

# Transportation System Performance Report 2023

December 2023

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# Prepared by

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January 3, 2024

The Honorable Frank Hornstein, Chair  
House Transportation Finance & Policy Committee  
563 State Office Building  
Saint Paul, Minnesota 55155

The Honorable Scott Dibble, Chair  
Senate Transportation Committee  
3107 Minnesota Senate Building  
Saint Paul, Minnesota 55155

The Honorable Erin Koegel, Chair  
House Sustainable Infrastructure Policy Committee  
445 State Office Building  
Saint Paul, Minnesota 55155

The Honorable John Petersburg, Republican Lead  
House Transportation Finance & Policy Committee  
217 State Office Building  
Saint Paul, Minnesota 55155

The Honorable John Jasinski, Ranking Minority  
Member  
Senate Transportation Finance & Policy Committee  
2227 Minnesota Senate Building  
Saint Paul, Minnesota 55155

The Honorable Mary Franson, Republican Lead  
House Sustainable Infrastructure Policy Committee  
303 State Office Building  
Saint Paul, Minnesota 55155

Re: 2023 Transportation System Performance Report

Dear Legislators:

The Minnesota Department of Transportation is pleased to present this 2023 Transportation System Performance Report to the Legislature. As required by [Minn. Stat. 174.03, Subd. 12\(d\)](#), the report presents trunk highway and transportation system performance measures, describes performance gaps, and outlines the agency's progress toward achieving the state transportation goals established in section [174.01](#).

Minnesota's transportation system is complex, and transportation system management can be fluid. The system has made performance gains in several areas over the last year such as improved pavement conditions, maintenance practices, and sustainable construction strategies. However, transportation safety continues to be a challenge with the annual number of serious injuries on Minnesota roadways at the highest point in last five years and the number of roadway fatalities at their second highest point. Going forward, MnDOT will continue to revisit current performance measures for improvement and identify new areas for performance management.

Please let me know if you have questions. You can contact me at [jean.wallace@state.mn.us](mailto:jean.wallace@state.mn.us) or 651 366-3181. With your help, we can maintain and build a transportation system that makes that state transportation goals a reality.

Sincerely,



Jean Wallace, P.E.  
Chief Engineer, Department of Transportation

# Legislative Request

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This report is issued to comply with [Minn. Stat. 174.03, subd. 12\(d\)](#).

**Subd. 12. Trunk highway performance, resiliency, and sustainability.** (a) The commissioner must implement performance measures and annual targets for the trunk highway system in order to construct resilient infrastructure, enhance the project selection for all transportation modes, improve economic security, and achieve the state transportation goals established in section [174.01](#).

(b) At a minimum, the transportation planning process must include:

(1) an inventory of transportation assets, including but not limited to bridge, pavement, geotechnical, pedestrian, bicycle, and transit asset categories;

(2) lag (resulting), and where practicable lead (predictive), performance measures and annual targets that are:

(i) statewide and district-specific;

(ii) for assets in each asset category specified in clause (1) for a period of up to 60 years; and

(iii) identified in collaboration with the public;

(3) gap identification and an explanation of the difference between performance targets and current status; and

(4) life cycle assessment and corridor risk assessment as part of asset management programs in each district of the department.

(c) At a minimum, the ten-year capital highway investment plan in each district of the department must:

(1) be based on expected funding during the plan period;

(2) identify investments within each of the asset categories specified in paragraph (b), clause (1);

(3) recommend specific trunk highway segments to be removed from the trunk highway system; and

(4) deliver annual progress toward achieving the state transportation goals established in section [174.01](#).

(d) Annually by December 15, the commissioner must report trunk highway performance measures and annual targets and identify gaps, including information detailing the department's progress on achieving the state transportation goals, to the chairs and ranking minority members of the legislative committees having jurisdiction over transportation policy and finance. The report must be signed by the department's chief engineer.

The cost of preparing the report elements required by Minn. Stat. 174.03, Subd. 12(d) is approximately \$30,000.

# Introduction

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## Report Purpose

This report is submitted to the Minnesota Legislature to satisfy [Minn. Stat. 174.03, subd. 12\(d\)](#). It directs the commissioner of the Department of Transportation to annually report on trunk highway performance measures, annual targets, identify performance gaps, and describe MnDOT's progress toward achieving the state transportation goals (from this point forward referred to as "the goals") established in [Minn. Stat. 174.01](#). These performance measures and targets are to support construction of resilient infrastructure, enhance the project selection for all transportation modes, and improve economic security for all people living in Minnesota.

There are two other components established by the statute:

- 174.03, subd. 12(b): Describes the minimum requirements for the transportation planning process
- 174.03, subd. 12(c): Describes the minimum requirements for the ten-year Capital Highway Investment Plan

Appendix A, starting on page 67, provides an overview of relevant MnDOT strategies and efforts for both the asset management planning process and the 10-year Capital Highway Investment Plan.

## Report Organization

### Relationship of SMTP Objectives to State Transportation Goals

To describe how the transportation system is performing, the goals and the related performance measures are organized around the [Statewide Multimodal Transportation Plan](#) (SMTP) objectives. Based on MnDOT's [Minnesota GO Vision](#) and the 16 goals, the SMTP sets the policy direction, priorities, and the framework for MnDOT's Family of Plans (i.e., the modal and system investment plans). The Family of Plans offer mode-specific strategies and guidance and include aviation, bicycle, freight, highway, pedestrian, ports and waterways, rail, and transit.

Performance measures already in the SMTP were automatically assigned to the same objective while other MnDOT performance measures from the Family of Plans were assessed and prioritized by an inter-division MnDOT work group. The resulting prioritization informed which measures are highlighted in this report. Appendix B on page 70 describes the Minnesota GO Vision, the SMTP, and the Family of Plans in more detail.

The SMTP objectives and associated goals are listed in Table 1<sup>1</sup>. There are four goals that do not have primary performance measures associated with them (goals 5, 7, 10, and 13). These goals are described with the correlated measures in their applicable SMTP objective sections. Appendix C on page 74 lists all the measures and their definitions presented in this report.

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<sup>1</sup> Because the Open Decision Making objective does not directly relate to the goals and focuses primarily on MnDOT rather than the entire transportation system, measures related to this goal are not presented in the main body of the report. A summary of the public trust and public confidence performance measures tracked by MnDOT are available in Open Decision Making section of Appendix B on page 70.

**Table 1. SMTP objective relationship to the legislative goals**

SMTP Objective	Associated Transportation Goals
Transportation Safety	(1) <b>Safety</b> : to minimize fatalities and injuries for transportation users throughout the state
System Stewardship	<p>(7) <b>Technological advancements</b>: to promote accountability through systematic management of system performance and productivity through the use of technological advancements</p> <p>(8) <b>Maximizing long-term benefits</b>: to maximize the long-term benefits received for each state transportation investment</p> <p>(9) <b>Infrastructure maintenance</b>: to provide for and prioritize funding of transportation investments that ensures that the state’s transportation infrastructure is maintained in a state of good repair</p> <p>(16) <b>Minimize environmental impacts</b>: to accomplish these goals with minimal impact on the environment</p>
Climate Action	<p>(11) <b>Promote high-occupancy and low-emission vehicles</b>: to promote and increase the use of high-occupancy vehicles and low-emission vehicles</p> <p>(15) <b>Reduce GHG emissions</b>: to reduce greenhouse gas emissions from the state’s transportation sector</p>
Critical Connections	<p>(3) <b>Reasonable travel time</b>: to provide a reasonable travel time for commuters</p> <p>(4) <b>Enhance economic development</b>: to enhance economic development and provide for the economical, efficient, and safe movement of goods to and from markets by rail, highway, and waterway</p> <p>(5) <b>Encourage tourism</b>: to 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</p> <p>(6) <b>Transit in all counties</b>: to provide transit services to all counties in the state to meet the needs of transit users</p> <p>(12) <b>Air transportation</b>: to 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</p> <p>(13) <b>Transit mode shift</b>: to 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</p>
Healthy Equitable Communities	<p>(2) <b>Economic well-being</b>: to 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</p> <p>(10) <b>Environmental and energy consistency</b>: to ensure that the planning and implementation of all modes of transportation are consistent with the environmental and energy goals of the state</p> <p>(14) <b>Bike and walk mode shift</b>: to promote and increase bicycling and walking as a percentage of all trips as energy-efficient, nonpolluting, and healthy forms of transportation</p>

# Report Terminology

## Performance Measure Timeline

Unless noted otherwise, the performance measures included in the report are summarized by calendar year (CY) and use 2022 as the most recent year available. For measures relying on performance projections from MnDOT's 2024-2033 10-year Capital Highway Investment Plan (CHIP), this report uses data available as of September 2023.

## Transportation System Terminology

Several performance measures in the report describe current and historic conditions by roadway system. An important component of Minnesota's transportation system is the state highway system, which consists of the following roadways:

- **National Highway System (NHS) roadways:** Includes all interstate highways (i.e., NHS – Interstate) and other NHS highways (i.e., NHS – Non-Interstate) that serve statewide and inter-state travel and are the primary connection between large urban areas.
- **Non-NHS roadways:** State highways that provide connections for regional and local travel and generally carry lower traffic volumes.

## Performance Measure Terminology

The report uses several performance management terms, which are defined below. MnDOT uses performance targets to calculate needed investment levels, stimulate innovation, and guide decision-making for the modal and system plans. These targets are set through public planning processes that incorporate numerous factors including engineering standards and other technical criteria, historical experience, and assessments of stakeholder expectations. MnDOT seeks to predict outcomes when adequate data is available and reasonable predictions can be made.

- **Performance measure:** An expression of how much or how well products or services are working towards a goal or desired outcome during a specified time frame.
  - **Primary measure:** A performance measure that is most directly evaluating progress towards a state transportation goal.
  - **Correlated measure:** A performance measure that has multiple connections and dependencies to multiple state transportation goals.
- **Desired outcome:** An end-state condition of well-being for people or the transportation system.
- **Expected outcome (Projection):** An estimate of future performance based on a predictive model or projection.
- **Current condition (Result):** A quantifiable description of a performance measure historically and up to the current time with respect to circumstances.
- **Target:** A specific performance level associated with a goal or desired outcome.
- **Indicator:** A measure that provides meaningful information about the condition of the transportation system but is neither managed nor directly used to evaluate the effectiveness of policies, strategies, investments, products, or services.



## Reporting Performance Information

Each SMTP objective report section presents the associated goals, an analysis of the current and historical performance of the measures (as available), regional or district-level performance measure data (where data and reporting allows), and a description of what MnDOT and its partners are doing to move towards the goals. When applicable, the report identifies and discusses gaps between the historical and current conditions and the statewide targets.

Additionally, each goal section contains scorecard summary tables providing details for the performance measures. The tables display the performance measure, the statewide target (if applicable), the current condition (i.e., the most recent year available), the desired trend direction, and the observed trend direction. Because the transportation system is operated by MnDOT and many other state and local partner agencies, the scorecards also identify whether MnDOT is the lead agency or a partner agency in terms in contributing to the desired outcome for a measure. Figure 1 displays the lead and partner icons.

Figure 1. Lead and Partner Icons

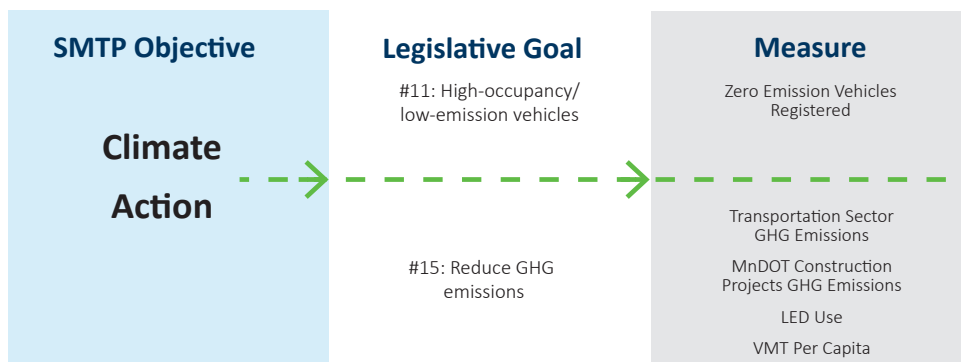


MnDOT’s partners include the Metropolitan Council, other metropolitan and regional planning organizations, city and county governments, tribal governments, the Minnesota Department of Public Safety (DPS), the Metropolitan Airports Commission (MAC), the Federal Aviation Administration (FAA), the US Army Corps of Engineers, and local government airports, port authorities, transit operators, and non-profit partners.

## Primary and Correlated Measures

Many of the goals have primary and correlated performance measures associated with them. Figure 2 shows the relationship between SMTP Objective, the goals, and measures using the Climate Action objective as an example. Figure 3 on the next page shows the legislative goals with entire set of performance measures in this report and identifies the primary (P) and correlated (C) relationships. When applicable, each goal section lists the correlated measures included in the report and the pages where they are found.

Figure 2. Example relationship



**Figure 3. Primary and correlated measures by goals (P = Primary; C = Correlated)**

MEASURE:	GOAL:															
	1. Safety	2. Multimodal & intermodal access	3. Reasonable travel time	4. Economic development	5. Tourism	6. Transit in all counties	7. Use technology	8. Maximize long-term benefits	9. Asset maintenance	10. Environment & energy	11. High-occupancy/low-emission vehicles	12. Air transportation	13. Transit mode shift	14. Walk/bike mode shift	15. Reduce GHG emissions	16. Minimal environmental impact
Roadway Fatalities	P															
Roadway Serious Injuries	P															
Highway-Rail Grade Fatalities and Serious Injuries	P	C		C												
Pedestrian fatalities and serious injuries	P													C		
Bicycle fatalities and serious injuries	P													C		
Snow Fences	P						C									
Bridge Inspection							C	P								
Rest Area Building Condition				C	C			P								
Bridge Condition				C				C	P							
Culvert Condition								C	P							C
Pavement Condition				C				C	P							
ADA Compliance		C						P						C		
Road Salt Chloride Use							C			C						P
Sustainable Pavements							C			C						P
Native Seeding and Plantings								C		C						P
Electric Vehicles Registered											P				C	
Transportation Sector GHG Emissions											C				P	C
LED Use										C					P	C
VMT Per Capita		C									C		C	C	P	
Interstate Travel Time Reliability			P	C												
Job Accessibility by Car			P	C												
Job Accessibility by Bicycle and Transit		C	P	C		C						C	C			
Twin Cities Freeway Congestion			P	C												
Traveler Delay			P	C												
Truck Travel Time Reliability Index (TTTRI)			P	C												
Public Transit Ridership		C				P					C		C		C	
Transit On-Time Performance		C				P						C			C	
Air Transportation					C							P				
Transportation and Housing Costs		P														
Physical Activity														P	C	



## New Performance Measures Development

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MnDOT regularly revisits current performance measures for improvement and evaluates where new performance measures are needed. The 2022 Transportation System Performance Report identified three key areas for new or updated performance measurements – multimodal destination access, transportation equity, and transportation system resilience. Although the performance measures for these areas are in different stages of development, MnDOT has made progress on all three.

### Multimodal Destination Access and Transportation Equity

In 2023, performance and risk analysis staff created a new annual public engagement plan for performance measure development. The goal is to gain public insight into the performance measures MnDOT is using and creating. The focus and method of engagement may vary year-to-year as the staff identifies new measurement areas for development. The most recent focus has been on multimodal destination access and transportation equity.

As a first step, staff conducted a transportation equity survey through the public engagement platform, Let's Talk Transportation. A summary of the preliminary survey findings begins on page 12. The survey responses will help MnDOT staff assess how accurately the in-development transportation and housing cost measures reflect the lived experiences of Minnesotans and inform the refinement of a multimodal destination access measure. Multimodal destination access is the study of the travel between origins and destinations.

### Transportation System Resilience

As part of the federal [Promoting Resilient Operations for Transformative, Efficient, and Cost-Savings Transportation \(PROTECT\) Formula Program](#), MnDOT is in the process of developing a Resilience Improvement Plan to document program priorities and program processes to invest PROTECT funds. The plan will be designed to support immediate and long-range planning activities and investments and demonstrate a systemic approach to transportation system resilience. The plan will also include a risk-based assessment of vulnerabilities to transportation assets and systems for current and future weather events and natural disasters.

For the plan, climate resiliency performance measures for three categories will be identified:

- **Adaptation and natural environment:** Performance measures describing how the transportation system

is being adapted to mitigate against climate change and how MnDOT is using natural features to achieve its goals. Examples include the stormwater treatment counts, tree and shrub planting counts, the percent of projects using native plantings, and the percent of project acres with native seedings.

- **Climate and extreme weather impacts:** Performance measures describing how specific asset conditions that either directly measure vulnerability to climate change or are proxies for potential vulnerabilities in the transportation system. Examples include annual dollars spent on maintenance for flooding and washouts and pavement blow-ups by internal maintenance forces.
- **Asset condition and vulnerability:** Performance measures describing asset vulnerability to climate change. Examples include highway culvert condition, bridge culvert condition, and the number of scour critical bridges.

## Public Engagement Efforts

Public outreach is a critical component for planning activities and refining performance measures. Two recent public engagement efforts informing transportation equity performance measure development are summarized in this section.

### Initial Transportation Equity Survey Findings

In summer 2023, performance and risk analysis staff conducted a survey through the public engagement platform, Let's Talk Transportation. Survey participants were invited to respond to five questions focused on transportation and housing costs and multimodal destination access. Participants could also identify which destinations were most important to them on a map of Minnesota.

Between August and September 2023, 103 people responded to the survey. For the amount typically spent on transportation, 46% of respondents said it is too high, while 40% said it is about right, and 14% said it is lower than expected. The reasons provided by respondents who said it was "too high" ranged from the cost of gas and car maintenance, age of vehicle, inability to bike, walk or use transit to get to work, lack of safety for non-car modes of transit, among others. The "lower than expected" responses focused mainly on working from home, low gas prices, and using non-car transportation modes like bikes, transit or walking.

For the amount typically spent on housing, 55% of respondents said it is about right, 40% said it is too high, and 5% said it is lower than expected. The "too high" responses focused on high and increasing rental prices, cost of housing in walkable/bikeable neighborhoods, and mortgage rates. The "lower than expected" responses were focused on paid off or low-interest mortgages.

