Annual Minnesota Transportation Performance Report

2010

Your Destination...Our Priority

Cover Photo: David Gonzalez, MnDOT
Welding work on Wakota Bridge over Mississippi River
St. Paul, Minnesota

September 2011

Dear Citizens of Minnesota,

I am pleased to share with you the 2010 Minnesota Transportation Performance Report. The performance measures in this third annual Report show results, indicating how well or not so well Minnesota's statewide transportation system is working.

Last year, the Association of Government Accountants honored MnDOT with a gold Certificate of Achievement in Performance Reporting. MnDOT ranks high among states leading the nation in performance measurement and using data to guide and prioritize transportation investment decisions.

This year's Report builds on the strengths of the 2009 Report by adding data, narrative content and analysis. Key findings indicate continuing reductions in the number of traffic fatalities, strong state bridge condition that will continue to improve and on-time snow removal on state roads in four out of the last five winters. Freeway congestion in the Twin Cities Metro area grew for the second straight year, balanced by gains on rail and express bus transit lines, which now constitute 26 percent of all transit ridership.

State highway pavement condition improved in 2010. The improvements were due to increased spending as a result of the American Recovery and Reinvestment Act of 2009, as well as increased patching efforts by MnDOT maintenance crews. Because the improvement is only temporary under the base investment program, MnDOT initiated the Better Roads for a Better Minnesota program to allocate additional resources and stem the growth in poor pavements over the next four years. The goal is to improve more than 700 miles of roads and reduce poor pavements.

To address performance concerns, MnDOT uses enterprise risk management practices to seek innovative approaches to stretch available revenues and makes trade-off decisions when times are uncertain. Our approaches include using public-private partnerships, accelerating low-cost/high benefit congestion management projects, pursuing context sensitive and flexible design solutions and considering all transportation modes for improving mobility and accessibility in the Twin Cities metro area and in Greater Minnesota.

MnDOT is committed to building public trust by being transparent and accountable to the public. We want Minnesotans to understand what we do with their tax dollars. We will continue to measure and report transportation's performance and involve citizens, stakeholders and partners in the implementation of plans and future transportation investment and policy decisions.

Together, we can realize the shared vision of a safe, efficient and sustainable transportation system that supports the state's economy and makes a substantial contribution to the quality of life in Minnesotan.

Sincerely,

Thomas K. Sorel

Annual Minnesota Transportation Performance Report

2010

Minnesota Department of Transportation

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Introduction

Good transportation systems are essential to Minnesota's economic competitiveness and quality of life—supporting thriving communities and successful businesses. This third annual Minnesota Transportation Performance Report describes trends in the condition and service levels provided by Minnesota's transportation systems. The report also summarizes the plans, investments, strategies, and innovations MnDOT and its partners are using to optimize performance. Eighteen performance measures track progress on nine policy goals in the Minnesota Statewide Transportation Policy Plan 2009-2028. To visit the plan go to dot.state.mn.us/planning/program/index.html.

MnDOT has been using measurement tools to evaluate its services and to guide its plans, projects and investments since the 1990s. Performance information, citizen input and legislative direction are used to make investment choices and trade-off decisions within available resources.

Scope: Minnesota and MnDOT

The state transportation system is operated by MnDOT and partners including the Metropolitan Council, other metropolitan and regional planning organizations, the Metropolitan Airports Commission, the Department of Public Safety, railroads, port operators, the Federal Aviation Administration, U.S. Army Corps of Engineers, local government airports, port authorities and transit operators. Minnesota's transportation system is summarized on page 54.

Some of Minnesota's transportation systems are showing their age and need maintenance or replacement—putting pressure on limited state, local and federal financial resources. At the same time expanded transportation options are being developed to relieve pressure on highways and meet citizen demands. These options include light rail and commuter rail, express buses and bus rapid transit, MnPASS freeway lanes, bike facilities, accessible pedestrian facilities, Complete Streets, and intercity passenger rail. The report provides available performance data for these options.

2010 Results Scorecard

The Minnesota 2010 Transportation Results Scorecard on pages 10-11 summarizes progress for the nine statewide transportation plan goals. MnDOT has primary responsibility for the measures highlighted by a MnDOT logo in the far right column.

Measures with **performance targets** have a green, yellow, or red symbol showing results. MnDOT uses performance targets to meet citizen expectations, stimulate innovation and calculate needed investment levels for transportation services. MnDOT uses surveys and interviews with citizens to help set targets for snow removal and pavement smoothness. MnDOT uses national engineering and safety standards to set bridge condition targets. MnDOT performance targets play a major role in extending the life and minimizing the cost of transportation assets, and supporting the state's economy and quality of life.

Source: MnDOT

Performance Highlights

Minnesota's transportation system showed some positive gains in performance in 2010:

- Fatalities fell for the seventh out of the last eight years.
- State pavement condition improved temporarily due to major increases in investment.
- State bridge condition remained good, exceeding or close to targets.
- Snow and ice removal on state roads met its on-time target the last two winters.
- Interregional highway travel connections and Minnesota's extensive local airport system performed well above target levels.

At the same time there were signs that economic recovery helped trigger performance challenges:

- Metro Area freeway congestion increased for the second straight year. After some improvements in the last decade, it is expected to resume its long-term growth trend.
- After an 8 percent decline over the previous five-years, Minnesota's transportation fuel consumption grew slightly in 2010. Ongoing growth would erode progress toward Minnesota's Next Generation Energy Act goals for greenhouse gas reductions.

The mixed trends in 2010 continue to reflect the trade-offs between growing challenges and limited resources.

2010 Strengths

Safety—Fatalities on Minnesota's state and local roads fell again in 2010 to 411—just short of the Toward Zero Death target of 400. Fatalities have declined 37 percent from the 2002 peak. Minnesota had the 3rd lowest fatality rate among all states in 2009 (most recent data available)—35 percent below the national average. State, federal, local and private agencies along with legislation have reduced fatalities for seven categories targeted by TZD—under 21, unbelted drivers, speeding-related, run-off-the road, alcohol-related, intersection crashes, and head-on and side-swipe crashes.

Bridges—86.9 percent of state bridges on principal arterials are in good or satisfactory condition—exceeding MnDOT's target of 84 percent. A near record low 3.2 percent of bridges were rated poor in 2010. The share rated poor is projected to fall to the 2 percent target by 2014 as a result of the estimated $2.1 billion 2008-2018 state-funded bridge program. Minnesota had the 4th lowest share of bridges rated structurally deficient or functionally obsolete in 2010—less than half the U.S. average

Snow and Ice—MnDOT's snow and ice operation, covering more than 30,000 lane miles, met its performance targets for clearance time to bare lanes 79 percent (preliminary) of the time in the winter of 2010-2011, exceeding its annual target of 70 percent. Annual costs hit record levels after receiving the most snowfall since 1983-1984.

Statewide travel connections are strong. Measures for **access to airports** and for **Interregional Corridor (IRC) travel speed** both exceed MnDOT targets. Ninety-eight percent trips on IRCs outside the Twin Cities Metro area can be driven at average speeds near 55 or 60 miles per hour. The IRC system comprises one-fourth of state highway miles and carries about 44 percent of state system vehicle miles travelled.

Local airports support passenger service, private and corporate aircraft, package delivery and freight, agriculture, and medical, law enforcement and emergency services. There are 118 local paved and lighted airports within 20 miles of about ninety-six percent of Minnesotans. Eighty-five percent of local **airport pavement** is in good condition—exceeding MnDOT's target. MnDOT is working with local authorities to reduce runways in poor condition as a growing share age and local governments experience declining tax bases and local aid.

2010 Performance Gains

MnDOT expects to continue performance gains in **bridge inspection and maintenance** and making state highways facilities accessible. In 2010, 99.4 percent of state bridges were inspected on schedule—close to MnDOT's 100 percent target—and up from 94 percent in 2009. Increased funding, staffing, and equipment drove improvements. MnDOT is rolling out new measures to ensure that priority bridge repairs are completed on time.

MnDOT completed 89 **accessible pedestrian signal** installations at state highway intersections in 2010. This brought the share of the system with APS to 18 percent of 1,179 locations, up from 10 percent in 2009. MnDOT expects to meet its long-range target of 100 percent by applying new road design ADA accessibility standards to all construction projects and investing $2.5 million per year in dedicated funds through 2014. New measures will track improvements to curb ramps, sidewalks and rest areas.

2010 Weaknesses

Pavement—State highway pavement improved temporarily in 2010. Gains were the result of major increases in state bonding and in federal economic stimulus funds - along with increased patching, which has a very short-term benefit. Poor roads were reduced nearly 2 percent from 987 miles to 744 miles. Good principal arterials exceeded the 70 percent target for the first time since 2002.

Source: MnDOT

Pavement is predicted to resume deterioration under the base investment program set for 2011-2014—unless the proposed investment under Better Roads for a Better Minnesota moves forward at a substantial level. Without it, state pavement spending would fall from a peak of about $370 million per year in 2009 and 2010 to an average of $270 million year from 2011-2014. Under the base program, miles of poor state roads would rise from about 750 in 2010 to 1900 miles by 2020—more than 13 percent of all state roads.

2010 Challenges

Metro freeway congestion—After five years with improvements between 2002 and 2008, peak period congestion (speed below 45 mph) on Metro area freeways grew for the second straight year in 2010 to 21.5 percent of the system—the highest level since 2001. In 2010, 326 miles were congested, up from 276 miles in 2009.

Transportation agencies and elected officials are addressing the congestion challenge with an array of strategies. Evidence shows these strategies have moved more Minnesotans faster and reduced congestion below where it would have otherwise been.

- Recent lower-cost high-benefit projects reduced congested miles 15 to 80 percent in project areas.
- The Twin Cities area ranks first among 31 metropolitan areas of similar size in the amount of road delay avoided as a result of operational strategies—including incident clearance, freeway ramp metering, and MnPASS lanes, and traffic signal coordination and access management on non-freeway routes.
- Trips on expanding **rail and express bus** lines increased 18 percent from 2006 to 2010, and now constitute 26 percent of all transit trips.
- Express buses carry up to 30 percent of all persons during peak hours on some congested freeways. 132 express bus routes use MnPASS lanes and the nation's largest system of bus-only shoulders to save riders 5 to 15 minutes per trip.
- The percentage of people biking to work increased 55 percent in Minneapolis from 2006 to 2009, to 3.9 percent, and 25 percent across all large Minnesota metro areas.

To mitigate congestion and move more people, MnDOT and the Metropolitan Council have agreed to deploy an arsenal of strategies:

- A larger system of MnPASS priced lanes to provide a reliable, congestion-free alternative,

Source: MnDOT

- Active traffic management with dynamic signing, variable speed limits, and dynamic shoulder lanes to increase throughput, capacity and reliability on existing roads,
- Quick clearance legislation passed in 2010 to speed removal of crashes,
- Construction of Central Corridor, planning of Southwest Light Rail and evaluation of other potential routes,
- Expanded lower-cost, high benefit road projects, and
- Selected major capacity expansions, such as the extension of Highway 610 in Maple Grove.

Greater Minnesota Bus Service—Greater Minnesota is projected to add nearly half a million residents by 2025. Meeting the need for transit service in rural areas and in growing urban areas like Rochester, Mankato and St. Cloud, is a challenge for local public transit providers and MnDOT. Total hours of bus service per capita in 77 counties increased 10 percent from 2004 to 2007 due to increased funding. Since 2007 both total hours of service and service hours per capita have been flat. With future projections of flat revenues and inflation, MnDOT expects a widening gap between the target and the level of service provided.

Transportation Fuel Use—Minnesota transportation fuel consumption flattened in 2010—increasing one percent after an eight percent drop from 2004 to 2009. If the gain becomes a trend, progress toward meeting the Next Generation Energy Act goal of reducing greenhouse gas emissions would erode. In 2009 Minnesota ranked 25th among the states in per capita gasoline use for transportation.

Minnesota relies on fuel taxes for a major share of transportation funding. State fuel tax revenue is expected to be flat from 2013 to 2015.

Economic Competitiveness

National and global connections—MnDOT's goals include supporting Minnesota's economy and quality of life. Citizens and the economy benefit when transportation assets are maintained in good physical condition; crashes are reduced; travel times are improved; and there is adequate capacity to move business travelers and freight. Minnesota has strong air, rail, and waterway systems to support commerce, but any shifts in indicators should be watched closely.

Minnesota has nearly universal **access to airports** for private and commercial aviation, and scheduled air service to 135 **nonstop destinations** in the nation and the world from Minneapolis-St. Paul—ranking 10th among U.S. metro areas. **Available seat miles** (total available airline seats times miles flown) from MSP ranks 18th in the nation, down from 16th in 2000. Seat miles available in Rochester increased 38 percent from 2000 to 2009, and stayed nearly steady at Duluth. Nevertheless, several trends may be of concern:

- A 15 percent drop in available seat miles at MSP from 2000 to 2009, well exceeding the national 1 percent decline.
- Loss of scheduled air service at St. Cloud and Grand Rapids – and vulnerability of scheduled air service at several other cities if federal subsidies are cut.

Minnesota's water transportation system is vital to agriculture, energy, and mining. With economic recovery in 2010 and high world demand for commodities, **shipments** to and from Minnesota ports rebounded, including gains in taconite shipments and wheat exports and steady movement of coal and wind turbines. Further gains are predicted. Lack of federal funds to dredge ports and rivers and aging undersized locks downstream from Minnesota can limit the tonnage carried by Great Lakes ships and Mississippi River barges.

Minnesota **rail shipments** grew 18 percent from 2001 to 2008. While state data is not in, national data point to strong growth in 2010. To maintain competitiveness, MnDOT's Statewide Freight and Passenger Rail Plan recommends addressing rail bottlenecks and upgrading deficient track to handle higher speeds and heavier rail cars.

Minnesota 2010 Transportation Results Scorecard

Green: At or above target | **Yellow**: Moderately below target | **Red**: Seriously below target | **MnDOT Primarily Responsible** | **Target** | **Results Trend**

Measure	Score	Result	Target	Trend		Analysis
traveler safety						
Minnesota Traffic Fatalities—All state and local roads	Green	411	400 by 2010	2006 2010	Better	2010 fatalities are 411, slightly lower than the 421 fatalities in 2009, but still higher than the 2010 target of 400. Fatalities are down by 246 since 2002. **Comparison**—3rd best state in 2009, with fatality rate 35% below U.S. average.
infrastructure preservation						
Bridge Condition—% Good and Satisfactory—State principal arterials	Green	86.9%	84%	2006 2010	Better	In 2010 bridges on principal state roads in Good or Satisfactory condition dropped 0.5% to 86.9%. The percent rated Poor improved to 3.2%. Levels will improve and meet targets with the greatly increased state investment underway. **Comparison**—Minnesota has the 4th lowest percentage of bridges rated structurally deficient or functionally obsolete—less than half the national average—according to 2010 rankings by Better Roads magazine.
Bridge Condition—% Poor—State principal arterials	Yellow	3.2%	2%	2006 2010	Better	
Pavement—Ride Quality Poor—State principal arterials, % of miles	Yellow	3.7%	2%	2006 2010	Better	State pavement condition improved significantly in 2010. Principal Arterials met the % Good target for the first time since 2002. Poor miles were temporarily reduced by almost 2% of the system in 2010. Much of the improvement was due to increased spending from ARRA and increased patching. Still, pavement condition is predicted to resume deterioration under the regular investment program set in the 2011-2014 STIP. The Better Roads program is proposed to stem the increase in poor pavements over the next four years by improving more than 700 miles of roadway. Without Better Roads and increased investment after 2015, the share of Poor miles will grow to nearly 5% of Principal Arterials and a record 10% of Non-Principals by 2014 and more than 13% of all state roadway miles by 2020. **Comparison**—For Interstate highways in poor condition, Minnesota ranked 44th of the 50 states (USDOT data for 2008, corrected for Minnesota).
Pavement—Ride Quality Poor—State non-principal arterials, % of miles	Red	6.8%	3%	2006 2010	Better	
Pavement—Ride Quality Good—State principal arterials, % of miles	Green	70.2%	70%	2006 2010	Better	
Pavement—Ride Quality Good—State non-principal arterials, % of miles	Yellow	59.8%	65%	2006 2010	Better	
maintenance						
Snow and Ice—Frequency of Achieving Bare Lane Within Target Hours—all storms and routes	Green	79% (preliminary)	70%	2006-7 2010-11	Better	During 2010-11 winter season, MnDOT achieved target clearance times 79% (preliminary) of the time, exceeding its 70% target. MnDOT has met its system-wide target in all but one of the last five years.
Bridge Safety Inspections—% Completed On Time—All state bridges	Yellow	99.4%	100%	2007 2010	Better	In 2010, 100% of bridges with safety inspections due received inspection, and 99.4% were inspected within the required time period (calendar due date + 30 days). Recent performance gains are due to increased funding, staffing and equipment, and improved processes.
Customer Satisfaction with State Highway Maintenance—on a scale from 1 to 10	Yellow	6.1	7.0	2006 2010	Better	Overall customer satisfaction with road maintenance rose slightly in 2010 but remains below target in the "neutral" zone at 6.1 on a 1-10 scale. This result is linked to pavement ride quality. Note: there was no survey in 2007.

Measure	Score	Result	Target	Trend	Analysis
national and global connections					
Airline Annual Available Seat Miles from MSP—on scheduled commercial flights	N/A	19.5 million miles 2009	tracking indicator	2005 2009 Better	Annual available seat miles (ASMs) for Minneapolis-St. Paul Airport (MSP) fell 15% from 2000 to 2009, with a larger decline on domestic routes. Greater Minnesota capacity (eight airports) in 2009 was slightly above the level at the beginning of the decade.
Port Shipments to and from MN Great Lakes & river ports—annual tonnage	N/A	72 million tons	tracking indicator	2006 2010 Better	Waterway tonnage increased significantly in 2010 due mainly to higher taconite shipments. Taconite shipments in 2010 were up 97% over 2009 levels. **Comparison**—Duluth is the 25th largest US port by tonnage (2009).
Shipments on Minnesota Railroads—annual tonnage from, to and through Minnesota	N/A	232 million tons 2008	tracking indicator	2004 2008 Better	Freight rail shipments decreased in 2008, the most recent year with data. Other indicators show a drop in tonnage in 2009 due to the recession and growth in 2010. **Comparison**—Minnesota ranked 13th of the 50 states by tons of freight carried by rail (2008 data).
statewide connections					
Interregional Corridors—Greater MN—% of Miles +/- 2 mph of Target Speed (55 or 60 mph) or faster	●	98% 2009	95%	2008 2009 Better	98% of major interregional routes beyond the Metro fringe can be driven at average trip speeds near 55 or 60 mph. Predicted to sustain 98% through 2020, then decline.
Airport Access—Percent of Minnesota population within 20 miles of an airport with paved and lighted runway	●	96% 2009	90%	2006 2009 Better	118 local paved and lighted airports provide ready access to 96% of Minnesotans for business, shipping, recreation, medical services, law enforcement and fire fighting.
twin cities mobility					
Twin Cities Urban Freeway System Congestion—% of miles below 45 mph in AM or PM peak	N/A	21.5%	tracking indicator	2006 2010 Better	Metro congestion grew in 2010 to 21.5%, up from 18.2 % in 2009. It is expected that in coming years congestion will increase as economic activity increases. Comparison— 7th most congested of 31 peer metro areas in 2009, 19th most congested overall (Texas Transportation Institute).
Clearance Time for Metro Urban Freeway incidents—3 yr. average	▲	37.7 minutes 2009	35.0 minutes	2005 2009 Better	2009 average clearance times increase slightly due in part to the incident detection system expanding beyond FIRST coverage.
Annual Rail and Express Bus Transit Ridership—Express buses (all providers), light rail, commuter rail	N/A	24 million	tracking indicator	2006 2010 Better	Metro area rail and express transit ridership grew by 18% from 2006 to 2010, surpassing overall transit growth of 7%. Ridership growth was distributed equally between rail and express bus transit.
greater minnesota metropolitan and regional mobility					
Greater Minnesota Bus Service Hours—Public transportation	▲	1.03 million hours 2009	1.60 million hours 2015	2005 2009 Better	Apart from a small drop in 2008, Greater Minnesota bus service hours were between 1.03 and 1.04 million hours per year from 2007 to 2010. This trend of little or no growth is expected to continue over the long-term, due primarily to flat revenue projections and the effect of inflation. With transit need projected to increase, MnDOT expects a widening gap between need and the level of service.
community development and transportation					
ADA—Accessible Pedestrian Signals—% of state highway intersections with APS	N/A	16%	100% by 2030	2009 2010 Better	Compliant signals increased in 2010 from 10% to 16%. Dedicated funds of $2.5M/yr and new road design guidelines will gradually increase the percentage of state road intersections with accessible signals, and improve curb ramps and sidewalks.
Bike, Walk and Transit Share of commuter trips—large Minnesota metro areas	TBD	7.5% commuter trip share 2009	tracking indicator	2006 2009 Better	In major metropolitan areas, bicycle commuting, walking and public transit combined grew from 7% to 7.5% from 2006 to 2009. Bicycling showed the most growth at 25%. **Comparison**—In 2009, Minneapolis was ranked #2 out of 70 cities for its share of bicycle commuters.
energy and the environment					
Transportation Fuel Consumption—Billions of gallons sold in Minnesota	N/A	3.08 billion	tracking indicator	2006 2010 Better	After three years of decline, fuel consumption was flat in 2010. Overall, fuel consumption in 2010 was down 7% from a 2004 high of 3.32 billion gallons. **Comparison**—In 2009, Minnesota ranked 25th of 50 states in per capita gasoline use.

How to Navigate this Report

Each performance measure area is displayed in a standard template over a two-page spread. A description of each section follows.

Traffic Fatalities

TRAVELER SAFETY

Measures

Description of the measure. [A more technical explanation is provided on pp 54-55.]

System

Describes the scope or system that the measure applies to

Why this is important

Describes why MnDOT or partners have set a goal and a measure for this

General measurement area

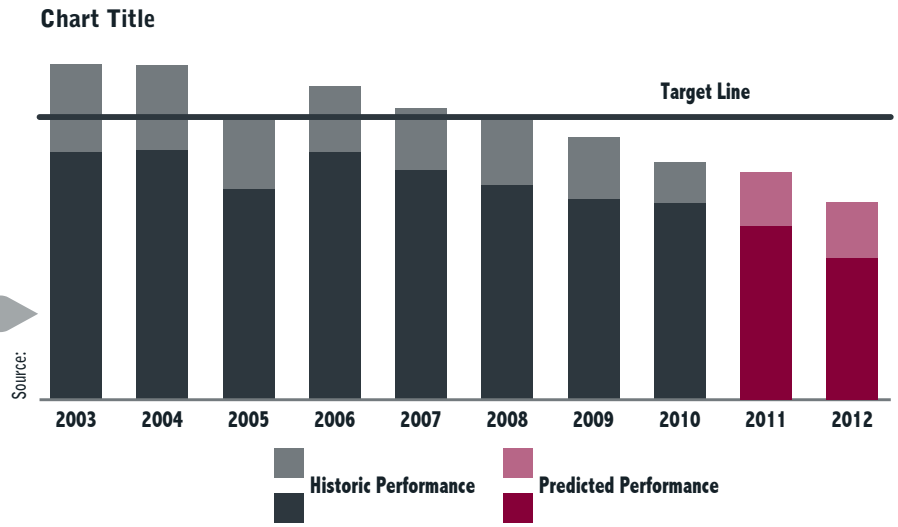
This heading provides a simple label for each measurement area.

State Plan policy area

This heading corresponds to the Statewide Transportation Policy for which the measure tracks performance.

Performance Data

Performance data is presented for a majority of the measures, usually in a bar chart.



Our progress

Usually accompanied by a performance graph or map, this section describes how well MnDOT or the transportation system is performing in relation to the measure and the reasons for the trends. If there is a performance target, it is shown.

How we decide

MnDOT's and its partners' decision-making processes are very elaborate. This section describes who makes decisions and the criteria used.

What we are doing

"What we are doing" is a broad assessment of how MnDOT and its partners approach work to improve results in the measure area.

Strategies

The strategies section describes specific strategies and tactics MnDOT and other agencies employ to improve performance.

Investment/Spending

This section describes the financial resources being directed towards specific measure areas. It is not intended as a replacement for official budget documents or as an accounting tool.

Historical spending was primarily obtained from the appropriate MnDOT office or partner agencies. Estimates of future spending were provided by the office responsible for the measure or were generated as part of the Statewide 20-year Highway Investment Plan 2009-2028.

Sustainability

This section describes program or project features that enhance financial or environmental sustainability.

Innovation

This section highlights innovative programs or projects in the measurement area.

For comparison

Provides a ranking or comparison with other states, regions or nationally. Does not always compare using the exact methodology as the measure section it is in because identical data is not always available.

Learn more

If you want to find out more about a particular measure and its related strategies for improvement, this section lists internet sources you can contact for more information. The list includes MnDOT contacts as well as the internet sites of many of transportation partners.

Traffic Fatalities

TRAVELER SAFETY

Measures

Total traffic fatalities and serious injuries from vehicle crashes

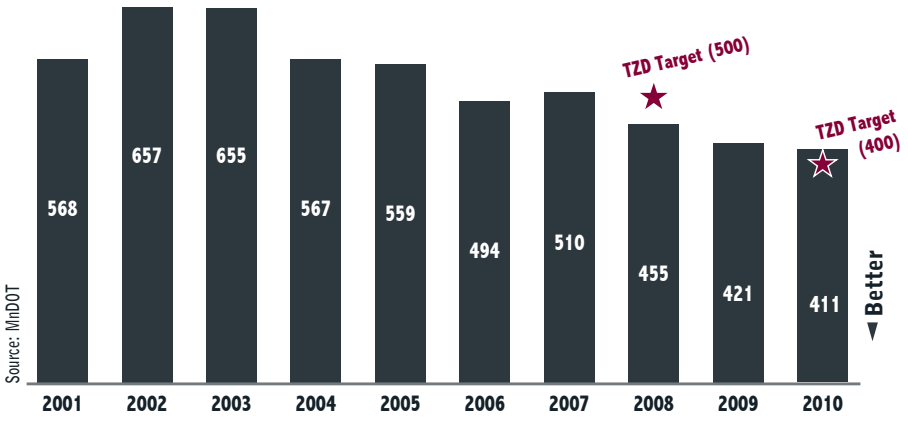
System

All state and local roads (141,000 miles)

Why this is important

Nationally, vehicle crashes are the leading cause of death for people younger than 35, and the fifth leading cause of death overall. On an average day in 2010, at least one person died on Minnesota highways and more than three were seriously injured. Serious injuries prevent walking, driving or continuing other activities of daily life, creating significant costs for families and for society. MnDOT and its partners have made reducing fatalities and associated severe injuries one of their highest priorities.

Minnesota traffic fatalities on all state and local roads



Fatal crashes by category 2000-2010 (crashes can be counted in more than one category)

Category	2000 Total	2010 Total	Average annual reduction
Single vehicle run-off-the-road	197	99	8%
Unbelted	283	132*	7%
Under 21	167	70	7%
Speed related	175	76	7%
Alcohol related	245	141*	6%
Intersection related	238	151	4%
Head-on/sideswipe	138	97	3%

Source: MnDOT Office of Traffic, Safety and Technology *2009 data

Our progress

Fatalities from Minnesota traffic crashes decreased for the third straight year in 2010 to 411 based on preliminary results. Though an improvement, this did not quite meet the 2010 target of 400. The 421 fatalities in 2009 were the fewest since 1945. Serious injuries have declined steadily from 3,460 in 1999 to a new low of 1,191 in 2010 based on preliminary data. This surpassed the 2010 target of 1200. As the table shows, Minnesota has reduced seven categories of fatal crashes that have been identified for aggressive strategies in the state's highway safety plan and by recent laws passed by the legislature. However, bicycle and pedestrian-related fatalities have not followed the same decreasing pattern.

