Women	\$125	10,207	167	8	0	0	2	\$0.75	NA	NA
Round 2 SMTP - Target: Minnesotans of color, Spanish speakers, zip codes	\$1,400	121,087	1,778	200	14	31	66	\$0.79	417	\$3.36
Round 2 MnSHIP - Target: Women, Minnesotans of color, Spanish speakers, zip codes	\$1,350	130,628	1,676	118	12	8	34	\$0.81	140	\$9.64
Round 3 SMTP - Target: Women, African American ethnic affinity	\$1,000	64,573	1,654	128	64	106	26	\$0.60	1,097	\$0.91
Round 3 MnSHIP - Target: Women, African American ethnic affinity	\$1,000	94,046	1,156	50	4	21	18	\$0.87	237	\$4.21

Table D-4: Facebook targeted ad results - Formal public comment period

FACEBOOK AD SET	AMOUNT INVESTED	REACH	CLICKS	POST LIKES	POST COMMENTS	POST SHARES	COST PER CLICK
Total or average	\$950	75,425	28,056	276	11	67	\$0.33
Round 1 Video (08/29/16 - 09/05/16) - Target: All Minnesotans	\$150	11,144	7,237	55	10	31	\$0.02
Round 1 Video (08/29/16 - 09/05/16) - Target: Ethnic Affinity	\$150	13,692	6,406	55	10	31	\$0.02
Round 1 Video (09/12/16 - 09/19/16) - Target: Women 18-55	\$150	12,792	6,307	55	10	31	\$0.02
Round 2 Video (09/27/16 - 10/05/16) - Target: All Minnesotans under 35	\$200	26,297	7,786	20	1	3	\$0.03
Round 2 Post (10/05/2016-10/13/2016) - Target: All Minnesotans	\$150	5,409	172	201	0	33	\$0.87
Round 2 Post (10/05/2016-10/13/2016) - Target: Ethnic Affinity	\$150	6,091	146	201	0	33	\$1.03

Facebook Video

The project team created a one-minute animated video to help promote the formal public comment period. The video focused on spreading the word about the draft plans and explaining how to comment. MnDOT shared the video via social media. This included the use of Facebook ads to boost views and to reach target populations.

Figure D-2: Screen capture of video frame



STAKEHOLDER EMAIL UPDATES

The project team sent update emails to MnDOT's planning and public participation email lists throughout the project. Individuals signed up for email updates via the project website. The emails went out roughly every other month during the project.

The first stakeholder e-mail update:

- **E-mail date:** October 13, 2015
- **Key messages:** Introduction to the project, launch of the website, RSVP for the first round of stakeholder forums
- **Number of recipients:** 242

The second stakeholder e-mail update:

- **E-mail date:** December 21, 2015
- **Key messages:** Engagement update, call to participate
- **Number of recipients:** 8,536

The third stakeholder e-mail update:

- **E-mail date:** March 21, 2016
- **Key messages:** Last call for Phase 1 online survey participation, links to translated surveys, save the data for the second round of stakeholder forums
- **Number of recipients:** 11,182

The fourth stakeholder e-mail update:

- **E-mail date:** April 13, 2016
- **Key messages:** RSVP for the second round of stakeholder forums, links to Phase 2 online surveys
- **Number of recipients:** 11,211

The fifth stakeholder email update:

- **Email date:** June 13, 2016
- **Key messages:** Link to engagement summary, next steps and project timeline
- **Number of recipients:** 11,242

The sixth stakeholder email update:

- **Email date:** August 29, 2016
- **Key messages:** Announcement of the formal public comment period, call to participate
- **Number of recipients:** 11,212



Minnesota GO summer update

A screenshot of a webpage titled "Minnesota GO summer update". The page features a navigation bar with tabs for "2015", "2016", and "2017", with "2016" selected. Below the navigation bar is a "Public Engagement" section with a "We archive" dropdown menu. The main content area includes a "Thank you for your input!" message, a "Remember those surveys and conversations?" section, and a "Next steps" section. The page is designed with a clean, professional layout using blue and white colors.

Thank you for your input!

This past year, we traveled around the state of Minnesota to gather your input on the future of transportation. During this time, we received over 12,450 responses across a broad range of geographic and demographic groups. Your voices set the stage for writing draft plans for our state's transportation future.

Remember those surveys and conversations?

We're pleased to share the results! Take a look at what we learned by downloading the executive summary of engagement.

Next steps

How will this input be used? Great question! Now it's time to draft the policy and investment direction. Throughout the next few months, we'll be busy writing the

The seventh stakeholder email update:

- **Email date:** September 28, 2016
- **Key messages:** Reminder to review the draft plans and provide comment
- **Number of recipients:** 11,213

The project team will send a final stakeholder email upon project completion in January 2017.

INTERACTIVE ONLINE PLANS & COMMENT TOOL

As part of the formal public comment period, the project team developed interactive online versions of the plans in addition to print and PDF versions. The project website, www.MinnesotaGO.org, hosted the web-based plans. These HTML versions of the plans helped to ensure the plan content was accessible to all readers. They also allowed for content to be cross-referenced, which made for easier navigation of the document and helped show connections between themes and chapters. Additionally, the web versions of the plan included a built-in comment tool. This allowed individuals to provide comments on specific plan content as they read it. A summary of the online plans is provided below:

- **Total views of online plan pages:** 3,731
- **SMTP:** 1,625
- **MnSHIP:** 2,106

AUDIENCES REACHED

The information and analysis in this section only includes data from the primary engagement phase (October 2015 – March 2016).

MnDOT tracked demographics as a part of this engagement effort. Four questions were posed on all anonymous participation tools. The questions were optional. They were:

- What is your zip code?
- What is your age?
- What is your gender?
- What is your race/ethnicity?

The project team collected this data throughout the primary engagement phase to determine if certain populations were missed. Data helped refine the engagement strategy from month-to-month in order to address gaps and build on successes. The intended outcome was to reach a population that is representative of Minnesota’s demographic makeup. In addition to these questions, MnDOT gained audience data through the project website and social media accounts.

Table D-5: Minnesota demographics

CATEGORY	POPULATION	PERCENTAGE OF TOTAL
Total state	5,303,925	100%
White	4,524,062	86%
Black or African American	274,412	6%
Asian	214,234	5%
American Indian or Alaska Native	60,916	1%
Native Hawaiian or Other Pacific Islander	2,156	<1%
Multiple races	121,996	1%
Hispanic	250,258	5%
Male	2,632,132	50%
Female	2,671,793	50%
20 and younger	1,434,502	27%
21 to 35	1,111,382	21%
36 to 50	1,060,785	20%
51 to 65	1,060,785	20%
Greater than 66	636,471	12%

The four demographic questions appeared on the hard-copy worksheets, online surveys and iPad surveys. There were 6,876 participants using these tools through the month of March. Fifty-six percent of participants (3,884) answered at least one optional demographic question.

Key Demographic Takeaways

The project team analyzed the demographic data and used it to adjust the engagement strategy on a monthly basis. Key takeaways from the engagement data include:

- **Average age skews older:** The data below shows the average age of participants by event type. The median age in Minnesota is 37.6.
 - **Community event:** 42.1
 - **Social media survey:** 50.7
 - **Stakeholder briefing:** 49.2
 - **Stakeholder forum:** 45.8
 - **Website survey:** 49.0
 - **Workplace:** 43.2
 - **Overall:** 47.6
- **Correcting for disproportionately high representation of men:** The primary engagement phase ended with 53 percent female participation and 47 percent male participation. The breakdown for MnSHIP is 53 percent men and 47 percent women. The breakdown for SMTP is 57 percent women and 43 percent men. Concerted social media efforts to increase participation by women on MnSHIP and SMTP surveys increased the overall female representation from 42 percent in November 2015 to 53 percent in March 2016.
- **Correcting for disproportionately low participation from people of color:** The project ended with 87 percent of participants identified as white. This was an overall improvement (13 percent) in participation by people of color from early participation results. The month of December 2015 included one week of targeted Facebook ads to help increase participation from people of color in Minnesota. MnDOT implemented additional strategies from January through March 2016 aiming to address these disparities. The involvement of TPT / ECHO also helped to increase representation from people of color. MnSHIP and SMTP saw an overall increase in the Hispanic, Black or African American, Asia and American Indian or Alaskan Native participation.

DEMOGRAPHIC BREAKDOWN BY TACTIC

Table D-6: Percentage breakdown of participant demographics by tactic

Note: Three participants identified as "Trans"; one participant identified as "Other"

TACTIC	20 AND BELOW	21-35	36-50	51-65	66+	MALE	FEMALE	WHITE	BLACK OR AFRICAN AMERICAN	AMERICAN INDIAN OR ALASKA NATIVE	ASIAN	NATIVE HAWAIIAN OR OTHER PACIFIC ISLANDER	MULTIPLE	HISPANIC
Total	3%	24%	25%	35%	13%	47%	53%	87%	6%	1%	5%	0%	1%	5%
Community Event	11%	34%	25%	23%	6%	44%	56%	60%	19%	3%	16%	0%	1%	20%
Social Media Survey	2%	18%	24%	41%	15%	24%	76%	88%	7%	1%	2%	0%	2%	3%
Stakeholder Briefing	0%	20%	26%	41%	12%	75%	25%	94%	1%	1%	2%	0%	1%	0%
Stakeholder Forum	0%	32%	23%	41%	5%	59%	41%	95%	0%	0%	0%	5%	0%	0%
Website Survey	2%	22%	25%	37%	14%	58%	42%	96%	1%	1%	2%	0%	1%	1%
Workplace	0%	37%	31%	19%	13%	58%	42%	93%	0%	0%	6%	0%	0%	0%
MnSHIP	3%	24%	26%	35%	13%	53%	47%	89%	4%	1%	6%	0%	1%	5%
Community Event	9%	34%	28%	24%	5%	42%	58%	61%	17%	1%	20%	0%	0%	16%
Social Media Survey	2%	20%	21%	41%	15%	34%	66%	93%	4%	0%	1%	0%	1%	6%
Stakeholder Briefing	0%	19%	26%	41%	14%	73%	27%	95%	0%	1%	2%	0%	1%	0%
Website Survey	2%	20%	26%	38%	14%	59%	41%	97%	1%	0%	2%	0%	0%	1%
Workplace	0%	34%	30%	23%	14%	57%	43%	94%	0%	0%	6%	0%	0%	1%
SMTP	3%	24%	25%	35%	13%	43%	57%	85%	7%	2%	4%	0%	2%	5%
Community Event	12%	32%	22%	28%	6%	46%	54%	59%	21%	5%	12%	0%	2%	24%
Social Media Survey	1%	15%	21%	51%	12%	20%	80%	86%	8%	1%	3%	0%	3%	2%
Stakeholder Briefing	0%	19%	22%	50%	9%	77%	23%	94%	1%	1%	3%	1%	1%	1%
Website Survey	1%	19%	20%	48%	12%	57%	43%	95%	2%	1%	2%	0%	1%	2%
Workplace	1%	34%	27%	29%	9%	59%	41%	90%	1%	1%	7%	0%	0%	0%

Table D-7: Raw values breakdown of participant demographics by tactic

Note: Three participants identified as "Trans"; one participant identified as "Other"

TACTIC	20 AND BELOW	21-35	36-50	51-65	66+	MALE	FEMALE	WHITE	BLACK OR AFRICAN AMERICAN	AMERICAN INDIAN OR ALASKA NATIVE	ASIAN	NATIVE HAWAIIAN OR OTHER PACIFIC ISLANDER	MULTIPLE	HISPANIC
Total	105	813	863	1205	432	1623	1796	2380	159	33	131	5	36	136
Community Event	69	213	158	145	37	295	369	292	94	16	78	0	6	98
Social Media Survey	16	192	249	433	157	240	776	694	52	6	18	2	18	23
Stakeholder Briefing	2	89	115	178	54	345	118	401	3	5	9	2	5	2
Stakeholder Forum	0	7	5	9	1	13	9	20	0	0	0	1	0	0
Website Survey	17	234	270	400	156	605	434	783	9	5	13	0	7	12
Workplace	1	78	66	40	27	125	90	190	1	1	13	0	0	1
MnSHIP	44	361	386	530	192	802	704	1090	54	8	68	1	9	58
Community Event	26	102	82	72	16	132	181	147	42	3	48	0	1	38
Social Media Survey	6	59	61	120	45	95	182	195	8	1	2	0	3	12
Stakeholder Briefing	1	46	64	102	34	190	72	226	1	3	4	1	3	1
Website Survey	11	112	142	207	80	311	214	407	3	1	7	0	2	6
Workplace	0	42	37	29	17	74	55	115	0	0	7	0	0	1
SMTTP	61	445	472	666	239	808	1083	1270	105	25	63	3	27	78
Community Event	43	111	76	96	21	163	188	145	52	13	30	0	5	60
Social Media Survey	10	133	188	462	112	145	594	499	44	5	16	2	15	11
Stakeholder Briefing	1	43	51	115	20	155	46	175	2	2	5	1	2	1
Website Survey	6	122	128	301	76	294	220	376	6	4	6	0	5	6
Workplace	1	36	29	31	10	51	35	75	1	1	6	0	0	0

Total Participant Demographic Breakdown

Table D-8: Percentage breakdown of participant gender by tactic

TACTIC	MALE	FEMALE
Total	47%	53%
Community Event	44%	56%
Social Media Survey	24%	76%
Stakeholder Briefing	75%	25%
Stakeholder Forum	59%	41%
Website Survey	58%	42%
Workplace	58%	42%

Table D-9: Percentage breakdown of participant age by tactic

TACTIC	20 AND BELOW	21-35	36-50	51-65	66+
Total	3%	24%	25%	35%	13%
Community Event	11%	34%	25%	23%	6%
Social Media Survey	2%	18%	24%	41%	15%
Stakeholder Briefing	0%	20%	26%	41%	12%
Stakeholder Forum	0%	32%	23%	41%	5%
Website Survey	2%	22%	25%	37%	14%
Workplace	0%	37%	31%	19%	13%

Table D-10: Percentage breakdown of participant race / ethnicity by tactic

TACTIC	WHITE	BLACK OR AFRICAN AMERICAN	AMERICAN INDIAN OR ALASKA NATIVE	ASIAN	NATIVE HAWAIIAN OR OTHER PACIFIC ISLANDER	MULTIPLE	HISPANIC
Total	87%	6%	1%	5%	0%	1%	5%
Community Event	60%	19%	3%	16%	0%	1%	20%
Social Media Survey	88%	7%	1%	2%	0%	2%	3%
Stakeholder Briefing	94%	1%	1%	2%	0%	1%	0%
Stakeholder Forum	95%	0%	0%	0%	5%	0%	0%
Website Survey	96%	1%	1%	2%	0%	1%	1%
Workplace	93%	0%	0%	6%	0%	0%	0%

SMTP Participant Demographic Breakdown

Table D-1: Percentage breakdown of SMTP participant gender by tactic

TACTIC	MALE	FEMALE
Total	43%	57%
Community Event	46%	54%
Social Media Survey	20%	80%
Stakeholder Briefing	77%	23%
Website Survey	57%	43%
Workplace	59%	41%

Table D-12: Percentage breakdown of SMTP participant age by tactic

TACTIC	20 AND BELOW	21-35	36-50	51-65	66+
Total	3%	24%	25%	35%	13%
Community Event	12%	32%	22%	28%	6%
Social Media Survey	1%	15%	21%	51%	12%
Stakeholder Briefing	0%	19%	22%	50%	9%
Website Survey	1%	19%	20%	48%	12%
Workplace	1%	34%	27%	29%	9%

Table D-13: Percentage breakdown of SMTP participant race / ethnicity by tactic

TACTIC	WHITE	BLACK OR AFRICAN AMERICAN	AMERICAN INDIAN OR ALASKA NATIVE	ASIAN	NATIVE HAWAIIAN OR OTHER PACIFIC ISLANDER	MULTIPLE	HISPANIC
Total	85%	7%	2%	4%	0%	2%	5%
Community Event	59%	21%	5%	12%	0%	2%	24%
Social Media Survey	86%	8%	1%	3%	0%	3%	2%
Stakeholder Briefing	94%	1%	1%	3%	1%	1%	1%
Website Survey	95%	2%	1%	2%	0%	1%	2%
Workplace	90%	1%	1%	7%	0%	0%	0%

MnSHIP Participant Demographic Breakdown

Table D-14: Percentage breakdown of MnSHIP participant gender by tactic

TACTIC	MALE	FEMALE
Total	53%	47%
Community Event	42%	58%
Social Media Survey	34%	66%
Stakeholder Briefing	73%	27%
Website Survey	59%	41%
Workplace	57%	43%

Table D-15: Percentage breakdown of MnSHIP participant age by tactic

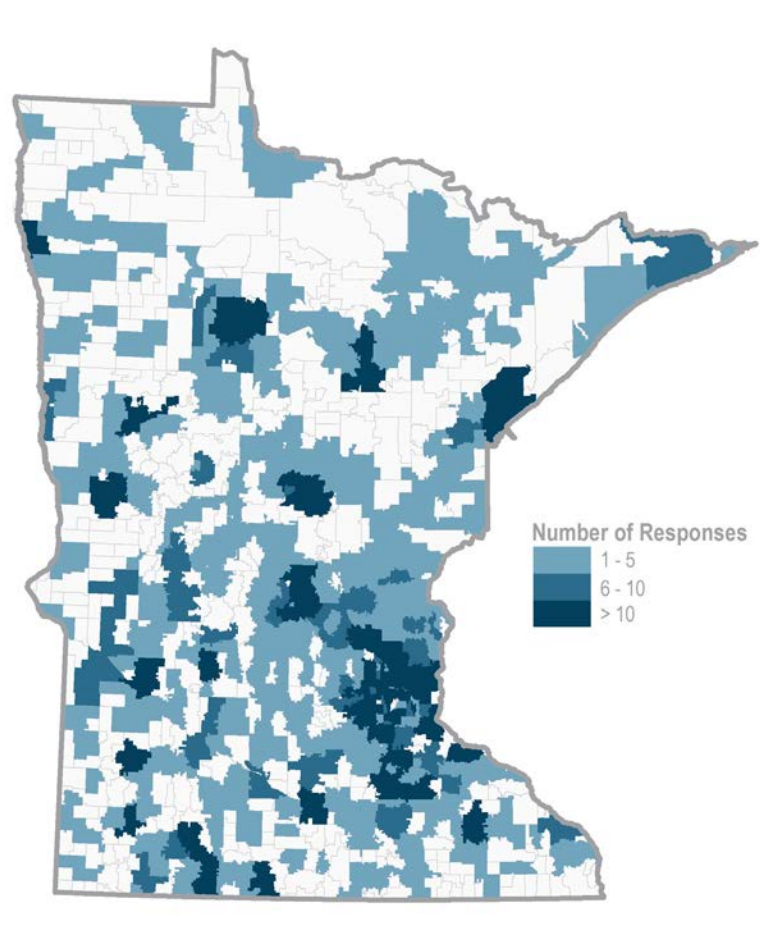
TACTIC	20 AND BELOW	21-35	36-50	51-65	66+
Total	3%	24%	26%	35%	13%
Community Event	9%	34%	28%	24%	5%
Social Media Survey	2%	20%	21%	41%	15%
Stakeholder Briefing	0%	19%	26%	41%	14%
Website Survey	2%	20%	26%	38%	14%
Workplace	0%	34%	30%	23%	14%

Table D-16: Percentage breakdown of MnSHIP participant race / ethnicity by tactic

TACTIC	WHITE	BLACK OR AFRICAN AMERICAN	AMERICAN INDIAN OR ALASKA NATIVE	ASIAN	NATIVE HAWAIIAN OR OTHER PACIFIC ISLANDER	MULTIPLE	HISPANIC
Total	89%	4%	1%	6%	0%	1%	5%
Community Event	61%	17%	1%	20%	0%	0%	16%
Social Media Survey	93%	4%	0%	1%	0%	1%	6%
Stakeholder Briefing	95%	0%	1%	2%	0%	1%	0%
Website Survey	97%	1%	0%	2%	0%	0%	1%
Workplace	94%	0%	0%	6%	0%	0%	1%

GEOGRAPHIC DISTRIBUTION

Figure D-3: Breakdown of participant home zip code



RESULTS

This section summarizes results of engagement for the primary engagement phase (October 2015 – March 2016, plus the State Fair) and the second engagement phase (April – May 2016).

Statewide Multimodal Transportation Plan

PHASE 1

The first phase focused on connecting with the general public and transportation partners. This was the primary phase of engagement. It began in August 2015 at the Minnesota State Fair and continued through March 2016. The majority of engagement activities occurred between October 2015 and March 2016. This phase asked about the future of the state and transportation. To plan for the future, it is important to understand what is important to Minnesotans. To do this, MnDOT asked participants about a number of changes projected for Minnesota over the next 20 years. These shifts – in the economy, environment, population, technology and transportation behavior – will affect how people and goods move. The goal was to understand which of these changes, or types of changes, were most important for the plan to consider moving forward. Participants helped prioritize more than 20 individual trends in five different areas:

Environmental Trends

- [*Climate Change*](#)
- [*Environmental Quality*](#)

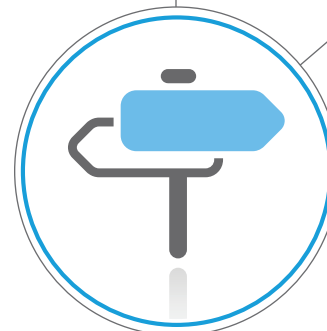
Transportation Behavior Trends

- [*Transportation Behavior Changes*](#)
- [*Mobility as a Service*](#)
- [*Teleworking & e-Shopping*](#)

Population Trends

- [*Demographic Trends in Minnesota*](#)
- [*Urban & Rural Population Trends*](#)
- [*Racial Disparities & Equity*](#)
- [*Minnesota's Aging Population*](#)
- [*Health Trends in Minnesota*](#)

More information related to the trends can be found in **Chapter 3.**





Economic Trends

- [*Economic Sectors & Employment Patterns*](#)
- [*Freight Rail in Minnesota*](#)
- [*Aging Infrastructure*](#)
- [*Public-Private Partnerships*](#)
- [*New Logistics*](#)
- [*Dynamic Road Pricing*](#)

Technology Trends

- [*Autonomous Vehicles*](#)
- [*Mobile Telecommunications & Activity in Motion*](#)
- [*Sensors, Monitors & Big Data*](#)
- [*Electrification & Alternative Fuels*](#)
- [*Unmanned Aircraft Systems / Drones*](#)

Engagement Activities

IN-PERSON ENGAGEMENT

Community Events & Traditionally Underserved Community Partnerships

The in-person engagement was kicked off at the Minnesota State Fair. Fairgoers were asked to prioritize two of the five broad categories of change – economy, environment, population, technology and transportation behavior – based on what they felt was more important to plan for. More than 5,000 people responded during the fair.

MnDOT staff attended additional community events throughout Minnesota. At these events people were asked to decide how important it was to plan for the different trends. Feedback was received using an interactive survey on iPads. Approximately 900 Minnesotans attended 28 events across the state.

Twin Cities Public Television / Emergency, Community, Health, Outreach and MnDOT partnered to connect with traditionally underserved communities at 10 of the 28 community events. Specific focus was placed on reaching Minnesotans in the Hispanic, Hmong and Somali communities. ECHO staff led the engagement at these events using interactive iPad surveys that were translated into Spanish, Hmong and Somali. More than 300 responses from these cultural communities were received through this joint effort.

Workplace-Based Outreach

MnDOT staff also reached out to employers throughout Minnesota to connect with people at their workplaces. Employers selected the engagement activity that was most appropriate for their place of business. Kiosk and formal presentation options were offered. In total, nine workplace sessions were completed collecting about 250 responses.

Partner & Stakeholder Briefings

In addition to engaging with the public, there were meetings with key partner and stakeholder groups around the state. A total of 70 meetings were held during this engagement period. At the meetings, information was presented about the trends facing Minnesota. Attendees were asked to vote on which trend topics they wanted to discuss in more detail. Attendees were also asked to fill out a worksheet to provide input about which trends are most important to focus on. There were responses from approximately 550 partners and stakeholders as a result of these briefings.

Stakeholder Forums

Also as part of Phase 1, MnDOT hosted three all-day stakeholder forums. These forums included discussions of the Statewide Multimodal Transportation Plan, the Minnesota State Highway Investment Plan and the Greater Minnesota Transit Investment Plan. The forums provided an opportunity for more in-depth conversation than the community events, workplace-based outreach and stakeholder briefings. Each stakeholder forum featured a presentation on the various trends, group discussion about each trend category and opportunities for participants to submit a worksheet that documented the top trends they wanted considered as part of the planning process. Attendees submitted 150 responses during events in Mankato, Minneapolis and Brainerd.

ONLINE ENGAGEMENT

Interactive Website

Online engagement was a large part of the approach in addition to in-person engagement. The project website (www.MinnesotaGO.org) hosted information about the plan and the update process, summaries and full reports about the different trends, and a number of ways for Minnesotans to give input online. The site also included an interactive map and calendar to connect people to upcoming in-person events. Visitors could request a presentation and sign-up for project emails. Links to online surveys allowed visitors to prioritize trend topics. The online surveys closely mirrored the questions asked at in-person events. In total, there were more than 7,500 website visits during the first phase of engagement and approximately 2,300 people completed the web surveys.

Social Media

Social media also helped get the word out about the plan and opportunities to get involved. An organized social media campaign on Facebook and Twitter included posts related to the Statewide Multimodal Transportation Plan, the Minnesota State Highway Investment Plan, the Greater Minnesota Transit Investment Plan and other MnDOT planning efforts. Facebook was used with sponsored posts to direct people to the website surveys. These posts specifically targeted populations that were less likely to respond through the other engagement methods. Approximately 2,800 survey responses were gained using social media.

Email Updates

Bi-monthly email updates were sent out to more than 11,000 people with general information and highlights about opportunities to get involved.

Engagement Results

TREND AREAS

Participants were asked to identify how important it was for MnDOT to plan for different categories of change – economy, environment, population, technology and transportation behavior. Some tools asked participants to select one or two areas as the most important. Other tools asked participations to rate how important each area was on a scale of zero to three (three being very important). Results are broken out by different audiences and demographic groups, when sufficient data was available, and are shown in the following tables.

Table D-17: Trend area preference by audience

TREND AREA	FREQUENCY – PUBLIC (N9000+)	AVERAGE RATING – STAKEHOLDER (N461)
Environment	30.1%	1.77
Behavior	20.2%	2.28
Population	19.5%	2.13
Economy	17.0%	2.20
Technology	13.1%	2.04

Table D-18: Trend area preference by gender

TREND AREA	FREQUENCY – FEMALE (N1001)	FREQUENCY – MALE (N605)
Environment	32.4%	19.7%
Behavior	30.4%	31.2%
Population	20.9%	16.5%
Economy	10.0%	18.3%
Technology	6.4%	14.2%

Table D-19: Trend area preference by age

TREND AREA	FREQUENCY – 20 AND UNDER (N60)	FREQUENCY – 21 TO 35 (N364)	FREQUENCY – 36 TO 50 (N403)	FREQUENCY – 51 TO 65 (N579)	FREQUENCY – 66+ (N204)
Environment	41.7%	31.0%	24.8%	26.4%	25.0%
Behavior	18.3%	33.8%	31.3%	32.1%	28.9%
Population	8.3%	16.2%	19.9%	21.2%	23.5%
Economy	8.3%	11.5%	14.9%	11.9%	12.7%
Technology	23.3%	7.4%	9.2%	8.3%	9.8%

Table D-20: Trend area preference by race / ethnicity

TREND AREA	FREQUENCY – AMERICAN INDIAN OR ALASKA NATIVE (N14)	FREQUENCY – ASIAN (N78)	FREQUENCY – BLACK OR AFRICAN AMERICAN (N115)	FREQUENCY – WHITE (N988)	FREQUENCY – MULTIPLE RACES (N24)	FREQUENCY – HISPANIC (N78)
Environment	57.1%	21.8%	19.1%	28.5%	37.0%	33.3%
Behavior	7.1%	35.9%	23.5%	32.8%	29.2%	12.8%
Population	21.4%	14.1%	21.7%	19.9%	12.0%	17.9%
Economy	7.1%	16.7%	27.0%	9.8%	12.5%	26.9%
Technology	7.1%	11.5%	8.7%	8.9%	8.3%	9.0%

Table D-21: Trend area preference by geography

TREND AREA	FREQUENCY – GREATER MINNESOTA (N589)	FREQUENCY – TWIN CITIES (N1182)
Environment	27.3%	28.3%
Behavior	30.9%	29.8%
Population	15.3%	21.1%
Economy	17.5%	11.3%
Technology	9.0%	9.6%

INDIVIDUAL TRENDS

Participants were also asked to prioritize 21 specific trends based on how important they felt it was for MnDOT to plan for the trend (on a one to three scale). The question was asked using many different engagement tools. The following tables show the cumulative rating across all participants and by demographic groups, as data availability allowed.

Table D-22: Statewide trend preference

TREND	AVERAGE RATING – ALL (N3597)
Aging Infrastructure	2.30
Urban & Rural Populations	2.08
Climate Change	1.98
Environmental Quality	1.91
Transportation Behavior Changes	1.85
Aging Population	1.66
Economy & Employment	1.40
Mobility as a Service	1.36
Health	1.33
Electrification and Alternative Fuels	1.24
Autonomous Vehicles	1.21
Racial Disparities	1.18
Freight Rail	1.07
Demographics	1.05
Public-Private Partnerships	1.02
Mobile Technology	0.98
New Logistics	0.95
Teleworking & E-Shopping	0.90
Dynamic Road Pricing	0.89
Sensors, Monitors & Big Data	0.79
Unmanned Aircraft Systems / Drones	0.61

Table D-23: Trend preference by gender

TREND	AVERAGE RATING – MALE (N829)	AVERAGE RATING – FEMALE (N1104)
Aging Infrastructure	2.38	2.11
Urban & Rural Populations	1.82	2.27
Climate Change	1.29	2.33
Environmental Quality	1.34	2.08
Transportation Behavior Changes	1.76	1.96
Aging Population	1.28	1.92
Economy & Employment	1.17	1.53
Mobility as a Service	0.97	1.59
Health	0.73	1.64
Electrification and Alternative Fuels	1.00	1.04
Autonomous Vehicles	1.04	1.07
Racial Disparities	0.69	1.48
Freight Rail	0.78	1.15
Demographics	0.64	1.28
Public-Private Partnerships	0.71	0.94
Mobile Technology	0.67	0.88
New Logistics	0.63	0.96
Teleworking & E-Shopping	0.72	0.94
Dynamic Road Pricing	0.61	0.84
Sensors, Monitors & Big Data	0.56	0.84
Unmanned Aircraft Systems / Drones	0.44	0.54

Table D-24: Trend preference by age

TREND	AVERAGE RATING – 20 AND UNDER (N62)	AVERAGE RATING – 21 TO 35 (N456)	AVERAGE RATING – 36 TO 50 (N490)	AVERAGE RATING – 51 TO 65 (N676)	AVERAGE RATING – 66+ (N243)
Aging Infrastructure	2.00	1.87	2.45	2.48	2.45
Urban & Rural Populations	2.76	2.07	2.09	2.09	1.99
Climate Change	2.65	1.82	1.86	1.95	1.89
Environmental Quality	2.20	1.68	1.71	1.92	1.93
Transportation Behavior Changes	2.18	1.87	1.81	1.90	1.89
Aging Population	2.17	1.20	1.61	1.73	2.14
Economy & Employment	1.55	1.40	1.28	1.25	1.22
Mobility as a Service	2.58	1.20	1.14	1.44	1.35
Health	1.83	1.14	1.13	1.22	1.46
Electrification and Alternative Fuels	2.40	0.89	0.86	1.10	1.28
Autonomous Vehicles	1.47	0.86	1.13	1.12	1.10
Racial Disparities	1.83	1.14	1.03	1.06	1.28
Freight Rail	1.00	0.74	0.76	0.97	1.41
Demographics	1.67	1.10	0.87	0.93	0.95
Public-Private Partnerships	1.33	0.81	0.82	0.74	0.82
Mobile Technology	1.87	0.61	0.71	0.79	0.82
New Logistics	1.00	0.66	0.83	0.73	0.69
Teleworking & E-Shopping	1.57	0.63	0.77	0.95	0.76
Dynamic Road Pricing	1.53	0.75	0.69	0.63	0.61
Sensors, Monitors & Big Data	2.27	0.50	0.64	0.61	0.64
Unmanned Aircraft Systems / Drones	1.67	0.38	0.46	0.38	0.63

Table D-25: Trend preference by race / ethnicity

TREND	AVERAGE RATING – AMERICAN INDIAN OR ALASKA NATIVE (N25)	AVERAGE RATING – ASIAN (N89)	AVERAGE RATING – BLACK OR AFRICAN AMERICAN (N118)	AVERAGE RATING – WHITE (N1265)	AVERAGE RATING – MULTIPLE RACES (N26)	AVERAGE RATING – HISPANIC (79)
Aging Infrastructure	1.11	1.96	2.67	2.26	2.40	2.76
Urban & Rural Populations	1.08	1.42	2.54	2.00	2.62	2.58
Climate Change	2.00	2.00	2.54	1.72	2.17	2.74
Environmental Quality	1.75	1.98	2.33	1.68	1.86	2.26
Transportation Behavior Changes	1.33	1.68	2.23	1.83	2.00	2.00
Aging Population	1.36	1.64	2.30	1.49	1.80	2.60
Economy & Employment	0.70	1.84	2.27	1.06	2.13	2.37
Mobility as a Service	1.00	1.31	1.79	1.16	1.30	2.10
Health	1.18	1.36	2.19	1.03	1.60	2.8
Electrification and Alternative Fuels	0.33	1.05	2.50	0.88	1.50	2.13
Autonomous Vehicles	0.33	1.45	1.92	0.94	1.00	2.38
Racial Disparities	1.09	1.27	2.59	0.90	1.80	2.67
Freight Rail	0.11	0.75	2.00	0.64	1.40	2.09
Demographics	0.45	1.95	2.15	0.82	1.40	2.79
Public-Private Partnerships	0.00	1.46	1.87	0.56	0.80	1.86
Mobile Technology	0.33	0.85	2.33	0.59	0.75	1.63
New Logistics	0.33	1.13	2.03	0.47	1.00	2.33
Teleworking & E-Shopping	0.67	1.27	1.64	0.67	0.40	1.55
Dynamic Road Pricing	0.40	1.33	1.64	0.56	0.50	1.29
Sensors, Monitors & Big Data	0.11	1.20	2.17	0.45	1.75	2.38
Unmanned Aircraft Systems / Drones	0.11	0.90	1.08	0.38	0.75	1.13

OPEN RESPONSE SUMMARY

Opportunities to provide open-ended feedback were part of all engagement activities. The key messages received are highlighted below, organized by SMTP policy objective.