Respondents identified grocery stores, work, and medical care as the top three locations that are most important to them. Work and the grocery store were also identified most frequently as the locations that would be most impacted by an additional 10-minute travel time. Reasons for this impact were focused on frequency of trips, length of commute, and location (or nearness) of the destination.

Pinned destinations on the optional map include parks, stores, light rail access, and locations where respondents' visit family members.

### "Tell Us How You Move Around" Project

In 2022 MnDOT launched "Tell Us How You Move Around"; a public engagement project designed by Sarah Petersen, MnDOT's Transportation Equity Fellow (an artist-in-residence pilot in partnership with Smart Growth America). The project consisted of an interactive website hosted on Let's Talk Transportation, surveys,

workshops, games, a poster campaign, and a public engagement kit. Each part of the project built on the previous portion of the project – the online website responses informed the in-person workshops, which informed the poster series.

The project allows MnDOT to hear directly about people’s lived experiences and provides data on transportation needs on what people want and need to shift transportation modes. It also acts as a tool for people to self-reflect on their experiences and values while communicating with MnDOT. Additionally, MnDOT can educate people on the variety of transportation options available to them along with the potential limitations on those options.

As of May 2023, 172 people have taken the one-question Tell Us How You Move Around survey, 132 have taken the more substantive Transit Mode Survey, 12 pins and stories have been added to the MN Map showing people’s favorite place to go without a car, three internal MnDOT workshops, and three external in-person pop-up workshops with over 200 combined participants were held across Minnesota. Several of these workshops were offered in the Metro district, District 6, and District 3. The workshops showed that hands-on creative play accelerated open conversation while open thinking conversations and gameboards gave insight into where MnDOT could talk to people about changing their travel mode when they have a choice.

This project not only created a prototype for how MnDOT can talk to the public about their transportation needs and choices, but also gathered qualitative and quantitative data that MnDOT can use to further understand how the public is viewing and using transportation services. It also created space for people to reflect on their transportation choices.



# Transportation Safety

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Transportation safety applies to all users of the transportation system regardless of their mode of travel. Comprehensive traveler safety involves an integrated approach that includes the “4Es” of safety – education, enforcement, engineering, and emergency medical and trauma services – and more. Each of these areas is critical to improving overall safety and helping to grow a transportation safety culture in Minnesota.



















## Goal 1

This section contains six key performance measures that help describe how MnDOT and partners are working to achieve goal 1: **To minimize fatalities and injuries for transportation users throughout the state.** The performance measures include:

- **Roadway fatalities:** The number of people killed in crashes involving motor vehicles on Minnesota roadways in a 12-month period.
- **Roadway serious injuries:** The number of people who were seriously injured resulting from crashes involving a motor vehicle in a 12-month period. The number of serious injuries is classified by first responders at the scene of the accident.
- **Highway-rail grade fatalities and serious injuries:** The number of people who were killed or seriously injured resulting from crashes at highway-rail grade crossings involving a motor vehicle in a 12-month period. This is a subset of total fatalities and serious injuries.
- **Pedestrian fatalities and serious injuries:** The number of people walking along Minnesota roadways who were killed or seriously injured resulting from crashes involving a motor vehicle in a 12-month period. This is a subset of total fatalities and serious injuries.
- **Bicyclist fatalities and serious injuries:** The number of people bicycling on Minnesota roadways who were killed or seriously injured resulting from crashes involving a motor vehicle in a 12-month period. This is a subset of total fatalities and serious injuries.
- **Snow fences:** The total number of miles of snow fences comprised of structural (e.g., composite rails snow fences), living (e.g., trees and shrubs), or vegetative (e.g., corn rows or hale bales) fences on Minnesota roadways. Snow fences trap snow by causing it to pile up before it reaches a road, which increases safety.

Table 2 lists each performance measure for Goal 1, statewide target (if applicable), the current condition, and the performance score (if applicable). The transportation safety measures are based on information from the annual [Minnesota Motor Vehicle Crash Facts report](#), which is produced by the Office of Traffic Safety at the Minnesota Department of Public Safety (DPS).

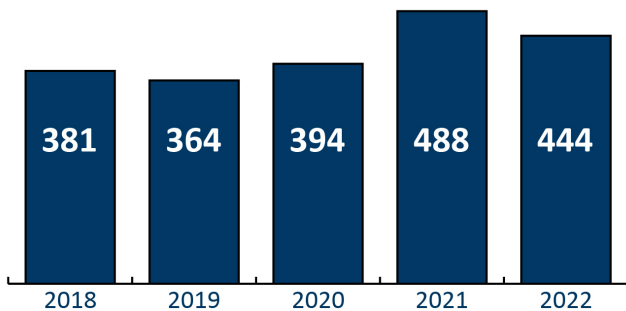
**Table 2. Goal 1 performance measures summary**

Measure	Role	Statewide Target	Current Condition	Trend Desired	Trend Observed
Roadway fatalities		≤225 by 2025; decreasing towards 0	444 traffic fatalities (2022)		
Roadway serious injuries		≤980 by 2025; decreasing towards 0	1,910 serious injuries (2022)		
Pedestrian fatalities/serious injuries		Decreasing towards 0	45 fatalities; 204 serious injuries (2022)		
Bicyclist fatalities/serious injuries		Decreasing towards 0	6 fatalities; 82 serious injuries (2022)		
Highway-rail grade fatalities/serious injuries		Decreasing towards 0	2 fatalities; 7 serious injuries (2022)		
Snow Fences		NA	Short-term: 41 Long-term: 116 miles (2022)		

## Fatalities and Serious Injuries

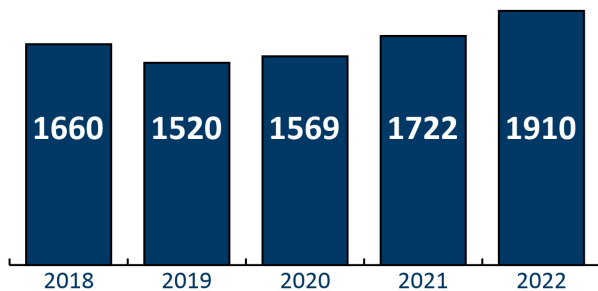
The 2020-2024 [Minnesota Strategic Highway Safety Plan](#) (SHSP) set a target of no more than 225 roadway fatalities annually by 2025. The plan and performance targets are updated every five years to reflect current and emerging crash trends and incorporate new safety strategies<sup>2</sup>. In 2022, 444 people were killed in motor vehicle crashes on Minnesota roads, which was a slight decrease from 2021 but still the second highest total in the previous five years and the third highest since 2007 when there were 510 (Figure 4).

**Figure 4. Annual fatalities on Minnesota Roadways, 2018 to 2022**



Additionally, 1,910 people were seriously injured on Minnesota roadways in 2022, which is the highest since 2018 (Figure 5). The 2020-2024 SHSP set an aggressive target of no more than 980 serious injuries by 2025.

**Figure 5. Annual serious injuries on Minnesota roadways, 2018 to 2022**



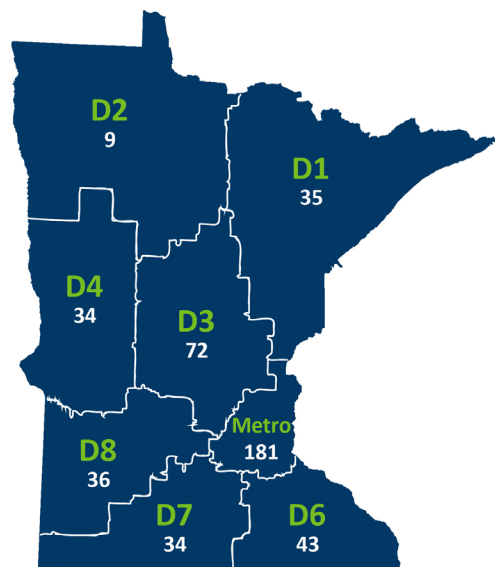
<sup>2</sup> The 2025-2029 Strategic Highway Safety Plan is in development.

## Regional Discussion

The figures below display fatalities and serious injury data available at the MnDOT district level. Technically, the data are tracked by Minnesota's eight [Area Transportation Partnerships \(ATP\)](#). For the purpose of this section, however, the data are summarized by district. While ATP boundaries mostly align with district boundaries, there are some differences because they follow county lines. As such, there will be some variation as to where the fatalities and serious injuries are reported. Due to regional differences such as population densities, geography, roadway types, and frequency of use, the statistics differ across districts. Because performance measure targets are set at a statewide level, district-level data should not be compared to those targets or across districts. Traffic safety strategies also vary by district and region of the state depending on the local conditions such as the number of high-risk rural intersections.

Regionally, the number of people killed in motor vehicles crashes in 2022 varied. Fatalities ranged from 9 in District 2 to 182 in the Metro District (Figure 6).

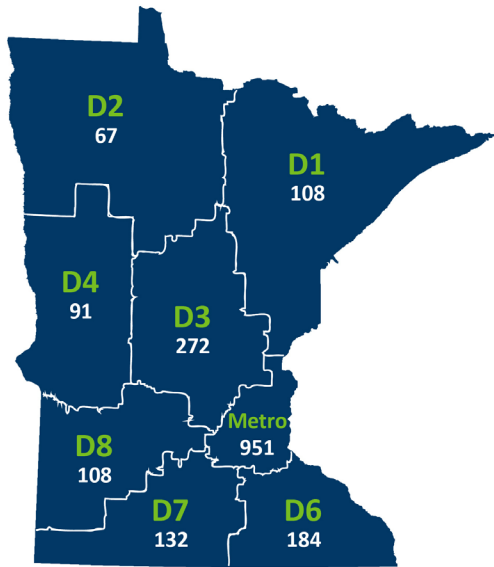
**Figure 6. Fatalities on Minnesota roadways by MnDOT district, 2022**





The number of people seriously injured in motor vehicles crashes in 2022 also varied by region ranging from 67 in District 2 to 951 in the Metro District (Figure 7).

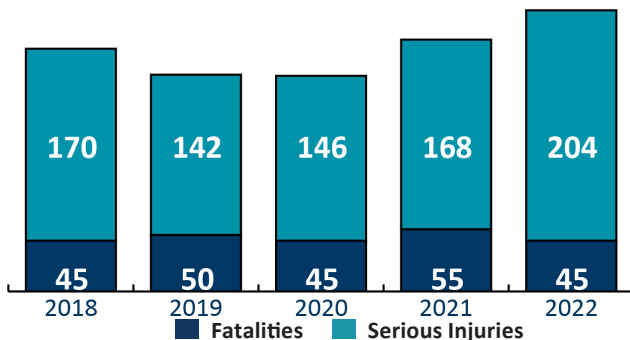
**Figure 7. Serious injuries on Minnesota roadways by MnDOT district, 2022**



## Pedestrian, Bicyclist, and Highway Rail-Grade Crossings Fatalities and Serious Injuries

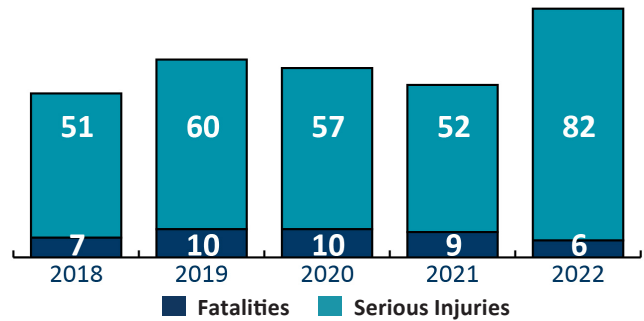
In 2022, 45 pedestrians were killed in crashes with motor vehicles and 204 were seriously injured. After a downward trend, there have been slight increases in serious injuries since 2019 (Figure 8).

**Figure 8. Pedestrian fatalities and serious injuries, 2018 to 2022**



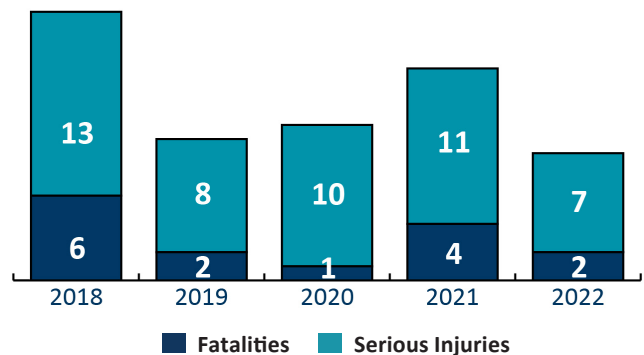
In 2022, six bicyclists were killed in crashes with motor vehicles and 82 were seriously injured (Figure 9). While the totals remained relatively stable over the previous four years, the 2022 total was an increase and the highest among the five-year period.

**Figure 9. Bicycle fatalities and serious injuries, 2018 to 2022**



In 2022, two people were killed and 7 people were injured at highway rail grade crossings (Figure 10). The numbers have varied over the past five years with 2022 having the lowest fatalities total and 2018 having the highest with six.

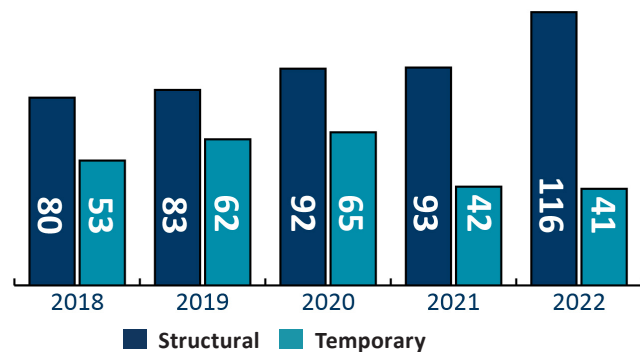
**Figure 10. Highway-rail grade crossing fatalities and serious injuries, 2018 to 2022**



## Snow Fences

Snow fences play a key role in winter maintenance productivity and roadway safety by helping to limit blowing snow across Minnesota roads. For maintenance, this is helpful where high winds make chloride use ineffective. For roadway safety, the snow fences improve driver visibility, reduce icy roads, and serve as visual clues. In 2022, there were 116 miles of long-term snow fences (i.e., combination of structural and living snow fencing) and 41 miles of temporary snow fences (i.e., standing corn rows, stacked hay bales, or four-foot-tall seasonal snow fencing) across Minnesota (Figure 11). Miles of structural snow fences have increased each year since 2018 while temporary snow fence totals have fluctuated year-to-year.

Figure 11. Miles of structural and temporary snow fences on Minnesota roadways, 2018 to 2022



## What is MnDOT Doing to Move Towards Goal 1?

MnDOT seeks to eliminate fatalities and injuries for transportation users on Minnesota roadways through several strategies. The [Minnesota Strategic Highway Safety Plan](#) sets overall direction for future safety strategies and presents a framework for selecting strategies. Through the State Aid programs, MnDOT partners with local government units (e.g., cities and counties) to fund and develop [road safety initiatives and plans](#). For roadway design, MnDOT incorporates a [Safe System Approach](#) that builds multiple layers of protection to prevent crashes from happening and minimize harm to people involved in crashes when they occur. Additionally, MnDOT provides traffic engineering training courses to county, city, and private professionals on a variety of road safety topics including lighting design, pavement markings, and work zone traffic engineering.

[Minnesota Towards Zero Deaths \(TZD\)](#) is a key traffic safety program that uses an interdisciplinary approach to reducing roadway deaths and serious injuries. According to the crash data collected by DPS, the top four contributing factors in traffic fatalities are speeding, unbuckled motorists, impaired driving, and distracted driving with frequency of speeding and unbuckled motorists increasing in recent years. Through TZD, MnDOT works with DPS and the Minnesota Department of Health to identify and improve locations at risk for the types of crashes most likely to result in death or serious injury, ensure compliance with traffic laws, educate drivers about the risks of behaviors like not wearing seat belts and drinking alcohol and driving, and respond to crashes quickly with emergency medical and trauma services.

### Learn more

MnDOT Traffic Engineering  
<http://www.dot.state.mn.us/trafficeng/index.html>

Minnesota Toward Zero Deaths  
<https://www.minnesotatzd.org/>

Minnesota's Highway Grade Crossing Safety Improvement Program provides funding for installation of new highway-rail grade crossing signal systems, interconnection of highway-rail grade crossing signals with roadway traffic signals, and replacement of outdated warning devices. Other activities include installing improved or additional warning devices, crossing consolidations, crossing closures, and sign changes. All these investments in safety improvements are efforts to prevent train-motor vehicle collisions at crossings, which can cause fatalities and injurious and lead to derailments.

Snow fences provide a variety of environmental, safety, and economic benefits by keeping roads clear of snow. To improve safety and mobility for people traveling on roadways, [MnDOT's snow fence program](#) partners with landowners to install snow fences in open areas along state highways.

## Other Measures Correlated to Goal 1

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There are no correlated measures identified.



## System Stewardship

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A key priority for MnDOT and local partners is maintaining the existing transportation system. System stewardship addresses three concepts: asset management, system management, and system resiliency. Targets are set during the planning process, with input from stakeholders and the public, at levels that prioritize higher volume roads and bridges.

The goals related to system stewardship and highlighted in this section include:

- **Goal 7:** To promote accountability through systematic management of system performance and productivity by using technological advancements.
- **Goal 8:** To maximize the long-term benefits received for each state transportation investment.
- **Goal 9:** To provide for and prioritize funding of transportation investments that ensures the state's transportation infrastructure is maintained in a state of good repair.
- **Goal 16:** To accomplish these goals with minimal impact to the environment.

### Goal 7

MnDOT does not track performance measures directly related to goal 7: **to promote accountability through systematic management of system performance and productivity through the utilization of technological advancements**. However, since 2015, MnDOT has reported efficiencies gained in the “Major Highway Projects, Trunk Highway Fund Expenditures and Efficiencies Report.” MnDOT uses a targeted approach to identify and quantify efficiencies in the report in two key areas of the agency:

- **State road construction:** development and delivery of construction projects funded through Minnesota's state road construction budget.
- **Administration, maintenance, and operations:** the administration of the organization including all daily maintenance, long term maintenance, and operation of transportation systems.

Efficiency in this context means maximizing the public benefit of every dollar invested in transportation. The efficiency calculation is based on deliberate decisions or business process improvements that provide cost savings or cost avoidance without compromising the quality of outcomes for the state. MnDOT uses a best practice case-analysis approach which reviews efficiency in quality, time, and cost. It analyzes what has worked,

why it has worked, in what conditions it has worked, and how it may work in the future. State road construction was analyzed for efficiency at the project level, while the administration, maintenance, and operations activities were evaluated at the program level.