Source: MnDOT

What we are doing

Minnesota's Toward Zero Deaths partnership and MnDOT's Strategic Highway Safety Plan establish goals and strategies for reducing fatal and serious crashes. Minnesota has invested $3.8 million over three years to provide each of the eight MnDOT districts and 87 counties with their own safety plans. Minnesota's TZD partner organizations are now aiming for new targets of 350 or fewer fatalities and 850 or fewer serious injuries by 2014. The Departments of Public Safety, Transportation, and Health lead the TZD initiatives. Other partners include the State Patrol, the Federal Highway Administration, Minnesota county engineers, the Center for Transportation Studies at the University of Minnesota and other traffic safety partners.

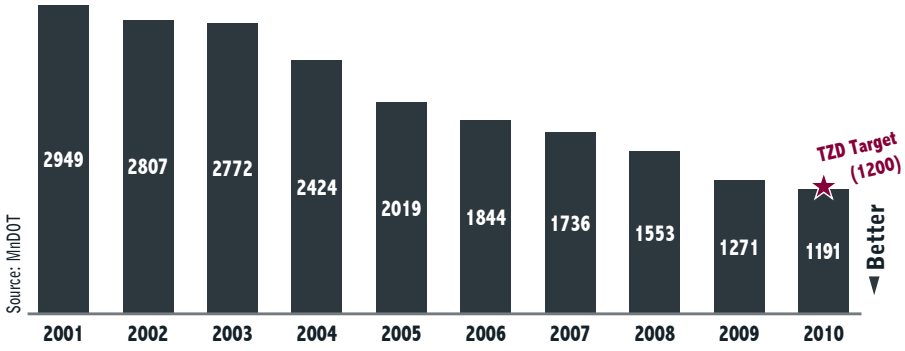
Strategies

In order to promote projects that will introduce safety strategies across jurisdictions, the eight MnDOT districts and 87 counties will develop their own road safety plans by 2012. The plans will identify strategies based on local crash trends. In the past, the focus has been on reactive improvements to locations with a history of crashes. Current strategy, developed through the SHSP, takes a proactive approach to identify and improve road segments and intersections with a high risk of future crashes. The major TZD strategies can be summarized as the Four Es:

Engineering—Low-cost roadway safety enhancements such as rumble strips, intersection lighting and improved signing reduce highway injuries and deaths. To prevent deadly crossover crashes, cable median barriers have been installed statewide on 259 miles of vulnerable four-lane divided roadways, with an additional 51 miles planned for 2010-2011. A primary focus is placed on engineering solutions for crash types that are most likely to result in fatal and serious injury crashes, such as angle crashes at intersections and run-off-the-road crashes in rural areas.

Enforcement—The State Patrol and local law enforcement are emphasizing enforcement of DWI, seat belts and speed laws. MnDOT and the Department of Public Safety will continue the High Enforcement of Aggressive Traffic program for the next three years to reduce the number of speed related crashes. Enforcement has traditionally been considered an effort exclusive to police officers. However, others can assist in enforcing good driving behaviors. For example, employers can institute policies such as prohibiting cell phone use while driving a company vehicle..

Serious traffic injuries on all Minnesota state and local roads

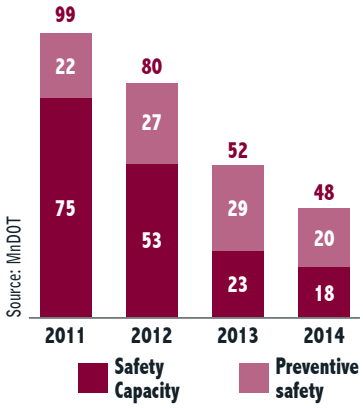


Funding by source for HSIP projects, state fiscal years 2005-2011

State fiscal year	HSIP funds (millions)	Total state and federal funds (millions)
2005	$19.3	$30.1
2006	$10.0	$58.7
2007	$14.0	$73.1
2008	$15.0	$56.6
2009	$25.1	$40.3
2010	$26.9	$36.6

Source: MnDOT

2011-14 STIP safety investments ($millions)



What we are doing (cont.)

Education—Helping drivers understand the risks associated with behaviors such as seat belt use and drinking and driving can help reduce crashes due to those factors. Recent practice has been to incorporate education and enforcement activities to heighten the awareness of key messages. For example, an annual public safety announcement detailing the importance of seat belt use is paired with special enforcement activities focused on enforcing the seat belt laws.

Emergency trauma systems—The Minnesota Department of Health is working with Minnesota hospitals and health care providers on new systems to transport crash victims rapidly to the right type of care facility to address their injuries. Additionally, the statewide trauma system will provide an opportunity to evaluate the effectiveness of the care people receive after a motor vehicle crash has occurred.

The Four Es are vital to moving Minnesota toward zero deaths. Recent efforts have focused on a multifaceted approach which includes a combination of activities across each of the Four Es. This diverse approach is expected to continue the sustained reduction of fatal and serious injury crashes in the foreseeable future.

Investment/spending

Investments intended to reduce the number of traffic fatalities and serious injuries can be categorized as preventive safety projects or safety capacity improvements. Preventive safety projects follow the low-cost, proactive engineering strategies listed above. Included in this category are federally funded Highway Safety Improvement Program projects. Established as a core federal program in 2005, HSIP is intended to significantly reduce fatalities and serious injuries on all roads. HSIP funds are distributed across the MnDOT districts based on total fatalities and are divided between MnDOT and local agencies.

Safety capacity improvements are most often initiated as stand-alone projects on high-volume corridors or intersections. Examples might include:

- adding turn lanes
- adding passing lanes,
- constructing an interchange.

Such projects also provide mobility and access benefits. In addition, many projects developed for other reasons such as preservation and mobility also have safety benefits. MnDOT's construction program for 2011-2014 includes $267 million in state and federal funds for safety projects.

How we decide

MnDOT's Office of Traffic, Safety and Technology coordinates planning, strategies, performance measures and decision-making criteria across the state. MnDOT district traffic safety engineers, planners and local road authorities play an integral role in the decision-making process. MnDOT's State Aid for Local Transportation Division provides outreach to local road authorities for safety projects. Conventional district construction projects are identified in MnDOT's four-year State Highway Investment Plan or the 10-year Highway Investment Plan. Many safety features are built on state and local roadways as part of larger construction projects. The funding for these safety features is included in overall construction costs.

MnDOT uses the State Highway Investment Plan to fund safety strategies. Since about half of fatalities occur on local roads, about half this money is targeted to counties and cities. MnDOT solicits local safety projects in greater Minnesota through regional Area Transportation Partnerships. Cities and counties submit proposals for projects that are competitively selected by an expert committee at MnDOT. The Metropolitan Council administers the process in the Twin Cities metropolitan area.

Source: MnDOT

For comparison

In 2009, Minnesota's fatality rate per 100 million vehicle-miles traveled was 3rd lowest of the 50 states, according to USDOT. Minnesota's 2009 fatality rate was 0.74, 35% lower than the national rate of 1.13.

Learn more

MnDOT Office of Traffic, Safety and Technology
www.dot.state.mn.us/trafficeng/safety

Minnesota Department of Public Safety Office of Traffic Safety
www.dps.state.mn.us/ots

Toward Zero Deaths Initiative
www.minnesotatzd.org

Bridge Condition

INFRASTRUCTURE PRESERVATION

Measures

Structural condition of bridges

System

Bridges over 20 feet and on state highway principal arterials (2,533 bridges), which comprises 85 percent of all state bridges, measured by deck area

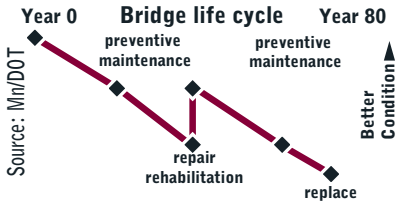
Why this is important

Bridges provide critical economic links across Minnesota. Timely maintenance and replacement of bridges reduce long-term costs and ensure safety. Preserving the structural integrity of Minnesota's bridges is a top priority for MnDOT. New directives and funding from the 2008 Legislature supported this goal.

Our progress

In 2010, 86.9 percent of state principal arterial bridges were in good or satisfactory structural condition, exceeding the target of 84 percent. Another 13.1 percent were in fair or poor condition well within the performance target of 16 percent or less.

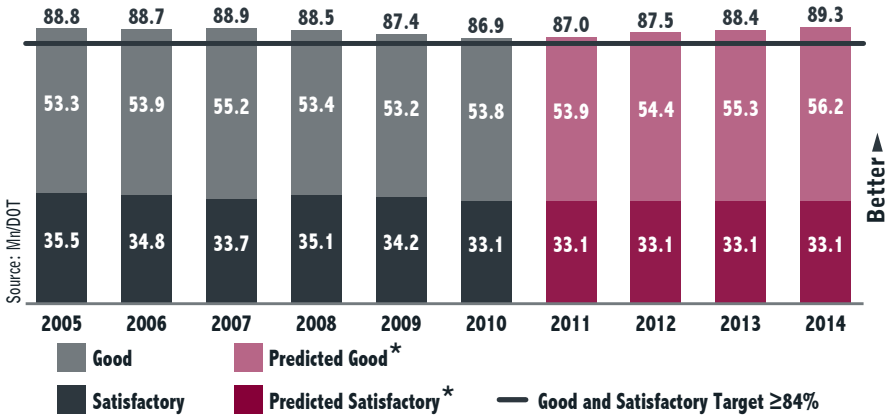
MnDOT has set a goal that the share of principal arterial bridges in poor structural condition be 2 percent or less. The poor share improved to a new low of 3.1 percent in 2007, rose slightly to 3.5 percent in 2009, and then was reduced to 3.2 percent in 2010. Improvement to near the target level of 2% is predicted based on the aggressive 2011-14 construction program. Poor condition bridges are termed "structurally deficient" by the US Department of Transportation. They are safe to drive on, but are approaching the end of their useful lives. Unsafe bridges are closed promptly.



For comparison

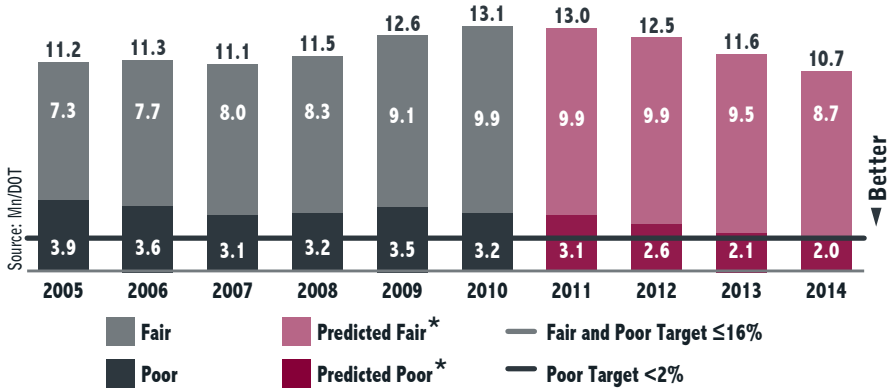
Minnesota has the 4th lowest percentage of bridges classified as either structurally deficient or functionally obsolete—less than half the national average—according to 2010 ranking published by Better Roads magazine.

Percent of bridges in good and satisfactory condition by principal arterial square footage



*Predicted Condition based on the 2011-14 STIP

Percent of bridges in fair and poor condition by principal arterial square footage



*Predicted Condition based on the 2011-14 STIP

What we are doing

MnDOT is carrying out a major bridge program to accelerate replacement and repair of a significant number of state bridges through 2018. The 2008 Legislature provided new funding through Chapter 152 allowing approximately 40 fracture critical bridges and 80 structurally deficient bridges to be replaced or repaired. Twenty other bridges not included in the count either already had work underway before the Chapter 152 program started, or are not required to be addressed by the program but have work planned by 2018. By the end of the 2011 construction season 59 bridges in the program will be substantially complete.

MnDOT like other departments of transportation has long used the national system of rating bridges good, satisfactory, fair or poor for their structural condition based on a numeric scale. However, on rare occasions other factors could also put a bridge at risk requiring closure for repairs—such as geometric factors, a bridge's fracture-critical nature and other special vulnerabilities, or scouring from excessive river flows. If it is a bridge with high traffic volumes, heavy truck traffic or long detours, the cost of closing it is higher for the public and MnDOT. Therefore, in 2010, with MnDOT's support, the Legislature added new criteria for prioritizing bridges that will be used to guide selection and scheduling of bridges for repair or replacement. Prioritization will also include input from MnDOT district bridge engineers and planners. Based on traditional structural ratings and the new risk-based criteria, MnDOT will use this new Bridge Replacement and Improvement Management model for planning and programming of projects in the future.

Strategies

- **Bridge preservation**—MnDOT manages state bridges to meet performance targets, ensure safety and extend the life of bridges in good or satisfactory condition within the normal 70- to 80-year life cycle.

Major bridges funded through the Chapter 152 program

County	Bridge and Location	Project Status*
Stearns	Hwy 23 DeSoto Bridge over the Mississippi River & Riverside Drive in St. Cloud	Replaced
Kittson	Hwy 11 over Red River of the North at Robbin-Drayton	Replaced
Dakota	US 61 Hastings Bridge over the Mississippi River	Underway
Ramsey	US 52 Lafayette Bridge over the Mississippi River in St. Paul	Underway
Winona	I-90 Dresbach Bridge over the Mississippi River	Planned FY 2012
LeSueur	Hwy 99 over the Minnesota River in St. Peter Rehabilitation	Planned FY 2013
Washington	Hwy 36 over the St. Croix River in Stillwater	Planned FY 2014
Winona	Hwy 43 over the Mississippi River in Winona	Planned FY 2015
Ramsey	I-35E over Cayuga Street in St. Paul	Planned FY 2013
Polk	US 2B Sorlie Bridge over the Red River in East Grand Forks	Planned FY 2018
Lake of the Woods	Hwy 72 over the Rainy River in Baudette	Planned FY 2018
Goodhue	US 63 over the Mississippi River in Red Wing	Planned FY 2018
Brown	Hwy 14 over the Minnesota River in New Ulm	Planned FY 2018

Source: MnDOT

What we are doing (cont.)

- **Bridge improvement**—MnDOT rehabilitates bridges to get full, efficient use during their service life. The condition of a bridge will decline over its first 40 years of use until rehabilitation is needed. A rehabilitation project brings a bridge back into good condition until it gradually deteriorates over the years and replacement is necessary.

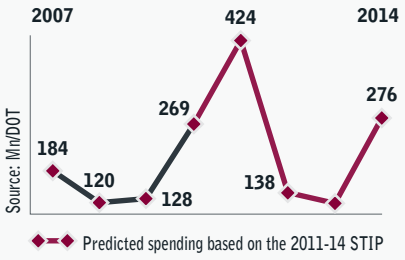
Sustainability

To best manage the state's available funds for bridges, MnDOT plans repair and rehabilitation projects to minimize costs over the life of the bridge while maximizing the safe and useful life of the bridge. Once a bridge reaches poor condition, based on federal rating definitions, replacement is most often the best solution. However, replacement is often scheduled to coincide with other projects in a highway corridor. Therefore, lower-cost improvements are often used to safely extend the life of the bridge.

Investment/spending

MnDOT's investment in bridges has increased significantly in the last decade from less than $50 million in 2001. Under the Chapter 152 Bridge Program, MnDOT is investing an estimated $2.1 billion through 2018 for state bridges using about $1.2 billion in regular state and federal funds and $900 million in bonds sold by the state. In December 2009, an additional $30.3 million in bridge projects were funded through the American Recovery and Reinvestment Act, with the majority of work completed as of this date.

Bridge construction spending (millions)



How we decide

The MnDOT Bridge Office guides inspection, maintenance and construction of bridges, and oversees the design of new state highway bridges. Actual inspection, construction and reactive and preventive maintenance are carried out by MnDOT's eight districts. The Bridge Office collaborates with district bridge engineers, planners and maintenance engineers to identify both near-term and long-range bridge maintenance, repair and replacement needs and cost-effective and safe solutions. Local communities may also participate in decisions affecting them.

The Bridge Office provides guidance to districts on whether a bridge should be replaced or repaired based on factors such as age, structural condition rating, repair and reconstruction history and the traffic level affected by any construction activity. The districts use this guidance along with their own hands-on knowledge to formulate a strategy to address bridge needs across their district. Bridge, safety, pavement, mobility and other needs are considered and scheduled according to available funding. Projects are selected by the districts and ultimately are approved for funding by MnDOT's executive-level Transportation Program Investment Committee and the commissioner.

In 2008 the Legislature set strong priorities and guidelines in law for replacement or repair of bridges with fracture critical designs and bridges rated as structurally deficient. Legislative criteria require MnDOT to classify all bridges in the program into three tiers. In general, all bridge projects within a higher tier must be addressed before starting projects in a lower tier. Once the Bridge Replacement and Improvement Management tool is calibrated, the rankings will also be used for making investment decisions.

Learn more

MnDOT Bridge Office

www.dot.state.mn.us/bridge
Nancy Daubenberger–nancy.daubenberger@state.mn.us

MnDOT Office of Capital Programs and Performance Measures

Trunk Highway Bridge Improvement Program
www.dot.state.mn.us/planning/program/pdf/CH152AnnualInventoryReport2011.pdf

Minnesota Office of the Legislative Auditor

2008 Legislative Auditor's Report, State Highways and Bridges:
www.auditor.leg.state.mn.us/ped/2008/trunkhwy.htm

Pavement Condition

INFRASTRUCTURE PRESERVATION

Measures

Percent of roadway miles in good and poor condition

System

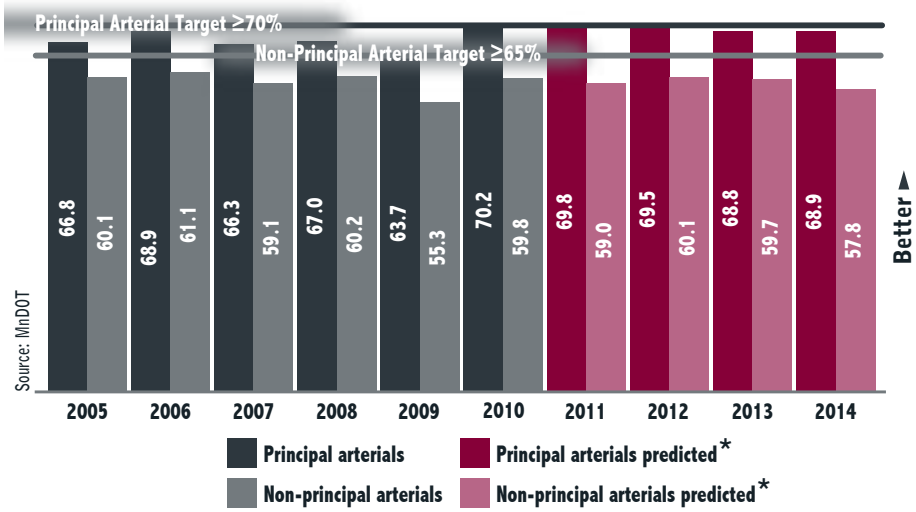
State highway principal arterials (7,570 roadway miles, 53% of total—the highest traffic volume roads)

State highway non-principal arterials (6,740 roadway miles, 47% of total) mostly in Greater Minnesota

Why this is important

Preserving the functional and structural integrity of Minnesota's highways is a priority for MnDOT. Timely repair and replacement reduce long-term costs. Also, MnDOT customer research has found that Minnesotans' satisfaction with overall state highway maintenance is greatly affected by highway smoothness.

Percent good pavement ride quality state principal and non-principal arterials



*Predicted condition based on the 2011-14 STIP

2008 Midwest States Interstate Pavement Condition

State	% Good	% Poor
Minnesota	55.3%	2.7%
Wisconsin	60.0%	2.0%
Iowa	59.4%	1.8%
South Dakota	66.5%	0.0%
North Dakota	90.0%	0.0%

Source: MnDOT

Source: MnDOT

Our progress

The share of miles on state principal arterials (the highest traffic volume roads) with a good quality ride rose to 70.2 percent in 2010 from 63.7 percent in 2009. This is the first time since 2002 that this measure has met the target of 70 percent. The share of principal arterials rated poor improved from 5.5 percent in 2009 to 3.7 percent in 2010, still short of the 2 percent target. Much of this improvement was due to increased spending as a result of the American Recovery and Reinvestment Act of 2009, as well as increased patching efforts by MnDOT maintenance crews.

Pavement condition on non-principal arterials also improved in 2010 compared to 2009, though neither the percent rated good nor the percent rated poor met their target.

Under the regular investment program for 2011-2014, pavement condition is predicted to resume deterioration. An aging transportation system and competing investment needs are among the reasons MnDOT is falling short of its targets.

In May 2011, the Better Roads for a Better Minnesota program was proposed to stem the increase in poor pavements over the next four years and improve more than 700 miles of roads. Without this increase in investment, total miles of pavement of the state highway system in poor condition are predicted to rise from 744 miles in 2010 to 1,917 in 2020.

Investments above and beyond MnDOT's regular program will be needed after the next four years. These investments will be determined based on an enterprise risk management approach—a systematic determination of the best course of action under uncertainty.

The Better Roads program was developed in response to a risk assessment which found that deteriorating pavement is MnDOT's most serious problem. MnDOT determined that 5 to 9 percent of pavement in poor condition is an acceptable risk. New pavement quality targets may be established in the future to reflect this. The Better Roads program provides additional investments to keep poor pavements in the 5 to 9 percent range until about 2018.

To ensure alignment with our customers' expectations, market research was conducted (Fall 2010) to test our technical classifications for pavement quality. Customers were driven over varying pavement sections and asked to evaluate each for smoothness/roughness. This research confirmed that customer ratings and technical measures yielded similar results. These measures are used to inform our plans and programs, including Better Roads.

What we are doing

MnDOT's objective is to preserve the structural integrity of its pavements in good condition and minimize the share in poor condition by doing preventive maintenance, rehabilitation and replacement at the right times. Once pavements are in poor condition, the options for cost effective repair are limited. To minimize life-cycle costs, pavement engineers recommend the most cost-effective treatment for every segment of state road to help achieve the twin objectives of smooth ride and maximum service life.

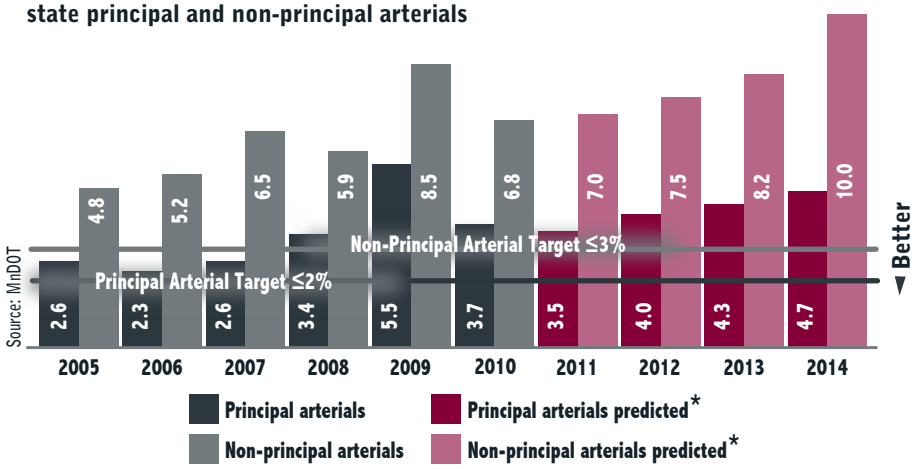
Strategies

MnDOT is continually pursuing better ways to get more value for each dollar invested in pavement and to build longer lasting pavements. Strategies include:

Low-cost maintenance and repair—Using recycled materials, innovative pavement designs (such as thin concrete overlays and full-depth reclamation), or deploying low-cost preventive maintenance treatments (such as chip seals and micro-surfacing).

Performance-based design—Focusing

Percent poor pavement ride quality state principal and non-principal arterials



*Predicted condition based on the 2011-14 STIP

Source: MnDOT

How we decide

Decisions to invest in state highway pavements are guided by a combination of each MnDOT district's hands-on knowledge, common statewide policies, performance measures and targets in the Statewide Transportation Plan and 20-year Highway Investment Plan and MnDOT executive level guidance.

MnDOT's Materials Office in Maplewood measures the physical condition of state roads every year and provides the data to districts. District pavement engineers and planners analyze the data, evaluate the percentage of highways in good and poor condition and recommend a pavement investment goal. Districts with a higher percentage of roadways failing to meet targets are expected to invest more if funds are available.

Districts annually update four-year construction programs and 10-year plans. They identify potential pavement projects, perform field reviews and exercise engineering judgment to narrow options. They then select projects and scope them to establish a definitive cost. Other needs, such as safety, are added if consistent with the purpose of the project. When funds are limited, districts sometimes choose short-term repair over recommended major rehabilitation of a roadway.

What we are doing (cont.)

projects to cost-effectively meet pavement and safety performance needs.

Alternate Bidding—Providing two comparable repair strategies in the construction plan so the contractors can bid the most cost effective solution, whether it is asphalt or concrete.

Research—MnDOT is a lead partner in the MnROAD facility, located on I-94, near Albertville. MnROAD is a world-class research facility dedicated to testing new and innovative construction and pavement materials.

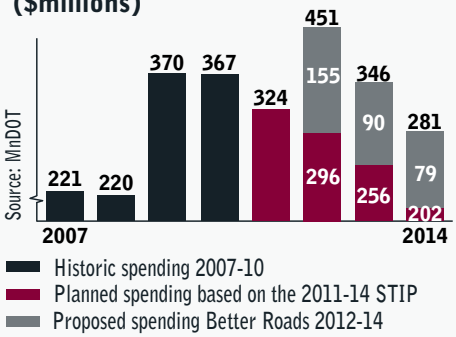
Sustainability

MnDOT is a leader in the use of recycled products. Specifications allow the use of recycled asphalt and concrete back into the roadbed and pavement. Manufactured scrap and tear-off shingles are allowed in the asphalt pavement specifications. Standards allow the use of warm mix asphalt construction, which decreases the amount of fuel used to prepare the mixture. Fly ash, a waste product generated from the combustion of coal, can be used in concrete to decrease the use of cement and avoid sending the ash to landfills.

Investment/spending

MnDOT invested an average of $234 million per year on pavement preservation between 2002 and 2010. Anticipated 2011-2014 base spending will average $270 million per year and drop to an average of about $205 million per year from 2015-2020. The Better Roads program would add $357 million toward pavement preservation in the years 2012-2015. After this four year period, more investments beyond the regular program will be needed to manage pavements.

Pavement preservation spending ($millions)



For comparison

According to USDOT data for 2008 (the latest year available) corrected for Minnesota, 2.7% of Minnesota Interstate miles were rated in poor condition compared to 1.6% of US miles. 55.3% of Minnesota Interstates were rated good, versus 72.6% for the US. Minnesota ranked in the bottom quarter of the 50 states for both.

Learn more

MnDOT Office of Materials and Road Research

www.dot.state.mn.us/materials/index.html
Keith Shannon—keith.shannon@state.mn.us

MnDOT Pavement Condition Information

www.dot.state.mn.us/materials/pvmtmgmt.html

Statewide 20-year Highway Investment Plan 2009-2028

www.dot.state.mn.us/planning/stateplan/download-investmentplan.html
Peggy Reichert—peggy.reichert@state.mn.us

Snow & Ice Management

MAINTENANCE

Measure

Frequency of achieving bare lane within targeted number of hours

System

State Highways (approximately 30,000 lane miles)

Why this is important

The safety of Minnesota's traveling public is the primary goal of MnDOT's snow and ice removal operations. Citizens expect to be able to carry out normal activities through most weather events and to have transportation facilities that safely accommodate travel shortly after the event has passed. Effective snow and ice management also reduces congestion caused by weather.