Accountability, Transparency & Communication (Open Decision-Making)

- There was overwhelming support for MnDOT to continue to monitor the various trends and to update the summaries as needed. Specifically, there was an interest in including more analysis of the impacts the trends will have on transportation and how transportation can impact the trends. There was also support for continued research into the trend topic areas to learn more. Specific trends mentioned more frequently for further study include autonomous vehicles and demographics. It was noted that a better following of all trends would allow transportation partners to make more proactive decisions. Most of the comments were supportive of MnDOT looking at a broad range of trend topics. However, some commenters indicated that the focus should be limited to the trends that most directly connect to transportation. MnDOT was encouraged to continue to share the trend information with local and regional partners.
- There was significant support for improved coordination between transportation systems and partners from an operations and communication standpoint. MnDOT was encouraged to improve coordination with partners and expand beyond the usual transportation partners to include others, such as health, watershed districts, businesses, trade associations, etc. There was a desire to eliminate layers of government whenever possible, specifically from the user standpoint. An example given was that users don't care that MnDOT operates the highways, cities operate streets and the Metropolitan Council operates transit. Users should be able to find information about all transportation in one place. Another example was to streamline environmental processes on projects.
- There was significant support for improving data integration and sharing. Transportation data should be better integrated with economic and health data. There was also support for ensuring mapping and data sources are kept as up-to-date as possible.
- There was support for additional transportation funding and for transportation partners to continue to communicate about transportation costs and needs.

- There was support for MnDOT to continue to conduct research to improve the knowledge and data available to support decision-making. Technical and non-technical topics were recognized as important for research. There was also support for MnDOT and Minnesota to position itself as a research and innovation leader. This was seen as a way to help make proactive decisions rather than reactive. This was a particularly common theme related to the autonomous vehicle trend. Many respondents encouraged MnDOT to partner with the private sector and become a national leader related to new vehicle technology.
- There was support for more use of surveys and other methods to understand public perceptions. Surveys were seen as tools to help MnDOT better understand the transportation priorities of Minnesotans and to help measure the success of the system. It was noted that it is important for MnDOT to talk to actual people and not just rely on data and statistics. Key questions identified as important to get feedback on included: Will the public accept a smaller system? Do individuals have their preferred transportation options available to them? Is the system meeting the needs of businesses?
- There was support for transportation partners to try new types of engagement, such as more ongoing conversations with the public and stakeholders. It was noted that if planning continues to be done in the same way, it will produce the same, bad results [in terms of participation]. Ensuring engagement reaches all populations was identified as important. Related, it was noted that transportation partners should pay more attention to institutional issues that contribute to disparities in participation.
- A number of comments encouraged MnDOT to take a more active approach to educating the public and stakeholders on key transportation topics and to be out in front of issues rather than reactive. Topics that were identified included how transportation projects are selected, the project development process, transportation funding, needs identification, safety issues and the benefits of different treatments, what MnDOT is planning for the future and how / when the public can influence decisions.
- A number of comments noted the need for improved communication about current and upcoming construction projects, including improved detour communication. Frustration was expressed over the amount of construction, particularly in the Twin Cities.
- A number of comments wanted MnDOT to take a more active role in encouraging mode shift through increased coordination among partners and services as well as through promotion of non-driving modes. While many individuals supported this, some expressed the opposite opinion.
- A few comments encouraged transportation partners to more actively promote tourism.

Traveler Safety (Transportation Safety)

- There was overwhelming support for more focus on bicycle and pedestrian safety. It was noted that these users are more vulnerable and that increased safety, or the perception of safety, can help facilitate greater use, leading to health improvements. Ensuring that the appropriate facilities are available and that there are design standards for these modes is linked to actual and perceived safety for all users of the system. Commenters asked: How would decision-making change if the focus was on the vulnerable roadway user perspective?
- The number of crashes and the number of fatalities were the most commonly identified measures of success, both for transportation safety but also as indicators for the overall success of the system. Tracking trends for different types of crashes was also frequently identified. Additionally, there was a note that there should be improved crash data sharing.
- There was some support for increasing multimodal transportation options, namely transit and walking. Increasing transportation options can help roadway safety, particularly related to providing non-auto options for the aging population. MnDOT should take a more active role in promoting these other modes as a safety strategy.
- There was support for making roadway safety improvements that help older drivers (e.g. enhanced pavement markings and high visibility signage) standard design elements, particularly since the population is aging overall. Commenters noted that these improvements also improve safety for all.
- A number of comments related to roadway design, specifically newer safety improvements such as roundabouts. They encouraged MnDOT to keep roadway designs easy to use / navigate. It was noted that MnDOT needs to do a better job of communicating, particularly with older populations, how to use new design elements. Related, commenters encouraged MnDOT not to use technology-only safety solutions as they can be difficult for seniors.
- A number of comments encouraged MnDOT to support the adoption of autonomous vehicles as a roadway safety strategy. However, they cautioned that MnDOT needs to ensure the vehicles are able to operate safely before pushing too hard. It was noted that autonomous vehicle technology may lead to an increase in distracted driving in the short term.

- Concern was expressed related to freight safety. Railroad safety issues such as speed, spills and crossings were identified frequently. Issues with truck freight were also identified, including the importance of passing lanes. Focusing more resources to safety improvements for these modes, and encouraging freight to move to safer modes were offered as suggestions.
- Concern was expressed related to safety issues associated with poor infrastructure conditions. It was noted that MnDOT should prioritize keeping infrastructure in good condition.
- A few comments expressed an interest in tougher traffic safety laws, although others expressed the opposing opinion – that traffic safety laws do not accomplish what is intended. Increase testing / retesting for older drivers was also mentioned as a way to improve overall traffic safety.
- Distracted driving was identified as an issue by many. However, no suggestions on how to address it were offered.
- Other topics that were noted include increasing funding for safety, crash data sharing, potential issues with mobility as a service, drone safety and the use of drones for incident relief.

Critical Connections

- Commenters noted the importance of an integrated multimodal transportation system with multiple options. This included transit, intercity bus, bicycle and pedestrian accommodations, rail and roadways. The commenters said that providing a variety of transportation options, whether for the movement of people or the movement of goods, allows Minnesota to be resilient and nimble to changes in the economy, demographics, technology or the environment.
- Over and over, commenters noted the differences between rural and urban areas. Urban and rural populations use the transportation system differently. There is no one-size-fits-all solution. What may work well in one area of the state may not work in another. The state's transportation system needs to acknowledge and accommodate these differences.
- As the state's population ages, many commenters noted the importance of transportation options, particularly transit.
- Some commenters noted the importance of improving transportation connections. Some areas of the state may be declining in population, but transportation options should be provided to community service centers such as schools and health care facilities.

- Many commenters emphasized the relationship between the state's transportation system and the health of its economy. They responded that connections between employers, job seekers, suppliers, producers and distributors make a reliable transportation system with multiple options necessary for future economic growth.

Asset Management (System Stewardship)

- There was significant support for maintaining the state's transportation assets. Numerous commenters noted that the quality of the transportation system impacts the health of the state's economy and a well-maintained transportation system is needed to remain competitive.
- Many commenters questioned the current size of the state's transportation system with questions such as: Is the current transportation network too big? What is needed? Should parts of the system be let go?
- Many commenters pushed for more funding to address the state's aging infrastructure. Recommendations included focusing on preservation before expansion, raising awareness of preservation needs and continued research in construction materials and methods.
- Several commenters noted the role of asset management and changing technology, particularly autonomous vehicles. MnDOT must continue monitoring technology changes and plan for any related infrastructure changes that may be needed such as improved pavement markings.
- Several commenters emphasized that the transportation system needs to adapt to an aging population. This includes providing a variety of transportation options. For the roadway system, commenters noted the need for improvements in signage, lighting and pavement markings

Transportation in Context (Healthy Communities)

- Commenters frequently brought up the differences between Minnesota's urban and rural communities and the different ways that transportation is used in different settings. Frequently commenters asked that transportation funding be shifted towards one setting as opposed to the other. Many also identified additional flexibility in project delivery and design as a key change that should be made going forward.
- Multiple commenters brought up the importance of ensuring that Minnesota's seniors remain connected to key destinations within their community, regardless of their ability to drive. These connections have the potential to impact seniors' physical, mental and economic health. Affordability of transportation services was another key concern raised.

- Commenters were split in terms of directing mode shift from single-occupancy vehicles to bicycling, walking or transit usage. There was interest in maintaining the system as it exists today while also working to develop alternatives to automobile travel.
- Many commenters emphasized the importance of transportation investments in ensuring that Minnesota's economy remains strong into the future. Commenters said that connections between employers, job seekers, suppliers, producers and distributors make a reliable transportation system with multiple options necessary for further economic growth.
- Several commenters connected transportation investments to improving the health of Minnesotans, particularly in encouraging the use of active transportation modes and ensuring that people have access to medical facilities, healthy foods, education, employment and recreation.
- Environmental issues related to the transportation system such as greenhouse gas emissions, shifting weather patterns, flash flood vulnerability, invasive species and pollution were important to a number of commenters. Suggestions to address these issues included shifting away from single-occupancy vehicle use, reinforcing existing infrastructure and creating habitat for native plants and animals along roadsides.
- Commenters encouraged MnDOT to advance equity through the transportation system by using new public engagement techniques, ensuring that projects are not disruptive to existing communities and by offering new transportation options in low-income communities.

PHASE 2

The second phase of engagement occurred during April and May 2016 and built off of Phase 1. A number of specific questions rose up as the project team worked to incorporate the priorities heard in Phase 1 into the plan. These questions covered a range of topics and mostly dealt with the details about how proposed changes would be implemented. Given this emphasis on implementation, the focus during Phase 2 was reaching out to transportation partners, including different groups within MnDOT. Even though the focus was on transportation partners, anyone was welcome to comment. The major topics covered in this phase of engagement included:

- Land use and transportation connections
- Urban and rural system performance
- Equity and ability
- Climate change and environmental quality

Engagement Activities

Four stakeholder forums and a webinar were held as part of Phase 2. Stakeholder forums were held in Grand Rapids, Fergus Falls, Willmar and Apple Valley. Each forum and the webinar included an overview of Phase 1 engagement results and an overview of the major policy topics. Participants were asked to weigh in on key questions within each of the topics. MnDOT leadership and key staff throughout the agency were also asked for input on the same topics.

For those that were not able to attend one of the forums or the webinar, an online survey version of the questions was available at project website. Additionally, materials were provided to MnDOT's planning partners, who were asked to share the information with their networks.

Engagement Results

LAND USE & TRANSPORTATION

Table D-26: Which types of decisions make sense to be linked to context?

CHOICES	FREQUENCY – MNDOT (N58)	FREQUENCY – EXTERNAL (N62)
Roadway design standards	53.4%	74.2%
Complete streets considerations	79.3%	66.1%
Public engagement expectations	63.8%	50.0%
Driveways and intersection spacing guidance	63.8%	50.0%
Local / state cost-sharing expectations	65.5%	64.5%
Other (e.g. safety, Safe Routes to School)	Not asked	11.3%
No contexts should have different expectations	6.9%	3.2%

Table D-27: Which types of investments should prioritization based on land form be applied to?

CHOICES	FREQUENCY – MNDOT (N56)	FREQUENCY – EXTERNAL (N69)
Safe Routes to School	82.1%	60.9%
Transportation Alternatives Program funding	62.5%	47.8%
Transit service improvements	44.6%	69.6%
Bicycle investments on state highways	83.9%	59.4%
Pedestrian investments on state highways	82.1%	66.7%
Land form should not affect investment priority	Not asked	8.7%

URBAN & RURAL SYSTEM PERFORMANCE

Table D-28: How concerned are you with MnDOT's ability to address urban highway corridors? (Scale: 10 is very concerned)

RESULTS	MNDOT (N58)	EXTERNAL (N70)
Average Rating	7.16	7.97

Table D-29: If MnDOT were to start reporting performance measures by urban and rural, which should be included?

CHOICES	FREQUENCY – MNDOT (N57)	FREQUENCY – EXTERNAL (N68)
Asset management measures	59.6%	73.5%
Safety / crash measures	64.9%	80.9%
Mobility measures	66.7%	72.1%
None	7.0%	2.9%

Table D-30: Moving forward, which definition of urban would be most useful for performance reporting?

CHOICES	FREQUENCY – MNDOT (N59)	FREQUENCY – EXTERNAL (N70)
2,500 (U.S. Census definition)	13.6%	11.4%
5,000 (FHWA & State-Aid definition)	39.0%	34.3%
50,000 (MPO designation)	23.7%	12.9%
Regional Trade Centers (population is only one factor)	13.6%	40.0%

EQUITY & ABILITY

Table D-31: How important is it for the SMTP to explicitly address equity and individual ability? (Scale: 10 is very important)

RESULTS	MNDOT (N59)	EXTERNAL (N72)
Average Rating	7.24	7.00

Table D-32: Which of the following should MnDOT commit to in order to advance equity?

CHOICES	FREQUENCY – MNDOT (N59)	FREQUENCY – EXTERNAL (N72)
Support workforce diversity	57.6%	37.5%
Pilot approaches to add equity to decision-making	55.9%	44.4%
Study and better define equitable transportation	79.7%	68.1%
Measure and report on access to jobs by more than two modes	Not asked	29.2%
Incorporate equity into project selection	28.8%	41.7%
Invest to heal divisions caused by transportation	Not asked	29.2%
MnDOT should not explicitly address equity	Not asked	11.1%

CLIMATE CHANGE & ENVIRONMENTAL QUALITY

Table D-33: Which of the following should MnDOT do to address environmental issues?

CHOICES	FREQUENCY – MNDOT (N59)	FREQUENCY – EXTERNAL (N71)
Assess transportation infrastructure vulnerability	83.1%	76.1%
Reestablish a flood mitigation program	42.4%	40.8%
Advance GHG emission reduction with industry partners	66.1%	42.3%
Set targets for MnDOT salt use	45.8%	43.7%
MnDOT should not address climate change or environmental quality	Not asked	7.0%

Table D-34: How do you feel about MnDOT adopting NGEA 2025 benchmark targets for the transportation sector? (Scale: 10 is “I like it a lot”)

RESULTS	MNDOT	EXTERNAL (N71)
Average Rating	Not asked	6.82

Minnesota State Highway Investment Plan

PHASE 1

During the first phase of outreach, the Minnesota State Highway Investment Plan outreach focused on gaining input on what investments MnDOT should prioritize on the state highway system. Outreach targeted transportation partners, stakeholders and the public around the state. MnSHIP's public engagement asked three key questions that would influence the development of the investment direction.

- Which of the three investment approaches do you prefer the most?
 - **Approach A** – Focus investments on repairing and maintaining existing state highway pavements, bridges and roadside infrastructure
 - **Approach B** – Balance investment in repairing and maintaining existing state highways infrastructure with strategic investment in improving travel time reliability
 - **Approach C** – Focus investments on improving travel time reliability, non-motorized investments and regional and locally-driven priorities
- What investment categories are most important for investment?¹
 - Pavement Condition
 - Bridge Condition
 - Roadside Infrastructure
 - Jurisdictional Transfer
 - Facilities
 - Traveler Safety
 - Twin Cities Mobility
 - Greater Minnesota Mobility
 - Bicycle Infrastructure
 - Accessible Pedestrian Infrastructure
 - Regional and Community Improvement Priorities

¹ Small Programs and Project Delivery were not part of the investment trade-off discussion. The Freight investment category was added after Phase 1 outreach in response to the FAST Act federal transportation bill.

- What should MnDOT invest in? This was an open-ended question allowing participants to communicate their priorities for investment and include priorities that may not have been identified in the previous questions.

Engagement Activities

MnSHIP used several tools to gain input from transportation partners, stakeholders and the public.

IN-PERSON ENGAGEMENT

MnDOT created multiple in-person opportunities for the public, stakeholders and transportation partners to provide input on the priorities for the investment direction. The in-person outreach focused on going to where the people are. MnDOT relied heavily on going to existing meetings, workplaces and community events to seek input. In some cases, MnDOT had an hour on a meeting agenda to present. In other cases, MnDOT only had a few seconds to interact with people. With this in mind, MnDOT prepared multiple tools for various engagement settings to seek in-person input. Below are four different in-person settings used to gather input.

Community Events

The project team identified 19 community events throughout the state as locations for engagement sessions. The sessions consisted primarily of roving surveys which used iPads equipped with the GetFeedback survey tool. The survey provided plain language statements to describe the combination of investment in the three investment approaches. Instead of selecting a preferred approach, participants rated the approaches on a scale of zero to 100. The survey also asked participants to rank the investment category with the most important categories on top and identify any priorities for additional investment. MnDOT was able to gather over 900 responses.

Stakeholder Forums

MnDOT hosted three stakeholder forums in November of 2015 attended by 200 participants. The forums provided an opportunity for more in-depth input on specific questions and issues and provided an opportunity to discuss differing stakeholder perspectives. The project team presented and facilitated a discussion on the investment categories and investment approaches. Stakeholders selected the approach which best aligned with their investment priorities as well as areas where they would adjust the investment categories.

Partner and Stakeholder Briefings

The project team presented to various transportation partners and internal and external stakeholders at over 100 meetings. These presentations were generally 30 minutes to an hour. Similar to the Stakeholder Forums, the presentation discussed the three investment approaches and asked participants to select the approach that best aligned with their priorities. Participants selected their three most important investment categories and identified any additional priorities for investment. MnDOT recorded over 500 responses from these meetings.

Workplace-Based Outreach

The project team reached out to employers throughout Minnesota with two options for engagement. Ten workplaces invited MnDOT to conduct outreach with their employees collecting over 250 responses. An employer could request a presentation for their employees similar to the partner and stakeholder briefings or conduct roving surveys with employees, using iPads equipped with an online survey tool. The goal of these events was to reach individuals who do not normally participate in the planning process by making it easy and convenient. Engagement conducted at universities is also included in this category.

ONLINE ENGAGEMENT

MnDOT used several online tools to supplement the in-person engagement techniques. Online engagement was critical to reaching a greater audience. Online tools mirrored those used for in-person engagement. MnDOT created its first Online ADA Plan as part of the Public Participation Plan to ensure that all web-based engagement was accessible to persons with visual impairments. Below is a summary of the tools used for online engagement.

Online Surveys

An online survey began in October 2015 and continued through March 2016. The survey was available through the project website as well as advertised through social media. The survey was also available in an ADA accessible version. Participants selected the approach which best aligned with their investment priorities. MnDOT collected approximately 2,300 responses through online surveys.

Project Website

The project team created a project website using the web address www.MinnesotaGo.org as the hub for information, resources and online engagement for MnSHIP and SMTP. The website provided background information on the plan including the project timeline and information about the MnSHIP investment categories. MnDOT received over 7,500 visits to the project website.

Social Media

Online engagement through social media allowed MnDOT to promote engagement activities and reach a large audience. MnDOT was able to reach over 100,000 social media users. The social media strategy used the Minnesota GO Facebook and Twitter accounts, with interaction and occasional posts from the MnDOT general Twitter and Facebook accounts. Posts were uploaded, on average, every week. The purpose of the posts was to drive traffic to the project website for information on the plans, promote surveys and provide other feedback opportunities and interacting with followers to gain input directly through Twitter.

Facebook Targeted Ads

MnDOT launched three rounds of targeted Facebook ads. The main goal of the ads was to drive participation to the online survey tools. Through these ads, MnDOT collected over 2,800 responses.

Stakeholder E-mail Updates

Project update emails were sent to MnDOT's planning and public participation email lists throughout the project. This list consists of over 11,000 email address. Individuals were able to sign-up for email updated through the project website. MnDOT sent updates to the stakeholder list approximately bi-monthly throughout the project.

TRADITIONALLY UNDERSERVED COMMUNITY ENGAGEMENT

MnDOT provided specific outreach opportunities for traditionally underserved populations by piloting new engagement tools and techniques.

Tribal Outreach

MnDOT used several different strategies to seek input from Minnesota's tribal communities and consult with the tribal governments. MnDOT used all three platforms for input including making presentations to regularly scheduled tribal meetings, conducting surveys at events such as the Tribes and Transportation Conference and the Bois Forte State of the Band, and asking tribal staff to promote the online survey in their communities. Staff also met with interested tribal government staff and officials to discuss transportation issues and trends facing the tribe. MnDOT attended ten meetings and events with tribal communities and engaged with over 200 participants.

Facebook Targeted Ads

MnDOT used Facebook Ads to target traditionally underserved communities. Targeted ads allowed MnDOT to increase participation and better reflect the demographic breakdown of Minnesota's population. Some ads focused on increasing participation from women, African Americans, Asian Americans and Spanish speakers. Through collecting optional demographic data, the project team was able to review the results of the targeted ads, identify successes and make any adjustments based on lessons learned for future targeted ads.

ECHO Outreach

MnDOT partnered with Twin Cities Public Television / Emergency, Community, Health, Outreach to conduct engagement within traditionally underserved communities, specifically the Hispanic, Hmong and Somali communities in Minnesota. ECHO staff translated the iPad surveys into Spanish, Hmong and Somali. ECHO staff identified ten locations to conduct outreach including ethnic markets, community centers and religious institutions. MnDOT and ECHO received over 300 responses. ECHO outreach lasted from February through March of 2015.

Statewide Results

APPROACH PREFERENCE

Figure D-35: Investment approach preference - statewide

APPROACH	FREQUENCY (N786)
A	250
B	302
C	224

APPROACH RATING

Table D-36: Investment approach rating – statewide

APPROACH	RATING (N1625)
A	70.40
B	68.70
C	63.30

INVESTMENT CATEGORY RANKING

Table D-37: Investment category ranking – statewide

RANK	CATEGORY	AVERAGE RATING (N1125)
1	Pavement Condition	4.21
2	Bridge Condition	4.55
3	Roadside Infrastructure	5.10
4	Regional and Community Improvement Priorities	5.75
5	Traveler Safety	5.80
6	Twin Cities Mobility	5.94
7	Greater Minnesota Mobility	6.04
8	Accessible Pedestrian Infrastructure	6.40
9	Bicycle Infrastructure	6.56
10	Facilities	7.64
11	Jurisdictional Transfer	7.98

Results by Demographic Group

APPROACH PREFERENCE

Table D-38: Investment approach preference – gender

APPROACH	WOMEN (N229)	MEN (N346)
A	57	130
B	88	128
C	84	88

Table D-39: Investment approach preference – race / ethnicity

APPROACH	AMERICAN INDIAN OR ALASKA NATIVE (N1)	ASIAN (N10)	BLACK OR AFRICAN AMERICAN (N2)	HISPANIC (N3)	MULTIPLE RACES (N4)	NATIVE HAWAIIAN OR PACIFIC ISLANDER (N1)	WHITE (N485)
A	1	1	0	0	2	0	163
B	0	4	1	2	1	0	180
C	0	5	1	1	1	1	142

Table D-40: Investment approach preference – age

APPROACH	20 AND UNDER (N35)	21-35 (N132)	36-50 (N132)	51-65 (N222)	66+ (N88)
A	1	34	44	76	36
B	0	59	78	74	15
C	5	61	51	51	9

Table D-41: Investment approach preference – audience

APPROACH	PUBLIC (N516)	STAKEHOLDERS (N260)
A	178	72
B	187	115
C	151	73

Table D-42: Investment approach preference – geography

APPROACH	GREATER MINNESOTA (N284)	TWIN CITIES AREA (N326)
A	119	80
B	99	129
C	66	117

Table D-43: Investment approach preference – MnDOT district

APPROACH	DISTRICT 1 (N38)	DISTRICT 2 (N27)	DISTRICT 3 (N52)	DISTRICT 4 (N32)	DISTRICT 6 (N48)	DISTRICT 7 (N39)	DISTRICT 8 (N49)	METRO DISTRICT (N309)
A	14	10	15	16	27	20	17	51
B	8	7	23	10	11	12	24	74
C	16	10	14	6	10	7	8	41

Table D-44: Investment approach preference – MPO

APPROACH	ST. CLOUD APO (N16)	GRAND FORKS / EASTGRAND FORKS MPO (N5)	MANKATO / NORTHMANKATO APO (N16)	METRO COG (N2)	MIC (N25)	ROCOG (N17)	MET COUNCIL (N326)
A	4	1	7	1	8	11	80
B	5	2	6	0	6	3	129
C	7	2	3	1	11	3	117

APPROACH RATING

Table D-45: Investment approach rating out of 100 – gender

APPROACH	WOMEN (N530)	MEN (N491)
A	72.42	70.56
B	71.51	68.04
C	69.58	61.04

Table D-46: Investment approach rating out of 100 – race / ethnicity

APPROACH	AMERICAN INDIAN OR ALASKA NATIVE (N3)	ASIAN (N57)	BLACK OR AFRICAN AMERICAN (N52)	HISPANIC (N53)	MULTIPLE RACES (N5)	WHITE (N485)
A	57.33	81.09	86.08	69.42	79.20	70.38
B	59.67	62.65	86.17	82.00	71.80	68.93
C	88.67	72.18	89.10	82.60	69.00	63.72

Table D-47: Investment approach rating out of 100 – age

APPROACH	20 AND UNDER (N42)	21-35 (N253)	36-50 (N265)	51-65 (N365)	66+ (N119)
A	71.71	66.46	69.32	73.66	75.86
B	74.81	73.33	69.32	67.29	67.34
C	77.55	73.92	64.83	57.92	58.76

Table D-48: Investment approach rating out of 100 – geography

APPROACH	GREATER MINNESOTA (N433)	TWIN CITIES AREA (N690)
A	72.62	76.03
B	69.12	72.28
C	64.26	67.81

Table D-49: Investment approach preference – MnDOT district

APPROACH	DISTRICT 1 (N60)	DISTRICT 2 (N25)	DISTRICT 3 (N137)	DISTRICT 4 (N19)	DISTRICT 6 (N83)	DISTRICT 7 (N68)	DISTRICT 8 (N41)	METRO DISTRICT (N657)
A	67.35	71.80	73.64	60.21	72.49	79.74	71.61	69.61
B	66.10	71.28	71.76	66.17	65.16	71.67	67.98	70.53
C	65.91	71	68.14	72.47	59.34	55.97	64.80	64.21

Table D-50: Investment approach preference – MPO

APPROACH	ST. CLOUD APO (N72)	GRAND FORKS / EAST GRAND FORKS MPO (N2)	MANKATO / NORTH/MANKATO APO (N15)	METRO COG (N4)	MIC (N30)	ROCOG (N34)	MET COUNCIL (N690)
A	75.35	59.5	79.13	72.75	72.80	79.59	69.63
B	76.51	87	83.56	74.33	61.69	62.55	70.13
C	76.71	55	71.69	69.67	73.83	59.76	64.25

INVESTMENT CATEGORY

Table D-51: Investment category average – MnDOT district

INVESTMENT CATEGORY	DISTRICT 1 (N32)	DISTRICT 2 (N19)	DISTRICT 3 (N73)	DISTRICT 4 (N7)	METRO DISTRICT (N379)	DISTRICT 6 (N52)	DISTRICT 7 (N56)	DISTRICT 8 (N28)
Walking	6.78	7.79	5.77	5.29	6.36	7.63	7.39	7.54
Bicycling	6.69	6.95	6.18	5.43	6.85	7.31	7.71	6.46
Highway surface / pavements	3.25	2.47	4.37	3.14	3.93	3.17	3.14	3.36
Bridges	4.66	4.58	4.51	5.57	4.28	3.62	4.07	4.54
Supporting Infrastructure	4.81	5.05	4.90	4.43	4.57	4.35	4.79	3.82
Rest areas / weigh stations	7.00	8.05	7.84	8.00	7.79	7.37	7.52	7.64
Highway ownership	9.22	9.11	8.49	9.43	8.53	8.62	8.29	8.39
New safety investment	5.44	4.95	5.74	6.00	5.84	6.69	5.96	6.50
Greater MN mobility	4.25	5.11	5.36	5.71	6.49	4.77	4.21	4.68
Regional/local priorities	5.13	4.11	5.67	5.14	6.05	4.56	4.84	4.29
Twin Cities mobility	8.77	7.84	7.18	7.86	5.23	7.92	8.07	8.79

Table D-52: Investment category preference (top 3) – audience

RANK	STAKEHOLDER INVESTMENT CATEGORY (WORKSHEET: STAKEHOLDER BRIEFING) (N499)	PUBLIC INVESTMENT CATEGORY (GETFEEDBACK: COMMUNITY EVENT, ECHO, SOCIAL MEDIA SURVEY, WEBSITE SURVEY) (N1125)
1	Highway surface / pavements	Highway surface / pavements
2	Bridges	Bridges
3	New safety investment	Supporting infrastructure

Table D-53: Investment category average – geography

INVESTMENT CATEGORY	GREATER MN (N270)	TWIN CITIES AREA (N396)
Walking	6.76	6.40
Bicycling	6.78	6.82
Highway surface / pavements	3.54	3.87
Bridges	4.42	4.26
Supporting infrastructure	4.63	4.58
Rest areas / weigh stations	7.55	7.82
Highway ownership	8.67	8.54
New safety investment	5.94	5.86
Greater MN mobility	4.80	6.47
Regional/local priorities	4.96	6.08
Twin Cities mobility	7.95	5.24

Table D-54: Investment category preference (top 3) – gender

RANK	FEMALE (N348)	MALE (N267)
1	Highway surface/pavements	Highway surface/pavements
2	Bridges	Bridges
3	Supporting Infrastructure	Supporting Infrastructure

Table D-55: Investment category preference (top 3) – race / ethnicity

RANK	ASIAN (N54)	BLACK OR AFRICAN AMERICAN (N51)	HISPANIC (N50)	WHITE (N342)
1	Highway surface / pavements	Walking	Highway surface / pavements	Highway surface / pavements
2	Supporting infrastructure	Supporting infrastructure	New safety investment	Bridges
3	Twin Cities mobility	New safety investment	Greater MN mobility	Supporting infrastructure

Table D-56: Investment category preference (top 3) – age

RANK	20 AND BELOW (N35)	21-35 (N132)	36-50 (N132)	51-65 (N222)	66+ (N88)
1	Highway surface / pavements	Highway surface / pavements	Highway surface / pavements	Highway surface / pavements	Bridges
2	New safety investment	Supporting infrastructure	Supporting infrastructure	Bridges	Highway surface / pavements
3	Bicycling	Regional / Local priorities	Bridges	Supporting infrastructure	Supporting infrastructure

EARLIER VERSION

An earlier version of this question that was also used at the Minnesota State Fair had slightly different investment categories shown in community events surveys and website surveys. Results are shown below.

Table D-57: Most important investments – State Fair

INVESTMENTS	FREQUENCY
Repair & maintain roads & bridges	5,817
Safe travel	2,494
Bicycling	1,891
Reliable travel times	1,690
Walking	1,351
Partnering for local highway priorities	1,101
Support facilities	1,083
Main stree improvements	923

Table D-58: Rank the investment categories – earlier version

INVESTMENTS	AVERAGE RATING
Repair & maintain roads & bridges	2.33
Safety improvement projects	3.55
Reduce unexpected travel delays	3.66
Regional and locally-driven priorities	4.25
Walking	4.41
Bicycling	4.60
Support facilities	5.20

PHASE 2

The second phase of engagement occurred in April and May of 2016. This phase sought feedback on the investment direction developed based on Phase 1 outreach and priorities for additional revenue if MnDOT were to receive any new funding. Phase 2 engagement was targeted to stakeholder within MnDOT as well as external partners that share the responsibility for the Minnesota's transportation system.

Table D-59: Results of draft investment direction discussion

RATING	FREQUENCY
I love it!	10
I like it alright	33
This isn't what I was hoping for but I can see why these decisions were made.	33
This does nothing for me. I do not like this plan.	4

Table D-60: Results of increased revenue priorities

INVESTMENT CATEGORY	RATING FROM 0-3
Bridge Condition	2.53
Pavement Condition	2.45
Roadside Infrastructure	2.12
Traveler Safety	2.05
RCIPs-Main Streets	2.04
RCIPs-Expansion	1.71
Greater MN Mobility	1.67
Pedestrian	1.55
Bicycle	1.46
RCIPs-Flood Mitigation	1.40
Jurisdictional Transfer	1.36
Twin Cities Mobility	1.34
Facilities	1.19

OUTCOMES

Input from the public, stakeholders and partners influenced many aspects of this plan updates in terms of process and outcome. Highlighted in the following sections are examples. However, the full influence of engagement extends beyond these examples.

Impacts to the Plan Update Process

The demographic data collected as a part of engagement helped the project team identify who was being reached and to make adjustments to the approach in real time. The project team analyzed the data monthly to see which tools were the most effective and how well project participation mirrored Minnesota's population. Each month, the project team made adjustments to the engagement strategy to focus on the more successful tools and tactics. This data and process contributed to the higher than expected participation as well as participation reflective of the state's population.

Impacts to the Statewide Multimodal Transportation Plan

Examples of how the trend area and individual trend priorities from Phase 1 influenced the SMTP policy direction include:

- Two strategies included related to climate change – one to reduce emissions from the transportation sector and one to identify risks to the transportation system such as more frequent flooding
- A strategy included related to considering context when developing transportation projects, which includes considering urban and rural differences

Examples of how the implementation questions from Phase 2 helped MnDOT refine the policy direction include:

- Moving forward with urban and rural reporting was identified for a number of SMTP performance measures
- The work plan includes developing an Advancing Transportation Equity report to better study and define equitable transportation
- The work plan includes developing tools and resources to support transportation decisions that reflect the surrounding context

Impacts to the Minnesota State Highway Investment Plan

Examples of how input on the investment approaches and the most important investment categories influence the development of MnSHIP include:

- Approach B was the most preferred investment approach and was the starting point for development of the MnSHIP investment direction
- MnDOT considered feedback on the most important investment categories when making adjustments to Approach B to reach a final investment direction

Examples of how the results from Phase 2 outreach help inform the development of MnSHIP include:

- Feedback on the investment direction told MnDOT the public either liked the investment direction or understood why certain trade-offs were made even if they did not like the overall results of the investment direction
- Results informed priorities for additional revenue if MnDOT were to receive any in the future



Appendix E

MNSHIP FINANCIAL SUMMARY

FINANCIAL SUMMARY

Revenue Forecast

Unlike many other public sector budget priorities, transportation holds an advantage in securing reliable funding because the great majority of transportation investment is enabled by dedicated sources at the state and federal levels, supported by taxes assessed on drivers. However, this freedom from having to directly compete for funding with other government areas is no guarantee for the availability of sufficient money to pay for the preservation of current highway system infrastructure, much less progress toward improved conditions. Since 2008, nearly \$60 billion¹ has been transferred within the federal budget from the treasury's unrestricted-use general fund to the dedicated highway account of the Highway Trust Fund, and the reauthorization agreed to at the end of 2015 continues this practice with a further \$52 billion transfer.² These ad-hoc transfusions failed to restore the long-term balance between tax collections and spending for the highway account, leaving continued viability of the "user-pays" transportation model in question.