In the most recent [Major Highways Report for SFY 2022](#), for example, MnDOT identified an estimated \$67.9 million in savings from efficient practices deployed across the organization. Most of these efficiencies came from construction program delivery and project development. There were approximately \$52.6 million in savings with the state road construction with the largest efficiencies coming from the value engineering method followed by performance-based practical design.

Efficiencies identified in SFY 2022 led to administrative, maintenance, and operations costs that were lower than if the efficient strategies were not implemented. Staff time savings were reallocated to administrative, maintenance, and operational priorities. There were approximately \$15.3 million in savings with the largest savings was in the Maintenance Decision Support System (MDSS) program followed by LED roadway lighting and tow plows.

## Other Measures Correlated to Goal 7

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There are three measures that correlate to Goal 7. They are listed in Table 3 along with their primary state transportation goal and the report page number where more information is available.

**Table 3. Other measures correlated goal 7**

Performance Measure	Primary Goal	Report Page Number
Bridge inspection	8	23
Road salt chloride use	16	32
Sustainable pavements	16	32

## GOAL 8







## Maximizing Long-term Benefits

This section contains two key performance measures that help describe how MnDOT is **working to maximize the long-term benefits received for each state transportation investment**. The performance measures include:

- **Bridge inspection:** The percent of routine bridge inspections completed within 30 days of the calendar due date in a 12-month period.
- **Rest area buildings condition:** The percent of MnDOT-owned rest area buildings that were rated as being in poor condition based on an assessment of the infrastructure.

Table 4 lists each performance measure for Goal 8, statewide target (if applicable), the current condition, and the performance score (if applicable).

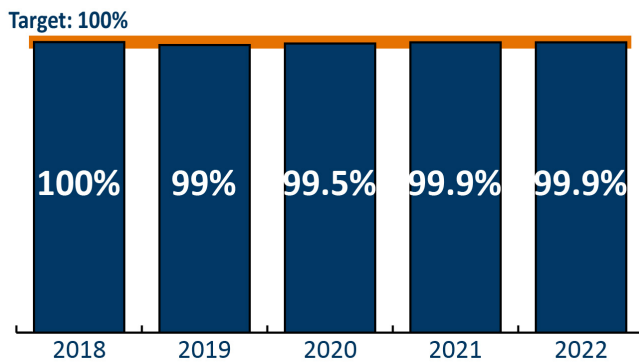
**Table 4. Goal 8 performance measures summary**

Measure	Role	Statewide Target	Current Condition	Trend Desired	Trend Observed
Bridge Inspection		100% on time	99.9% (2022)		
Rest Area Building Condition		<4% poor	8.3% (2021)		

## Bridge Inspections

In 2022, nearly all (99.9%) inspections of MnDOT-owned bridges were completed on-time, which has been consistent over the last five-year period (Figure 12). A bridge inspection is considered on-time if it is completed within 30 days of its calendar due date. All bridges receive their required safety inspections, but sometimes a small number are delayed past their due date because of weather or a scheduling issue. Since 2013, MnDOT has completed bridge inspections on time 99% of the time.

**Figure 12. Percent of routine bridge inspections completed on time, 2018 to 2022**

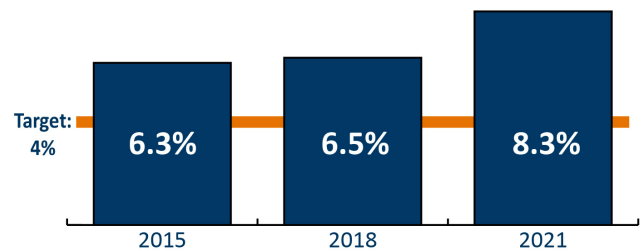


## Rest Area Condition

Rest area facilities conditions are assessed on a three-year cycle in which about one-third of buildings are assessed each year. MnDOT is currently in the first year of the next three-year cycle and is assessing 17 rest area facilities. 2021 is the most recent year a complete assessment of the 58 MnDOT-owned facilities is available. In 2021, 8.3% of buildings in MnDOT rest areas were categorized as being in poor condition, which was a slight increase from the previous years with complete data (Figure 13). A building is in poor condition when the total value of deferred maintenance on all the systems in the building is between one quarter up to half of the replacement value of the building. It is MnDOT's goal to have less than 4 percent of rest area buildings in poor condition.

Note that there are three rest areas where more than half of the property is owned by the Minnesota Department of Natural Resources (DNR). These three are excluded from the MnDOT assessments because they are assessed separately by the DNR.

**Figure 13. Percent of rest area buildings in poor condition, 2015 to 2021**



## What is MnDOT Doing to Move Towards Goal 8?

MnDOT strives to achieve 100% of on-time bridge inspections. However, delays can occur due to weather, conflicting construction activities, or high priority reactive maintenance activities. Providing accurate data from these inspections allows MnDOT and its transportation partners to better plan for bridge improvements, maintenance, and operations throughout the state. All of Minnesota's MnDOT-owned bridges receive scheduled safety inspections as required by state and federal rules and regulations. In general, bridge inspections typically occur on two-year cycles. Some structures are on shorter or longer inspection cycles, depending on current condition, type of design and materials used in construction.

Rest areas provide strategic locations to support the economy including tourism. They eliminate unsafe stops on shoulders, provide information to travelers, reduce driver fatigue, and promote transportation safety. The facilities play a key role in the long-term management and operation of the transportation system. As part of the

## GOAL 8 • Maximizing Long-term Benefits

building assessments, MnDOT inspects detailed components of a rest area building's infrastructure including walls, doors, HVAC systems, pavement, and more. Along with the assessments, MnDOT also uses a [scoring criteria matrix](#) and customer feedback to help identify specific areas in need of the most improvement and target project investments accordingly. Because all systems in a building are assessed individually, targeted investment in replacing systems can have a large impact on the overall condition of a building. Additionally, MnDOT is in the process of implementing a new performance measure to track the physical conditions of the entire rest area site. More information on safety rest areas and waysides is available on the [MnDOT Rest Areas webpage](#).

### Other Measures Correlated to Goal 8

In addition to the primary performance measures presented this section, there are five other measures that correlate to Goal 8. They are listed in Table 5 along with their primary legislative goal and the page number where more information is available.

**Table 5. Other measures correlated to goal 8**

Performance Measure	Primary Goal	Report Page Number
Snow fences	1	18
Bridge Condition	9	26
Culvert Condition	9	26
Pavement Condition	9	28
Native Seedings and plantings	16	32



## GOAL 9

## Infrastructure Maintenance













### Goal 9

This section contains four key performance measures that help describe how MnDOT is working to **achieve the goal to provide for and prioritize funding of transportation investments that ensures that the state's transportation infrastructure is maintained in a state of good repair**. The performance measures include:

- **Bridge condition:** The annual percentage of total state bridges rated as being in poor condition based on evaluations of the bridge deck, substructure, and superstructure.
- **Culvert condition:** The annual percentage of total culverts under state highway lanes rated as being in poor or severe condition.
- **Pavement condition:** The annual percentage of total interstate, other NHS, and non-NHS roadways rated as having poor ride quality.
- **ADA compliance:** The percentage of total state-owned sidewalks, signals, curbs, and driveways substantially compliant with Americans with Disabilities Act (ADA) standards.

Table 6 lists each performance measure for Goal 9, statewide target (if applicable), the current condition, and the performance score (if applicable).

**Table 6. Goal 9 performance measures summary**

Measure	Role	Statewide Target	Current Condition	Trend Desired	Trend Observed
Bridge Condition		NHS Poor: ≤5% Non-NHS Poor: ≤8%	NHS: 6.3% Non-NHS: 4.2% (2022)		
Culvert Condition		Poor or Severe: ≤10%	20% (2022)		
Pavement Condition		Interstate Poor: ≤2% NHS Poor: ≤4% Non-NHS Poor: ≤8%	Interstate: 0.5% NHS: 0.6% Non-NHS: 2.1% (2022)		
ADA Compliance		100% by 2037	Curb Ramp: 46% Sidewalk: 56% Signals: 76% (2022)		

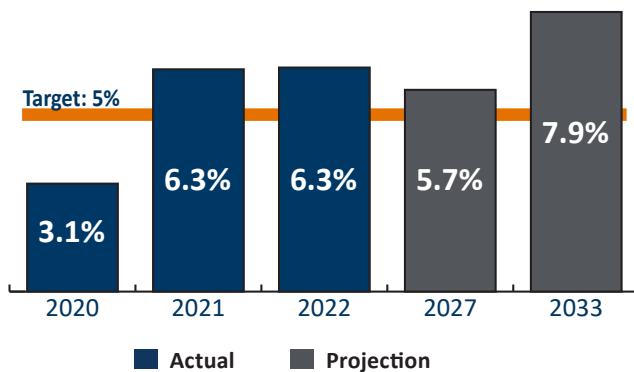
<sup>3</sup> From 2020-2022 MnDOT reassessed the baseline for ADA assets which included assets not previously counted.

## Bridge and Culvert Conditions

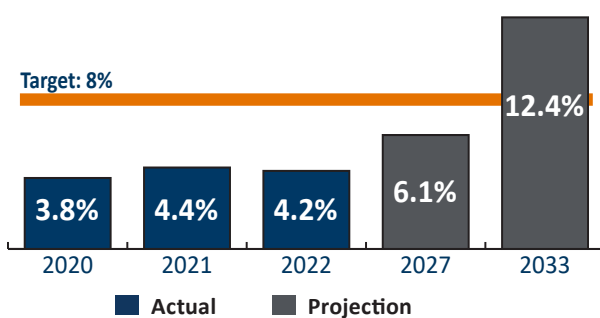
### Bridges

In 2022, 6.3% of NHS bridges were rated as being in poor condition, which exceeds the statewide target of 5 percent (Figure 14). The increase from 2020 to 2021 is due in large part to the Blatnik Bridge in Duluth falling into poor condition (the Blatnik Bridge, connecting Duluth and Superior, WI, is Minnesota's second longest bridge). For non-NHS bridges, 4.2 percent of non-NHS bridges were in poor condition, which is in line with previous years and better than the statewide target (Figure 15). However, according to CHIP projections as of September 2023, the proportions of NHS and non-NHS bridges in poor condition are expected to increase and exceed the statewide targets by 2033.

**Figure 14. NHS bridges in poor condition, 2020 to 2032 (projected)**



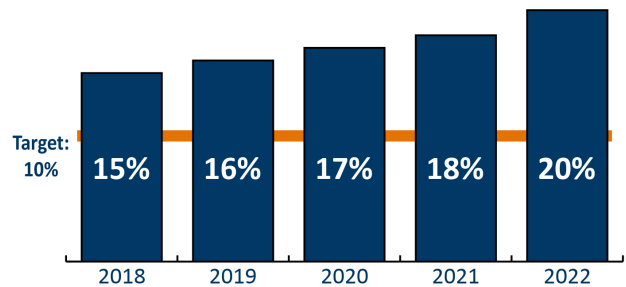
**Figure 15. Non-NHS bridges in poor condition, 2020 to 2032 (projected)**



### Culverts

Highway culverts include culverts smaller than a 10-foot span that are under state highway traffic lanes and function to move surface water through a roadway embankment and away from the highway. MnDOT's statewide target for culverts in poor or severe condition is less than or equal to 10 percent. In 2022, 20% of culverts were in poor or severe condition (Figure 16). In prior years, the annual percentages were also above the statewide goal, ranging from 15% to 18%.

**Figure 16. Culvert in poor or severe conditions, 2018 to 2022**



### Regional Discussion

The figures in this section display state bridge and culvert data available at the MnDOT district level. Infrastructure conditions vary across districts due to differences in climate conditions, the age and number of bridges and culverts in a district, and the frequency of use. Because performance measure targets are set at a statewide level, district-level data should not be compared to those targets or across districts.

The number of bridges and the total square feet of bridge deck varies by district so a change in the condition of one bridge in one district can significantly impact the percentage in poor condition. Table 7 lists the 2022 totals for NHS and non-NHS bridges as well as the total bridge deck area by district (in thousands of square feet). The Metro District has the most NHS and non-NHS bridges and most square feet of bridge deck area. While District 6 has the second highest bridge counts, District 1 has the second most square feet of NHS bridge deck.

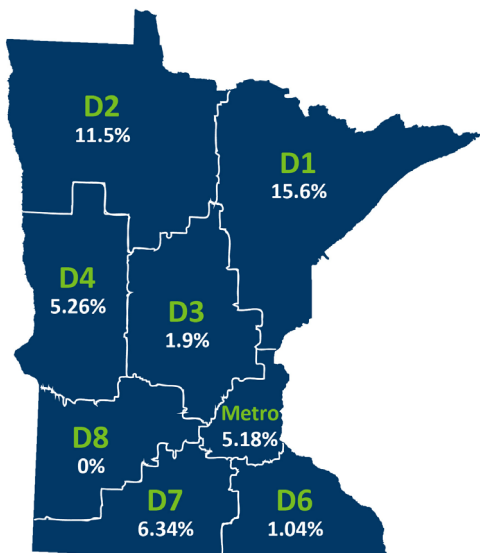
Table 7. Number of bridges and bridge deck area by district, 2022<sup>4</sup>

District:	Number of NHS Bridges:	NHS Bridge Deck Area*:	Number of Non-NHS Bridges:	Non-NHS Bridge Deck Area*:
1	181	4,319	149	1,752
2	41	738	75	814
3	146	1,985	88	1,056
4	76	815	73	678
6	200	2,588	237	2,700
7	129	1,767	111	1,307
8	67	703	62	366
<b>Metro</b>	<b>516</b>	<b>14,264</b>	<b>661</b>	<b>12,256</b>

\*Units: sq. ft. (thousands)

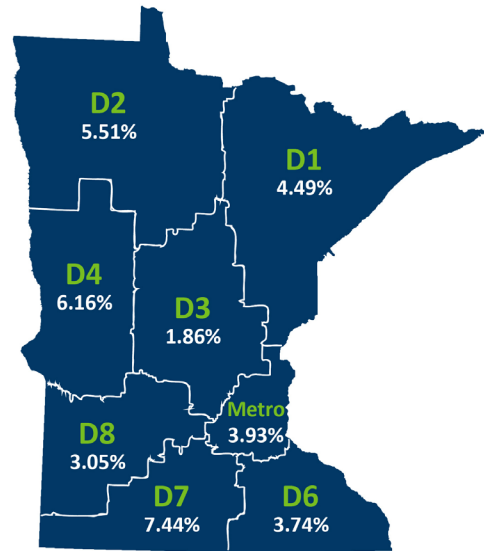
In 2022, the percentage of NHS bridges in poor condition ranged by district from 0% in District 8 to nearly 16% in District 1 (Figure 17). The relatively high percentage in District 1 is due to the Blatnik Bridge falling into poor condition in 2021.

Figure 17. NHS bridges in poor condition by MnDOT district, 2022<sup>5</sup>



Non-NHS bridges in poor condition in 2022 ranged from nearly 2% in District 3 to about 7.5% in District 7 (Figure 18).

Figure 18. Non-NHS bridges in poor condition by MnDOT district, 2022



4 Bridge conditions are tracked and reported by Area Transportation Partnership (ATP).

5 Bridge conditions are tracked and reported by ATP.

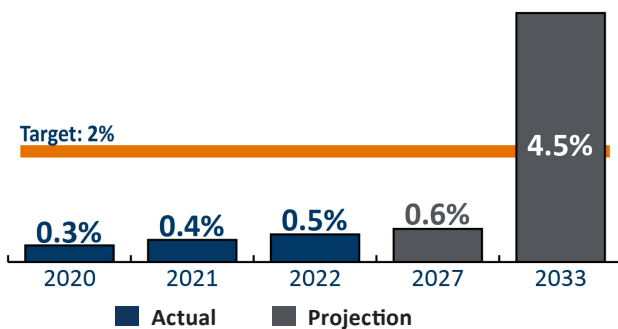
## Pavement Condition

MnDOT measures pavement condition annually on its roadways (roadways with poor and good conditions are tracked). The statewide targets for poor ride quality in the travel lane is less than or equal to 2% for the Interstate system; 4% for other NHS roadways; and 8% for the non-NHS. In 2022, the percent of roadways with poor ride quality for each system were:

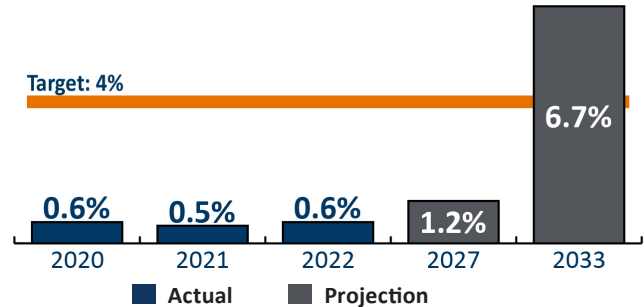
- NHS Interstate: 0.5% (Figure 19)
- NHS non-Interstate: 0.6% (Figure 20)
- Non-NHS: 2.1% (Figure 21)

The share of roadways with poor ride quality were better than the statewide targets and continued an improving trend from recent years. However, based on CHIP estimates as of September 2023, the share of Interstate and other NHS pavement with poor ride quality will increase and exceed the statewide targets by 2033. Pavement rated poor can still be driven on, but the ride is sufficiently rough that most people would find it uncomfortable and may reduce their speed. Rough pavement can also negatively impact freight movement by increasing the risk of damaging cargo.