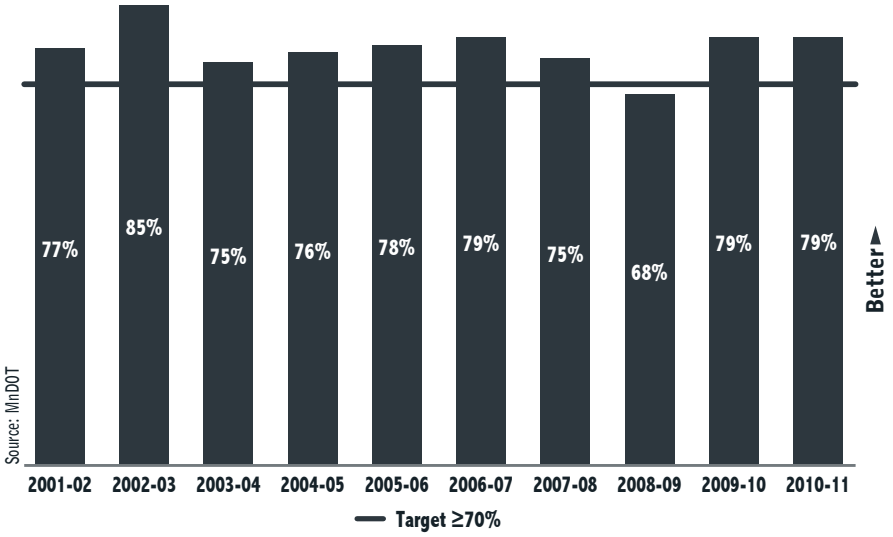
Targets and results by roadway category, 2010-11 (preliminary)

Roadway category	Average daily traffic	Target clearance time	2010-11 Average clearance time
Super commuter	Over 30,000	0 to 3 hours	2.2 hours
Urban commuter	10,000 to 30,000	2 to 5 hours	4.4 hours
Rural commuter	2,000 to 10,000	4 to 9 hours	6.6 hours
Primary collector	800 to 2,000	6 to 12 hours	9.2 hours
Secondary collector	Under 800	9 to 36 hours	15.2 hours

Source: MnDOT

Source: MnDOT

Frequency of achieving bare lane within targeted number of hours



Our progress

In the 2010-2011 season MnDOT met its target range for snow and ice clearance time 79 percent of the time (preliminary), exceeding its 70 percent target despite receiving the most snowfall since 1983-1984. The chart shows the frequency that MnDOT achieved bare lanes within the targeted number of hours, for all events and all routes from 2001-2002 to 2010-2011. MnDOT has met its target nine out of the last ten seasons.

MnDOT groups all state roads into one of five categories based on traffic volume and has a target clearance time for each. The Snow and Ice Route Classifications table shows each category, along with average daily traffic volumes, target clearance times and average clearance times for the 2010-2011 winter season. MnDOT met all these targets in the 2010-11 season, and historically has met targets for each roadway category as measured as an average regain time for all storms over the entire season. Temperatures, duration of snowfall and other highly variable conditions mean that MnDOT may not meet targets for every storm.

What we are doing

Snow and ice services are delivered on more than 30,000 lane miles of state highway by more than 1,700 snowfighters in eight districts. MnDOT puts a high priority on meeting snow and ice performance targets. To counteract rising fuel and material costs, MnDOT uses technology to increase efficiency. The department regularly tests and adopts innovative strategies to monitor road conditions, prevent ice build-up and remove snow and ice. Additionally, MnDOT's maintenance research program continually brings forth new ways to improve maintenance operations.

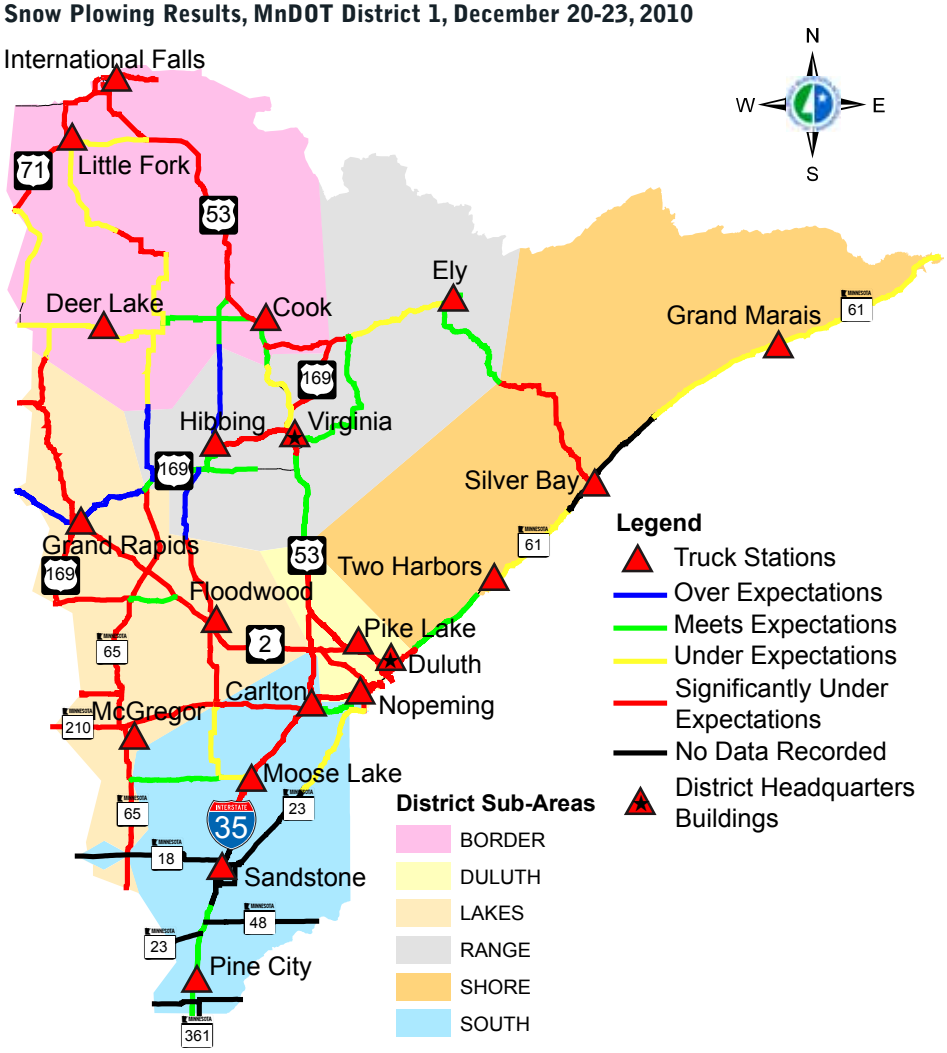
Strategies

Three effective techniques MnDOT uses to inhibit ice formation and improve the roadway surface for plowing includes:

- **Anti-icing**—Prevents frost and bonding between snow and ice and the pavement surface. Anti-icing chemicals are primarily liquids applied before or early in a snowfall.
- **Pre-wetting**—Adds salt brine or other commercial chemical solutions to the salt and sand mixture. This causes the mixture to stick to the road.
- **De-icing**—Uses chemical or mechanical means to break the bond that has formed between ice and the pavement surface.

MnDOT continues to advance the use of Automatic Vehicle Locating technologies in winter snow and ice services. AVL, a global positioning based system, allows tracking of resources, including chemical and material usage, as well as monitoring truck deployment. MnDOT is accelerating deployment of the Maintenance Decision Support System. MDSS is an in-cab expert computer system that provides AVL connectivity, real time weather forecasts and aids snowfighters in making decisions about chemical type and application rates.

Snow Plowing Results, MnDOT District 1, December 20-23, 2010



Source: MnDOT

How we decide

Performance management tools are well established in MnDOT snow and ice services with a strong statewide structure of measures and targets. These targets were developed cooperatively by MnDOT's districts in the 1990s based on past experience and customer research conducted most recently in 2007.

District maintenance engineers and supervisors who understand local conditions make operations decisions such as scheduling plows and drivers. They, along with snowplow drivers, evaluate results after snow events. One evaluation tool is post-storm mapping, such as the map from District 1 to the left. MnDOT managers receive monthly district and statewide reports on results and expenditures throughout the winter season.

MnDOT supervisors and maintenance engineers work together to compare practices and implement technology, innovations and best practices. Key to MnDOT's success at meeting its plowing targets is its extensive training, use of technology, and the commitment of its work force. District staff receive technical assistance from MnDOT's Office of Maintenance, which also provides support services to districts for contracts for salt, chemicals and equipment; training for snowfighters, equipment purchasing and snow plow fabrication.

Source: MnDOT

MnDOT statewide sand use (thousands of tons)

What we are doing (cont.)

Another technique MnDOT uses to control snow and ice on roadways is living snow fences which are plantings of trees, shrubs and native grasses located along highways. Properly designed and placed, these living barriers trap snow as it blows across fields before it reaches the highway. There are a total of 245 living snow fences averaging one-fourth of a mile long adjacent to MnDOT maintained highways.

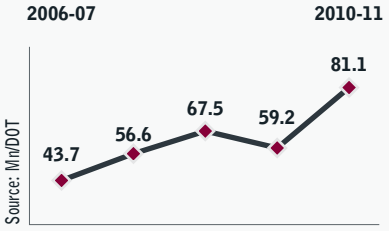
Sustainability

Mn/DOT is committed to the proper use of winter chemicals and works toward this through extensive operator training, investments in new technology such as MDSS, and research of new chemical materials. This focus has resulted in a strong downward trend in the use of sand. Introducing less sand, salt and other chemicals into the environment controls costs and supports Mn/DOT's best practices for environmental stewardship.

Investment/spending

Funding for snow and ice is a top priority for all districts and fluctuates depending on the severity of the winter. Funding for winter services comes directly from each district's operating budget. In severe winters, districts may redirect summer maintenance dollars to winter snow-plowing activities. Increasing prices for commodities, such as salt and diesel fuel, have also impacted snow and ice expenditures. MnDOT spent $81.1 million on snow and ice control during the 2010-11 winter season, which is the highest of any season on record.

Snow and ice expenditures (in $millions)



Learn more

MnDOT Office of Maintenance
www.dot.state.mn.us/maintenance/
Steven Lund—steven.lund@state.mn.us

Minnesota Department of Transportation
Snow and Ice Facts—
www.dot.state.mn.us/workzone/snowicefacts.html

Highway Systems Operations Plan
www.dot.state.mn.us/planning/program/hsop.html

Bridge Safety Inspections

MAINTENANCE

Measure

Bridge safety inspections—percent completed on time

System

All state highway bridges over 20 feet in length (3,639 bridges)

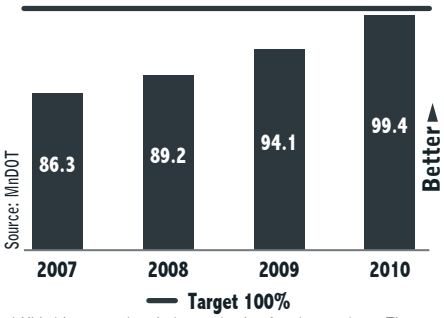
Why this is important

Bridge inspections are a key component in maintaining a safe transportation system. They ensure the structural integrity of our bridges and keep the agency in compliance with state and federal laws. Bridge safety inspections also provide the condition assessment data that supports MnDOT decisions regarding bridge repair, rehabilitation and replacement. Careful monitoring of bridge conditions allows us to make the right investment at the right time to maintain safe and reliable highways for the traveling public.

Source: MnDOT

Source: MnDOT

Bridge safety inspection-percent completed on time*



*All bridges receive their required safety inspections. The chart shows the percentage completed within the required time period (calendar due date + 30 days).

Our progress

Over the past four years, on-time bridge inspection performance has risen from 86 percent to 99.4 percent. This improvement is a result of a strong focus on proper staffing and improved scheduling and processes. MnDOT has set an aggressive target of 100 percent, and MnDOT expects to complete at or near 100% of its bridge safety inspections on-time every year. Occasionally delays can occur due to weather, conflicting construction activities, or high priority reactive maintenance activities but our "no excuses" approach means that we assign the highest priority to ensuring the safe condition of our bridges.

All of Minnesota's bridges do receive their safety inspections on either a one or two year cycle as required. A bridge inspection is considered on-time if it is completed within 30 days of its calendar due date.

What we are doing

There are three key elements to Minnesota's bridge management system: Assessment, Preservation, and Improvement. Assessment involves establishing and maintaining accurate and current information about the condition of our bridges. Preservation includes both preventive and reactive bridge maintenance activities. Improvement is the systematic planning and programming of major rehabilitations and bridge replacements projects. Decision-making in all three components of bridge management is supported by the condition data that is generated by our bridge inspection program.

Strategies

- **Staffing**—MnDOT maintains a statewide team of qualified and dedicated personnel to manage our bridge program. This includes certified inspectors, bridge maintenance workers and bridge engineers working together to gather data, make decisions and carry out the work.
- **Technology**—During the 2011 inspection season, all bridge inspectors in Minnesota will be using a new software program for entering, approving and storing their inspection data. The Structure Information Management System (SIMS) is a state-of-the art program developed for MnDOT. SIMS also serves as an "electronic bridge file", giving inspectors direct access to inspection history, photos, manuals, load rating information and other key documentation.
- **Training**—Our bridge inspectors are certified by attending a rigorous, two-week training class. Additionally, they need to pass a field proficiency test and training for bridge inspectors.

Source: MnDOT

What we are doing (cont.)

Sustainability

A proactive regimen of condition assessment and preventive maintenance helps Minnesota bridges stay in good condition longer. The deterioration rate is slowed and major bridge rehabilitation and replacement efforts are deferred as long as possible. Extending the service life of a bridge ensures that Minnesota gains the maximum use from transportation investments. Forestalling major bridge projects preserves materials and reduces economic and environmental disruption.

Investment/spending

Expenditures for bridge inspections increased starting in state fiscal year 2006, coincident with a change in federal regulations that increased the inspection frequency for fracture critical bridges. Expenditures for bridge inspection peaked in fiscal 2008 when accelerated inspections for all bridges were mandated by the governor. These expenditures have stabilized over the past two years and are expected to remain at that level in the foreseeable future.

Bridge maintenance expenditures have been relatively stable over the past four years. A recent study of bridge maintenance needs identified that additional expenditures in this area could produce a large benefit in preserving our bridge infrastructure. This recognizes that small investments in bridge maintenance activities can delay or eliminate the need for large future investments in bridge replacement and major rehabilitation.

Preventive bridge maintenance:
keeping good bridges in good condition

Reactive bridge maintenance:
repairs in response to emergencies or problems

How we decide

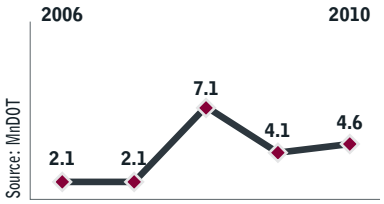
Decisions about managing MnDOT's bridge infrastructure are fundamentally based on bridge condition assessment data. Collecting this data generates a large volume of accurate information to guide our bridge investments.

Based on the bridge condition assessments, maintenance needs are identified, prioritized and entered into a work plan. District bridge workers perform the required preventive and reactive maintenance. At the end of each year, accomplishments are evaluated against established inspection and maintenance performance targets.

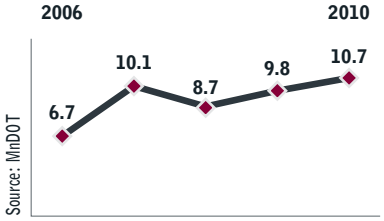
In each district, planning and prioritization are done by the district bridge engineer, in consultation with bridge maintenance supervisors and the Bridge Office. Any high priority maintenance needs that may affect the safe function of the bridge or deteriorate into a critical condition are addressed within 12 months. Those items categorized as low or medium priority are added to the district work plan and addressed in the appropriate time frame.

Bridge condition assessment also helps MnDOT's planners and investment managers establish short- medium- and long-range plans for major rehabilitation and replacement of our state's bridges.

Bridge inspection expenditures ($ millions)



Bridge maintenance expenditures ($ millions)



Learn more

MnDOT—Minnesota Statewide Bridge Inspections

www.dot.state.mn.us/i35wbridge/statewide_inspections/inspections.html

Tom Styrbicki—tom.styrbicki@state.mn.us

Federal Highway Administration—National Bridge Inspection Standards

www.fhwa.dot.gov/Bridge/nbis.htm

Customer Satisfaction

MAINTENANCE

Measures

Customer satisfaction with state highway maintenance on a scale from 1 to 10

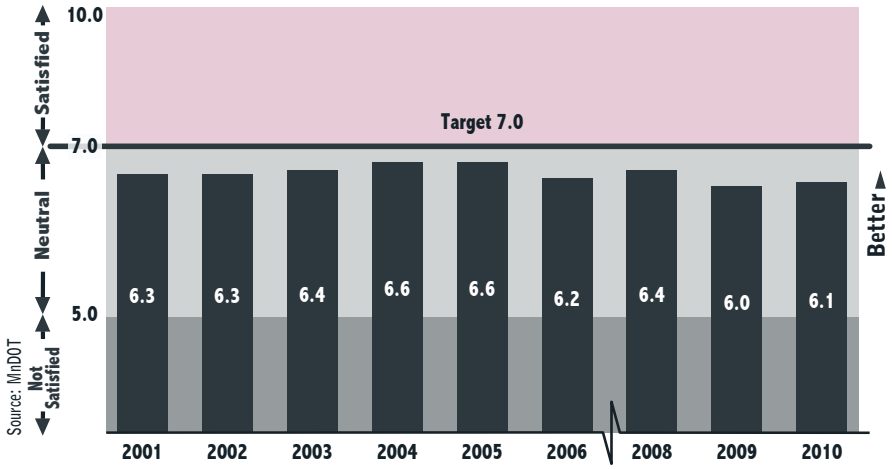
System

State Highways (approximately 30,000 lane miles)

Why this is important

Maintaining the transportation system is critical to the safety and mobility of the traveling public. Maintenance activities keep the system operating in all weather and traffic conditions, and are also central to extending infrastructure life and lowering overall ownership costs. This is especially important as much of the highway system is aging and nearing the end of its design life.

Customer satisfaction with state highway maintenance (1-10 scale) Omnibus survey



Note: No omnibus survey conducted in 2007

Source: MnDOT

Our progress

Overall customer satisfaction with state highway maintenance moved up slightly to 6.1 in 2010 from its low point of 6.0 in 2009. These results are below the 7.0 target, but are in the neutral zone of the 1-10 scale. Survey data indicates MnDOT's overall maintenance score is heavily influenced by the smooth road surface rating. Notably, the number of miles of poor pavements increased from 2003 to 2009 and have been consistently below target.

Customer satisfaction survey data from 2004 to 2010 indicates that most of the individual maintenance services, such as snow and ice, have positive ratings above the 7.0 target and are generally stable. Customer ratings of smooth road surface continues to rate the lowest at 6.2, close to the level of overall road maintenance customer satisfaction.

Source: MnDOT

What we are doing

MnDOT is updating its Highway Systems Operation Plan which will guide management and non-capital highway investments for the next two bienniums. MnDOT will continue to monitor performance of its highway maintenance with ongoing district and statewide performance reports that include bridge inspection and maintenance, drainage, pavement patching, signs, striping, and fleet management. Snow and ice removal performance is reported monthly during the winter season by roadway classification at the district and state level.

MnDOT's eight districts are responsible for the maintenance and operations of their state highways and bridges with all districts working toward common statewide performance targets.

Strategies

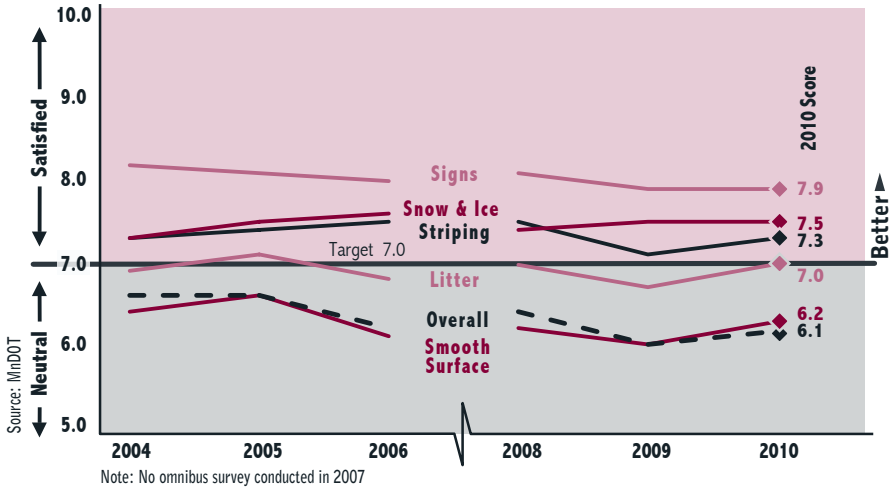
Strategies to improve MnDOT's maintenance performance include:

Maintenance research/new technology—Maintenance performance is improved through MnDOT's maintenance research program and commitment to new technology. A recent example related to snow and ice is a mobile chemical "blending station" that mixes liquid chemical and salt which enables the de-icing material to work better in lower temperatures. Without this, salt is effective to only about 15 degrees Fahrenheit. An example of new technology making summer maintenance more efficient is the "road groom/shoulder reclaimer." It can maintain about 40 to 60 miles of shoulder per day using less fuel compared to a traditional motor grader which can cover about 20 miles per day.

Maintenance best practices—Best practices are proven-effective processes or tools that are replicated across multiple MnDOT districts or offices. There are three fully deployed best practices in the maintenance area that have become standard MnDOT practice including: automatic pothole patchers; pre-wetting of deicing winter materials; and snowplow underbody plows. Several other maintenance best practices are in various stages of deployment.

Training—MnDOT has a strong commitment to maintenance training. Examples include MnDOT's annual snowfighter boot camp for new recruits, annual refresher training for all snowfighters, and yearly training in roadside

MnDOT road maintenance customer satisfaction ratings (1-10 scale) Omnibus survey



Source: MnDOT

What we are doing (cont.)

vegetation management.

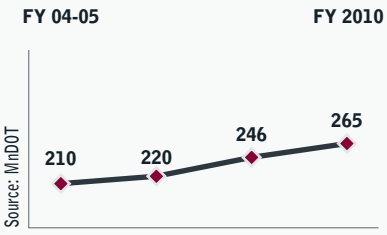
Customer research—In addition to the yearly market research outlined above, more in-depth customer market research is completed on a periodic basis to better understand customer needs and expectations for specific services, including MnDOT's innovative Online Customer Community. Customer research has helped identify appropriate levels of service for winter plowing, driver tolerance for road surface roughness, and assisted with funding trade-offs for non-safety services.

Investment/spending

The chart shows MnDOT's overall Infrastructure Operations and Maintenance spending from FY 2004 to FY 2010. This includes snow plowing and maintenance for pavement, roadsides and bridges, as well as traffic management, fleet and facilities maintenance. Average annual spending increased to $245 million in the FY 08-09 biennium compared to $210 million in FY 04-05. Spending in FY 2010 was $264 million. Though the trend shows an increase since 2004, much of the purchasing power has been eroded due to prices increasing more than the rate of general inflation in items such as salt, fuel, and paving material.

Operations and Maintenance received some additional funding over the last decade to address high priority maintenance needs including snow and ice removal; bridge inspection and maintenance; pavement and drainage maintenance; and safety and traffic operations. In FY 2006 MnDOT requested and received approval to shift a portion of the State Road Construction funds to the Operations and Maintenance budget based on recommendations in the 2005 Highway Systems Operation Plan. In FY 2009, the Legislature added funding for Operations and Maintenance through Chapter 152.

Infrastructure operations and maintenance spending*



*Average annual by biennium

How we decide

Maintenance decisions are guided by a combination of MnDOT district managers' experience and knowledge of their district along with statewide performance measures and targets, and recommendations from the Highway Systems Operations Plan. Each district prioritizes their maintenance needs, but district maintenance managers coordinate on issues of statewide concern to improve MnDOT's maintenance practices while working toward common statewide targets.

Generally, maintenance and operations needs are greater than the available dollars distributed to the districts, so services are provided based on statewide priorities, safety and needs in each district. For instance, snow and ice removal is a safety service for MnDOT and receives funding priority over other maintenance operations. This may impact summer maintenance services following a particularly harsh winter.

Past market research has measured the importance of many maintenance services. Customers consistently rate mowing and eliminating roadside weeds as significantly less important than maintenance of the road itself. Because of that finding, MnDOT reduced efforts in those areas and redirected resources where there is a higher perceived value such as snow and ice removal, clearly visible roadway markings, and road surfaces.

Source: MnDOT

Learn more

MnDOT Office of Maintenance
www.dot.state.mn.us/maintenance/
Steven Lund—steven.lund@state.mn.us

Pothole information
www.dot.state.mn.us/information/potholes/index.html

MnDOT Market Research
Karla Rains—karla.rains@state.mn.us

Air Transportation

NATIONAL AND GLOBAL CONNECTIONS

Measure

Number of available seat miles (ASMs) offered on scheduled service nonstop flights from Minnesota, as reported by the U.S. Department of Transportation. Analogous to vehicle miles traveled, one ASM is defined as one aircraft seat flown a distance of one mile. As an example, a regional jet with 44 seats covering the 268 miles from Rochester to Chicago would generate 11,792 ASMs per flight.

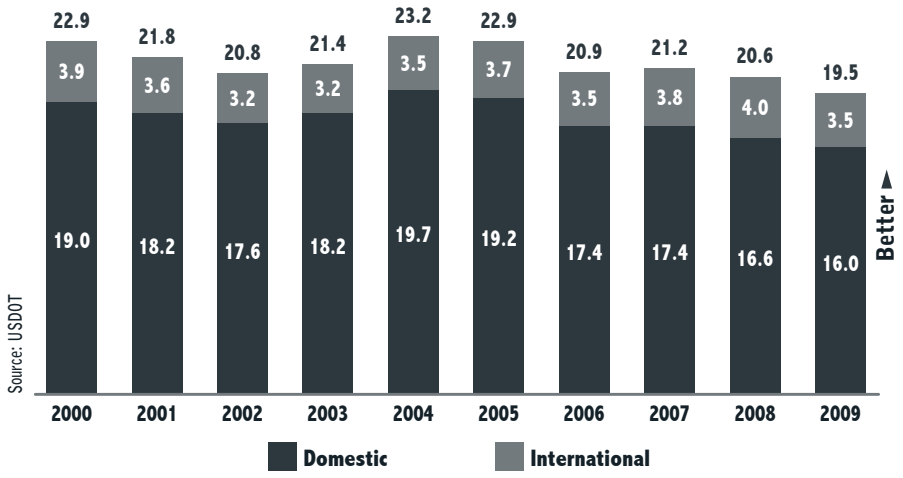
System

Eight Minnesota airports provide scheduled service: Minneapolis-St. Paul (MSP), Bemidji, Brainerd, Chisholm/Hibbing, Duluth, International Falls, Rochester and Thief River Falls. Scheduled service was suspended from St. Cloud in 2010 and from Grand Rapids in 2004. Minnesotans are also served by airports located in adjacent states.