This chapter describes the primary sources of public revenues for state highway transportation in Minnesota, along with historical trends in revenues and costs and their projections.

TRANSPORTATION EXPENDITURES IN MINNESOTA

In 2012, all levels of government combined spent \$4.6 billion on highway services—including capital (roughly half the total), maintenance, and other budget areas—across Minnesota's 139,000 miles of federal, state, county, and local public roads.³ This represented 1.8 percent of the state Gross Domestic Product—a measure of aggregate economic output.

At the end of the 2015 Legislative session, Minnesota's state operating budget was expected to be \$75 billion for the 2016-2017 biennium (July 1, 2015 to June 30, 2017).⁴ Appropriated levels may change over the course of the biennium if tax and user fee collections vary from current projections.

State funding for all forms of transportation—including highways, transit, and other modes—accounts for \$7.1 billion (an annual average of \$3.5 billion for the biennium) or 9 percent of this operating budget, and ranks as the third-largest state program after health and human services and E-12 education.

Figure E-1 shows transportation's share of state expenditures in the context of the overall budget.

1 <http://www.fhwa.dot.gov/highwaytrustfund/index.htm>

2 House-Senate conference report to accompany H.R. 22, the FAST Act: <http://1.usa.gov/1NG9o0K>

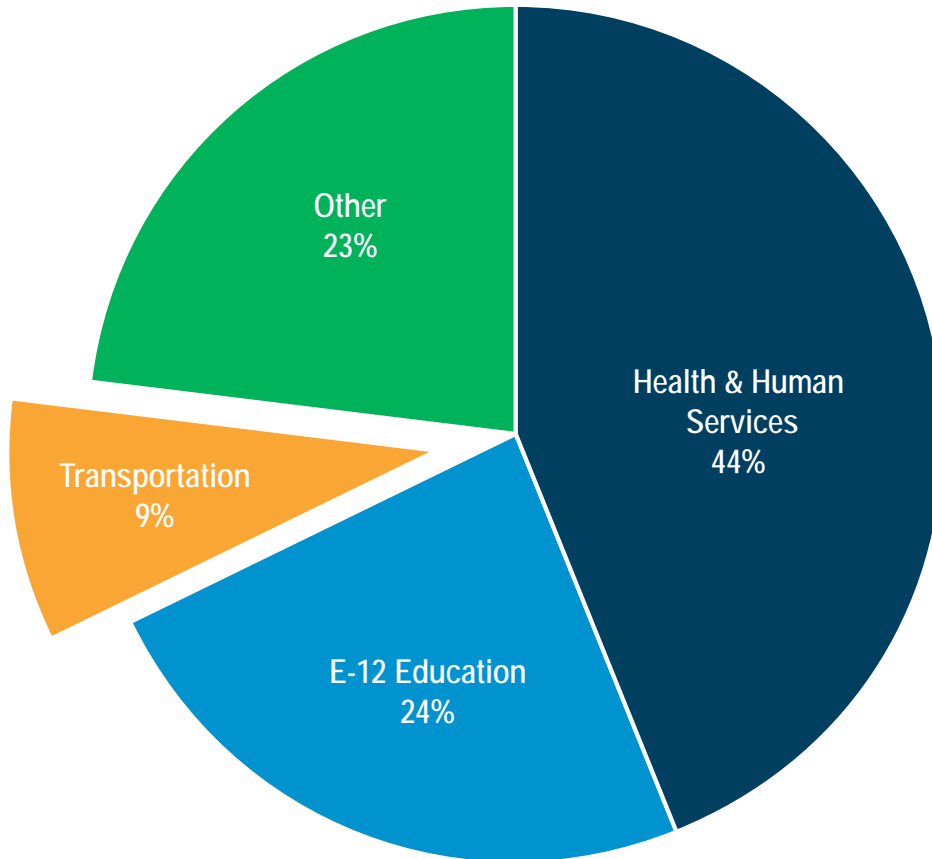
3 <http://www.fhwa.dot.gov/policyinformation/statistics.cfm> Tables LGF-2 (2013) and SF-2 (2012)

4 https://mn.gov/mmb/assets/where-fund-dollars-go_tcm1059-130347.pdf

While looking at the revenue forecast to determine funding availability for state road construction, it is important at the same time to consider the expected levels of related accounts, including operations & maintenance and debt service, so as to ensure the fiscal and operational integrity of the comprehensive plan.

MINNESOTA HIGHWAY REVENUE SOURCES

Figure E-1: Minnesota Total Appropriated State Expenditures, All Operating Funds, 2016 to 2017 Biennium (\$75 billion)



Source: Minnesota Management & Budget

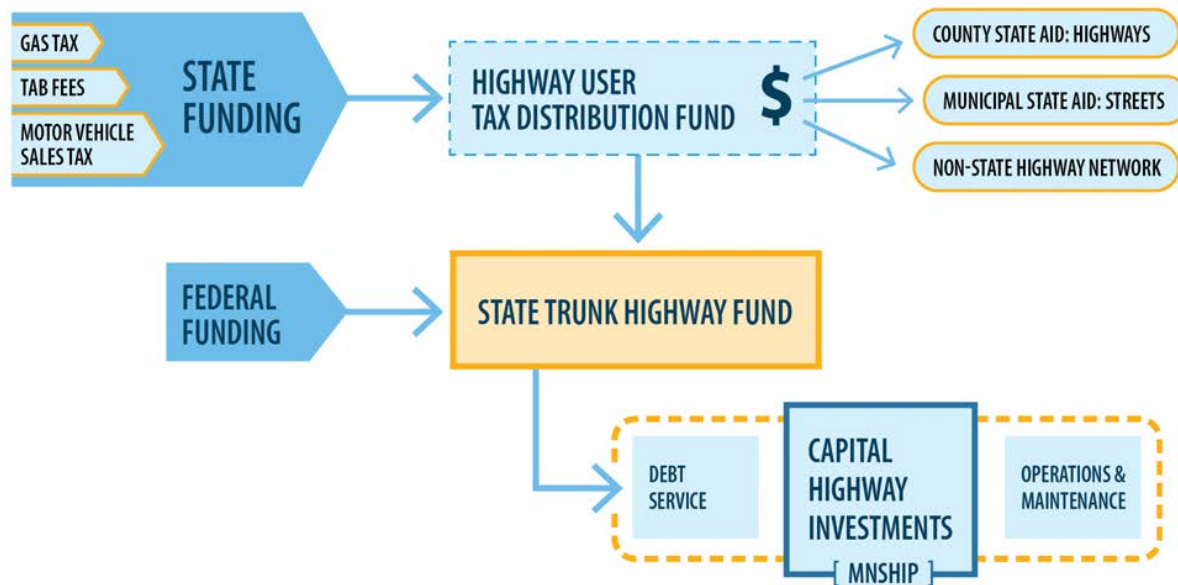
Highways are funded by state and federal revenues that are raised through taxes and user fees. **Figure E-2** illustrates the flow of revenue for state transportation investments.

The four main permanent revenue sources for the State Trunk Highway Fund generated \$1.7 billion in state fiscal year 2014. The net realized amounts (all in millions) and shares of each were:⁵

- Federal-Aid Highway Program \$507 (30%)

⁵ Percentages do not sum to 100% due to the presence of other, smaller contributors.

Figure E-2: Minnesota's Primary Transportation Funding Sources for State Highways



Source: MnDOT Office of Transportation System Management

- Motor Fuels Excise Taxes \$501 (30%)
- Motor Vehicle Registration Tax \$382 (23%)
- Motor Vehicle Sales Tax \$225 (13%)

Highway improvements may also be financed by bonding. Bonding, which must be authorized by the Minnesota Legislature, is a financing approach, rather than a primary source of revenue. Bond financing can be used to advance the construction of projects and accelerate the delivery of benefits to the traveling public by effectively borrowing against future revenue. The principal and interest on the bonds are typically repaid over a 20-year period. This type of financing may also help to avoid construction cost increases due to inflation—an advantage that must be weighed against the additional interest expense incurred with bonding. Major bonding programs enacted by the Minnesota Legislature, including *Corridors of Commerce*⁶, modify the short-term distribution of highway investments proposed in the State Highway Investment Plan, generally in favor of additional capacity development projects. The increased debt service obligation that accompanies these bonding initiatives also diverts available funds anticipated throughout the later years of the plan.

State transportation revenues are first deposited in the Highway User Tax Distribution Fund. After withholdings for administrative costs, transfers to the Department of Natural Resources, and a set-aside of 5 percent for the Flexible Highway Account (no part of which is currently directed to state highways), the

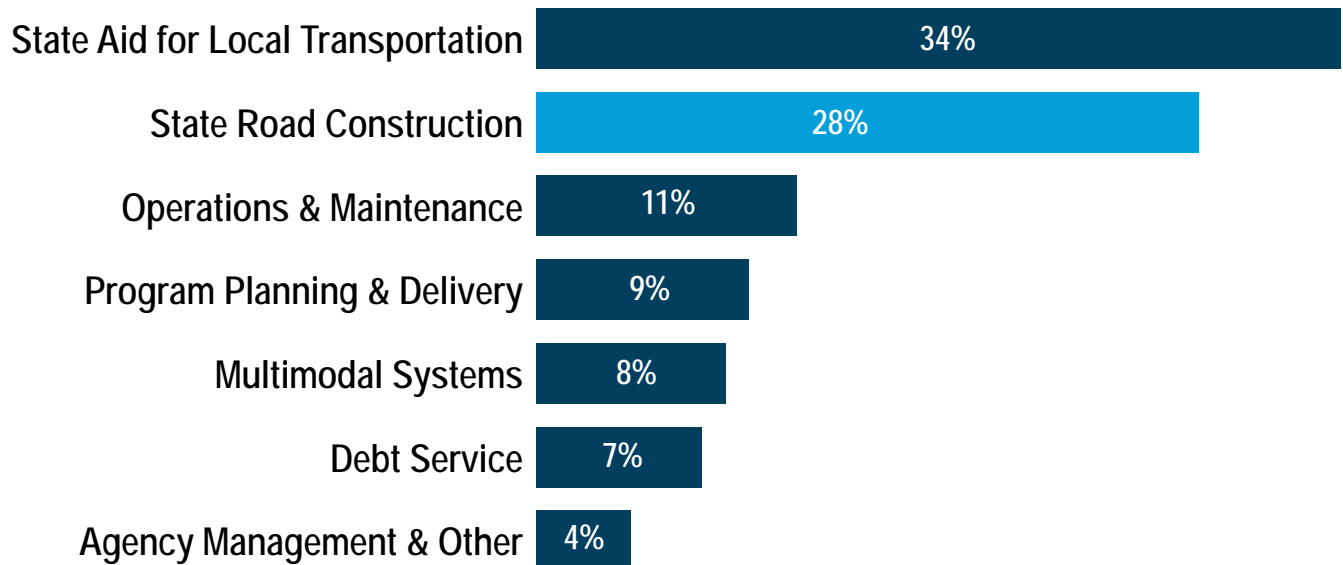
⁶ <http://www.dot.state.mn.us/corridorsofcommerce/>

remaining revenue is constitutionally distributed among the Trunk Highway Fund (62 percent), the County State-Aid Highway Fund (29 percent), and the Municipal State-Aid Streets Fund (9 percent) for cities with populations greater than 5,000 (Figure E-3).

MnDOT manages the Trunk Highway Fund to support four broad types of expenditures on the state highway system:

- Debt Service, for bond retirement
- Operations and Maintenance, combining traffic management, snow removal, pavement patching, and similar activities
- Program Planning and Delivery, including design and engineering work
- State Road Construction, representing the capital program for new construction and reconstruction of state highways and bridges

Figure E-3: MnDOT Appropriation Distribution Plan, All Appropriations, 2016 to 2017 Biennium (\$7 billion)



Source: MnDOT Office of Financial Management, Financial Snapshot, State Fiscal Year 2016, November Forecast

Turning to the Federal-Aid Highway Program, tax proceeds from gasoline (and gasohol gasoline/ethanol blends), diesel, and other user fees are collected in the highway account of the Highway Trust Fund. Highway account apportionments to Minnesota and other states, for use on both eligible state and local facilities, are then governed by a formula that takes into account the size and usage of each state's highway network, among other factors.⁷

The subsequent program-level allocation of federal funds within Minnesota follows the FAST Act surface transportation reauthorization enacted in December 2015. A small fraction of federal revenue is directed to local uses

⁷ A small fraction—5% on average for the duration of the FAST Act—of federal highway budget authority is outside of the formula program.

across the state, including for bridges not on the Federal-Aid Highway System, Greater Minnesota transit, and railroad-highway crossings. Remaining federal support is distributed among the eight Area Transportation Partnerships through a target formula. This target formula takes into account each ATP's share of statewide infrastructure preservation (60 percent), mobility (30 percent), and safety (10 percent) needs. Each ATP consists of a MnDOT district and various local transportation partners, including Metropolitan Planning Organizations, Regional Development Commissions, transit, other modal, county, city, and tribal government representatives. The ATPs integrate state and local priorities for federal funding within their regions and decide the division of federal funding between MnDOT and local governments. While an average of approximately 2/3 of federal funding is programmed for state highways, this share varies across ATPs and over time.

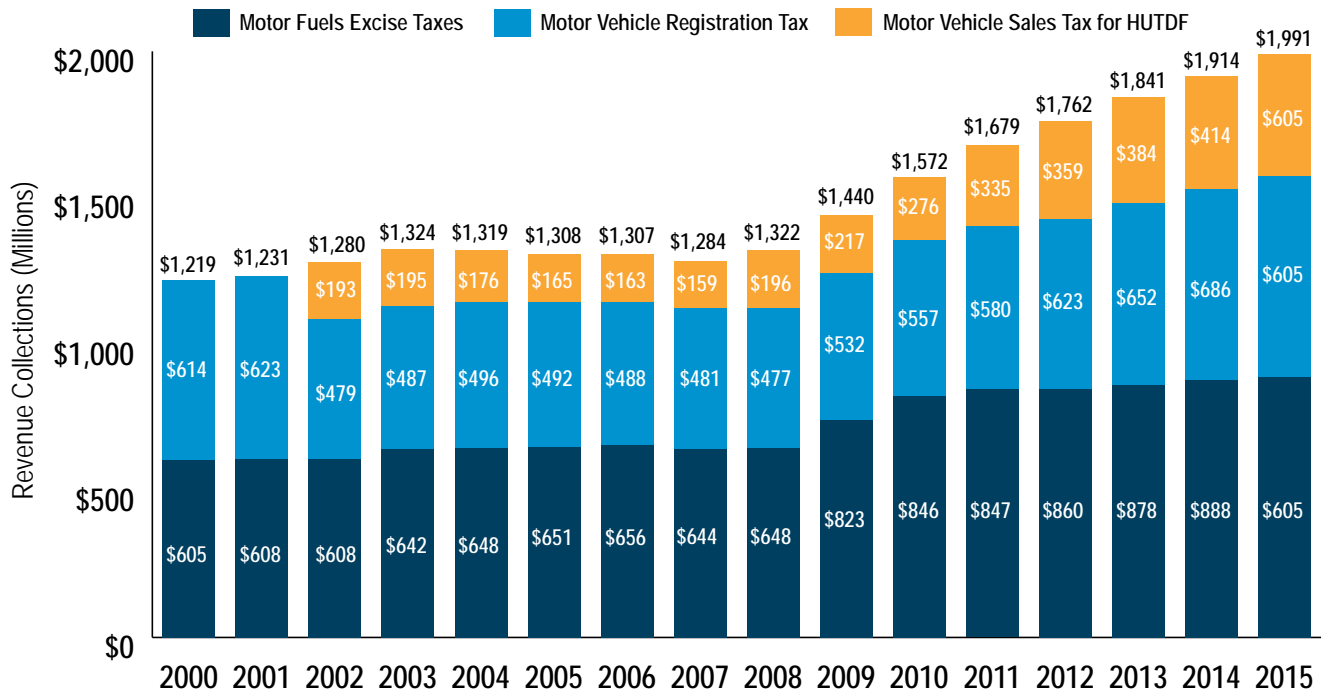
TRENDS IN MINNESOTA HIGHWAY REVENUES AND COSTS FROM 2000 TO 2015

State Revenue Trends

State highway revenue collections increased at an annual rate of 3.5 percent between 2000 and 2015. Between 2000 and 2007, however, state transportation revenue edged up at an annual rate below 1 percent, and both 2006 and 2007 saw small declines, as illustrated in [Figure E-4](#).

To revive revenue growth, tax rates and terms were subsequently changed for all state sources, generating additional MnDOT funding:

Figure E-4: Trends in Minnesota's Primary State Transportation Revenue Sources



Source: MnDOT Office of Financial Management

- Incremental fuel tax surcharges for debt service (reaching the final step of 3.5 cents per gallon in the summer of 2012)
- Adjusted depreciation schedule and elimination of maximum registration taxes for newer vehicles
- Rising share of the sales tax devoted to highways (now 60 percent)

CHAPTER 152 BOND FUNDING

Minnesota Laws 2008, Chapter 152 authorized an additional \$1.8 billion in bonding capacity between 2009 and 2018 to finance state highway-related improvements. At the same time, the base motor fuel tax rate was raised on gasoline and diesel, for the first time since 1988, from 20 to 25 cents per gallon. A further per-gallon surcharge was implemented, starting at 0.5 cents in state fiscal year 2009 and eventually reaching 3.5 cents from SFY 2013. This surcharge will remain in effect while debt service payments continue on the Chapter 152 bonds. Through August 2015, the state had sold 80 percent (\$2.4 billion) of the total \$3.0 billion in trunk highway bonds authorized since 2000.⁸

Chapter 152's increased bonding availability was predominately directed to the Tiers 1 and 2 Bridge Program for repair or replacement of fracture-critical or structurally-deficient bridges. MnDOT expects 120 bridges will be under contract for such work by June 30th, 2018. The total program cost was estimated at \$2.5 billion over the 10-year period, to be funded through \$1.2 billion of bonds and \$1.3 billion of Trunk Highway Fund revenue. (Interchange projects, a specific legislative priority, and accelerated pavement and safety projects consumed the residual Chapter 152 financing.)

MOTOR FUELS EXCISE TAXES

Beginning in 2001, strengthening demand for oil, particularly from India and China—without comparable supply increases—pressured world oil prices and heightened sensitivity to periodic supply shocks. Between 2003 and 2008, fuel tax proceeds stagnated, and the debt service-related surcharge initiated in 2008 was solely responsible for this source resuming a transitory upward trajectory. In other words, with volume consumption (gallons) essentially flat, the only way to obtain higher revenue is through a per-gallon tax rate increase, or by changing the tax mechanism and replacing/reinforcing the existing simple gallon basis with a percentage of the purchase price. This idea of revamping the motor fuels tax to align with sales taxes on other goods has featured prominently in recent legislative funding debates.

MOTOR VEHICLE REGISTRATION TAX

Popularly known as “tab fees,” motor vehicle registration tax collections fell sharply after 2001 with the implementation in 2000 of caps that limited the bill

⁸ MnDOT Office of Financial Management, Financial Snapshot, State Fiscal Year 2016, November Forecast

for the first renewal period to \$189 and set the maximum fee for subsequent renewals at \$99. The lifting of this restriction in 2008 set a course for sustained growth through 2015 in excess of 5 percent annually.

MOTOR VEHICLE SALES TAX

Prior to 2000, all MVST revenue was deposited in the state general fund. In 2000, to compensate for the revenue lost by capping the registration tax, the state legislature statutorily directed 30 percent of motor vehicle sales tax revenue to the highway user tax distribution fund. This shift from tab fees to MVST meant transportation revenue would, in the future, be more dependent on new vehicle purchases.

Just as a portion of MVST revenue was transferred for highway purposes, its value as a funding source began to subside from the high growth recorded in the late 1990s. Demand for new vehicles remained depressed in the medium term following the 2001 recession, and MVST collections for HUTD did not surpass their 2003 peak for the next several years.

Late in 2006, voters approved a constitutional amendment that would eventually—over a five-year phase-in period—dedicate 100 percent of MVST revenue to transportation investment. The amendment further specified that up to 60 percent of MVST proceeds would be dedicated to highways (via the HUTD Fund) and at least 40 percent to transit. These ceiling/floor conditions, and the zeroing out of the state general fund share, were attained beginning in SFY 2012 (from July 1st, 2011).

Federal Revenue Trends

As graphed in [Figure E-5](#), from 2000 to 2014, multi-year authorization bills for the Federal-Aid Highway Program enabled revenue received by Minnesota to increase, though with some year-to-year volatility.

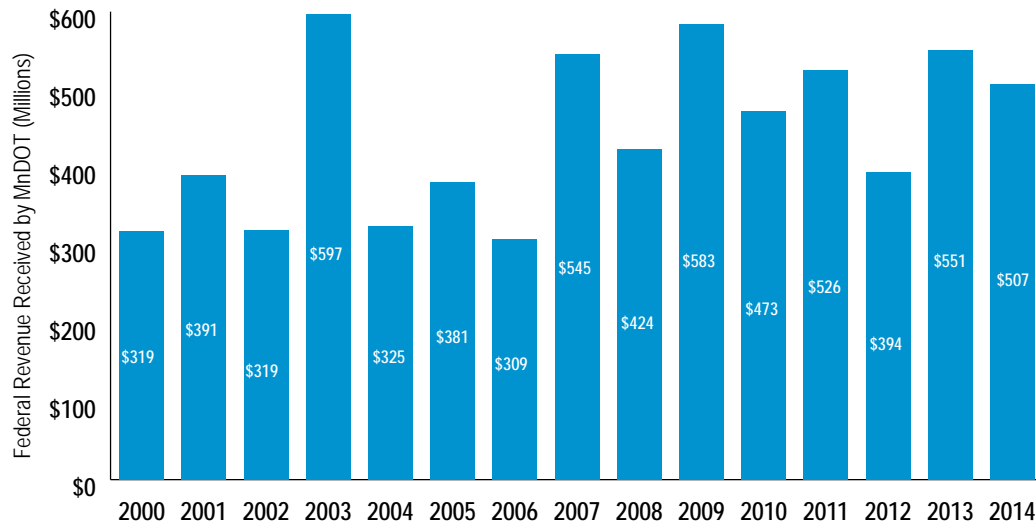
A previous federal transportation bill (SAFETEA-LU) passed in 2005 increased highway funding through two policy changes. First, a redistribution between the two sub-accounts of the Highway Trust Fund was made for gasohol (blended gasoline and ethanol) tax collections. Taken as a whole, the Highway Account benefited (offset by Transit Account reductions) from these extra excise tax proceeds. Minnesota's mandated use of gasohol⁹ created a preferential gain from the accounting change. Second, Congress supported increased federal funding by drawing on the accumulated Highway Trust Fund balance.

However, as depicted in [Figure E-6](#), the balance for the Highway Account of the Highway Trust Fund progressively diminished with the approach of SAFETEA-LU's (original) expiration, as growth in federal fuel tax collections underperformed the authorized spending curve. To continue fulfilling the spending level commitments, a series of transfers from the general fund to the

⁹ Minnesota was the first state with such a mandate and in 2005 enacted a requirement to achieve 20% ethanol content in all gasoline sold by 2013.

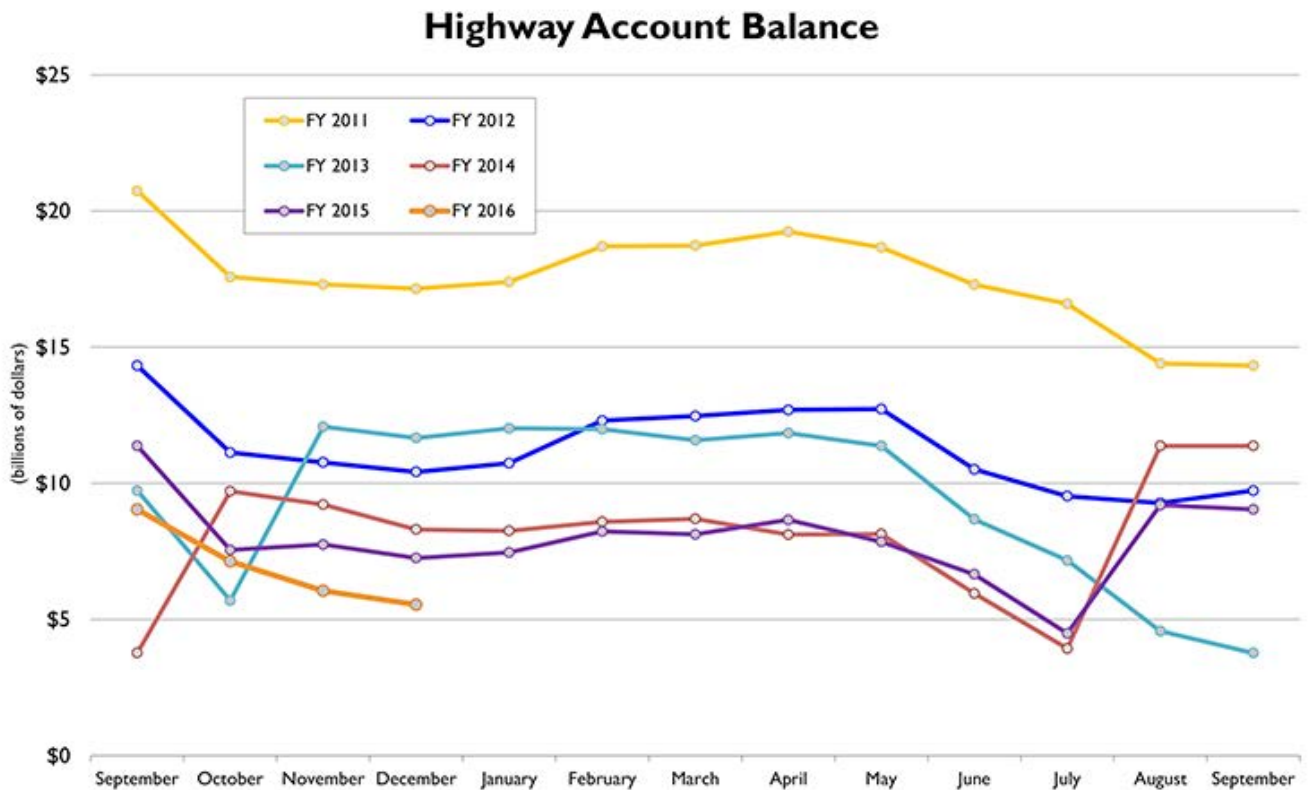
highway account were passed in federal fiscal years 2008, 2009, and 2010.

Figure E-5: Trend in Federal-Aid Highway Program Revenue



Source: MnDOT Office of Financial Management

Figure E-6: Historical Balances for Federal Highway Trust Fund, Highway Account



For FY 2012, includes \$2.4 billion transferred from the Leaking Underground Storage Tank (LUST) Trust Fund in August pursuant to P. L. 112-141
 For FY 2013, includes \$6.2 billion transferred from the GF in November pursuant to P.L. 112-141, of which \$316.2 million was sequestered in August.
 For FY 2014, includes \$10.4 billion transferred from the GF in October pursuant to P.L. 112-121 less sequester of \$748.8 million. Also includes \$7.765 billion transferred from the GF and \$1 billion transferred from the LUST Trust Fund in August pursuant to P.L. 113-159.
 For FY 2015, includes \$6.068 billion transferred from the GF in August pursuant to P.L. 114-41.

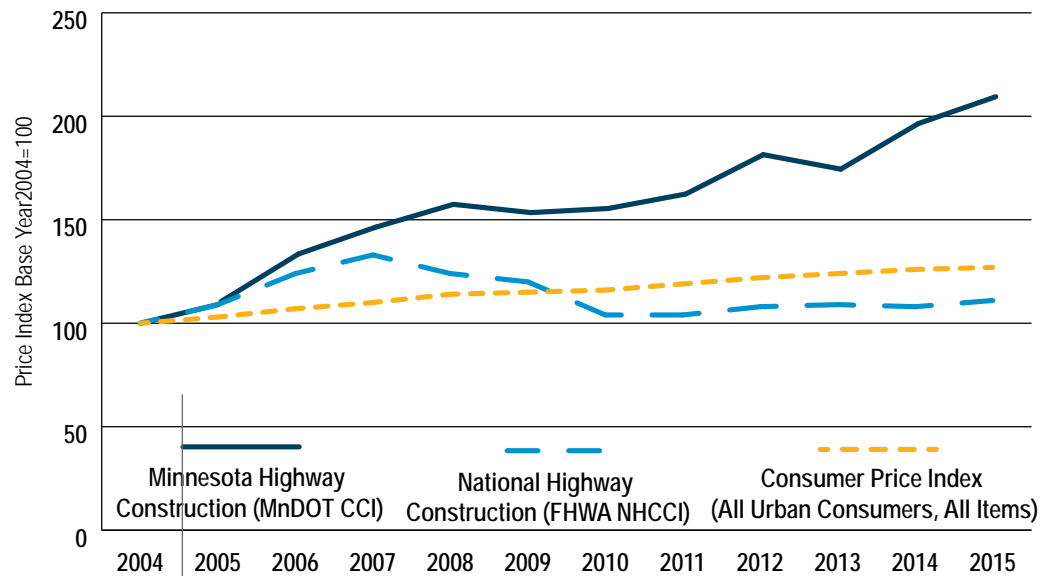
Source: U.S. Dept. of Transportation, Federal Highway Administration

MAP-21, the successor to SAFETEA-LU, acknowledged the ongoing structural gap between fuel tax revenues and desired investment program size by proactively supplementing the Highway Trust Fund with non-transportation-related general fund infusions. The current five-year FAST Act likewise fails to provide a more lasting resolution to the chronic inflow/outgo imbalance.

Highway Construction Cost Trends

Over the period from 2004 to 2015, highway construction costs, measured by MnDOT's Construction Cost Index increased at an annual rate of 6.9 percent. CCI spikes in the middle of the past decade were largely attributable to the underlying pricing environment for essential commodities such as bituminous, steel, and concrete. The global recession beginning in 2007 reduced demand for these materials and stabilized prices, but a divergence persisted between the inflation for inputs specific to highway infrastructure and that measured by broadly reported general indicators such as the consumer price indexes, designed to track transactions for a wider selection of goods and services. Minnesota highway construction costs have also not shared in the post-recession downturn registered by the National Highway Construction Cost Index computed by the Federal Highway Administration (FHWA NHCCI), for reasons including climate and market conditions for commodities and contractor resources specific to the Midwest. Surveying the cost index increase over the past decade in other states cited by FHWA reveals Minnesota to be in the middle of the range of growth rates (all of which substantially exceed NHCCI). A comparison of the recent development for these two indexes is shown in Figure E-7.

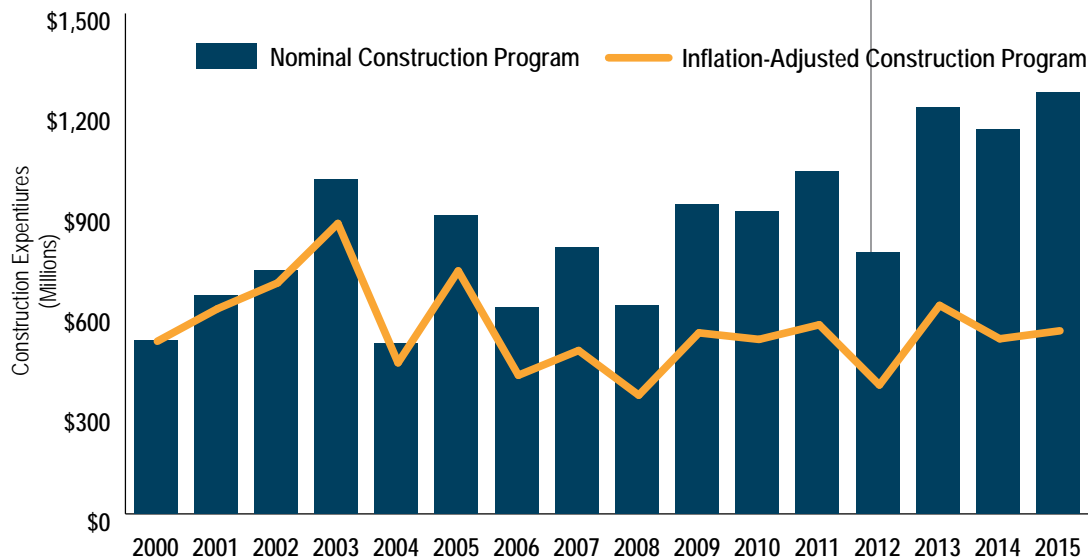
Figure E-7: Recent Trends for Highway Construction (MnDOT CCI), National Highway Construction (FHWA NHCCI) and Consumer Price Indexes



Source: MnDOT Office of Project Management & Technical Support, Cost Data & Estimating Unit; U.S. Dept. of Labor, Bureau of Labor Statistics

The relatively high inflation rate experienced for highway construction decreased the purchasing power of transportation revenues. **Figure E-8** represents actual construction program expenditures, noted using nominal/current/year-of-construction¹⁰ dollar terms, and the same activity expressed in real/constant year 2000 dollars. Adjusting for inflation in this way demonstrates

Figure E-8: Minnesota State Highway Construction Expenditures, Nominal and Real Amounts



Source: MnDOT Office of Transportation System Management

the difficulty of accomplishing a given volume of work output, as measured in units such as paved lane-miles or bridges built by deck length and structural type—when year-to-year growth in the prices of required inputs is outpacing additional funding availability. Although the absolute, nominal construction budget may increase over time, when inflation rises more quickly, MnDOT’s ability to sustain a fixed level of effort or quantity of system improvements will be compromised. This erosion of purchasing power is expected to remain a challenge to investment decision making over the 20-year planning horizon, as detailed later in the chapter.

State Road Construction Outlook from 2018 to 2037

February 2008 marked the state legislature’s last major act affecting ongoing transportation funding for highways. Subsequent to this legislation, the projections that follow assume current MnDOT budget policies, and state and federal tax laws, remain in effect through 2037. No new one-time funding is included, only the existing dedicated transportation taxes are forecast, and all revenue collected in a certain year is spent within that year, beyond what is already programmed. No scenarios for fund balance accumulation or drawing down are considered.

¹⁰ All of these labels are synonymous and will later be used interchangeably.

While a long-term perspective is necessary for planning purposes, any multi-decade revenue guidance is naturally subject to significant uncertainties and reflects consensus opinions and data, gathered within MnDOT and other state agencies and from national, governmental, and private forecasters—available at this writing (summer of 2015). Such a snapshot of the expected direction for major revenue sources enables the development of fiscally-constrained investment scenarios detailed in **Chapter 4, Development of Investment Direction**. Any material departures from the baseline assumptions affecting future revenues as a result of new or revised policies at the federal or state level will be separately assessed as they emerge.

The outlook additionally relies upon MnDOT requesting, and the legislature approving, future year appropriations to support the indicated investment levels. As a final guiding principle, debt service on trunk highway bonds is assumed to remain a first charge on Trunk Highway Fund tax collections. The forecast specifies the distribution of remaining Trunk Highway Fund revenue between, state road construction, and all other eligible uses.

