APPENDIX I - PERFORMANCE MEASURES

Minnesota Department of Transportation (MnDOT) began using performance measures to inform management and investment decisions in the mid-1990s. In 2003, MnDOT adopted the first performance-based statewide transportation plan in the nation. Performance measures show how well the system is functioning. Targets communicate desired outcomes or the achievement of an objective. Performance measures cover all modes, system assets and operations. A few examples include crash rates, fatalities, roadway and bridge condition and age of transit vehicles. MnDOT carefully considers existing commitments, priorities and tradeoffs when adding or changing performance measures and targets. All adopted performance measures and targets are included in MnDOT's annual performance report.

Performance measures provide useful feedback and are integrated into MnDOT and its partners' practices.

- At a strategic level, performance measures help to establish and inform goals, objectives, strategies and actions in the Statewide Multimodal Transportation Plan (SMTP). The SMTP then guides other performance-based plans, such as the State Highway Investment Plan, the Transportation Asset Management Plan, Statewide Pedestrian System Plan, Statewide Bicycle System Plan, Statewide Ports and Waterways Plan, State Aviation System Plan, State Rail Plan and the State Freight Plan. Performance measures also communicate progress toward achieving goals to agency leadership, elected officials, partners and the public.
- At the decision-making level, performance measures are used to inform the allocation of funds among programs such as safety, highway preservation, operations and maintenance, system expansion and public transportation.
- At the project delivery level, performance measures help to monitor the efficiency and effectiveness of projects and services in the State Transportation Investment Program (STIP), District 10-year Capital Highway Investment Plans (CHIPs) and in the capital plans of other agencies and partners. The measures also help identify organizational and operational improvements.

At the federal level, the 2012 Moving Ahead for Progress in the 21st Century Act established national performance measures related to the National Highway System, safety, congestion, emissions and freight movement. MAP-21 required states to develop performance-based plans and to coordinate with metropolitan planning organizations when developing performance targets. These requirements were continued under the 2015 Fixing America's Surface Transportation Act and 2021 Infrastructure Investment and Jobs Act. Federal Highway Administration (FHWA) has three performance measure categories–safety, bridge and pavement condition, and system reliability and the Congestion Mitigation and Air Quality Improvement Program (CMAQ). Federal Transit Administration (FTA) has two performance measure categories–Transit Asset Management (TAM) Plans and Public Transportation Agency Safety Plans (PTASP).

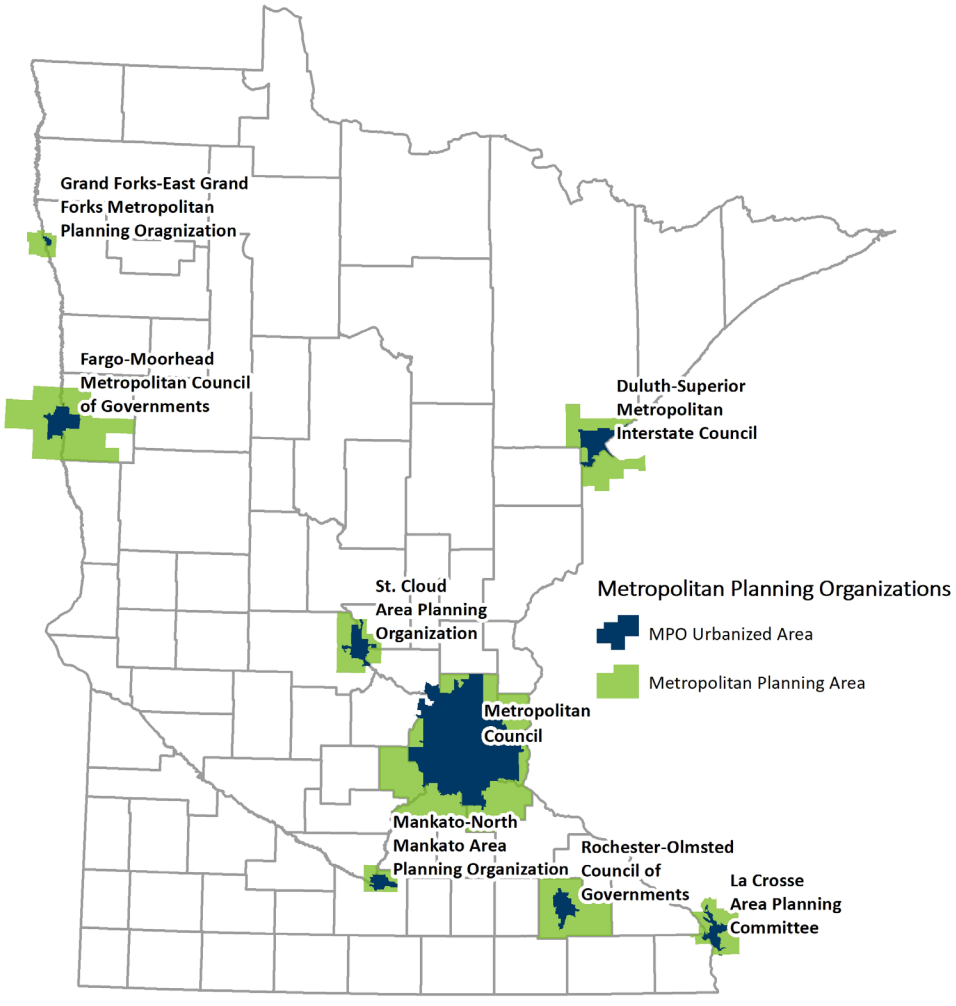
In addition to each state setting its federal performance measure targets, the metropolitan planning organizations (MPOs) within each state have 180-days from the date that the state or transit agency sets their federal performance measure targets to adopt targets for their metropolitan planning area. Minnesota has eight MPOs within the state. Five are bi-state MPOs, which means that part of the planning area is located within Minnesota and North Dakota or Wisconsin.

MPOs have two boundaries. The Urbanized Area (UZA) is an adjusted boundary that is determined by

the Decennial Census population counts. UZAs that have populations over 50,000 are MPOs and designated following the release of Decennial Census data. The Metropolitan Planning Area (MPA) is the broad area that encompasses the UZA and that is anticipated to become urbanized over the next twenty years. The MPA is the area in which planning work is conducted using federal planning dollars. Minnesota's eight MPOs are below in alphabetical order and their boundaries are depicted in Figure I-1.

- Duluth-Superior Metropolitan Intestate Council (MIC) – bi-state with Wisconsin
- Fargo-Moorhead Metropolitan Council of Governments (Metro COG) – bi-state with North Dakota
- Grand Forks – East Grand Forks Metropolitan Planning Organization (GFEGF MPO) – bi-state with North Dakota
- La Crosse Area Planning Committee (LAPC) – bi-state with Wisconsin
- Mankato-North Mankato Area Planning Organization (MAPO)
- Metropolitan Council (Met Council) – bi-state with Wisconsin
- Rochester-Olmsted Council of Governments (ROCOG)
- St. Cloud Area Planning Organization (APO)

Figure I-1 : Minnesota Metropolitan Planning Organizations, 2022



Performance management ensures the most efficient investment of transportation funds by increasing accountability, providing transparency and linking investment decisions to key outcomes. Below are the state and federal performance measures and targets. The state measures are grouped by SMTP objective. The federal measures are identified by performance measure rule.

STATE PERFORMANCE MEASURES

Below are the 2022 SMTP six objectives and the performance measures supporting each objective. Each section has a table of measures, their targets and how the measure is reported. Following the tables are brief descriptions of the measures and targets and how they support the objective.

Each table has four columns:

- Measure – a quantifiable assessment of condition or performance.
- Measure Description – a more detailed explanation of the measure.
- Target or Desired Direction – a target is a specific performance level representing the achievement of a goal, outcome or objective. If no target has been established, a desired direction indicates the preferred trend line (increasing or decreasing).
- Reporting – identifies how the measure is conveyed on the Performance Measure Dashboard (percentage, number, average, etc.). The annual performance measure report card is another location in which performance measures are reported.

The state performance measures are a mix of metrics MnDOT has authority over and some MnDOT does not. Some of the measures influence annual decision-making processes. Other measures help to understand how the transportation system is functioning over time but are beyond any one agency to directly influence. To clarify the difference between the performance measures, the tables below include a column titled “MnDOT’s Role.” The agency’s role may be a mix of Lead, Partner and Support reflecting the following considerations:

- Lead: MnDOT has authority to influence the measurable outcomes that help to meet SMTP objectives.
- Partner: MnDOT collaborates with key partners to measure system performance over time.
- Support: MnDOT has limited direct authority and focus may be on long-term outcomes.

It’s important to note that some measures are being developed further through the implementation of the 2022 SMTP Work Plan. More information on these targets can be found in Chapter 6.

TRANSPORTATION SAFETY

Safeguard transportation users as well as 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.

PERFORMANCE MEASURES

Transportation safety is a top priority for Minnesota. It includes the safety of people travelling and the safety of the communities connected by the system. By measuring fatalities and serious injuries by mode, MnDOT can understand how and where to prevent crashes. When crashes occur, it is important to be able to quickly and safely clear a crash site to ensure the safety of people traveling and those clearing the area and to prevent more crashes. Transportation safety also includes the perception of safety, which MnDOT measures through the Omnibus Survey every two years. Understanding the perception of how safe transportation is helps transportation partners to foster a culture of transportation safety in Minnesota.

Table I-1 outlines the specific Transportation Safety performance measures. More information can be found on MnDOT's Performance Dashboard under Transportation Safety.

FATALITIES

In 2021, 488 people were killed on Minnesota roads. The number of annual fatalities counted are results of crashes involving motor vehicles. This is the highest number of fatalities since 2007. Motorcyclists and people walking were more prevalent in crashes resulting in death and serious injury in 2020 and 2021 than in prior years. In 2021, more younger drivers were involved in crashes resulting in death or serious injury. MnDOT is seeking ways to better address the factors contributing to fatalities on Minnesota roads. Influencing the cultural norms that drive these factors will take sustained and widespread focus from MnDOT and partners.

The target of no more than 225 traffic fatalities by 2025 is aligned with the 2020-2024 Minnesota Strategic Highway Safety Plan (SHSP). The SHSP is developed with the coordination of MnDOT and the Minnesota Department of Public Safety. The SHSP states the long-term goal is to eliminate deaths on Minnesota roads.

SERIOUS INJURIES

Serious injuries are classified by first responders at the scene of the crash. In 2021, 1,722 people were seriously injured on Minnesota roadways. Understanding the number, causes, type and locations of crashes is necessary in order to develop effective countermeasures to improve transportation safety. The number of annual serious injuries counted are results of crashes involving motor vehicles. MnDOT is seeking ways to better address major factors contributing to roadway injuries.

The target of no more than 980 serious injuries by 2025 is aligned with the 2020-2024 SHSP. The SHSP also states the long-term goal is to eliminate serious injuries on Minnesota roads.

PEDESTRIAN FATALITIES AND SERIOUS INJURIES

People walking who have suffered a serious injury or fatality in a crash with a vehicle are tracked to continually improve the safety for all on the transportation network. In 2021, 55 pedestrians were killed in crashes with motor vehicles and 168 were seriously injured. For more information about crash facts see the 2020 Minnesota Motor Vehicle Crash Facts report.

The target of zero pedestrian fatalities and serious injuries is aligned with the 2020-2024 SHSP.