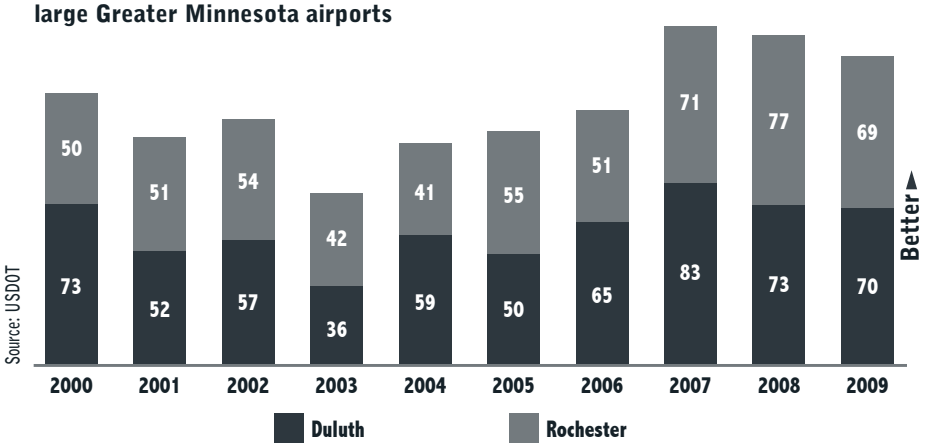
Why this is important

Maintaining air capacity to the nation and the world for the transportation of people and freight is critical to the state's economic future. Access to scheduled air service from Greater Minnesota cities is important to regional economic viability and quality of life.

Available seat miles:
Minneapolis St. Paul International Airport



Available seat miles:
large Greater Minnesota airports



Our progress

Available seat miles for travel fell significantly during the last decade, but demand for air travel, measured in revenue passenger miles, fell far less. On average, airlines used smaller planes and offered fewer flights, and planes had fewer empty seats.

By contrast, the seven Greater Minnesota airports ASM capacity in total ended the 10-year period about where it started. ASMs hit a low in 2003 but mostly maintained their level during the recession.

Duluth and Rochester (the two largest Greater Minnesota airports) each finished the decade with ASMs at about 70 million. This represents nearly 40 percent growth for Rochester and nearly the same capacity for Duluth compared to 2000. Each of the other five airports experienced significant year-to-year variability.

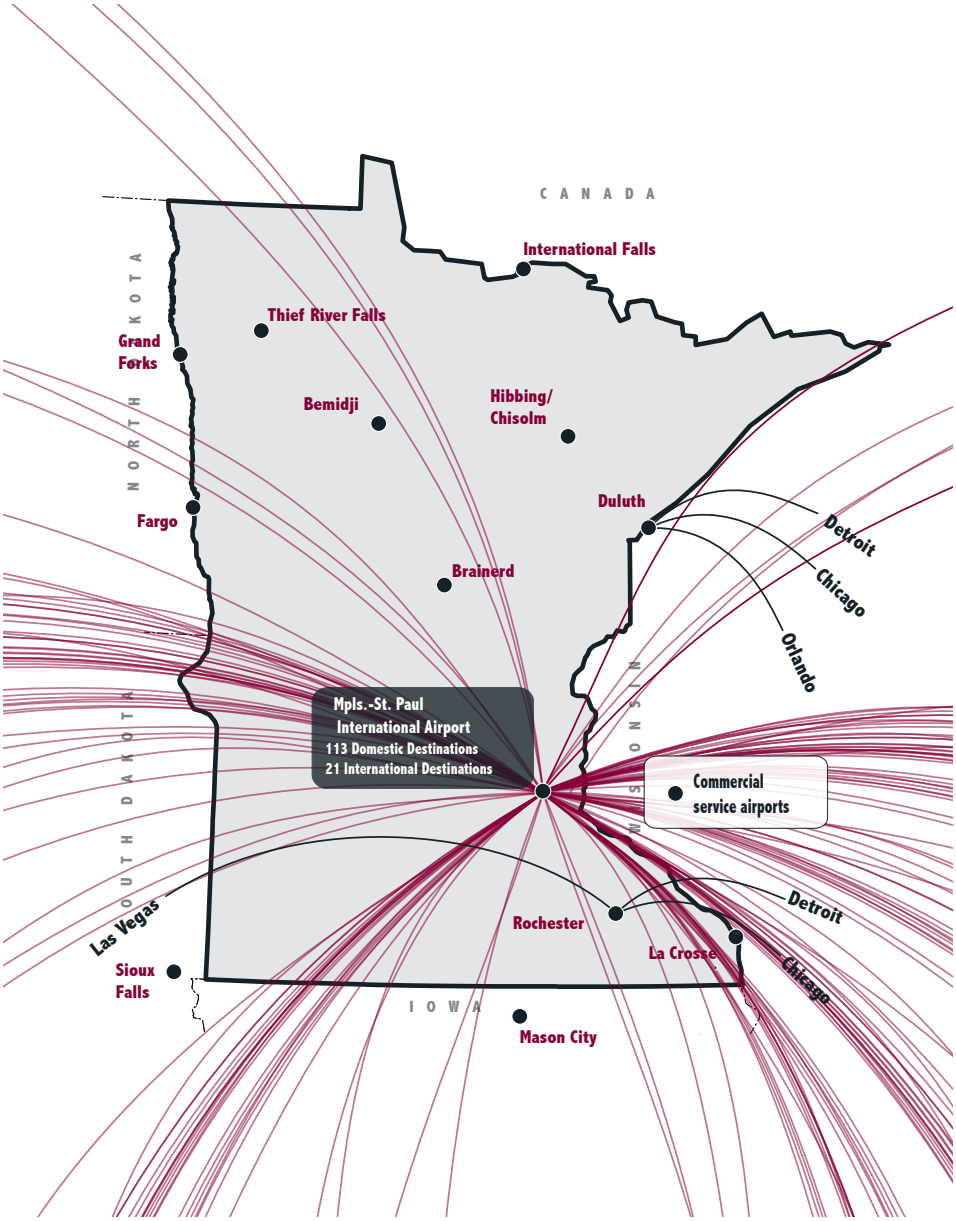
Aviation fuel prices are a primary factor in airline capacity decision-making. Fuel makes up 40 percent of operating expenses at current levels. Rising fuel prices work against adding additional service to accommodate demand as the economy recovers. At the same time, fuel surcharges and rising fares typically depress demand.

Three variables influence ASM totals: aircraft capacity, flight distance and frequency of flights. Isolating frequency, MSP offered 9 percent fewer flights in 2009 than in 2000, against the 15 percent ASM decrease cited earlier, which points to the use of smaller aircraft and/or a shorter average flight length.

While ASM measures the supply of air service, a companion metric, revenue passenger miles, measures the demand for air service. RPMs at MSP fell only 4 percent over the last decade, far less than the drop of available seat miles. This is because flights were filled closer to capacity with fewer empty seats. This load factor at MSP rose from 73 percent in 2000 to 82 percent in 2009.

Market forces in the past decade have diminished the majority presence maintained by Northwest Airlines/Delta Air Lines at MSP. In 2000, the locally headquartered hub carrier and its now merged partner controlled 79 percent of the ASMs from MSP. By 2009, this share had been cut to 69 percent. This indicates growing competition at MSP which could result in a more competitive pricing environment.

Large areas of western and southern Minnesota lack scheduled service, although access is available across state borders in Fargo and Grand Forks, ND; Sioux Falls, SD; and La Crosse, WI.



Source: MnDOT

What we are doing

MnDOT's Office of Aeronautics works with the Local Airline Service Action Committee, the Metropolitan Airports Commission and other partners to maintain and improve air service in Minnesota by investing in airport infrastructure and supporting legislation at both the state and federal levels. LASAC is made up of representatives of the cities in Minnesota that have air service

Strategies

MnDOT strategies working with partners include:

- Supporting cities' efforts to attract airline service,
- Investing to create more secure and passenger friendly terminal buildings,
- Developing the potential of Greater Minnesota airports, and
- Continuing the Air Service Marketing Program.

Investment/spending

Commercial service airports receive a larger share of both state investment and federal Airport Improvement Program funds than airports without commercial service. This funding allows airports to provide improved airfield and terminal designs so that airlines can operate more effectively. Greater Minnesota communities with air service also are eligible to apply for grants from the Air Service Marketing Program. Expenses eligible for reimbursement include air service advertising, marketing studies and route analysis. Funding for this program comes from the State Airports Fund, with an annual budget in FY 2011 of $250,000.

How we decide

Decisions on air routes and markets served are made by the commercial airlines and shaped by a changing airline industry and economy. MnDOT and other agencies such as MAC and local governments can lobby, provide incentives and offer marketing information to strengthen the business case for service to be maintained or extended to more communities.

MnDOT supports airline or airport requests that add scheduled air service routes. The US DOT is responsible for approval of international airline route requests. Project based decision-making is accomplished through the Capital Improvement Plan process for state funds and through the Airport Capital Improvement Plan process for federal funds.

The Minneapolis-St. Paul International Airport is owned and operated by the Metropolitan Airports Commission, whose board is largely appointed by the governor.

Source: MnDOT

For comparison

In 2009, Minneapolis-St. Paul ranked 18th nationally in ASM, down two places from 16th in 2000. However, MSP still overtook Detroit to become the second-largest hub in the combined Delta Air Lines network behind Atlanta.

MSP ranked 10th in total nonstop destinations among U.S. metro areas in 2010, according to MAC analysis. MSP added one domestic destination in 2010 for a total of 114 and preserved its 2009 level of 21 international markets.

Learn more

MnDOT Office of Aeronautics

aeroinfo@state.mn.us
Dick Theisen—dick.theisen@state.mn.us

2006 Minnesota Aviation System Plan

www.dot.state.mn.us/aero/avoffice/planning/sasp.html

Federal Aviation Administration

www.faa.gov

Metropolitan Airports Commission

www.mspairport.com/mac
www.metroairports.org/mac/appdocs/pubs/2009MSPLegislativeReport.pdf

Port Shipments

NATIONAL AND GLOBAL CONNECTIONS

Measures

Annual shipments by weight to and from Great Lakes and river ports

System

4 ports on Lake Superior

5 ports on 222 miles of commercially navigable rivers: Mississippi (187), Minnesota (15), St Croix (20)

Why this is important

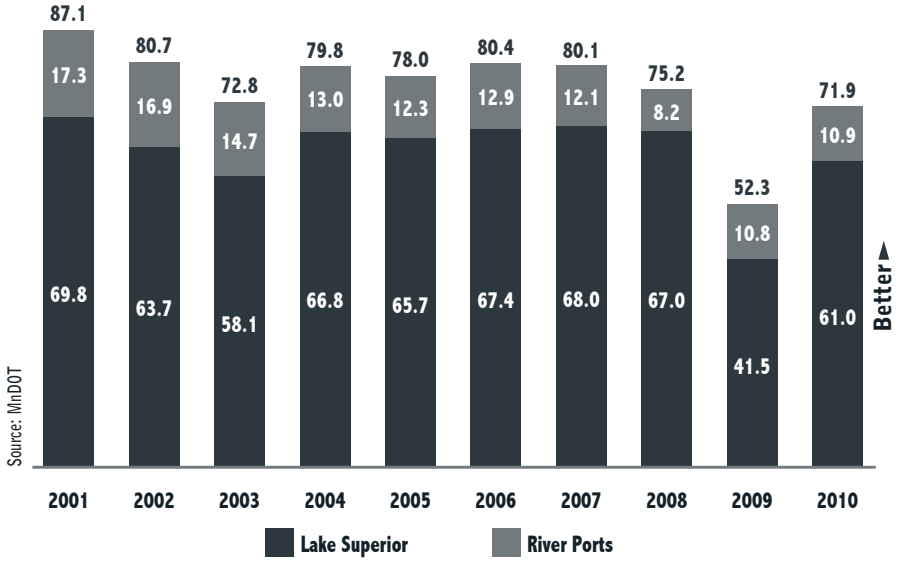
Commercial navigation transports millions of tons of freight into and out of the state. Without a system of commercial navigation, much of this heavy freight would be moved by rail or by truck, resulting in accelerated wear to highway pavements and in some cases contributing to congestion. Export via water transportation is important to resource-based industries such as taconite and grain that comprise significant portions of Greater Minnesota's economy now and into the future. Approximately six percent of freight tonnage in Minnesota is carried by water.

Value of Minnesota waterway shipments

Great Lakes	$6.5 billion
Mississippi River	$2.1 billion
Total	$8.6 billion

Source: MnDOT

Annual port shipments (millions of tons)



Our progress

In 2010, Lake Superior shipping levels recovered rapidly from the recession. River shipping regained momentum the year before. Great Lakes taconite shipping grew to more than 34 million tons because of higher worldwide demand for steel. Coal shipping held steady at 18 million tons. Wind generation component traffic continued to be strong through the Port of Duluth.

The Port of Duluth-Superior recorded higher wheat exports in 2010 due to droughts in Russia that offset an increase in diversion of corn to the production of ethanol. Grain shipments from Minnesota's river ports were more than five million tons in 2010. In 2011, increased global demand for grain should cause increased grain shipping on the rivers and Great Lakes.

The level of waterway freight shipped each year is a function of domestic and international demand, ocean freight rates and world crop production. Over the last eight years, inland river freight has been decreasing in Minnesota and rail freight has been increasing. This is due primarily to a shift to western coal sources and the use of Minnesota corn for ethanol production. MnDOT has limited influence on shipping volume but does have an interest in reducing the impact of heavy trucks on highway pavements.

How many miles can one gallon of diesel fuel move one ton of freight?

Trucking	155 miles
Railroad	413 miles
Barge	576 miles
Great Lakes vessel	650 miles

Source: Texas Transportation Institute, December 2007

What we are doing

Minnesota sits at the upstream end of the Mississippi River system and at the western end of the Great Lakes and St. Lawrence Seaway. The capacity and condition of aging downstream locks on this system can limit shipping to and from Minnesota. Responsibility for improving commercial navigation infrastructure on this system is shared by the U.S. Army Corps of Engineers, the U.S. Coast Guard, local port authorities and private operators. Port authorities own some of the terminal facilities, but the terminals are all managed by private operators.

Strategies

Federal role —The commercial waterway channels on both the Great Lakes and the inland waterway systems are maintained by federal agencies. The U.S. Army Corps of Engineers operates locks and dredges navigation channels to maintain depths of nine feet on the river system and 28 feet on the Great Lakes. The U.S. Coast Guard maintains navigation markers on both systems. Shippers on the Great Lakes pay a freight value tax and river carriers pay a fuel user tax to offset some federal costs.

State role—MnDOT administers the Port Development Assistance Program, which uses funds appropriated by the Minnesota legislature to help port authorities improve efficiency at their waterway freight terminals. The goals of the program are to preserve Minnesota's waterway capacity, expedite the movement of commodities and promote economic development. With the help of these funds, port authorities have been able to rehabilitate dock walls and warehouses, purchase or overhaul product handling equipment, dredge mooring areas and improve rail and truck access to port facilities.

Port authorities—The state's five public port authorities provide facilities for shipping, promote waterway transportation, lease shoreline for barge mooring and work with the Corps of Engineers to designate areas for channel dredge disposal.

Sustainability

Operators are replacing engines and generators with more fuel-efficient models. On the

How we decide

The MnDOT Ports & Waterways Section meets regularly with port authorities to develop and update a priority list of projects to improve terminal efficiency and meet state safety standards. State funded projects must be capital improvements that will increase efficiency and capacity.

National issues

Great Lakes—The new 1200-foot lock at Sault St Marie, Michigan lacks funds for completion. This is the only gateway to Minnesota's Lake Superior ports. A larger problem is the lack of federal funds for the Corps of Engineers to dredge harbors and river channels to prescribed depths. This limits the tonnage carried by each ship. The corps estimates it needs $200 million from the harbor trust fund for dredging.

Mississippi River—The lower five locks on the Mississippi River above St. Louis and the lower two locks on the Illinois Waterways need to be replaced with 1,200-foot chambers to optimize shipping access to Minnesota. The locks were built in the 1930s to handle tows of six barges; the average tow is more than twice as large today. Lock replacement will cost about $2 billion, with the carriers paying half.

Freight moved by water, 2010

Type	Millions of tons	Largest commodities
Lake export	55.6	Taconite, coal
Lake import	5.3	Coal
River export	6.4	Grain, petroleum
River import	4.5	Salt, aggregate, fertilizer, cement

Source: MnDOT

For comparison

According to a 2009 U.S. Army Corps of Engineers report, Duluth-Superior ranked 25th of U.S. ports by tonnage; Two Harbors ranked 56th; and St. Paul ranked 75th. Minnesota ranked 23rd of the 50 states.

Minnesota lake and river ports

Source: MnDOT

Fiscal year expenditures for Minnesota Great Lakes and river ports from the Port Development Assistance Program

Year	2005	2006	2007	2008	2009	2010	2011
Federal	$0	$0	$0	$0	$0	$3,000,000	$0
MnDOT	$12,000	$1,539,157	$1,000,000	$2,925,000	$349,398	$2,258,809	$1,333,183
Local	$31,627	$460,843	$300,000	$922,898	$87,350	$1,191,191	$2,949,354
Total	$43,627	$2,000,000	$1,300,000	$3,847,898	$436,748	$6,450,000	$4,282,537

Source: MnDOT

Port development project spending 2009-11

Year	Project	Port Development Funds
2009	Duluth—Reroof transit shed	$ 258,809
2010	Duluth—Rehab 6,000 feet of dock wall	$1,050,000
2010	Lower MN River—Install culvert to dredge disposal area	$37,831
2010	Winona—Construct new municipal dock wall	$1,200,000
2011	St. Paul—Rehabilitate Barge Terminal #1 seawall	$250,000

Source: MnDOT

Case study–Duluth

Copper bacteria has been corroding the sheet piling dock walls at the harbor of Duluth-Superior. Without action, the walls would collapse within 10 years, along with the roadways and rail lines these docks support. The Duluth Port Authority received $3 million in Federal ARRA (American Recovery and Reinvestment Act) funds to rehabilitate about 6,000 lineal feet of dock wall this past year. The Minnesota Port Development Assistance Program also added $1 million and the port paid the remaining portion of the $5 million project.

Source: MnDOT

What we are doing (cont.)

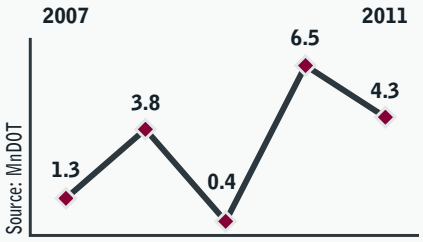
Great Lakes, the Motor Vessel Edwin Gott is the fourth ship to replace its propulsion engines in the past few years. Two of these converted from steam to diesel, which reduces fuel use by 50 percent. On the Mississippi River, all eight towboats of St. Paul's harbor operator have had new engines and generators installed since 1993—increasing fuel efficiency by one-third. These fuel savings will pay for the engines in a few years.

Investment/spending

The Minnesota Legislature began funding the Port Development Assistance Program in 1996. Since then, Minnesota has committed $21 million for 33 projects to increase port efficiency and preserve infrastructure.

Legislative appropriations must have at least a 20 percent match in funding from the benefiting port. Federal dollars have been added to some projects to enable larger improvements.

Federal, state and local expenditures on Minnesota ports ($ millions)



Learn more

MnDOT Ports and Waterways
www.dot.state.mn.us/ofrw/waterways.html
dick.lambert@state.mn.us

The Port of Duluth
www.duluthport.com

U.S. Army Corps of Engineers
www.usace.army.mil

Rail Shipments

NATIONAL AND GLOBAL CONNECTIONS

Measures

Annual rail freight shipments by weight

System

In 2009 there were 20 railroad companies operating on 4,440 miles of track. Four major railroads – BNSF, Canadian National, Canadian Pacific and Union Pacific – operate over 70 percent of the network. The remainder is operated by 16 short-line railroads.

Why this is important

Minnesota's railroads play a critical role in the state's economy, carrying 38 percent of all freight tonnage. Major Minnesota industries rely on the rail system for efficient delivery of goods to markets throughout North America and to the world through service to the Great Lakes and coastal seaports. Rail provides critical options to shippers in terms of market access, economics and service. It increases the state's attractiveness to business. Rail is more energy efficient than trucks and reduces the wear of heavy trucks on public highways.

Our progress

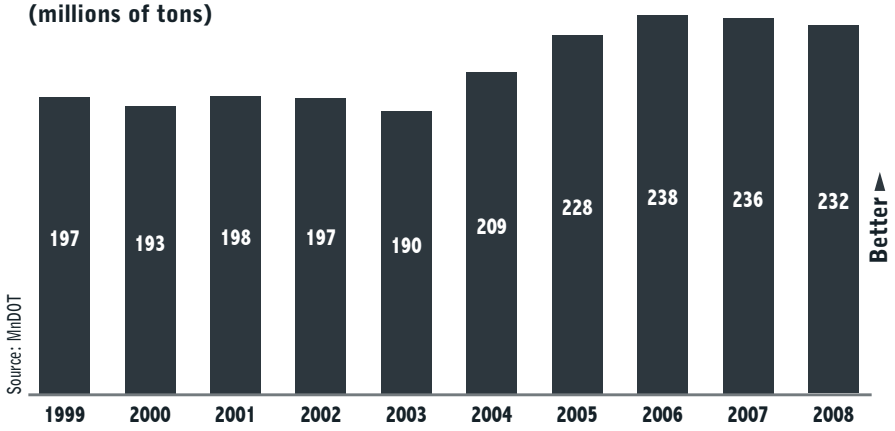
Freight rail shipments decreased slightly in 2008, the most recent year for which these data are available. Other indicators point to a drop in tonnage in 2009 due to the recession and a resurgence in 2010 to past levels. The pattern reflects the broader economy. The amount of freight transported by rail versus other modes depends on the type of cargo, the regulatory environment and other economic factors like fuel prices.

Source: MnDOT

For comparison

Minnesota ranked 13th of the 50 states by tons of freight carried by rail and 18th by carloads carried, according to 2008 data from the American Association of Railroads. As of 2009, Minnesota had the eighth largest state rail network in the United States.

Rail freight shipments in Minnesota (millions of tons)



Source: MnDOT

What we are doing

The Minnesota Comprehensive Statewide Freight and Passenger Rail Plan was completed in February 2010. The plan provides a vision for the use and development of the statewide rail system and guides rail initiatives and investments. Key strategies include maintaining short line services and expanding intermodal container access.

The plan identifies segments on the major railroads that have high potential for congestion. These segments will become more congested as shipping volumes increase in the future, especially on corridors where passenger service is introduced. Improvements to address these issues could include modernizing signals and upgrading weight-restricted tracks and bridges. None of the short-line railroads have congestion issues, but many are weight or speed restricted.

Strategies

The following strategies are identified in the Statewide Rail Plan as necessary to make progress toward the system vision.

- Maintain primary railroad arterials
- Address critical network bottlenecks
- Upgrade main line track to 25 mph minimum speed
- Improve track to support 286,000 pound railcars
- Modernize traffic control and safety systems
- Expand intermodal access

The freight railroads are expected to continue to fund most of their own improvements. There may be opportunities for public agencies to partner with the railroads for infrastructure improvements that have a clear public benefit.

Sustainability

Rising fuel prices tend to drive a shift in freight shipments from truck to rail. According to the American Association of Railroads, rail is four times more fuel efficient than trucking. Major railroads are making efforts to become more efficient by using newer and better engines, higher-capacity and lighter-weight cars and improved operations.

How we decide

Rail carriers and rail users are eligible for Minnesota Rail Service Improvement program loans. Projects that are deemed economically viable and meet the MnDOT criteria established in the rules are funded on a priority basis as funds permit. The criteria include previous shipping levels from the facility, estimated future shipping levels from the facility and benefits to the state. A single location can receive no more than two loans. All projects are evaluated to determine whether they have the financial capacity to repay their loans.

Case study–Rush City

In 2008, Horizon Milling in Rush City used the St. Croix Valley Railroad to receive 160,000 tons of wheat and ship 124,000 tons of flour. This is the equivalent of approximately 12,000 truckloads. In 2009, the railroad bridge over the Snake River in Pine City was closed to rail traffic because a portion of the concrete around the south pier failed. The piers and timber foundation were originally constructed prior to 1906. As a result, the mill, which relies on rail service, was forced to shut down. The St. Croix Valley Railroad received nearly $1 million in federal ARRA funds through MnDOT to repair the bridge, and the mill was reopened when repairs were completed.

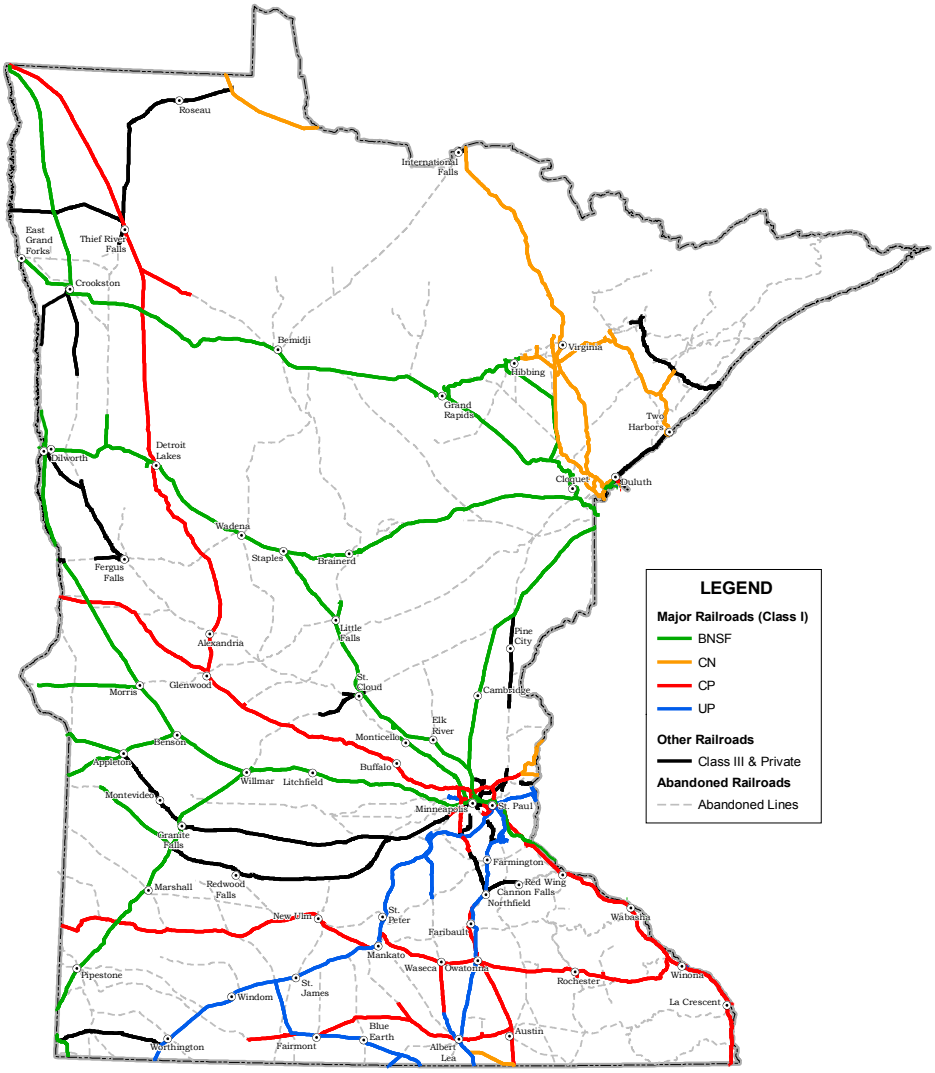
What we are doing (cont.)

Investment/spending

Funding to operate, maintain and improve freight railroads generally comes from private sources. Recently, major railroads have shown consistent profitability and have been investing in infrastructure capacity. Because of issues in the trucking industry such as increasing operating costs and a potential driver shortage, railroads are in better position to take advantage of economic recovery. However, low volume rail corridors and short lines often lack the financial capacity to make infrastructure investments.

The Minnesota Rail Service Improvement program was created in 1976 to assist railroads with capital funding. Over the life of the program, MRSI received general fund appropriations totaling $9.6 million and general obligation bond appropriations totaling $27.0 million, which has leveraged more than $100 million in private, federal and local funds. MRSI funds are loaned to rail users and rail carriers for capital improvements to rehabilitate deteriorating lines and improve rail-shipping opportunities. The MRSI program also buys, preserves and maintains abandoned rail corridors for future transportation uses.