Construction Cost Expectations

Highway construction cost inflation forecasts are annually updated in the fall for a 10-year horizon, and the latest mid-range projections are assumed to prevail for the following decade as well. Actual year-to-year inflation will naturally fluctuate, but the compound average rate of 4.4 percent assumed from 2018 to 2037 amounts to a tapering off from observations over the past decade and extends the comprehensive historical average since the CCI's inception in 1977 of 4.5 percent. This inflation factor can be interpreted as the bridge between nominal and real representations of future funding amounts, and both perspectives will be considered later in the chapter.

It is worth noting that this level above 4 percent will almost certainly exceed broader inflationary measures, such as the headline consumer price index and other areas of MnDOT's own budget. Specifically, based on long-term performance, operations and maintenance activities, requiring a higher labor input component and lower manufacturing / commodity intensity compared with initial construction, should expect lower average inflation—pegged here at 3.2 percent—owing to more moderate escalation in employee compensation. The division of funding between, state road construction, and operations and maintenance, has been managed while recognizing the distinct inflationary paths projected for each budget category, as described below.

Future Revenue-Generation Context

TRENDS IN LIGHT-DUTY VEHICLES

An EPA report¹¹ published in December 2015 highlights trends in new vehicle

¹¹ Light-Duty Automotive Technology, Carbon Dioxide Emissions, and Fuel Economy Trends: 1975 Through 2015, <http://www.epa.gov/otaq/fetrends.htm>

characteristics that help to explain historical stability in highway-related tax revenues.

All else equal, heavier and more powerful vehicles have higher sticker prices (boosting sales tax receipts) and enduring valuations (raising recurring registration payments). Since 1987, average light duty vehicle weights and horsepower ratings climbed 26 percent and 95 percent, respectively. Neither attribute has fluctuated materially over the past decade.

Bearing this out, IHS Global Insight analysis shows the typical price for a new light duty vehicles has grown at an annual rate of 3.1 percent since 1990, outperforming inflation across all CPI items for the period (2.4 percent). Forecasts call for future vehicle price increases to keep up their historical pace to average 3.2 percent annually through 2037.

Table E-1: Light-Duty Vehicle Characteristics Trends

VEHICLE CHARACTERISTIC	1975	1987	2004	2008	2014
Adjusted Fuel Economy (MPG)	13.1	22.0	19.3	21.0	24.3
Weight	4,060	3,221	4,111	4,085	4,060
Horsepower	137	118	211	219	230
Truck Production	19%	27%	48%	41%	41%
Hybrid Powertrain	-	-	0.5%	2.5%	2.6%

The truck share of the LDV fleet has subsided somewhat from its 2004 peak, yet remains 15 times the gas-electric hybrid fraction. (Pure-electric plug-in car adoption has fallen short of even the industry's conservative business plans, and this segment is an inconsequential part of today's fleet composition.) Trucks and SUVs are also disproportionately favored in Minnesota, making up nearly seven in 10 new vehicle sales in 2014, according to the Minnesota Automobile Dealers Association.

Multiple approaches may be pursued to achieve future gains in average fuel economy. Besides a tilt of the fleet mix in favor of smaller, lighter vehicles, implemented changes to the composition of vehicle frames—notably by raising the aluminum-to-steel ratio in pickup trucks—also hold promise to incrementally lift aggregate MPG. The federal Energy Information Administration 2015 Annual Energy Outlook projects that in 2037, the average light-duty stock vehicle will achieve 36 MPG and a new “on-the-road” LDV will test at 39 MPG. The same source suggests motor gasoline prices will hold constant on an inflation-adjusted basis, only rising from \$3.55 per gallon in 2013 to \$3.66 per gallon by 2037, while pumps in the year 2037 will read a nominal \$5.59 per gallon.¹²

TRENDS IN DRIVER BEHAVIOR

As summarized in a November 2015 report written by MnDOT's Office of

¹² http://www.eia.gov/forecasts/aeo/excel/aeotab_12.xlsx

Transportation System Management¹³,

In previous decades, Minnesota had seen steady growth in VMT [vehicle miles traveled]. However, since 2004 VMT growth in Minnesota has been virtually flat, and from 2010 to 2013 it declined by 0.2%. In 2014 [latest data available] VMT increased by 1.0% to 57.4 billion to a new high, just slightly higher than 2006. Nationally, VMT increased 1.7% [in 2014] and appears to be increasing for 2015.

Spanning the 2004 inflection point, annual growth rates for the 1992-2014 period averaged 1.5 percent within Minnesota and 1.4 percent nationally. However, by controlling for population growth, the Office of Transportation System Management found that per capita metro-area VMT in 2014 fell below the 1998 level.

Even after factoring in some degree of post-recession recovery—reinforced by response to current and forecast subdued fuel prices—the Energy Information Administration forecasts national LDV VMT will increase at an annual rate of 1.1 percent from 2018 through 2037. The comparable per capita (population age 16 and older) annual statistic is minimal growth of 0.4 percent.

Combining these future trajectories for MPG and VMT, EIA modeling indicates West North Central (including Minnesota) regional motor fuel consumption will decline by 0.7 percent a year between 2018 and 2037. IHS Economics expects a net result marginally closer to neutral from offsetting MPG and VMT developments, leading total consumption of gasoline and special fuels (e.g. diesel) to fall 0.4 percent annually over the 20 years. A blend of EIA and IHS Economics scenarios is adopted for the revenue plan here, in line with the procedures of the Office of Financial Management in their nearer-term forecasts. (No attempt was made to supplement these third-party projections with independent forecasts of the direction and/or magnitude for the potential impacts of either autonomous/self-driving vehicle adoption or car-sharing service expansion.)

The 17.5 million LDV sales for calendar year 2015 broke the old all-time record set in 2000, signaling the recovery from the recession that shrank the industry to 10.4 million units sold in 2009. Despite an unprecedented six-year streak of growth in new car purchases, average LDV age nevertheless also set a record as of mid-2015 at 11.5 years old, endorsing continued elevated production in the interim to the 20-year planning period. Starting from such a strong baseline, over the long run LDV unit sales will grow at an average annual rate of just 0.2 percent from 2018 through 2037, according to IHS Economics.

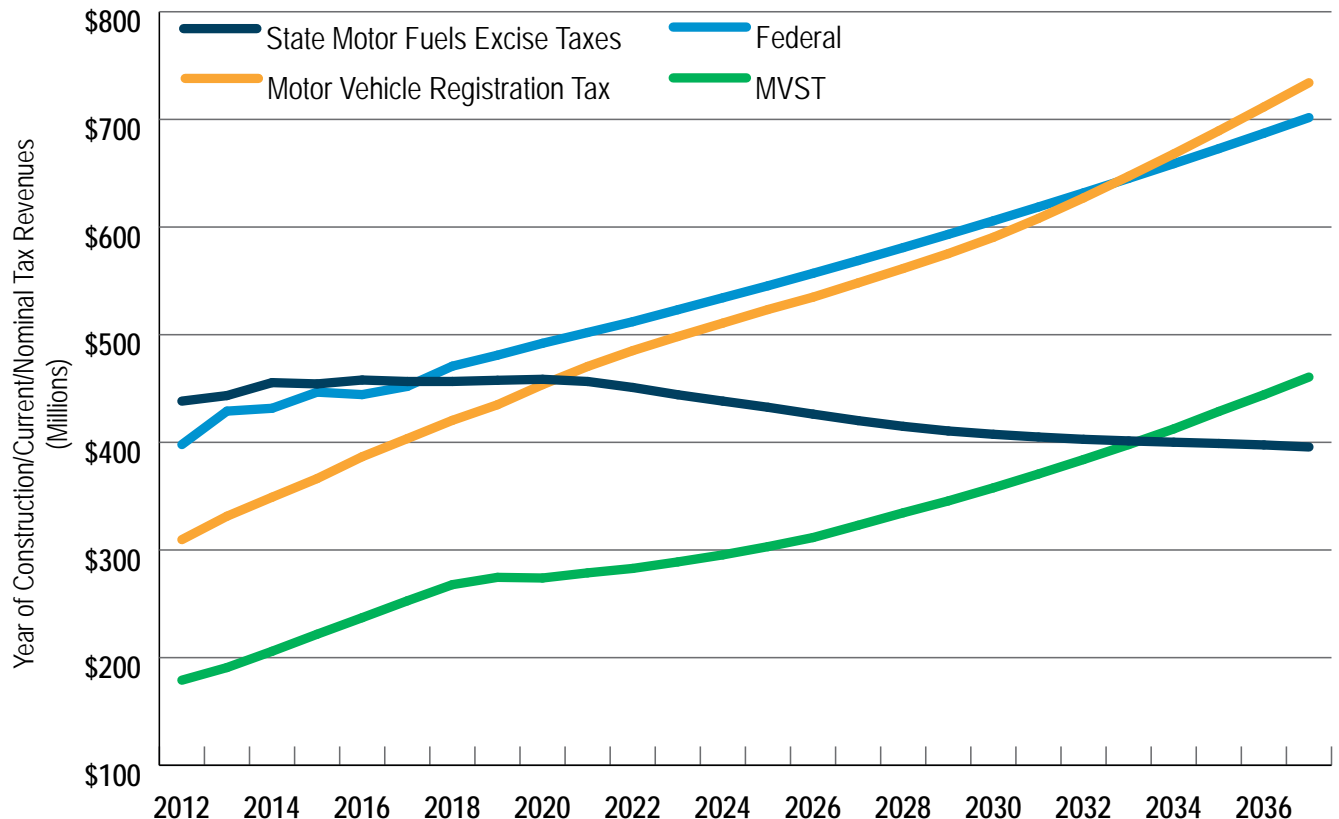
¹³ Vehicle Miles of Travel Trends in Minnesota: 1992-2014, http://www.dot.state.mn.us/traffic/data/reports/traffic%20volume/2014_VMT_Report.pdf

REVENUE FORECAST

Looking first at the aggregate level of the four major permanent revenue stream of the Trunk Highway Fund, **Figure E-9** illustrates the projected evolution—viewed from a nominal-dollar perspective—of state and federal sources over the next 20 years.¹⁴

Although currently the largest contributor to the total, the state motor fuels excise taxes are due to be overtaken as the largest contributor early in the planning window, and will most likely experience a “first-to-worst” relative

Figure E-9: Long-Term Trends for Revenue Sources, Flows into Trunk Highway Fund



Source: MnDOT Office of Transportation System Management

descent, trailing all others by 2037. As observed previously, offsetting growth in VMT and fuel economy should generate slightly declining net gasoline consumption. Absent the passage of any per-gallon or percentage-of-value rate increase, tax collections will proportionately mirror this volume trend plateau.

Conversely, the three other transportation revenue pillars are forecast to grow in nominal dollars. Higher LDV initial pricing and recurring assessed values will propel motor vehicle registration tax and MVST to annual increases in the neighborhood of 3 percent. Weighted down by negligible changes to collections in motor fuels excise taxes, the collective state revenue pool is projected to

¹⁴ Values for state sources shown here are prorated after removal of non-MnDOT/highway allocations.

expand at a 1.9 percent annual rate.

Federal dollars are modeled as growing 2.2 percent per year. The key assumption behind this factor is that authorized spending post-FAST Act (SFY 2021 and beyond) will not be constrained by federal fuel tax proceeds as currently scheduled. This is consistent with the general fund support integrated into the FAST Act. Spending levels specified by the FAST Act comprise the initial years of the projection, through SFY 2020, extending the two-biennium budget horizon by a year. Subsequently, the plan follows Congressional Budget Office forecasting for federal obligation limitation amounts.¹⁵

While the great majority of the Federal-Aid Highway Program is restricted to state road construction use, more discretion is permitted for revenues collected at the state level. Consequently four alternative scenarios were evaluated for the division of state-sourced Trunk Highway Fund revenues that remain after forecast debt service payments are set aside. These strategies are listed in ascending order of the share each would award for state road construction:

- Fund operations and maintenance at an annual growth rate equal to its expected 3.2 percent inflationary increases (remainder to state road construction)
- Continue allocation for state road construction as budgeted since SFY 2009 (\$290 million annually) (remainder to operations and maintenance)
- Choose growth rates for state road construction and, operations and maintenance so that the expected future purchasing power change (loss)—defined as the gap between funding and inflationary increases—is the same for both categories
- Fund state road construction at an annual growth rate equal to its expected 4.4 percent inflationary increases (remainder to operations and maintenance)

Weighing enterprise obligations and risks/uncertainties, option (c) was considered to be preferred and serves as the basis for **Figure E-10**, presenting a consolidated picture of Trunk Highway Fund accounting projected over the next 20 years.

Appearing as a negative quantity, below the horizontal axis, is each year's estimated debt service payment, shaded red. This commitment is expected to reach approximately \$240 million in SFY 2018 before gradually declining from its crest into the 2020s. This is equivalent to 17 percent of total state-sourced Trunk Highway Fund revenues. To comply with established debt policy guidelines, annual payments should not exceed the 20 percent threshold on

¹⁵ CBO projects Highway Trust Fund balances through 2025; 2026 and later extrapolates this trend. <https://www.enotrans.org/wp-content/uploads/2015/09/CBO-Aug-15-Baseline-HTF-spending.pdf>

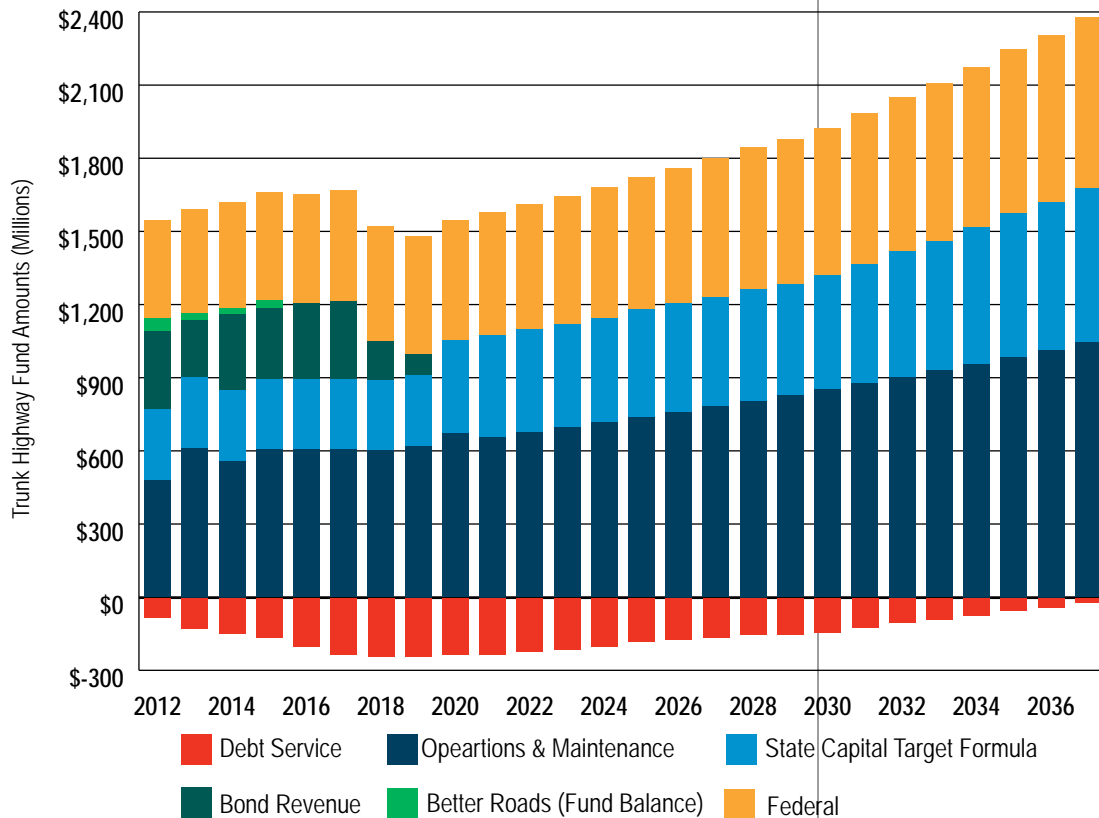
this measure, indicating a restricted capacity for further bond issuance. In SFY 2037, the final year of this plan, debt service will have been almost entirely discharged, with only a residual \$20 million predicted.

The first two positive column segments illustrate the agreed-upon division between operations and Maintenance and, state road construction (capital investment funding distributed through a target formula), colored blue and green, respectively. The allocation for operations and maintenance rises at an annual rate just less than 3 percent, compared with growth for state road construction of 4 percent. Placed against their corresponding inflation targets, both uses experience annual purchasing power erosion of close to half a percent. The 20-year funding total for operations and maintenance is \$16.1 billion and capital target formula for state road construction rises to \$9.3 billion.

Continuing to climb the column, a temporary addition to the revenue buildup is quantified: the revenue received from newly-issued Trunk Highway bonds (in yellow). The current bond sale schedule anticipates approximately \$160 million in SFY 2018 and a small final issue of about half that size in SFY 2019. The top of each stack measures the Federal-Aid Highway Program contribution to state road construction, shown in navy.

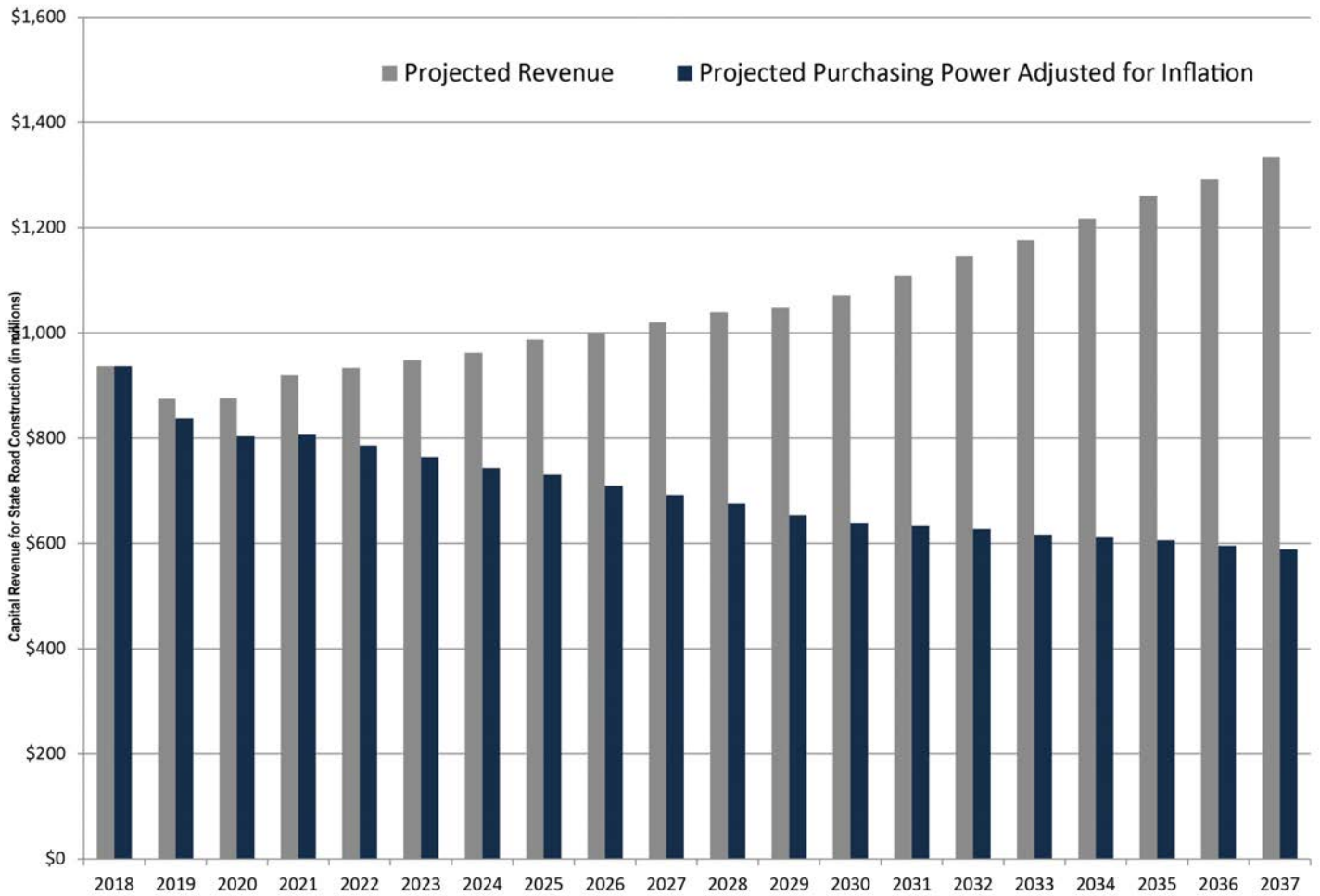
To summarize, adding together all segments appearing above operations and maintenance—namely, State Capital Target Formula, Bond Revenue (when

Figure E-10: Trunk Highway Fund Components and Budgeted Uses



Source: MnDOT Office of Transportation System Management

Figure E-11: Anticipated Construction Revenue by Year Including Adjustments for Inflation



Source: MnDOT Office of Transportation System Management

applicable), and Federal—yields the nominal-dollar state road construction 20-year grand total of \$21 billion.

It should be remembered, however, that there are two complementary ways to think about the long-range funding outlook. As compared in [Figure E-11](#), the nominal approach, reflecting traditional budgetary accounting practice, tells a story of mostly-increasing available resources. The notable exception is the drop from SFY 2018 to 2019, when projected bond revenues contract by \$70 million. These annual amounts are indicated with the combined heights of the solid and gray column halves. Alternatively, after adjusting for the loss of purchasing power caused by 4.4 percent annual construction cost inflation, the emerging trend in real-dollar terms (solid section) is one of markedly diminishing investment capacity. This interpretation acknowledges the persistent challenge of funding capital improvements when cost growth is projected to outstrip revenue expansion. This systemic fiscal constraint shapes the next step of the planning process: consideration of investment priorities to optimize system performance for Minnesota drivers.

Project Selection Process Summary

10-YEAR CAPITAL HIGHWAY INVESTMENT PLAN

The **10-Year Capital Highway Investment Plan** is updated each year to communicate MnDOT's proposed capital investments for the next 10 years and, it serves as an annual check-in between the 4-year MnSHIP plan update cycles. The are three primary objectives of the CHIP including:

- Detail MnDOT capital investments over the next 10 years on the state highway network
- Compare planned and programmed projects with the investment priorities established in MnSHIP, and explain any change in direction or outcomes
- Allow districts to coordinate with local units of government on future investment.

The CHIP includes projects in two time periods:

- Years 5-10 represent MnDOT's planned projects.
- Years 1-4 called the **Statewide Transportation Improvement Program** which represents projects MnDOT is committed to delivering.

The CHIP allows MnDOT to be transparent with its proposed capital investment and decision-making process. In addition, it provides the opportunity to track investments compared to the investment guidance established in MnSHIP, ensuring accountability.

Each year MnDOT districts receive investment guidance based on the current MnSHIP and the districts develop their CHIP in accordance with that guidance. The District CHIPs are included in this document to form MnDOT's 10-Year Capital Highway Investment Plan. Districts fund projects through two programs: the **Statewide Performance Program** and **District Risk Management Program**.

Selecting projects on the state highway system is a yearly process for MnDOT. MnDOT starts identifying potential projects 10 years in advance. MnDOT district staff works together with MnDOT central office and specialty office staff to complete a 10-year list of projects for each district. MnDOT then combines the project lists into the 10-year Capital Highway Investment Plan. The CHIP's main purpose is to communicate potential projects 10 years in advance providing early coordination of projects between MnDOT and local and regional transportation partners.

STATE TRANSPORTATION IMPROVEMENT PROGRAM

The 10-Year CHIP is updated annually to include new projects identified in year 10 and adjust any projects from the previous CHIP based on new information. Projects listed in year 5-10 do not officially have funding attached and may fluctuate as MnDOT looks at the needs of those projects and collaborates with regional and local transportation partners to identify local needs or concerns. By the time projects reach Year 4 of the CHIP, the projects become part of the State Transportation Improvement Program. Projects listed in the four years of the STIP represent the projects MnDOT is committed to constructing over the next four years. Until Year 4, projects do not have funding committed to them.

MnDOT districts work closely with a broad range of stakeholders through **Area Transportation Partnerships**. These partnerships provide a collaborative decision-making process for the selection of projects that are recommended to receive federal funds. In addition, ATPs provide a local perspective on potential state-funded projects. ATPs sign off on the district's list of programmed projects in the STIP.

With funding committed, MnDOT begins designing the project to prepare to enter construction by the time the project reaches Year 1 of the STIP. Just like the 10-Year CHIP, the STIP is updated annually. Once a project reaches Year 1, it becomes part of MnDOT construction program for that fiscal year.

TYPICAL PROJECT DEVELOPMENT TIMELINE

Year 10: Project Identification

MnDOT identifies potential state highway projects 10 years in advance. In coordination with the District, MnDOT central office, and specialty offices, the projects are identified using guidance developed from the MnSHIP investment direction. State Transportation Improvement Program and District Risk Management Program projects are included. Districts also provide initial estimates of how projects costs will break out into the MnSHIP investment categories. Year by year these projects move forward towards construction in Year 1.

Years 6-9: Refining Project Concepts

As projects progress towards construction in Year 1, districts work with ATPs, MPOs, and other key partners making recommended adjustments to needs the project is addressing and the timing of the project. Districts also make changes to the project based on additional studies, MnDOT planning and policy recommendations, new condition information, MPO policy direction, or new legislative special funding programs.

Year 5: Initial Project Scoping

During year 5, projects begin initial project scoping and scheduling begins. Districts identify specific project needs related to areas such as planning, hydraulics, or traffic. The goal is to have the projects incorporated into the STIP the following year. Not all projects move into the STIP. There may not be enough funding available to commit to the project. A project may be held in Year 5 for a few years before being listed in the STIP due to funding availability.

Year 2-4: Commitment to Delivery

In Years 2-4, districts update a project's scope, schedule and cost estimate annually based on designing and engineering for the project. Projects listed in Years 2-4 represent a commitment to deliver the project. If necessary, MnDOT works to complete any studies and identifies any impacts a project may have on the surrounding environment.

Year 1: Annual Construction Program

When a project reaches Year 1 it becomes part of MnDOT's annual construction program and begins construction.

Funding Program Overview

MnDOT invests in state highway projects through two programs: the Statewide Performance Program and the District Risk Management Program. The purpose of establishing these two programs is to ensure the agency efficiently and effectively works toward common statewide goals—in particular, meeting identified outcomes of the MnSHIP investment direction—while maintaining some flexibility to address unique risks and circumstances at the district level.

WHAT IS THE STATEWIDE PERFORMANCE PROGRAM?

MnDOT created the Statewide Performance Program in 2013 to respond to changes in federal requirements. Federal legislation, places greater emphasis on National Highway System performance and requires MnDOT to make progress toward national performance goal areas, including those related to condition, safety, and travel time reliability on the NHS. Failure to do so results in the loss of some federal funding flexibility. The SPP manages investment and project selection on the NHS to meet statewide outcomes listed in the MnSHIP investment direction.

Project Selection through the Statewide Performance Program

The SPP selects projects that continue MnDOT's progress towards meeting the outcomes identified in MnSHIP on the NHS. Staff from MnDOT's central office, district offices, and specialty offices collaborate to develop a list of potential projects and planned investments to address these risks through the SPP. MnDOT adds new SPP projects annually in year 10 of the CHIP. Existing projects continue year by year through the CHIP. Each MnDOT district coordinates with Area Transportation Partnerships, MPOs, and other key partners to make recommended adjustments to project scope and timing. Upon final selection for inclusion in the STIP, each MnDOT district is responsible for designing and delivering the selected projects. The following types of projects drive the SPP project selection process.

INTERSTATE AND REMAINING NHS PAVEMENT PROJECTS

Projects focus on rehabilitation or replacement of existing pavements to bring the segment of the highway into good condition. MnDOT's Office of Materials and Road Research uses a Pavement Management System to predict future pavement conditions and develop a schedule of suggested fixes on the Interstates and remaining NHS. The Office of Materials and Road Research manages its program to meet performance outcomes on the NHS listed in MnSHIP. The districts suggest modifications to the project list based on a number of considerations, including local knowledge of conditions, input from stakeholders, and timing of other scheduled improvements in the area.

NHS BRIDGE PROJECTS

Bridge projects focus on rehabilitation or replacement of existing bridges to bring the bridges into good condition. As is the case with pavement projects, MnDOT prioritizes bridge projects on high-volume NHS roads. MnDOT's Bridge Office uses the Bridge Replacement and Improvement Management process to recommend future bridge improvements based on condition and risk factors, including length of detour and traffic volume. The bridge office and district offices generate a list of bridge projects for NHS and non-NHS bridges based on the results of the BRIM process. In modifying the BRIM results, districts consider stakeholder input and local expertise to coordinate timing with other planned projects in the region. Districts primarily choose projects with long-term fixes for NHS bridges and focus investment on non-NHS bridges in the greatest need of repair.

NHS MOBILITY PROJECTS

NHS mobility projects focus on improvements that address performance related to mobility and travel time reliability in the Twin Cities metropolitan area and Greater Minnesota. The 2013 MnSHIP investment guidance only directed investment to improve mobility and travel time reliability in the Twin Cities area. In the Twin Cities Metro area, MnDOT's Metro District worked in collaboration with the Metropolitan Council to develop a list of Twin Cities Mobility cost-constrained projects that align with MnSHIP. A process for selecting projects to address mobility and travel time reliability in Greater Minnesota will be developed as the new investment direction is implemented.

STATEWIDE SOLICITATIONS

MnDOT selects projects through statewide and internal solicitations to partner with stakeholders and local jurisdictions to fund non-performance-based projects managed by MnDOT's central office. These statewide solicitations fund projects that leverage local funds to provide economic, quality of life, and transportation benefits. An example of a statewide solicitation is the Transportation Economic Development program. MnDOT categorizes these projects under the Regional and Community Improvement Priorities investment category.

SAFETY PROJECTS

MnDOT selects safety projects on the NHS coordinating between the districts and the Office of Traffic, Safety and Technology. The mix of project types varies by district. Districts draw from two main sources to select projects:

- **District Safety Plans.** Each district uses its safety plan to prioritize proactive safety infrastructure projects and determine which strategic improvements to implement. In addition, the 10-Year Capital Highway Investment Plan includes Highway Safety Improvement Program

investments. HSIP is a federal program that emphasizes data driven, strategic approaches to improving highway safety. HSIP projects correct a hazardous road location or address a highway safety problem.

- **Sustained crash locations list.** MnDOT's Office of Traffic, Safety, and Technology identifies areas throughout the state that experience a high crash rate over a five-year period. Districts include high-priority projects at some of these locations.

The districts also estimate the costs associated with installing roadway safety infrastructure as part of other projects, namely pavement improvements.

INCLUSION OF OTHER INVESTMENTS ON SPP PROJECTS

While a project in the Statewide Performance Program primarily focuses on one of the five categories above, a portion of SPP project costs may include additional improvements such as roadside infrastructure, bicycle or pedestrian improvements. However, they do not drive the project selection process in the SPP.

WHAT IS THE DISTRICT RISK MANAGEMENT PROGRAM?

The SPP focuses funding on addressing key performance targets on NHS routes, but the DRMP focuses funding on all other non-NHS highways other non-performance-based needs (RCIPs) on all state highways. The majority of the program supports pavement and bridge rehabilitation or replacement projects. The DRMP project selection process is structured to give districts the flexibility to address their greatest regional and local risks. Districts are also able to make additional investments on the NHS system if the proposed project is in response to a high risk issue. MnDOT distributes different levels of funding to the districts for this program based on a revenue distribution method that accounts for various system factors (Figure E-12).

Resource Distribution Formula

MnDOT created a resource distribution formula for the purpose of distributing funds for projects in the DRMP program, among the eight districts. The funds each district receives for programming its DRMP projects are determined through this target formula.

The Resource Distribution Formula considers five factors: a district's projected condition for Non-NHS pavement, a districts projected condition for Non-NHS bridges, a district's portion of total trunk highway lane miles, vehicle miles traveled, and heavy commercial VMT. The amount allocated to each district depends on these factors according to the breakdown below.

MnDOT revises the distribution annually with updated data from that year, and

applies the distribution to years 5-10 in the CHIP. DRMP funding in the first four years in the current CHIP will remain unaffected. The process will remain this way to give districts fixed funding in years 1-4 for programming and finalizing the scope of projects. This will also ensure that there is a more accurate reflection of remaining needs in each district as projects get completed and pavement and bridge conditions improve or decline each year. The districts will see less dramatic swings in each subsequent year as the data being used is updated annually and projected conditions do not improve or decline dramatically.

Figure E-12: Resource Distriction Formula Factors

DISTRIBUTION FACTOR	PERCENT OF FORMULA	DATA SOURCE
Non-NHS Pavement Condition	20%	2015 data for 2021-2026 average annual funding needed to reach 60% good, 10% poor from Materials Pavement Model poor
Non-NHS Bridge Condition	20%	2015 data for 2021-26 bridge funding needs based on remaining service life to reach 50% good, 8% poor
TH Lane Miles	30%	2014 lanes miles
Vehicle Miles Traveled (VMT)	24%	2014 VMT on all roads
Heavy Commercial VMT	6%	2013 HCVMT (State highways only)

Project Selection through District Risk Management Program

In the DRMP, each MnDOT district is responsible for selecting projects that mitigate their highest risks and are not addressed through the SPP in the areas of System Stewardship, Transportation Safety, Critical Connections, and Healthy Communities. Each MnDOT district coordinates with Area Transportation Partnerships, MPOs, and other key partners to recommend adjustments for project scope and timing. The majority of DRMP projects a district selects are pavement, bridge and safety projects on non-NHS routes.

NON-NHS PAVEMENT PROJECTS

The Office of Materials & Road Research generates an initial project list for district consideration. However, it is the districts' responsibility to identify and select pavement projects. The districts select projects based on a number of considerations, including local knowledge of conditions, input from stakeholders, and timing of other scheduled improvements in the area.

NON-NHS BRIDGE PROJECTS

The MnDOT Bridge Office generates an initial project list for district consideration. However, it is the districts' responsibility to identify and select bridge projects. The districts select projects based on a number of considerations, including local knowledge of conditions, input from

stakeholders, and timing of other scheduled improvements in the area.

SAFETY PROJECTS

District select stand-alone safety projects based on location with fatal and serious injury crashes, which are shared with the Office of Traffic, Safety and Technology for approval. Funding for these projects comes from the Highway Safety Improvement Program.

OTHER PROJECTS

The majority of projects districts select are pavement, bridge, or safety projects, districts also select projects in other investment categories. Districts may identify a high priority improvement as a stand-alone project because there is not an upcoming pavement, bridge or safety project where the improvement could be included as part of the project. These stand-alone can include roadside infrastructure improvements such as replacing culverts, guardrails, signs or lighting, mobility improvements, bicycle improvements, or pedestrian improvements.