Table I-1: Transportation Safety Performance Measures

MEASURE	DESCRIPTION	CURRENT CONDITION	TARGET OR DESIRED DIRECTION	MNDOT'S ROLE	REPORTING
Fatalities	Annual traffic fatalities on Minnesota roadways	488 traffic fatalities (2021)	≤225 by 2025 Decreasing to 0	Lead & Partner	Number and trend
Serious Injuries	Annual traffic serious injuries on Minnesota roadways	1,722 serious injuries (2021)	≤980 by 2025 Decreasing to 0	Lead & Partner	Number and trend
Pedestrian Fatalities and Serious Injuries	Annual fatalities and serious injuries of people walking on Minnesota roadways	55 pedestrians killed and 168 seriously injured (2021)	Decreasing to 0	Lead & Partner	Number and trend
Bicycle Fatalities and Serious Injuries	Annual fatalities and serious injuries of people bicycling on Minnesota roadways	Nine bicyclists killed and 52 seriously injured (2021)	Decreasing to 0	Lead & Partner	Number and trend
Perception of Safe Walking and Bicycling	Percent of MnDOT Omnibus Survey respondents perceiving safe environments for walking/bicycling	84% of respondents felt safe bicycling 78% of respondents felt safe walking (2020)	≥80% overall and for all demographic segments	Partner	Percent and trend; report by different demographic segments
Aviation Fatalities and Crashes	Total number of aviation fatalities and incidents	Four fatalities in four crashes (2021)	0	Partner	Number and trend
Rail Derailments	Annual total number of rail derailments	18 (2020)	0	Partner	Number and trend
Rail Grade Crossing Fatalities and Serious Injury Crashes	Annual number of crashes at highway-rail grade crossings that result in a fatality or serious injury	4 fatalities and 11 serious injuries (2021)	0	Lead & Partner	Number and trend
Rail Grade Crossings	Annual percent of highest risk crossings receiving improvements	Under Redevelopment	≥5% annually	Lead & Partner	Percent and trend
Incident Clearing Time	Average incident clearance time	≤35 minutes since 2010	≤35 minutes	Lead	Number and trend
Transit Safety Events	Urban transit operators (i.e., 5307) safety events	In development	Decreasing number of events	Partner	Under consideration through SMTP Work Plan

BICYCLE FATALITIES AND SERIOUS INJURIES

Bicycling is key component of the transportation network in Minnesota. Understanding vehicle and bicycle crashes helps Minnesota move towards a safer transportation network for all. In 2021, nine bicyclists were killed in crashes with motor vehicles and 52 were seriously injured. Of the total bicycle-motor vehicle crashes in 2020, 92% occurred in urban areas with populations over 5,000. Additionally, 58% of the crashes occurred from 3 p.m. to 6 p.m. on any day of the week. Knowing the circumstances of the fatalities and injuries can help to improve the overall safety of the system for all people. For more information about crash facts see the 2020 Minnesota Motor Vehicle Crash Facts report.

The target of zero bicyclist fatalities and serious injuries is aligned with the 2020-2024 SHSP.

PERCEPTION OF SAFE WALKING AND BICYCLING

Understanding the perception of how safe transportation feels to people, MnDOT and partners can work to foster a culture of transportation safety in Minnesota. Respondents to MnDOT's Omnibus Survey are asked to rate their perception of safety for bicycling and walking. In 2020, 84% of respondents found their environment safe for bicycling and 78% found it safe for walking. This information provides MnDOT and transportation partners with a baseline to track how projects and engagement can increase the public's perception that it is safe to walk and bicycle. The 2020 Omnibus Survey provided some demographic breakdowns, but additional demographic segments will begin in the 2022 Omnibus Survey to help MnDOT further understand the demographics associated with the data.

AVIATION FATALITIES AND CRASHES

MnDOT provides for aviation safety through the inspection and licensing of airports, permitting of tall towers, licensing of commercial operators, registering aircraft and ensuring regulatory compliance. It also provides education and training programs, pilot safety programs and information services (such as navigational charts) which enhance the overall safety of the aviation system. In 2021, there were four fatalities in four fatal crashes.

Air travel is among the safest modes of transportation. Establishing a target of zero is reasonable considering aviation fatalities and crashes rarely occur.

RAIL SAFETY

The Federal Railroad Administration (FRA) defines a derailment as when on-track equipment leaves the rail for a reason other than a collision, explosion or highway-rail grade crossing impact. Railroads are required to report all derailments with total reportable damages exceeding $10,700 to the FRA. Derailments are most often caused by track conditions, human error or mechanical defects. MnDOT uses FRA data to track the number of derailments in Minnesota.

MnDOT rail inspectors ensure that railroad track and equipment are in compliance with federal safety regulations, which are designed to reduce equipment and track related derailments. Additionally, MnDOT invests in improvements at rail grade crossings in an effort to prevent train-vehicle collisions at crossings, which can lead to derailments.

RAIL CROSSING FATALITIES AND SERIOUS INJURY CRASHES

Minnesota's 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 existing antiquated warning devices. Activities include installation of improved or additional warning devices, crossing consolidations, crossing closures and sign changes. All these investments in safety improvements are efforts to prevent train-vehicle collisions at crossing, which can cause fatalities and lead to derailments.

RAIL CROSSINGS

Minnesota's grade crossing safety improvement program provides funding to install warning devices or other roadway improvements at railroad highway grade crossings. Activities include installation of improved or additional traffic control devices, improvements to roadway alignments, crossing consolidations, crossing closures, improvement of parallel roads and sign changes. All these investments in improvements are efforts to prevent train-vehicle collisions at crossing, which can also lead to derailments.

Targeting 5% of high-risk ranked crossings to be addressed annually will mean that every 20 years all the high-risk crossings will be addressed. Additionally, the useful life of crossing equipment is approximately 20-years, which makes this a sustainable target over the long term.

INCIDENT CLEARING TIME

Incident clearance time represents the total time from the report of an incident to the time the last vehicle clears the roadway. The quicker the clearance time, the less likely a secondary crash will occur. Incident clearance time can vary depending on the response time of MnDOT's Freeway Incident Response Safety Team trucks, state patrol, emergency services and tow trucks. It can also depend on the severity and type of incident. Since 2010, incident clearance times have been below the target of 35 minutes.

TRANSIT SAFETY EVENTS

A transit safety event is defined by FTA as the total number of reportable incidents. The rate of the transit safety events is calculated per total vehicle revenue miles by mode. Safety events are indicators of system challenges that lead to fatalities and serious injuries. Rural transit systems have different safety challenges than urban systems. MnDOT in coordination with transit systems throughout Minnesota track the number of safety events each transit operator has.

Each urbanized area (5307) transit operator in Minnesota is federally required to develop a Public Transportation Agency Safety Plan (PTASP). Within the PTASP there are seven safety performance targets per mode. One of these targets is the number of safety events per vehicle revenue miles. Each 5307 transit operator tracks and records the data needed for the targets. The goal is that these targets are being met and there is a decreasing trend to indicate that the systems are safe and taking appropriate steps to ensure the safety of the operators and riders on the system. This performance measure is under development and will be refined through the work plan.

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.

PERFORMANCE MEASURES

The transportation system includes all the ways people travel and the various assets that make up the system. The condition of each asset plays a role in how people experience their transportation journey. With a changing climate and other disruptive events, there is a focus on resiliency of the transportation system. Each of these components plays a key role in ensuring the transportation network is reliable for people. Developing the transportation workforce can provide opportunities for new ideas to leverage innovation and technology. Innovation is critical to get the most out of transportation investments. Each measure's target indicates a portion of the overall system. When transportation system works people experience smooth and reliable trips that work for and are present for the communities the system serves.

Table I-2 outlines the specific System Stewardship performance measures. More information can be found on MnDOT's Performance Dashboard under System Stewardship.

PAVEMENT CONDITION

Measuring pavement quality on MnDOT roads helps the agency plan for areas that need the most improvement. Pavement condition indicates the overall condition of the roadway system it is assessing, which helps MnDOT and transportation partners strategically build, manage, maintain, operate and adapt the transportation system. See Chapter 2 Figure 2-1 for a map of the Minnesota State Highway network.

Pavement quality on the National Highway System (NHS) is measured and reported by Interstate and by Non-Interstate NHS. Every year, a van with specialized equipment drives each road measuring the pavement quality. The roadways are given a ride quality score based on those measurements. Poor ride quality looks like uneven surfaces to significant cracks in the road. Good ride quality can look like even surfaces and pavement that provides safe driving experiences.

Poor ride quality on the roadway system in Minnesota is projected to increase slightly in the next three years, but condition is expected to remain better than targets (i.e., lower percentages of the system). Good ride quality on the Interstate and Non-Interstate NHS has been consistent over the years with conditions above targets (i.e., higher percentages of the system). However, good ride quality is projected to decline in the next three years.

MnDOT also measures and reports pavement condition on the Non-NHS portion of the state highway system. Poor ride quality on the Non-NHS improved in 2020 and has continued to maintain levels better than the 8% target. Good ride quality on the Non-NHS also improved in 2020 and is projected to remain steady for the next four years, meeting or exceeding the 60% target.

Table I-2: System Stewardship Performance Measures, 1 of 2

MEASURE	DESCRIPTION	CURRENT CONDITION	TARGET OR DESIRED DIRECTION	MNDOT'S ROLE	REPORTING
Pavement Condition	Annual percent of state highways with good and poor ride quality	• Interstate Good: 92.5% • Interstate Poor: 0.4% • NHS Good: 82.2% • NHS Poor: 0.5% • Non-NHS Good: 77.2% • Non-NHS Poor: 2.0% (2021)	• Interstate Good: ≥70% • Interstate Poor: ≤2% • NHS Good: ≥65% • NHS Poor: ≤4% • Non-NHS Good: ≥60% • Non-NHS Poor: ≤8%	Lead	Percent, trend and predicted future
Bridge Condition	Annual percent of state bridges in good and poor condition as a percent of total bridge deck area	• NHS Good: 30.4% • NHS Poor: 6.3% • Non-NHS Good: 30.5% • Non-NHS Poor: 4.4% (2021)	• NHS Good: ≥55% • NHS Poor: ≤5% • Non-NHS Good: ≥50% • Non-NHS Poor: ≤8%	Lead	Percent, trend and predicted future
Bridge Inspections	Annual percent of routine bridge inspections completed on time	99.5% (2020)	100%	Lead	Percent and trend
Culvert Condition	Annual percent of highway culverts in poor or severe condition	17% (2020)	≤10%	Lead	Percent and trend
ADA Compliance	Total percent of state-owned sidewalks, signals, curbs and driveways substantially compliant with ADA standards	• Sidewalk 66% compliant • Signals 76% compliant • Curb Ramp 61% compliant (2021)	100% by 2037	Lead	Percent and trend
Airport Pavement Condition	Measure identifying the condition and quality of the airport infrastructure across the state	Under Redevelopment	≤4%	Lead & Partner	Percent and trend

Table I-2: System Stewardship Performance Measures, 2 of 2

MEASURE	DESCRIPTION	CURRENT CONDITION	TARGET OR DESIRED DIRECTION	MNDOT'S ROLE	REPORTING
Rural Transit Vehicle Condition	Percent of 5311 vehicles exceeding Useful Life Benchmark (ULB)	7.5% (2020)	<10%	Partner	Percent and trend
Rest Area Condition	Share of buildings in poor condition	8% (2021)	<4%	Lead	Percent and trend
Native Seeding and Plantings	Percentage of acres planted with native seeds and plants as part of large projects	• Seeding: 61% (2020) • Planting: 50% of projects planted wtih native plantings (2021)	• Seeding: ≥75% • Planting Urban: ≥80% • Planting Rural: ≥90%	Lead	Percent and trend
Road Salt Chloride Use	Rate of liquid to solid de-icing chemicals applied to reduce overall chlorides used on the roadway for snow and ice control	41 gallons of liquid chlorides used for every ton of salt (2020-2021)	200 gallons of liquid per ton of solid by 2027	Lead	Rate and trend
Workforce Participation	Annual percent ethnic representation and women in the highway-heavy construction workforce	12.9% of people working on a federal aid highway project were ethnic representation and 11.1% were women (July 2021)	Increasing	Partner	Percent and trend
Representation within MnDOT	Annual percent racial and ethnic representation and women in MnDOT's workforce	11% ethnic representation and 22% women in MnDOT's workforce	Increasing	Lead	Percent and trend

BRIDGE CONDITION

Bridge condition is assessed during inspections, which are performed at least every two years on all state highway bridges. Ratings combine deck, substructure and superstructure evaluations. Bridges rated poor are safe to drive on, but they are near the point where significant investment in repair or replacement is necessary. The cost and disruption of repairing or replacing large, heavily used bridges are also greater compared to bridges that are smaller and less traveled.