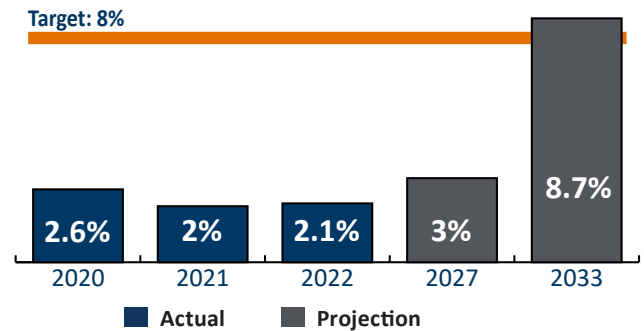
**Figure 19. NHS Interstate system with poor ride quality in the travel lane, 2020 to 2033 (projected)**



**Figure 20. NHS Non-Interstate with poor ride quality in the travel lane, 2020 to 2033 (projected)**



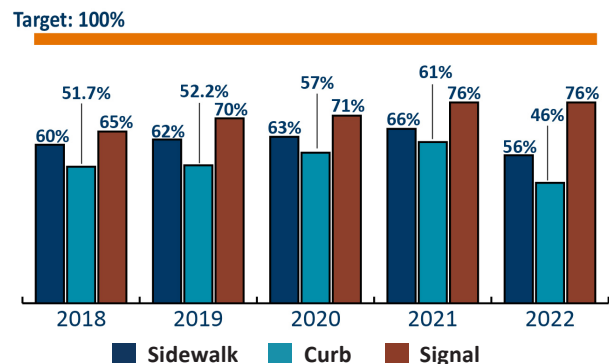
**Figure 21. Non-NHS state highways with poor ride quality in the travel lane, 2020 to 2033 (projected)**



## ADA Compliance

MnDOT's goal is for 100% of sidewalk-miles, curbs, signals, and driveways along state highways to be substantially compliant with American with Disability Act (ADA) standards by 2037. In 2022, MnDOT identified 56% of sidewalk-miles, 46 percent of curbs, and 76% of signals along state highways as ADA compliant, which are below the statewide target (Figure 22). NOTE: From 2020-2022 MnDOT reassessed the baseline for ADA assets which included assets not previously counted. This resulted in the observed decrease in the compliance rate for sidewalk miles and curbs.

Figure 22. ADA Compliance: Sidewalks, Curbs, and Signals, 2018 to 2022



## What is MnDOT Doing to Move Towards Goal 9?

MnDOT monitors the condition of bridges, culverts, and roadways on an ongoing basis. As guided by the [Transportation Asset Management Plan](#) (TAMP) and its focus on life cycle planning, monitoring and measuring the condition of these assets helps MnDOT and its partners strategically build, manage, maintain, operate, and adapt the transportation system. For state highway bridges, condition is assessed through inspections performed at least every two years. The assessments include evaluating the bridge deck, substructure, and superstructure. Bridges rated as poor are still safe to drive on, but they are near the point where significant investment in repair or replacement is necessary (MnDOT also tracks the percent of NHS and Non-NHS bridges in good condition). Because bridges are large, complex, and expensive assets that deteriorate over time, MnDOT also proactively performs preventative maintenance activities such as flushing, crack sealing, joint maintenance, and spot painting.

Measuring pavement and culvert quality on roadways also helps the agency plan for areas that need the most improvement. For example, pavement quality on the NHS and non-NHS roadways is measured every year using a van with specialized equipment. The roadways are given a ride quality score based on those measurements. As with bridges, MnDOT also proactively performs preventive pavement maintenance activities including patching and crack filling. More information about infrastructure investment planning is available in the TAMP and the [Minnesota State Highway Investment Plan](#) as well as Appendix A starting on page 67.

MnDOT's [Americans with Disabilities Act Transition Plan](#) details how the department ensures that its facilities, services, programs, and activities are accessible to all individuals. As part of this regularly updated plan, MnDOT adopted the national [Public Right-of-Way Accessibility Guidelines](#) as a basis for updates to facility design standards and policies. MnDOT also dedicated additional staff to evaluate the accessibility of construction projects, respond to complaints, and manage an ADA investment program. In 2021, MnDOT adopted its first [Statewide Pedestrian System Plan](#). This plan directs MnDOT's efforts to increase the safety and mobility of

### Learn more

MnDOT Bridge Office

<https://www.dot.state.mn.us/bridge/index.html>

MnDOT Asset Management Project Office

<https://www.dot.state.mn.us/assetmanagement/ampo.html>

MnDOT Active Transportation Program

<http://www.dot.state.mn.us/active-transportation-program>

people walking along the state highway network. It also establishes performance measures that track progress toward pedestrian-related goals, including ADA compliance.

## **Other Measures Correlated to Goal 9**

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There are no correlated measures identified.

## GOAL 16

# Minimize Environmental Impacts










## Goal 16

This section contains three key performance measures that help describe how MnDOT is working to **accomplish these goals with minimal impact to the environment**. The performance measures include:

- **Road salt chloride use:** The ratio of liquid to solid de-icing chemicals applied to reduce overall chlorides used on the roadway for snow and ice control in a winter season.
- **Sustainable pavements:** Annual number of MnDOT projects using sustainable pavement practices.
- **Native seedings and plantings:** The percent of acres planted with native seeds and native plants as part of large projects in a 12-month period.

Table 8 lists each performance measure for Goal 16, statewide target (if applicable), the current condition, and the performance score (if applicable).

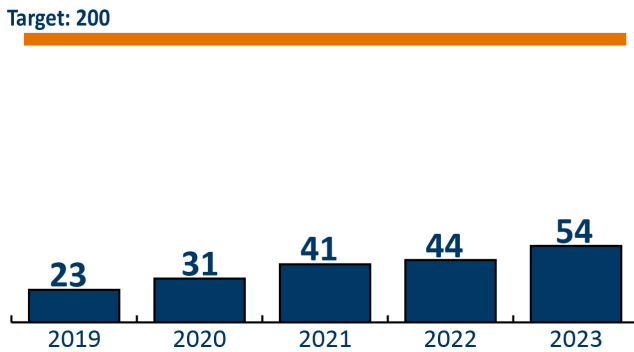
**Table 8. Goal 16 performance measure summary**

Measure	Role	Statewide Target	Current Condition	Trend Desired	Trend Observed
Road Salt Chloride Use		200 gallons of liquid per ton of solid by 2027	54 gallons of liquid per ton of salt (2022-2023)		
Sustainable Pavements		NA	7 projects (2022)		
Native Seedings and Plantings		Native Seedings: 75% of project acres by 2025; Native Plantings: 80% of urban projects; 90% of rural projects	42% of acres planted with native seeds; 65% of projects planted with native plantings (2022)		

## De-icing Roadways

MnDOT’s target is to increase the frequency of using liquids to de-ice roads to 200 gallons per ton of solid by 2027. In the 2022-23 winter season, 54 gallons of liquid were used for every ton of salt (Figure 23), which continued the trend of increasing the use of liquids to de-ice roads.

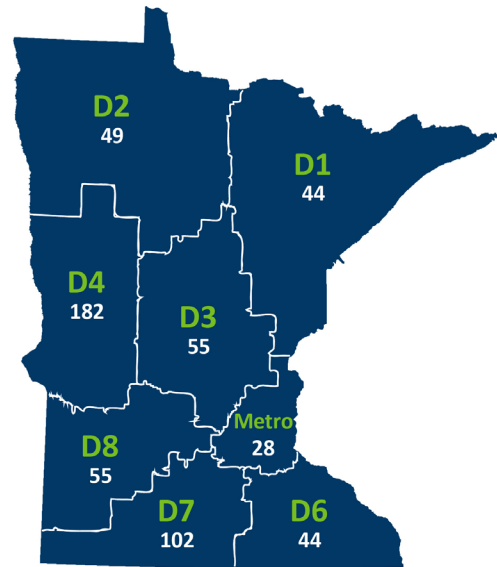
**Figure 23. Gallons of liquid chloride used per ton of solid, 2019 to 2023**



### Regional Discussion

Figure 24 shows the road salt chloride use measure at the MnDOT district level. In the 2022-2023 winter season, the rate of liquid to solid deicing chemicals ranged from 28 gallons in Metro to 182 in District 4. The transition from dry chlorides to liquid chlorides requires multiple investment areas, including equipment and staff education. As a result, usage varies across districts. Performance measure targets are set at a statewide level and district-level data should not be compared to those targets or across districts.

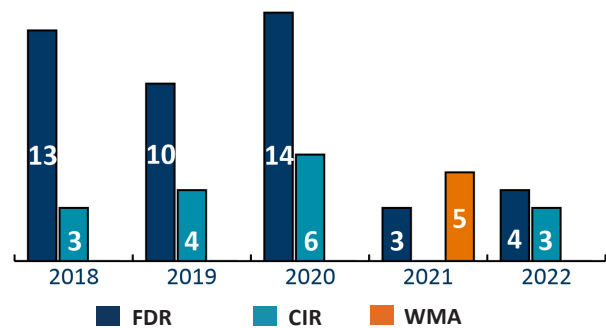
**Figure 24. Gallons of liquid chloride used per ton of solid by MnDOT district, 2022-2023 winter season**



## Sustainable Practices

MnDOT used sustainable pavement practices in seven projects in 2022 (Figure 25). Of those projects, four were full depth reclamation (FDR) and three were cold in-place recycling (CIR). These sustainable pavement methods reduce the carbon emissions associated with paving roads, and in certain cases, provide a way to recycle paving materials. All the methods extend the life span of the pavement.

**Figure 25. Projects with sustainable pavements, 2018 to 2022**

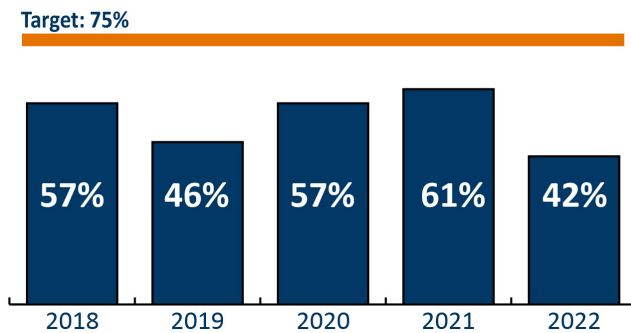




## GOAL 16 • Minimize Environmental Impacts

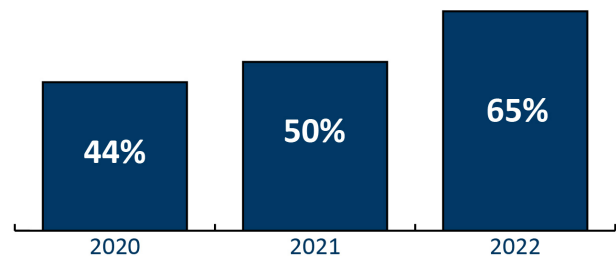
MnDOT's statewide target is for 75% of project acres planted with native seedings by 2025. The percent of project acres of native seedings have fluctuated between 42% and 61% since 2018. In 2022, the percent of project acres planted with native seedings was 42%. Overall, the percent of native seeding acres have decreased during the five-year period, (Figure 26).

**Figure 26. Percent of project acres with native seedings**



MnDOT's statewide target is for 80% of projects in urban areas and 90% of projects in rural areas to be planted with native plantings. These targets are new and data tracking prior to 2022 was done at a statewide level. In 2022, 65% of projects were planted with native plantings (Figure 27). These projects were all in urban areas. MnDOT does not aim for 100% of plantings to be native because non-invasive, non-native species and cultivars are also used where they are needed to withstand site specific functions. Please note the results represent plants specified by MnDOT Environmental Planning and Design Unit in the Office of Environmental Stewardship for contract, partnership, and maintenance projects. The results do not include State Aid or consultant designs, nor MnDOT site development or snow control designs.

**Figure 27. Percent of projects with native plantings**



## What is MnDOT Doing to Move Towards Goal 16?

To help minimize environmental impacts, MnDOT pilots and deploys sustainable practices in its maintenance and project operations. Salt chlorides play a key role in keeping roads safe during winter months by lowering the freezing point of water. MnDOT is working to better manage pollutants by increasing the use of liquid chlorides compared to dry during snow and ice operations. MnDOT research has shown that at rates at least greater than 100 gallons per ton a 25% reduction in total chlorides can be realized.

For pavement practices, full depth reclamation and cold in-place recycling can lower construction greenhouse gas emissions by reducing the amount of material that needs to be extracted and produced, as well as transported to the site. Warm mix asphalt uses less fuel to produce, increases durability, and extends paving season as it can be placed at lower temperatures. Another technique explored by MnDOT, but not yet used, is stabilized full depth reclamation, which produces a stronger roadway base and requires less new asphalt.

### Learn more

MnDOT's Environmental Stewardship Office

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

[MnDOT's roadside vegetation management](#) serves many critical functions in operating the transportation

## GOAL 16 • Minimize Environmental Impacts

system including safety, drainage, erosion control, storm water treatment, and invasive species control. MnDOT projects using native seedings decreases construction impacts to the surrounding environment by providing structure to the soil which minimizes erosion and impacts of harsh seasonal weather. Using native vegetation on roadsides can also provide several additional benefits such as improved aesthetics, wildlife habitat, carbon sequestration, and biodiversity protection by reintroducing native species. Currently, MnDOT is in the process of developing resiliency performance measures focused on adaptation and the natural environment to better track progress. Additionally, in 2023, the Minnesota Legislature directed MnDOT to create a Highways for Habitat Program to enhance roadsides with pollinator, other wildlife habitat, and vegetative buffers and to develop best management practices for integrated roadside vegetation management.

### Other Measures Correlated to Goal 16

In addition to the primary performance measure presented in this section, there are three other measures that correlate to goal 16. They are listed in Table 9 along with their primary legislative goal and the page number where more information is available.

**Table 9. Other measures correlated to legislative goal 16**

Performance Measure	Primary Goal	Report Page Number
Culvert Condition	9	26
Transportation sector greenhouse gas emissions	15	39
LED use	15	39



# Climate Action

Climate change impacts the way transportation infrastructure is used, built, operated, and maintained. Innovative solutions are needed to ensure the transportation system can be more resilient and adaptable to effects of climate change and extreme weather. A more resilient system can reduce adverse health impacts and minimize disruptions to the movement of people and goods. Key commitments include reducing emissions, coordinating with communities, and building resiliency to enhance transportation options and provide a variety of choices for people to access goods, services, and destinations.

The legislative goals related to climate action and highlighted in this section include:

- **Goal 11:** To promote and increase the use of high occupancy vehicles and low emission vehicles.
- **Goal 15:** To reduce greenhouse gas emissions from the state transportation sector.

## Goal 11

This section contains one key performance measure that helps describe how MnDOT is working to achieve the goal **to promote and increase the use of high occupancy vehicles and low emission vehicles**. The performance measure is:

- **Electric vehicles registered:** Total percentage of electric vehicles (including plug-in hybrid and battery electric vehicles) registered in Minnesota.

Performance measures describing the use of high occupancy vehicles such as public transit and strategies focused on increasing ridership are included in the Goal 6 report section on page 52.

Table 10 lists the performance measure for Goal 11, the statewide target and the current condition.

**Table 10. Goal 11 performance measure summary**

Measure	Role	Statewide Target	Current Condition	Trend Desired	Trend Observed
Electric vehicles registered		5% by 2025 65% by 2040	34,499 EVs registered in Jan. 2023		

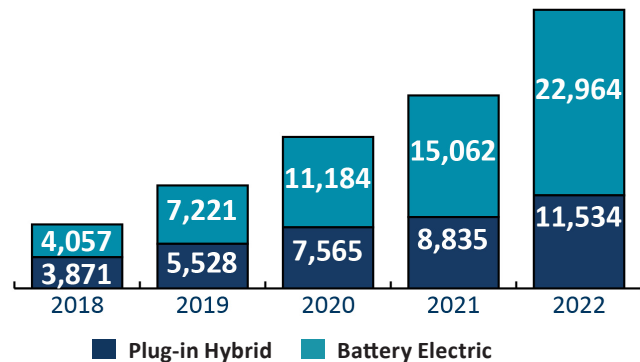
## GOAL 11

# Promote High-occupancy and Low-emission Vehicles

## Electric Vehicles

MnDOT's goal is for 5% of light-duty vehicles registered in Minnesota to be EVs by 2025 and 65% by 2040. The number of EVs registered in Minnesota has increased each year from 2018 to 2022, with growth in battery electric vehicles outpacing plugin hybrid electric vehicles (Figure 28). However, with 34,498 EVs registered as of January 2023, Minnesota is not currently on track to meet the 2025 or 2040 statewide goals.

Figure 28. Electric vehicles registered in Minnesota, 2018 to 2022



## What is MnDOT Doing to Move Towards Goal 11?

Light-duty vehicles with internal combustion engines are the largest contributors to transportation greenhouse gas emissions in the state. While federal fuel economy standards will lower emissions in the future, electrifying and having light duty electric vehicles are important strategies to meet the state's climate goal. While not yet on track to meet the statewide targets, EVs registrations continue to increase in Minnesota. EV's include electric vehicles, hydrogen fuel cell powered vehicles and other non-carbon-based fueled vehicles. More detailed information is available on the [EValueMN dashboard](#). MnDOT also analyzed EV market trends and strategies for increasing the number of EVs on the road in its [2021 Minnesota EV Assessment](#).

At the federal government level, the National Electric Vehicle Infrastructure (NEVI) Formula Program was created to provide funds to states to install fast chargers for elective vehicles. As described in the 2022 [Statewide Electric Vehicle Infrastructure Plan](#), MnDOT expects to invest about \$68 million in NEVI funds over five years (along with a 20 percent non-federal match). The focus in 2022 was light duty EV charging needs for the state's existing Alternative Fuel Corridors (AFCs) along Interstate 94 and Interstate 35. The next focus will be on medium and heavy-duty EV charging needs. Following a 2023 plan update, MnDOT will also begin developing proposed program evaluation metrics for tracking progress toward the state's EV goals such as statewide system miles covered by EV charging stations and the percent of the state population within 15 and 50 miles of a station.

### Learn more

MnDOT's Office of Sustainability and Public Health— Electric Vehicle Planning

<http://www.dot.state.mn.us/sustainability/electric-vehicles>.

Transit in Greater Minnesota

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

In addition to the strategies described in the Goal 6 report section on page 52, MnDOT promotes the use of high occupancy vehicles by partnering with transit providers around the state to provide riders with local public transit information, van pooling, and ride sharing resources. MnDOT also administers several transit programs such as [transit grants for Greater Minnesota](#), which include the Greater Minnesota Public Transit Operating grant, the Public Transit New Service Grant, the Replacement Bus Grant and the Public Transit Facilities and

## GOAL 11 • Promote High-occupancy and Low-emission Vehicles

Public Transit Large Capital Grant. MnDOT also administers the [Rural Transit Assistance Program](#), which works with transit agencies to provide customer service-focused training and knowledge transfer opportunities.

### Other Measures Correlated to Goal 11

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In addition to the primary performance measure presented in this section, there are three other measures that correlate to goal 11. They are listed in Table 11 along with their primary legislative goal and the page number where more information is available.