Minnesota Freight Railroads



Source: MnDOT

Source: MnDOT

Minnesota Rail Service Improvement Program 2004-2011*— Spending in millions of $

Year	State	Federal	Total
2004	1.45	1.99	3.44
2005	1.18	0.00	1.18
2006	0.56	2.00	2.56
2007	0.61	0.00	0.61
2008	2.20	0.50	2.70
2009	1.96	0.00	1.96
2010	3.17	2.50	5.67
2011*	1.59	0.00	1.59
Total	12.72	6.99	19.71

Source: MnDOT *2011 projected

Learn more

Statewide Freight and Passenger Rail Plan
www.dot.state.mn.us/planning/railplan

Minnesota Rail Service Improvement Program
www.dot.state.mn.us/ofrw/mrsi.html

American Association of Railroads
www.aar.org/

Minnesota Regional Railroad Association
www.minnesotarailroads.com

Interregional Corridors

STATEWIDE CONNECTIONS

Measures

Percent of interregional corridor miles in Greater Minnesota performing within 2 mph of average corridor travel speed target (55 or 60 mph) or faster

System

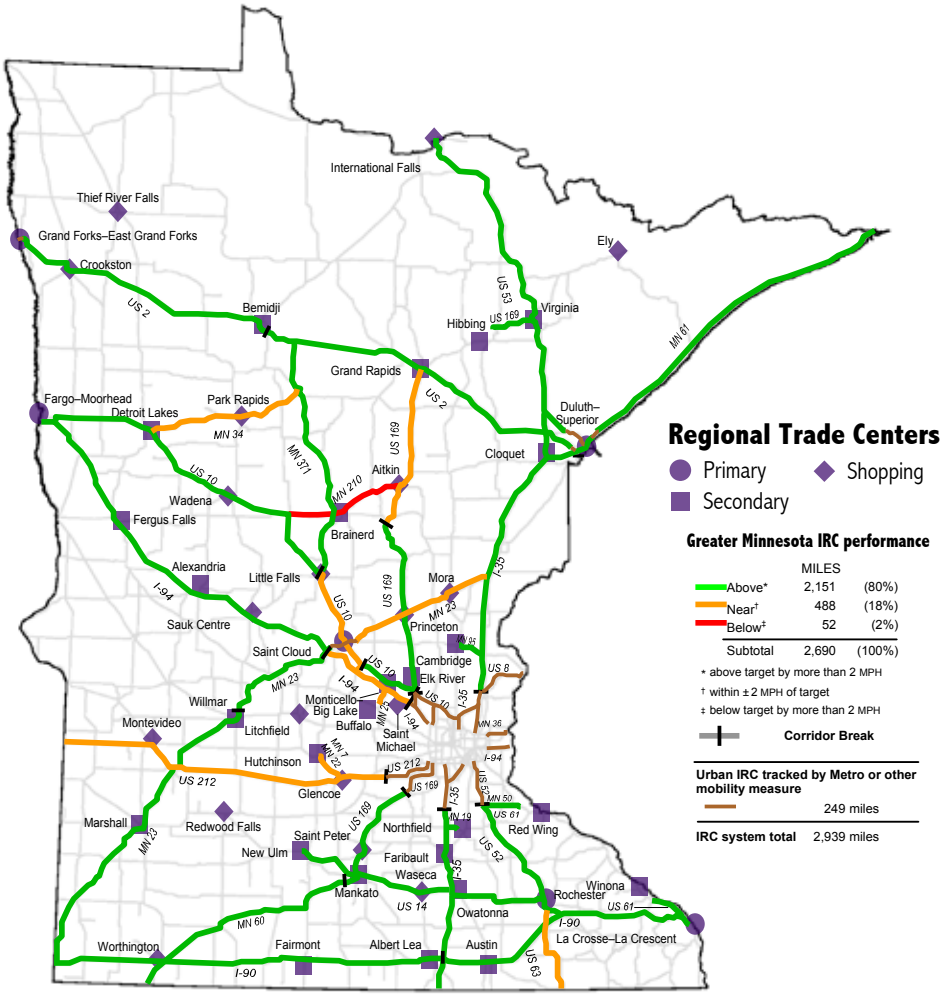
Greater Minnesota state highway interregional corridors (2,690 miles)

Why this is important

The interregional corridor system connects the 50 largest regional trade centers in Minnesota with each other and with neighboring states and Canada. Safe and efficient connections provide access to markets and services and facilitate recreational travel, improving economic competitiveness and quality of life.

The IRC system consists of Greater Minnesota's most heavily traveled roads. Although the IRC system accounts for only 2 percent of all the roadway miles in the state, it carries about 30 percent of all statewide travel. IRCs serve as the backbone of the state highway system, comprising 25 percent of state highway miles but carrying 44 percent of total vehicle miles traveled and 55 percent of heavy truck traffic.

2009 Greater Minnesota interregional corridors average travel speeds vs. target speeds



Source: MnDOT

Our progress

In 2000, MnDOT established targets of 55 or 60 mph for average corridor travel speed for trips on the IRCs. In 2009, 98 percent of the IRC system performed within 2 MPH of its corridor target. Taking into account improvements MnDOT plans through 2019, performance is forecast to remain at 98 percent through 2020. Highway 210 from Motley to Aitkin is the only corridor that performs at more than 2 mph below desired travel speed (shown in red on the map).

What we are doing

MnDOT is currently assessing the IRC system to determine whether any changes are needed in the system of highways, the performance measure for mobility, or management strategies. The review is considering whether to include additional routes and intermodal connectors that are important to freight. It is also developing a more comprehensive set of measures beyond mobility, such as indicators of safety and condition of assets that will help guide investments.

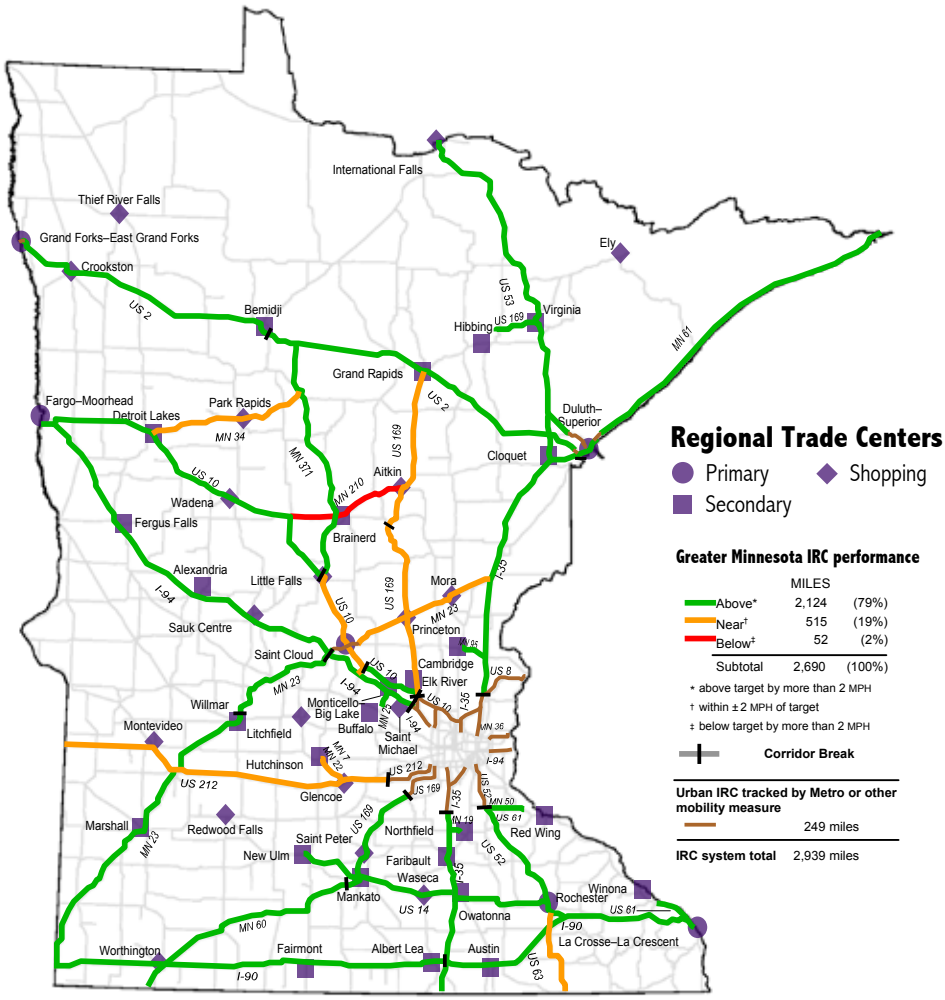
The IRC system was adopted in 2000. Routes were selected to connect the major trade centers in Minnesota as defined by a 2003 study. The study determined a hierarchy of cities using population and the number of several types of businesses to indicate economic importance. By connecting the highest-level centers, the corridors link people with jobs, manufacturers with markets, shoppers with stores and tourists with recreational activities.

Strategies

MnDOT pursues a variety of approaches, from low-cost solutions to major projects. Selective investments continue as funding allows. Projects to improve mobility on corridors performing below mobility targets can include signal timing or elimination, intersection modifications, access management changes, interchanges or capacity expansion.

The 2010 Minnesota Legislature authorized the $44.5 million Safety and Mobility Interchange Program to reduce fatal and serious-injury crashes and relieve traffic congestion. Grants awarded for projects on the IRC system include Highway 52 in Cannon Falls and Highway 169 at Highway 69 in Shakopee.

2019 forecast Greater Minnesota interregional corridors average travel speeds vs. target speeds*



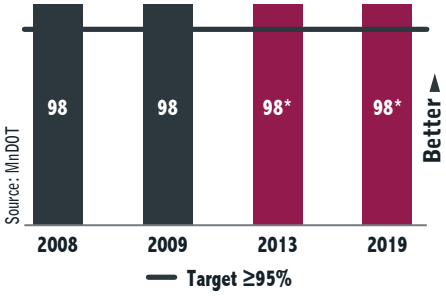
*Based on planned 2010-2013 STIP and 2014-2019 HIP improvements.

Source: MnDOT

How we decide

Decisions to invest in IRCs are guided by MnDOT districts' expertise, policies and performance measures set forth in the Statewide Transportation Policy Plan, and the priorities set forth by MnDOT's executive-level Transportation Program Investment Committee. Communities also provide input through consultation with MnDOT district planners.

Percent of Greater Minnesota IRC miles performing within 2 mph of average speed target or faster



* Predicted performance based on the 2010-13 STIP and 2014-2019 HIP improvements

Source: MnDOT

What we are doing (cont.)

Innovation

The Minnesota Transportation Economic Development (TED) program is a joint effort of MnDOT and the Minnesota Department of Employment and Economic Development (DEED) to address the twin goals of better highways and job growth. Through the TED program, $35 million in bond proceeds and $4 million in DEED grants were set aside in 2010 to fund up to 70% of the transportation and other public infrastructure costs associated with economic development projects. Examples of projects approved for TED funds include a new interchange at US 10 and County Road 34 in Perham and a series of safety enhancements to the existing US 52/ County Road 68 interchange in Zumbrota.

Investment/spending

With 98 percent of Greater Minnesota IRC miles meeting targets for travel speed, MnDOT put minimal funds into construction projects dedicated to improving IRC travel speed from 2006 to 2009. Investment guidelines for 2009–2028 prioritize infrastructure preservation and traveler safety, within a balanced program. Limited remaining funds are available for IRC mobility projects.

Other types of projects often benefit IRC mobility. For example, Highway 14 between Waseca and Owatonna is being upgraded from two-lanes to a four-lane divided expressway to improve safety. When complete, travel time will be shorter and motorists will no longer encounter traffic signals and reduced speed limits in Waseca.

Learn more

MnDOT Office of Capital Programs and Performance Measures
www.dot.state.mn.us/planning/program/

Peggy Reichert—
peggy.reichert@state.mn.us

Minnesota Statewide Transportation Plan 2009–2028
www.dot.state.mn.us/planning/stateplan

Aviation Access

STATEWIDE CONNECTIONS

Measure

Percent of Minnesota population within 20 miles of an airport with a paved and lighted runway

System

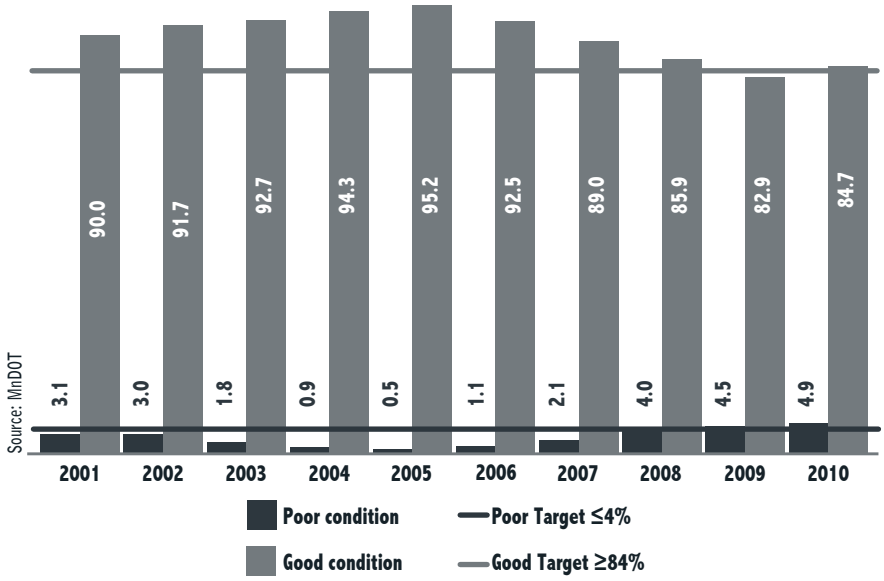
Publicly owned airports (136 airports)

Why this is important

The statewide air transportation system serves Minnesotans who rely on aviation for personal travel, business, recreation and delivery of goods. This system provides access to passenger airlines, air charter providers, corporate aircraft and package delivery services that connect Minnesota to regional, national and international destinations. The air transportation system also supports agricultural needs in crop protection and the delivery of medical and emergency services such as the Minnesota State Patrol, aerial fire fighters, the Civil Air Patrol and local law enforcement.

A paved and lighted runway allows for a broader range of aircraft to use an airport, especially during periods of reduced visibility. During the spring melt, or in periods of exceptionally wet weather, unpaved runways may be too wet and soft for aircraft to use. If the airport does not have at least one paved runway, it is effectively closed to aircraft operations until it dries out.

Percentage runway and taxiway pavements in good and poor condition



Source: MnDOT

Our progress

Of the 136 publicly owned airports in Minnesota, 118 have paved and lighted runways, an increase from the 111 in 2006. Analysis done as part of the State Aviation System Plan found that 96 percent of Minnesota's population lives within 20 miles of these airports, exceeding a target of 90 percent. High levels of access reflect sustained local government commitments.

MnDOT also tracks the condition of Minnesota's air transportation system by measuring pavement quality at public airports. Minnesota airports met target for good pavement in 2010 with 84.7 percent, but were short of target for poor pavement at 4.9 percent. The chart displays the percent of airport runway and taxiway pavements in good or poor condition for the years 2000-2010. After years of very strong performance, pavement condition declined in the second half of the decade.

The relative decline in pavement condition reflects an aging system in which an increasing number of runways are reaching the end of their useful life. It also may reflect decisions by some local units of government to defer repair and reconstruction of runways in the face of local government aid cuts and declining local tax bases.

What we are doing

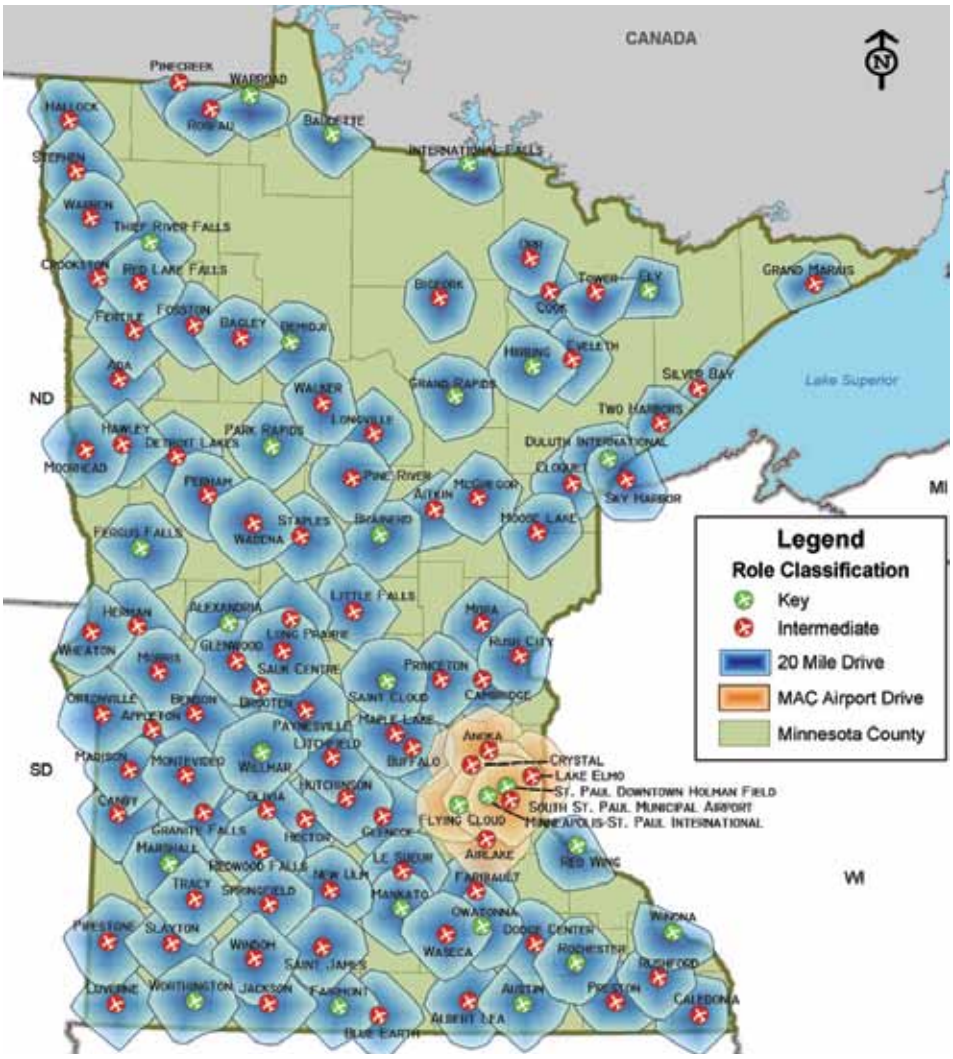
Most Minnesota airports outside the Twin Cities are owned by a city, county or a locally established airport authority. The MnDOT Office of Aeronautics provides technical support and funding assistance to these entities to identify critical short-term needs, plan long-term maintenance and expansion, and bring about cost effective investments that enhance the state's economic vitality and quality of life.

Strategies

MnDOT conducts these activities to support aviation in Minnesota:

- Provides State Airport Fund grants-in-aid for maintenance and improvements.
- Facilitates applications for and receipt of federal Airport Improvement Program grants.
- Monitors runway pavement condition and encourages timely investment to maintain pavements.
- Performs safety inspections and pilot safety training.

Population within 20 miles of an airport with a paved and lighted runway



Source: MnDOT

How we decide

An airport project is initiated at the local government level since they own the facility and must provide a local funding share. Projects at airports included in the National Plan of Integrated Airport Systems qualify for federal funding up to 95% of eligible cost. To be eligible for state funding, a project must be part of the state's Capital Improvement Program, which is used to develop and preserve publicly owned airports in Minnesota. Each year, more projects are listed in the CIP than can be funded. Priority for state funding is given to projects that enhance safety or preserve the existing state airport system.

Case Study – Thief River Falls

Airports support economic growth in cities across Minnesota. One example is the Thief River Falls Regional airport, which plays an important role in the operation of Digi-Key, now the nation's fourth largest electronic component distributor with about $1.5 billion in annual sales. Convenient access to a paved and lighted runaway enables Digi-Key's 2,400 Thief River Falls employees to provide same-day response to orders placed from all over the world.

What we are doing (cont.)

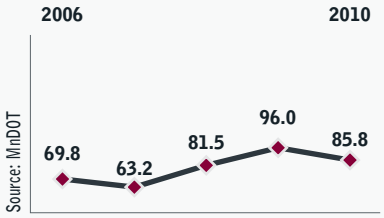
Innovation

MnDOT is in the process of installing Wide Area Multi-Lateration (WAM) technology to address the lack of low-level radar coverage in west central Minnesota. Currently, aircraft operating in this area have to be above 4,000 feet and sometimes as high as 10,000 feet to be in radar contact. WAM will triangulate signals from aircraft transponders to determine an aircraft's position, allowing air traffic controllers to track aircraft at lower altitudes. This will bring many efficiency and safety benefits to Minnesota aviation – saving time, money, fossil fuel and potentially lives.

Investment/spending

Funding for local aviation in Minnesota is derived from federal, state and local taxes and fees on system users. Federal funding sources include collections related to passenger tickets, passenger flight segments, international arrivals/departures, cargo waybills, aviation fuels and frequent flyer mile awards from non-airline sources like credit cards. State funding sources include the Airline Flight Property Tax, the Aviation Fuel Tax and aircraft registration fees. Congress and the Minnesota Legislature appropriate funds that are delivered through grant processes. Individual airports can apply for grants to develop, maintain and operate their facilities. Local airports also receive funding from surrounding municipalities. Total federal and state funding to Minnesota airports is illustrated in the chart below. Over the last six years, 86 percent of this money was from the Federal Aviation Administration.

State and federal grants to publicly owned airports in Minnesota (in millions)



Source: MnDOT

Learn more

MnDOT Office of Aeronautics
aeroinfo@dot.state.mn.us
Kathy Vesely– kathy.vesely@state.mn.us

2006 Minnesota Aviation System Plan
www.dot.state.mn.us/aero/avoffice/planning/sasp.html

Federal Aviation Administration
www.faa.gov

Metropolitan Airports Commission
www.mspairport.com/mac

Congestion

TWIN CITIES MOBILITY

Measures

Percent of Twin Cities freeway miles that are congested

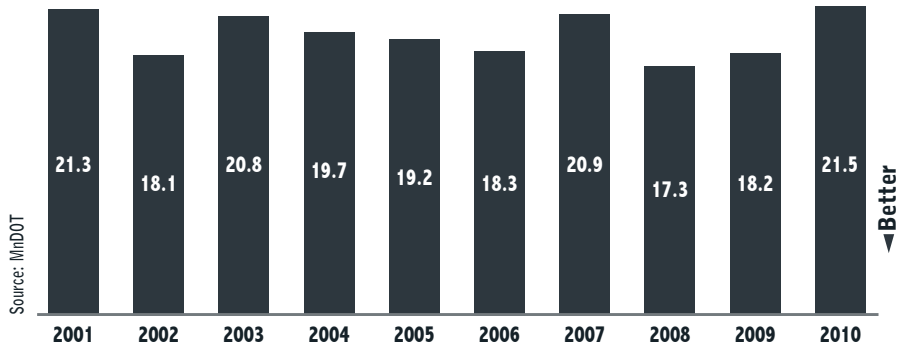
System

Twin Cities urban freeways (379 miles)

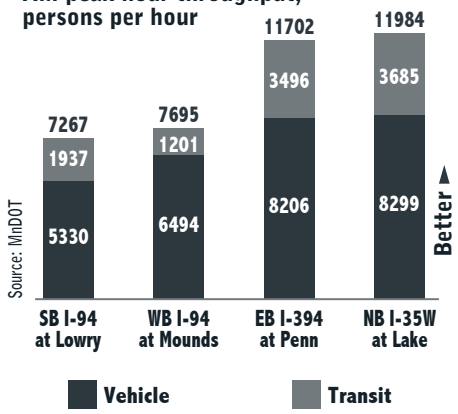
Why this is important

Congestion plays a major role in the daily lives of people in the Twin Cities area. Managing congestion improves quality of life, safety and air quality. More than 50 percent of roadway travel in the state occurs on the 13 percent of roadway miles in MnDOT's Metro District. The region's congestion delay compared to other major metropolitan areas can impact economic competitiveness. Given finite resources and the growth in the region's population, MnDOT's goals are to slow the growth of congestion while providing uncongested alternatives using MnPASS lanes and express transit.

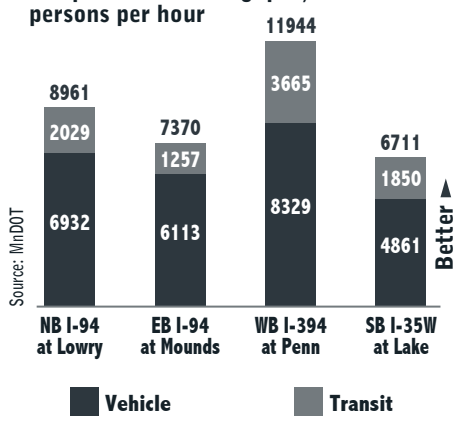
Percent of Twin Cities urban freeway miles congested



AM peak hour throughput, persons per hour



PM peak hour throughput, persons per hour



Our progress

MnDOT defines congestion on the Twin Cities freeway system as traffic flowing below 45 mph for any length of time in weekday peak periods – from 5 a.m. to 10 a.m. and from 2 p.m. to 7 p.m.

In 2010, the Twin Cities freeways saw an increase in congestion to 21.5% from 18.2% in 2009. This represents an increase from 276 to 326 of 1,516 peak directional miles. After a number of years of improvement, congestion has now increased two years in a row. MnDOT expects continued congestion increases as economic activity grows in the next few years.

The duration of congestion is also increasing. Nine miles of freeway were congested for more than three hours in the a.m. peak period in 2010, up from 2.5 in 2009. In the afternoon, urban miles congested for more than three hours increased from 15 in 2009 to 24 in 2010.

Shortly after annual system congestion was measured in October 2010, it dropped due to completion of the Highway 62 Crosstown I-35 project. Congestion on I-35W decreased and congestion shifted east and west on 62 away from the I-35W interchange.

Performance data for individual corridors helps MnDOT analyze the relative severity of congestion and evaluate cost-effective options for improvement. The table and maps on the next page show congestion by corridor. The bar chart titled AM Peak Hour Throughput shows that up to 30 percent of travelers are moved by express transit on four major sample corridors. The table of lower-cost high-benefit projects shows the significant performance gains achieved by three recent projects – measured by reduced congestion and increased throughput. Person throughput—the number of people moved on individual corridors —is one "mode-neutral" measure used to compare the benefits of highway and express transit improvement alternatives.

Lower-cost, high benefit project performance gains

Highway	Project	Results in nearby affected area
I-94	Lane additions McKnight Road	50% reduction in congested miles (PM peak) 15% increase in vehicle throughput (PM peak)
I-394	Westbound auxiliary lane Louisiana Avenue	89% reduction in congested miles (PM peak) 10% increase in vehicle throughput (PM peak)
100	Shoulder conversion 36th St to I-394	77% reduction in congested miles (AM peak) 80% reduction in congested miles (PM peak)

Source: MnDOT

What we are doing

In 2010, MnDOT completed an update to its Metro District 20-year Highway Investment Plan. This coincided with the updated Metropolitan Council Transportation Policy Plan. Due to constrained funding, both plans mark a shift away from relying heavily on major capacity expansion projects towards more cost efficient strategies. They address a greater number of problem areas region–wide and increase reliance on innovation, technology and multi-modal options. While it is not realistic to eliminate congestion, it can and should be mitigated to the fullest extent possible.