Appendix F

FEDERAL AND STATE LEGISLATIVE REQUIREMENTS

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National Goals for Performance Based Planning

Federal statute¹ states that statewide transportation plans must provide for the establishment and use of a performance-based approach to transportation decision-making that support seven national goals. **Table F-1** show how the national goals for performance-based planning influenced the Minnesota State Highway Investment Plan investment categories.

Table F-1: National goals and related MnSHIP investment categories

NATIONAL GOAL	INVESTMENT CATEGORY
Safety – to achieve a significant reduction in traffic fatalities and serious injuries on all public roads	<ul style="list-style-type: none"> Traveler Safety
Infrastructure condition – to maintain the highway infrastructure asset system in a state of good repair	<ul style="list-style-type: none"> Pavement Condition Bridge Condition Roadside Infrastructure Facilities
Congestion reduction – to achieve a significant reduction in congestion on the National Highway System	<ul style="list-style-type: none"> Twin Cities Mobility Greater Minnesota Mobility Freight
System reliability – to improve the efficiency of the surface transportation system	<ul style="list-style-type: none"> Twin Cities Mobility Greater Minnesota Mobility Freight
Freight movement and economic vitality – to improve the national freight network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development	<ul style="list-style-type: none"> Freight Regional and Community Improvement Priorities
Environmental stability – to enhance the performance of the transportation system while protecting and enhancing the natural environment	<ul style="list-style-type: none"> Twin Cities Mobility Regional and Community Improvement Priorities
Reduced project delivery delays – to reduce project costs, promote jobs and the economy, and expedite the movement of people and goods by accelerating project completion through eliminating delays in the project development and delivery process, including reducing regulatory burdens and improving agencies' work practices	<ul style="list-style-type: none"> Project Delivery

Federal Planning Factors

Federal statutes² states that state transportation plans must also consider ten planning factors. **Table F-2** shows how federal planning factors influenced the development of MnSHIP investment categories.

¹ Source: 23 USC 135(d)(2); 23 CFR 450.206(c)

² Source: 23 USC 135(d)(1); 23 CFR 450.206(a)

Table F-2: Federal planning factors and related MnSHIP investment categories

FEDERAL PLANNING FACTORS	INVESTMENT CATEGORY
Support the economic vitality of the United States, the States, metropolitan areas, and non-metropolitan areas, especially by enabling global competitiveness, productivity and efficiency	<ul style="list-style-type: none"> • Twin Cities Mobility • Greater Minnesota Mobility • Freight • Regional and Community Improvement Priorities
Increase the safety of the transportation system for motorize and non-motorized users	<ul style="list-style-type: none"> • Traveler Safety • Bicycle Infrastructure • Accessible Pedestrian Infrastructure • Regional and Community Improvement Priorities
Increase the security of the transportation system for motorized and non-motorized users	<ul style="list-style-type: none"> • Regional and Community Improvement Priorities
Increase accessibility and mobility of people and freight	<ul style="list-style-type: none"> • Twin Cities Mobility • Greater Minnesota Mobility • Freight • Regional and Community Improvement Priorities
Protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and State and local planned growth and economic development patterns	<ul style="list-style-type: none"> • Twin Cities Mobility • Bicycle Infrastructure • Accessible Pedestrian Infrastructure
Enhance the integration and connectivity of the transportation system, across and between modes throughout the State, for people and freight	<ul style="list-style-type: none"> • Twin Cities Mobility • Greater Minnesota Mobility • Freight • Regional and Community Improvement Priorities
Promote efficient system management and operation	<ul style="list-style-type: none"> • Pavement Condition • Bridge Condition • Roadside Infrastructure • Jurisdictional Transfer • Facilities • Twin Cities Mobility • Greater Minnesota Mobility • Freight
Emphasize the preservation of the existing transportation system	<ul style="list-style-type: none"> • Pavement Condition • Bridge Condition • Roadside Infrastructure • Jurisdictional Transfer • Facilities
Improve the resiliency and reliability of the transportation system and reduce or mitigate stormwater impacts of surface transportation	<ul style="list-style-type: none"> • Regional and Community Improvement Priorities
Enhance travel and tourism	<ul style="list-style-type: none"> • Roadside Infrastructure • Facilities • Small Programs

State Transportation Goals

The Minnesota State Legislature has identified 16 statewide goals for transportation.³ These goals as a whole have guided transportation planning within the state and for MnDOT, especially the **Minnesota GO Vision** and the **Statewide Multimodal Transportation Plan**. MnSHIP continues their advancement by identifying how investments in various categories strive to address these goals. However, MnDOT's ability to make progress towards all 16 goals is compromised by fiscal constraints and MnSHIP's main priority of maintaining the existing system.

Table F-3 outlines the connections between the goals and the MnSHIP investment direction.

Table F-3: State transportation goals and related MnSHIP investments

STATE GOALS FOR THE TRANSPORTATION SYSTEM	INVESTMENT DIRECTION
Minimize fatalities and injuries throughout the state	<ul style="list-style-type: none"> Investment in Traveler Safety focuses on high priority, lower cost proactive projects and installing and reactive lighting projects at sustained crash locations Investment in Bicycle Infrastructure focuses on adding bicycle improvements to existing bridge and pavement projects to improve safety and connectivity of the state bikeway system Investment in Accessible Pedestrian Infrastructure focuses more investment in sidewalks, curb ramps, and accessible pedestrian signals to meet ADA requirements as well as making other pedestrian improvements via complete streets and completing gaps in the network on a limited basis
Accomplish these goals with minimal impact on the environment	<ul style="list-style-type: none"> The investment direction focuses investment to maintain the conditions of existing infrastructure such as roads, bridges, and roadside infrastructure over investment to expand the state highway system Investment in Bicycle Infrastructure and Accessible Pedestrian Infrastructure continue to promote these non-motorized transportation options
Reduce greenhouse gas emissions from the state's transportation sector	<ul style="list-style-type: none"> Investment in Twin Cities Mobility provides for two additional corridors with MnPASS express lanes and six spot mobility improvements to address travel time reliability and reduce idling and the emission of greenhouse gases. Investment in Bicycle Infrastructure and Accessible Pedestrian Infrastructure continue to promote these non-motorized transportation options
Promote and increase the use of high-occupancy vehicles and low-emission vehicles	<ul style="list-style-type: none"> Investment in Twin Cities Mobility provides for two additional corridors with MnPASS express lanes that provide advantages to transit vehicles and carpools.

³ Source: Minnesota State Statute 174.01, subd. 2; 174.02, subd. 1a.

STATE GOALS FOR THE TRANSPORTATION SYSTEM	INVESTMENT DIRECTION
<p>Ensure that the planning and implementation of all modes of transportation are consistent with the environmental and energy goals for the state</p>	<ul style="list-style-type: none"> • The investment direction focuses investment to maintain the conditions of existing infrastructure such as roads, bridges, and roadside infrastructure over investment to expand the state highway system. • Investment in Twin Cities Mobility provides for two additional corridors with MnPASS express lanes that provide advantages to transit vehicles and carpools and reduce idling and the emission of greenhouse gases. • Investment in Greater Minnesota Mobility focuses on improving travel time reliability through operational improvements that reduce idling and the emission of greenhouse gases at locations in Greater Minnesota. • Freight investment will implement improvements for highway freight through the National Highway Freight Program • Investment in Bicycle Infrastructure and Accessible Pedestrian Infrastructure continue to promote these non-motorized transportation options
<p>Increase access for all persons and businesses and ensure economic well-being and quality of life without undue burden placed on any community</p>	<ul style="list-style-type: none"> • Investment in Twin Cities Mobility provides for two additional corridors with MnPASS express lanes that provide advantages to transit vehicles and carpools and reduce idling and the emission of greenhouse gases • Investment in Greater Minnesota Mobility focuses on improving travel time reliability through operational improvements that reduce idling and the emission of greenhouse gases at locations in Greater Minnesota • Freight investment will implement improvements for highway freight through the National Highway Freight Program • Investment in Bicycle Infrastructure and Accessible Pedestrian Infrastructure continue to promote these non-motorized transportation options • Investment in Regional and Community Improvement Priorities continues economic development projects on a limited basis through the Transportation Economic Development program
<p>Provide an air transportation system sufficient enough to encourage economic growth and allow all regions of the state the ability to participate in the global economy</p>	<ul style="list-style-type: none"> • Emphasis on preservation through System Stewardship investments on the state highway system allows for safe and reliable transportation to and from airport • Freight investment is eligible for investment on highway freight connectors to important multimodal freight hubs such as airports through the National Highway Freight Program

STATE GOALS FOR THE TRANSPORTATION SYSTEM	INVESTMENT DIRECTION
Encourage tourism by providing appropriate transportation to Minnesota facilities designed to attract tourists and to enhance the appeal of tourist destinations across the state	<ul style="list-style-type: none"> Investment Roadside Infrastructure Condition allows for maintaining wayside pull offs and scenic overlooks popular along scenic byways Investment in Facilities includes maintaining rest areas which are popular among tourists and provide tourist information Investment in Small Programs addresses historic priorities which can include historic overlooks or roadside monuments which have a tourism draw
Enhance economic development and provide for economical, efficient, and safe movement of goods to and from markets by rail, highway, and waterway	<ul style="list-style-type: none"> Investment in Twin Cities Mobility provides for two additional corridors with MnPASS express lanes and six spot mobility improvements to address travel time reliability Investment in Greater Minnesota Mobility focuses on improving travel time reliability through operational improvements Freight investment will implement improvements highway freight through the National Highway Freight Program Investment in Regional and Community Improvement Priorities continues economic development projects on a limited basis through the Transportation Economic Development program
Increase use of transit as a percentage of all trips statewide by giving highest priority to the transportation modes with the greatest people-moving capacity and lowest long-term economic and environmental cost	<ul style="list-style-type: none"> Investment in Twin Cities Mobility provides for two additional corridors with MnPASS express lanes that provide advantages to transit vehicles and carpools
Promote and increase bicycling and walking as a percentage of all trips as energy-efficient, nonpolluting, and healthy forms of transportation	<ul style="list-style-type: none"> Investment in Bicycle Infrastructure and Accessible Pedestrian Infrastructure continues to promote these non-motorized transportation options
Provide transit service to all counties in the state to meet the needs of transit users	<ul style="list-style-type: none"> MnSHIP's scope does not include transit investments. The Greater Minnesota Transit Investment Plan addresses this state transportation goal

STATE GOALS FOR THE TRANSPORTATION SYSTEM	INVESTMENT DIRECTION
Provide a reasonable travel time for commuters	<ul style="list-style-type: none"> Investment in Twin Cities Mobility provides for two additional corridors with MnPASS express lanes and six spot mobility improvements to address travel time reliability Investment in Greater Minnesota Mobility focuses on improving travel time reliability through operational improvements
Promote accountability through systematic management of system performance and productivity through the utilization of technological advancements	<ul style="list-style-type: none"> The investment direction focuses investment on maintaining existing infrastructure such as roads, bridges, and roadside infrastructure over investment to expand the state highway system Investment in Twin Cities Mobility provides for two additional corridors with MnPASS express lanes and six spot mobility improvements to address travel time reliability Investment in Greater Minnesota Mobility focuses on improving travel time reliability through operational improvements
Maximize the long-term benefits received for each state transportation investment	<ul style="list-style-type: none"> The investment direction focuses investment on maintaining existing infrastructure such as roads, bridges, and roadside infrastructure over investment to expand the state highway system
Provide for and prioritize funding of transportation investments that ensures the state's transportation infrastructure is maintained in a state of good repair	<ul style="list-style-type: none"> The investment direction focuses investment to maintain the conditions of existing infrastructure such as roads, bridges, and roadside infrastructure over investment to expand the state highway system

Previous Five Year Capital Investment Analysis

As a part of state legislative requirements, MnSHIP must summarize the amount and analyze the impact of the department's capital investments and priorities over the past five years on performance targets, including a comparison of prior plan projected costs with actual cost. The five year investment look back analysis covers fiscal years 2012-2015. The analysis has been broken out by fiscal years 2012-2013 and 2014-2016. This is because two different state highway investment plans influenced these fiscal years. Fiscal years 2012 and 2013 were influenced by the 2009 Statewide 20-year Highway Investment Plan. Fiscal years 2014-2016 were influenced by the 2013 Minnesota 20-Year State Highway Investment Plan.

FISCAL YEARS 2012 AND 2013

There were many difficulties in analyzing planned investments compared to actual investment. The 2009 plan divided the 20 year investment direction into three time periods: years 2009-2012, years 2013-2018, and years 2019 to 2028. Each time period divided out the total investment in the time period by four strategic investment priorities: Traveler Safety, Infrastructure Preservation, Mobility, Regional and Community Improvement Priorities. In addition, the first four year period had a total investment set aside for right of way, consultants, and supplemental agreements which represents costs to deliver projects. After 2012 there was no investment identified for these costs.

However, actual investments in 2012 and 2013 were not tracked using these four strategic investment priorities. For this analysis, actual investments were grouped to try to mirror the four strategic investment priorities. Pavement, bridge and roadside infrastructure projects totals were combined to mirror Infrastructure Preservation. Stand alone safety projects and Highway Safety Improvement Program funded projects totals were combined to mirror Traveler Safety. Major construction projects and traffic management projects were combined to mirror Mobility. Municipal agreements costs were combined to mirror Regional and Community Improvement Priorities. Actual costs for right of way, use of consultants, and supplemental agreements were available and used for this analysis. [Table F-4](#) compares the planned investment in years 2012 and 2013 compared to the actual investment.

Table F-4: Comparison between planned and actual investment in fiscal years 2012 and 2013

STRATEGIC INVESTMENT PRIORITIES	PLANNED INVESTMENT	ACTUAL INVESTMENT
Infrastructure Preservation	\$1.21B	\$1.34B
Traveler Safety	\$179M	\$76M
Mobility	\$148M	\$316M
Regional and Community Improvement Priorities	\$84M	\$88M
Right of Way, Consultants, Supplemental Agreements	\$93M	\$366M
Total	\$1.72B	\$2.19B

Total investment is off for two reasons. The first reason is in fiscal year 2013, the 2009 plan did not try to estimate any investment for right of way, consultants or supplemental agreements. However, actual investments for these items are made for 2013. The second reason is that a new federal transportation bill (MAP-21) was passed in 2012 which slightly increased the amount of federal revenue to Minnesota.

FISCAL YEARS 2014, 2015, AND 2016

Starting in 2014, MnDOT began tracking investments by ten investment categories for planned investments as a part of 2013 Minnesota 20-Year State Highway Investment Plan and programming of investments in the Statewide Transportation Improvement Program. **Table F-5** compares the planned investment in years 2014 to 2016 compared to the actual investment.

Table F-5: Comparison between planned and actual investment in fiscal years 2012 and 2013

INVESTMENT CATEGORIES	PLANNED INVESTMENT	ACTUAL INVESTMENT
Pavement Condition	\$867M	\$988M
Bridge Condition	\$459M	\$537M
Roadside Infrastructure	\$201M	\$268M
Traveler Safety	\$96M	\$108M
Twin Cities Mobility	\$156M	\$221M
Interregional Corridor Mobility	\$0M	\$0M
Bicycle Infrastructure	\$30M	\$23M
Accessible Pedestrian Infrastructure	\$36M	\$47M
Regional and Community Improvement Priorities	\$171M	\$386M
Project Support	\$261M	\$436M
Total	\$2.28B	\$3.01B

Looking back to compare planned investment versus actual investment, the amount of total investment increases. This is due to two main factors:

- The state legislature created the Corridors of Commerce program in 2013 and provided \$300 million in trunk highway bonds for projects to be completed in fiscal years 2014 and 2015
- Truck highway bonds for the US Highway 53 relocation project
- Additional funding from the state legislature for creation of an Advanced Preservation Program
- A new federal transportation bill which increased federal revenues to the state

These additional funds are mainly reflected in the increase between planned investment and actual investment in Pavement Condition, Bridge Condition, Regional and Community Improvement Priorities and Twin Cities Mobility with some investment increases in other categories including Traveler Safety, and Project Support.

PERFORMANCE TARGETS

Pavement Condition Measures

Due to slight over investment in pavement from planned investment versus actual investment, condition of state highway pavements have generally improved in the past five years.

Table F-6: Pavement Condition from 2011-2015

MEASURES	TARGETS	2011	2012	2013	2014	2015
Interstate Poor Ride Quality (RQI)	2%	3.9%	2.4%	2.4%	1.9%	2.1%
Non-Interstate NHS Poor Ride Quality (RQI)	4%	5.1%	4.3%	2.9%	3.0%	2.7%
Non-NHS Poor Ride Quality (RQI)	10%	8.6%	7.5%	6.8%	4.4%	5.1%

Bridge Condition Measures

Over the past five years, bridge investments have limited the amount of bridges in poor condition between 3.0% and 4.7% on National Highway System (NHS) bridges and between 1.3% and 3.1% on non-NHS bridges.

Table F-7: Bridge Condition from 2011-2015

MEASURES	TARGETS	2011	2012	2013	2014	2015
NHS Bridges in Poor Condition	2%	3.3%	4.7%	3.3%	4.5%	3.0%
Non-NHS Bridges in Poor Condition	8%	2.0%	2.1%	3.1%	1.3%	3.1%

Traveler Safety Measures

While traffic fatalities have declined in recent years, it is difficult to tie the outcome directly to the investment in new safety improvements. MnDOT and the Department of Public Safety have also invested in the Towards Zero Death program which includes investment in non-engineering strategies including education, enforcement, and emergency response. However, through engineering improvements and non-engineering strategies, traffic fatalities have been decreasing over time. In year 2015, there was a sharp increase in traffic fatalities indicating that more still needs be done to accomplish the goal of zero traffic fatalities on Minnesota roads.

Table F-8: Traffic fatalities on Minnesota roadways from 2010-2015

MEASURE	2010	2011	2012	2013	2014	2015	2020
Traffic Fatalities	411	368	395	387	361	411	N/A
Targets	400	-	-	-	350	-	300

Twin Cities Mobility

Investment in Twin Cities Mobility have managed the growth of congestion on the state highway system. In 2015, congestion increases were mainly attributed to major construction projects in the Twin Cities on US Highway 169, MN Highway 100, and I-35E.

Table F-9: Congestion on Twin Cities Freeways from 2011-2015

MEASURE	2011	2012	2013	2014	2015
Twin Cities Freeway Congestion	21.0%	21.4%	19.9%	21.1%	23.4%

Accessible Pedestrian Measures

Accessible Pedestrian Infrastructure investments have mainly targeted bringing existing pedestrian infrastructure into compliance with the Americans with Disabilities Act. **Tables F-10, F-11, and F-12** show the compliance rates of sidewalks, curb ramps, and accessible pedestrian signals. Recent investments have not allowed MnDOT to make progress towards ADA compliance. One of the commitments in this MnSHIP update is to increase the amount of investment to reach ADA substantial compliance by 2037.

Table F-10: ADA sidewalk compliance from 2014 and 2015

MEASURES	TARGET	2014	2015
Percent of State Highway Sidewalk Miles Compliant with ADA Requirements	100%	54%	46%
Percent of State Highway Sidewalk Miles in Greater MN Compliant with ADA Requirements	100%	45%	41%
Percent of State Highway Sidewalk Miles in Metro District Compliant with ADA Requirements	100%	59%	55%

Table F-11: ADA curb ramp compliance from 2012 -2014

MEASURES	TARGET	2012	2013	2014
Percent of State Highway Curb Ramps Compliant with ADA Requirements	100%	18%	30%	28%

Table F-12: Accessible Pedestrian Signals compliance from 2011 -2015

MEASURES	TARGETS	2011	2012	2013	2014	2015
Percent of Eligible State Highway Intersections with APS Installed	100%	21%	28%	33%	36%	40%

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Minnesota **GO**
 A Collaborative Vision
 for Transportation

**20-Year
 State Highway
 Investment Plan**

Appendix G

PLANNING CONTEXT SUMMARY

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Federal Laws, Rules and Regulations

Several federal regulations inform the development of the 20-year State Highway Investment Plan. The requirements listed include changes from the most recent surface transportation bill, Fixing America's Surface Transportation Act, adopted in December 2015 and the Moving Ahead for Progress in the 21st Century Act, adopted in July 2012. MnSHIP, together with the Statewide Multimodal Transportation Plan and other MnDOT plans, meets the federal definition of a state transportation plan. According to federal regulations, a statewide transportation plan must:

- Have a minimum 20-year planning horizon at time of adoption
- Provide for the development and implementation of the multimodal transportation system
- Consider and include, as applicable, elements and connections between public transportation, non-motorized modes, rail, commercial motor vehicles, water, and aviation facilities, particularly with respect to intercity travel
- Reference any applicable plans, studies, policies, goals and objectives used in the development of the plan (e.g., transportation, safety, economic development, social and environmental effects or energy)
- Provide a reasonable opportunity for the general public and interested parties to comment on the proposed plan
- Be published in electronically accessible formats

The statewide transportation plan may include a financial plan that:

- Demonstrates how the adopted statewide transportation plan can be implemented
- Indicates resources from public and private sources that are reasonably expected to be made available to carry out the plan
- Recommends any additional financing strategies for needed projects and programs

For illustrative purpose, additional projects can be included in the adopted statewide transportation plan if additional resources beyond those identified in the financial plan were available. There is no requirement for states to select any project from the illustrative list of additional projects.

Source: 23 USC 135 (f)(1), (f)(3) (5) (6) (8); 23 CFR 450.214(a), (c), (k), (n)¹

¹ Unless otherwise noted, all 23 CFR 450 references are to the rules enacted on February 14, 2007.

FEDERAL PLANNING FACTORS

Statewide transportation plans must consider ten planning factors:

- Support the economic vitality of the United States, the States, metropolitan areas, and non-metropolitan areas, especially by enabling global competitiveness, productivity and efficiency
- Increase the safety of the transportation system for motorized and non-motorized users
- Increase the security of the transportation system for motorized and non-motorized users
- Increase accessibility and mobility of people and freight
- Protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and State and local planned growth and economic development patterns
- Enhance the integration and connectivity of the transportation system, across and between modes throughout the State, for people and freight
- Promote efficient system management and operation
- Emphasize the preservation of the existing transportation system
- Improve the resiliency and reliability of the transportation system and reduce or mitigate stormwater impacts of surface transportation²
- Enhance travel and tourism²

Source: 23 USC 135(d)(1); 23 CFR 450.206(a)

PERFORMANCE-BASED INVESTMENT PLANNING

MAP-21 has direct implications for need and investment guidance outlined in the MnSHIP update. The Federal Highway Administration will identify performance measures for pavement, bridge, traveler safety, and mobility. These are outlined below:

- Pavement (by lane mile) – percent of Interstate in poor/good conditions; percent of Non-Interstate NHS in poor/good conditions
- Bridge (by deck area) – percent of NHS bridges in poor/good conditions
- Traveler safety (5-year rolling averages, all roads) – fatalities and fatality rate (per 100 million vehicle miles traveled); serious injuries and serious injury rate (per 100 million vehicle miles traveled)

² New federal planning factors identified in the FAST Act.

- **Mobility** – annual travel time delay and reliability index for all roadway users
- **Freight Mobility** - annual travel time delay and reliability index specific to highway freight movement. The statewide planning process must integrate, either directly or by reference, the goals, objectives, performance measures and targets developed to meet the MAP-21 requirements, those included in other state transportation plans and processes, or as developed by public transportation providers not represented by MPOs. The state must consider these performance measures and targets when developing policies, programs and investment priorities.

Statewide transportation plan must provide for the establishment and use of a performance-based approach to transportation decision-making that supports the national goals:

- **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 and economic vitality** – 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 stability** – to enhance the performance of the transportation system while protecting and enhancing the natural environment
- **Reduced project delivery delays** – to reduce project costs, promote jobs and the economy, and expedite the movement of people and goods by accelerating project completion through eliminating delays in the project development and delivery process, including reducing regulatory burdens and improving agencies' work practices

The selection of performance targets must be coordinated with MPOs to ensure consistency. In areas not represented by MPOs, the selection of public transportation performance targets must be coordinated with public transportation providers.

Source: 23 USC 135(d)(2), 23 CFR 450.206(c)³

STATE FREIGHT PLAN REQUIREMENT

The FAST Act created the requirement for a state freight plan. Each state shall develop a freight plan that provides a comprehensive plan for the immediate and long-range planning activities and investments of the State with respect to freight. The state freight plan may be developed separately from or incorporated into the statewide strategic long-range transportation plan and shall have a plan horizon of 5 years. The plan must include a freight investment plan that includes a list of priority projects to be funded by the highway freight formula program and describes how funds would be invested and matched. See Statewide Freight System Plan in Section 3.

Source: 49 USC 70202

COOPERATION AND CONSULTATION

The statewide transportation plan must be developed in cooperation⁴ with metropolitan planning organizations and nonmetropolitan officials with the responsibility for transportation, and in consultation with tribal governments and State, tribal and local agencies responsible for land use management, natural resources, environmental protection, conservation and historic preservation.

Source: 23 USC 135 (f)(2); 23 CFR 450.214(f)-(i)

ENVIRONMENTAL MITIGATION

The statewide transportation plan must include a discussion of potential environmental mitigation activities and potential areas to carry out these activities. This discussion must be developed in consultation with federal, state and tribal wildlife, land management and regulatory agencies.

Source: 23 USC 135 (f)(4); 23 CFR 450.214 (j)

ENVIRONMENTAL JUSTICE

The statewide transportation plan must identify and address disproportionately high and adverse human health or environmental effects on minority and low-income populations. Compliance is demonstrated through the public participation plan and an analysis of the plan's recommendations.

Source: Executive Order 12898, US DOT Order 5610.2(a) (2012), FHWA Order 6640.23A (2012), FTA Circular 4703.1 (2012)

³ Proposed planning rules published June 2, 2014.

⁴ 23 CFR 450.214(g) notes consultation with non-metropolitan local officials. The proposed rulemaking issued on June 2, 2014, changes consultation to cooperation.

GOVERNMENT ACCOUNTING STANDARDS BOARD STATEMENT 34

The Government Accounting Standards Board Statement 34 calls for state, local, and municipal governments to more closely align government financial reporting practices with those that are presently used by proprietary funds and for corporate-style accounting.

GASB 34 establishes methods for governments to be more accountable to bond market analysts and underwriters, citizens, and other financial users. The Statement provides for a comprehensive understanding of a government's financial position, making transparent the ability to repay long-term debt and deal with infrastructure maintenance obligations.

The annual reports give government officials a more comprehensive way to demonstrate their stewardship in the long term, in addition to the way they currently demonstrate their stewardship in the short term and through the budgetary process.

Governments may choose to report how much of the estimated original cost of the infrastructure has been depreciated, or, if they meet certain requirements, report as expense the cost to maintain and renew that infrastructure on an annual basis (modified approach). Those requirements are that the government agency must inventory and assess the condition of the assets, decide on a minimum level of acceptable condition, estimate the amount necessary to maintain and renew the assets, and then demonstrate that investment has been sufficient to maintain the target condition level established by the government. This information is included in the Required Supplementary Information section of the annual State of Minnesota Comprehensive Annual Financial Report.

Source: Government Accounting Standards Board Statement 34

State Laws and Regulations

STATE TRANSPORTATION GOALS

State multimodal transportation plans must be updated every four years, incorporate the 16 state transportation goals (listed below); establish objectives, policies and strategies for achieving the goals; and identify performance targets for measuring progress and achievement of the goals, objectives or policies.

- Minimize the fatalities and injuries for transportation users throughout the state
- Provide multimodal and intermodal transportation facilities and services to increase access for all persons and businesses and to ensure economic well-being and quality of life without undue burden placed on any community
- Provide a reasonable travel time for commuters
- Enhance economic development and provide for the economical, efficient, and safe movement of goods to and from markets by rail, highway, and waterway
- Encourage tourism by providing appropriate transportation to Minnesota facilities designed to attract tourists and to enhance the appeal, through transportation investments, of tourist destinations across the state
- Provide transit services to all counties in the state to meet the needs of transit users
- Promote accountability through systematic management of system performance and productivity through the utilization of technological advancements
- Maximize the long-term benefits received for each state transportation investment
- Provide for and prioritize funding of transportation investments that ensures that the state's transportation infrastructure is maintained in a state of good repair
- Ensure that the planning and implementation of all modes of transportation are consistent with the environmental and energy goals of the state
- Promote and increase the use of high-occupancy vehicles and low-emission vehicles

- Provide an air transportation system sufficient to encourage economic growth and allow all regions of the state the ability to participate in the global economy
- Increase use of transit as a percentage of all trips statewide by giving highest priority to the transportation modes with the greatest people-moving capacity and lowest long-term economic and environmental cost
- Promote and increase bicycling and walking as a percentage of all trips as energy-efficient, nonpolluting, and healthy forms of transportation
- Reduce greenhouse gas emissions from the state's transportation sector
- Accomplish these goals with minimal impact on the environment

Source: Minnesota State Statute 174.01, subd. 2; 174.02, subd. 1a.

STATE STATUTES FOR TRANSPORTATION PLANNING

Statewide Multimodal Transportation Plan

The commissioner shall revise the statewide multimodal transportation plan by January 15, 2013, and by January 15 of every four years thereafter. Before final adoption of a revised plan, the commissioner shall hold a hearing to receive public comment on the preliminary draft of the revised plan.

Each revised statewide multimodal transportation plan must:

- incorporate the goals of the state transportation system;
- establish objectives, policies, and strategies for achieving those goals; and
- identify performance targets for measuring progress and achievement of transportation system goals, objectives, or policies.

Source: Minnesota State Statute 174.03, subd. 1a

20-Year Statewide Highway Capital Investment Plan

By January 15, 2013, and in conjunction with each future revision of the statewide multimodal transportation plan, the commissioner shall prepare a 20-year statewide highway capital investment plan that:

- incorporates performance measures and targets for assessing progress and achievement of the state's transportation goals, objectives, and policies identified in this chapter for the state trunk highway system, and those goals, objectives, and policies established in the statewide multimodal transportation plan. Performance targets must be based on

objectively verifiable measures, and address, at a minimum, preservation and maintenance of the structural condition of state highway bridges and pavements, safety, and mobility;

- summarizes trends and impacts for each performance target over the past five years;
- summarizes the amount and analyzes the impact of the department's capital investments and priorities over the past five years on each performance target, including a comparison of prior plan projected costs with actual costs;
- identifies the investments required to meet the established performance targets over the next 20-year period;
- projects available state and federal funding over the 20-year period, including any unique, competitive, time-limited, or focused funding opportunities;
- identifies strategies to ensure the most efficient use of existing transportation infrastructure, and to maximize the performance benefits of projected available funding;
- establishes investment priorities for projected funding, including a schedule of major projects or improvement programs for the 20-year period together with projected costs and impact on performance targets; and
- identifies those performance targets identified under clause (1) not expected to meet the target outcome over the 20-year period together with alternative strategies that could be implemented to meet the targets.

Source: Minnesota State Statute 174.03, subd. 1c

OLMSTEAD PLAN

As a result of a suit brought against the Minnesota Department of Human Services, the state came to an agreement to develop a Minnesota Olmstead Plan, which was adopted in November 2013. The plan's overall goal is to guide state agencies on how to integrate and include people with disabilities within state policies and services. As it related to transportation, the Olmstead plan requires that "people with disabilities will have access to reliable, cost-effective, and accessible transportation choices that support the essential elements of life such as employment, housing, education, and social connections. As a result MnDOT has taken action to address the needs of people with disabilities by instituting changes to its policies and business.

Source: Minnesota's 2013 Olmstead Plan

TRIBAL CONSULTATION

In addition to federal consultation requirement, a state executive order also directs MnDOT to consult with the state's 12 federally recognized tribes as it develops and implements policies and programs that directly affect Indian tribes and their members.

Source: Governor Executive Order 03-05

PLAIN LANGUAGE

All state agencies must communicate using plain language. Plain language is communication which an audience can understand the first time they read it or hear it. Language that is plain to one set of readers may not be plain to others. While plain language does not prohibit the use of jargon and other specialty terms, it asks writers to replace complex words with simpler words.

Source: Governor Executive Order 14-07

MnDOT Family of Plans

MINNESOTA GO 50-YEAR VISION

The Minnesota GO vision presents a set of long-range outcomes for transportation in the state that may take up to 50 years to be fully realized. This vision and guiding principles are intended to be used by all agencies responsible for transportation planning, construction and delivery in Minnesota to inform their investment and service decisions. Below is the vision and guiding principles.

Minnesota's multimodal transportation system maximizes the health of people, the environment and our economy. The system:

- Connects Minnesota's primary assets—the people, natural resources and businesses within the state—to each other and to markets and resources outside the state and country
- Provides safe, convenient, efficient and effective movement of people and goods
- Is flexible and nimble enough to adapt to changes in society, technology, the environment and the economy

Quality of Life

- Recognizes and respects the importance, significance and context of place – not just as destinations, but also where people live, work, learn, play and access services
- Is accessible regardless of socio-economic status or individual ability

Environmental Health

- Is designed in such a way that it enhances the community around it and is compatible with natural systems
- Minimizes resource use and pollution

Economic Competitiveness

- Enhances and supports Minnesota's role in a globally competitive economy as well as the international significance and connections of Minnesota's trade centers
- Attracts human and financial capital to the state

Guiding Principals

- **Leverage public investments to achieve multiple purposes:** The transportation system should support other public purposes, such as environmental stewardship, economic competitiveness, public health and energy independence.
- **Ensure accessibility:** The transportation system must be accessible and safe for users of all abilities and incomes. The system must provide access to key resources and amenities throughout communities.
- **Build to a maintainable scale:** Consider and minimize long-term obligations—don't overbuild. The scale of the system should reflect and respect the surrounding physical and social context of the facility. The transportation system should affordably contribute to the overall quality of life and prosperity of the state.
- **Ensure regional connections:** Key regional centers need to be connected to each other through multiple modes of transportation.
- **Integrate safety:** Systematically and holistically improve safety for all forms of transportation. Be proactive, innovative and strategic in creating safe options.
- **Emphasize reliable and predictable options:** The reliability of the system and predictability of travel time are frequently as important or more important than speed. Prioritize multiple multimodal options over reliance on a single option.
- **Strategically fix the system:** Some parts of the system may need to be reduced while other parts are enhanced or expanded to meet changing demand. Strategically maintain and upgrade critical existing infrastructure.
- **Use partnerships:** Coordinate across sectors and jurisdictions to make transportation projects and services more efficient

Source: [Minnesota GO Vision](#)

STATEWIDE MULTIMODAL TRANSPORTATION PLAN (2012)

The Statewide Multimodal Transportation Plan is Minnesota's highest level policy plan for transportation. It translates the Minnesota GO 50-year Vision into policy direction for all types of transportation and for all transportation partners. The plan starts to answer the question- how are we going to achieve the Vision? The policy objectives and strategies developed in the SMTP guides the development of system and modal plans including MnSHIP. The

SMTP is structured around six policy objectives:

- **Accountability, Transparency and Communication** addresses how MnDOT and other transportation partners make decisions and communicate those decisions to each other and to the public.
- **Traveler Safety** focuses on how we ensure safe travel for all users on all types of transportation.
- **Transportation in Context** looks at all the areas that impact and are impacted by transportation such as land use, the environment and the economy.
- **Critical Connections** addresses how all types of transportation work together to create a multimodal transportation system.
- **Asset Management** focuses on how we maintain the infrastructure we have.
- **System Security** looks at the role the transportation system plays in keeping Minnesota running and Minnesotans safe.