**Table 11. Other measures correlated to goal 11**

Performance Measure	Primary Goal	Report Page Number
Transportation sector greenhouse gas emissions	15	39
Vehicle miles traveled per capita	15	40
Public transit ridership	6	53

## GOAL 15

## Reduce GHG Emissions










### Goal 15

This section contains three key performance measures that help describe how MnDOT is working **to achieve the goal to reduce greenhouse gas emissions from the state transportation sector**. The performance measures include:

- **Transportation sector greenhouse gas emissions:** Amount of greenhouse gas (GHG) emissions, measured in metric tons of carbon dioxide equivalent (CO<sub>2</sub>e)<sup>6</sup>, from the transportation sector in a 12-month period. The transportation sector emissions include tail pipe emissions from motor vehicles (cars and trucks) on the road and emissions from aviation, rail, and marine vehicles.
- **LED use:** Total percent of light fixtures using Light Emitting Diodes luminaries, more commonly called LED, on MnDOT- managed roadways.
- **Vehicle miles traveled per capita:** The total annual vehicle miles traveled divided by the population. In simple terms, it is the number of vehicle miles that a typical person in Minnesota travels per year.

Table 12 lists each performance measure for Goal 15, the statewide target (if applicable), the current condition and the performance score (if applicable).

**Table 12. Goal 15 performance measure summary**

Measure	Role	Statewide Target	Current Condition	Trend Desired	Trend Observed
Transportation sector GHG emission		29.5 million metric tons CO <sub>2</sub> e (30% reduction) by 2025; 8.0 million metric tons CO <sub>2</sub> e (80% reduction) by 2040	36.1 million metric tons CO <sub>2</sub> e (2020) 28.2 million metric tons of CO <sub>2</sub> (2022 Tailpipe CO <sub>2</sub> )		
LED use		Convert all lighting on MnDOT managed roadways by 2020	99.5% complete (2022)		
VMT per capita		9,195 by 2040	9,906 miles (2022)		

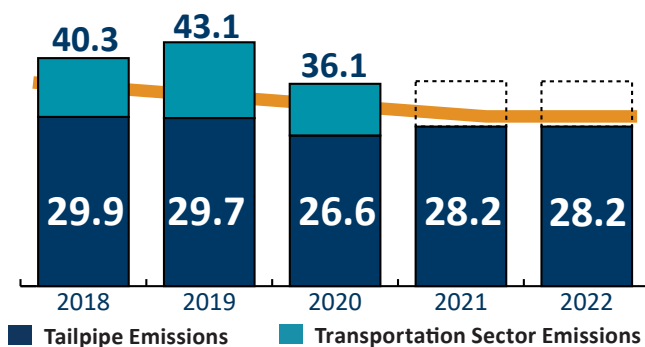
<sup>6</sup> Greenhouse gases for both construction and maintenance are expressed in terms of carbon dioxide equivalent (CO<sub>2</sub>e). CO<sub>2</sub>e combines the climate effects of various GHGs as if they were all carbon dioxide. More information for how MnDOT analyzes GHG emissions is available at: <http://www.dot.state.mn.us/project-development/subject-guidance/greenhouse-gas-analysis/process.html>.

## Emissions Reductions

The transportation sector is the largest GHG emissions contributor in Minnesota. Emissions from the transportation sector include tail pipe emissions from motor vehicles (cars and trucks) on the road and emissions from aviation, rail, and marine vehicles. At the state level, the [Next Generation Energy Act](#) set the state’s goal to reduce GHG emissions across all sectors from 2005 levels by 30% by 2025 and 80% by 2050. Furthermore, the 2022 Minnesota Climate Action Framework set goals to reduce emissions by 50% by 2030 and achieve net-zero emissions by 2050. In 2023, legislation also established a new standard for 100% carbon-free electricity by 2040. Utilities are directed to supply Minnesota customers with electricity generated or procured from carbon-free resources, beginning at an amount equal to 80% of retail sales for public utility customers in Minnesota in 2030 and increasing every 5 years to reach 100% for all electric utilities by 2040.

In 2020, there were 36.1 million metric tons of CO<sub>2</sub>e emitted by the transportation sector. Tailpipe emissions comprised 26.6 million metric tons of that total. In 2022, tailpipe emissions totaled 28.2 million metric tons of CO<sub>2</sub>e (Figure 28). CO<sub>2</sub>e emissions from the transportation sector are calculated by MPCA. This data is in the process of being recalculated using a new system and current data is not yet available. MnDOT is aiming to return to using MPCA data for CO<sub>2</sub>e emissions from the transportation section rather than internally calculated tailpipe emissions data.

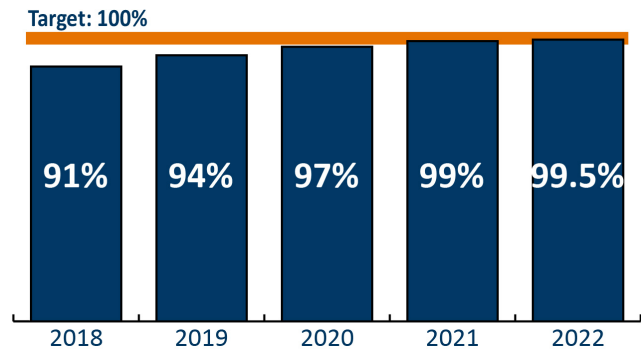
**Figure 29. Transportation sector greenhouse gas emissions, 2018 to 2022**



MnDOT is re-evaluating how construction GHG emissions are calculated. Previously, data was categorized by the year a construction document was signed rather than the year of project construction. Also, a GHG analysis of construction emission totals estimated through the Minnesota Infrastructure Carbon Estimator (MICE) tool for projects greater than \$1 million were not required until January 8, 2020, meaning many construction projects started prior to 2020 do not have an emissions analysis. MnDOT’s goal is to have more accurate accounting of emissions data by 2025. The five years between the 2020 GHG analysis requirement and 2025 should give adequate time to ensure nearly all approved projects will have a documented GHG analysis. When the data collection and calculation for this measure is re-established, it will return to the report.

MnDOT’s statewide goal for LED luminaries in light fixtures was 100% of all MnDOT-managed roadways by 2020. In 2022, 99.5% of light fixtures used LED luminaries on MnDOT roadways (Figure 30). The percentage of light fixtures using LED luminaries is considered steady at this point, as the transition to LED luminaries is considered complete. This measure will no longer be reported on in future reports but will remain on [MnDOT’s Performance Dashboard](#).

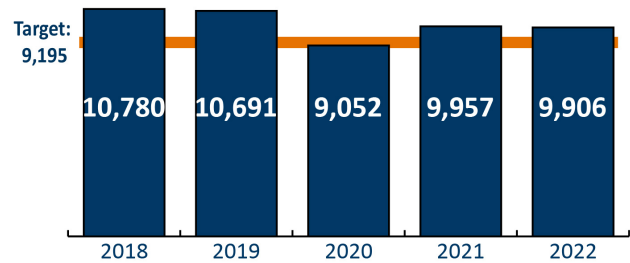
**Figure 30. Percent of MnDOT-managed roadways using LEDs, 2018 to 2022**



## Vehicle Miles Per Capita

MnDOT has a target to reduce vehicle miles traveled per capita to 9,195 by 2040. VMT per capita was 9,906 in 2022 (Figure 31). This is still below pre-pandemic numbers and near steady from 2021.

Figure 31. Vehicle miles traveled per capita in Minnesota, 2018 to 2022



## What is MnDOT Doing to Move Towards Goal 15?

To support the state GHG emission reduction goals in the transportation sector, targets to reduce emissions were set through the 2007 Next Generation Energy Act. The goals were updated in 2022 by the [Minnesota Climate Action Framework](#) to reduce emissions 50 percent by 2030 and achieve net-zero emissions by 2050. In 2023, legislation also established a new standard for 100% carbon-free electricity by 2040. Utilities are directed to supply Minnesota customers with electricity generated or procured from carbon-free resources, beginning at an amount equal to 80% of retail sales for public utility customers in Minnesota in 2030 and increasing every 5 years to reach 100% for all electric utilities by 2040. The bill also requires that, by 2035, an amount equal to at least 55% of an electric utility's total retail electric sales to customers in Minnesota must be generated or procured from eligible energy technologies. MnDOT is looking at various strategies on how to achieve these goals. Strategies include increasing the number of electric vehicles and zero emission vehicles on the road, implementing a clean fuels standard, and decreasing per VMT per capita by increasing the use of public transportation and non-motorized transportation.

### Learn more

MnDOT's Office of Sustainability and Public Health — Reducing carbon pollution from transportation  
<https://www.dot.state.mn.us/sustainability/reducing-carbon.html>

Through the federal Infrastructure Investment and Jobs Act (IIJA), MnDOT has established the [Carbon Reduction Program](#), which provides grant funds to cities and counties to incorporate GHG reduction strategies and techniques into local projects. Project solicitations will start in fall 2023. At the direction of the 2023 Minnesota Legislature, MnDOT also established a [Transportation Greenhouse Gas Emissions Impact Mitigation Working Group](#) to prepare recommendations for implementing Transportation Greenhouse Gas Emissions Impact Assessments for capacity expansion projects on state highways prior to inclusion in the State Transportation Improvement Program (STIP) or a metropolitan Transportation Improvement Program (TIP).

By using more LED luminaries in roadways light fixtures, energy consumption and environmental impacts associated with consumption are reduced. At 100 percent LED use, MnDOT estimates GHG emission reductions of 16,811 metric tons. Additionally, labor associated with LED luminaries is lower than traditional luminaries because the lifespan is nearly 7 times longer. More information about how and why MnDOT uses LED luminaries is available at: [Lighting Facts](#).

VMT is a key measure to understand travel behavior and impacts on the environment at a state level, and whether MnDOT strategic changes are impacting behavior year over year. Lower VMT signals fewer transportation related emissions. VMT per capita helps understand how much the average Minnesotan travels in a year. Reducing VMT per capita is beneficial to Minnesota because, among other things, it represents



increased use of multimodal options, decreased congestion on roadways, and decreased emissions from the transportation sector.

## Other Measures Correlated to Goal 15

In addition to the primary performance measure presented in this section, there are four other measures that correlate to goal 15. They are listed in Table 13 along with their primary legislative goal and the page number where more information is available.

**Table 13. Other measures correlated to goal 15**

Performance Measure	Primary Goal	Report Page Number
Zero emission vehicles registered	11	36
Public transit ridership	6	53
Transit on-time performance	6	53
Physical Activity	14	64



## Critical Connections

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The transportation system is a vital part of keeping Minnesotans connected to jobs, family, shopping, health care, school, places of worship, recreation, and entertainment. Individuals and businesses identify different connections as critical based on their location and specific needs. MnDOT is committed to maintain and improve multimodal transportation connections essential for Minnesotans' prosperity and quality of life and will strategically consider new connections that help meet performance targets and maximize social, economic, and environmental benefits.

The goals related to critical connections highlighted in this section include:

- **Goal 3:** To provide a reasonable travel time for commuters.
- **Goal 4:** To enhance economic development and provide for the economical, efficient, and safe movement of goods to and from markets by rail, highway, and waterway.
- **Goal 5:** To 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.
- **Goal 6:** To provide transit services to all counties in the state to meet the needs of transit users.
- **Goal 12:** To 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.
- **Goal 13:** To 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.

### Goal 3
















This section contains four key performance measures that help describe how MnDOT is working **to achieve the state transportation goal to provide a reasonable travel time for commuters**. For individual travelers, reliability may be an important consideration when choosing a mode or route of travel. The performance measures include:

- **NHS travel time reliability:** The percent of NHS (combining NHS Interstate and NHS Non-Interstate) person-miles traveled that are considered reliable in travel times (also known as travel time reliability), as measured from day-to-day or across different times of the day.

- **Job accessibility by car:** The average number of jobs accessible within a 30-minute drive by personal motor vehicle.
- **Job accessibility by bicycle and transit:** The average number of jobs accessible within a 30-minute ride by bicycle or transit.
- **Twin Cities freeway congestion:** The percent of Twin Cities metropolitan-area freeway miles with an average traffic speed less than 45 miles per hour during morning and afternoon peak times.
- **Twin Cities traveler delay:** The average delay in minutes per weekday per person in the Twin Cities metropolitan area.

Table 14 lists each performance measure for Goal 3, the statewide target (if applicable), the current condition, and the performance score (if applicable).

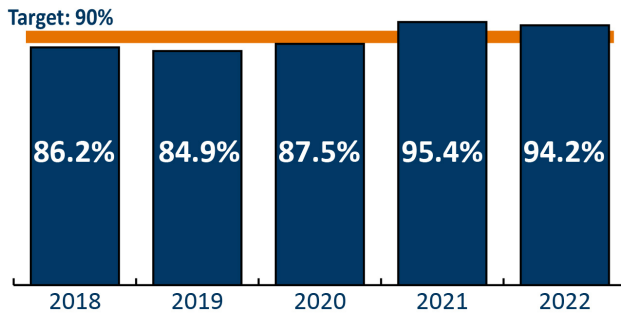
**Table 14. Goal 3 performance measures summary**

Measure	Role	Statewide Target	Current Condition	Trend Desired	Trend Observed
NHS Travel Time Reliability		≥90%	94.2% (2022)		
Job Accessibility by Car		NA	844,817 (2021)		
Job Accessibility by Bicycle or Transit		NA	By bicycle: 43,164 By transit: 14,319 (2021)		
Twin Cities Freeway Congestion		NA	13.7% (2022)		
Twin Cities Traveler Delay		≤9 minutes per weekday	5.3 minutes (2020)		

### Travel Time Reliability

The statewide target for the percent of person-miles traveled that are considered reliable (i.e., travel time reliability) is greater than or equal to 90%. Travel time reliability measures the proportion of travel on the NHS that occurs under conditions meeting a threshold level of variation in observed travel times. The reliability of travel is an important consideration for individuals and freight. Lower percentages of reliability mean increased delays and inconsistent travel times for people and goods. In 2022, statewide travel time reliability on the NHS was 94.2% (Figure 32). Prior to the COVID-19 pandemic, reliability was consistently around 85%.

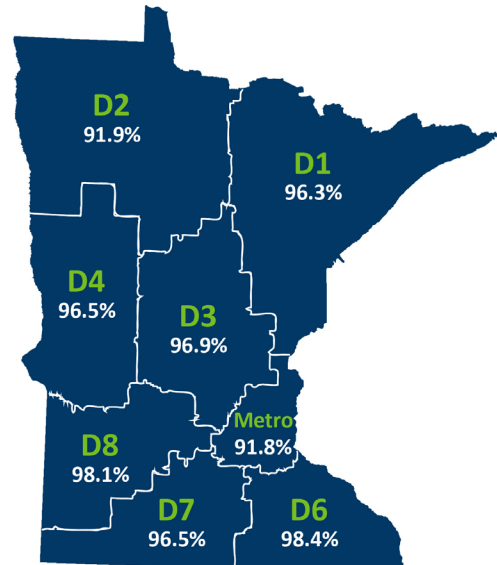
Figure 32. NHS travel time reliability, 2018 to 2022



#### Regional Discussion

Figure 33 displays NHS travel time reliability at the MnDOT district level. Travel time reliability differs across districts reflecting different travel experiences that could be caused by congestion, construction-related delays, traffic signal operations, rail grade crossings, or other impediments. Because performance measure targets are set at a statewide level, district-level data should not be compared to targets or across districts.

Figure 33. NHS travel time reliability, 2022 by MnDOT District

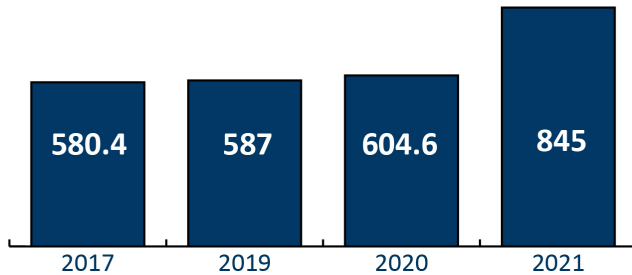


### Job Access

Job accessibility can be an important consideration for people when choosing where to live and their mode or route of travel. Multimodal accessibility measures evaluate how easily people can reach destinations by car, transit, and bicycle.

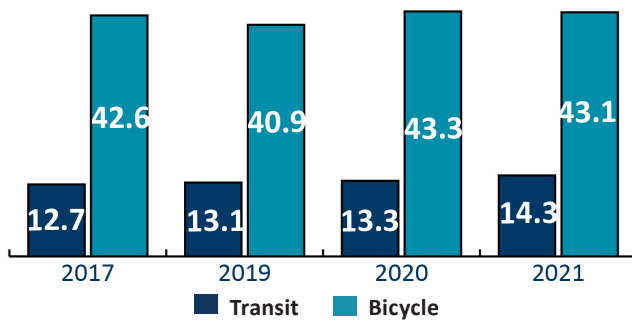
Between 2017 and 2021 (the most recent data available), the average number of jobs accessible for Minnesotans within 30-minute drive by personal motor vehicle increased from 580,390 to 844,817 (Figure 34). The increase in 2021 is due in large part to the COVID-19 pandemic which reduced peak period commuting traffic. Decreased delay and congestion, especially at morning and evening commute times, resulted in higher accessibility to jobs.

**Figure 34. Job accessibility by car within 30 minutes, 2017 to 2021 (in thousands)**



The average number of jobs accessible within 30-minutes by a transit ride increased from 12,733 in 2017 to 14,319 in 2021 (Figure 35). The average number of jobs accessible by bicycle (low and medium stress routes) decreased slightly in 2021 to 43,164, however average access has still increased from 2019.

**Figure 35. Job accessibility by transit or bicycle within 30 minutes, 2017 to 2021 (in thousands)**



**Regional Discussion**

The average number of jobs accessible within a 30-minutes by car, transit, or by bicycle on low and medium stress routes differs across the across the state when comparing by Metropolitan Planning Organizations (MPOs). MPOs are entities designated by law with the lead responsibility for developing transportation plans and coordinating the transportation planning process for metropolitan areas with over 50,000 people. Minnesota has eight MPOs. The differences in job access across MPOs reflects differences in land use, population density, travel impedances, job opportunities, and multimodal transportation options. In 2021, for example, the Metropolitan Council, which covers the Twin Cities

metropolitan area, had the largest number of jobs accessible by automobile within 30 minutes, but has a smaller lead on jobs accessible by bicycle. (Table 15).