A lower target for poor bridge condition is positive, while having higher percentages of bridges in good condition is also positive. MnDOT has tried in recent years to increase the quality and standards of inspection efforts, resulting in more accurate assessments of condition. Having accurate data allows transportation partners and MnDOT to better plan for improvements, maintenance and operations for bridges throughout the state. In 2021, 6.3% of NHS bridges were in poor condition, while 30.4% of NHS bridges were in good condition.

BRIDGE INSPECTIONS

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. A bridge inspection is considered on-time if it is completed within 30 days of its calendar due date. Since 2013, MnDOT has completed bridge inspections on time over 99% of the time. Occasionally, delays can occur due to weather, conflicting construction activities or high priority reactive maintenance activities.

Continuing to strive for 100% of on-time bridge inspections provides accurate data that allows transportation partners and MnDOT to better plan for improvements, maintenance and operations for bridges throughout the state.

CULVERT CONDITION

The culvert condition performance measure tracks the percentage of highway culverts in poor or severe condition. 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/or away from the highway. Since 2014 the percentage of culverts in severe or poor condition has been holding steady between 15% to 17%.

Maintaining a target of less than or equal to 10% is important to clearly indicate to MnDOT and transportation partners throughout Minnesota that replacing and improving the quality of these culverts is an important aspect of the transportation system. Further information about investments can be found in the Transportation Asset Management Plan and the Minnesota State Highway Investment Plan.

ADA COMPLIANCE

MnDOT's Americans with Disabilities Act (ADA) Transition Plan details how the department will ensure that its facilities, services, programs and activities are accessible to all individuals. As part of this 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.

Consistent with the ADA Transition Plan, intersections are selected for conversion to accessible pedestrian signals using a rating tool that considers, among other things, pedestrian use, surrounding properties, transit availability and user requests. For sidewalks and curb ramps, MnDOT is using inventory data to identify barriers and prioritize need. MnDOT is also working at a policy level to include accessibility standards earlier in the design and right-of-way acquisition phases of project development. Facilities that are accessible, but do not meet current standards will continue to be improved through MnDOT's routine construction program. Facilities that are inaccessible but will not be improved in the course of a typical roadway project will be prioritized by districts as part of a separate barrier removal program.

In 2021, MnDOT adopted its first Statewide Pedestrian System Plan. This plan directs MnDOT's efforts to increase the safety and mobility of people walking along the state highway network. It also establishes performance measures that track progress toward pedestrian-related goals, including ADA compliance. In 2018, MnDOT identified 348 of 620 total sidewalk-miles along state highways that comply with the American with Disability Act. This represents 56% of sidewalk-miles along state highways. Driveways with excessive slope are the most common deficiency in the network. MnDOT expects near-term changes in sidewalk condition to be modest due to limited budget and the long life-cycle of sidewalks.

AIRPORT PAVEMENT CONDITION

Adequate approaches for airports ensure that planes can take off and land safely. Monitoring pavement condition and implementing timely investments to maintain runway surfaces is one way to ensure that air travel is safe and reliable in Minnesota. The number of Minnesota airports with adequate approaches has been growing steadily. The target is to have 100% of all airports' approaches in an adequate or higher condition.

The Office of Aeronautics maintains an Airport Pavement Management system for 103 paved airports in Minnesota. Airports are surveyed on a three-year cycle. The measure focuses on runway and parallel taxi pavement quality for airports across the state of Minnesota. The goal of measuring pavement quality is to identify pavements that will receive the most benefit from an optimally timed repairs and avoid higher rehabilitation costs caused by excess deterioration. Overall, this information provides a planning tool for MnDOT and airports to help identify pavement needs, optimize the selection of projects and treatments over a multi-year period and understand the significance of these plans. See the MnDOT Aeronautics and Aviation website for information on airport pavement condition.

RURAL TRANSIT VEHICLE CONDITION

Transit Asset Management (TAM) Plans are required by FTA for rural transit providers (5311 transit operators). In 2018, the statewide TAM Plan set a target for all rolling stock (e.g., revenue vehicles) that no more than 10% exceed their useful life benchmark (ULB). This is the rural transit vehicle condition performance measure.

In 2020, 7.5% of the 5311 transit vehicles exceeded their ULB, which is below the target. When all vehicles are divided out by category, buses account for 95% of all 5311 vehicles providing transit service, while vans account for the remaining 5%. In 2020, 62.5% of the 5311 operators' vans exceeded their ULB. Understanding this breakdown can help MnDOT coordinate with 5311 operators to know which vehicles need to be replaced and when to maintain a reliable transit system.

REST AREA CONDITION

Rest areas provide strategic locations to support the economy including tourism. Facilities are often sited on high volume roads at reasonable intervals. Rest areas eliminate unsafe stops on shoulders, provide information to travelers, reduce driver fatigue and promote transportation safety. The facilities play a key role in the management and operation of the transportation system.

NATIVE SEEDING AND PLANTINGS

Roadside vegetation serves critical functions for operating a transportation system, including safety, drainage, erosion control, stormwater treatment and invasive species control. Native species are more effective in accomplishing these functions and create a diverse ecological system and healthy environment.

MnDOT started tracking native plantings in 2021 as part of project installations. As data is collected over time, an increased understanding through trends will help MnDOT set informed targets that indicate the environmental health of the transportation system.

ROAD SALT CHLORIDE USE

Salt chlorides play a key role in keeping roads safe during winter months because it lowers the freezing point of water. MnDOT is working to better manage pollutants, such as chlorides, by switching to liquid chlorides instead of dry ones applied to roadways. By switching to liquid chlorides, the overall chlorides applied to Minnesota roadways is reduced by at least 25% without sacrificing safety or chloride performance on roadways.

MnDOT's target is to significantly increase the rate of liquid chlorides in relation to dry over the next five years. In the 2020-21 winter season, 41 gallons of liquid were used for every ton of salt. MnDOT looks to increase the rate of using liquids to 200 gallons per ton by 2027. This will reduce total chloride use on state highways no matter how severe a given winter is in the state.

WORKFORCE PARTICIPATION

MnDOT proactively works with contractors, education institutions, women and ethnic community members and career fairs throughout the state to increase participation, retention and advancement for workers placed through these recruitment programs. Contractors working on a federal aid highway construction project during the last payroll period in July must report their workforce by job category, gender, race and ethnicity. During the last week of July 2021, 12.9% of people working on a federal aid highway construction project were ethnic representation and 11.1% were women. By comparison, 12.6% of people working on a federal aid highway construction project were ethnic representation and 11.3% were women during the last week of July 2020. Women and ethnic representation highway construction participation rates are also tracked at the county level to determine compliance with goals established through state and federal regulations.

Minnesota's transportation workforce should match the demographics for the state overall. Changes in workforce participation can indicate the need to make changes to recruitment and retention practices. Understanding trends over time can help strengthen MnDOT's ability to recruit, hire, develop, promote and retain talent and remove barriers to equal opportunity. Further examination and determination of regional targets is to be refined through the work plan and coordination with MnDOT's Office of Civil Rights and Minnesota Department of Human Rights.

REPRESENTATION WITHIN MNDOT

MnDOT strives to have a diverse, well qualified and inclusive workforce that reflects the populations of Minnesota. A goal of MnDOT's Unified Diversity & Inclusion Plan is that the diversity of the state is reflected in the workforce at all levels and in all roles throughout the organization. Representation within MnDOT is tracked annually and is measured as the annual percent ethnic representation and women in MnDOT's workforce.

The workforce statistics have remained stagnant for the past 10 years. New recruitment strategies and emphasis on underserved and underrepresented communities is a renewed focus in recent years. At this time, the target is to increase the percentages towards a workforce more reflective of the populations in Minnesota.

CLIMATE ACTION

Advance a sustainable and resilient transportation system. Enhance transportation options and technology to reduce emissions. Adapt Minnesota's transportation system to a changing climate.

PERFORMANCE MEASURES

As the climate changes the transportation system must adapt. A resilient transportation system withstands increasing extreme weather events. Through evaluation of the system's resilience MnDOT and transportation partners can better prepare. Similarly, asset resilience is important to ensure the reliability of the system for the public. Further the transportation sector is the number one producer of greenhouse gas (GHG) emissions, which is a major cause of climate change. MnDOT has a responsibility to reduce GHG emissions in Minnesota. Tracking zero emission vehicle (ZEV) registration and sales are just a few ways to enhance transportation options and reduce GHG.

Table I-3 outlines the specific Climate Action performance measures. The Climate Action objective is new to the 2022 SMTP and doesn't yet have a corresponding section on the Performance Dashboard.

GREENHOUSE GAS EMISSIONS

Transportation is the largest contributor of GHG emissions in Minnesota. The transportation sector for GHG includes tail pipe emissions from cars and trucks on the road as well as aviation, rail and marine emissions. Per the Next Generation Energy Act, Minnesota has a goal of reducing GHG from 2005 levels by 30% by 2025 and 80% by 2050. In 2021, President Biden signed the Paris Agreement committing to reducing GHG by 26-28% by 2025 from 2005 levels and by 2030 the GHG levels should be 50-52% below 2005 levels.

To support both these sets of goals, MnDOT is setting targets for the reduction of GHG emissions in the transportation sector to 29.5 million metric tons CO2e (30%) by 2025, 20.1 million metric tons CO2e (50%) by 2030, 14.1 million metric tons CO2e (65%) by 2035 and 8.0 million metric tons CO2e (80%) by 2040. 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, decreasing per capita vehicle miles traveled (VMT) and increasing the use of public transportation and non-motorized transportation.

ZERO EMISSION VEHICLES REGISTERED IN MINNESOTA

Light-duty vehicles are the largest portion of transportation GHGs in the state. While federal fuel economy standards will lower emissions in the future, electrifying and having zero emission light duty vehicles are important strategies to meet the goal. Zero Emissions vehicle (ZEVs) registrations continue to increase in Minnesota. ZEVs include electric vehicles, hydrogen fuel cell powered vehicles and other non-carbon-based fueled vehicles. Transitioning away from gasoline and diesel vehicles and toward EVs and other clean fuels will play an important role in reaching state goals.

As of December 2021, 23,897 electric vehicles (EVs) were registered in Minnesota. Growth in battery electric vehicle registrations outpaced growth in plug-in hybrid electric vehicle registrations at 55% and 37%, respectively, between 2019 and 2020. Over 80% of the EVs are registered in the seven-county metro area. Significantly more EVs are needed in the next 10 years to achieve the state goal of 20% of light-duty vehicles in Minnesota are electric by 2030.

ZERO EMISSION VEHICLES SOLD IN MINNESOTA

Vehicles sold in Minnesota do not always stay and are not always registered in the state. People from all over purchase vehicles in Minnesota. The number of ZEVs sold in Minnesota indicates the change in overall market and transportation sector demand. As of 2021, about 2% of all light-duty vehicles sold in Minnesota were EVs.

Having 5-year targets out of the total number of all vehicles sold for 2030, 2035 and 2040 provide indicators to the shift in overall transportation sector GHG emission reduction. These target percentages are higher than ZEVs registered in Minnesota because registration is always going to be a portion of the total vehicles sold.

Table I-3: Climate Action Performance Measures

MEASURE	DESCRIPTION	CURRENT CONDITION	TARGET OR DESIRED DIRECTION	MNDOT'S ROLE	REPORTING
Greenhouse Gas Emissions	Total annual greenhouse gas emissions from the transportation sector (percentages shown in parenthesis reflect percent reduction from 2005)	40.3 million metric tons CO2e (2018)	• 29.5 million metric tons CO2e (30%) by 2025 • 20.1 million metric tons CO2e (50%) by 2030 • 14.1 million metric tons CO2e (65%) by 2035 • 8.0 million metric tons CO2e (80%) by 2040	Lead & Partner	Number and trend
Zero Emission Vehicles (ZEV) Registered in Minnesota	Percent of all light-duty vehicles registered in Minnesota that are electric or another type of ZEV	23,897 EVs registered, 0.4% of total vehicles (December 2021)	• 5% by 2025 • 20% by 2030 • 45% by 2035 • 65% by 2040	Support	Percentage and trend
Zero Emission Vehicles (ZEV) Sold in Minnesota	Percent of new light-duty vehicles registered in Minnesota that are electric or another type of ZEV	About 2% (2021)	• 20% by 2025 • 60% by 2030 • 100% by 2035 • 100% by 2040	Support	Percentage and trend
System Resilience	Measure that evaluates resilience at a system level (i.e., not just individual assets)	In development	Work plan item	Lead	Under consideration through SMTP Work Plan
Asset Resilience	Resilience of assets by type (e.g., bridges, culverts, etc.)	In development	Work plan item	Lead	Under consideration through SMTP Work Plan

SYSTEM RESILIENCE

MnDOT's Resilience Advisory Committee has begun the process of developing a suite of measures for resilience. The advisory committee hopes to complete its work and produce a recommendation for measures by summer 2022. This work will springboard a refined measure and target that will be determined through a work plan item. See more information in Chapter 6.