These six policy objectives are supported by 33 strategies which provide more targeted direction to MnDOT and partners.

Implications for MnSHIP

As a system investment plan, MnSHIP serves to link the Minnesota GO Vision and the Statewide Multimodal Transportation Plan objectives and strategies with capital investments on the state highway system. While considering all objective areas and strategies in the SMTP, MnSHIP focuses heavily on the objective areas of Asset Management, Traveler Safety, Critical Connections, and Transportation in Context and the strategies which relate to the state highway system.

STATE AVIATION SYSTEM PLAN

The State Aviation System Plan provides a description and assessment of the performance of the current aviation system as well as guidance for the future development of aviation in Minnesota. SASP has five goals: safety; mobility; financial opportunity and responsibility; operations; and asset management. The goals are designed to help meet Minnesota's vision for aviation which aims to provide safe, fast, and reliable air transportation for citizens and businesses through partnership and innovation. The Plan also identified trends that impact the aviation system such as increasing fuel prices, leveling of passenger demand, changes to fleet, and aging airport infrastructure.

Implications for MnSHIP

The State Aviation System Plan focuses on the state system of airports infrastructure and operations and does not address the state highway system. Therefore, there are no implications for MnSHIP.

Source: [Minnesota Statewide Aviation System Plan](#)

STATEWIDE BICYCLE SYSTEM PLAN

The Statewide Bicycle System Plan is a policy plan which outlines goals and strategies for MnDOT to invest in bicycle facilities across the state and increase ridership. The goals of the plan include:

- **Safety and comfort:** Build and maintain safe and comfortable bicycling facilities for people of all ages and abilities
- **Local bikeway connections:** Support regional and local bicycling needs
- **State bikeway connections:** Develop a connected network of state bikeways in partnership with national, state, regional and local stakeholders
- **Ridership:** Increase the number of bicycle trips made by people who already bike and those who currently do not

The key findings of the plan include:

- State bikeways create opportunities for inter-community travel across the state and beyond.
- The public values state bikeways, but people value opportunities for local and regional bicycle travel more.
- People prefer riding on facilities that are separated from motor vehicle traffic.

Implications for MnSHIP

The Statewide Bicycle System Plan provides guidance for implementation of bicycle improvements for local and regional bicycle connections, a state bikeway network, and separated bicycle facilities. The plan's investment guidance differs from the 2013 MnSHIP in that it specifically calls for investments on a combination of local roads, trails and highways to better build out network. It prioritizes local and regional connections over statewide connections by recommending 70 percent of investments fund projects that support local and regional networks with the rest invested in a State Bikeway Network. Local improvements and facilities may be along or across a state highway. The plan identifies several statewide bikeway corridors to create the Statewide Bikeway Network. The plan does not identify specific facilities,

whether roadways or trails, these statewide bikeway routes will be located on but it does state facilities that separate bicyclists from motor vehicle traffic, such as separated bike lanes, are preferred investments. Further discussion with the districts will identify whether a portion of a state bikeway is located on a state highway.

Source: [Statewide Bicycle System Plan](#)

STATEWIDE FREIGHT SYSTEM PLAN

Minnesota's Statewide Freight System Plan, completed in 2016, provides a policy framework and strategies for MnDOT and other freight stakeholders to guide planning and investment in various transportation modes. Developed cooperatively with private and other public entities, the comprehensive plan also provides guidelines in project development and operational decisions, all in accordance with the Moving Ahead for Progress in the 21st Century Act.

The Statewide Freight System Plan highlights best practices, strategies, and cooperative partnerships/associations, while also addressing other federal and Minnesota initiatives.

Implications for MnSHIP

The Statewide Freight System Plan identifies a Principal Freight Network, performance measures, and strategies. The Principal Freight Network represents a multimodal network of highways, rail corridors, airports, waterways, ports, and pipelines which are critical to freight access and mobility. The plan identifies the National Highway System as the priority network for trucking. The Freight Plan also recommends performance measures and indicators for freight movement and economic vitality, safety and infrastructure condition for trucking. With the passage of the FAST Act, additional funding for freight projects will be invested based on MnSHIP guidance. An update to the Statewide Freight System Plan will include an investment plan section that will outline priorities for the NHS and Principal Freight Network.

Source: [Statewide Freight System Plan](#)

GREATER MINNESOTA TRANSIT INVESTMENT PLAN

The Greater Minnesota Transit Investment Plan is a policy and investment plan that defines the vision, policies, and strategies for transit in Greater Minnesota. The Greater Minnesota Transit Investment Plan identifies specific priorities for future transit investment. These investment priorities connect the goals of the policy plan to MnDOT's annual funding allocation to individual transit systems. The goal of the plan is to reduce the unmet transit service needs by market research, technical analysis and public outreach. The Minnesota legislature set requirements to meet 80 percent of the total transit service needs in Greater

Minnesota by 2015, 90 percent of the need by 2025 and identify costs of meeting 100 percent of total transit service needs every five years from 2010 to 2030. The investment priorities are associated with different funding levels, with differing priorities if more or less funding is allocated towards Greater MN Transit.

Implications for MnSHIP

The update to the Greater Minnesota Transit Investment Plan is currently underway with expected completion by the summer of 2016. Investment priorities for the Greater Minnesota Transit Investment Plan are dependent on the funding available. If funding increases, priority will be to expand the system. If funding remains constant, the priority will be to preserve the existing system. If funding decreases, the priority will be to reduce the system.

Source: [Greater Minnesota Transit Investment Plan](#)

STATE RAIL PLAN

The purpose of the State Rail Plan is to guide the future of both freight and passenger (intercity) rail systems and rail services in the state. The plan has a list of goals and policy objectives that are designed to maintain and ensure broad access to competitive freight rail services throughout the state. The plan hopes to better integrate rail into the public planning process and recommends actively pursuing public-private partnerships. It also identified several trends that effect rail operations such as crude-by-rail shipments, Taconite production, growth of corn and corn-derived products and other economic shifts that impact freight rail.

Implications for MnSHIP

The State Rail Plan has implications for MnSHIP as it relates to at-grade rail crossing safety and improvements. At-grade crossings improvements are identified as a part of the Traveler Safety investment category in MnSHIP.

Source: [State Rail Plan](#)

Other MnDOT Supporting Plans

HIGHWAY SYSTEMS OPERATIONS PLAN

The Highway Systems Operations Plan (HSOP 2012 – 2015) documents policy, strategies, performance targets and investment priorities for maintenance and operations-related activities. The plan provides a framework for managing key operations and maintenance activities throughout Minnesota, supports the MnDOT's strategic direction, and complements other strategic planning efforts, such as the District Highway Investment Plans, which focus on capital infrastructure needs. In addition, the plan builds on prior efforts for performance-based planning and data-driven decision-making by establishing operations and maintenance performance measures and targets.

Implications for MnSHIP

While the latest HSOP planning period was from 2012-2015 it is important to still consider the implications MnSHIP capital investments have on operational and maintenance needs. Additionally, capital investment decisions can impact how well MnDOT meets state road operations and maintenance performance measures and targets as established in HSOP.

Source: [Highway Systems Operations Plan](#)

TRANSPORTATION ASSET MANAGEMENT PLAN

The Transportation Asset Management Plan (TAMP) serves as an accountability and communication tool and informs established capital and operations planning efforts. In addition to being a federal requirement, the TAMP is a planning tool by which MnDOT more thoroughly evaluates risks and develops mitigation strategies, analyzes life-cycle costs, establishes asset condition performance measures and targets, and develops investment strategies. It formalizes and documents the following key information to meet MAP-21 federal requirements, into a single document:

- Description and condition of pavements and bridges on the NHS
- Asset management objectives and measures
- Summary of gaps between targeted and actual performance
- Life-cycle cost and risk management analysis
- Financial plan that addresses performance gaps
- Investment strategies and anticipated performance

The TAMP document is accompanied by a TAMP Technical Guide, which provides further detail about the process, methodology analyses, and

procedures used during its development. The TAMP Technical Guide is designed to roughly parallel the main TAMP with nine sections, each of which corresponds to a specific TAMP chapter.

Implications for MnSHIP

Through the TAMP process, assets such as pavements, bridges, hydraulic infrastructure, other traffic structures identified recommended performance targets and life-cycle costs. Additional assets such as signs, lighting, and ITS infrastructure are currently in the asset management planning process and have draft performance targets. With these additional performance targets and life-cycle cost data better informing the investments levels required to maintain state highway infrastructure, MnSHIP will increasingly base its investment direction on decisions made using performance based planning.

MnSHIP can also influence the adoption of performance measures or targets by inclusion of these in the plan. Per the MnDOT Performance Measure and Target Adoption Policy all measures or targets included in a statewide plan/program that undergoes a formal public comment period are formally adopted when the plan/program is adopted.

Source: [Transportation Asset Management Plan](#)

ADA TRANSITION PLAN (2010)

The ADA Transition Plan details how MnDOT will ensure that all of its facilities, services, programs, and activities, are accessible to all individuals. The ADA Transition Plan identified five policy objectives:

- Compile self-evaluations of MnDOT's physical assets and current policies and practices, spanning eight areas: fixed work sites, rest areas, accessible pedestrian signals, curb ramps and sidewalks, pedestrian bridges, Greater Minnesota Transit, policies, and maintenance.
- Implement Correction Programs to address barriers identified in self-evaluations, and to improve facilities that do not meet MnDOT's Public Right-of-Way Accessibility Guidance.
- Provide grievance procedure for facility users to file complaints that MnDOT has not provided reasonable accommodations.
- Ensure compliance with ADA, MNIT, and MnDOT's communications requirements, including MNIT's web content accessibility guidelines (WCAG), MnDOT's public participation guidance, and contract language that includes accessible documents as a required part of deliverables.
- Provide agency-wide training on ADA and Title II requirements, MnDOT policies and procedures, and technical training on design, construction, maintenance, and inspection.

Implications for MnSHIP

The Minnesota State Highway Investment Plan must consider accessibility in the planning process and investment direction of the state highway system. During the planning process, the project team must consider the accessibility of the project website and project materials which will be made public or published with the final planning document. MnSHIP needs to consider the ADA Transition Plan when selecting the investment direction and the impact the investment direction will have on the timeline to reach substantial ADA compliance. Through the ADA Transition Plan, MnDOT details how the organization will ensure that all of its facilities, services, programs and activities are accessible to all individuals.

STATEWIDE INTELLIGENT TRANSPORTATION SYSTEMS PLAN

The purpose of the Statewide Intelligent Transportation Systems Plan (SITSP) is to identify immediate, short-term, and mid-term Intelligent Transportation Systems (ITS) needs to meet the goals and objectives identified in MnDOT's 50 year vision. ITS is defined as the application of advanced sensor, computers, electronics, communication technologies, and management strategies—in an integrated manner—to improve the safety and efficiency of the surface transportation system. This definition encompasses a broad array of systems and information processing and communications technologies.

Implications for MnSHIP

The plan includes three investment scenarios: a fiscally constrained investment scenario; a scenario focused on asset management of existing infrastructure; and an optimized investment scenario. After choosing an investment scenario, steps will need to be taken to realign investment at the district and agency level which would involve both near term fiscal and organizational steps. Additionally, there are key performance measures and indicators associated with each goal: safety, mobility, fiscal, operations, and consistency.

Source: [Statewide Intelligent Transportation Systems Plan](#)

STRATEGIC HIGHWAY SAFETY PLAN

The Minnesota Strategic Highway Safety Plan provides insight and direction on how to reduce traffic-related crashes that involve motor vehicles on all Minnesota roads. It describes how many, where, what type and to whom motor vehicle crashes occur. Although there is no defined policy objectives included in the SHSP, the document outlined trends that relate to overall transportation safety, (i.e. aging and increasingly diverse population, technology, increased urban settings, and health impacts). The plan contains investment priorities which represent factors that contribute to crashes and provide context for

setting future traffic safety priorities. The primary focus areas identified for Minnesota during the next several years are: traffic safety culture and awareness; intersections; lane departure; unbelted occupants; impaired roadway users; inattentive drivers; speed. Additionally, the plan discussed the role of collaboration with stakeholders, such as the Department of Health, law enforcement, counties and cities, and schools.

Implications for MnSHIP

The plan has priorities for different areas of the state base on factors that contribute to crashes and provide context for setting future traffic safety priorities. The primary focus areas identified for Minnesota during the next several years are: traffic safety culture and awareness; intersections; lane departure; unbelted occupants; impaired roadway users; inattentive drivers; speed.

Source: [*Strategic Highway Safety Plan*](#)

Other Policies and Initiatives

COMPLETE STREETS

Complete streets policy considers and balances the needs of all transportation users. From a system planning level, MnDOT's technical memorandum states:

- MnSHIP and district plan must consider the needs of all users.
- Modal plans should identify system condition and needs to prioritize projects and work towards systems and networks that eliminate or minimize the impact of system and network gaps and barriers for all users.
- Multi-jurisdictional coordination, collaboration, partnering and planning is key for efficient and effective system planning for all modes.
- MnDOT must undertake early, continuous and meaningful public involvement, including reaching out to populations that may be underrepresented or underserved by the transportation system.

Source: [Technical Memorandum No. 14-08-TS-02 \(June 2014\)](#)

COST PARTICIPATION

MnDOT's cost participation policy is a framework to determine the potential expenditure of trunk highway funds on elements of cooperative construction projects and maintenance. The policy allows for the shared cost of construction and subsequent maintenance with local units of governments on a mutually beneficial transportation project on the state highway system.

Source: [Cost Participation Policy](#)

ENHANCING FINANCIAL EFFECTIVENESS

MnDOT's strategic priority is enhancing financial effectiveness. Focusing on this priority will reinforce stakeholder trust and confidence that MnDOT effectively and efficiently uses public resources. MnDOT identified four key teams:

- Information and outreach team – communicate progress and actions taken to demonstrate efficient and effective use of public resources
- Project management team – optimize letting schedules and processes to better plan resources to deliver projects on time, and improve project scoping, project risk management and contingency funding throughout the project
- Asset management team – make investment decisions that preserve



and enhance the condition of MnDOT's assets, reduce agency risk, and minimize life cycle costs while continuing to meet the expectations of the traveling public

- Financial management team – develop a products and services framework for budgeting and demonstrate cost saving efficiencies in how MnDOT implements its program and operates as an agency

Source: <http://ihub.dot.state.mn.us/efe/index.html>

PERFORMANCE MEASURES AND TARGET POLICY

The Minnesota Department of Transportation (MnDOT) formally adopts performance measures and targets through public planning processes or through review and approval by designated management groups. MnDOT carefully considers existing commitments, relative priorities and tradeoffs when adopting or modifying performance measures and targets. The policy provides a uniform process for adopting, revising, and retiring performance measures and targets. It also identifies roles and responsibilities and provides clear direction to MnDOT decision-makers and staff seeking to adopt, revise, or retire performance measures and targets. Furthermore, the policy clarifies the status of existing performance measures and targets and provides a basis for reviewing and approving measure and target proposals. Finally, the Performance Measures and Targets Policy ensures that MnDOT meets various state and federal laws.

Source: [Performance Measures and Target Policy](#)

METROPOLITAN PLANNING ORGANIZATIONS LONG RANGE PLANS

There are 11 Long Range Transportation Plans by MPOs which focus on multimodal transportation investments in their respective urban areas over the next 20-25 years. The plans contain policy objectives to maximize the region's economic competitiveness, livability, health and safety, among other socioeconomic indicators.

IMPLICATIONS FOR MNSHIP

The implications of MPO plans for MnSHIP includes coordinating on any projects that involve or include trunk highways and working with the organizations to ensure that their investment priorities are reflected in MnSHIP. Nearly all MPO plans identified investment priorities which consist of a multi-modal focus of investments, and working with other agencies, including MnDOT, to optimize their local investments. The plans have also placed an emphasis on maintaining and preserving the system and finding non-expansion type solutions to improve mobility.

TRIBAL TRANSPORTATION PLANS

The state has six Tribal Transportation Plans which provide a framework for investing in, and maintaining roads on Indian Reservations. These are required by the Bureau of Indian Affairs and are used to assess needs and plan for growth within their jurisdiction.

IMPLICATIONS FOR MNSHIP

Since the Tribal Transportation Plans pertain to investments and management of roadways completely within a tribe's reservation or boundary, there are no significant implications for MnSHIP to consider. There are investment priorities which involve railroad crossings that might need to be coordinated through MnDOT's rail and bridge offices as the planning of those projects advance.



20-Year State Highway Investment Plan

Appendix H

ENVIRONMENTAL JUSTICE ANALYSIS

ENVIRONMENTAL JUSTICE ANALYSIS

MnSHIP provides the framework for MnDOT decision-making and for prioritizing investments on Minnesota's highway system. This appendix provides an analysis of how investment priorities established in MnSHIP may positively or negatively impact the state's environmental justice populations. Similar to the [Statewide Multimodal Transportation Plan](#), this environmental justice analysis is general and qualitative in nature. This is due to the fact that while MnSHIP identifies investment categories for implementation over the next 20 years, specific project details and associated details such as potential project limits and impacts have not yet been identified.

As protocol, MnDOT addresses environmental justice concerns for individual projects at the time of scoping and planning to analyze whether proposed activities may result in disproportionate impacts as the projects progress.

This appendix includes the following information:

- Environmental justice introduction
- Summary of environmental justice populations in Minnesota as presented in the Statewide Multimodal Transportation Plan
- MnSHIP's public involvement activities
- How MnSHIP investment direction and investment categories relate to environmental justice populations
- How Minnesota environmental justice populations may be affected by investments on the state highway system

ENVIRONMENTAL JUSTICE OVERVIEW

Presidential Executive Order 12898, issued in 1994, directed each federal agency to "make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies and activities on minority and low-income populations."¹ The order builds on Title VI of the Civil Rights Act of 1964 which prohibits discrimination on the basis of race, color or national origin. The order also provides protection to low-income groups.

There are three fundamental principles of environmental justice:

- To avoid, minimize or mitigate disproportionately high and adverse human

¹ Executive Order 12898, Federal Actions to Address Environmental Justice in Minority and Low-Income Populations

health and environmental effects, including social and economic effects, on minority and low-income populations

- To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process
- To prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations

The Executive Order and subsequent orders by the U.S. Department of Transportation define minority and low-income populations as:

- Black – a person having origins in any of the black racial groups of Africa
- American Indian and Alaskan Native – a person having origins in any original people of North America and who maintains cultural identification through tribal affiliation or community recognition
- Asian – a person having origins in any of the original peoples of the Far East, Southeast Asia or the Indian subcontinent
- Native Hawaiian or Other Pacific Islander – a person having origins in any of the original peoples of Hawaii, Guam, Samoa and other Pacific Islands
- Hispanic – a person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race
- Low-income – a person whose household income (or in the case of a community or group, whose median household income) is at or below the U.S. Department of Health and Human Services poverty guidelines

While not specifically identified by Title VI or the Executive Order, MnDOT chose to expand its environmental justice analyses to include four additional population groups with unique transportation needs.

- Persons age 65 and older
- Persons age 17 and younger
- Households with limited English proficiency
- Households with zero vehicles

MINNESOTA'S ENVIRONMENTAL JUSTICE POPULATIONS

The following section provides a summary of environmental justice populations in Minnesota as defined in the *Statewide Multimodal Transportation Plan*. Based on the 2010-2014 American Community Survey, it is estimated that 5.38 million persons lived in Minnesota in 2014 (up from 5.30 million in 2010). **Table H-1** shows Minnesota's 2014 estimated population based on race, ethnicity, age, limited English proficiency households, low-income individuals, and households with zero vehicles.

As noted in the **Table H-1**:

- 85.2 percent of Minnesota's population is white
- Minnesota's black population is the state's largest minority population (5.4 percent), closely followed by the Hispanic (4.9 percent) and Asian populations (4.3 percent)
- Persons age 65 and older account for 13.6 percent of the state's population, while those 17 and under account for 23.8 percent
- 11.5 percent of Minnesotans are below the poverty level
- 4.3 percent of Minnesotans speak English less than "very well"
- 7.3 percent of Minnesotan households do not own a vehicle

While **Table H-1** provides a statewide overview, population is not evenly distributed across the state. **Tables H-2** through **H-7** provide a breakdown of populations based on Area Transportation Partnership boundaries shown in **Figure H-1**. While not exact, the ATP boundaries closely follow MnDOT district boundaries and the terms are used interchangeably. Each table is accompanied by a map (**Figures H-2** through **H-8**) of areas with higher concentrations of the various EJ populations and their relation to the **National Highway System**. The NHS is the priority network for investment in MnSHIP. As a part of this EJ analysis, MnDOT also examined any positive or negative impacts from prioritizing the NHS.

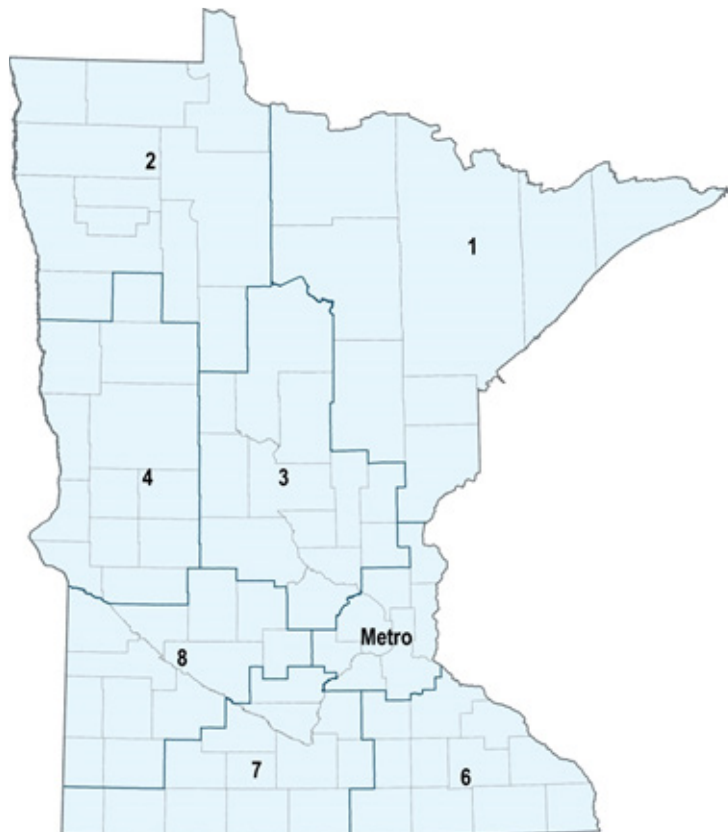
From a population perspective, Metro ATP has the greatest number of different population groups compared to the other ATPs. However, from a percentage of total ATP population, it varies by group.

Table H-1: Minnesota's Demographics

POPULATION	2014 POPULATION	PERCENTAGE OF TOTAL MINNESOTA POPULATION
Total Population	5,383,661	100.0%
White Alone	4,585,781	85.2%
Black Alone	290,545	5.4%
American Indian and Alaska Native Alone	56,490	1.0%
Asian Alone	230,798	4.3%
Native Hawaiian or Other Pacific Islander Alone	2,166	<0.1%
Some Other Race Alone	78,863	1.5%
Two or More Races	139,018	2.6%
Hispanic	264,265	4.9%
Age 65 and older	730,382	13.6%
Age 17 and under	1,280,022	23.8%
Families below the poverty level ¹	605,761	11.5%
Limited English Speaking Households ¹	217,737	4.3%
Households with zero vehicles ¹	153,366	7.3%

¹ Total estimated households in Minnesota was 2,115,337
 Source: U.S. Census, 2010-2014 American Community Survey 5-year Estimates

Figure H-1: Area Transportation Partnerships Boundaries



MINORITY AND HISPANIC

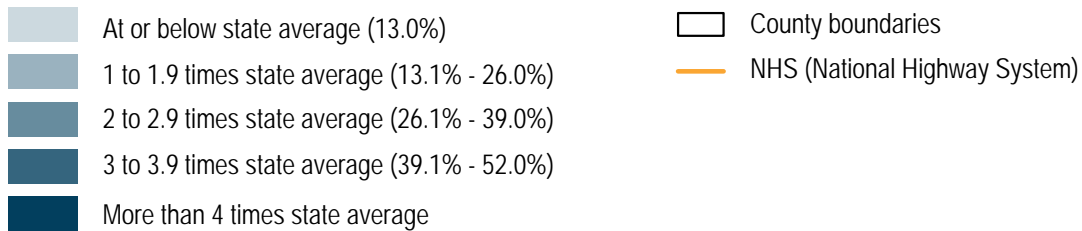
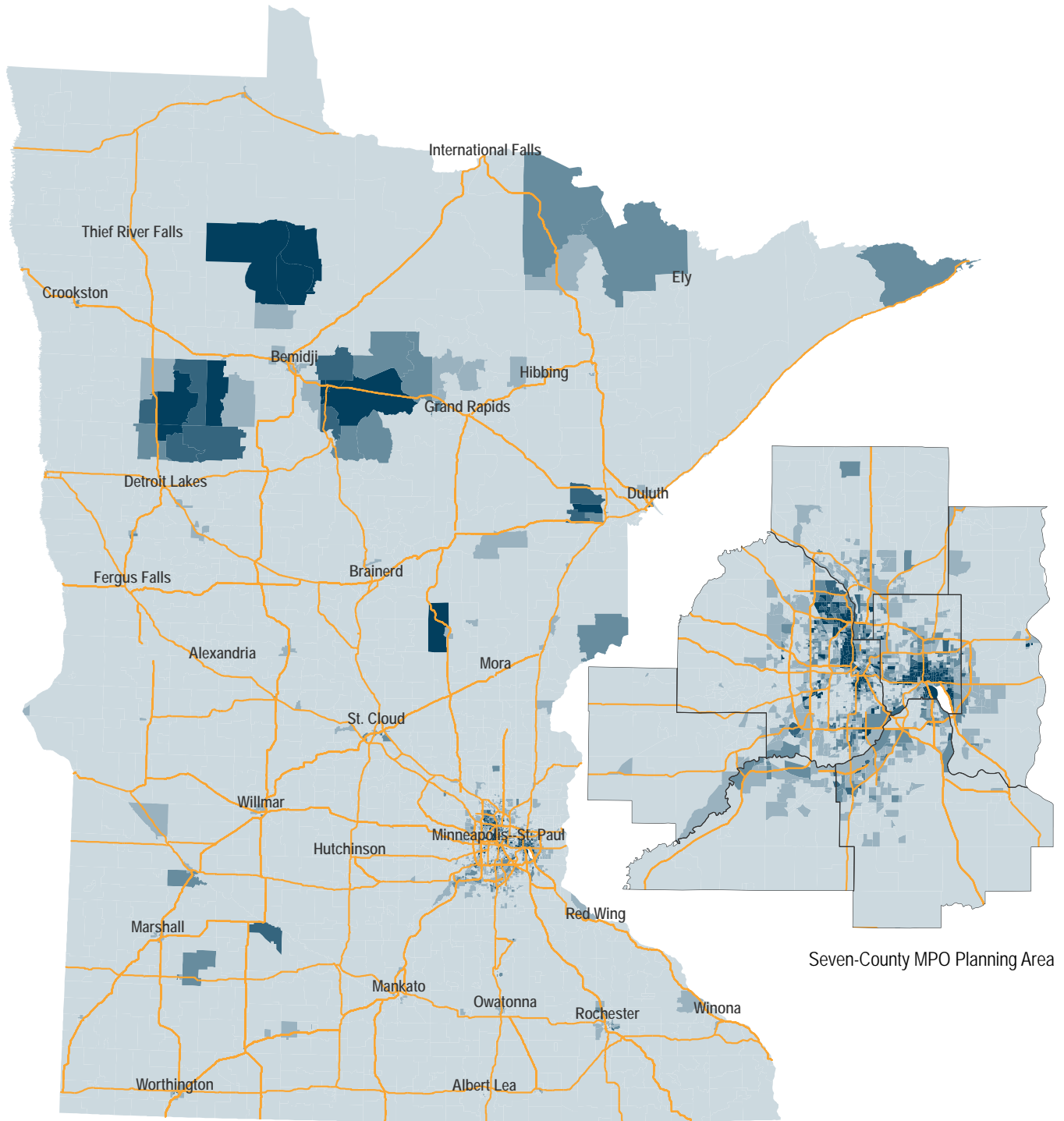
While Metro ATP has the state's largest American Indian population, ATP 2 follows closely. After Metro ATP, ATP 6 has the state's largest black, Asian and Hispanic populations. Statewide, populations that self-identify as part of a race, or multiple races, other than those five the U.S. Census Bureau tracks are estimated to make up 2.5 percent of the state's population. **Figure H-2** shows the higher concentrations of minority populations in conjunction with the NHS system. Most census blocks are near a NHS route with a few exceptions, most notably the Red Lake Nation in ATP 2.

Table H-2: Minnesota's Racial and Ethnic Populations by Area Transportation Partnership

ATP	TOTAL POP.	WHITE ALONE	BLACK ALONE	AMERICAN INDIAN OR ALASKAN NATIVE ALONE	ASIAN ALONE	NATIVE HAWAIIAN AND OTHER PACIFIC ISLANDER	SOME OTHER RACE ALONE	TWO OR MORE RACES	HISPANIC
1	355,733	329,585 92.6%	4,642 1.3%	9,609 2.7%	2,637 0.7%	114 <0.1%	934 0.3%	8,212 2.3%	4,969 1.4%
2	164,425	145,319 88.4%	1,353 0.8%	11,133 6.8%	1,377 0.8%	149 <0.1%	934 0.3%	4,082 2.5%	4,613 2.8%
3	650,824	610,556 93.8%	10,837 1.7%	7,515 1.2%	7,021 1.1%	126 <0.1%	4,413 0.7%	10,356 1.6%	15,116 2.3%
4	244,005	227,616 93.3%	2,240 0.9%	6,234 2.6%	1,527 0.6%	68 <0.1%	1,295 0.5%	5,025 2.1%	6,342 2.6%
Metro	2,974,435	2,351,185 79.0%	250,417 8.4%	17,556 0.6%	199,077 6.7%	1,299 <0.1%	58,594 2.0%	96,307 3.2%	176,448 5.9%
6	498,131	456,254 91.6%	13,514 2.7%	1,534 0.3%	12,754 2.6%	154 <0.1%	5,246 1.1%	8,675 1.7%	25,885 5.2%
7	284,211	266,733 93.9%	4,747 1.7%	953 0.3%	4,124 1.5%	86 <0.1%	3,769 1.3%	3,799 1.3%	18,450 6.5%
8	211,897	198,533 93.7%	2,795 1.3%	1,956 0.9%	2,281 1.1%	86 <0.1%	3,600 1.7%	3,799 1.3%	12,442 5.9%

Source: U.S. Census, 2010-2014 American Community Survey 5-year Estimates

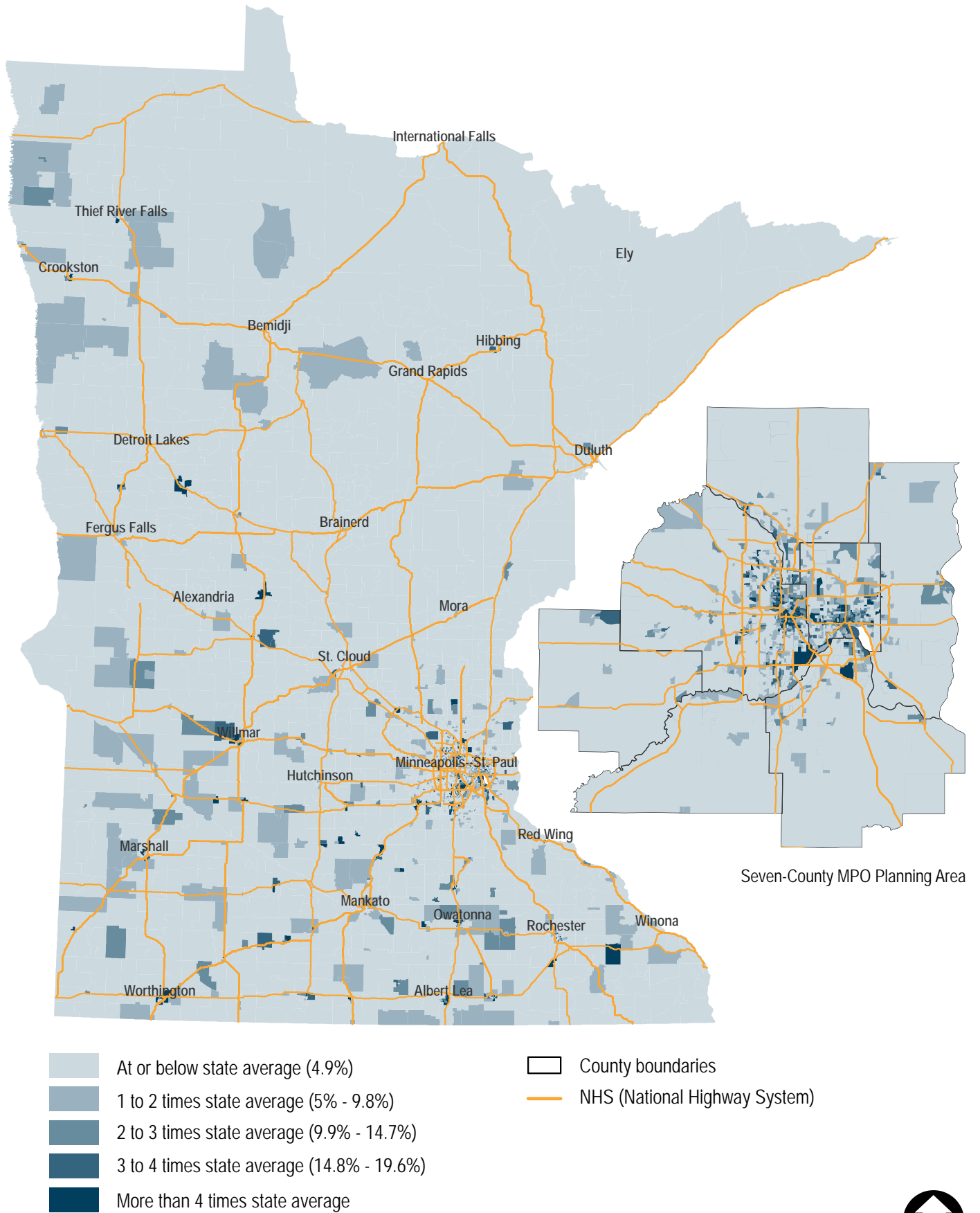
Figure H-2: Locations of Higher Concentrations Racial Minorities in Minnesota



Source: 2014 American Community Survey



Figure H-3: Locations of Higher Concentrations Hispanics in Minnesota



Source: 2014 American Community Survey



Figure H-3 shows the relation of concentrations of Hispanic populations to the NHS system in the state. The highest concentrations of Hispanics are in urban areas and near the NHS system.