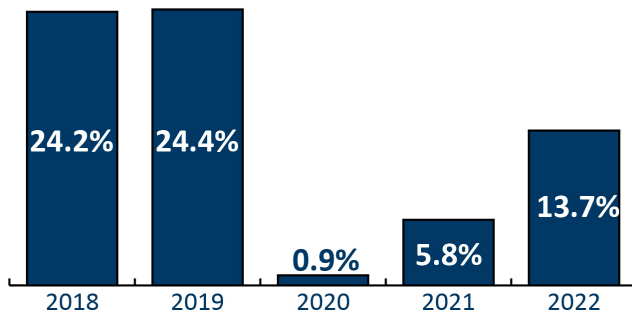
**Table 15. Job Accessibility in 30 minutes by Metropolitan Planning Organization, car, transit, and bicycle (low and medium stress), 2021**

MPO	Car	Transit	Bicycle
Duluth-Superior Metropolitan Interstate Council	100,035	11,492	16,297
Fargo-Moorhead Metropolitan COG	136,844	9,865	41,283
Grand Forks-East Grand Forks MPO	44,530	6,935	25,204,
La Crosse Area Planning Committee	87,653	5,928	20,037
Mankato / North Mankato Area Planning Organization	62,145	5,236	19,601
Metropolitan Council	1,400,511	22,804	68,139
Rochester-Olmsted COG	109,326	5,924	41,313
St. Cloud Area Planning Organization	103,082	4,144	20,406

**Twin Cities Freeway Congestion and Traveler Delay**

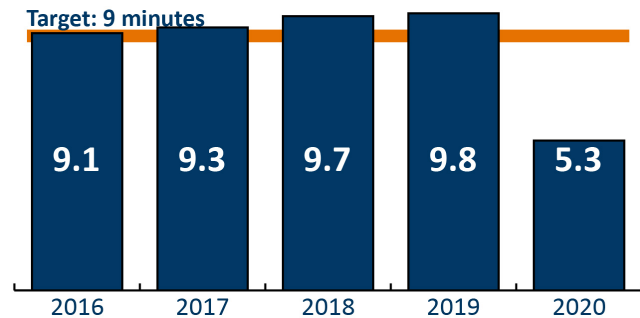
The COVID-19 pandemic significantly impacted traffic levels in the Twin Cities metropolitan freeway system. According to [MnDOT's 2022 Congestion Report](#), highway volume decreased by as much as 50% in some corridors. In 2020, 0.9% of the freeway system was congested, which was nearly a 25-percentage point decrease from 2019. While freeway congestion increased to 5.8% in 2021, it was still well below pre-COVID-19 trends (Figure 36). Freeway congestion in 2022 increased to 13.7%, which suggests that travel patterns are shifting as more people return to in-person work part-time or full-time.

**Figure 36. Twin Cities metropolitan area freeway congestion, 2018 to 2022**



While congestion is a sign of a healthy economy, excessive amounts of delay can dampen economic competitiveness and reduce quality of life. Measuring traveler delay helps track the amount of delay people experience with the goal of keeping it to reasonable levels. Between 2016 and 2019, traveler delay in the Twin Cities metropolitan area averaged 9.5 minutes per weekday (Figure 39). Like with freeway congestion, traveler delay decreased by 46% to 5.3 minutes per weekday in 2020 (the most recent year available). The target of nine minutes per weekday (or 40 hours of annual delay per person) represents about a 5% improvement from 2018 levels.

**Figure 37. Twin Cities metropolitan area traveler delay (in minutes), 2016 to 2020**



## What is MnDOT Doing to Move Towards Goal 3?

Job accessibility is a key measure to understand the multimodal transportation network in Minnesota and changes due to a variety of factors including land use, job location, transportation networks, and scheduling. Access to other key destinations such as grocery stores, hospitals, and schools can also be used to understand the multimodal network impacts. MnDOT is currently developing and implementing multimodal accessibility analysis to better understand how the transportation network impacts access to key destinations.

Increasing traffic congestion increases fuel usage and emissions, creates a higher risk for crashes, increases shipping costs, and reduces the time available to spend on other activities. Factors that affect congestion include economic conditions and population growth. To ensure reasonable travel time for commuters and travelers and reduce congestion on the interstate highway system, MnDOT currently relies on several strategies including active traffic management (e.g., an advanced system of cameras, loop detectors, and ramp meters), low-cost spot mobility improvements to improve traffic flow, E-Z Pass lanes, and strategic capacity enhancements (e.g., bus-only shoulders, unpriced dynamic shoulder lanes, and interchange capacity improvements). MnDOT also has a goal to manage the growth of congestion through transportation alternatives.

### Learn more

Statewide Multimodal Transportation Plan

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

MnDOT Office of Traffic Engineering

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

## Other Measures Correlated to Goal 3

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In addition to the primary performance measures presented in this section, there is another measure that correlates to Goal 3. Table 16 lists the correlated measure along with its primary legislative goal and the page number where more information is available.

**Table 16. Other measures correlated to goal 3**

Performance Measure	Primary Goal	Report Page Number
Truck Travel Time Reliability (TTR) Index	4	49




**GOAL 4****Enhance Economic Development****Goal 4**

This section contains a key performance measure that helps describe how MnDOT is working **to enhance economic development and provide for the economical, efficient, and safe movement of goods to and from markets by rail, highway, and waterway**. The performance measure includes:

- **Truck Travel Time Reliability (TTTR) Index:** An index measuring the consistency of commercial truck travel times on the Interstate system in a 12-month period. An index value of 1.0 is the lowest possible score and means truck travel speeds are perfectly uniform. In reality, 1.02 or 1.03 are the lowest observed index values.

Table 17 lists each performance measure for Goal 4, the statewide target (if applicable), the current condition, and the performance score (if applicable).

**Table 17. Goal 4 performance measure summary**

Measure	Role	Statewide Target	Current Condition	Trend Desired	Trend Observed
Truck Travel Time Reliability (TTTR) Index		≤1.5	1.32 (2022)		

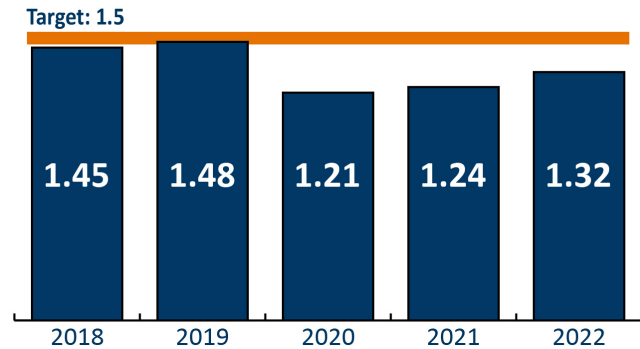


## Truck Travel Time Reliability

TTTR Index measures the consistency of commercial truck (e.g., freight trucks, semi-trucks, or tractor trailers) travel times on the Interstate system. The index fluctuates by season but has historically settled between 1.4 and 1.5 during the years prior to the pandemic. The statewide TTTR Index target is less than or equal to 1.5. In 2019, the index increased to 1.48 which continued the slight upward trend from 2017 to 2018. However, due to the COVID-19 pandemic and

fewer vehicles on roadways, the index decreased to 1.21, meaning the consistency of commercial truck travel times improved. It increased slightly in 2021 to 1.24 and again to 1.32 in 2022 in part caused by increasing passenger car traffic (Figure 38). Overall, reliability is decreasing, but still meeting the target.

**Figure 38. Truck Travel Time Reliability Index, 2018 to 2022**



## What is MnDOT Doing to Move Towards Goal 4?

Consistent and reliable movement of goods is essential to Minnesotan’s and the Minnesotan economy. Tracking and understanding truck travel time reliability is vital to enhance economic development and movement of goods throughout Minnesota. To ensure reasonable travel time for commercial trucks and reduce congestion on the highway system, MnDOT currently relies on several strategies. MnDOT uses National Highway Freight Program federal funds to address truck freight mobility on locations selected on a competitive basis through the [Minnesota Highway Freight Program](#).

MnDOT is currently working to balance freight movement needs with environmental sustainability efforts including a per capita VMT reduction target. Strategies that benefit all vehicles, including commercial vehicles, include active traffic management strategies (e.g., an advanced system of cameras, loop detectors, ramp meters, low-cost spot mobility improvements to improve traffic flow, E-Z Pass lanes, and strategic capacity enhancements such as bus-only shoulders). MnDOT also maintains and updates a [State Rail Plan](#) and a [Ports Plan](#) to advance railway, waterway, and multimodal planning and integration. For railways, MnDOT convenes the [Minnesota Freight Advisory Committee \(MFAC\)](#), which is a partnership between MnDOT and businesses designed to exchange ideas and recommend policies and actions. One strategy to upgrade waterways facilities and infrastructure is the [Port Development Assistance Program \(PDAP\)](#). In 2023, the Minnesota Legislature appropriated \$18.1 million to program.

### Learn more

MnDOT Office of Freight and Commercial Vehicle Operations  
<http://www.dot.state.mn.us/ofrw/index.html>

MnDOT Office of Traffic Engineering  
<http://www.dot.state.mn.us/trafficeng/index.html>

## Other Measures Correlated to Goal 4

In addition to the primary performance measure presented in this section, there are seven other measures that correlate to Goal 4. They are listed in Table 18 along with their primary legislative goal and the page number where more information is available.

**Table 18. Other measures correlated to Goal 4**

Performance Measure	Primary Goal	Report page number
Highway-rail grade fatalities and serious injuries	1	17
Rest area building condition	8	23
Bridge condition	9	26
Pavement condition	9	28
Job accessibility by car	3	44
Job accessibility by bicycle and transit	3	44
Twin Cities freeway congestion	3	45
Twin Cities traveler delay	3	45
NHS travel time reliability	3	44

## Goal 5

MnDOT does not track performance measures primarily related to Goal 5: **to 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.** However, there are two measures that correlate: available seat miles offered from commercial service airports in Minnesota and rest area building condition.

Table 19 lists the performance measures, their primary goal, and the pages where they are discussed in detail. Available seat miles offered from commercial service airports measures available tourism capacity through scheduled flights in Minnesota. Rest areas buildings are a key part of the roadway network by providing safe stopping areas for passenger and commercial travelers.

**Table 19. Measures correlated to Goal 5**

Performance Measure	Primary Goal	Report Page Number
Rest area building condition	8	23
Air transportation	12	56

## GOAL 6

## Transit in all Communities







### Goal 6

This section contains two key performance measures that help describe how MnDOT is working **to achieve the goal to provide transit services to all counties in the state to meet the needs of transit users**. The performance measures include:

- **Public transit ridership:** The total number of boardings in a 12-month period recorded by Metro Transit and transit providers in Greater Minnesota.
- **Transit on-time performance:** Percent of annual public transit trips with Metro Transit and the Greater Minnesota transit system considered on-time annually.

Table 20 lists each performance measure for Goal 6, the statewide target (if applicable), the current condition, and the performance score (if applicable).

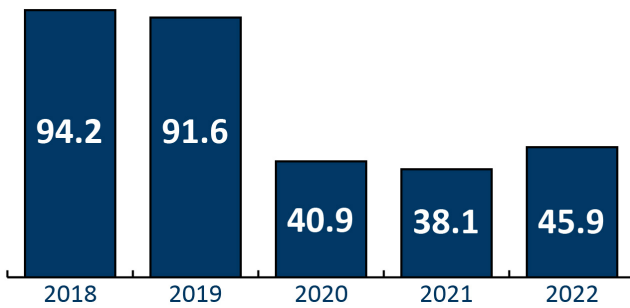
**Table 20. Goal 6 performance measure summary**

Measure	Role	Statewide Target	Current Condition	Trend Desired	Trend Observed
Public Transit Ridership		Increasing transit ridership	MSP: 45.9 million Greater MN: 7.2 million (2022)		
Transit on-time Performance		Metro Transit: ≥90% Greater MN: ≥90%	Metro Transit: 81.3% Greater MN: 90% (July-Dec. 2022)		

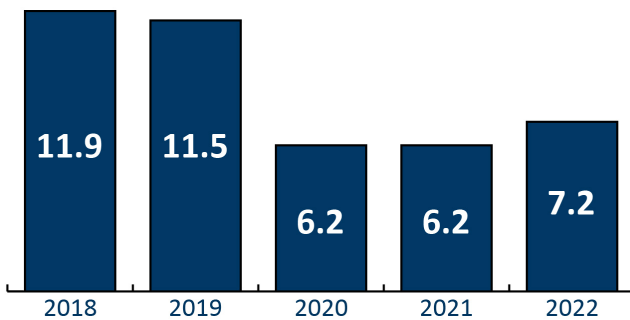
## Public Transit

MnDOT’s public transit ridership targets for the Twin Cities metropolitan area and Greater Minnesota are to increase public transit ridership throughout the state. In 2022, public transit ridership was 45.9 million in the Twin Cities area and 7.2 million in Greater Minnesota (Figure 39 and Figure 40). Transit ridership slowly declined before rapidly declining due to the COVID-19 pandemic in 2020. Changes in travel behavior and the continuing pandemic contributed to a slow rebound in ridership. Ridership increased again in 2022, which was the highest ridership since 2020.

**Figure 39. Twin Cities metro area public transit ridership (in millions), 2018 to 2022**



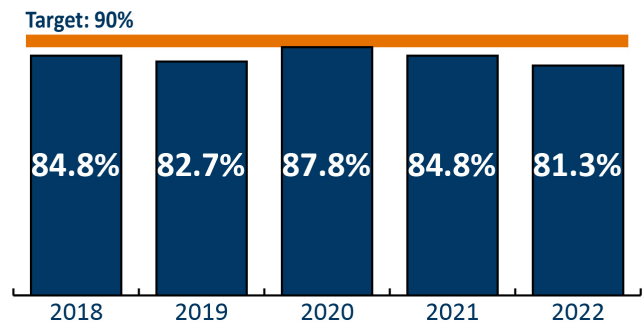
**Figure 40. Greater Minnesota public transit ridership (in millions), 2018 to 2022**



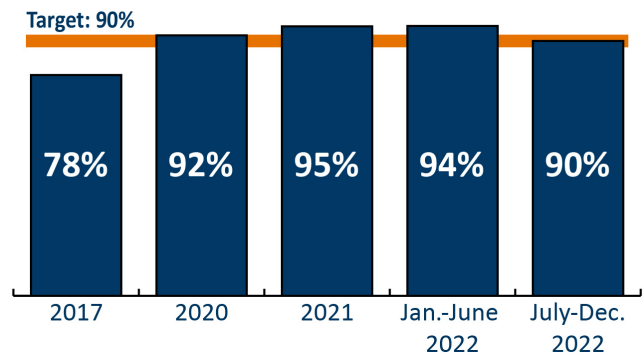
## Transit On-Time Performance

Metro Transit's and MnDOT's on-time performance target is for 90% of trips to be within one minute early to four minutes late of scheduled times. MnDOT’s on-time performance target for Greater Minnesota’s transit systems is 90% to be within 45-minutes of scheduled times. In 2022, 81.3% of Metro Transit’s trips were considered on-time. For the Greater Minnesota transit system, 94% of trips were on time between January and June and 90% were on time between July and December (Figure 41 and Figure 42). Data for 2020 and 2021 were reported in the same January-June and July-December method as 2022 but were combined and averaged in this report. Note: In Greater Minnesota, information on on-time performance was not collected for 2018 and 2019 as a transition to a new reporting methodology was completed.

**Figure 41. Metro Transit on-time performance, 2018 to 2022**



**Figure 42. Greater Minnesota transit system on-time performance, 2017 to 2022<sup>7</sup>**



<sup>7</sup> Greater Minnesota data on on-time performance was not collected for 2018 and 2019 as a transition to a new reporting methodology was completed.

## What is MnDOT Doing to Move Towards Goal 6?

Through public transit providers, MnDOT is committed to providing multimodal transportation options. Access to safe and timely transit is a key piece of the multimodal transportation network. The Metropolitan Council, which operates Metro Transit and works with other metropolitan transit providers, expects additional growth in 2023. Some routes and services, like Metro Mobility, Metro Transit’s on-demand ride service for those with disabilities or health concerns, are operating at 80 percent of their pre-pandemic capacity. Changes in travel patterns continue to affect transit ridership – peak travel times moved from typical commute patterns to 3 p.m., ridership is lower Monday through Friday, and ridership is less predictable. With two full years of data to help understand these changes, the Met Council believes that ridership will continue to increase as they work to provide better service to their customers<sup>8</sup>.

A major issue impacting Metro Transit ridership in 2021 and 2022 was a shortage of transit operators. Metro Transit addressed this by increasing starting wages, offering paid training to applicants, and inviting externally trained applicants for the first time. The aim is to increase services provided as staffing shortages decrease. While this shortage is still an issue in 2023, these changes show growing interest.

In 2022, the Greater Minnesota transit ridership began to rebound. An increase in staffing of licensed transit drivers allowed the addition of transit routes and return in transit services cut during the pandemic. There was also an increase in people returning to in-person work and school. Several universities returned to an in-person learning environment, increasing transit ridership, particularly in small urban systems. As the threat of COVID decreased, people were more willing to take transit as an option. Overall, the small urban systems saw the biggest increase in ridership with an increase of 677,277 rides, though ridership increased across all systems.

Future transit services across Minnesota will continue to adapt to ridership needs as providers navigate the post-pandemic landscape.

## Other Measures Correlated to Goal 6

In addition to the primary performance measure presented in this section, there is one other measure that correlates to Goal 6. It is listed in Table 21 along with its primary legislative goal and the page number where more information is available.

**Table 21. Other measures correlated to goal 6**

Performance Measure	Primary Goal	Report Page Number
Job accessibility by bicycle and transit	3	44

<sup>8</sup> “Transit Ridership increased by 17% in 2022,” Metropolitan Council, February 27, 2023.

<https://metrocouncil.org/News-Events/Transportation/Newsletters/Transit-ridership-2022.aspx>

**GOAL 12**

**Air Transportation**




**Goal 12**

This section contains a key performance measure that help describe how MnDOT is working **to achieve the goal to 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.**

- **Air transportation:** The total number of available seat miles offered on scheduled service nonstop flights from airports in the Twin Cities metropolitan area and in Greater Minnesota in a 12-month period. As defined by the United States Bureau of Transportation Statistics, one available seat is one aircraft seat flown one mile.