This measure once developed will contribute vital information for performance-based risk management planning and practice. Risk management helps to identify threats and opportunities to the transportation system. A system resilience measure aims to look beyond individual assets to help MnDOT understand risk at a program and organizational level.

ASSET RESILIENCE

MnDOT has measures of asset condition and asset maintenance but does not currently have resilience measures. MnDOT is working to define what resilience means for its assets and to develop measures that can assist in decision making. A refined measure and target will be determined through a work plan item. See more information in Chapter 6.

Like a system resilience measure, this measure will contribute vital information for performance-based risk management planning and practice. Risk management helps to identify threats and opportunities to the transportation assets. An asset resilience measure aims to understand which assets are at risk for different types of events, how to optimize assets to changing conditions and data to inform post-event recovery.

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.

PERFORMANCE MEASURES

Transportation ensures critical connections for people throughout Minnesota. Maintaining and improving the multimodal elements of the transportation system increases the quality of life for Minnesotans. Measuring travel time reliability and transit on time performance, as well as other measures for bicycling, driving and flying help MnDOT and transportation partners understand the modal performance of the transportation system. Other performance measures, such as VMT and job accessibility can help to meet broader goals and maximize social, economic and environmental benefits.

Table I-4 outlines the specific Critical Connections performance measures. More information can be found on MnDOT's Performance Dashboard under Critical Connections.

TRAVEL TIME RELIABILITY

Travel Time Reliability measures the consistency of time it takes to go a specific distance on the NHS. This measure indicates the percent of all person-miles traveled on the NHS that are reliable. 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. Reliability on the NHS statewide were 83.7% in 2017, 86.2% in 2018, 84.9% in 2019 and 97.5% in 2020. Then reliability improved dramatically during the COVID-19 pandemic as reflected with 2020 data. For more information on travel time reliability see the Minnesota GO Performance Dashboard.

Table I-4: Critical Connections Performance Measures, 1 of 2

MEASURE	DESCRIPTION	CURRENT CONDITION	TARGET OR DESIRED DIRECTION	MNDOT'S ROLE	REPORTING
Travel Time Reliability	Percent of person-miles traveled on the National Highway System (NHS) that are considered reliable	• 84.9% in 2019 • 95.4% in 2021	≥90%	Lead	Percent and trend
Truck Travel Time Reliability	Index measuring the consistency of commercial truck travel times on the Interstate system	• 1.48 in 2019 • 1.24 in 2021	≤1.5	Lead	Number and trend
Vehicle Miles Traveled per Capita	Number of miles traveled across Minnesota per capita (percentages shown in parentheses are the percent reduction from 2019)	• 10,691 miles per capita (2019) • 9,957 miles per capita (2021)	• 10,263 (-4%) by 2025 • 9,835 (-8%) by 2030 • 9,515 (-11%) by 2035 • 9,195 (-14%) by 2040	Partner	Number and trend and by urban, suburban and rural

Table I-4: Critical Connections Performance Measures, 2 of 2

MEASURE	DESCRIPTION	CURRENT CONDITION	TARGET OR DESIRED DIRECTION	MNDOT'S ROLE	REPORTING
Job Accessibility by Bicycle, Car and Transit	Average annual number of jobs accessible within 30-minutes during morning peak traffic by bicycle (on medium stress roads), driving and transit	• 40,967 jobs accessible by bicycle (on medium stress roads) • 586,940 jobs accessible by car • 13,069 jobs accessible by transit (2019)	Increasing	Lead & Partner	Number and trend by mode
Traveler Delay	Average delay per person in the Twin Cities	9.7 minutes (2018)	≤9 minutes per weekday	Lead & Partner	Number and trend
Transit On-time Performance	Annual transit on-time performance within the Twin Cities and within Greater Minnesota	• Twin Cities: Metro Transit Bus: 84.8% (2021) • Greater Minnesota: 95.2% (2021)	• Twin Cities: Metro Transit Bus: ≥90% • Greater Minnesota: ≥90%	Partner	Percent and trend
Transit Span of Service	Measure communicating the percentage of public transportation services that meet minimum service guidelines for access in the Twin Cities and Greater Minnesota	Under Redevelopment	≥90%	Partner	Percent and trend
Transit Ridership	Boardings recorded by public transit providers	• Urban: 91.6 million (2019); 38.1 million (2021) • Rural: 11.5 million (2019); 6.2 million (2021)	Increasing	Partner	Number and trend by Twin Cities Metropolitan Area and in Greater Minnesota
Air Transportation	Annual number of available seat miles offered from commercial service airports	• MSP: 24.3 million (2019); 16.8 million (2021) • Greater Minnesota: 181,447 (2019); 131,952 (2021)	Increasing	Support	Number and trend

TRUCK TRAVEL TIME RELIABILITY

Travel Time Reliability measures the consistency of time it takes to go a specific distance on the NHS. This measure indicates the percent of all person-miles traveled on the NHS that are reliable. 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. Reliability on the NHS statewide were 86.2% in 2018, 84.9% in 2019, 97.5% in 2020 and 95.4% in 2021. Reliability improved dramatically during the COVID-19 pandemic as reflected with 2020 data. For more information on travel time reliability see the Minnesota GO Performance Dashboard.

VEHICLE MILES TRAVELED PER CAPITA

VMT measures the amount of travel for all vehicles in a geographic area over a period of time, usually daily or annually. Over the last three decades, VMT in Minnesota has increased almost twice as fast as the population has grown. The exception to this is around the 2008 recession when VMT flatlined. Much of the VMT on Minnesota roads is useful, but relatively high capita VMT suggests that Minnesotans do not have effective transportation options to get to their destinations. It also suggests that people drive farther to get to the places they need to go, such as work and grocery stores. VMT reduction is also a key component to reducing GHG emissions.

As part of the SMTP, MnDOT is establishing targets consistent with reducing per capita VMT by 20% by 2050 (equivalent to a 7% reduction in total VMT if the current population forecast holds). Increasing the quality of access to walking, bicycling and transit are key strategies for advancing this target. Improving multimodal options and reducing per capita VMT will also reduce GHG emissions in the transportation sector.

JOB ACCESSIBILITY BY BICYCLE, CAR AND TRANSIT

Accessibility measures evaluate how easily people can reach destinations within a given amount of time by various modes of travel. Accessibility reflects the progress in connecting people to destinations that matter. Job accessibility measures the number of jobs reachable within a given travel time for various modes. Access to destinations such as jobs, education and health care is a factor for people when choosing a place to live. The Accessibility Observatory at the University of Minnesota produces an annual accessibility dataset along with statewide and MPO maps of average job accessibility by automobile, bicycle and public transit. Destination types will be expanded in coming years to include education and health care.

TRAVELER DELAY

Highway mobility (the ability of people and goods to move efficiently and reliably along highways) is a core element of the transportation system, regional vitality and quality of life. While congestion is a sign of a healthy economy, excessive amounts of delay can dampen economic competitiveness and reduce quality of life. The purpose of measuring traveler delay is not to eliminate congestion, but to limit the amount of delay people experience to reasonable levels. The target of nine minutes per weekday (or 40 hours of annual delay per person) represents about a 5% improvement from 2018 levels.

TRANSIT ON-TIME PERFORMANCE

Transit on-time performance is tracked at the service level (e.g., fixed route or on-demand). As reliability increases, the more a person can depend on a system to get them to their destination on time. This is true for transit and other modes. Targeting to increase on-time performance within the seven-county metro area and Greater Minnesota transit systems aims to improve transit experiences throughout the state. Minnesota's Olmstead Plan sets a goal of improving to 90% within a 45-minute timeframe for Greater Minnesota. The baseline for Greater Minnesota on-time performance was 76% in 2014 and has improved to over 95% in 2021. A measure for the entire Twin Cities transit system is in development, Metro Transit's on-time bus performance is being utilized in the interim. On-time transit service allows people to predict arrival and departure times, as well as the time it should take to travel between locations. The target indicates increasing dependability of transit as a mode statewide.

TRANSIT SPAN OF SERVICE

Transit providers across Minnesota are subject to minimum guidelines for the frequency per hour per day of service. The guidelines are dependent on the individual community and vary across the state. Compliance with the guidelines is important to ensure residents in communities across the state have reliable access to destinations via transit.

TRANSIT RIDERSHIP

Transit ridership is broken out into two subcategories: Twin Cities and Greater Minnesota.

Twin Cities transit ridership is measured by the annual number of boardings recorded by all Twin Cities transit providers including Met Council, University of Minnesota and the four suburban transit systems. Public transit experienced a dramatic drop in ridership in 2020 and 2021 due to changes in service and travel patterns caused by the COVID-19 pandemic. Prior to the pandemic, ridership was declining on fixed routes. However, rail and bus rapid transit ridership grew in 2019 and transit providers continue to adjust services to match changing demands.

Greater Minnesota's 40 public transit systems are operated by local governments, joint powers organizations, non-profits and tribal governments. Five of these are tribal systems, 7 are small urban (5307) systems and 28 are rural area (5311) systems. The number of passenger boardings (rides) is recorded daily by all transit systems. MnDOT supports these systems through planning, research, technical assistance and management of state and federal transit funding programs. Consistent with the Greater Minnesota Transit Investment Plan, MnDOT's first priority is continuation of financial assistance to systems meeting performance standards, then expanding transit service into new areas and finally to expand the frequency, coverage and daily duration of service currently provided. Greater Minnesota transit ridership decreases from the COVID-pandemic remained in 2021 with 6.2 million boardings compared to 11.5 million boardings in 2019.

Further review of transit ridership following the COVID-19 pandemic will need to occur to determine the validity of transit ridership as a successful measure of transit system effectiveness.

AIR TRANSPORTATION

Air transportation is one of the many modes in Minnesota that connects people within and beyond the state boundaries. Ensuring seat availability on scheduled service nonstop flights from Minneapolis-St. Paul (MSP) airport and Greater Minnesota airports is an important indicator of how economically competitive the state is nationally and globally. The number of available seat miles at MSP increased between 2013 and 2019. The desired direction is to keep increasing these numbers. The number of available seat miles decreased dramatically in 2020 due to the COVID-19 pandemic causing airlines to drastically reduce scheduled service for a large portion of the year.

HEALTHY EQUITABLE COMMUNITIES

Foster healthy and vibrant places that reduce disparities and promote healthy outcomes for people, the environment and our economy.

PERFORMANCE MEASURES

Transportation has the ability to enhance and encourage healthy equitable communities for people throughout Minnesota. Measuring air quality and physical activity can help MnDOT and transportation partners understand the physical impacts of the transportation system on people.

Other performance measures, like transportation cost, helps quantify the economic impacts transportation can have on people. Multimodal accessibility provides a broader picture of the impact of transportation on people's time. Finally, measuring how MnDOT can increase transportation equity helps reduce disparities.

Table I-5 outlines the specific Healthy Equitable Communities performance measures. More information can be found on MnDOT's Performance Dashboard under Healthy Equitable Communities.