LOW INCOME

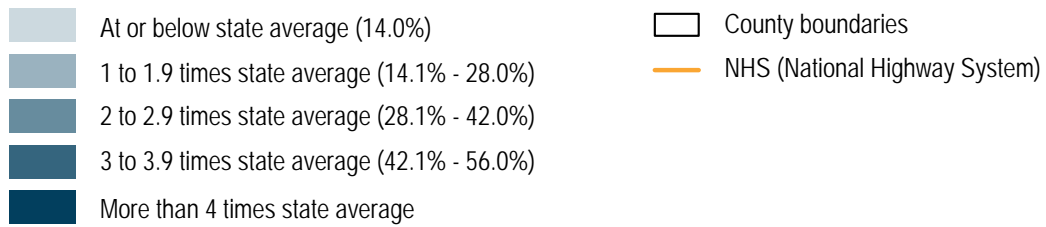
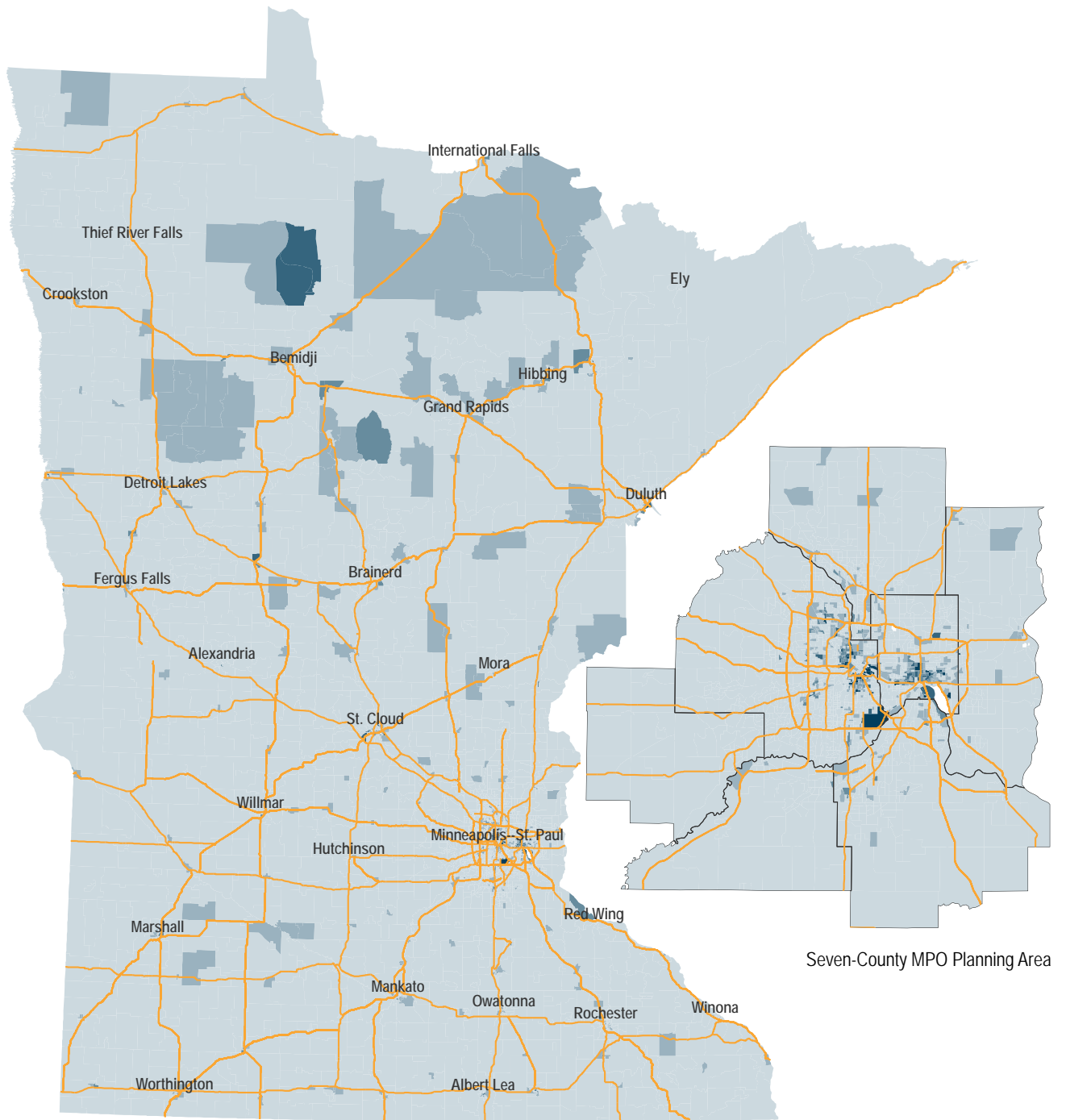
Table H-3 provides a summary of low-income populations within each ATP and as a percentage of the district's population. Low-income populations include all persons whose median household income is at or below the poverty guidelines set by the U.S. Department of Health and Human Services. Statewide, 11.5 percent of persons were below the poverty level. ATP 1 and 2 had the highest percentages of population below the poverty level, at 15.5 percent and 14.0 percent respectively. ATP 6 had the lowest, at 10.8 percent. As shown in, **Figure H-4**, most areas of higher concentrations of low-income population are located within the Twin Cities urban core communities and in northern Minnesota.

Table H-3: Minnesota's Low Income Populations by Area Transportation Partnership

ATP	ESTIMATED ATP POPULATION	ESTIMATED ATP POPULATION BELOW POVERTY	ESTIMATED PERCENTAGE BELOW POVERTY
1	342,964	53,255	15.5%
2	159,674	22,375	14.0%
3	635,882	70,105	11.0%
4	236,067	28,564	12.1%
Metro	2,925,336	320,954	11.0%
6	479,558	51,736	10.8%
7	273,573	35,515	13.0%
8	207,297	23,257	11.2%

Source: U.S. Census, 2010-2014 American Community Survey 5-year Estimates

H-4: Location of Higher Concentrations of Low Income Population in Minnesota



Source: 2014 American Community Survey

LIMITED-ENGLISH SPEAKING

A person's ability to speak English, at least moderately well, can be a barrier to participation in the transportation planning process. The American Community Survey estimates the number of individuals age 5 years and older who speak English "less than very well." **Table H-4** provides a summary of limited English-speaking populations by MnDOT district and as a percentage of the total districts's population. Limited English speakers make up approximately 217,737 or 4.3 percent of Minnesota's population. The majority, 79 percent, live in the Metro ATP. ATP 2 has the fewest number of persons who speak English less than "very well." **Table H-5** compares languages spoken at home and what percentage of each community speaks limited English.

Table H-4: Minnesota's Limited English Speaking Population by Area Transportation Partnership

ATP	ESTIMATED DISTRICT POPULATION	ESTIMATED PERSONS WHO SPEAK ENGLISH LESS THAN "VERY WELL"	ESTIMATED PERCENT OF ATP POPULATION
1	337,000	337,000	0.8%
2	154,364	154,364	1.1%
3	606,887	606,887	1.5%
4	228,914	228,914	1.3%
Metro	2,775,699	2,775,699	6.2%
6	466,428	466,428	3.4%
7	266,711	266,711	3.3%
8	198,479	198,479	2.7%

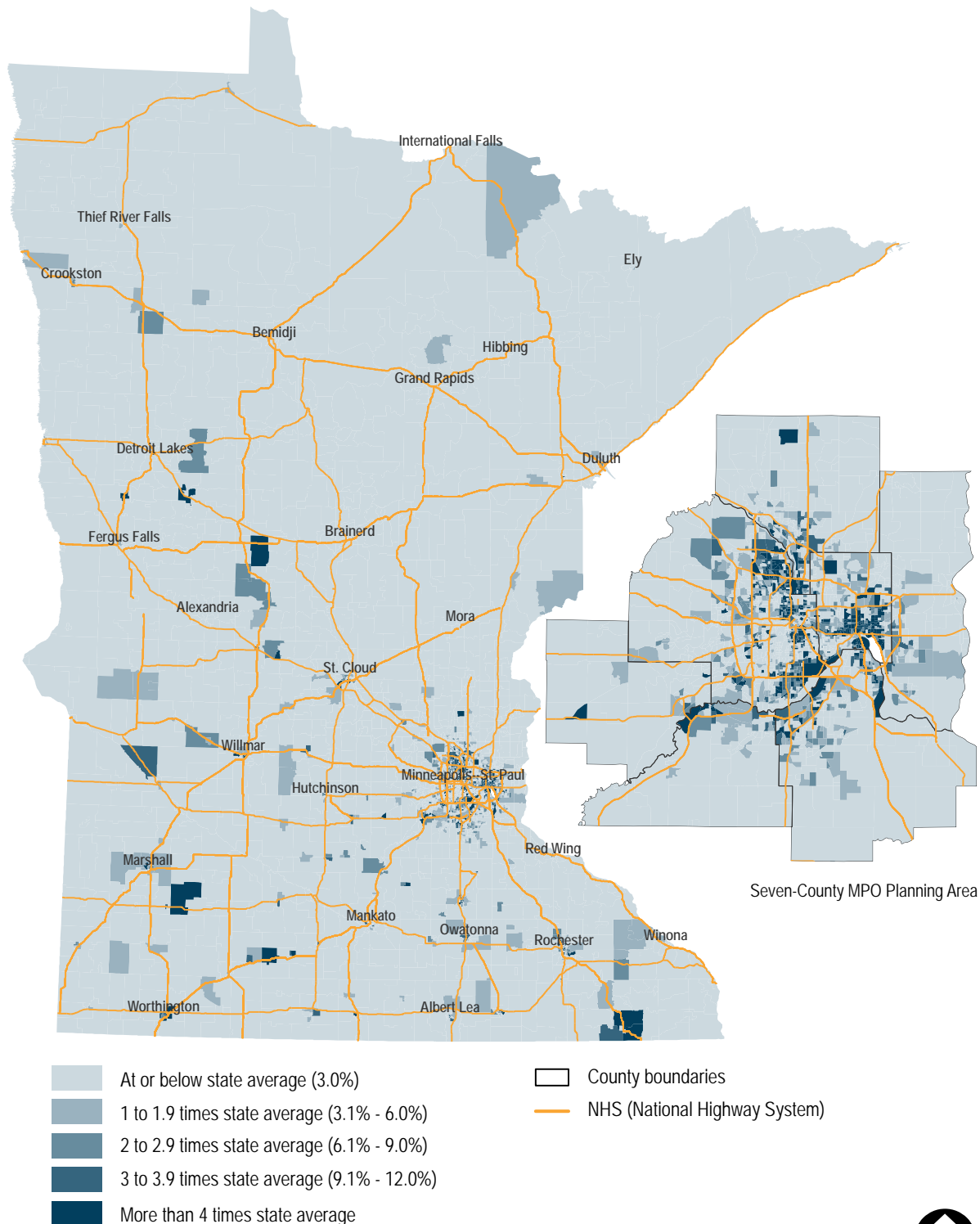
Table H-5: Languages Spoken in Minnesota as a Percentage of Total Population

LANGUAGE SPOKEN AT HOME	POPULATION	PERCENT OF POP.	POP. THAT SPEAKS ENGLISH LESS THAN "VERY WELL"	PERCENTAGE THAT SPEAKS ENGLISH LESS THAN "VERY WELL"
Speak only English	4,485,551	89.11%	N/A	N/A
Spanish or Spanish Creole	193,111	3.84%	83,799	43.4%
African languages	69,415	1.38%	29,487	42.5%
Hmong	57,513	1.14%	24,584	42.7%
German	23,258	0.46%	4,032	17.3%
Chinese	22,266	0.44%	9,922	44.6%
Vietnamese	21,915	0.44%	13,241	60.4%
Other Asian languages	20,476	0.41%	9,426	46.0%
French (incl. Patois, Cajun)	15,072	0.30%	3,187	21.1%
Russian	14,106	0.28%	6,463	45.8%
Arabic	10,703	0.21%	3,251	30.4%
Other Languages	100,366	1.99%	30,345	30.2%

Source: U.S. Census 2010-2014 American Community Survey 5-year Estimates
 The population of Spanish speakers is by far the highest, followed by Hmong and African languages (this category includes Swahili, Somali, Amharic, Ibo, Twi, Yoruba and Bantu, amongst others). Approximately half of Chinese, Vietnamese and Russian speakers are also limited in their English.

Figure H-5 shows a map of areas of higher concentration of limited English speaking populations by census block group. Most of the higher concentrations areas are within the Twin Cities area. There are additional higher concentrations in western and southern Minnesota. Most concentrations are around a NHS route.

Figure H-5: Location of Higher Concentrations of Limited English Speaking Population in Minnesota



Source: 2014 American Community Survey



YOUTH AND SENIOR

Table H-6 provides a summary of Minnesota senior and youth populations by MnDOT district. While not specifically required as part of the EJ analysis, it is important to consider how these populations use transportation and could be adversely affected by investments. Those 17 years old and under comprise 23.8 percent of Minnesota's population, while seniors make up 13.6 percent. Minnesota's youth and senior populations total 2,010,404 or 37 percent of the state. Senior populations in the state are estimated to increase significantly over the next 30 years and by 2035 there are projected to be more than 1.2 million seniors in Minnesota.

District 8 has the largest percentage (18.1 percent) of persons age 65 and older. The Metro District has the smallest percentage (11.5 percent) of those age 65 and older. District 3 has the highest percentage of those age 17 and younger (25.2 percent), while District 1 has the smallest percentage (20.1 percent) of those 17 and younger.

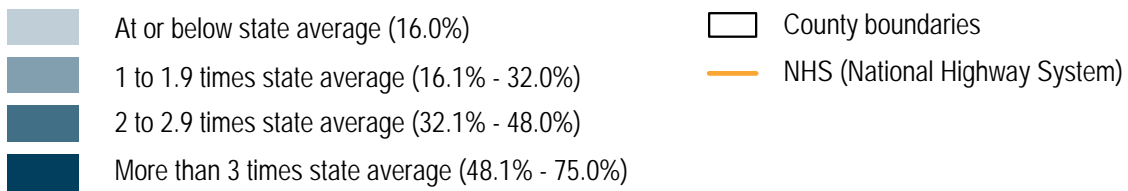
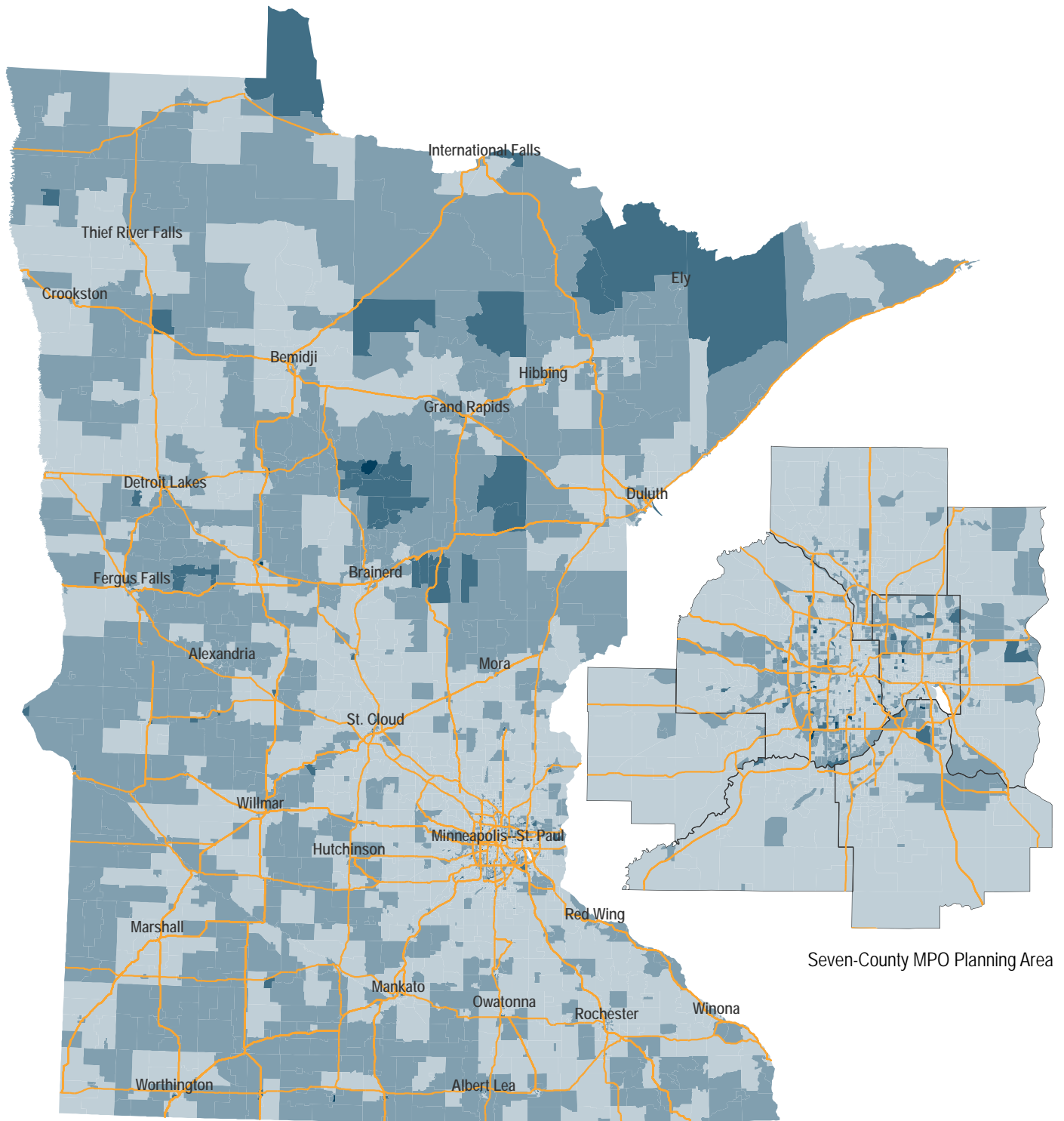
Table H-6: Minnesotans Age 17 and Under and Age 65 and Older by Area Transportation Partnership

ATP	TOTAL DISTRICT POP.	AGE 65 AND OLDER ESTIMATED POPULATION	AGE 65 AND OLDER ESTIMATED PERCENTAGE OF DISTRICT POPULATION	AGE 17 AND UNDER ESTIMATED POPULATION	AGE 17 AND UNDER ESTIMATED PERCENTAGE OF DISTRICT POPULATION
1	355,733	63,765	17.9%	71,527	20.1%
2	164,425	28,046	17.1%	39,157	23.8%
3	650,824	89,804	13.8%	164,139	25.2%
4	244,005	45,022	18.5%	54,880	22.5%
Metro	2,974,435	342,773	11.5%	718,198	24.1%
6	498,131	76,292	15.3%	117,640	23.6%
7	284,211	46,319	16.3%	64,101	22.6%
8	211,897	38,361	18.1%	50,385	23.8%

Source: U.S. Census, 2010-2014 American Community Survey 5-year Estimates

Figure H-6 shows a map of senior population by census block group. **Figure H-7** shows a map of youth population by census block group. Senior population is spread out across the state with slightly higher concentration of seniors in northern Minnesota and the Twin Cities suburbs. Likewise, Minnesota's youth population is spread out across the state without many areas of high concentration.

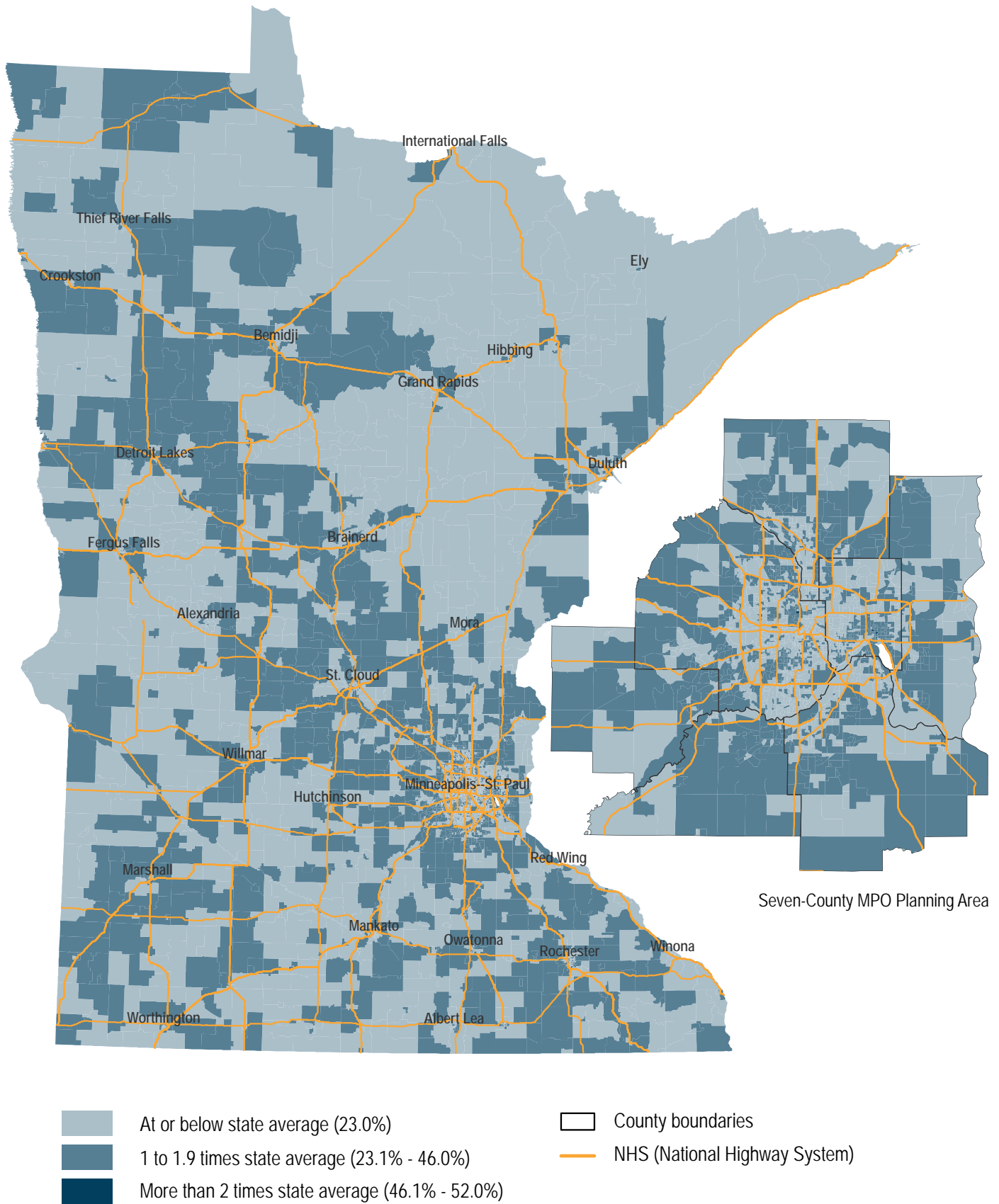
Figure H-6: Location of Higher Concentrations of Populations Age 65 and Older in Minnesota



Source: 2014 American Community Survey



Figure H-7: Location of Higher Concentrations of Populations Age 17 and Under in Minnesota



Source: 2014 American Community Survey



ZERO-VEHICLE HOUSEHOLDS

Households with zero vehicles may have a greater reliance on transit and non-motorized transportation. Zero vehicle households tend to use the transportation system differently by relying more on transit, biking, walking, taxis and more recently car-sharing and ride-sharing services (e.g. Uber). **Table H-7** shows the estimated number of Minnesota households with zero vehicles. The American Community Survey estimated that 7.3 percent, or approximately 153,366 Minnesota households, do not have a vehicle. **Figure H-8** shows a map of households without vehicles. Most of the higher concentrations of zero vehicle households are within the urban core of the Twin Cities area. There are also concentrations of zero vehicle households in northern Minnesota, which seem to correlate with the location of tribal nations.

Table H-7: Minnesota Households with Zero Vehicles by Area Transportation Partnership

ATP	ESTIMATED HOUSEHOLDS	ESTIMATED HOUSEHOLDS WITH ZERO VEHICLES	PERCENT OF ESTIMATED HOUSEHOLDS WITH ZERO VEHICLES
1	150,292	12,316	8.2%
2	66,073	4,082	6.2%
3	246,738	13,174	5.3%
4	99,755	6,132	6.1%
Metro	1,159,372	94,135	8.1%
6	193,754	12,616	6.5%
7	112,973	6,348	5.6%
8	86,380	4,563	5.3%

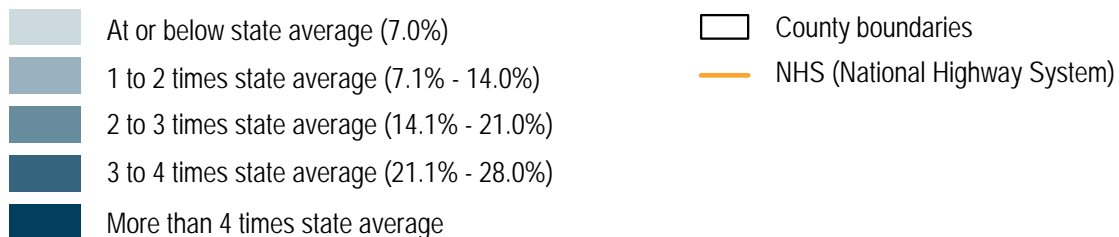
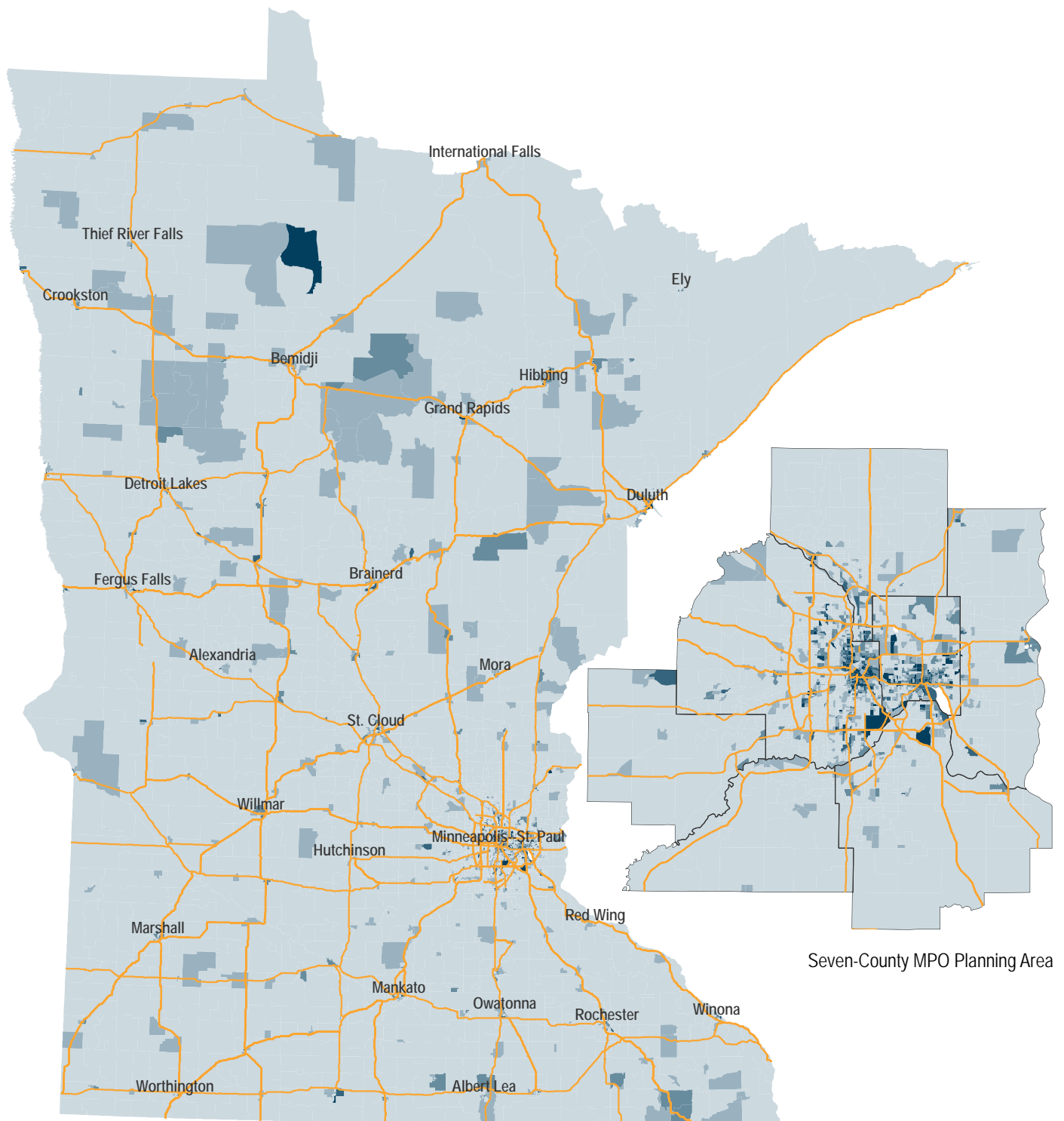
Source: U.S. Census, 2010-2014 American Community Survey 5-year Estimates

User safety with these forms of transportation can have a disproportionate impact on all EJ populations. In general, poor neighborhoods have higher per-capita pedestrian deaths and injuries than other areas. Between 2008 and 2012 pedestrian death rates in low-income census tracts were roughly double that of rates in middle to high income tracts.

Older adults also suffer disproportionately from pedestrian deaths nationally. People 65 and older make up 13 percent of the population but account for a disproportionate number of pedestrian deaths (20 percent in 2012), and sustain more severe injuries in nonfatal (crashes).² In Minnesota, 12.4 percent of the population age 65 and older account for 25.7 percent of pedestrian fatalities across the state from 2003-2010. People 75 years and older account for 6.2 percent of Minnesota's population and 17.5 percent of pedestrian fatalities.

² Minnesota Walks: Current and Future Steps Towards A Walkable Minnesota. Minnesota Department of Transportation. May 2015.

Figure H-8: Location of Higher Concentrations of Households with Zero Vehicles in Minnesota



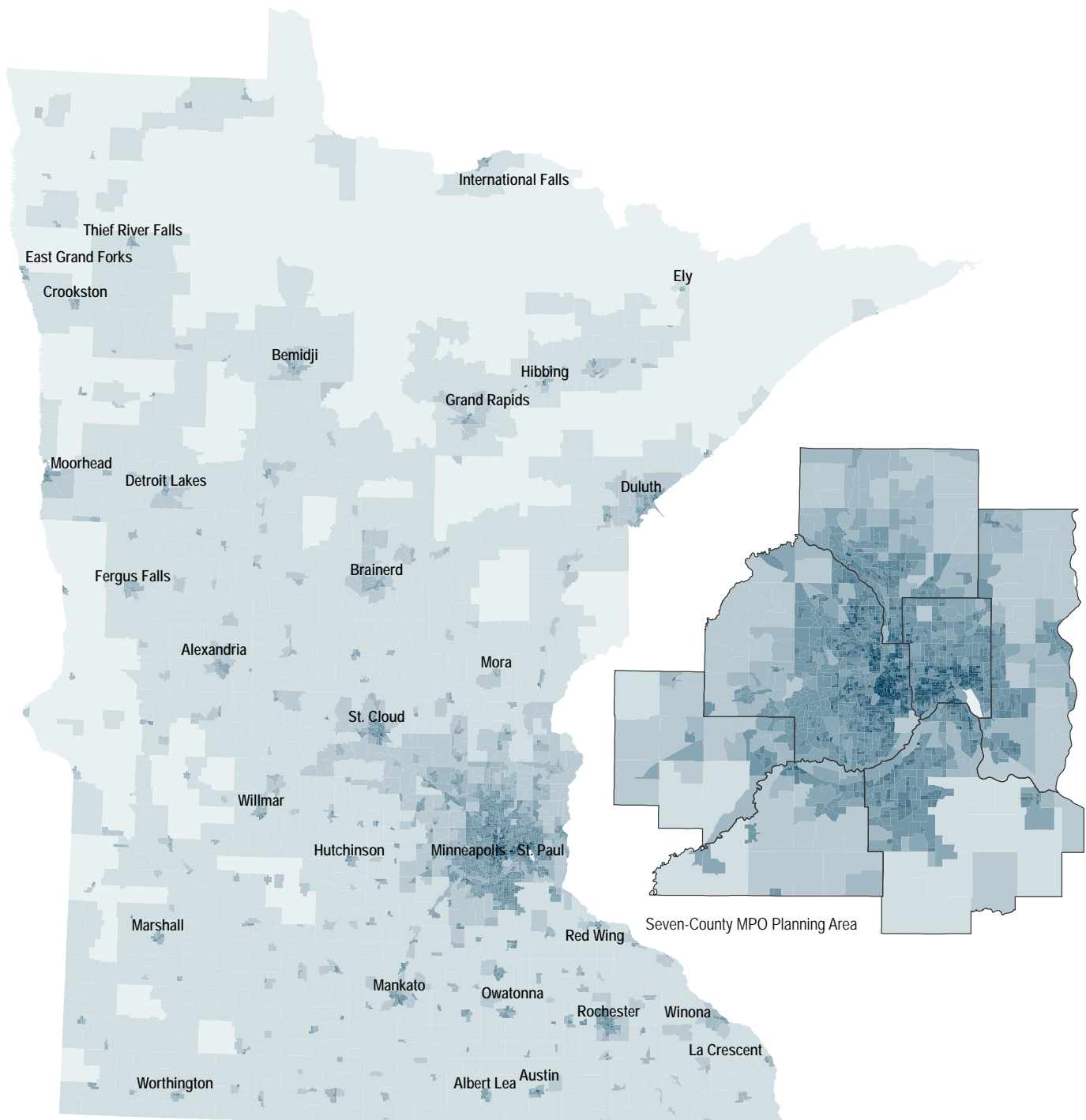
Source: 2014 American Community Survey





EJ POPULATION DENSITY

Figure H-9 shows the density of population in Minnesota, while **Figure H-10** shows the concentrations of various EJ populations. The darker the blue, the more EJ population concentrations found in the census block. Some of the most concentrated areas with multiple EJ populations are located in northern Minnesota.