Table 22 lists the performance measure for Goal 12 and the current condition. MnDOT does not have a statewide target for the measure.

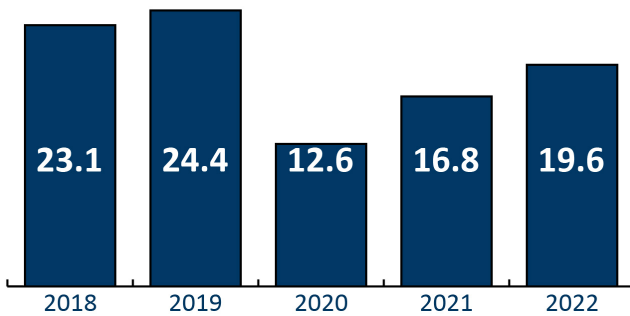
**Table 22. Goal 12 performance measure summary**

Measure	Role	Statewide Target	Current Condition	Trend Desired	Trend Observed
Air Transportation		NA	MSP: 19.6 billion available seat miles Greater MN: 131,631 available seat miles (2022)		

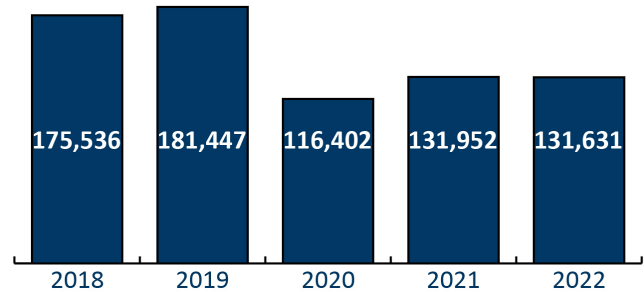
## Available Seat Miles

In 2022, there were 19.6 billion available seat miles offered from the Minneapolis-St. Paul International Airport (MSP) and 131,631 available seat miles offered from airports in Greater Minnesota (Figure 43 and Figure 44). These figures show an increase and stabilization in available seat miles following the decrease in 2020 due to the COVID-19 pandemic.

**Figure 43. Number of available seat miles offered from MSP (in billions of miles), 2018 to 2022**



**Figure 44. Annual number of available seat miles offered from Greater Minnesota airports, 2018 to 2022**



## What is MnDOT Doing to Move Towards Goal 12?

Air transportation is one of the many modes in Minnesota that connects people within and beyond the state boundaries. While MnDOT does not have direct influence on available seat miles, ensuring seat availability on scheduled service nonstop flights from Minneapolis-St. Paul airport and Greater Minnesota airports is an important indicator of how economically competitive the state is nationally and globally. This measure is primarily driven by the activities of individual air carriers and Federal Aviation Administration (FAA) regulations. The Metropolitan Airports Commission (MAC) operations staff works with the airlines to safely respond to changing conditions (e.g., congestion, weather, operations incidents) that may impact available seat miles.

### Learn more

Metropolitan Airports Commission  
<https://metroairports.org/>

## Other Measure Correlated to Goal 12

There are no correlated measures identified.



## Goal 13

MnDOT does not track performance measures primarily directly related to Goal 13: **to 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.** However, there are three measures that correlate, which include job accessibility by bicycle and transit, transit on-time performance, and public transit ridership. Table 22 lists the performance measures, their primary goal, and the pages where they are discussed in detail. Job accessibility by bicycle and transit tracks the average annual number of jobs accessible within a 30-minute ride by bicycle or transit. Transit on-time performance is important for measuring the reliability of the transit system. Public transit ridership measures how many Minnesotans are using transit as a mode of transportation.

**Table 23. Measures correlated to Goal 13**

Performance Measure	Primary Goal	Report Page Number
Vehicle miles traveled per capita	15	40
Job accessibility by bicycle and transit	3	44
Transit on-time performance	6	53
Public transit ridership	6	53



## Healthy Equitable Communities

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Healthy equitable communities provide opportunities for everyone to reach their fullest potential. They connect people to employment, education, recreation, goods, services, and more. The places people live, work, and play have considerable impact on health and wellbeing. Investments preserve and promote community identity and should be considered a part of the community. Not all places are the same and there is no one-size-fits-all transportation solution. Advancing the health of people and communities means expanding opportunities, access, and mobility choices for people. Transportation can be a barrier, especially for underserved communities. Tailoring solutions to specific places lead to projects that respect and complement people, the environment, and our economy. This also helps ensure that Minnesota is advancing equitable access to opportunities, preserving the natural and cultural heritage for future generations, and maintaining an environmentally and economically viable transportation system for all to use in the future.

The goals related to healthy equitable communities and highlighted in this section include:




- **Goal 2:** To 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
- **Goal 10:** To ensure that the planning and implementation of all modes of transportation are consistent with the environmental and energy goals of the state
- **Goal 14:** To promote and increase bicycling and walking as a percentage of all trips as energy-efficient, nonpolluting, and healthy forms of transportation

**GOAL 2****Economic Well-Being****Goal 2**

This section contains a key performance measure that helps describe how MnDOT is working to **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.**

- **Transportation and Housing costs:** The percent of median household income spent on housing and transportation in Minnesota.

**Table 24. Goal 2 performance measure summary**

Measure	Role	Statewide Target	Current Condition	Trend Desired	Trend Observed
Transportation and Housing costs		NA	21.8% (2021)		

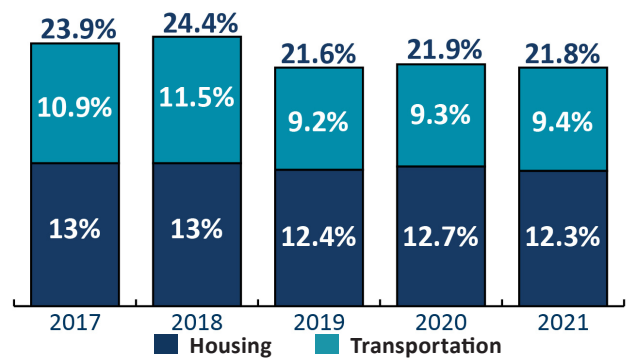
## Transportation and Housing Costs

Transportation and housing costs is a new performance measure. Using Minnesota Department of Employment and Economic Development Cost of Living data and American Community Survey data on median household income in Minnesota, MnDOT can calculate percentage of median household income necessary to meet basic housing and transportation needs. For this measure, a typical family in Minnesota is comprised of 3 people – 2 adults, 1 child, and 1.5 workers. While MnDOT has not yet adopted a target for this measure, its goal is to understand the proportion of a Minnesotan’s income that is

needed to be spent on the necessities of housing and transportation.

In 2021, the typical Minnesotan household needed 21.8% of their income for basic transportation and housing needs (Figure 45). This follows an overall pattern of decreasing transportation and housing basic costs over the last five years. The 2022 ACS data will not be available until at least December 2023.

**Figure 45. Annual Percent of Household Income for Transportation and Housing Costs, 2017 to 2021**



## What is MnDOT Doing to Move Towards Goal 2?

Through the proposed [SMTP work plan](#), MnDOT will continue to explore measures related to healthy equitable communities. Multimodal accessibility is the study of the travel between origins and destinations. MnDOT is currently developing a multimodal accessibility performance measure that will help inform how well the transportation network provides multimodal options. As public engagement on performance measurement continues, multimodal accessibility will be an area of focus to aid in developing the measure.

## Other Measures Correlated to Goal 2

In addition to the primary performance measure presented in this section, there are five other measures that correlate to Goal 2. They are listed in Table 25 along with their primary legislative goal and the page number where more information is available.

**Table 25. Other measures correlated to Goal 2**

Performance Measure	Primary Goal	Report Page Number
Highway-Rail grade Fatalities and Serious Injuries	1	17
ADA compliance	8	28

**GOAL 2 • Economic Well-Being**

<b>Performance Measure</b>	<b>Primary Goal</b>	<b>Report Page Number</b>
Vehicle miles traveled per capita	15	40
Job accessibility by bicycle and transit	3	44
Transit on-time performance	6	53

## Goal 10

MnDOT does not track performance measures primarily related to Goal 10: **to ensure that the planning and implementation of all modes of transportation are consistent with the environmental and energy goals of the state.**

However, at the direction of the 2023 Minnesota Legislature, MnDOT established a [Transportation Greenhouse Gas Emissions Impact Mitigation Working Group](#) to prepare recommendations for implementing Transportation Greenhouse Gas Emissions Impact Assessments for capacity expansion projects on state highways prior to inclusion in the State Transportation Improvement Program (STIP) or a metropolitan Transportation Improvement Program (TIP). The goal of an assessment is to align project decision-making with the state's greenhouse gas emissions reductions targets under Section 174.01 Subdivision 3 and vehicle miles traveled (VMT) reduction targets established in the Statewide Multimodal Transportation Plan (SMTP).

There are also four measures that correlate to goal 10. Table 24 lists the performance measures, their primary goal, and the pages where they are discussed in detail. Sustainability strategies such as native seedings and plantings, LED luminary use, and sustainable pavement practices help minimize environmental impacts. Snow fences play a key role in winter maintenance productivity by helping to limit blowing snow across Minnesota roads.

**Table 26. Measures correlated to Goal 10**

Performance Measure	Primary Goal	Report Page Number
Snow fences	7	18
Native seedings and plantings	16	32
Sustainable pavements	16	32
Road salt chloride use	16	32
LED use	15	32

**GOAL 14**

**Bike and Walk Mode Shift**




**Goal 14**

This section contains a key performance measure that helps describe how MnDOT is working **to promote and increase bicycling and walking as a percentage of all trips as energy-efficient, nonpolluting, and healthy forms of transportation; energy-efficient, nonpolluting, and healthy forms of transportation.**

- **Physical Activity:** The percent of Minnesotans who say they bicycle or walk at least weekly.

Table 27 lists the measure for Goal 14, statewide target and the current condition of the performance measure.

**Table 27. Goal 14 performance measure summary**

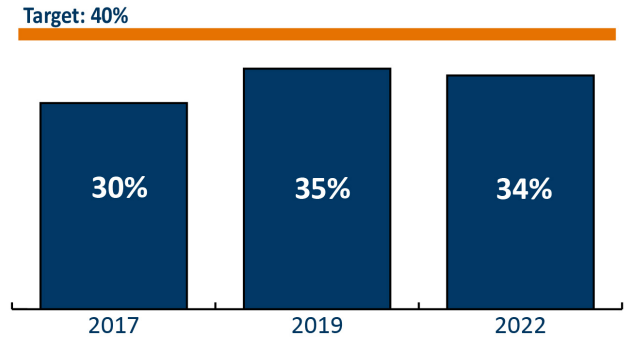
Measure	Role	Statewide Target	Current Condition	Trend Desired	Trend Observed
Physical Activity		40% by 2025 60% by 2040	34% of Minnesotans bike or walk at least weekly (2022)		

## Physical Activity

MnDOT’s statewide target is to increase the percent of people who say they bike or walk at least weekly to 40 percent by 2025, and then increase it by 5 percentage points every five years following up to 60 percent by 2040. In 2022, 34% of Minnesotan’s reported that they walked or bicycled at least weekly, which is a slight decrease from 35 in 2019 (Figure 55). Overall, MnDOT moved further away from its 2025 target. MnDOT calculates the measure by using results from the public opinion survey question: “How frequently did you use the following modes of transportation for traveling

to and from places (for example, to work, school, the grocery store, other places you travel for errands and entertainment as well as vacation?” This is a relatively new measure that will continue to be tracked in the future to help understand the trends. Additionally, MnDOT has moved survey data collection to even-numbered years meaning the public opinion survey will be conducted next in 2024.

**Figure 46. The percent of Minnesotans who say they bicycle and walk at least weekly, 2017, 2019 and 2022**



## What is MnDOT Doing to Move Towards Goal 14?

MnDOT is using the work plan in recently adopted 2022-2041 [SMTP](#), the [Statewide Pedestrian System Plan](#) and the [Statewide Bicycle System Plan](#) to help increase the percent of people walking, bicycling, or both by creating walking and bicycling access and opportunities. The plans represent MnDOT’s vision for pedestrians and guide state investments helping to prioritize and create spaces that are safe and convenient for people to access and move along state highways (the [Centers for Disease Control](#) recommends that adults get 150 minutes of moderate-intensity physical activity weekly). Additionally, MnDOT administers the Active Transportation Program to provide grants to increase the number of people walking and biking to destinations. The [Safe Routes to School Program’s](#) vision is to enable youth to safely, confidently, and conveniently walk, bike, and roll to school and in daily life.

### Learn more

MnDOT’s Active Transportation Program

<https://www.dot.state.mn.us/active-transportation-program/index.html>

## Other Measures Correlated to Goal 14

In addition to the primary performance measure presented in this section, there are five other measures that correlate to goal 14. They are listed in Table 28 along with their primary legislative goal and the page number where more information is available.



**Table 28. Other measures correlated to Goal 14**

<b>Performance Measure</b>	<b>Primary Goal</b>	<b>Report Page Number</b>
Pedestrian fatalities and serious injuries	1	17
Bicycle fatalities and serious injuries	1	17
ADA compliance	8	28
Vehicle miles traveled per capita	15	40
Job accessibility by bicycle and transit	3	44

# Next Steps

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## Priority Areas for Ongoing Measure Development

MnDOT is continually revisiting current performance measures for improvement, and evaluating where new performance measures are needed. The key areas where MnDOT sees a near term need for continued efforts around performance measurement include – public engagement on emerging transportation equity performance measures and further measures development for climate resiliency and transportation asset management. Although these efforts are in different stages of development, MnDOT has made a commitment to fully develop and continually track performance for each.

### Focus Groups for Public Engagement

Building on the findings from the Transportation Equity survey set to be completed in Fall 2023 (described on page 12), performance and risk analysis staff from MnDOT are planning targeted transportation equity focus groups. With the help of a consultant, MnDOT will identify and recruit people from specific stakeholder groups to participate in focus group conversations on housing and transportation costs and multimodal destination access. The feedback shared by focus group participants will help MnDOT better understand how accurately the in-development transportation and housing cost measure reflects the lived experiences of Minnesotans from specific stakeholder groups as well as inform the refinement of a multimodal destination access measure.

### Asset Management and Climate Resiliency Performance Measures

As part of tracking asset conditions, the Transportation Asset Management Plan (TAMP) includes performance targets for each Intelligent Transportation System (ITS) sub-asset. MnDOT will be developing aggregate ITS performance measures to track how groups of assets such as those that are approaching or are beyond their useful service life. Additionally, following a 2023 update to the Statewide Electric Vehicle Infrastructure Plan, MnDOT will begin developing proposed program evaluation metrics for tracking progress toward the state's EV goals such as statewide system miles covered by EV charging stations and the percent of the state population within 15 and 50 miles of a station.

The federal [Promoting Resilient Operations for Transformative, Efficient, and Cost-Savings Transportation \(PROTECT\) Formula Program](#) was created in 2021 to make transportation assets more resilient to current and future weather events and natural disasters. MnDOT is developing climate resiliency performance measures to respond to the PROTECT formula program requirements. Resilience measures will be used in performance reporting to describe how the MnDOT multi-modal system is becoming more resilient to climate change. The primary focus of these initial measures will be on the trunk highway system. Some measures of resilience have already been established with further measures in development. The categories of measurement include adaptation and natural environment, climate and extreme weather impacts, and asset condition and vulnerability.

# Appendix A: Asset Management and Planning Overview

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## 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 network. The CHIP is updated yearly to remove projects that are currently being constructed, adjust timing of existing planned projects, and add new planned projects. The primary purpose of the document is to communicate programmed and planned capital highway projects over the next 10 years. The document also 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) and explains any change in strategy or outcomes from the investment direction.

The first four years of the CHIP represent state highway projects in the State Transportation Improvement Program (STIP), which is MnDOT’s committed construction project program. The CHIP also identifies projects in the six years after the current STIP, which are the agency’s planned investments. While projects are not commitments until they reach the STIP stage, listing potential projects five to ten years into the future allows for advanced coordination and ultimately better projects for all those served.

### Learn more

10-Year Capital Highway Investment Plan 2022-2031

[https://edocs-public.dot.state.mn.us/edocs\\_public/DMResultSet/download?docId=16760336](https://edocs-public.dot.state.mn.us/edocs_public/DMResultSet/download?docId=16760336)

10-Year District Capital Highway Investment Plans

<https://www.dot.state.mn.us/planning/10yearplan/resources.html>

## Asset Management at MnDOT

### Transportation Asset Management Plan

Minnesota’s transportation infrastructure is constantly experiencing physical and chemical processes of deterioration, damaging impacts of floods and other hazards, and wear from normal use. MnDOT and its partners work to offset these effects and keep the state’s valuable assets in service for as long as possible at minimum costs. MnDOT’s [Transportation Asset Management Plan](#) (TAMP) helps achieve the department’s vision for effective asset management by mitigating risks, optimizing return on investment, and using the best and available tools.

### Learn more

Asset Management Project Office

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

MnDOT uses the TAMP to further evaluate risks, develop mitigation strategies, analyze life cycle planning, establish asset condition performance measures and targets, maintain an asset inventory, and develop risk management and investment strategies. The TAMP contains twelve MnDOT-owned asset classes: pavements, bridges, culverts, deep storm water tunnels, overhead sign structures, high-mast light tower structures, noise walls, signals, lighting, pedestrian infrastructure, buildings, and intelligent transportation systems.

## TAMS

The Transportation Asset Management System (TAMS) is MnDOT’s primary enterprise asset and work management system for pavement and ancillary assets such as signals, lighting, traffic barriers, signs, drainage infrastructure (e.g., pipes, structures, ponds, tunnels), pavement markings, and intelligent transportation assets (e.g., dynamic message signs, traffic monitoring cameras, Road Weather Information Systems). The system tracks asset inventory, condition/assessment, and maintenance work performed on the asset. Data contained within the system is invaluable in making critical agency decision making. For example, system data is utilized to report on MnSHIP, TAMP, and report on maintenance performance.