Strategies

Strategies identified in the 20-year Highway Investment Plan include:

Active traffic management—MnDOT currently uses an advanced system of cameras, loop detectors, ramp meters, FIRST incident response trucks, changeable message signs and other traveler information systems. Benefits include increases in average throughput, capacity and reliability, and decreases in incidents and travel time. Newer ATM tools to be deployed include dynamic signing and

How we decide

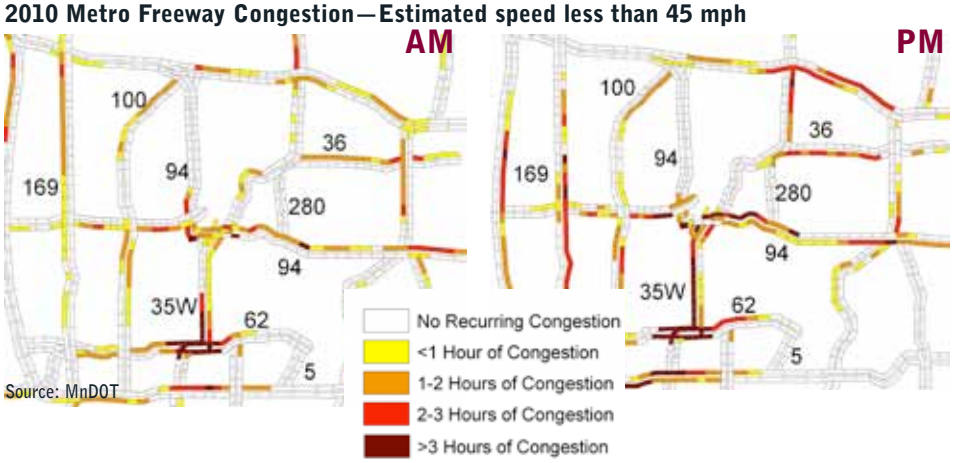
Decisions involving day-to-day management of area highways, such as incident clearance and timing of traffic signals are guided by MnDOT's Metro District, including its Regional Transportation Management Center in Roseville, working with counties and cities.

Long-term decisions on how to address congestion in the Twin Cities are made through a complex, collaborative process. MnDOT's Metro District develops alternatives and plans and makes decisions in partnership with the Metropolitan Council, cities, counties, regional and county transit authorities. Public input is taken on both the Metropolitan Council's Transportation Policy Plan and MnDOT's Metro District Highway Investment Plan. These plans direct projects that go into MnDOT's annual four-year construction program.

Projects to improve mobility are balanced with projects to improve safety or preserve bridges and pavement.

Actual project decisions are affected by changing factors such as revenues, costs and community input. Corridor measurements of travel speed, congestion, throughput and crashes help identify needs and design options but do not alone determine which projects are built. Specific designs for highways or transit facilities are shaped by MnDOT planners and engineers and contracted engineering firms.

2010 Metro Freeway Congestion—Estimated speed less than 45 mph



Source: MnDOT

What we are doing (cont.)

re-routing, dynamic shoulder lanes and variable speed limits.

Lower-cost, high-benefit improvements— These projects improve traffic flow by relieving bottlenecks on freeways and arterials, improving geometric design and addressing safety hazards. Some enhance capacity by adding short auxiliary lanes, and others focus on system management. In some cases, flexible design principles are used to optimize the use of available pavement and right-of-way. Examples of the performance benefits achieved in recent projects are shown in the table below. To preserve arterial performance, MnDOT and its local partners are using strategies such as access management and improving signal coordination on major expressway routes.

Priced managed lanes—MnDOT operates two MnPASS express lanes on I-394 and I-35W. They provide a congestion-free travel option for those driving alone who are willing to pay, those who ride express transit, or who are in carpools. They can move people more reliably, reduce peak travel demand, improve the flow of traffic in adjacent free lanes and enable greater speed and reliability for transit. MnDOT and the Metropolitan Council plan to add lanes to the MnPASS system in the metro area.

Strategic expansion—In some locations, new general purpose lanes may be needed to provide lane continuity or to complete an unfinished segment of the highway system. An example is the extension of Highway 610 in Maple Grove.

Investment/spending

MnDOT's Metro District has identified $285 million in investments dedicated to mobility improvements for the 2011-2014 State Transportation Improvement Program. Several projects scheduled for 2011-2014 that will improve mobility are listed in the table below.

Project	Cost estimate
Interchange at I-494 and Hwy 169	$172 M
Hwy 610 extension from Hwy 169 to County Road 81	$42 M
I-35E bridge reconstruction at Cayuga St	$200 M
I-694/Hwy 51/Hwy 10 interchange lane addition	$42 M

Source: MnDOT

For comparison

By travel time index (the ratio of peak to free-flow travel time), the Twin Cities area is the 7th most congested of 31 metropolitan areas of similar size (19th of 101 overall), according to the 2010 Texas Transportation Institute Urban Mobility Report (Data are from 2009).

Congestion on Twin Cities interstate freeway corridors

Route	Segment	% Congested AM	% Congested PM
I-94	Hwy 101 to I-494	38%	0%
	I-494 to Hwy 100	16%	13%
	Hwy 100 to I-394	11%	4%
	I-394 to Hwy 280	77%	85%
	Hwy 280 to I-35E	45%	62%
	I-35E to I-694	42%	26%
	I-694 to St. Croix River	17%	0%
I-494	I-94 to Hwy 52	0%	0%
	Hwy 52 to Hwy 77	8%	8%
	Hwy 77 to Hwy 100	44%	93%
	Hwy 100 to Hwy 212	41%	41%
	Hwy 212 to I-394	7%	40%
	I-394 to I-94	27%	34%
I-694	I-94 to I-35W	37%	56%
	I-35W to I-35E	54%	61%
	I-35E to I-94	0%	7%
I-394	Dntwn Mpls to Hwy 100	44%	53%
	Hwy 100 to I-494	39%	42%
I-35W	I-35 to I-494	26%	12%
	I-494 to I-94	67%	75%
	I-94 to I-694	22%	29%
	I-694 to I-35	19%	2%
I-35E	I-35 to I-494	2%	8%
	I-494 to I-94	22%	26%
	I-94 to I-694	31%	28%
	I-694 to I-35	18%	3%

Source: MnDOT

Learn more

MnDOT Metropolitan Freeway System 2010 Congestion Report
www.dot.state.mn.us/congestionreport/CongestionReport2010.pdf

MnDOT Metro District 20-year Highway Investment Plan 2011-2030
www.dot.state.mn.us/planning/stateplan/download-investmentplan.html

MnDOT real time traffic information and maps
www.dot.state.mn.us/tmc/trafficinfo/traffic.html

Metropolitan Council Transportation Policy Plan
www.metrocouncil.org/planning/transportation/TPP/2010/index.htm

Texas Transportation Institute Urban Mobility Report
http://mobility.tamu.edu/ums/

Incident Clearance

TWIN CITIES MOBILITY

Measures

Clearance time for urban freeway incidents

System

Twin Cities urban freeways (400 miles)

Why this is important

Incidents are a major source of non-recurring congestion. As a rule of thumb, four minutes of congestion results from each minute one traffic lane is blocked by an incident. Among the objectives in the Metro District Highway Investment Plan is an increase in travel time reliability. Clearing incidents from the freeway system quickly helps reduce congestion and secondary crashes. The Freeway Incident Response Safety Team (FIRST) program has a benefit-cost ratio of about 16 to 1 based on reduced delay, crashes, fuel consumption and emissions.

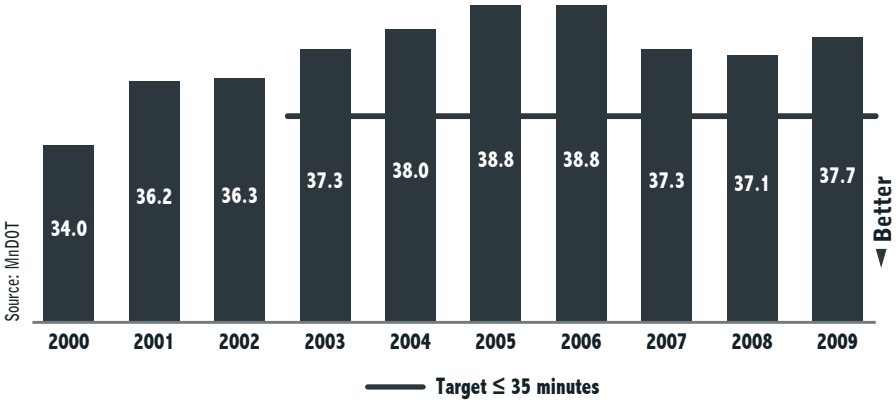
Our progress

Average incident clearance time was longer in 2009 than in the past two years. The incident detection system has expanded to areas previously not covered by FIRST incident response trucks.

Cameras allow the RTMC to monitor traffic in real time.

Source: MnDOT

Average clearance time for Twin Cities urban freeway incidents (minutes, 3-year average)



Source: MnDOT

Source: MnDOT

What we are doing

MnDOT works with the Minnesota State Patrol, local police, towing companies and other emergency responders to improve speedy clearance of incidents from freeways. Also, there are new laws that allow quick clearance of incidents. MnDOT and the State Patrol also have signed an "Open Roads Policy" agreeing to expedite the removal of vehicles, cargo and debris from state highways to more quickly restore traffic flow following a crash or incident. MnDOT is able to respond to more incidents because FIRST coverage has approximately doubled since the program began.

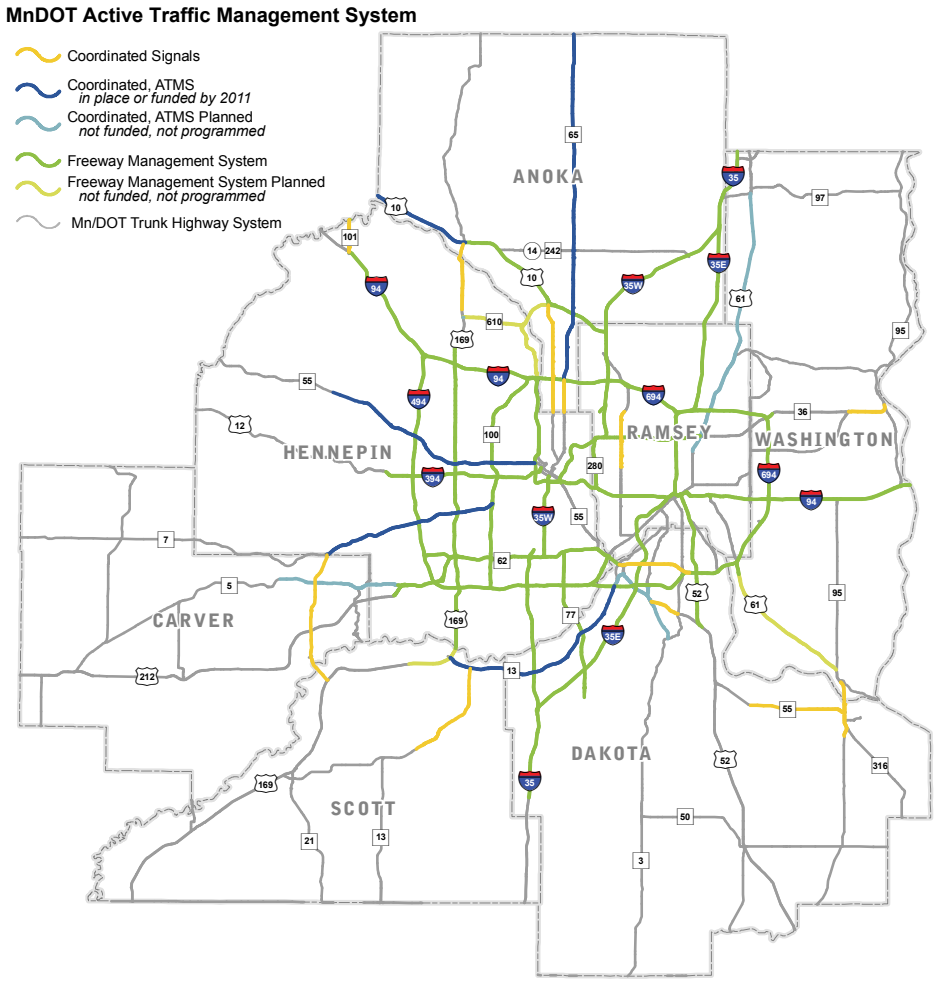
In 2010, the Minnesota Legislature passed a "quick clearance" law that allows MnDOT and the State Patrol to remove obstructions from roads without waiting for the owners to do so. This applies to vehicles involved in crashes or spilled loads that block the road or aggravate an emergency.

Strategies

MnDOT's Metro District 20-year Highway Investment Plan and the updated Metropolitan Council Transportation Policy Plan both emphasize management strategies to optimize the use of existing lanes. As facilities accommodate more traffic within existing capacity, operations such as incident clearance will become more important to ensure reliable travel. Other reliability strategies include providing MnPASS high-occupancy/toll lanes as a congestion-free alternative on freeways, and coordinating signals and limiting access points to reduce traffic flow disruptions on arterials.

Strategies to improve freeway incident clearance time include:

- Expanding FIRST coverage on Highway 10, I-35W and I-35E when funding becomes available.
- Improving on-site efficiency with use of



Source: MnDOT

How we decide

MnDOT Metro District's Freeway Management team and maintenance staff, along with the State Patrol, are located at the Regional Transportation Management Center in Roseville. They monitor 400 miles of the Twin Cities urban freeway system with cameras and vehicle loop detectors buried in the roadways. When an incident is identified, RTMC personnel communicate with MnDOT field personnel and other emergency responders to decide the best method for responding to and clearing the incident. FIRST drivers work closely with troopers and maintenance to secure the scene, control traffic and clear blocked lanes.

Source: MnDOT

What we are doing (cont.)

automated crash forms by the State Patrol and computer-aided State Patrol dispatching on laptops in FIRST trucks.

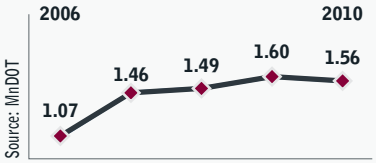
- Conducting Emergency Responder Safety training, that emphasizes keeping traffic moving while safely securing the scene; following guidelines developed with various partners.
- Working with external partners, including towing associations on quick clearance, the State Patrol on Open Roads Policy and FHWA to meet the National Unified Goal for Traffic Incident Management.

Strategies such as lane control signals and dynamic message signs help warn motorists and manage traffic until clearance personnel arrive.

Investment/spending

Incident management extends beyond the FIRST program at the Regional Transportation Management Center. MnDOT's supporting activities include maintenance crews and equipment that help clear major incidents, freeway system design and repair, cameras, dynamic message signs and traveler information to radio, television and the internet. Additional resources are committed by the State Patrol, local fire and rescue squads, local law enforcement, EMS/ambulance services and tow-truck operators. The following chart displays FIRST program expenditures from 2006 to 2010.

FIRST program spending: $million



For comparison

The Twin Cities ranks first of 31 metropolitan areas of similar size (11th of 101 overall) in the amount of delay avoided because of operational treatments, according to the 2010 Texas Transportation Institute Urban Mobility Report (Data are from 2009). Operational treatments included are incident management, ramp metering, signal coordination, access management and HOV lanes.

Learn more

MnDOT Regional Transportation Management Center (RTMC)

brian.kary@state.mn.us
www.dot.state.mn.us/rtmc/index.html

MnDOT real time traffic information

www.511mn.org/.

Federal Highway Administration Congestion Reduction Toolbox

www.fhwa.dot.gov/congestion/toolbox/service.htm.

Metro Area Transit: Rail & Express Bus

TWIN CITIES MOBILITY

Measures

Annual rail and express transit ridership in the Twin Cities metropolitan area: includes express buses (all providers), light rail transit and commuter rail.

System

Includes transitways and supporting infrastructure within the metro area transit system. Transitways are corridors where a dedicated running way or other feature enables transit to move more quickly or reliably than personal vehicles. They include light rail transit, bus rapid transit, commuter rail, and express buses with transit advantages. Express bus services provide a premium over regular-route bus service in travel time or ride quality.

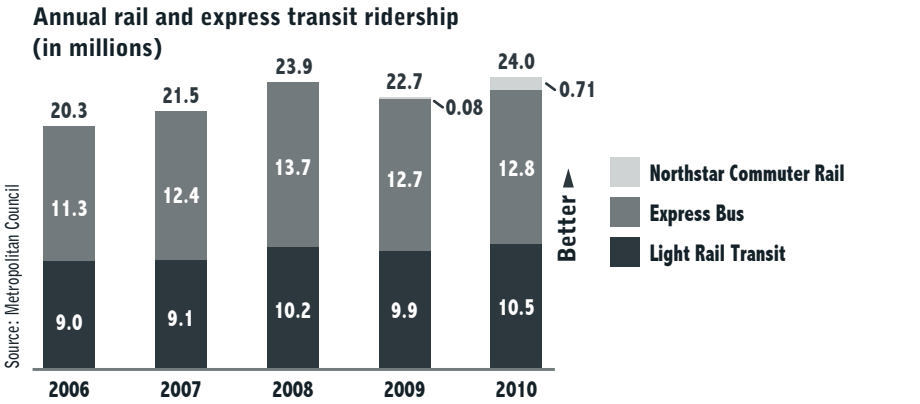
Transit features on highways that serve express transit include: 296 miles of bus-only shoulders, 12 miles of bus-only lanes on city streets, 7 miles of exclusive busways, 49 miles of HOV/HOT lanes, and 94 ramp meter bypasses. Supporting infrastructure for express transit includes 111 Park & Ride lots with over 28,860 spaces and 32 Transit Centers with improved transfer facilities and waiting conditions.

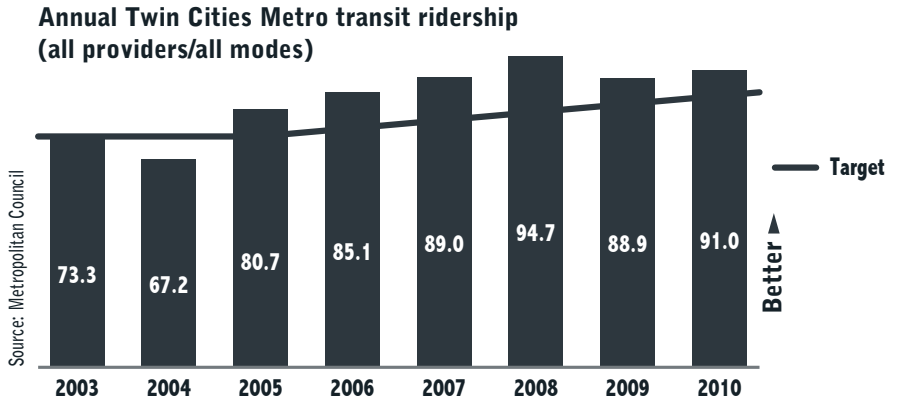
Why this is important

Transit connects people to jobs, family, schools, shopping, health care centers, sports and cultural events. Transit is an alternative to driving that can reduce congestion, fuel consumption, and greenhouse emissions. Rail and express transit offers more reliable trips over longer distances during peak commute hours than regular transit.

For comparison

According to the Office of the Legislative Auditor, in 2008 Metro Transit ranked fourth among 11 national peer agencies for having the lowest cost per passenger. Metro Transit also had the second highest fare recovery percentage, with 31 percent of its operating expenses covered by fare revenue.





Our progress

Rail and express transit ridership was 24 million trips in 2010, an 18% increase from 2006. Most of the increase is explained by rising use of express bus and LRT service – both added 1.5 million annual riders over the four year period. The rest of the increase reflects ridership on the Northstar Commuter Rail Line. Rail and express transit ridership constituted 26.4 percent of all transit trips in 2010.

Part of this growth can be traced to increased gasoline prices. Another factor is congestion. Freeway congestion has increased steadily since 2008, which makes the reliability and time savings of rail and express transit more attractive.

Recent changes in transit routes have helped attract more riders, as have new infrastructure such as park-and-ride lots, transit centers, additional bus lanes, and electronic signs showing bus arrival times in downtown Minneapolis.

Counting all forms of public transit, including regular route and dial-a-ride buses, 2010 ridership in the metro area totaled 91 million trips. This represented a partial rebound from the 2009 slump caused by the recession. Total transit ridership has exceeded Metropolitan Council targets every year since 2005. The council's goal is to double 2003 ridership by the year 2030.

What we are doing

Metropolitan Council—The Met Council's 2030 Transportation Policy Plan outlines strategies to increase transit ridership in the Twin Cities, including developing a regional transitway system. The Met Council has primary responsibility for planning transitways. It also oversees Metro Transit which operates the the largest fleet of express buses, the sole LRT line, and the sole commuter rail line. The Met Council uses engineering, enforcement, education, and emergency trauma systems to accomplish its goals.

Minnesota Department of Transportation—MnDOT contributes to transitways by providing transit advantages on state highway corridors. Transit advantages enable express buses to move more people faster along existing corridors by bypassing peak-hour congestion. MnDOT also assists the Met Council and county transit authorities in planning, designing, financing and constructing light rail and commuter rail lines.

Counties Transit Improvement Board—CTIB is a joint powers agreement among Anoka, Dakota, Hennepin, Ramsey and Washington counties. It receives and distributes a one-quarter percent transit sales tax for the development, construction and operation of transitways serving the five-county area. CTIB has committed 30 percent of the funding to construct the Central Corridor LRT line. It also committed operating funds for the Hiawatha

Source: MnDOT

What we are doing (cont.)

LRT line, Northstar, and the I-35W and Cedar Avenue BRT lines.

Strategies

The map above displays the current and planned metro area transitways system. The Central Corridor LRT line is under construction and the Southwest Corridor LRT line has applied to enter preliminary engineering. In the East Metro, the Met Council and CTIB are funding an express bus demonstration on the Rush Line corridor between St. Paul and Forest Lake. Other transitways being explored are the Red Rock corridor to Hastings, Highway 65 into Anoka County, and I-94 from St. Paul to the St. Croix River.

Many strategies to expand rail and express transit ridership have already been described. Chief among them is the expansion of system coverage and frequency, and the construction and maintenance of park-and-ride facilities throughout the region.

MnDOT helps make rail and express transit more competitive by building and maintaining the bus shoulder system; providing ramp meter bypasses for buses; planning and constructing special highway lanes such as MnPASS; and contributing to Bus Rapid Transit projects such as those on I35W and TH77/Cedar Avenue.

Sustainability

MnDOT is a pioneer in the use of bus shoulders, which have environmental and fiscal benefits. They increase the productivity of existing highway right-of-way by moving more people faster and reducing fuel use and emissions caused by idling in congestion. Today, the 296-mile system is the nation's largest. More than 130 express bus routes use bus-only shoulders, typically saving metro area riders 5 to 15 minutes per trip.

Investment/spending

Capital investment in transit infrastructure varies widely from year to year depending on projects under construction. The largest source of funding for the construction of rail projects is generally the Federal Transit Administration. Other major sources are the CTIB, state general funds and local governments. Additional partners have been the Metropolitan Airports Commission on the Hiawatha LRT Line and the Minnesota Twins on Northstar.

Major expenditures in 2010 included:

- Met Council - $298 million in capital investment, $379 million in operating expenditures
- CTIB - $94 million in capital and operating grants
- MnDOT - $31 million in capital funds. Over half went to rebuild bus shoulders on I-94 in St. Paul.

How we decide

Expansion and improvements of express bus transit advantages on highways have traditionally been made through a process guided by Team Transit, consisting of transit planners and engineers from the MnDOT Metro District, Met Council/Metro Transit, and other providers in the region. MnDOT examines each potential project for maximum impact on ridership and congestion.

Roles in light rail and commuter rail development vary by project. On the Hiawatha LRT Line, Hennepin County led initial planning, MnDOT provided design and construction services and the Met Council administered financing and now operates the line. For the Central Corridor, Ramsey County led initial planning. Met Council is the lead agency during design, construction and will operate the line. MnDOT provides assistance with construction, property acquisition, utilities and environmental preservation.

Innovation

The Urban Partnership Agreement was a collaboration of the U.S. Department of Transportation, MnDOT, Met Council, the city of Minneapolis and other partners. The goal was to reduce congestion on I-35W and Highway 77 by packaging innovative concepts together in a way that creates more combined performance benefits than traditional approaches would have. UPA obtained $150 million in competitive federal funds and was completed in 2010. It produced 16 miles of new MnPASS Express Lanes on I-35W between Burnsville and Minneapolis, Smartlane traffic management technology, 2,800 additional parking spaces at six park & rides, 27 new buses, the region's first online BRT station and a 24-block street and sidewalk reconstruction of Marquette and Second Avenue in downtown Minneapolis—reducing bus travel times through downtown by up to 10 minutes.

Learn more

MnDOT Metro District –
www.dot.state.mn.us/metro
Bryan Dodds, Metro District Transit Director
bryan.dodds@state.mn.us

Metropolitan Council/Metro Transit
www.metrotransit.org

2030 Transportation Policy Plan—
www.metrocouncil.org/planning/transportation/TPP/2010/index.htm

Counties Transit Improvement Board
www.mnrides.org/

Urban Partnership Agreement Project
www.dot.state.mn.us/upa

Bus Service Hours

GREATER MINNESOTA METROPOLITAN AND REGIONAL MOBILITY

Measures

Greater Minnesota public transportation bus service hours. A bus service hour (revenue hour) measures the time that a vehicle is available to the general public with the expectation of carrying passengers.

System

59 public transit systems serving 77 out of 80 Greater Minnesota Counties (as of 2010).

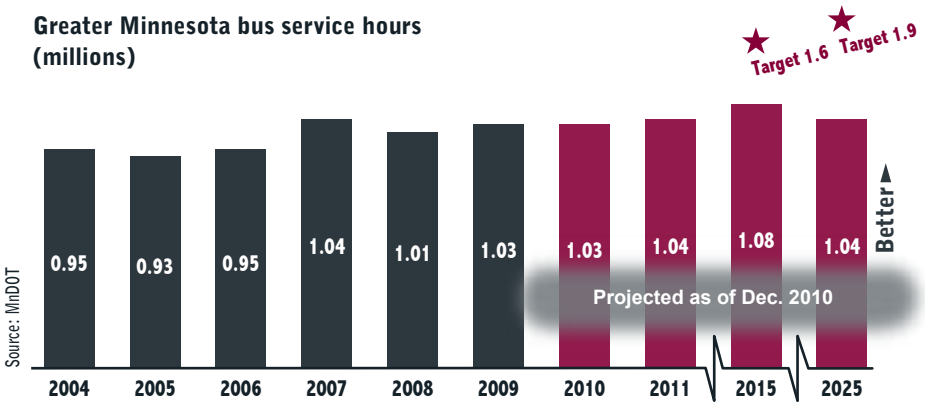
Why this is important

Greater Minnesota public transportation systems provide thousands of people with access to jobs, education, health care, shopping and recreation. These systems also enhance the mobility of the elderly and persons with disabilities in communities across the state.

Bus service hours are used to track the level of transit service provided in Greater Minnesota. Bus service hours are also used to calculate the service level necessary to meet transit need. To meet legislatively directed transit service targets, the Greater Minnesota Transit Investment Plan estimates that 1.6 million service hours will be needed in 2015 and 1.9 million service hours in 2025.

Source: MnDOT

Greater Minnesota bus service hours (millions)

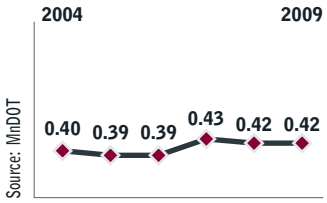


Our progress

Apart from a small drop in 2008, Greater Minnesota bus service hours were roughly 1.03 million per year between 2007 and 2010. This trend of little or no bus service hour growth is expected to continue over the long-term, due to flat revenue projections and the effect of inflation on transit providers' purchasing power. Because transit need is projected to increase, it will result in a widening gap between need and the level of service provided.