Table I-5: Healthy Equitable Communities Performance Measures

MEASURE	DESCRIPTION	CURRENT CONDITION	TARGET OR DESIRED DIRECTION	MNDOT'S ROLE	REPORTING
Air Quality	Number of criteria pollutants below National Ambient Air Quality Standards (NAAQS) threshold each year	Minnesota is in compliance with NAAQS	All criteria pollutants below threshold	Partner	Number of and which pollutants not meeting standards
Physical Activity	Percent of Minnesotans who bicycle or walk at least weekly	35% of Minnesotans bicycle or walk at least weekly (2019)	• 40% by 2025 • 45% by 2030 • 50% by 2035 • 60% by 2040	Partner	Percent and by demographic segments
Transportation Cost	Measure of how much household income goes to transportation	In development	Work plan item	Support	Under consideration through SMTP Work Plan
Multimodal Accessibility	(i.e., destination access) for walking, bicycling and transit at a project- and program-level	In development	Work plan item	Lead & Partner	Under consideration through SMTP Work Plan
Increase in Transportation Equity	Transportation equity is directly influenced by improving multimodal access, reducing transportation costs and improving transportation safety	In development	Work plan item	TBD	Under consideration through SMTP Work Plan

AIR QUALITY

The Clean Air Act requires the U.S. EPA to set national standards for six common air pollutants, called "criteria pollutants." The National Ambient Air Quality Standards (NAAQS) are set to protect health, the environment and property. The criteria pollutants are ground-level ozone, fine particles, lead, nitrogen dioxide, carbon monoxide and sulfur dioxide. Each state must demonstrate it is complying with these standards by monitoring its air quality. If a state fails to comply with one of the standards, it must develop a plan to come into compliance.

Air quality is not the same in all parts of Minnesota and doesn't affect all Minnesotans equally. People in some areas either experience pollution levels that worsen serious health conditions or are exposed to pollutants that don't have federal standards. In addition, health inequities mean some populations are more susceptible to the harmful effects of air pollution. Black people, Indigenous people, people of Color and people with low incomes often do not have adequate access to the conditions that support healthy living, including quality schooling, healthcare and clean surroundings. When equitable access to these is limited, poor air quality often contributes to and worsens health disparities.

Minnesota is complying with all of the NAAQS although levels of air pollution in compliance can still affect people's health. It is important to track this measure to comply with regulations, but also to ensure people are not impacted by poor air quality.

PHYSICAL HEALTH

MnDOT is using the work plan in Chapter 6 and the Statewide Pedestrian System Plan to help increase the percentage of people walking, bicycling or both. MnDOT is able to calculate these measures by using results from the Omnibus 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 vacations)?"

TRANSPORTATION COST

Minnesota Department of Employment and Economic Development (DEED) creates a statewide Cost of Living Tool that is updated annually. The tool provides a yearly estimate of the basic-needs cost of living in Minnesota by county, region and statewide.

Through the work plan in Chapter 6, MnDOT will explore formalizing a measure and target(s) similar to DEED's tool, but the measure will look at how much household income goes to transportation. DEED's transportations costs are tied to survey data conducted every three to four years. As part of the work plan development of this measure, MnDOT will be looking at what data sources are available and updated most frequently.

MULTIMODAL ACCESSIBILITY

Multimodal accessibility measures access to destinations by walking, bicycling and transit at a project and program level. Access to jobs is the most common destination to measure, but access to other destinations, such as healthcare, education, grocery stores and childcare can also be measured. Destination access is directly impacted by changes to the transportation network. This measure focuses on how MnDOT construction projects impact job accessibility by walking, bicycling and transit. The program-level portion of this measure is to be developed further as part of the SMTP Work Plan and more information can be found in Chapter 6.

INCREASE IN TRANSPORTATION EQUITY

MnDOT uses multiple measures to evaluate transportation equity. MnDOT is currently developing additional measures to evaluate impacts for specific people and places. Measures that significantly influence the equitability of the transportation system are multimodal access (see regional multimodal access measure already available), safety (see multimodal safety measures) and transportation cost (work plan item).

Equitably access is most directly measured by distribution of multimodal options (walking, bicycling and transit) as well as ADA compliance for people with disabilities. Safe infrastructure that is equitably distributed is also a significant measure of transportation equity. Finally, ensuring that people in Minnesota are not spending more on their transportation costs than is reasonable helps MnDOT understand transportation equity.

OPEN DECISION MAKING

Make equitable transportation decisions through inclusive and collaborative processes that are supported by data and analysis. Ensure effective and efficient use of resources.

PERFORMANCE MEASURES

Open decision making is about trust. The public needs to be able to trust that MnDOT will plan, program, build, maintain and operate so that there is an effective and efficient use of resources. That trust and confidence can be measured and evaluated using surveys and tools to collect and analyze data. Understanding who is being engaged and how they're being engaged helps MnDOT improve coordination, consultation and collaboration on projects at the planning and programming levels.

Table I-1 outlines the specific Open Decision Making performance measures. More information can be found on MnDOT's Performance Dashboard under Open Decision Making.

PUBLIC TRUST AND CONFIDENCE

MnDOT's Omnibus Survey is a biennial public opinion survey that provides department leadership, managers and program staff with public feedback on MnDOT's core operations. The results help inform department strategies, resource allocation and communication, outreach and education efforts based on the public's preferences, priorities and concerns. MnDOT uses the results at all levels of decision making to reflect the public's perception of MnDOT's effectiveness overall, as well as performance and trust levels in key service areas, such as maintenance, safety, infrastructure reliability and convenience. The survey is conducted every two years.

The 2021 Omnibus Survey indicated that 59% of respondents agreed that MnDOT acts in a fiscally responsible manner. In 2021, 67% of the public agreed that MnDOT communicates accurate information to Minnesotans about the state's transportation plans and projects. The 2021 Omnibus Survey provided some demographic breakdowns, but additional demographic segments will begin in the 2022 Omnibus Survey to help MnDOT further understand the demographics associated with the data.

PROJECT-LEVEL PUBLIC ENGAGEMENT MEASURES

MnDOT is in the process of developing a consistent way to collect public and stakeholder opinions. Having a standardized survey tool to collect data in a consistent way allows MnDOT to understand how effective its communications and engagement efforts are at the project and state levels. By understanding the effectiveness, MnDOT can make improvements where necessary and build upon successes. A challenge of this measure is that public engagement is not one-size-fits-all and needs be scaled to the specific participants and resources available. The goal is that the tool will be able to provide a baseline of data to gauge engagement effectiveness.

Improving public involvement processes to eliminate participation barriers and engage underserved populations is a major goal of this measure. Once baseline data is determined, MnDOT will have a better understanding of public engagement and communications-related efforts across the agency. A target for this measure can be set after the baseline and trends have been reviewed. The work related to the development of this measure, the target and reporting will be further developed through as a work plan item.

Table I-6: Open Decision Making Performance Measures

MEASURE	DESCRIPTION	CURRENT CONDITION	TARGET OR DESIRED DIRECTION	MNDOT'S ROLE	REPORTING
Public Trust and Confidence	Annual percent of respondents that agree with the following statements: • "I feel MnDOT understands my needs (and the needs of others like me) and has developed a transportation system that works well for me." • "MnDOT acts in a financially responsible manner." • "How confident are you today in MnDOT's ability to do a good job at communicating accurate information to Minnesota citizens about their transportation plans and projects?"	74% felt MnDOT understood their needs, 64% felt MnDOT acts in a financially responsible manner and 82% felt MnDOT was communicating accurately about transportation plans and projects (2020)	≥80% overall and for each demographic segments	Lead	Percent and trend; report by different demographic segments
Project-Level Public Engagement Measures	e.g., post-project surveys	In development	Work plan item	Lead	Percent and trend
Partner Coordination	Measure MnDOT coordination with external partners during planning and programming	In development	Work plan item	Lead	Under consideration through SMTP Work Plan

PARTNER COORDINATION

SMTP outreach identified an opportunity to measure coordination or communication with partners during planning and programming. The purpose is to ensure that there is transparency and continued coordination between MnDOT and transportation partners. The coordination needs to be inclusive and collaborative to ensure the efficient and effective use of resources available. The development of this measure, targets and reporting will occur as a work plan item. The measure will focus on frequency and timing of coordination.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FEDERAL PERFORMANCE MEASURES

There are 5 federally required performance measures with specific targets that each state DOT and MPO must set.

- Safety (FHWA)
- Bridge and Pavement Condition (FHWA)
- System Preformance (FHWA)
- Transit Asset Management (FTA)
- Public Transportation Agency Safety Plan (FTA)

SAFETY

The FHWA Safety Performance Measure Rule (PM1) incorporates five measures:

- Number of Fatalities
- Rate of Fatalities per 100 million VMT
- Number of Serious Injuries
- Rate of Serious Injuries per 100 million VMT
- Number of Non-motorized Fatalities and Serious Injuries

Each safety measure is based upon a five-year rolling average with targets for the next year established annually. Thus, 2020 performance is based on the totals for 2016, 2017, 2018, 2019 and 2020 then divided by five. With each year, the average changes based on removing the oldest year's data and including a new year of data.

MnDOT calculates VMT for the state and shares data with its transportation partners, such as the MPOs, to assist them in calculating their own FHWA PM1 measures and targets for their planning areas.

Table I-7 outlines the specific safety performance measure and displays the 2014 – 2018 baseline, 2020 performance, and the MnDOT 2020 - 2022 targets for the measure.

Table I-7: FHWA PM1 Safety - State performance & targets

MEASURE	2014-2018 BASELINE*	2020 PERFORMANCE (2016-2020)	2020 TARGET (2016-2020)	2021 TARGET (2017-2021)	2022 TARGET (2018-2022)
Number of Fatalities	380.6	377.8	375.4	352.4	352.4
Rate of Fatalities per 100 million VMT	0.648	0.65	0.626	0.582	0.582
Number of Serious In-juries	1,534.4	1,718.0	1,714.2	1,579.8	1,463.4
Rate of Serious Injuries per 100 million VMT	2.596	2.948	2.854	2.606	2.470
Number of Non-Motorized Fatalities & Serious Injuries	261.8	294.4	317.0	281.2	258.4

*Note: All performance results and targets are based on five-year rolling averages.

MINNESOTA'S REASON FOR TARGETS

When setting the targets for the five safety performance measures MnDOT must coordinate with transportation partners. Targets for three measures (fatalities, fatality rate and serious injuries) must align with targets submitted by Minnesota Department of Public Safety (DPS) to the National Highway Traffic Safety Administration (NHTSA).

The 2020-2024 Strategic Highway Safety Plan (SHSP) is Minnesota's plan to reduce fatalities and serious injuries on all public roads. The plan set a bold target of no more than 225 traffic deaths and no more than 980 serious injuries by 2025--a nearly 35% reduction from 2019. Targets in 2021 were established based on a trend from the 2019 outcome to the 2025 goal.

Based on feedback from additional transportation partners, no 2022 target should be set higher than the prior year, which means that the following determined the targets for each measure below.

- Number of fatalities: 2022 Target = 2021 Target
- Fatality rate: 2022 Target = 2021 Target
- Number of serious injuries: based on progression from 2019 to 2025 Strategic Highway Safety Plan goal
- Serious injury rate: based on progression from 2019 to 2025 Strategic Highway Safety Plan goal
- Number of non-motorists killed or seriously injured: based on progression from 2019 to 2025 Strategic Highway Safety Plan goal, scaled by the prevalence of non-motorists in fatalities and serious injuries.

MINNESOTA'S ACHIEVEMENT

IIn 2020, Minnesota did not meet or make significant progress toward its safety performance targets. To do so requires at least four of the five safety performance targets to have been met or the actual outcome be better than baseline performance. For 2020, the baseline performance is the five-year average from 2014 to 2018. FHWA made the official determination when it completed its assessment for calendar year 2020 safety performance targets in spring of 2022.

2020 was not a typical year. Fatalities were on the rise, VMT were down and the world paused due to the global pandemic of COVID-19. Despite these challenges, MnDOT continues to work toward zero deaths and increase the safety of transportation in Minnesota. The Highway Safety Improvement Program (HSIP) in Minnesota targets all the federal HSIP funds to safety improvement projects throughout the state. MnDOT shares 50-65% of HSIP funds with local entities throughout the state depending on the need and year.

In Greater Minnesota, the local funding solicitation prioritization is typically focused on projects with a wide scale that are regionally deployable and have shown to have proven measures. Conversely, local units of government in the Twin Cities metro area typically apply for roundabouts and whole intersection improvements with multiple safety components, such as bump-outs, wide sidewalks, pedestrian signaling and even three-lane conversions. For Greater Minnesota districts, there typically is a focus on proactive and reactive projects related to shoulder widening, roundabouts and cable median barriers. MnDOT's Metro District typically works on reduced conflict intersections (RCI), cable median barriers and roundabouts. Overall, the HSIP solicitation selection looks for the approaches that will affect the most change, which means MnDOT sees quite the mix of strategies applied and implemented.