## Life Cycle Planning

Life Cycle Planning (LCP), as defined by the Federal Highway Administration, is “a process to estimate the cost of managing an asset class, or asset sub-group, over its whole life with consideration for minimizing cost while preserving or improving the condition.”<sup>9</sup> As part of the TAMP, LCP is used to compare alternate strategies that fulfill the same performance requirements but differ with respect to construction, maintenance, and operational costs. These can be compared in terms of the total costs over the entire life cycle of the asset<sup>10</sup>. In addition to the TAMP, a Life cycle planning tool was developed that compares alternative strategies at the district level and calculates 10-year investment needs.<sup>11</sup>

## Corridor Risk

It is vital to assess risk when making trade off decisions within the transportation planning process. MnDOT uses several tools to track and manage risks including risk registers, risk reports, and risk mitigation plans. Since 2014, MnDOT has incorporated risk into the TAMP and planning process through a risk register by asset class that identifies risk categories, risk descriptions, ideal risk mitigation strategies, and current and post-mitigation risk ratings<sup>12</sup><sup>13</sup>. The TAMP and TAMP process also developed a comprehensive prioritization strategy across all asset risks to guide workgroups and the department overall<sup>14</sup>.

A geographic information system (GIS) map tool was created as a framework to capture and present critical risk-based information to key decision makers. The tool allows risk to be managed across several asset classes and assessed at statewide, district, and corridor levels. The map layers and data in the tool come from various sources throughout the agency and focus on risk-based analysis.

## Transportation System Resilience

MnDOT is committed to building and maintaining resilient transportation infrastructure that enables MnDOT to better respond and adapt to impacts from climate change and extreme weather.

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9 Code of Federal Regulations, Title 23, Chapter 1, subchapter F, part 515.5:

<https://www.ecfr.gov/current/title-23/chapter-1/subchapter-F/part-515>.

10 Transportation Asset Management Plan, Life Cycle Planning, pg. 84.

11 Spending Transportation Money Wisely: <https://www.minnesotago.org/cost-effectiveness/lcca/>.

12 Chapter 5 of the TAMP has more information about MnDOT’s asset risk management:

[https://edocs-public.dot.state.mn.us/edocs\\_public/DMResultSet/download?docId=1962550](https://edocs-public.dot.state.mn.us/edocs_public/DMResultSet/download?docId=1962550).

13 Appendix B of the TAMP contains the TAMP Risk Register:

[https://edocs-public.dot.state.mn.us/edocs\\_public/DMResultSet/download?docId=19625519](https://edocs-public.dot.state.mn.us/edocs_public/DMResultSet/download?docId=19625519).

14 Appendix A of the TAMP contains the risk tiers:

[https://edocs-public.dot.state.mn.us/edocs\\_public/DMResultSet/download?docId=19625511](https://edocs-public.dot.state.mn.us/edocs_public/DMResultSet/download?docId=19625511).

## PROTECT Formula Program in Minnesota

The federal [Promoting Resilient Operations for Transformative, Efficient, and Cost-Savings Transportation \(PROTECT\) Formula Program](#) was created in 2021 to make transportation assets more resilient to current and future weather events and natural disasters. PROTECT funds can be invested in highway projects, public transportation facilities or services, and port facilities. Fiscal years 2024 and 2025 will be the first years funds will be available.

MnDOT is also in the process of developing a Resilience Improvement Plan to document program priorities and program processes to invest PROTECT funds. The plan will be designed to support immediate and long-range planning activities and investments and demonstrate a systemic approach to transportation system resilience. The plan will also include a risk-based assessment of vulnerabilities to transportation assets and systems for current and future weather events and natural disasters.

As part of the process, MnDOT is developing climate resiliency performance measures for three categories:

- **Adaptation and natural environment:** Performance measures describing how the transportation system is being adapted to mitigate against climate change and how MnDOT is using natural features to achieve its goals. Examples include the stormwater treatment counts, tree and shrub planting counts, the percent of projects using native plantings, and the percent of project acres with native seedings.
- **Climate and extreme weather impacts:** Performance measures describing how specific asset conditions that either directly measure vulnerability to climate change or are proxies for potential vulnerabilities in the transportation system. Examples include annual dollars spent on maintenance for flooding and washouts and pavement blow-ups by internal maintenance forces.
- **Asset condition and vulnerability:** Performance measures describing asset vulnerability to climate change. Examples include highway culvert condition, bridge culvert condition, and the number of scour critical bridges.

# Appendix B: Minnesota GO Vision

The transportation system is built to move people and goods, ensure a high quality of life for Minnesotans, and support our economy. In 2011, MnDOT created the [50-year Minnesota GO Vision](#). The vision says, “Minnesota’s multimodal transportation system maximizes the health of people, the environment and our economy.” Furthermore, the vision helps answer the question, “What are we trying to achieve with transportation over the next 50 years?”

Based on the Minnesota GO vision and the 16 legislative goals for the transportation, the 20-year Statewide Multimodal Transportation Plan sets the policy direction, priorities, and the framework for MnDOT’s modal and system investment plans (i.e., Family of Plans). The Family of Plans offer mode-specific strategies and guidance and include aviation, bicycle, freight, highway, pedestrian, ports and waterways, rail, and transit. Together, the Family of Plans direct investments, maintenance, operations, modal programs, and services for all types of transportation throughout the state. Other plans such as for safety, accessibility, operations, and technology can also inform strategic decision but are not required to follow the SMTP’s policy direction.

**Figure 47. Family of plans hierarchy**



The state requires the SMTP to be updated every five years. The SMTP and the other plans in the Family of Plans combine to meet state and federal transportation planning requirements. These plans must support national, state, and local goals.

The objectives and their associated strategies for MnDOT and transportation partners support the Minnesota GO Vision and the 16 legislative goals for the transportation.

The SMTP objectives are:

- **Transportation Safety:** Safeguard transportation users and the communities the system travels through. Apply proven strategies to reduce fatalities and serious injuries for all modes. Foster a culture of transportation safety in Minnesota.
- **System Stewardship:** Strategically build, maintain, operate, and adapt the transportation system based on data, performance, and community needs. Ensure effective and efficient use of resources.

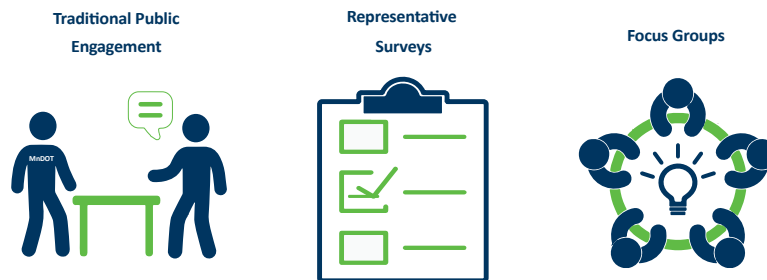
- **Climate Action:** Advance a sustainable and resilient transportation system. Enhance transportation options and technology to reduce greenhouse gas emissions. Adapt Minnesota’s transportation system to a changing climate.
- **Critical Connections:** Maintain and improve multimodal transportation connections essential for Minnesotans’ prosperity and quality of life. Strategically consider new connections that help meet performance targets and maximize social, economic, and environmental benefits.
- **Healthy Equitable Communities:** Foster healthy and vibrant places that reduce disparities and promote healthy outcomes for people, the environment, and our economy.
- **Open Decision Making:** Make transportation system decisions through processes that are inclusive, engaging, and supported by data and analysis.

## Public Collaboration

Public outreach is a critical component of planning activities. Federal and state legislation, guidance, and executive orders describe specific public outreach requirements and expectations. A detailed explanation of public engagement and collaboration requirements for all of MnDOT’s publicly developed plans is outlined in the [Plan Development Guidance](#). Similarly, MnDOT has specific public engagement expectations. Through the department’s [public engagement policy](#), MnDOT has pledged on-going engagement and relationship building with the public to earn trust and mutual understanding.

The Statewide Multimodal Transportation Plan incorporates a series of strategies to improve collaboration including focus groups and a representative public survey of Minnesotan’s that sought to identify strategic priorities and performance outcomes (Figure 48). MnDOT will incorporate these approaches for future updates of the performance measure report.

**Figure 48. Public collaboration strategies**



## Open Decision Making

Accountability, transparency, and communication are essential to open decision making. Transportation decision-makers are stewards of the transportation system and have the responsibility to make informed choices and be open about how and why decisions are made.

Open decision-making performance measures do not align directly with the state transportation goals. However, the measures provide an important opportunity to understand how the public feels towards MnDOT in two key areas: public trust and public confidence. Public trust and public confidence data come from a public opinion survey of a representative sample of Minnesota’s population conducted every two years<sup>15</sup>. It is important to note that in 2020 MnDOT completed a survey to assess the effects of the COVID-19 pandemic on transportation in Minnesota. The 2020 survey results are not included in this report, but more information about the 2020 survey results is available on MnDOT’s 2020 and 2021 performance scorecards<sup>16</sup>. Additionally, MnDOT has moved collection to even-numbered years meaning the public opinion survey will be conducted next in 2024. The trend analysis in the report is based on the ongoing the surveys from 2015, 2017, 2019, and 2022.

- **Public Trust:** The percentage of survey respondents who agree with the following statement –
  - o MnDOT understands my needs (and the needs of others like me) and has developed a transportation system that works well for me.
  - o MnDOT acts in a fiscally responsible manner
- **Public Confidence:** The percentage of survey respondents indicating they are confident in MnDOT –
  - o Communicating accurate information to Minnesota residents about their transportation plans and projects.

**Table 29. Open decision-making performance measures summary**

Performance measure	Statewide target	Current condition (Result)
Public trust: MnDOT understands customers’ needs	≥ 80% agreement overall and for each demographic group	72% agreement (2022)
Public trust: MnDOT acts in a fiscally responsible manner	≥ 80% agreement overall and for each demographic group	59% agreement (2022)
Public confidence: Communicating accurate information	≥ 80% agreement overall and for each demographic group	67% agreement (2022)

<sup>15</sup> More detailed information about open decision making and public trust and confidence performance measures is available at: <https://performance.minnesotago.org/open-decision-making/public-trust>.

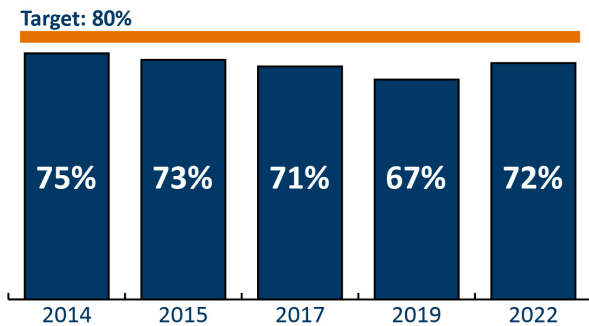
<sup>16</sup>MnDOT’s Performance Scorecards are available at: <http://www.dot.state.mn.us/measures/>.



## Public Trust

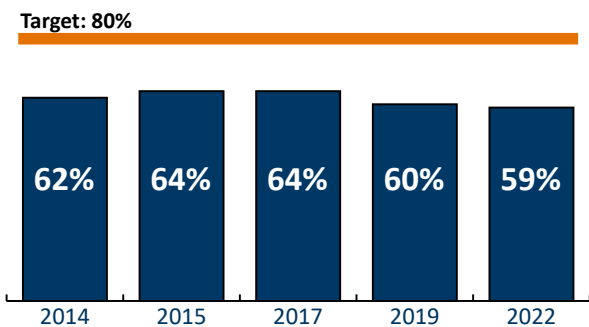
The public trust performance target is greater than or equal to 80% overall. In 2022, 72 percent of respondents agreed that MnDOT understands their needs, which is in line with the trend through the previous survey years (Figure 49).

**Figure 49. Public trust - Percent of Minnesotans who agree that MnDOT understands their needs, 2014 to 2022**



The percent of respondents who agreed MnDOT acts in a fiscally responsible manner was 59% in 2022 (Figure 50). The result is the lowest point among the most recent survey years.

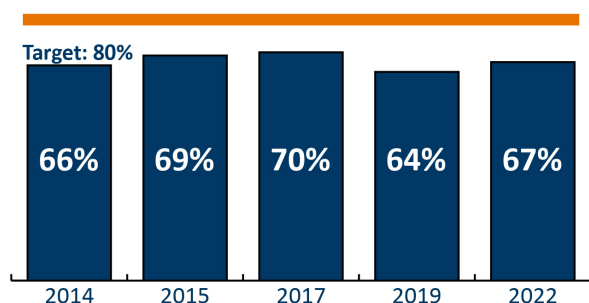
**Figure 50. Public Trust – Percent of Minnesota’s who agree that MnDOT acts in a fiscally responsible manner, 2014 to 2022**



## Public Confidence

The public confidence performance target is greater than or equal to 80% overall. In 2022, 67% of respondents agreed they have confidence in MnDOT’s ability to communicate accurate information about transportation plans and projects (Figure 51). While the 2022 result is below the 80% statewide goal, it was a small increase from the 2019 survey.

**Figure 51. Public Confidence – Communicating accurate information about MnDOT transportation plans and projects, 2014 to 2022**



# Appendix C: Full Performance Measure List

The table lists all the performance measures analyzed for the report, their definition, the related legislative goal, and the associated SMTP objective.

**Table 30. Full performance measure list**

Name	Definition	Leg. Goal	SMTP Objective	MnDOT Role
Roadway fatalities	The number of people killed in crashes involving motor vehicles on Minnesota roadways in a 12-month period.	1	Transportation safety	Partner
Roadway serious injuries	The number of people who were seriously injured resulting from crashes involving a motor vehicle in a 12-month period. The number of serious injuries is classified by first responders at the scene of the accident.	1	Transportation Safety	Partner
Highway-rail grade fatalities and serious injuries	The number of people who were killed or seriously injured resulting from crashes at highway-rail grade crossings involving a motor vehicle in a 12-month period.	1	Transportation Safety	Partner
Pedestrian fatalities and serious injuries	The number of people walking along Minnesota roadways who were killed or seriously injured resulting from crashes involving a motor vehicle in a 12-month period.	1	Transportation Safety	Partner
Bicyclist fatalities and serious injuries	The number of people bicycling on Minnesota roadways who were killed or seriously injured resulting from crashes involving a motor vehicle in a 12-month period.	1	Transportation Safety	Partner
Snow fences	The total number of miles of snow fences comprised of structural (e.g., composite rails snow fences), living (e.g., trees and shrubs), or vegetative (e.g., corn rows or hale bales) fences on Minnesota roadways.	1	Transportation Safety	Lead
Bridge inspection	The percent of routine bridge inspections completed within 30 days of the calendar due date in a 12-month period.	8	System Stewardship	Lead

Name	Definition	Leg. Goal	SMTP Objective	MnDOT Role
Rest area building condition	The percent of MnDOT-owned rest area buildings that were rated as being in poor condition based on an assessment of the infrastructure.	8	System Stewardship	Lead
Bridge condition	The annual percentage of total state bridges rated as being in poor condition based on evaluations of the bridge deck, substructure, and superstructure.	9	System Stewardship	Lead
Culvert condition	The annual percentage of total culverts under state highway lanes rated as being in poor or severe condition.	9	System Stewardship	Lead
Pavement condition	The annual percentage of total interstate, NHS, and non-NHS roadways rated as having poor ride quality.	9	System Stewardship	Lead
ADA compliance	The percentage of total state-owned sidewalks, signals, curbs, and driveways substantially compliant with Americans with Disabilities Act (ADA) standards.	9	System Stewardship	Lead
Road salt chloride use	The amount of liquid to solid de-icing chemicals applied to reduce overall chlorides used on the roadway for snow and ice control in a winter season.	16	System Stewardship	Lead
Sustainable pavements	Annual number of MnDOT projects using sustainable pavement practices.	16	System Stewardship	Lead
Native seeding and plantings	The percent of acres planted with native seeds and native plants as part of large projects in a 12-month period.	16	System Stewardship	Lead
Electric vehicles registered	Total percentage of electric vehicles (including plug-in hybrid and battery electric vehicles) registered in Minnesota.	11	Climate Action	Partner
Transportation sector greenhouse gas emissions	Amount of GHG emissions, measured in metric tons of carbon dioxide equivalent (CO <sub>2</sub> e), from the transportation sector in a 12-month period. The transportation sector emissions include tail pipe emissions from motor vehicles (cars and trucks) on the road as well as emissions from aviation, rail, and marine vehicles.	15	Climate Action	Partner

Name	Definition	Leg. Goal	SMTP Objective	MnDOT Role
LED use	Total percent of light fixtures using Light Emitting Diodes (LED) luminaries on MnDOT-managed roadways.	15	Climate Action	Lead
Vehicle miles traveled per capita	The total annual miles of vehicle travel divided by the total population of Minnesota.	15	Climate Action	Partner
NHS Travel time reliability	The percent of NHS person-miles traveled that are considered consistent or reliable in travel times (also known as travel time reliability), as measured from day-to-day or across different times of the day.	3	Critical Connections	Lead
Job accessibility by car	The average annual number of jobs accessible within a 30-minute drive by personal motor vehicle.	3	Critical Connections	Partner
Job accessibility by bicycle and transit	The average annual number of jobs accessible within a 30-minute ride by bicycle or transit.	3	Critical Connections	Partner
Twin Cities freeway congestion	The percent of Twin Cities metropolitan area freeway miles with an average traffic speed less than 45 miles per hour during morning and afternoon peak times.	3	Critical Connections	Lead
Twin Cities traveler delay	The average delay in minutes per weekday per person in the Twin Cities metropolitan area	3	Critical Connections	Lead
Truck Travel Time Reliability (TTTR) Index	An index measuring the consistency of commercial truck travel times on the Interstate system in a 12-month period. An index value of 1.0 is the lowest possible score and means truck travel speeds are perfectly uniform. In reality, 1.02 or 1.03 are the lowest observed index values.	4	Critical Connections	Lead
Public transit ridership	The total number of boardings in a 12-month period recorded by Metro Transit and in Greater Minnesota.	6	Critical Connections	Partner
Transit on-time performance	Percent of public transit trips with Metro Transit and the Greater Minnesota transit system considered on-time annually.	6	Critical Connections	Partner

Name	Definition	Leg. Goal	SMTP Objective	MnDOT Role
Air transportation	The total number of available seat miles offered on scheduled service nonstop flights from airports in the Twin Cities metropolitan area and in Greater Minnesota in a 12-month period. As defined by the United States Bureau of Transportation Statistics, one available seat is one aircraft seat flown one mile.	12	Critical Connections	Partner
Transportation and housing costs	The percent of median household income spent on housing and transportation in Minnesota.	2	Healthy Equitable Communities	Partner
Physical activity	The percent of Minnesotans who say they bicycle or walk at least weekly.	14	Healthy Equitable Communities	Partner