MnDOT calculates transit need using annual service hour per capita target rates that vary with population density. The target rate for large urban centers (Duluth, Rochester, and St. Cloud) is between 1.5 and 1.75 hours; the target rate for rural and small urban areas is between 0.5 and 0.75 hours. The chart below presents annual Greater Minnesota service hours per capita in the aggregate. The chart shows that bus service hour growth outpaced growth in population between 2005 and 2007, resulting in a 10% increase in service hours per capita. Since 2007 service hours per capita have been flat.

Greater Minnesota bus service hours per capita



What we are doing

Greater Minnesota's 59 public transit systems are operated by local governments and non-profits. MnDOT manages state and federal transit assistance programs, directs planning and research, and provides technical assistance.

Strategies

The most effective way to grow the number of bus service hours in Greater Minnesota is to maintain and expand the statewide public transit network. The Greater Minnesota Transit Plan 2010 – 2030 delineates three strategies to achieve this goal (Policy 1, pg 7-2).

First, prioritize financial assistance to public transit services that meet performance targets. MnDOT recommends local transit systems establish performance objectives for every kind of service, such as:

- fixed routes in larger cities like Duluth and St. Cloud,
- demand response routes, and
- deviated routes.

Local operators with service segments that do not meet local objectives are encouraged to reassign service to other segments that are more productive.

Second, provide resources to start new transit services in areas without public transit.

Third, support the expansion of core service frequencies and the weekday/weekend service hours of existing transit providers.

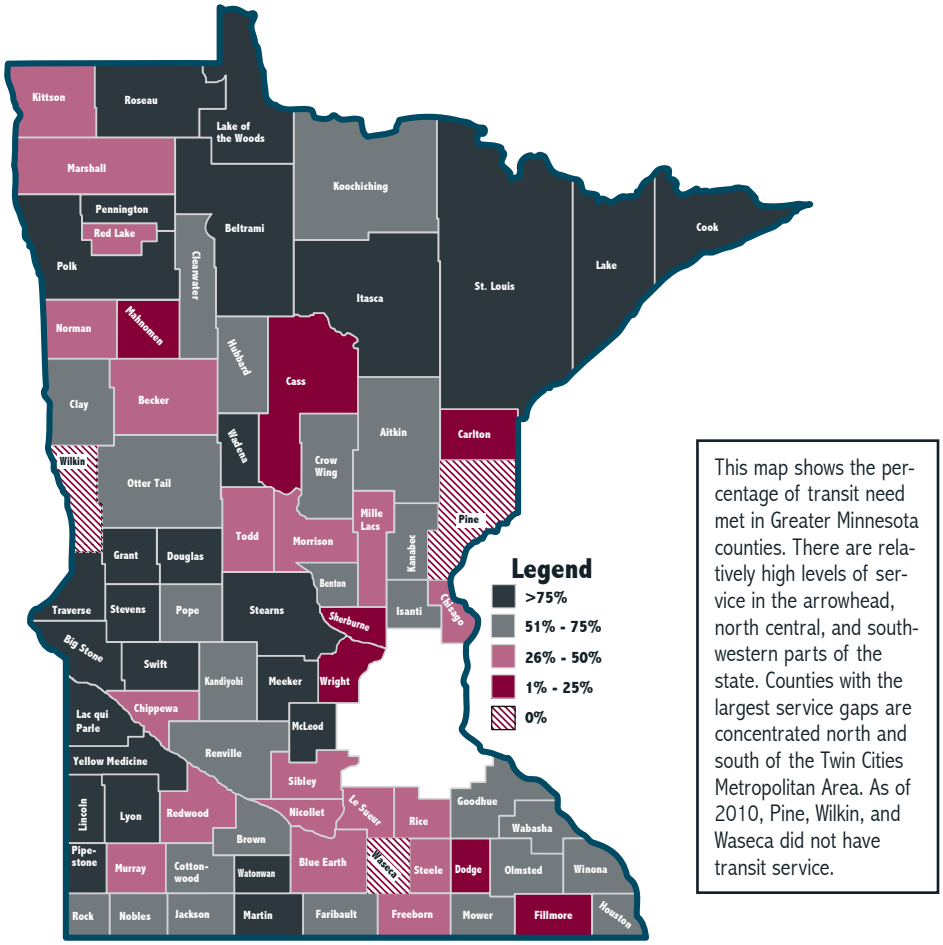
Sustainability

Rainbow Rider – a public transit system serving Douglas, Pope, Stevens, Todd, Traverse and Grant counties – recently became one of only a few rural transit systems in the nation to have hybrid buses in its fleet. Using funds from the American Recovery and Reinvestment Act, Rainbow purchased 8 handicapped accessible, 12-passenger vehicles powered by electric motors at speeds less than 28 mph. Rainbow Rider officials estimate that the hybrid buses could save 20 to 30 percent in gas costs.

Innovation

Arrowhead Transit in northeastern Minnesota recently added Intelligent Transportation System technologies to improve scheduling and dispatch.

2010 Percent of transit need met by county



This map shows the percentage of transit need met in Greater Minnesota counties. There are relatively high levels of service in the arrowhead, north central, and southwestern parts of the state. Counties with the largest service gaps are concentrated north and south of the Twin Cities Metropolitan Area. As of 2010, Pine, Wilkin, and Waseca did not have transit service.

Source: MnDOT

How we decide

Each year the transit systems submit transit grant applications to the Office of Transit for funding consideration. The application for funds includes a service plan that describes the hours of service, the routes or areas served, the number of buses, and the frequency and span of service.

According to the Greater Minnesota Transit Investment Plan, the first priority is to preserve existing systems. To qualify for preservation, a system must demonstrate local fiscal capacity and meet performance standards as measured through an annual, three-step system review process.

Step 1: Conduct system-level performance reviews based on peer groups. Reviews use the following measures:

- Cost per passenger
- Cost per service hour
- Passengers per service hour
- System revenue to total operating cost ratio

Step 2: Check compliance with state and federal reporting requirements.

Step 3: Conduct follow-up operational analysis. If a system fails on either of the first two steps, MnDOT requires a follow-up analysis to identify causes of poor performance. MnDOT works with systems to improve performance.

What we are doing (cont.)

The upgrades provided Arrowhead Transit with:

- automated data collection,
- mobile communication,
- in-vehicle navigation, and
- emergency response capabilities at one-third the cost of a traditional mobile data computer.

Operational improvements resulting from ITS enhancements have also supported the consolidation of four dispatch centers.

Investment/spending

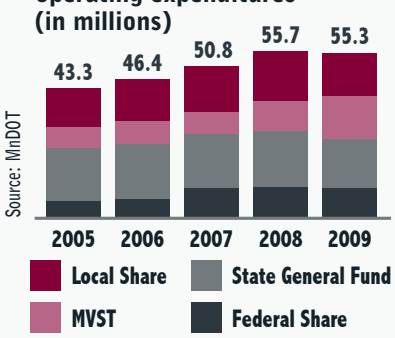
Public transportation programs in Minnesota are funded through a federal-state-local partnership. When state and federal funds are adequate, local sources pay a maximum share of the total operating costs, either 15 or 20 percent, depending on the type of service provided. When state and federal funds are not sufficient to fund service at the 80 and 85 percent targets, local systems have the option to make up the difference.

State funding of Greater Minnesota transit comes from General Fund appropriations and the Motor Vehicle Sales Tax (MVST). Greater Minnesota transit's share of MVST revenue is 4 percent

Federal funding for Greater Minnesota transit is set by the Federal Transit Administration's formula for distributing transit dollars to each state. Local contributions come primarily from passenger fares, contracts for services, and property taxes.

Greater Minnesota transit operating spending is shown below. The graph shows that Greater Minnesota transit spending increased dramatically from 2005-08. An increase in transit's share of the MVST largely offset reductions in state general fund and local transit spending during 2009.

Greater Minnesota transit operating expenditures (in millions)



Source: MnDOT

Learn more

MnDOT Office Transit
www.dot.state.mn.us/transit
Mike Schadauer—mike.schadauer@state.mn.us

Greater Minnesota Transit Plan 2010-2030 and other reports
www.dot.state.mn.us/transit/reports.html

Federal Transit Administration Grant Program
www.fta.dot.gov/grants_financing.html

Access

COMMUNITY DEVELOPMENT AND TRANSPORTATION

Measures

Percent of signalized intersections requiring accessible pedestrian signals that have them.

Percent of Greater Minnesota curb ramps that comply with the Americans with Disabilities Act.

System

ADA applies to all public right-of-way, facilities, buildings, meetings, hearings and documents. The APS measure applies to 1,179 state highway intersections. The curb ramp measure applies to all curb ramps at state highway intersections.

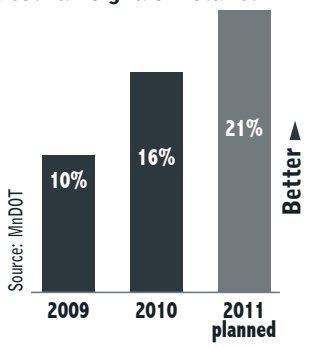
Why this is important

The goals of MnDOT's ADA strategic initiative are to ensure that:

- Minnesota transportation systems are accessible to all users, including people with disabilities;
- MnDOT's facilities, activities and programs are accessible to all;
- Minnesota complies with national ADA laws prohibiting state and local government agencies from discriminating based on disability;
- MnDOT builds public trust with users of accessible public services.

Source: MnDOT

Percent of intersections with accessible pedestrian signals installed



Our progress

The 89 APS installations in the 2010 construction season brought the system total to 194 of 1,179 locations where APS is required. The construction program for 2011 includes an additional 49 intersections. MnDOT's target is that all intersections with pedestrian push buttons will have APS by 2030. Based on normal signal replacement intervals for aging signals, and special dollars being invested, MnDOT expects to meet its target. APS is also required for all new signals, whether replacing existing signals or at a new location.

MnDOT is currently taking inventory of its curb ramps and sidewalks. Greater Minnesota districts have completed curb ramp inventories, and Metro District is about 25 percent complete. The sidewalk inventory will begin in 2011. The policy is to replace ramps that are structurally deficient before addressing those that are functionally substandard or obstructed.

What we are doing

MnDOT's ADA Transition Plan prioritizing departmental policies and infrastructure improvements was published in April 2010 and will be updated again in 2012. ADA is one of 12 flagship initiatives in the department's strategic plan. Internal and external advisory groups were consulted in the development of the transition plan, and continue to guide efforts to make the transportation system accessible. One of MnDOT's responses to the disability community's recommendations has been to adopt the national Public Right of Way Accessibility Guidelines as a basis for updates to facility design standards and policies. MnDOT has dedicated additional staff to ensure that construction projects are designed for proper accessibility, to manage the ADA investment program, and to provide leadership on accessibility to external partners.

Strategies

Continue APS installations for signal replacements and additions. APS provides directions in multiple formats including verbal messages, audible tones and vibrating surfaces.

Standard Design Guidance for sidewalks and curb ramps. MnDOT's design guidance is

How we decide

Stakeholder input is provided through three committees and gathered by the MnDOT ADA implementation coordinator. The MnDOT ADA Accessibility Advisory Committee includes individuals with various disabilities, representatives from the Minnesota State Council on Disability, and the Metropolitan Council. Within MnDOT, the ADA Advisory Committee provides direction on the integration of ADA policy and practice into project delivery and operations. The ADA Implementation Committee includes engineers from each district who provide technical support, track requests for improvements and serve as points of contact.

The ADA Transition Plan includes guidance on prioritizing necessary improvements. Intersections are selected for conversion to APS using a rating tool. Considerations also include:

- pedestrian use,
- surrounding properties, such as schools or medical facilities,
- transit presence and
- citizen requests.

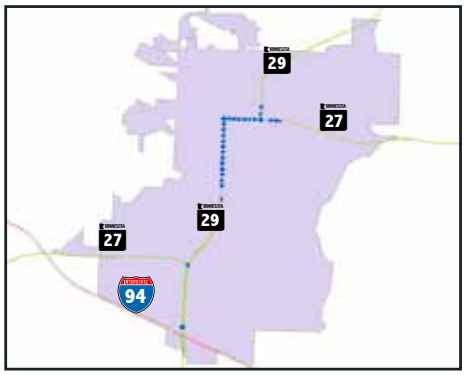
For curb ramps and sidewalks, the inventory data will help identify barriers within the system and prioritize needs. Construction project managers in each MnDOT district are responsible for determining what is necessary for their projects to meet ADA requirements. MnDOT is developing statewide design guidance for accessibility, and working on including it earlier in the design and right-of-way acquisition phases of project development.

ADA curb ramp compliance

District	Total curb ramps inventoried	# Completely compliant	# Compliant slope and landing
1 - Duluth	1698	4	11
2 - Bemidji	806	70	190
3 - Brainerd	1754	141	217
4 – Detroit Lakes	1308	49	151
6 - Rochester	2587	179	920
7 - Mankato	601	17	71
8 - Willmar	1798	60	229
Metro*	2412	419	602

* Metro District has completed approximately 25% of its inventory
Source: MnDOT

City of Alexandria curb ramp locations



Source:MnDOT

Above is a sample curb ramp inventory map for the City of Alexandria. The green lines are state highways through the city, and the blue dots are curb ramps for which MnDOT is responsible. The first goal of the inventory is to document the facilities that exist, not necessarily their quality. The policy is to replace ramps that are structurally deficient before addressing those that are functionally substandard or obstructed.

What we are doing (cont.)

being updated to reflect accessibility needs. Design issues include the width and slope of sidewalks and the presence of any barriers.

Rest Area improvements including signing, sidewalk repairs and modifications to drinking fountains and restroom fixtures.

Establish citizen input process for MnDOT to respond to user concerns about the accessibility of its facilities.

Innovations

- MnDOT is exploring alternative contracting methods that will allow the bundling of accessibility improvements to provide more cost-effective, higher quality projects.
- MnDOT's Complete Streets policy places additional emphasis on providing transportation facilities that are accessible to users of all abilities.
- Context Sensitive Design encourages broader consideration of the environment affected by a project and is another area where progress toward greater accessibility is being made.

Investment/spending

Most accessibility improvements are made as parts of larger projects. The accessibility components can range from including curb ramps in an intersection reconstruction to adding major elements such as the pedestrian facilities planned for the river bridge at Hastings. As a rough estimate, 1 to 2 percent of a project's cost goes toward pedestrian accommodations. In addition to the regular construction program, MnDOT has dedicated $2.5 million per year from 2010 to 2014 specifically for ADA improvements.

Because the accessibility of curb ramps is lower than anticipated, routine projects may not suffice to correct deficiencies in a timely fashion. The investment needed to correct sidewalk deficiencies will be known when the sidewalk inventory is complete, but a similarly low level of compliance is expected. To accelerate progress, MnDOT will need to explore additional dedicated funding sources.

Learn more

Accessibility and MnDOT
Kristie Billiar—kristie.billiar@state.mn.us
www.dot.state.mn.us/ada/

U.S. Department of Justice ADA Home Page
www.ada.gov/

Complete Streets
www.dot.state.mn.us/planning/completestreets/

Biking, Walking & Public Transit

COMMUNITY DEVELOPMENT & TRANSPORTATION

Measures

Bike, walk and public transit share of commuter trips–Larger metropolitan areas

Percent of people 16 or older who commute to work by bicycle, walking and/or public transportation as their primary mode. Source: American Community Survey, US Census.

System

Transit infrastructure, bike facilities, pedestrian facilities, and transitways in Minnesota metropolitan areas with population over 65,000 people.

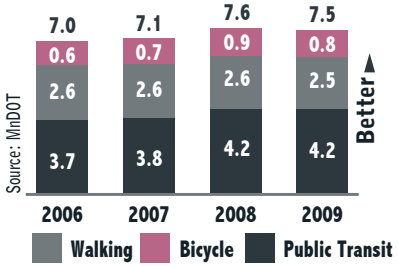
Why this is important

The benefits of riding a bicycle, walking or using public transportation include improved environmental and personal health, reduced traffic congestion, enhanced quality of life, and economic rewards.

MnDOT is providing an integrated multimodal transportation system by "promoting and increasing bicycling and walking as a percentage of all trips as energy-efficient, non polluting, and healthy forms of transportation; and by increasing the use of transit as a percentage of all trips giving the highest priority to the transportation modes with the greatest people-moving capacity and lowest long-term economic and environmental cost"(Minnesota Statutes 2010 Section 174.01).

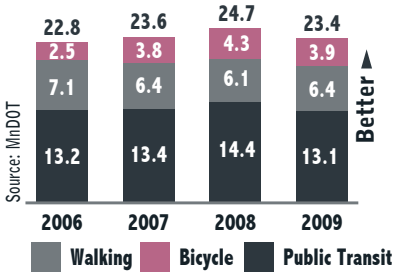
Source: MnDOT

Commuting to work in selected metro areas* (percent bike, walk and public transit)



* Mpls.-St. Paul-Bloomington, Duluth, Mankato-North Mankato, Rochester and St. Cloud

Commuting to work in Minneapolis (percent bike, walk and public transit)



Commuting to work in major Mn cities: percent bike, walk and public transit

Commuter Trips by Mode in Selected Metro Areas	% change 06-09
Bicycle	24.5%
Walking	-6.2%
Public transportation	14.5%
Total Share	7.6%

Source: MnDOT

Commuting to work in Minneapolis: percent bike, walk and public transit

Commuter Trips by Mode in Minneapolis	% change 06-09
Bicycle	54.6%
Walked	-9.9%
Public Transportation	-0.7%
Total share	2.5%

Source: MnDOT

Our progress

Bicycling numbers continue to increase in the state, while walking remains steady. Biking data shows an increase of 24.5% from 2006 to 2009. Workers commuting by public transit decreased 0.5% from 2008 to 2009 but showed an overall increase of 14.5% from 2006 to 2009. The share of workers walking decreased 1.5% from 2008 to 2009 and 6.2% from 2006 to 2009. Altogether, the total share of workers in the selected metro areas commuting by the three modes decreased 1.9% from 2008 to 2009, it increased 7.6% from 2006 to 2009.

From 2006 to 2009, the share of Minneapolis commuters bicycling increased 55%, while the share walking decreased 10% and the share of workers using public transportation remained steady. Overall, Minneapolis's bike, ped and transit mode share increased just 0.6 percentage points, from 22.8% to 23.4%, but this increase was made significantly smaller by the recession. The percentage of Minneapolis residents biking, walking and riding transit to work is increasing, driven primarily by rapid growth in bicycling.

In the past several years, Minneapolis has invested in important infrastructure improvements, a number of education and encouragement initiatives, as well as planning and evaluation. The opportunity to realize mode shift in other communities throughout the state exists.

What we are doing

MnDOT and its partners are designing, building, and operating a safer and more livable road network for all users—bicyclists, public transportation vehicles and riders, and pedestrians of all ages and abilities.

Because bicycling and walking are critical components of Minnesota's multimodal transportation system MnDOT is expanding its efforts in the five Es:

- **Enforcement**,
- **Engineering**,
- **Education**,
- **Encouragement**, and
- **Evaluation**.

Strategies

Enforcement—MnDOT provides materials to law enforcement officers. They regularly use Share the Road materials when giving out warnings and citations to motorists and bicyclists.

Engineering—MnDOT provides technical assistance to cities, counties, Metropolitan Planning Organizations, and Regional Development Commissions to accomodate bicyclists and pedestrians in construction projects and in developing bicycle and pedestrian plans.

Education—MnDOT's Share the Road campaign gives motorists and bicyclists safety information that addresses common crash scenarios.

Source: MnDOT

Source: MnDOT

How we decide

When making decisions about bicycling, walking, and public transportation, MnDOT uses the Context Sensitive Solutions approach to involve all stakeholders in a solution that fits its setting and enhances scenic, aesthetic, historic, community, and environmental resources, while improving safety, mobility, and infrastructure.

Biking and walking improvements in Greater Minnesota: 2010

Dist.	Project Description	Agency	Cost
1	Mn175: Mesabi Trail—McKinley to Biwabik ped/bike trail.	MnDOT	$900,000
2	Baudette parks ped/ bike trail—Phase II.	County	$63,445
3	Mn173: construct bicycle and pedestrian trails in the Cuyuna Recreation Area.	County	$476,786
4	Pedestrian underpass at us 75 and 40th Ave.	City	$439,045
6	ADA improvements districtwide—install APS signals; replace, retrofit, or install pedestrian curb ramps.	MnDOT	$533,505
7	Trail around Butterfield lake.	County	$219,383
8	Ped./Bike trail along the Redwood River in Marshall	County	$327,695

Source: MnDOT

What we are doing (cont.)

Encouragement—MnDOT works with partners throughout the state to encourage active transportation. The Minnesota Department of Health's Statewide Health Improvement Program encourages biking and walking, including walking and biking to school.

Evaluation and Planning—MnDOT develops and implements the Minnesota Statewide Bicycle Policy Plan. The goal of the plan is to improve conditions for bicycling on Minnesota roads.

Complete Streets—Minnesota has adopted a Complete Streets law. MnDOT's Complete Streets activities include:

- developing a balanced transportation system that integrates all modes, and
- including transportation users of all types, ages and abilities.

The law also encourages local agencies to adopt their own policies. Ten cities, one county, and one Metropolitan Planning Organization have enacted Complete Streets Resolutions, policies or plans.

Innovation

MnDOT supports research and innovation for the Multimodal Cyclopath—a free online web-based application developed by the University of MInnesota that allows users to create, edit, and rate their own bike routes on a regional basemap.

Sustainability

Encouraging drivers to bike, walk and use public transportation meets environmental, civic engagement, and economic goals of sustainability. Ridesharing Services provided by the Met Council offer additional transportation choices for commuters currently driving alone. Metro Transit works with individuals and business to develop alternatives to solo driving.

Ridesharing Services Accomplishments

Year	Trips (000)	Miles (000)	CO2 tons	Fuel Savings gal
2009	52	376	179	18,775
2010	197	2,193	667	106,000

Source: Met Council Perform Evaluation Reports 2009-2010

Investment/spending

In 2010, MnDOT provided an estimated $6 million for non-motorized transportation projects across the state. About $27 million was administered at the local level.

Minneapolis and its surrounding cities received a federal pilot grant of nearly $25 million to implement the Nonmotorized Transportation Pilot Program (NTPP) until 2010. The NTPP consists of infrastructure and operational improvements as well as education and promotion programs aimed to demonstrate how improved walking and bicycling networks can increase rates of walking and bicycling.

For Comparison

In 2009, Minneapolis was ranked #2 out of 70 cities for its share of bicycle commuters, behind Portland, Oregon. Source: League of American Bicyclist, US Census—2009 ACS data.

In the 2011 League of American Bicyclists U.S. rankings, Minnesota is 4th among the states.

Learn more

Bicycle Alliance of Minnesota (BikeMN)
www.bikemn.org/

Share the Road – Minnesota's Bicycle Safety Education Program
www.sharetheroadmn.org/

Complete Streets in Minnesota
www.dot.state.mn.us/planning/completestreets/

Statewide Health Improvement Program (SHIP)
www.health.state.mn.us/healthreform/ship/

Parks and Trails Legacy Grant Program
www.dnr.state.mn.us/grants/recreation/pt_legacy.html

Bicycling in Minnesota
www.dot.state.mn.us/bike/

Twin Cities CycloPLAN
www.bikewalktwincities.org/projects/robbinsdale/cycloplan

Fuel Use

ENERGY AND THE ENVIRONMENT

Measures

Gallons of transportation fuel consumed in Minnesota

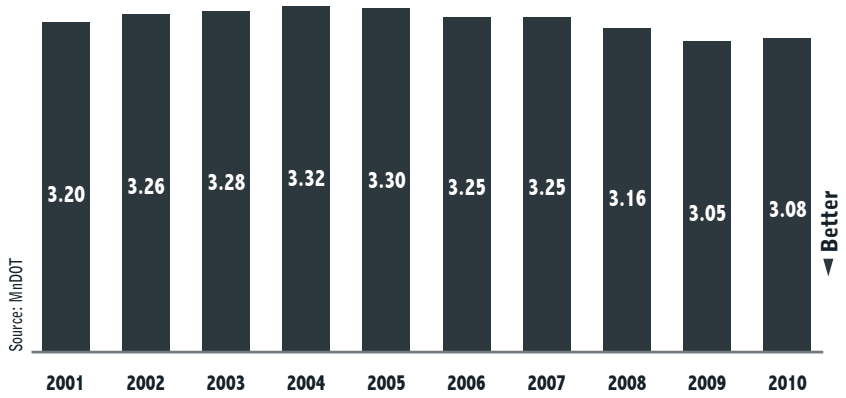
System

All taxable sales of gasoline and diesel fuel, including fuel sold for off-road use except aviation

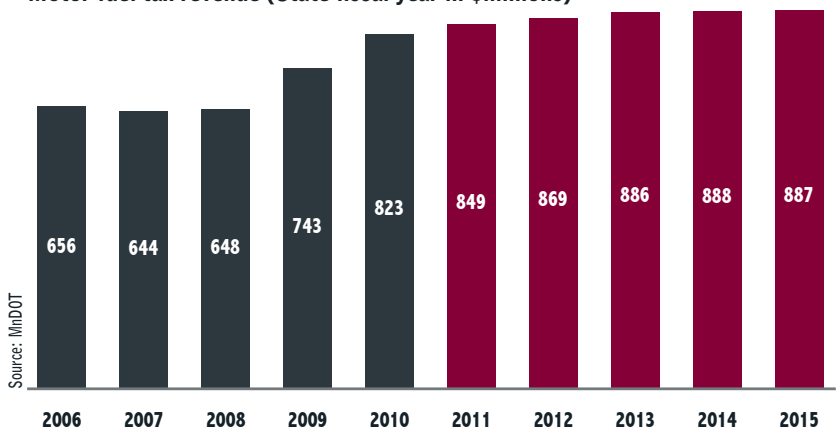
Why this is important

The 2007 Minnesota Next Generation Energy Act established greenhouse gas reduction goals of 15 percent by 2015, 30 percent by 2025, and 80 percent by 2050 compared with 2005. These goals apply to all sectors of the economy, as well as cities, counties and state agencies. In Minnesota, transportation is responsible for about 24 percent of greenhouse gas emissions. Reducing petroleum fuel consumption along with other strategies can help the state achieve these goals.

Transportation fuel consumption in Minnesota (calendar year, billions of gallons)



Motor fuel tax revenue (State fiscal year in $millions)



2011-15 forecast in February 2011

Our progress

In Minnesota, fuel use was up slightly in 2010 compared to 2009 as the economy began to recover. Transportation fuel consumption had declined from 2004 to 2009 after a long period of steady growth. At about the same time, the state saw a slowing and leveling off in annual vehicle miles of travel (VMT) which had increased consistently until 2004.

Transportation fuel consumption and travel reflect broad economic conditions. Other factors reducing fuel consumption include more efficient vehicles and peaking in the number of vehicles owned per driver. To meet the goal set in the Next Generation Act, transportation fuel use would decrease to 2.92 billion gallons by 2015.

State and federal fuel taxes are major sources of transportation funding. Revenue from the Minnesota state fuel tax is increasing because the tax increased passed in 2008 is still being phased in. After the increase is fully applied in 2012, state fuel tax revenue is expected to be flat through 2015 after a slight increase in 2013. Federal fuel tax revenue also is affected, as VMT is one of the factors used to apportion the funds among states.

What we are doing

The legislation that created MnDOT was amended in 2008 and again in 2010 to add environmental goals for the transportation system. These include increasing the use of high-occupancy and low-emission vehicles, promoting bicycling and walking as energy efficient, nonpolluting forms of transportation and reducing greenhouse gas emissions from the transportation sector.

Strategies

In a 2008 report titled "A Smaller Carbon Footprint," the University of Minnesota Center for Transportation Studies suggested three broad strategies for reducing transportation's contribution to greenhouse gas emissions. Reducing emissions requires broad participation by the traveling public, the private sector and public agencies.