Although significant progress in 2020 targets was not achieved, Minnesota has shown progress and continually achieved the safety performance measure targets set in previous years (2018 and 2019). Table I-8 outlines the calendar year 2018-2020 targets achieved and not achieved by indicating with a green check mark if the measure's target was met or better than baseline for that calendar year.

Table I-8: FHWA PM1 Safety - State target historic trends

MEASURE	MNDOT CY2018 TARGET	MNDOT CY2019 TARGET	MNDOT CY2020 TARGET
Number of Fatalities	375 ✓	372.0 ✓	375.4 ✓
Rate of Fatalities per 100 million VMT	0.620 ✓	0.620 ✓	0.626
Number of Serious In-juries	1,935 ✓	1,711 ✓	1,714.2 ✓
Rate of Serious Injuries per 100 million VMT	3.19 ✓	2.850 ✓	2.854
Number of Non-Motorized Fatalities & Serious Injuries	348 ✓	267.5	317 ✓

*Note: All targets are based on five-year rolling averages.

MPO TARGETS ACROSS THE STATE OF MINNESOTA

Of the eight MPOs in Minnesota, three chose to set their own safety targets. Table I-9 indicates the Safety Performance Measure Targets set by those MPOs for calendar year 2021. The other five MPOs in Minnesota adopted MnDOT's safety performance measure targets and agreed to plan and program projects so that they contribute to the accomplishment of the state targets. These include the MIC, Metro COG, LAPC, MAPO and ROCOG.

Safety targets are adopted annually between October 1 and February 26 of the year leading up to the calendar year the targets are in. As an example, between October 1, 2021 and February 26, 2022 the MPOs adopted their calendar year 2022 Safety Performance Measure Targets.

The APO's 2022-2025 Transportation Improvement Program (TIP) indicates that their rolling averages are: 9.0 (fatalities); 0.731 (rate of fatalities); 24.8 (serious injuries); 2.006 (rate of serious injuries); and 8.6 (non-motorized fatalities and serious injuries). The APO's TIP states that "electing to pursue targets more relevant to the regional baseline, the APO can better evaluate the effectiveness of its roadway safety and more efficiently monitor changes in this and other roadway safety numbers."

The Met Council identifies in their 2022-2025 TIP that they are working on various studies to improve safety within their planning area. The TIP also includes $78.8 million in FHWA Highway Safety Improvement Program (HSIP) funds to improve high-incident project locations (reactively) and new design locations to preemptively address safety (proactively).

The GFEGF MPO also has chosen to adopt its own safety targets. Within the GFEGF MPO 2022-2025 TIP there are several projects funded with HSIP funding to improve the safety of the transportation system.

More specific information on how each MPO is achieving their targets can be found in their annual TIP documents.

Table I-9: FHWA PM1 Safety - MPO Calendar Year 2021 targets (2017-2021)

MPO	NUMBER OF FATALITIES	RATE OF FATALITIES PER 100 MILLION VMT	NUMBER OF SERIOUS INJURIES	RATE OF SERIOUS INJURIES PER 100 MILLION VMT	NUMBER OF NON-MOTORIZED FATALITIES & SERIOUS INJURIES
APO	8.6	0.730	23.0	1.946	8.2
Met Council	106	0.36	738	2.49	181
GFEGF MPO	3 or fewer	0.599	15 or fewer	5.296	4 or fewer

*Note: All targets are based on five-year rolling averages.

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PAVEMENT & BRIDGE CONDITION

The FHWA Pavement and Bridge Condition Performance Measure Rule (PM2) established performance measures to assess pavement condition and bridge condition for the National Highway Performance Program. Pavement and bridge condition performance is assessed and reported over a four-year performance period. The first performance period was January 1, 2018 through December 31, 2021. The second four-year performance period will cover January 1, 2022 to December 31, 2025, with additional performance periods following every four years. PM2 includes six measures:

- Percentage of Interstate Pavement in Good Condition
- Percentage of Interstate Pavement in Poor Condition
- Percentage of Non-Interstate NHS Pavement in Good Condition
- Percentage of Non-Interstate NHS Pavement in Poor Condition
- Percentage of NHS Bridges in Good Condition
- Percentage of NHS Bridges in Poor Condition

These six performance measures can be broken into two categories: pavement condition and bridge condition.

Two- and four-year targets are established at the beginning of the four-year performance period, with the option to update four-year targets at the two-year mark mid-cycle. Two-year targets for the current performance cycle represent expected reliability at the end of calendar year 2019, while the four-year targets represent expected condition at the end of calendar year 2021. Results are reported at the mid-point and end of the performance period, and four-year targets can be adjusted at the mid-point.

PAVEMENT CONDITION

Each year, MnDOT collects pavement condition data on the entire trunk highway system and calculates several different metrics related to pavement performance. For the federal measure, the overall condition of each pavement section on the NHS is determined based on a number of identified metrics and whether they are excellent, good, fair or poor. These are then calculated into the percentage of lane miles in good condition and poor condition. Note that the federal measure calculations are different from how MnDOT calculates its pavement condition measures, resulting in different numbers even though both measures report the percentage of lane miles in good and poor condition.

Table I-10 outlines the pavement condition performance measures, MnDOT's baseline performance (2017), MnDOT's performance (2019), MnDOT's performance (2021), the MnDOT 2-year targets and the MnDOT four-year targets.

MNDOT'S REASON FOR TARGETS

Federal pavement performance targets were set using predicted condition trends and existing targets for MnDOT's state pavement measure based on the Ride Quality Index (RQI). These data and targets were used as reference points. At the time of initial target setting in 2018, MnDOT had limited (2014, 2015 and 2017) data to calculate the federal pavement measure. Additionally, MnDOT is unable to forecast three of the four components used for the federal measure calculation. The federal targets are conservative estimates for pavement conditions based on the programmed pavement projects over the time frame of the performance period. MnDOT coordinated with MPOs when establishing these targets through presentations and regular correspondence.

MNDOT'S ACHIEVEMENT

MnDOT continues to follow its investment direction for pavement condition and met its two-year pavement performance targets. While the MnDOT pavement management system is not able to make predictions for the federal measure, the predicted values of MnDOT's state measures and their observed relationship to the federal measures indicate MnDOT will meet the four-year federal targets.

The Minnesota State Legislature approved new funding in 2017 and MnDOT spent a large portion of it on long life pavement projects on the NHS to bring them out of poor condition. This increased investment both improved the current NHS conditions and extended their remaining service life. MnDOT has also increased preventive maintenance spending on the Interstate and NHS pavements to increase their life. MnDOT continues to use preventive maintenance strategies, such as crack sealing, chip seals and microsurfacing, to prolong pavement life. More extensive pavement fixes also help bring NHS pavements back into good condition.

MPO TARGETS ACROSS THE STATE OF MINNESOTA

Of the eight MPOs in the state of Minnesota, three chose to set their own pavement condition targets. Table I-11 indicates the Performance Measure 2 Pavement Condition Targets set by APO, Met Council and GFEGF MPO for 2019 and 2021. The other five MPOs in Minnesota adopted MnDOT's pavement condition targets and agreed to plan and program projects so that they contribute to the accomplishment of the state NHS pavement condition targets for the performance period 2018 through 2021. These include in the MIC, Metro COG, LAPC, MAPO and ROCOG.

Table I-10: FHWA PM2 Pavement Condition - State performance & targets

MEASURE	2017 PERFORMANCE	2019 PERFORMANCE	2021 PERFORMANCE	2-YEAR TARGET (2019)	4-YEAR TARGET (2021)
Percentage of Interstate Pavement in Good Condition	N/A*	63.5%	92.5%	Not required for the first performance period	55%
Percentage of Interstate Pavement in Poor Condition	N/A*	0.9%	0.4%	Not required for the first performance period	2%
Percentage of Non-Interstate NHS Pavement in Good Condition	*	59.1%	82.2%	50%	50%
Percentage of Non-Interstate NHS Pavement in Poor Condition	*	1.1%	0.5%	4%	4%

*Note: Baseline Performance (2017) is not displayed in this table. For the first reporting period only, Interstate pavement condition baseline and two-year targets were not required. MnDOT chose to report non-Interstate NHS condition using more elements than was required the first reporting period (full distress + International Roughness Index (IRI)), and baseline condition was not reported by FHWA.

Table I-11: FHWA PM2 Pavement Condition - MPO targets

MPO	INTERSTATE 2-YEAR TARGET (2019) % GOOD CONDITION	INTERSTATE 2-YEAR TARGET (2019) % POOR CONDITION	INTERSTATE 4-YEAR TARGET (2021) % GOOD CONDITION	INTERSTATE 4-YEAR TARGET (2021) % POOR CONDITION
APO	85%	1%	85%	1%
Met Council	N/A	N/A	55%	2%
GFEGF MPO	75.6%	3%	75.6%	3%

MPO	NON-INTERSTATE 2-YEAR TARGET (2019) % GOOD CONDITION	NON-INTERSTATE 2-YEAR TARGET (2019) % POOR CONDITION	NON-INTERSTATE 4-YEAR TARGET (2021) % GOOD CONDITION	NON-INTERSTATE 4-YEAR TARGET (2021) % POOR CONDITION
APO	60%	1%	60%	1%
Met Council	50%	4%	53%	3%
GFEGF MPO	50%	4%	50%	4%

For the Metro COG, LAPC and MIC, these pavement condition targets are only for the Minnesota portion of their planning area. The GFEGF MPO agreed to program across the entire metropolitan planning area for the Interstate pavement condition measure. MAPO does not have any Interstate miles within its planning area, so this MPO does not plan and program for the Interstate specific performance measures.

APO specifies in its 2022-2025 TIP that planning area data indicates 96.3% of the Interstate system is classified as in good condition, while 0% is classified as poor condition. The data also identified that 72.9% of the Non-Interstate NHS is classified as in good condition and 0% is classified as poor condition. The APO's MTP states that they will "prioritize the maintenance and preservation of the existing transportation network."

Met Council indicated in its 2022-2025 TIP that the "metro area is performing at a level greater than the (pavement condition) targets". There are projects programmed within that TIP to ensure pavement condition remains better than targets.

GFEGF MPO identifies in its 2022-2025 TIP that the projects programmed in the TIP align with their 2045 Street/Highway Plan, which emphasizes projects that support a State of Good Repair for pavement and bridges on the Interstate and Non-Interstate NHS and federal aid eligible system.

More specific information on how each MPO is achieving their targets can be found in their annual TIP documents.

BRIDGE CONDITION

For the bridge condition measures, each bridge on the NHS system is inspected on an established schedule based on type of bridge and its condition. In general, bridge inspections typically occur on two-year cycles. The score is entered into the National Bridge Inventory (NBI). The score is based on the inspection rating of the bridge's deck, superstructure and substructure. Each bridge is given an overall rating based on the lowest score of the three elements and is rated Good (7-9), Fair (5-6), or Poor (0-4). Bridges rated poor are safe to drive on, but they are near the point where significant investment in repair or replacement is necessary. Note that the federal measure calculations are similar to how MnDOT calculates its bridge condition measure. The difference is that the federal measure applies to bridges with spans larger than 20 feet, but the state measure includes bridges with spans of 10 ft and greater.

Table I-12 outlines the bridge condition performance measures, MnDOT's baseline performance (2017), MnDOT's mid-period performance (2019), MnDOT's performance (2021), the MnDOT two-year targets and the MnDOT four-year targets.

MNDOT'S REASON FOR TARGETS

Federal bridge performance targets were set based on conservative estimates for projected bridge condition in two and four years. Conservative targets manage the risk of one of MnDOT's large bridges falling into poor condition sooner than expected causing the percent poor to be higher than predicted. Though the federal and state measures are not exactly the same, the results track closely enough that MnDOT can set federal targets based on its projection of the state measure.