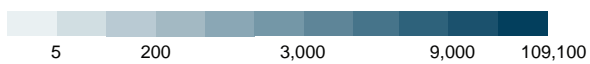
Figure H-9: Minnesota Population Density by Census Block Group



Legend

-  District boundaries (state map)
-  County boundaries (metro map)

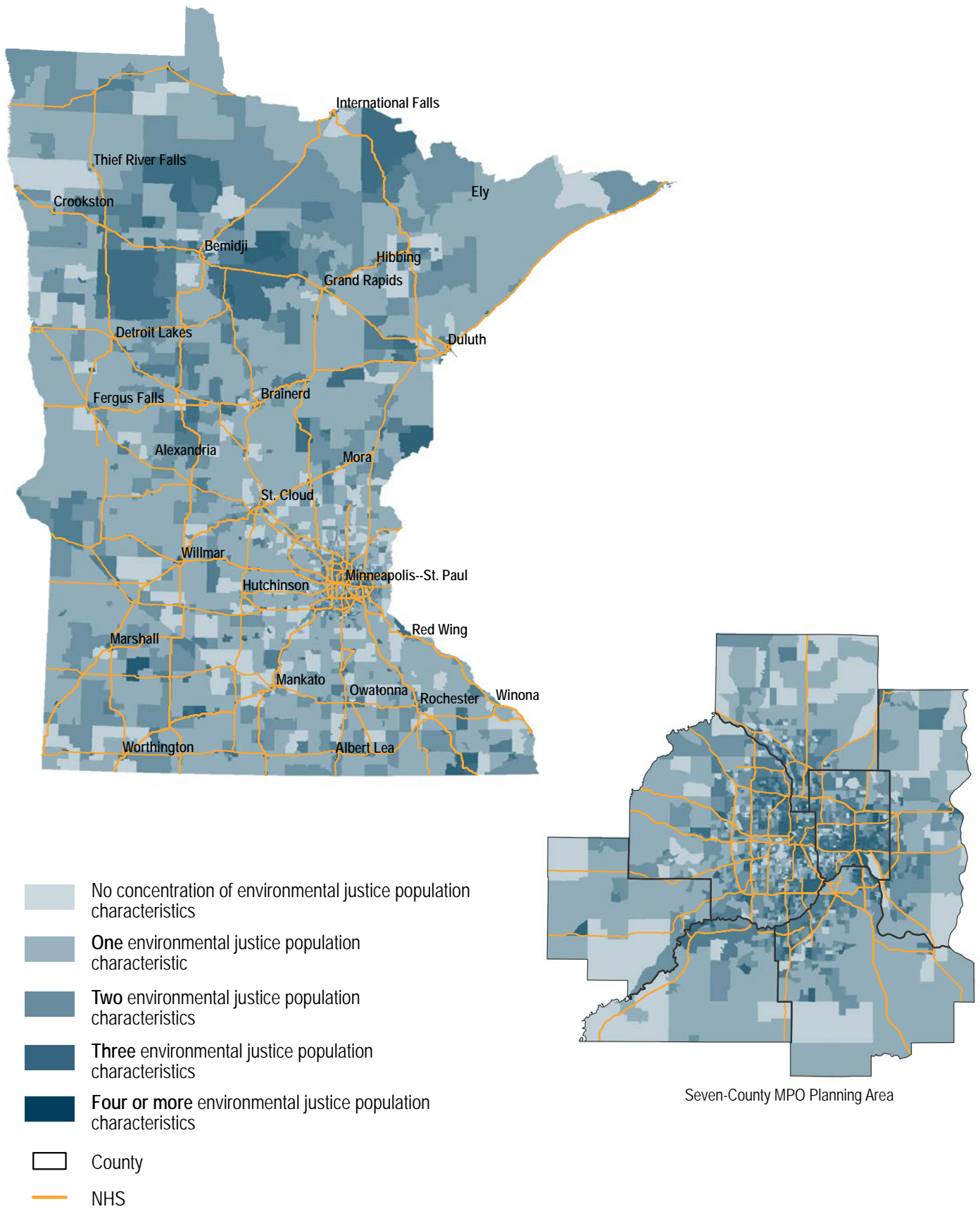
Population Density (ppl/sqmi)



Source: 2014 American Community Survey



Figure H-10: Minnesota EJ Population Density by Census Block Group



Source: 2014 American Community Survey



AREAS OF CONCENTRATED POVERTY

Another way of analyzing transportation impacts on EJ populations is by looking more closely at predominately low-income neighborhoods, especially in the Twin Cities metro area, since 75 percent of people of color in Minnesota live in the seven-county Twin Cities area, this section takes a closer look at the racial disparities in the Twin Cities and implications of poverty on transportation options and needs. Low-income populations are used as a proxy for communities of color in this portion of the study as they are more likely to be low-income than the general and white populations in the Twin Cities.

People of color are over-represented in the Twin Cities' **Areas of Concentrated Poverty** – census tracts where at least 40 percent of residents are considered low-income. According to the most recent American Community Survey data from 2009-2013, 82 of 112 ACPs in the seven-county region are majority people of color. Only 6 percent of the Twin Cities area's white population lives in ACPs compared to 40 percent of the region's black population and 34% of the region's Latino population. The data also shows that the low-income population does not entirely reside in the Twin Cities core. Currently, the suburban and rural areas within the seven-county Twin Cities area have more low-income residents than Minneapolis and St. Paul combined. For a more detailed survey of racial inequality in the Twin Cities, refer to the **Metropolitan Council's 2014 report Choice, Place, and Opportunity**, a comprehensive study of racial inequality in the region. Areas of concentrated poverty are the focus of increased planning efforts by the Metropolitan Council.

TRANSPORTATION BEHAVIOR, HEALTH AND SAFETY IN AREAS OF CONCENTRATED POVERTY

The Metropolitan Council analyzed differences in mode use and travel behavior between people living within ACPs and those living outside of ACPs. The results of this analysis found that people in ACPs rely more heavily on transit, bicycling and walking to get around. More than one-quarter of all trips made by people living in ACPs with incomes less than \$30,000 are taken via transit.³ Increased rates of travel via transit, walking and biking are not limited to only people with low incomes – even people making more than \$75,000 who live in ACPs rely more heavily on biking and walking to get around than those making similar amounts outside of ACPs.⁴

According to MnDOT research, some of the most dangerous intersections for pedestrians and bicyclists are also located in ACPs.⁵

³ Metropolitan Council, 2015.

⁴ Ibid.

⁵ Krizek K, Poindexter G, El-Geneidy A, et al. The Safety of Pedestrian and Bicycle Travel in Minnesota: Inventory, Analysis and Prospectus. January 2007.

Additionally, highways and the resulting congestion have negative impacts on the health of all users. Congestion can increase a person's exposure to pollution, specifically fine particulate matter. Negative effects on air quality are measurable within 600 feet of major highways. Examination of asthma rates and the locations of major highways in the Twin Cities area shows that individuals living next to major highways are much more likely to be hospitalized for asthma-related reasons. The highest rates of asthma hospitalizations follow the path of Interstate 94 through North Minneapolis, past downtown Minneapolis, and through the heart of St. Paul. This coincides with the Minnesota Department of Health's findings that people of color, many of whom live in these communities, are more vulnerable to air pollution than other racial and ethnic groups in Minnesota.

Research concluded that the health impacts of traffic congestion in at least some urban areas may be significant enough to warrant future evaluation on how well policies mitigate congestion.⁶

Noise pollution can also have health effects. It is widely reported that cognitive development, including learning, reading and problem solving are impaired when homes and schools are located near transportation corridors like highways.^{7,8} Also, noise can cause heightened sympathetic arousal and elevated blood pressure in children, which in turn negatively affects social and behavioral development.⁹ While the **Federal Highway Administration (FHWA)** and MnDOT analyze the impacts noise can have on communities nearby, it is still important to consider these impacts throughout a project or during the planning process.

HOW MNSHIP RELATES TO ENVIRONMENTAL JUSTICE POPULATIONS

MnSHIP is part of a coordinated, ongoing planning and outreach process that connects policy direction to improvements made on the state highway system. MnDOT's Family of Plans includes three tiers of planning. The first two tiers are the **Minnesota GO Vision** and the Statewide Multimodal Transportation Plan. The third tier consists of system investment plans, which use the principles, objectives and strategies from the Minnesota GO Vision and Statewide Multimodal Transportation Plan to guide investment decisions. The policies established in the Minnesota GO Vision and Statewide Multimodal Transportation Plan are the result of extensive stakeholder and public input.

6 Levy J, Buonocore J, and von Stackelberg K. Evaluation of the public health impacts of traffic congestion: a health risk assessment. National Institutes of Health. October 2010.

7 Lee CSY, Fleming GG. General Health Effects of Transportation Noise. U.S. Department of Transportation. dts-34-RR297-LR2. Washington, DC, 2002.

8 Suter AH. Noise and its Effects. Administrative Conference of the United States, 1991.

9 Stansfeld SA, Berglund B, Clark C, et al. Aircraft and road traffic noise and children's cognition and health: a cross national study.

The Minnesota GO Vision, adopted in 2011, established eight guiding principles to serve as a compass to move toward a multimodal transportation system that maximizes the health of the people, the environment, and the economy:

- Leverage public investments to achieve multiple purposes
- Ensure accessibility
- Build to a maintainable scale
- Ensure regional connections
- Integrate safety
- Emphasize reliable and predictable options
- Strategically fix the system
- Use partnerships

The Minnesota GO Vision Guiding Principles recognize Minnesota's aging and increasingly diverse population as a challenge and an opportunity for Minnesota over the next 50 years. This demographic shift will increase the urgency to improve accessibility of the transportation system for all users.

The Minnesota GO Vision also acknowledges the importance of the state's transportation system in maintaining the state's economic competitiveness. Economic competitiveness can be defined as simply as jobs or as broadly as building a solid educational system as the foundation to provide an educated work force.

Finally, the Minnesota GO Vision notes that transportation influences the health of people and the environment. The transportation system should be designed so it is compatible with natural systems and minimizes resource use and pollution. Transportation decisions directly and indirectly influence air quality, water quality, and noise. Land use and transportation conducive to active living can also influence Minnesotans' health. By seeking ways to avoid, minimize, and mitigate transportation's impact on the environment, Minnesotans' quality of life will improve.

The Statewide Multimodal Transportation Plan builds on the foundation provided by the Minnesota GO Vision. The objectives and strategies are written to make progress towards the Minnesota GO Vision, follow the guiding principles and address the challenges and opportunities identified during the visioning process.

The Statewide Multimodal Transportation Plan identifies five policy objectives:

- Open Decision Making

- Transportation Safety
- Healthy Communities
- Critical Connections
- System Stewardship

Each of these objectives includes a series of strategies to achieve the stated objective. At a statewide system-level, pursuing the five objectives and their related strategies have a positive impact on minority, age 65 and older, age 17 and younger, limited English proficiency, low-income, zero-vehicle household populations and other Minnesotans. The potential benefits for each objective are highlighted in the Statewide Multimodal Transportation Plan document.

The purpose of MnSHIP is to translate the policy objectives identified in the Statewide Multimodal Transportation Plan into actual improvements to the state highway system. Investment priorities in MnSHIP categorize improvements into 14 categories, enabling MnDOT to better select projects that make progress towards the Minnesota GO Vision and ensure that the public is getting high return-on-investment for the improvements being made. The 14 investment categories include:

- Pavement Condition
- Bridge Condition
- Roadside Infrastructure
- Jurisdictional Transfer
- Facilities
- Traveler Safety
- Twin Cities Mobility
- Greater Minnesota Mobility
- Freight
- Bicycle Infrastructure
- Accessible Pedestrian Infrastructure
- Regional and Community Improvement Priorities
- Project Delivery
- Small Programs

MnDOT is committed to delivering a multimodal state highway system that accounts for and addresses statewide transportation needs. MnDOT uses an

extensive performance-based and risk-based planning process to establish investment priorities for available resources, integrating federal and state laws, policy goals and objectives, technical information on system conditions, performance management, revenue projections and input from the public, MnDOT districts, specialty offices, and other transportation partners.

MNSHIP'S PUBLIC OUTREACH ACTIVITIES

With the 2017 update to MnSHIP, the project team set six specific goals to increase and improve public involvement. The following items are the overall goals:

- Create opportunities for public involvement early and often, focusing on going to the public and stakeholder groups where they are.
- Use innovative engagement methods to reach more individuals statewide and pilot new tools to reach communities typically underserved in the statewide planning engagement efforts.
- Offer a variety of platforms to provide input, including online and in-person coordination opportunities.
- Guide the development of policy objectives and strategies for transportation in Minnesota and specific investment direction for the state highway network.
- Convey complex, technical information using plain language and graphics.
- Comply with federal and state requirements.

MnDOT provided specific outreach opportunities for traditionally underserved populations by piloting new engagement tools and techniques. These targeted populations include ethnic or racial minority groups, low wage earners, non-English speakers, elderly, youth, persons with disabilities and zero motor vehicle households. Stakeholder groups associated with these targeted populations will be identified in the project stakeholder list.

It is understood that not every audience shares the same level of interest or commitment to the planning process. As a result, it was important to offer opportunities for different levels of involvement for different audiences. The project team identified a range of in-person and online engagement tools to customize based on the level of engagement, time available, and the audience.

In-Person Engagement

- Individual Stakeholder and Partner Meetings

- Advisory Stakeholder Briefings
- Stakeholder and Partner Forums
- Workplace-based Outreach
- Community Events
 - General Public Outreach
 - Traditionally Underserved Community Outreach
- Public Comment Period and Hearing

Online Engagement

- Project Website
- Social Media
- Targeted Facebook Ads
- Stakeholder Email Updates
- MetroQuest Surveys

Tribal Outreach

MnSHIP used several different strategies to seek input from Minnesota's tribal communities and consult with the tribal governments. The project team used various platforms for input including making presentations and seeking feedback at regularly scheduled meetings of the Advocacy Council for Tribal Transportation, conducting surveys at events such as the Tribes and Transportation Conference and the Bois Forte State of the Band, and asking tribal staff to promote the online survey in their communities. Staff also met with interested tribal government staff and officials to discuss transportation issues and trends facing the tribe.

Traditionally Underserved Community Outreach

The project team partnered with Twin Cities Public Television / Emergency, Community, Health, Outreach to conduct engagement within traditionally underserved communities, specifically the Spanish, Hmong and Somali communities in Minnesota. ECHO staff translated the iPad surveys into Spanish, Hmong, and Somali. ECHO staff identified locations to conduct outreach including ethnic markets, community centers and religious institutions. ECHO outreach was from February to March 2015.

The project team used Facebook ads to target traditionally underserved communities to increase participation and balance participation numbers to better reflect the demographic breakdown of Minnesota’s population. Some ads focused on increasing participation from women, African Americans, Asian Americans and Spanish speakers. By collecting optional demographic data, the project team was able to review the results of the targeted ads, identify successes and make any adjustments based on lessons learned for future targeted ads.

Outreach Results

Shown in **Table H-8**, the demographics of the responses received mirror the demographic breakdown of Minnesota’s population. More information can be found on the public engagement process in **Chapter 4** and **Appendix D**.

Table H-8: Percent Breakdown of Participant Demographics by Tactic

TACTIC	20 AND BELOW	21-35	36-50	51-65	66+	MALE	FEMALE	WHITE	BLACK OR AFRICAN AMERICAN	AMERICAN INDIAN OR ALASKA NATIVE	ASIAN	NATIVE HAWAIIAN OR OTHER PACIFIC ISLANDER	MULTIPLE	HISPANIC
MnSHIP	3%	24%	26%	35%	13%	53%	47%	89%	4%	1%	6%	0%	1%	5%
Community Event	9%	34%	28%	24%	5%	42%	58%	61%	17%	1%	20%	0%	0%	16%
Social Media Survey	2%	20%	21%	41%	15%	34%	66%	93%	4%	0%	1%	0%	1%	6%
Stakeholder Briefing	0%	19%	26%	41%	14%	73%	27%	95%	0%	1%	2%	0%	1%	0%
Website Survey	2%	20%	26%	38%	14%	59%	41%	97%	1%	0%	2%	0%	0%	1%
Workplace	0%	34%	30%	23%	14%	57%	43%	94%	0%	0%	6%	0%	0%	1%
Minnesota	27%	21%	20%	20%	12%	50%	50%	86%	6%	1%	5%	<1%	1%	5%

MNSHIP INVESTMENT DIRECTION AND CATEGORIES

MnDOT established an investment direction for the next 20-year period of MnSHIP focusing on the maintenance of existing infrastructure with limited investment in mobility. This approach differs from previous plan updates that had different investment priorities for the first 10 years of MnSHIP than the second 10 years. The first 10 years of the 2013 investment direction took a balanced approach between investing in preserving existing infrastructure and investing in mobility and regional and local priorities. The second 10-year period shifted to focus on maintaining the existing highway system and eliminating investment in mobility and regional and local priorities.

To assess the impact of MnSHIP on environmental justice populations, it is necessary to identify the potential impacts of the types of highway investments recommended in the plan with regard to minority, age 65 and older, age 17 and younger, limited English proficiency, low-income, or zero-vehicle household populations.

The analysis presented in this appendix is at the system level and is only one step in MnDOT's commitment to ensuring that its planning efforts and project-specific decisions do not result in disproportionately high and adverse human health or environmental effects, particularly on environmental justice populations. Additional environmental justice analyses will occur at the project level to analyze whether proposed activities may result in disproportionate impacts.

It is important to consider typical projects and how they can generally impact EJ populations. These types of projects might include bridge repair, road resurfacing, road reconstructions or road capacity projects (two lanes to four lanes). Less common projects could include road shoulder widening, intersection improvements (roundabouts, accessible curb ramps, etc.), or interchange construction.

Generally, highway capacity projects are types of projects that are associated with greater impacts. These types of projects could have one or more of the following effects:

- Require the acquisition of right of way land next to state highways, which could result in the displacement of households or businesses
- Change noise levels, which can impact nearby residents
- Change the visual aesthetics, which can cause less comfortable environments for pedestrians, bicyclists and transit riders
- Change access to the highway system which could result in altered land use or development patterns
- Change access to the highway system which could increase the travel time between destinations
- Change amount or pattern of traffic, which could decrease safety or reduce transit efficiency
- Increase appeal of highway, leading to more trips and more pollution
- Decrease travel time

The following sections describe how investing in each investment category and how these types of projects might result in disproportionately high and adverse human health or environmental effects, if at all.

Pavement Condition, Bridge Condition, and Roadside Infrastructure

MnDOT preserves the integrity and condition of its assets through investments in pavements, bridges, and roadside infrastructure. Investments made in these categories are selected on statewide and regional levels.

Projects that qualify as Pavement Condition improvements include overlays, mill and overlays, full-depth reclamation, and reconstruction of existing highways. Bridge Condition investments include replacements, rehabilitation, and painting of existing bridges. Roadside Infrastructure investments include the repair and replacement of existing drainage and culverts, traffic signals, signs, lighting, retaining walls, fencing, noise walls, guardrails, overhead structures, rest areas, **Intelligent Transportation Systems**, and pavement markings. The types of improvements associated with these investment categories are focused on maintaining existing infrastructure. This is a benefit for all highway system users.

These types of improvements may have short-term construction impacts; however; in most cases, minimal long-term impacts are expected.

Improved ride quality or smoother pavement surfaces could also have benefits to EJ populations that drive single occupancy vehicles. Poor roads can increase wear and tear on vehicles and low-income populations who drive would spend a larger proportion of their income on transportation including maintenance, ride quality could have a larger impact on them.¹⁰

Jurisdictional Transfer

Jurisdictional Transfer makes steps toward ensuring that Minnesota roads are maintained and operated at the right jurisdictional level (i.e. by the right agency) be it the state, county or municipal level. This allows roadways to be better managed to meet the expectations of customers. Whether a road is owned and managed by MnDOT or a local jurisdiction can impact minority and disadvantaged populations. For example, a particular road might be a low priority for MnDOT and so maintenance is delayed; but if the road was a locally managed road, maintaining it would be a high priority. If road maintenance is delayed, safety and ride quality may decrease, which could cause vehicle damage resulting in high cost and more frequent repairs affecting

¹⁰ Data is from U.S. Department of Housing and Urban Development's Location Affordability Index, which tracks the affordability of transportation and housing by measuring relevant spending for median income households and low-income households. Lower-income single-parent families, known as "single-parent families" in the Location Affordability Index, are defined as 1-person households with 1 worker and income equivalent to 50% of median income for the geography. Information can be found here: <http://www.mncompass.org/transportation/transportation-expenses#1-12157-g>

all populations, but having a disproportionate impact on EJ populations. Additionally, pedestrian and bicycle infrastructure investments could be delayed depending on the priority a road is given by an agency.

Facilities

The Facilities investment category includes investments in all 52 MnDOT rest areas and 10 weight enforcement buildings with weigh scales. While these facilities promote tourism and increase the safety of road users, investments in this category have limited impacts on EJ populations.

Traveler Safety

Traveler Safety projects include proactive lower cost, high-benefit strategies, and treatments at sustained crash locations. Investments made in traveler safety are selected on statewide and regional levels. Traveler Safety improvements benefit all system users, including minority and disadvantaged populations. Because minority populations typically suffer pedestrian death rates higher than whites, projects that improve non-motorized safety on the state highway network could benefit EJ populations.¹¹

Freight

Investment in freight can include improvement of pavements, bridges or roadside infrastructure along freight routes, facilities such as rest areas and weigh stations, new safety improvements and freight mobility improvements. As such, impacts to EJ populations from freight investments closely mirror the impacts listed in Pavement Condition, Bridge Condition, Roadside Infrastructure, Facilities, Traveler Safety, Twin Cities Mobility and Greater Minnesota Mobility.

Twin Cities Mobility

Twin Cities Mobility investments aim to increase mobility in the metro area, increase trip reliability, and enhance travel options. The types of improvements in this investment category include Active Traffic Management, spot mobility improvements, priced managed lanes (i.e. MnPASS express lanes) and strategic capacity enhancements. These types of investments help manage congestion and improve quality of life, safety and air quality for all system users. While priced managed lanes offer benefits for single occupancy vehicles willing to pay, the lanes are used by many buses which improve transit reliability and travel times. These benefit everyone by adding capacity; but, the benefits are especially high for those who depend on transit, including, many minority and disadvantaged populations, and zero-vehicle households that rely on transit as a primary mode of transportation. Approximately 13-20

¹¹ Krizek K, Poindexter G, El-Geneidy A, et al. Jan. 2007.

percent of EJ households do not own a car.¹² However, lane expansion could have negative benefits on EJ populations by creating barriers to pedestrian and bicycle networks, and increasing pollution and associated health risks to those living near state highways. The Statewide Multimodal Transportation Plan's Environmental Justice Analysis discusses the potential that individuals living next to major highways are more likely to be hospitalized for asthma-related reasons. These findings are supported by the US EPA and other research.¹³

Greater Minnesota Mobility

The goal of Greater Minnesota Mobility investment is to enhance the movement of people and freight in Greater Minnesota. The Greater Minnesota Mobility investment category focuses on improving movement of people and freight on the National Highway System, the priority network for MnSHIP. Under this investment direction, Greater Minnesota Mobility would receive limited funding. Investments could include operational improvements such as signal timing or turn lanes along corridors. Projects would likely have little impact on EJ population.

Bicycle Infrastructure

MnDOT typically constructs bicycle improvements as part of larger pavement and bridge projects, but also implements some stand-alone projects in urban areas or areas with high volumes of bicycle traffic. Investing in bicycle infrastructure makes progress on key multimodal objectives and outcomes. This may be a benefit for minority and disadvantaged populations, particularly low income and zero-vehicle households that may rely on bicycling as a primary mode of transportation. As a result of the **Statewide Bicycle System Plan** both urban and separated bicycle facilities are a priority.

Accessible Pedestrian Infrastructure

Most pedestrian and **1990 Americans with Disabilities Act** improvements are implemented as part of a larger pavement or bridge project. Standalone projects, especially ADA improvements, are implemented where needed because each MnDOT district has varying pedestrian and ADA infrastructure needs, ADA needs and different high risk pedestrian areas. Investment in this category is a benefit for all system users, particularly those who rely on alternate modes of transportation, users with limited mobility and zero-vehicle households. Typically, Accessible Pedestrian Infrastructure investments, such as sidewalks, are constructed in urban areas. A majority of Minnesota's EJ populations lives within an urban area, so pedestrian infrastructure provides benefits for a significant portion of these populations. Furthermore, transit

¹² American Community Survey 2011-2014. United States Census Bureau. 2015

¹³ Examples: Near Roadway Air Pollution and Health: Frequently Asked Questions, US EPA, EPA-420-F-14-044, August 2014; National Patterns in Environmental Justice and Inequality: Outdoor NO₂ Air Pollution in the United States, Clark et al, PLOS ONE, April 2014.; Quantifying Traffic Exposure. Pratt et al, Journal of Exposure Science and Environmental Epidemiology, May/June 2014.

riders rely on pedestrian infrastructure for safe connections to and from transit and other transportation networks.

Regional and Community Improvement Priorities

Regional and Community Improvement Priorities are investments that respond to regional concerns and collaboration opportunities beyond system performance needs to support economic competitiveness and quality of life in Minnesota. There are a variety of projects that are eligible under the category of RCIPs, including:

- Main street improvements that enhance the quality of life when state highways serve as main streets
- State highway improvements made as part of projects initiated by local agencies
- Intersection improvements that increase traffic flow and/or facilitate efficient freight movement
- Mobility enhancements, such as bypass or turning lanes
- Capacity expansion that advances economic competitiveness and quality of life
- Landscape improvements after major construction projects
- Flood mitigation projects to help manage water in the events of heavy precipitation

Project Delivery

Project Delivery includes components of projects that are critical to ensure the timely and efficient delivery of highway projects. These components include right-of-way costs, consultant services, supplemental agreements, and construction incentives associated with projects and do not have a direct impact on EJ populations.

Small Programs

The Small Programs investment category includes funding for short-term, unforeseen issues and one-time specialty program needs as they arise. In the past, investments included a noise wall program and the **Transportation Economic Development** solicitations. Small Programs also includes historical properties within MnDOT right-of-way. Investments made in Small Programs have limited impacts on EJ populations.

IMPACT OF

PRIORITIZATION OF NHS

With the decision to prioritize the NHS for investment, MnDOT examined whether impacts of that decision adversely affect an EJ population. To accomplish this, MnDOT identified the percentage of the population within a one-quarter mile of a state highway, a NHS route, a non-NHS and then calculated the statewide average.

Table H-9 shows that most of the EJ populations are no more concentrated on the NHS system compared to the non-NHS system or compared to statewide. The only exception is the state's minority population. According to the analysis, 17.9 percent of the population within one-quarter mile of the NHS system is a minority population compared with the non-NHS system (10.7 percent) and statewide (12.8 percent).

Table H-9: EJ populations near State Highway system

POPULATION	1/4 MILE OF STATE HIGHWAY	1/4 MILE OF NHS	1/4 OF NON-NHS	STATEWIDE
Total minority population	17.0%	17.9%	10.7%	12.8%
Persons below the poverty level	7.8%	7.9%	7.5%	13.8%
Age 65 and older	14.2%	13.9%	15.0%	16.1%
Age 17 and under	23.7%	23.6%	23.8%	23.3%
Persons who speak English less than "very well"	2.5%	2.7%	1.8%	3.1%
Households with zero vehicles	7.6%	8.0%	6.8%	7.3%

Source: U.S. Census, 2010-2014 American Community Survey 5-year Estimates

Table H-10 shows, however, that no single minority group is closer to the NHS system individually. Minority groups in general have a slightly higher concentration near the NHS system compared to the non-NHS system. By prioritizing investment on the NHS, minority populations receive the positive benefits, such as access to roadways with potentially more transportation amenities; however, minority populations may receive equally negative effects, such as noise and pollution impacts.

Table H-10: Minority populations near State Highway system

POPULATION	1/4 MILE OF STATE HIGHWAY	1/4 MILE OF NHS	1/4 OF NON-NHS	STATEWIDE
White Alone	86.1%	85.1%	89.3%	85.2%
Black Alone	4.9%	5.4%	3.2%	5.4%
American Indian and Alaska Native Alone	1.2%	1.1%	1.2%	1.0%
Asian Alone	3.9%	4.2%	2.9%	4.3%
Native Hawaiian or Other Pacific Islander Alone	0.0%	0.0%	0.0%	0.0%
Some Other Race Alone	1.5%	1.6%	1.2%	1.5%
Two or More Races	2.5%	2.6%	2.2%	2.6%
Hispanic	4.9%	5.0%	4.4%	4.9%

Source: U.S. Census, 2010-2014 American Community Survey 5-year Estimates

CONCLUSION

The environmental justice analysis presented in this appendix is a qualitative evaluation of MnSHIP investment effects on minority, age 65 and older, age 17 and younger, limited English proficiency, low-income and zero-vehicle household populations. As summarized in the previous sections, there may be some disproportionately high and adverse human health or environmental effects expected due to the investment direction and policy implications outlined in MnSHIP on minority populations because they are slightly more concentrated near the NHS system compared to the non-NHS system.

MnSHIP identifies the NHS as the priority network for investment in MnSHIP. With the investment direction set in this MnSHIP update, there will be more focus on the NHS system with the likelihood that there will be an increase in the number of construction projects on the NHS. Minority populations may experience negative effects from the increased investment such as more noise and air pollution. In addition, the NHS system will receive investments to improve mobility in Greater Minnesota and the Twin Cities metro area. These improvements could increase the amount of traffic along the NHS bringing more cars to travel through these corridors near minority populations.

However, much of the investment in mobility in MnSHIP will be used to construct two MnPASS corridors in the Twin Cities metro area. Mobility improvements in Greater Minnesota will address localized areas of congestions to improve travel flow. The MnPASS system adds new high occupancy toll lanes, not new general purpose lanes. Expansion of the MnPASS system also provides benefits to transit users in the highway corridor by allowing transit vehicles to operate in the high occupancy toll lanes, avoiding congestion and making transit a more appealing transportation option. Minority populations and low-income populations tend to use transit at a higher rate than the general population and may benefit from these infrastructure improvements. Therefore, it is difficult to conclude whether the prioritization of investment in the NHS system will have a net positive or net negative impact on minority populations. These impacts are better analyzed at the project level.

As projects progress into project development phases, MnDOT will continue to evaluate the potential impacts transportation projects on the state highway system have on the environment and environmental justice population. MnDOT is also investigating completing EJ analysis in conjunction with the 10-Year Capital Highway Investment Plan and analyzing whether selected projects fall within disproportionately high locations of EJ populations.

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Appendix I

INVESTMENT CATEGORY FOLIOS

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INVESTMENT CATEGORY FOLIOS

Performance Level Development

INVESTMENT CATEGORY WORK GROUPS

Starting in the summer of 2015 fourteen work groups were established for the investment categories being discussed in MnSHIP; the Main Streets/ CIMS work group was eventually folded into the RCIPs category. MnDOT convened these investment category work groups composed of staff from MnDOT's Central Office, specialty offices (e.g., the Bridge Office for the Bridge Condition work group), district office staff, and in some cases partners (e.g., representatives from the metropolitan planning organizations for the Twin Cities and Greater Minnesota Mobility work groups). A facilitator from the Office of Transportation System Management's Investment Planning Unit was assigned to each as well as a Chair from the greater membership base. Please see Appendix A: Acknowledgements for a list of the work groups and their members.

The work groups were critical in the development of three to five "performance levels" for most investment categories. The exception to this was the work undertaken by the Right of Way, Consultant Services, Cost Overruns and Supplemental Agreements (RCCS investments) and Small Programs work groups, which did not establish performance levels but rather used a historical analysis of spending to establish requirements for these areas.

The work groups each used the same methodology in applying performance measures and risk to define a potential range of investment for the next 20 years. Each performance level captures a different amount of investment and corresponds with a different set of improvements, performance outcomes, risks, and risk management strategies. Lower performance levels (Performance Level 0) correspond to a level of spending at which MnDOT would not want to go below; this level of spending demonstrates the greatest level of risks that could reasonably be acceptable given MnDOT's responsibility for public safety and basic system functionality. At the other end of the spectrum, higher investment levels (Performance Level 3 or 4) would allow MnDOT to make more progress toward the Minnesota GO Vision and limit the amount of risk that MnDOT would need to accept.

A summary of the work groups' efforts is presented in Appendix I: Investment Category Folios. The investment category folios were developed in 2015 prior to the passage of the Fixing America's Surface Transportation Act (FAST Act). The years outlined in the folios correspond with State Fiscal Years 2018-2037 (July 1 2017 – June 30 2037).

TRANSPORTATION NEEDS

MnDOT applied the results of the work groups' data and technical analyses to arrive at the costs associated with meeting performance-based targets and other key goals for the state highway system. The highest performance level for each investment category typically corresponds to the transportation need described in Chapter 3, Investment Needs. The one exception is for Pavement Condition; Performance Level 3 corresponds with the investment needed to meet performance measures, while Performance Level 4 illustrates the investment level needed to maintain current (2014) pavement condition on all three systems (Interstate, non-interstate National Highway System, and non-National Highway System). The total transportation need amount identified totals approximately \$34 billion over 20 years, compared to approximately \$20 billion in available revenue.

Investment Category Folio List

Pavement Condition

http://minnesotago.org/application/files/6414/7248/2147/Pavement_Condition_2017.pdf

Bridge Condition

http://minnesotago.org/application/files/6714/7248/2159/Bridge_2017.pdf

Roadside Infrastructure Condition

http://minnesotago.org/application/files/6514/7248/2172/Roadside_Infra_2017.pdf

Jurisdictional Transfer

http://minnesotago.org/application/files/2114/7248/2192/Jurisdictional_Transfer_2017.pdf

Facilities

http://minnesotago.org/application/files/4014/7248/2242/Facilities_2017.pdf

Traveler Safety

http://minnesotago.org/application/files/5114/7248/2273/Traveler_Safety_2017.pdf

Twin Cities Mobility

http://minnesotago.org/application/files/4414/7248/2298/TC_Mobility2017.pdf

Greater Minnesota Mobility

http://minnesotago.org/application/files/6814/7248/2309/Greater_Minnesota_Mobility_2017.pdf

Bicycle Infrastructure

http://minnesotago.org/application/files/8514/7248/2336/Bicycle_Infrastructure_2017.pdf

Accessible Pedestrian Infrastructure

http://minnesotago.org/application/files/4414/7248/2387/Accessible_Pedestrian_Infrastructure_2017.pdf

Regional and Community Improvement Priorities

http://minnesotago.org/application/files/4014/7248/2404/RCIP_2017.pdf

Project Delivery

http://minnesotago.org/application/files/9014/7249/1093/Project_Delivery_2017.pdf

Small Programs

http://minnesotago.org/application/files/3314/7248/2498/Small_Programs_2017.pdf

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