- **Reducing fuel consumption** per mile by improving vehicle fuel efficiency and creating regulations and incentives that lead consumers to purchase more efficient vehicles.
- **Reducing fuel carbon content** by developing new technologies for electric vehicles or biomass fuels, economic incentives and legislation.
- **Reducing vehicle miles** traveled by increasing development density, increasing non-auto mode share and facilitating land use patterns that reduce the number or length of necessary trips.

Additional strategies include:

- **Making the transportation system more efficient** by reducing congestion, delay, fuel consumption and emissions.
- **Changing personal driving habits to maximize fuel economy,** for example, by reducing idling time and accelerating and braking less aggressively.

Sustainability

MnDOT has limited influence on statewide transportation fuel consumption, but is pursuing approaches to make its own large fleet more fuel efficient. MnDOT is increasing its use of cleaner fuels along with other strategies to reduce emissions and improve energy efficiency in its fleet and facilities. However, in any given year, the total amount of fuel MnDOT uses depends largely on weather conditions and the size of the construction program.

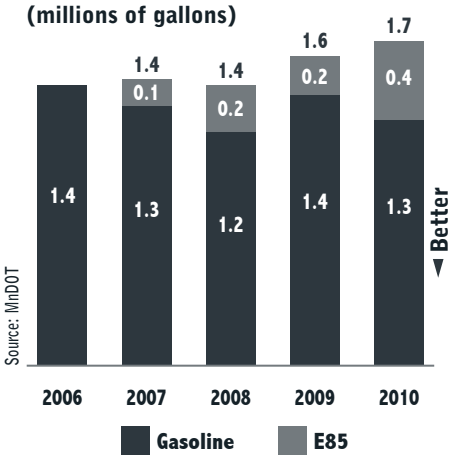
MnDOT has increased its use of E85 from 29 gallons in 2002 to more than 400,000 gallons in 2010, and increased its use of B20 biodiesel from 1260 gallons in 2007 to 182,000 gallons in 2010.

How we decide

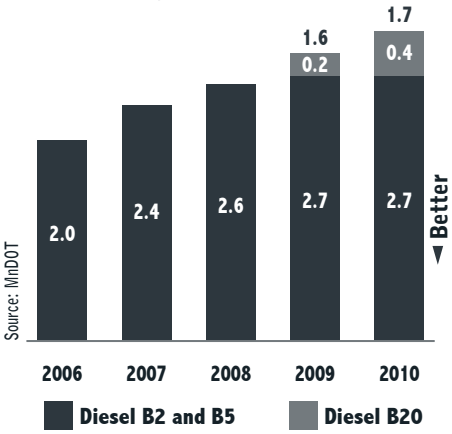
While MnDOT does not have any authority over individual travel choices or local land use decisions, it does plan, facilitate and promote the use of transportation alternatives. The Statewide Transportation Policy Plan 2009-2028 sets forth key components of this vision. Citizens, local officials, regulators, planners, developers and fleet operators all make decisions that influence fuel consumption and emissions.

Minnesota vehicle miles traveled 2001-2010 (billions)

MnDOT fleet gasoline use (millions of gallons)



MnDOT fleet diesel use (millions of gallons)



For comparison

In 2009, Minnesota ranked 25th of the 50 states by per capita gasoline use in the transportation sector, according to MnDOT analysis of data from the U.S. Energy Information Agency and the U.S. Census.

What we are doing (cont.)

MnDOT has 1600 light-duty vehicles in its fleet. Of these, 863, or 54 percent, are flex-fuel and can run on ethanol blends of up to 85 percent. When vehicles that can run on biodiesel are included, 56 percent are capable of running on cleaner fuels.

The types of vehicles and fuels used by MnDOT and other state fleets are guided by Minnesota law (Minn. Stat. Sec. 16C.135 and Sec. 16C.137.) Agencies are directed to purchase cleaner fuels, such as ethanol blends of 70 percent or greater and biodiesel blends of 20 percent or greater, whenever they are reasonably available. Subject to department needs, new on-road vehicles are to have fuel efficiency ratings of at least 30 miles per gallon and be able to run on cleaner fuels.

MnDOT light duty vehicle purchases

State Fiscal Yr	Light Duty E-85	Light Duty Total	% E-85
2004	52	242	21.5%
2005	62	175	35.4%
2006	71	106	67.0%
2007	118	136	86.8%
2008	46	53	86.8%
2009	192	219	87.7%
2010	162	178	91.0%

Source: MnDOT

Investment/spending

Congestion is a large and visible source of emissions. Projects that reduce congestion have a direct environmental benefit. The 2011-2014 State Transportation Improvement Program includes $198 million in federal congestion mitigation/air quality grant projects. Typical uses of grant funds include signal coordination, bus purchases and park-and-ride facility construction.

Source: MnDOT

Learn more

MnDOT Office of Environmental Stewardship

Frank Pafko, Chief Environmental Officer—frank.pafko@state.mn.us
www.dot.state.mn.us/environment/

University of Minnesota Center for Transportation Studies: A Smaller Carbon Footprint, June 2008

www.cts.umn.edu/Research/Featured/GreenhouseGas

USDOT Transportation and Climate Change Clearinghouse

www.climate.dot.gov

MnDOT Office of Transportation Data and Analysis – Traffic volume reports

www.dot.state.mn.us/traffic/data/html/traffic.html

Measure explanations and system definitions

Measure	Explanation	System Definition
traveler safety		
Minnesota Traffic Fatalities	This measure counts the annual number of deaths on all state and local roads resulting from crashes, usually involving a vehicle colliding with another vehicle, another road user, or a stationary object.	All state and local roads (141,000 miles) 58% state, 42% local (includes CSAH & MSAS) by vehicle-miles traveled
infrastructure preservation		
Bridge Condition	This measure is compiled from inspection ratings done for all state highway bridges at least every 24 months, as required by the U.S. Department of Transportation. The combined numeric rating includes the deck, superstructure and substructure. It uses the National Bridge Inspection Standards (NBIS) 0 to 9 scale. Bridges rated 7 to 9 are counted as "Good," and those rated 4 or lower are counted as "Poor," also termed "Structurally Deficient." Bridges rated Structurally Deficient are safe to drive on, but are approaching the end of their useful life. To arrive at the statewide percent measure, results are weighted based on each bridge's deck area, so that larger bridges are fully accounted for.	Bridges 20 feet and longer on State Highway Principal Arterials (2876 bridges). Principal Arterial bridges are 85% of all state bridges by deck area. Non-Principal Arterial Bridges make up only 15% of deck area; they are measured but not reported here due to the small share.
Pavement Ride Quality	The Ride Quality Index (RQI) measures smoothness and pavement condition. It uses a 0 to 5 scale with 5 being the best. Pavements with an RQI above 3.0 are classified as Good. Pavements with an RQI of 2.0 or lower are classified as Poor. Pavements rated "Poor" have deteriorated to the point where they may affect the speed of free-flow traffic. The pavement measures are broken into two sub-sets of state highways - one for Principal Arterials (the 53% of roadways with the highest traffic), and one for Non-Principal Arterials (the other 47% of state highways). It is more costly to repair a pavement once it deteriorates to poor condition than it is to maintain it in good condition.	Of the 14,310 miles of state highways, 7570 miles or 53% are principal arterials. The remaining 6740 miles (47%) of minor arterials and collectors are grouped together as non-principal arterials.
maintenance		
Snow and Ice—Frequency of Achieving Bare Pavement within Target Time	Target times for removing all snow and ice to bare pavement vary for 5 traffic volume categories: super commuter (0-3 hours), urban commuter (2-5 hours), rural commuter (4-9 hours), primary collector (6-12 hours), and secondary collector (9-36 hours). This measure tracks the frequency at which targets are met. Targets are based on research with Minnesotans and on historical results.	State highways (approximately 30,000 lane miles). All storms and snowplow routes are included.
Bridge Safety Inspections—% completed on time	This measure is compiled from the inspection dates in the Pontis bridge database, which are recorded upon completion. All bridges over 20 feet in length that either carry or cross over a state highway are included. An inspection is considered "on-time" if it occurs no later than 30 days past its due date. This 30-day grace period accounts for variable conditions such as weather and scheduling.	All bridges 20 feet and longer that carry or cross over a state highway (3657 bridges)
Customer Satisfaction with State Highway Maintenance	The MnDOT Omnibus Survey polls a statewide sample of 800 citizens annually by telephone. Participants are asked to rate performance in several maintenance categories and overall state road maintenance on a 10-point performance scale, 1 being low and 10 high.	Overall state highway system.
national and global connections		
Airline Annual Available Seat Miles from MSP—on scheduled commercial flights	This indicator tracks changes in the number of available seat miles—defined as one aircraft seat flown a distance of one mile—offered on scheduled service nonstop flights from Minnesota. Three variables influence available seat mile totals: service frequency, aircraft capacity, and flight distance.	Eight Minnesota airports provide scheduled service: Minneapolis-St. Paul, Bemidji, Brainerd, Chisholm/Hibbing, Duluth, International Falls, Rochester, and Thief River Falls.
Ports—Annual shipments by weight	Annual shipments to and from Minnesota's river and Great Lakes ports are measured by weight. Waterway shipments are affected by international and domestic demand, competition from other modes and weather conditions. MnDOT has minimal control over this measure, but helps fund improvements and coordinate policy.	Minnesota has four ports on Lake Superior (Duluth, Two Harbors, Silver Bay and Taconite Harbor) and five ports on the Mississippi River system (Minneapolis, St. Paul, Savage, Red Wing and Winona).
Railroads—Annual shipments by weight	Annual rail shipments originating, terminating and passing through Minnesota are measured by weight. Shipments are affected by international and domestic demand, competition from other modes and other economic factors such as fuel prices. MnDOT has minimal control over this measure, but helps fund improvements and coordinate policy.	All railroads in Minnesota are included (20 operators on 4631 track miles)

Measure	Explanation	System Definition
statewide connections		
Interregional Corridors in Greater MN—% of Miles Meeting or within 2 mph of Target Speed	Average travel speeds between regional centers and to the edge of the Twin Cities Metro Area are estimated. Corridor target speed is a length-weighted average of segment targets, which are 55 or 60 mph. The model is based on traffic volume, congestion severity and the number of stops along the corridor.	2939 miles of state highways are designated interregional corridors. Routes in Greater Minnesota (2690 miles) are included here. Routes within the Twin Cities area (249 miles) are tracked by the Twin Cities mobility measures.
Airport Access—% of Population within 20 Miles of an Airport with Paved and Lighted Runway	A paved and lighted runway allows a broader range of aircraft to use an airport, especially during periods of reduced visibility. General aviation access is vital for business and agriculture, recreation, and delivery of goods. This measure includes public airports across Greater Minnesota and in the Twin Cities area.	The measure includes all 136 publicly-owned airports in Minnesota, 118 of which currently have paved and lighted runways.
twin cities mobility		
Twin Cities freeway congestion: Percent of miles below 45 mph in AM or PM peak	Freeway miles operating below 45 mph for 5 minutes or more during weekday AM or PM peak periods are counted. The system measured has increased from 320 miles in 2003, decreasing the average congestion level with the addition of uncongested suburban freeway miles.	The instrumented system includes 379 centerline miles of freeway in the Twin Cities metropolitan area.
Clearance Time for Metro Urban Freeway Incidents—3-year average	This measure tracks the time it takes MnDOT and partners to clear incidents on the Metro Area freeway system, such as stalled cars, crashes and other disruptions to normal traffic flow. Time is counted from lane blockage to lane opening.	The Freeway Incident Response Safety Team operates on about 400 miles of Twin Cities area freeways.
MetroArea Transit: Rail and Express Bus	This measure tracks annual ridership of rail and express transit service in the Twin Cities Metro Area. Services included are express bus, bus rapid transit, light rail, and commuter rail. Express bus services are those that provide a premium over regular-route bus service in travel time or ride quality.	All providers are counted. Metro Transit is the largest provider. Others include Southwest Transit, Minnesota Valley Transit, Maple Grove, Shakopee, Minnetonka, Plymouth and Prior Lake.
greater minnesota mobility		
Greater Minnesota Bus Service Hours	This measure tracks the extent to which transit needs are met in Greater Minnesota. It measures bus service hours against the number of bus service hours needed to meet transit demand. A bus service hour measures the time that a vehicle is available to the general public with the expectation of carrying passengers (often referred to as a "revenue hour" in the transit industry).	Greater Minnesota transit systems (59 providers serving 77 of 80 counties). Local transit operators sponsored by cities, counties, or regional authorities provide regularly-scheduled bus service or dial-a-ride services.
community development and transportation		
ADA-Accessible Pedestrian Signals—% of state highway intersections with APS	This measure is expressed as a percentage of signalized intersections that meet ADA requirements for accessibility to people with disabilities. Accessible Pedestrian Signals (APS) include such components as audible signals, reachable push-button detectors and curb ramps oriented toward the crosswalk.	ADA applies to all pedestrian and public right of way facilities, and also to public hearings, meetings, buildings and documents. In addition, MnDOT is responsible for assisting local governments with compliance of streets, highways and pedestrian facilities. The measure tracks 1179 intersections on the state highway system.
Bike, walk and public transit share of commuter trips—Selected metropolitan areas in Minnesota	Percent of people 16 or older who commute to work by bicycle, walking and/or public transportation as their primary mode in Minneapolis-St. Paul-Bloomington, Duluth, Mankato-North Mankato, Rochester and St. Cloud. Source: American Community Survey, US Census.	American Community Survey data only available for larger Minnesota municipalities.
energy and the environment		
Transportation Fuel Consumption—Billions of gallons sold in Minnesota	Fuel sold for transportation is assumed to indicate fuel burned, causing emissions attributable to transportation. To be consistent with other reports, the DNR share of fuel tax receipts (for boats, ATVs, dirt bikes, snowmobiles) is not subtracted. This share amounts to about 2.2% of total fuel use.	All taxable sales of gasoline and diesel fuel are counted, including fuel sold for off-road use but not including aviation fuel.

Revenue and Investment Overview

Transportation is the third largest state program in Minnesota after Health and Human Services and Education. According to Minnesota Management and Budget's november 2010 forecast, transportation represents nearly 10 percent of 2010-11 state operating funds.

Sources

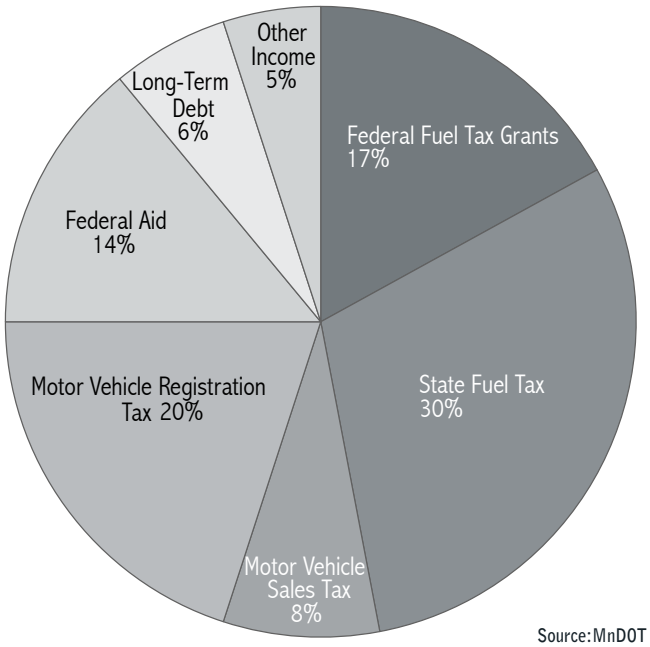
Each mode of transportation is funded in its own way. The largest sources of state highway funds are the motor fuel tax, motor vehicle sales tax and vehicle registration fees. Federal fuel taxes and earmarks are also major sources of highway funding. Transit also receives federal funds and a portion of motor vehicle sales tax proceeds, along with fares and other local sources. The state general fund is also an important source of transit dollars, especially in Greater Minnesota. Other modes such as ports, railroads and aeronautics are funded by various combinations of federal, state, local and private sources. The limited ability to distribute funds across modes presents a challenge for multimodal transportation system planning.

Uses

The largest share of transportation investment is devoted to roads and bridges. In state fiscal year 2010, state and local roads and bridges accounted for 64 percent of Minnesota state transportation funds. The state contribution to local road funding is only a portion of the total. Local governments collect additional funds from sources such as property taxes that are not included in these charts. Large individual projects can cause expenditures to vary significantly from year to year.

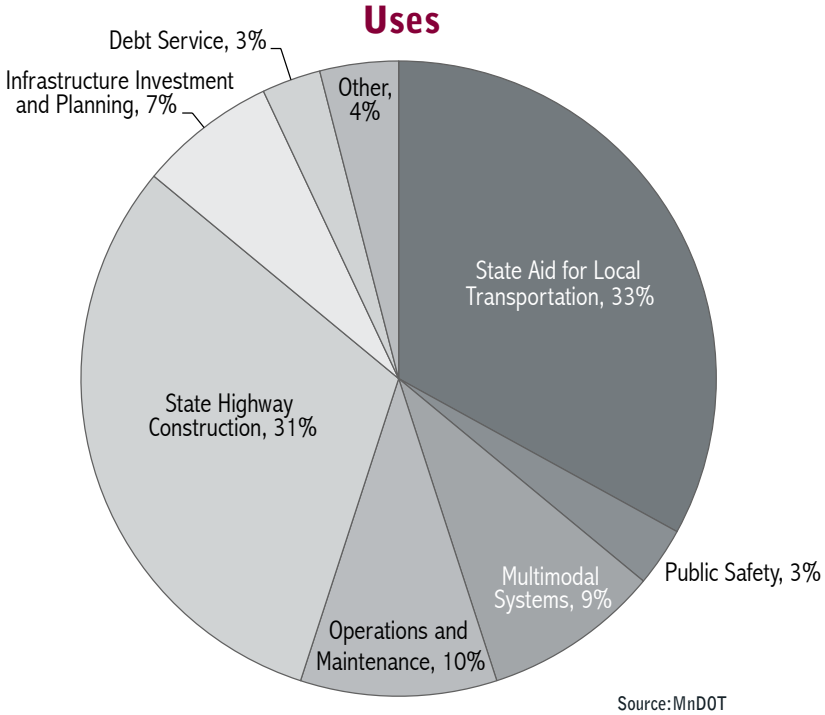
Funding: $2.72 billion in 2010

Sources



Source: MnDOT

Uses



Source: MnDOT

Statewide Highway Investment Plan

In 2009, MnDOT adopted a long-range Statewide Highway Investment Plan for 2009-2028. This plan identified system needs and priorities for 20 years of projected revenue. The goal of MnDOT's highway investment process is to balance performance-based investments in the strategic priority areas of traveler safety, infrastructure preservation and mobility with projects to benefit regional and community economic development. The 10-year Highway Investment Plan is updated each year to incorporate new revenue projections, current construction costs and changing investment priorities.

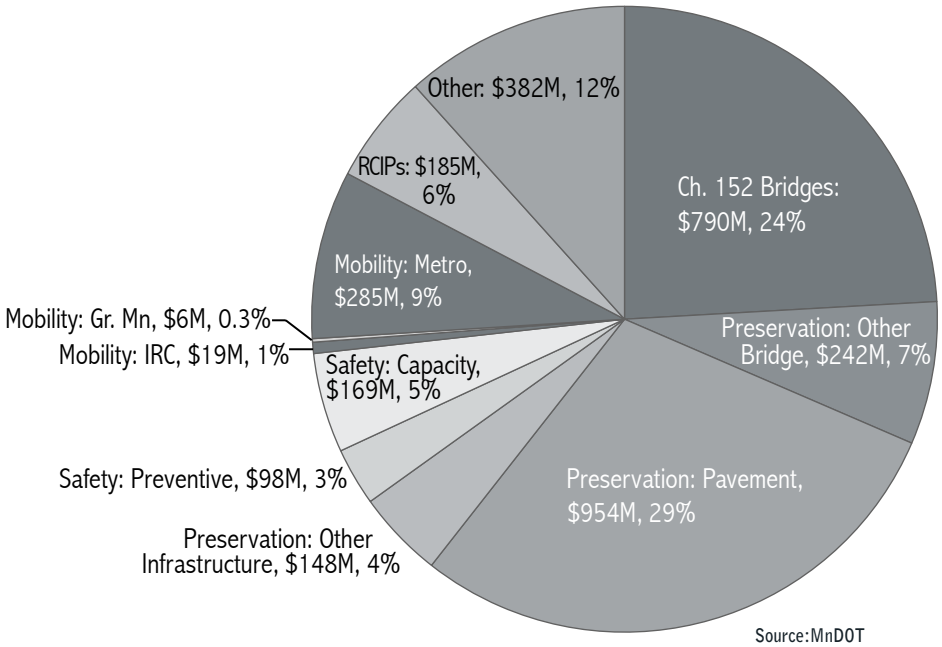
Since the identified needs far exceed projected funding, districts are directed to prioritize in the following order:

1. Legislative and agency directives, such as the Chapter 152 Bridge Program, interchange programs and other directed investments should be fully funded.
2. Approximately 85 percent of bridge preservation needs should be met.
3. Traveler safety should be funded at about three times each district's Highway Safety Improvement Program goal.
4. 70 percent of the remaining funds should be directed to pavement preservation.
5. Appropriate investment should be made to maintain other infrastructure such as drainage and ADA improvements.
6. Remaining funds are allocated among capacity improvements for mobility, and regional and community priorities.

Investments included in the 2011-2014 State Transportation Improvement Program are shown at right. The combined preservation investments for bridges, pavement and other highway infrastructure make up the largest portion of capital highway investment at 65 percent.

The trend in total construction program funding is shown in the chart to the right. Trunk Highway bonding and the American Recovery and Reinvestment Act provided an increase in funding starting in 2009. Outside of these temporary sources, MnDOT's regular program funding level is currently forecast to remain level, averaging about $635 million per year.

2011-14 STIP: $3.3 billion

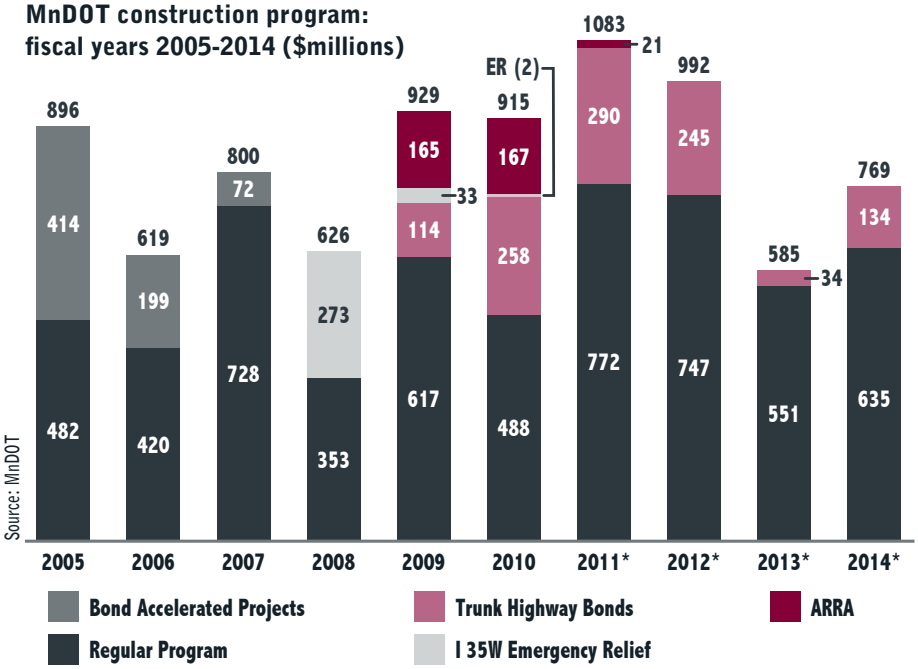


Source: MnDOT

Priority	2011-14 STIP
Preservation—65%	$2,134 M
Safety—8%	$267 M
Mobility—9%	$310 M
Regional & Community Improvements—6%	$185 M
Right-of-way, Supplemental Agreements, Other—12%	$382 M
Totals	$3,278 M

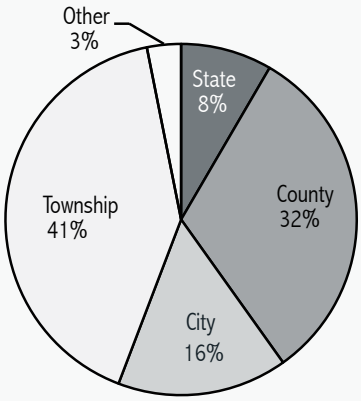
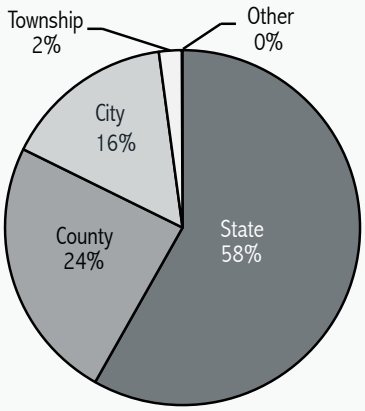
Source: MnDOT

MnDOT construction program: fiscal years 2005-2014 ($millions)



*Based on the 2011-14 STIP, Bonding Plan and other pertinent facts
The Construction Program includes right-of-way, construction related agreements & program delivery for bonds in addition to actual construction contracts. All dollars assigned to year of award.

Transportation systems in Minnesota

	System	Extent	Ownership	Funding source	MnDOT role
Streets, roads and highways	State Trunk Highways	11,896 miles	by share of centerline miles:  by share of vehicle-miles traveled: 	State fuel tax, motor vehicle sales tax, registration fees, federal funds	Construction, operation, maintenance, management
	County State Aid Highways (CSAH)	30,548 miles		State fuel tax, motor vehicle sales tax, registration fees, federal funds, local funds	Coordination of projects that impact state trunk highways, administration of state and federal funding (68% of county roads are eligible for state aid funds)
	Other County Roads	14,348 miles			
	Municipal State Aid Streets (MSAS)	3321 miles		State fuel tax, motor vehicle sales tax, registration fees, federal funds, local funds	Coordination of projects that impact state trunk highways, administration of state and federal funding (15% of city streets are eligible for state aid funds)
	Other City Streets	18,837 miles			
	Township	58,101 miles		State and local funds	Coordination of projects that impact state trunk highways
	Other	4431 miles			
	Total	141,482 miles			
Transit	Twin Cities area	218 bus routes, 1 light rail route, 1 commuter rail line	Metro Transit, Suburban Transit Providers and contracted operators on public right-of-way	Federal funds, state general funds, MVST, local funds, fares	Construct and maintain transit infrastructure
	Greater Minnesota	59 public transit systems serving 77 counties	City and county transit authorities		Planning and administration of funding
Rail	Freight	4631 track-miles	20 railroads operate and own track: 4 Class I (70% of network) and 16 Class III (30%)	Private funds for operations, state and private funds for track	Planning and policy, support for infrastructure improvements
	Passenger	Amtrak Empire Builder (Chicago to Seattle)	Federally operated on privately-owned track	Federal funds, fares	Planning, policy, research, federal and state program administration
Air	Passenger and cargo	136 airports, 8 with commercial service	Metropolitan Airport Commission owns 9 metro airports; Others are owned by Greater Minnesota cities and counties	Aircraft registration tax, airline flight property tax, aviation fuel tax, federal funds	Airport development, planning, research, navigational systems
Waterways	Great Lakes	Four ports on Lake Superior	Local port authorities and private companies provide port operations. Channels (9 ft. draft on rivers, 29 ft. on Great Lakes) are maintained by the U.S. Army Corps of Engineers.	Local port authority receipts, state general funds, federal funds	Planning and policy, support for infrastructure improvements
	Rivers	Five ports on 222 miles of the Mississippi River system			