MnDOT adjusted its four-year target for percent good from 50% to 35% at the mid-point in the performance period. While 50% looked achievable when the initial targets were set in 2018, MnDOT has increased the accuracy of bridge data through training, review and quality control of bridge inspections. The increased scrutiny of inspection data is providing a more realistic picture of the bridge inventory in the state making a four-year federal target of 35% more appropriate for this measure.

Table I-12: FHWA PM2 Bridge Condition - State performance & targets

MEASURE	2017 PERFORMANCE	2019 PERFORMANCE	2021 PERFORMANCE	2-YEAR TARGET (2019)	4-YEAR TARGET (2021)
Percentage of NHS Bridges in Good Condition	48%	37.3%	30.4%	50%	35%
Percentage of NHS Bridges in Poor Condition	1.9%	3.2%	6.3%	4%	4%

MNDOT'S ACHIEVEMENT

MnDOT met its two-year percent NHS bridges in poor condition target, but did not meet its four-year target. There was an increase in the percent of NHS bridges in poor condition between 2017 and 2021. This increase in percent poor is not due to Blatnik Bridge in Duluth, which fell into poor condition following the 2021 inspection. Instead, it is due to the combination of all bridges rated in poor condition.

MnDOT did not meet its two-year percent good target and made an adjustment from 50% to 35% for the four-year target. MnDOT also did not meet its adjusted four-year percent good target. MnDOT is now subject to additional reporting that will include a description of actions to be taken to achieve bridge targets for both good and poor condition. This additional documentation will be submitted with the Full Performance Progress Report due to FHWA on October 1, 2022. Further reasoning for the adjustment of targets can be found in the section above "MnDOT's Reason for Targets."

MnDOT continues to follow its investment direction for bridge condition. A large portion of the new funding MnDOT received from the Minnesota State Legislature in 2017 is going toward bridge rehabilitation and reconstruction projects on the NHS. This increased investment both improved the current NHS conditions and extended their remaining service life. MnDOT will continue to invest in preventive maintenance strategies such as such as flushing, crack sealing, joint sealing, rail sealing and joint maintenance.

MPO TARGETS ACROSS THE STATE OF MINNESOTA

Of the eight MPOs throughout the state of Minnesota, only one chose to set their own bridge condition targets. Table I-13 indicates the Performance Measure 2 Bridge Targets set by the APO for 2019 and 2021. The other seven MPOs in Minnesota adopted MnDOT's bridge performance measure targets and agreed to plan and program projects so that they contribute to the accomplishment of the state NHS bridge condition targets. These are the MIC, Metro COG, GFEGF MPO, LAPC, MAPO, Met Council and ROCOG.

APO specifies in its 2022-2025 TIP that 65.4% of the NHS bridges in the planning area are classified as in good condition, while 0% are classified as poor condition. The APO's Metropolitan Transportation Plan states that they will "prioritize the maintenance and preservation of the existing transportation network."

More specific information on how each MPO is achieving their targets can be found in their annual TIP document.

Table I-13: FHWA PM2 Bridge Condition - MPO targets

MPO	2- YEAR TARGET (2019) % OF BRIDGES IN GOOD CONDITION	2- YEAR TARGET (2019) % OF BRIDGES IN POOR CONDITION	4- YEAR TARGET (2021) % OF BRIDGES IN GOOD CONDITION	4- YEAR TARGET (2021) % OF BRIDGES IN POOR CONDITION
APO	60%	1%	60%	1%

SYSTEM PERFORMANCE

The FHWA System Performance, Freight and CMAQ Measure Rule (PM3) incorporates six measures. These six performance measures can be broken into two categories:

HIGHWAY RELIABILITY

- Percentage of Person Miles Traveled on the Interstate that are reliable
- Percentage of Person Miles Traveled on the Non-Interstate NHS that are reliable
- Truck Travel Time Reliability Index

CONGESTION MITIGATION AND AIR QUALITY IMPROVEMENT (CMAQ) PROGRAM

- Annual hours of peak hour excessive delay per capita (PHED)
- Percent of non-single occupant vehicle travel (Non-SOV)
- Cumulative two-year and four-year reduction of on-road mobile source emissions for CMAQ funded projects (CMAQ Emission Reduction)

Reliability is defined by the consistency or dependability of travel times from day to day or across different times of the day.

These three highway reliability performance measures can be broken into two categories: travel time reliability and freight movement reliability.

Two- and four-year targets are established at the beginning of the four-year performance period, with the option to update four-year targets at the two-year mark mid-cycle. Two-year targets for the current performance cycle represent expected reliability at the end of calendar year 2019, while the four-year targets represent expected condition at the end of calendar year 2021. Results are reported at the mid-point and end of the performance period, and four-year targets can be adjusted at the mid-point.

These three highway reliability performance measures can be broken further into two categories:

- Travel time reliability
- Freight movement reliability

TRAVEL TIME RELIABILITY

For the travel time reliability measures, FHWA provides states access to the National Performance Management Research Data Set (NPMRDS) to calculate the travel reliability for each roadway segment. Level of Travel Time Reliability (LOTTR) is defined as the ratio of the 80th percentile travel time to a “normal” travel time (50th percentile) per 23 CFR § 490.511. Reliable segments of roadway are considered to have a ratio of 1.50 or less, whereas segments of roadway with a ratio above 1.50 are considered unreliable.

NPMRDS uses passive travel data (probe data) to anonymously track how people travel and at what speed the vehicle travels. Data is collected in 15-minute segments during all time periods other than 8 p.m.- 6 a.m. (overnight) local time. The measures are the percent of person-miles traveled on the relevant NHS system that are reliable. Person-miles considers all the occupants of vehicles travelling on the NHS. Data to reflect the users can include bus, auto and truck occupancy levels.

Table I-14 outlines travel time reliability performance measures, MnDOT’s baseline performance (2017), MnDOT’s mid-period performance (2019), MnDOT’s performance (2021), the MnDOT two-year targets and the MnDOT four-year targets.

Due to the COVID-19 pandemic 2021 data depicts a higher level of travel time reliability than previous years.

MNDOT'S REASON FOR TARGETS

MnDOT selected its Interstate reliability targets in 2018 based on trend data from 2013 to 2017 that indicated that reliability is near 80% every year. For the Non-Interstate NHS, MnDOT selected conservative reliability targets in 2018 due limited data availability and consistency prior to 2017 and not knowing the actual values or trend. At the mid-point of the performance period with three years of consistent data, a four-year target of 90% looked more appropriate and the target was adjusted.

MNDOT'S ACHIEVEMENT

MnDOT met its two-year federal reliability measure targets for reliable person miles on the Interstate. Reliability on the highway system increased dramatically due to the pandemic in 2020. Even with some potential bounce back in 2021 MnDOT expects to meet four-year targets.

Due to the new funding from the Minnesota State Legislature in 2017, MnDOT is able to continue investing in Twin Cities Mobility through the full 20 years of the 2018-2037 State Highway Investment Plan. Twin Cities Mobility investment was originally scheduled to end in 2023 as the investment direction shifted to a primary focus of maintaining the existing system. MnDOT also continues operational strategies to improve reliability including robust statewide snow and ice operations; incident clearance from metro area freeways; active traffic management strategies; and a network of managed lanes. The Met Council's Congestion Management Process (CMP) planning and implementation for the Minneapolis-St. Paul metropolitan area should also have a positive effect on these measures. The Congestion Management Process is a system of strategies facilitated by MPOs to improve the transportation system's performance and reliability by reducing the adverse impacts of congestion. Though these measures are reported at the state level, results are driven by performance in the metro area.

MPO TARGETS ACROSS THE STATE OF MINNESOTA

MnDOT provides NPMRDS data to MPOs for Interstate and Non-Interstate NHS Reliability calculations. Of the eight MPOs throughout Minnesota, three chose to set their own travel time reliability targets. Table I-15 shows the PM3 Highway Reliability: Travel Time Reliability measures' targets set by the APO, Met Council and GFEGF MPO for 2019 and 2021. The other five MPOs in Minnesota adopted MnDOT's Highway Reliability: Travel Time Reliability measures' targets and agreed to plan and program projects so that they contribute to the accomplishment of the state's targets. These include the MIC, Metro COG, LAPC, MAPO and ROCOG.

Table I-14: FHWA PM3 Travel Time Reliability - State performance & targets

MEASURE	2017 PERFORMANCE	2019 PERFORMANCE	2021 PERFORMANCE	2-YEAR TARGET (2019)	4-YEAR TARGET (2021)
Percentage of Person Miles Traveled on the Interstate that are reliable	80.2%	81.2%	94.4%	80%	80%
Percentage of Person Miles Traveled on the Non-Interstate NHS that are reliable	*	89%	96.1%	Not required for the first performance period	90%

APO specifies in its 2022-2025 TIP that within their planning 100% of person miles traveled on the Interstate are reliable and 96.5% reliability for person miles traveled on the Non-Interstate NHS.

The Met Council's 2022-2025 TIP indicates its targets were chosen to improve reliability in the immediate future and prioritized highway projects integrated within the TIP. Data shown in the TIP illustrates that there is currently 69.5% reliability for person miles traveled on the Interstate and 79.6% reliable for person miles traveled on the Non-Interstate NHS. Projects programmed in the TIP were prioritized based on the effort to achieve the set four-year targets.

GFEGF MPO identified in its 2022-2025 TIP the need for reliability in the region. Traffic signal replacements are noted to improve the coordination and overall system reliability between East Grand Forks and Grand Forks.

More information on how each MPO is achieving their targets can be found in their annual TIP document.

Table I-15: FHWA PM3 Travel Time Reliability - MPO targets

MPO	2- YEAR TARGET (2019) % OF PERSON MILES TRAVELED ON THE INTERSTATE THAT ARE RELIABLE	2- YEAR TARGET (2019) % OF PERSON MILES TRAVELED ON THE NON-INTERSTATE NHS THAT ARE RELIABLE	4- YEAR TARGET (2021) % OF PERSON MILES TRAVELED ON THE INTERSTATE THAT ARE RELIABLE	4- YEAR TARGET (2021) % OF PERSON MILES TRAVELED ON THE NON-INTERSTATE NHS THAT ARE RELIABLE
APO	100%	90%	100%	90%*
Met Council	70%	75%	>70%	>80%
GFEGF MPO	90%	85%	90%	90%*

*Note: APO and GFEGF MPO have set individual MPO performance measure targets for the travel time reliability measures, but their percentage of person miles traveled on the Non-Interstate NHS that are reliable performance measure target is 90% reliability, which is the same as the state target.

TRUCK FREIGHT RELIABILITY

The freight reliability measure is the truck travel time reliability index (TTTRI) for the Interstate. The TTTRI is calculated using truck travel time ratios comparing the 95th percentile time to the normal time (50th percentile) for each segment on the Interstate per 23 CFR § 490.611. For this measure, a lower number is better.

Table I-16 outlines TTTRI performance measures, MnDOT's baseline performance (2017), MnDOT's mid-period performance (2019), MnDOT's performance (2021), the MnDOT two-year targets and the MnDOT four-year targets.

Due to the COVID-19 pandemic 2021 data depicts a higher level of truck travel time reliability than previous years.

MNDOT'S REASON FOR TARGETS

MnDOT selected conservative reliability targets in 2018 due to limited data availability and consistency prior to 2017. Targets were revisited during the mid-point of the performance period when three years of consistent data were available and determined the 1.5 target looked appropriate.

MNDOT'S ACHIEVEMENT

MnDOT met its two-year truck travel time reliability target and expects to meet its four-year target as well. MnDOT has used the National Highway Freight Program federal funds to address truck freight mobility. MnDOT has also identified and planned several improvements needed at truck bottleneck sites over the next 10 years. These are further refined within the STIP and the Capital Highway Investment Plan (CHIP). These improvements align with the investment direction from the Minnesota State Highway Investment Plan (MnSHIP).

MPO TARGETS ACROSS THE STATE OF MINNESOTA

Of the eight MPOs throughout Minnesota, two chose to set their own freight reliability targets. Table I-17 indicates the PM3 TTTRI targets set by the APO and Met Council for 2019 and 2021. The other six MPOs in Minnesota adopted the state's target and agreed to plan and program projects so that they contribute to the accomplishment of the state reliability target. These are the MIC, Metro COG, GFEGF MPO, LAPC, MAPO and ROCOG.

AAPO specifies in its 2022-2025 Transportation Improvement Program (TIP) a 1.15 TTTRI on the Interstate System in their planning area. There are currently no projects programmed for the APO planning area. The Interstate is under capacity within the APO planning area, so there is no evidence that travel time reliability will see adverse impacts.

Met Council specifies in its 2022-2025 TIP that its planning area would find it hard to achieve a 1.5 TTTRI given the increased traffic in the metro area compared to Greater Minnesota. The Met Council's planning area currently indicates a 2.32 TTTRI, which is less reliable than 1.5 TTTRI. Its adopted target aims for improvement over existing conditions.

More information on how the each MPO is achieving their targets can be found in their annual TIP document.

Table I-16: FHWA PM3 Truck Travel Time Reliability - State performance & targets

MEASURE	2017 PERFORMANCE	2019 PERFORMANCE	2021 PERFORMANCE	2-YEAR TARGET (2019)	4-YEAR TARGET (2021)
Truck Travel Time Reliability Index (TTTRI)	1.43	1.48	1.24	1.5	1.5

Table I-17: FHWA PM3 Travel Time Reliability - MPO targets

MPO	2- YEAR TARGET (2019) TRUCK TRAVEL TIME RELIABILITY INDEX	4- YEAR TARGET (2021) TRUCK TRAVEL TIME RELIABILITY INDEX
APO	1.24	1.24
Met Council	2.2	2.2

CMAQ PROGRAM

CMAQ measures apply to urbanized areas that are in nonattainment or maintenance for ozone, carbon monoxide (CO), or particulate matter. The Minneapolis-St. Paul, MN-WI adjusted urbanized area came into attainment for CO in November 2019. Before the mid-performance period reporting in October 2020, MnDOT and the Met Council were required to set a PM10 target due a small maintenance area in Ramsey County from a stationary (non-transportation) source. The CMAQ performance measure reporting requirements will apply until the 20-year maintenance period for PM10 ends in September 2022.

Table I-18 outlines the joint MnDOT and Met Council's CMAQ performance measures, MnDOT's baseline performance (2017), MnDOT's mid-period performance (2019), MnDOT's performance (2021), the MnDOT two-year targets and the MnDOT four-year targets.

MNDOT & MET COUNCIL'S REASON FOR TARGETS

For Peak Hour Excess Delay, MnDOT and the Met Council set an ambitious target of 8.5 hours in 2018 reflecting the Minneapolis-St. Paul region's desire to improve hours of delay. In 2018, just one year of data (2017) from a new provider was available for target setting. By the mid-point of the performance period with three years of consistent

Table I-18: FHWA PM3 Travel Time Reliability - State performance & targets

MEASURE	2017 PERFORMANCE	2019 PERFORMANCE	2021 PERFORMANCE	2-YEAR TARGET (2019)	4-YEAR TARGET (2021)
Annual hours of peak hour excessive delay per capita	Not required for the first performance period	8.5	3.2*	Not required for the first performance period	8.5
Percent of non-single occupant vehicle travel	23.2%	23.9%	26.7% (2020)	25%	25%
Emissions reductions for CO through CMAQ projects (kg/day)	10,402	2,648	2,648	6,800	2,647
Emissions reductions for PM10 through CMAQ projects (kg/day)	Not reported until mid-performance period	0.0	0.0	Not set until mid-performance period	0.0

*Note: Due to the COVID-19 pandemic 2021 data depicts a higher annual hour of excessive delay per capita than previous years.

data available MnDOT and the Met Council revisited the performance targets and decided to keep the 8.5-hour target.

Non-SOV travel has been incrementally improving in the Minneapolis-St. Paul, MN-WI urbanized area. The 25% target reflects a desire to improve non-SOV travel in the region.

Emission reduction varies based on the amount of reduced VMT from the projects. The reduction in CO emissions (in kg/day) from federally funded CMAQ projects in years 2009-2017 displayed no clear pattern. As these funds are awarded to projects that are submitted to the Regional Solicitation, there is no way to predict which projects will be selected each year. Therefore, the two-year target for the emission measures was set at 6,800 kg/day, which is the average CO reduction for 2009 - 2017. The four-year target was adjusted at the mid-point of the performance period to the rounded value of kg/day reduction based on projects with quantitative 2018-2019 CO emissions reductions estimates. The actual emissions reduction value is higher and would likely exceed the target. Four projects have no quantitative data available, so they rely on qualitative descriptions only and are therefore not included in the estimate. Since Minnesota is in attainment as of November 2019, only a couple of months of 2020-2021 CMAQ project emissions reductions would be in a maintenance area since from that point forward it is an attainment area. Therefore, MnDOT is assuming zero additional qualifying emission reductions in 2020-2021.

For PM10 emissions, MnDOT and the Met Council are responding to requirements to set a PM10 emissions reduction target for a small area of Ramsey County that is a maintenance area due to a stationary source. Though on-road emissions are not a significant contributor to the issue, the federal Clean Air Act does not provide any exceptions from transportation conformity requirements. PM10 emissions data is not estimated by CMAQ project proposers for the Regional Solicitation. MnDOT and Met Council discussed whether any 2018 or 2019 regional CMAQ projects might have a PM10 benefit to this area and determined that realistically benefits to this maintenance area are 0.0 kg/day reduction in PM10.

MNDOT & MET COUNCIL'S ACHIEVEMENT

MnDOT and the Met Council set ambitious federal targets the PHED and SOV travel targets. Three years of pre-pandemic data for the PHED measure indicate performance should be close to the four-year target. There was little peak hour excessive delay in 2020 and even with some potential bounce back in 2021, four-year targets should be met. Non-SOV travel has been incrementally improving in the Minneapolis-St. Paul area over the past several years. Even if the region does not meet this target, the increasing rate of non-SOV travel over the past four years indicates that the region likely will make significant progress on this measure by matching or improving upon baseline results for this measure.

TRANSIT ASSET MANAGEMENT (TAM)

In addition to the federal measures already discussed, a separate set of performance measures is required to be developed and maintained by transit agencies receiving federal funding assistance. Known as Transit Asset Management (TAM), public transit agencies must establish a system to monitor and manage public transportation assets to improve safety and increase reliability and performance. Transit agencies must also establish performance measures that will help the respective transit agency maintain a state of good repair, which aligns with the Useful Life Benchmark (ULB) for each asset. ULB is defined as the expected lifecycle of a capital asset or the acceptable period of use in service. State of good repair must be documented for the following assets:

- Equipment: Non-revenue support-service and maintenance vehicles
- Rolling Stock: Revenue vehicles by mode
- Infrastructure: Only rail-fixed guideway, track, signals and systems
- Facilities: Maintenance and administrative facilities; and passenger stations (buildings) and parking facilities. Facilities are measured on the Transit Economic Requirements Model (TERM) scale which assigns a numerical rating (1-5) based on conditions.

The FTA established four performance measures to evaluate state of good repair for transit assets:

- Rolling Sock: Percentage of revenue vehicles exceeding useful life benchmark
- Equipment: Percentage of non-revenue service vehicles exceeding useful life benchmark
- Facilities: Percentage of facilities rated under 3.0 on the TERM scale
- Infrastructure: Percentage of track segments under performance restriction

TAM Plan requirements fall into two tiers of public transportation operators:

- Tier I: Operates rail OR ≥ 101 vehicles across all fixed route modes OR ≥ 101 vehicles in one non-fixed route mode
- Tier II: Subrecipient of 5311 funds OR American Indian Tribe OR ≤100 vehicles across all fixed route modes OR ≤ 100 vehicles in one non-fixed route mode

Table I-19: FTA Tier I Operator - TAM Plans

TIER I OPERATOR	MOST RECENT TAM PLAN ADOPTION
City of East Grand Forks	November 2018
City of La Crescent	June 2021
City of Mankato	June 2018
City of Moorhead	October 2018
City of Rochester	October 2017
Duluth Transit Authority	August 2018
St Cloud Metropolitan Transit Commission	September 2018

MNDOT'S REASON FOR TARGETS

Within the Minnesota, there are both Tier I and Tier II operators.

Tier I Operators

The Tier I operators are located within the MPO areas and have adopted their own TAM Plans (Table I-19). Each small urban (5307) public transit provider worked with its partner MPO and MnDOT staff to develop individual TAM Plans. Each TAM Plan established both State of Good Repair targets and TERM scale targets for their facilities. Refer to each of the Tier I operators' TAM Plans for specifics about their adopted targets.

Each MPO programs a significant number of the transit projects in its 2022-2025 TIP. These transit projects consist mainly of operating funds for fixed-route and paratransit services. Although, there are also several vehicle replacement and other capital purchase projects.

Tier II Operators

All 30 Tier II operators (5311 Transit Systems) were asked and agreed to be part of the MnDOT-sponsored Group TAM Plan. More information about that plan can be found on MnDOT's Transit website. MnDOT and the Tier II Transportation Operators developed the performance targets for the TAM measures illustrated in Table I-20. Currently, no equipment meets the greater than $50,000 threshold for reporting and is thus not included in the table.

MINNESOTA'S ACHIEVEMENT

Shortly following TAM Plan approval in Fall 2018, MnDOT formed a Transit Advisory Committee (TAC) and continues to collaborate with the TAC on how to invest and work toward achieving TAM Plan targets. Together, MnDOT and the TAC completed a program development process to identify appropriate investment areas and funding amounts needed to meet appropriate metrics and targets. This process included identification of investment in rolling stock and facilities, which work toward achieving TAM Plan targets.

MnDOT currently invests $9 million annually in rolling stock vehicles and $7.5 million annually in facilities and large capital projects. Working with the TAC, MnDOT identified and has implemented asset management metrics to score, prioritize and award annual rolling stock and facility projects. For example, rolling stock are scored and prioritized based on a weighted score for age, mileage and maintenance costs.

Additionally, MnDOT inspects all transit facilities and a percentage of rolling stock annually to ensure assets are being properly maintained. Inspection results are documented and provide another metric to aid in how assets are prioritized for improvements or replacements to achieve targets.

Table I-20: FTA Tier II Operator - State targets

MEASURE	SUBCATEGORY	ULB (YEAR)	TARGET
Rolling Stock	Heavy-Duty Large Bus	14	<10% exceeding ULB
Rolling Stock	Heavy-Duty Small Bus	14	<10% exceeding ULB
Rolling Stock	Medium-Duty & Purpose-Built Bus	10	<10% exceeding ULB
Rolling Stock	Light-Duty Mid-sized Bus	10	<10% exceeding ULB
Rolling Stock	Light-Duty Small Bus	10	<10% exceeding ULB
Rolling Stock	Vans, Support Vehicles	10	<10% exceeding ULB
Facilities	Maintenance Facility (Service & Inspection)	40	<10% rated less than 3 on FTA TERM Scale
Facilities	General Purpose Maintenance Facility/Depot	40	<10% rated less than 3 on FTA TERM Scale
Facilities	Combined Administrative & Maintenance	40	<10% rated less than 3 on FTA TERM Scale
Facilities	Passenger or Parking	20	<10% rated less than 3 on FTA TERM Scale
Equipment	Equipment $50,000+	N/A	<10% exceeding ULB

PUBLIC TRANSPORTATION AGENCY SAFETY PLAN (PTASP)

The Public Transportation Agency Safety Plan (PTASP) regulation requires 5307 public transportation providers and state DOTs to establish safety performance targets to address the safety performance measures identified in the National Public Transportation Safety Plan.

MNDOT'S REASON FOR TARGETS & ACHIEVEMENT

MnDOT did not prepare PTASP as the 5307 systems opted out of a statewide plan. MnDOT assisted the operators in how to calculate the targets. Refer to each 5307 public transportation providers' specific PTASP.

MPO TARGETS ACROSS THE STATE OF MINNESOTA

MPOs have 180 days from their specific public transportation operator's PTASP adoption to adopt targets for their metropolitan planning area. The public transportation operator is required to update the PTASP on an annual basis, but MPOs are not required to adopt the public transportation safety targets on an annual basis. Only when a new PTASP is adopted (at least once every four years) does the MPO have to adopt new targets.